Support to Iberian lynx reintroduction and perceived impacts: Assessments before and after reintroduction

Miguel Delibes-Mateos | Jenny Anne Glikman | Regina Lafuente | Rafael Villafuerte | Fernando E. Garrido

Instituto de Estudios Sociales Avanzados (IESA-CSIC), Córdoba, Spain

Correspondence
Miguel Delibes-Mateos, Instituto de Estudios Sociales Avanzados (IESA-CSIC), Campo Santo de los Mártires 7, Córdoba 14004, Spain.
Email: mdelibes@iesa.csic.es

Funding information
Environmental Agency of the Andalusian Ministry of Environment and Spatial Planning

Abstract
The assessment of the human dimensions of wildlife reintroduction projects is essential for their success. To date, few longitudinal studies (if any) have compared attitudes and perceived impacts before and after human-assisted large predator reintroduction. In this study, we evaluated public (n = 1582) and hunters’ (n = 773) support and perceived benefits and concerns before and after the reintroduction of the Iberian lynx (Lynx pardinus) (2007–2008 and 2015–2016, respectively) in southern Spain through a telephone survey. Most respondents supported lynx reintroduction, although support was slightly lower among hunters. Furthermore, support remained very high some years after lynx release. Our findings also revealed that perceptions toward the majority of benefits and concerns did not change after lynx reintroduction, and that those supporting reintroduction perceived more benefits, while opponents were more concerned. This suggests that efforts should focus on those opponents to reintroduction to ensure recognition of the benefits associated with predator restoration, including new tourism opportunists and predator’s ecological values. Our research also points at the need of studying more in depth the views of those who oppose to predator reintroduction and of decision-makers (e.g., landowners or game managers) when poaching is still a risk for restored populations even if the social context is favorable, as in our case-study.

KEYWORDS
attitudes, big cats, human dimensions of wildlife, human-wildlife conflict, hunting, large predator conservation, longitudinal study, questionnaire survey

1 | INTRODUCTION

In the context of the current biodiversity crisis (IPBES, 2019), wildlife reintroduction has become an increasingly common conservation strategy (Gaywood et al., 2021; Jachowski et al., 2016; Pettorelli & Du Toit, 2019). Briefly speaking, reintroduction is returning a species that was locally extinct back to where it used to live (Corlett, 2016). Large carnivores have been often the focus of reintroduction projects because their return is
thought to be essential to restore trophic interactions and promote self-regulating biodiverse ecosystems (Ripple et al., 2014; Svenning et al., 2016).

At the same time, the reintroduction of large carnivores is often conflictive because of their depredation of domestic animals and/or game species and the fear they cause for human safety (e.g., Červený et al., 2019; Piedallu et al., 2016; Williams et al., 2002). Therefore, addressing public attitudes toward the reintroduction of large carnivores is often indispensable to the success of these projects (see e.g., Riley & Sandström, 2016 for an overview of the importance of human dimensions in reintroduction projects). Importantly, a stronger opposition to reintroduction of large carnivores is expected among some stakeholder groups like farmers or hunters whose interests may be impacted by the return of such species (Grima et al., 2021; Nilsen et al., 2007). Therefore, the assessment of the attitudes of these stakeholder groups is of paramount importance for the conservation of reintroduced species (Ericsson & Heberlein, 2003; Glikman et al., 2021).

Attitudes toward wildlife species are frequently influenced by people's experience with the animals (Arbieu et al., 2019; Treves et al., 2013), and therefore an attitude change after large predators' reintroduction may be expected. For example, successful wolf (Canis lupus) reintroductions are likely to reduce positive sentiment toward wolves, since their presence may facilitate that people experience the risks the canid poses for human activities (Williams et al., 2002). Most of the few longitudinal studies analyzing attitude change over time focus on expanding already established carnivore populations and/or on populations that colonize new areas naturally (Brusketter et al., 2007; Červený et al., 2019; Majic & Bath, 2010; Treves et al., 2013). In contrast, we are not aware of any study comparing attitudes before and after human-assisted large carnivore reintroduction.

Many researchers have found that socio-demographic characteristics of respondents like age, gender or education level influence the attitudes toward large carnivores and their reintroduction (Williams et al., 2002). In addition, it is known that ecological understanding and perception of the ecological role of large carnivores potentially affect attitudes toward their reintroduction (Arbieu et al., 2019; Sakurai et al., 2020). Overall, a thorough understanding of these determinants of attitudes may be helpful for decision-making as regards large carnivore reintroduction (Williams et al., 2002).

The International Union for the Conservation of Nature (IUCN) and Species Survival Commission (SSC) guidelines require reintroduction projects to consider anticipated impacts, including on humans (IUCN, 1998). In this sense, it is important to assess perceived impacts on livelihoods and quality of life before the reintroduction as these may influence people's support of large carnivores' presence (Hawkins et al., 2020; Hiroyasu et al., 2019). Most studies conducted to date have addressed perceived impacts before or after reintroduction (e.g., Grima et al., 2021; Nilsen et al., 2007; Sakurai et al., 2020), but we are not aware of any other research that assessed prior expectations and whether these were accomplished after predator restoration.

To date most research on attitude toward large carnivores' reintroduction has focused on relatively widespread species such as wolves, brown bear (Ursus arctos) or the Eurasian lynx (Lynx lynx), while other highly endangered predators like the Iberian lynx (Lynx pardinus) in southern Europe have received scant attention. Eurasian and Iberian lynxes are sister species that diverged around 1 million years ago during the Pleistocene glaciations. In its refugia within southern Spain, the Iberian lynx preyed upon another locally evolved species, the European rabbit (Oryctolagus cuniculus), on which the lynx became dependent for survival (Ferrer & Negro, 2004). Wild rabbits represent over 85% of the diet of the Iberian lynx (Delibes-Mateos et al., 2008), and rabbit densities of 1–4.6 rabbits/ha (during autumn and spring, respectively) are necessary to sustain territorial breeding lynx (Palomares et al., 2001). This felid was brought to the brink of extinction at the end of the 20th century due to a combination of factors including habitat loss, the decline of the European rabbit, and illegal killing (Simón, Gil-Sánchez, et al., 2012). For example, predator control activities, shooting and accidental deaths in leg-hold traps set for rabbits accounted for most non-natural lynx deaths between 1950 and 1990 (Rodríguez & Delibes, 2004). By the end of the 20th century, only less than 100 mature individuals occurred in southern Spain concentrated in two populations in Andalusia (Andújar-Cardeña and Doñana-Aljarafe) (Rodríguez & Delibes, 1992; Guzmán et al., 2004; Figure 1). Its distribution range is therefore orders of magnitude narrower than that of its Eastern counterpart, the Eurasian lynx (Ferrer & Negro, 2004).

As a consequence of Iberian lynx decline, a reintroduction program was launched in the 2000s and the first captive-bred lynxes were released since 2009 in Andalusia, southern Spain (Simón, Gil-Sánchez, et al., 2012; Simón, Arenas, et al., 2012: Figure 1). Since then, lynx numbers have increased to more than 1000 individuals in 8 populations across central-southern Iberia (https://www.wwf.es/nuestro_trabajo/especies_y_habitats/linces_ibericos/; Figure 1). Between 2012 and 2014, a study conducted following an ethnographic approach showed that key actors were mostly positive
about lynx presence in two pre-selected areas for lynx reintroduction in Portugal (e.g., Lopes-Fernandez et al., 2018). The primary goal of our research was to compare support toward lynx reintroduction before and after the release of the lynxes in an area of southern Spain where first reintroductions took place. We were also interested in identifying the drivers of support toward lynx reintroduction in both periods. In addition, perceived impacts (both positive and negative) before and after the reintroduction were investigated. Finally, differences in the support and perceived impacts between the general public and hunters were assessed.

2 | METHODS

2.1 | Study area

Since 1994, the European Union has funded several LIFE projects for the conservation of the Iberian lynx. Such projects have tried to reverse lynx decline through increasing its abundance in the two remaining populations, reestablishing extinct populations, and connecting all of them (e.g., Simón, Gil-Sánchez, et al., 2012). Many different conservation actions have been launched within these projects including habitat management, restoration of lynx key prey, the European rabbit, and establishment of artificial feeding areas for the lynx (López-Bao et al., 2010; Moreno et al., 2004; Moreno & Villafuerte, 1995). Above these actions, lynx restoration in extinct populations was achieved through an ambitious reintroduction program using mostly captive-bred individuals (Simón, Arenas, et al., 2012).

Assessments of potential areas for lynx reintroduction were conducted within the scope of a LIFE project that started in 2006. The selection and delimitation of reintroduction areas were established by experts from the Regional Ministry of the Environment and Spatial Planning based on knowledge gathered in previous studies (Simón, Arenas, et al., 2012; Simón, Gil-Sánchez, et al., 2012) and guidelines from the IUCN (1998). Environmental requirements for reintroductions areas included variables related to habitat structure and composition, prey availability and human pressure (e.g., Simón, Arenas, et al., 2012). Following these criteria, two subareas within the ecoregional unit of Sierra Morena were initially selected: Guadalmellato river valley and Guarrizas river valley (hereafter Guadalmellato and Guarrizas; Table 1, Figure 1).

Sierra Morena is mainly composed of well-preserved Mediterranean woodlands and scrubland (Gastón et al., 2019). The two nuclei are located to the west and to the east (Guadalmellato and Guarrizas, respectively), from Andújar-Cardeña (Figure 1), one of the historical distribution territories of the Iberian lynx (Rodríguez & Delibes, 1992). Both nuclei represent a remarkable continuity of suitable habitats along the east–west axis of Sierra Morena, as well as the presence of highly permeable communication routes (roads without fences or crossing river channels by wide viaducts). The main characteristics of these zones are shown in Table 1. Briefly speaking, these are relatively low-populated rural areas in which main land uses include farming and hunting. Importantly, there are no major socioeconomic or environmental differences between both nuclei.
First lynxes were reintroduced in Guadalmellato and Guarrizas in 2009 and 2010, respectively (Simón, Gil-Sánchez, et al., 2012). Since then, several lynxes have been released annually in both territories. Reintroduced lynxes successfully established and bred in the wild, and the population increased every year. In 2017, there were more than 80 lynxes and 18 breeding females in each nucleus (Table 1). The main mortality causes in both study areas between 2012 and 2017 were road-kills followed by poaching (Table 1). Other causes of mortality in the reintroduced areas include diseases, killing by other lynxes or drowning, but their incidence in the period 2012–2017 was always much lower (http://www.iberlince.eu/index.php/esp/).

### Table 1: Some characteristics of the study area

| NUCLEI       | Guadalmellato | Guarrizas |
|--------------|---------------|-----------|
| Total inhabitants\(^a\) | 15,826 | 21,989 |
| Surface of lynx’s selected reintroduction area (ha) | 17,578 | 14,226 |
| Population Density (inhabitants/km\(^2\)) | 38.69 | 28.20 |
| Total of hunting licenses | 2651 | 2429 |
| Predominant property type and accessibility | Private ownership and limited access | Private ownership and limited access |
| Main land uses | Hunting (big and small game), cattle farming, olive grove | Hunting (big and small game); sheep farming |
| Year of initial lynx releases | 2009 | 2010 |
| N\(^b\) of lynxes (2017) | 82 | 85 |
| N\(^b\) of breeding females (2017) | 18 | 18 |
| Estimated lynx mortality caused by road-killing between 2012 and 2017 (%)\(^b\) | 54.84 (n = 31) | 39.47 (n = 38) |
| Estimated lynx mortality caused by poaching between 2012 and 2017 (%)\(^b\) | 22.58 (n = 31) | 23.68 (n = 38) |

\(^a\)Official population figures of the Municipal Register (2015) (www.ine.es). This figure corresponds to the inhabitants living in the municipalities affected by the lynx’s reintroduction selected area.

\(^b\)Figures provided by the Iberlince LIFE project. Available at http://www.iberlince.eu/index.php/esp/.

2.2 Data collection

The methodology used in this study to collect data was quantitative. In particular, two telephone surveys were conducted in the study area, before and after lynx releases, targeting two different groups: the general public and hunters. The latter were selected because hunters could perceive lynx reintroduction as a risk for rabbits, one of the main small-game species in the study areas and the main prey for the lynx (Ferrer & Negro, 2004).

The initial survey was conducted to the general public (2007) and hunters (2008) before first lynx releases took place, and the second survey was carried 6 years after the first releases (2015 and 2016, respectively, Table 2). Questionnaires for the general public and hunters were relatively long as they were part of a wider project. In particular, these surveys were conducted within the framework of Iberian lynx LIFE projects (Simón, Gil-Sánchez, et al., 2012), and thus included general questions about perceptions and attitudes toward the environment, the conservation of wildlife species, or the characteristics and problems of hunting practice. After that, we gradually introduced specific questions addressing the situation of the Iberian lynx and its protection, or the assessment of the reintroduction of this carnivore in the local area of the interviewee. In this article, however, we only present responses to those questions that focused on the support to the reintroduction of the lynx and the expected and perceived impacts of that reintroduction (see a list of the questions in Table S1), as these were the main goals of this study. Potential benefits and concerns associated with lynx reintroduction were identified from previous studies on large carnivores. For
example, impact of predators on prey species is frequently a matter of concern for local people (e.g., Pate et al., 1996). In contrast, predator tourism has been linked to positive attitudes toward predator species (e.g., Romañach et al., 2007). In the specific case of the Iberian lynx, a pioneer study suggested that the lynx could control smaller predators thus benefiting small-game species (Palomares et al., 1995). To design the questionnaire of our initial survey, all this information was combined with the knowledge provided by experts on the Iberian lynx who were involved in the Iberian lynx LIFE projects in which this study was set. The questionnaire was refined for the second survey using updated literature and information of interviews to stakeholders (e.g., landowners, hunters, or farmers) that were part of a qualitative study on lynx reintroduction in other area (results not presented here).

All the questionnaires were applied by telephone through a computer-assisted telephone interview (CATI) system using a structured questionnaire and adjusting its design to the requirements of this procedure survey in order to formulate the questions in simple and synthetic terms (De Rada & Portilla, 2015; Olson et al., 2019). The interviews were conducted by qualified interviewers who received previous specific training. To avoid potential response biases toward lynx reintroduction, they presented the study as a survey about issues related to the protection of natural environment and the citizens. A pretest was conducted before the start of the survey to check the understanding of the questionnaire and to be sure that the average response time was between 12 and 16 minutes.

The sample for the general public surveys was extracted from the telephone lists of the municipalities included in the study area. Telephone numbers were randomly selected (in 2007 from the telephone directory) or generated (in 2015, through the Random Digit Dialing technique), stratified by area, with proportional size to the population of the municipalities in the area, and establishing gender and age quotas.

Hunters sample was extracted from the list of people with hunting license residing in the municipalities of the study area. This list was provided by the Andalusian Ministry of the Environment and Spatial Planning exclusively for this study, in compliance with the Organic Law on Data Protection 15/1999 of December 15, in force at that time. The sampling procedure was a simple two-stage random sampling, with random selection of households of hunters residing in the area, and subsequent random selection of the hunter in those cases in which there were more than one hunter in the household. Sample size, margin of error, nonresponse rates, and interview average duration for each group (i.e., general public and hunters) and study period (i.e., before and after lynx reintroduction) are shown in Table 2. Nonresponse rates were estimated following the recommendations of the American Association of the Public Opinion Research (AAPOR) as the number of refusals divided by the number of successful interviews plus nonresponded calls plus the cases of unknown eligibility.

It is important to note that in both cases, general public and hunters, two independent samples were taken in each phase of the study, before and after lynx reintroduction. Only 2.7% of the general public interviewed in 2015 remembered to have participated in the 2007 lynx survey, whereas only 10% of the hunters surveyed in 2016 stated that they were also interviewed in

| Year  | Sample size | Nonresponse rate (%) | Margin of error (rate) (%) | Interview average duration (min.) | Dates       |
|-------|-------------|----------------------|---------------------------|----------------------------------|-------------|
| General public | 2007 | 808 | 39 | ±3.32 | 15 | 5–12, June |
|       | 2015 | 774 | 59 | ±3.52 | 12 | 12–25, November |
| Hunters | 2008 | 409 | 40 | ±3.87 | 16.7 | 9–11, January |
|       | 2016 | 364 | 24 | ±4.7 | 13 | 7–11, March |

Note: Margin of error: \( p = q = .5 \), confidence level of 95%.

**FIGURE 2** Percentages of support to lynx reintroduction by hunters (n = 409) and general public (n = 800); DK/NR refers to people who responded “don’t know (DK)” or who did not respond (NR)
To ascertain their opinion before the lynx reintroduction program, previous studies have shown that the comparison of independent samples may be useful to assess changes in attitudes toward predators (e.g., Bruskotter et al., 2007; Červený et al., 2019; Majic & Bath, 2010). In addition, such an approach presents some advantages over a design based on paired samples (i.e., the same respondents surveyed twice). For example, when samples are paired, researchers need to collect participants’ personal data in order to contact them in the second survey. This does not only require a higher data protection policy, but also may influence responses on more sensitive topics (Murdoch et al., 2014).

### 2.3 Data analysis

The four samples (general public before and after reintroduction and hunters before and after reintroduction) were treated as independent since they complied with the principles of normality and homogeneity of their variances. Taking into account the measurement level of the variables, in the case of nominal variables, we ran contingency tables, measuring the strength and the significance of the association using V-Cramer. For example, this approach was used to test for differences in the level of agreement given to the item “Are you in agreement with reintroducing lynxes in your region? (Yes/No).” For numerical variables, we calculated the differences of means, using independent sample t-test and one-way analysis of variance (ANOVA) depending on the number of variables to compare. For example, the former was used to assess differences in the level of importance given to the item “Reintroducing lynxes in those areas where they used to be present” (Not important; little important; moderate; somewhat important; really important), and the latter to test for differences among hunters and the public in relation to the question “After these years, in a scale from 0 to 10, where 0 means ‘total disaster’ and 10 ‘total success’, how do you evaluate the lynx reintroduction program that was carried out in your region?”

We used IBM SPSS version 26.0 (Statistical Package for the Social Sciences) for all analyses. Significance was set at $p<.05$ for all tests.

### RESULTS

#### 3.1 Support to lynx reintroduction

A majority of the respondents supported lynx reintroduction. However, there was a significant difference between the general public (94.3%) and hunters (78.9%) in support of reintroduction, with hunters being more likely to oppose it (14%).

#### Table 3: Support to lynx reintroduction (estimated as percentage of respondents) in function of sociodemographic variables of the general public and hunters

| Gender          | Age | Education level | Professional status |
|-----------------|-----|-----------------|---------------------|
|                 | Men (%) | Women (%)     | 18–29 | 30–44 | 45–59 | >59 | No formal education (%) | Primary education (%) | Secondary education (%) | Advanced education (%) | Employed (%) | Retired or pensioner (%) | Unemployed (%) | Student (%) | Household work or unpaid work (%) |
| General public  | Yes 94.3 | 89.2 | 95 | 94.7 | 91.9 | 85.2 | 83.1 | 90.6 | 95 | 97.7 | 96.8 | 88.8 | 83.5 | 94.1 | 85.8 |
|                | No 4.7 | 5.1 | 4.5 | 4.9 | 3.4 | 6.7 | 9.5 | 5.2 | 3.5 | 2.3 | 3.2 | 6.4 | 16.5 | 4.9 | 6.7 |
|                | DK/ NR 1 | 5.4 | 0.5 | 0.4 | 4.1 | 8.1 | 7.4 | 4.2 | 1.5 | 0 | 0 | 4.8 | 0 | 1 | 7.5 |
| Total          | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

| Hunters        | Yes — | — | 78.9 | 91.8 | 84 | 74.7 | 69 | 85.1 | 85.4 | 81.1 | 85.7 | 72.5 | 90 | 73.3 | 100 |
|                | No — | — | 14 | 7.3 | 14.1 | 17.7 | 21.4 | 12.1 | 11 | 13.5 | 11.5 | 20.0 | 10 | 13.3 | 0 |
|                | DK/ NR — | — | 7.1 | 0.9 | 1.9 | 7.6 | 9.5 | 2.8 | 3.6 | 5.4 | 2.8 | 7.5 | 0 | 13.3 | 0 |
| Total          | — | — | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

*DK/NR refers to people who responded “don’t know (DK)” or who did not respond (NR). Information regarding the gender of the hunters was not available.*
difference V-Cramer = 0.149; \( p < .001 \) between general public and hunters, with the former being more positive than the latter (91.7% vs. 83.1%; Figure 2). Complementarily, when participants were asked in a 1–5 scale if they agreed in reintroducing lynxes in those areas where lynxes used to be present, the general public was on average more positive than hunters (average values: \( M_{\text{public}} = 4.51 \pm 0.87 \); \( M_{\text{hunters}} = 4.16 \pm 1.14 \); \( t = 7.556, p < .001 \)).

Within the general public, men were more favorable in reintroducing lynxes in their region than women (V-Cramer = 0.132; \( p < .01 \); Table 3), and youngsters were more positive than elders (V-Cramer = 0.118; \( p < .001 \); Table 3). In addition, those who had completed higher studies (V-Cramer = 0.140; \( p < .001 \); Table 3) and those who were currently working (V-Cramer = 0.129; \( p = .002 \); Table 3) were the most in agreement with reintroducing lynxes in their region. Similarly, within the hunters, those between 30 and 44 years old were the most favorable in reintroducing lynxes in their region (V-Cramer = 0.163; \( p < .001 \); Table 3). Furthermore, those who considered themselves as “somewhat enthusiast” of hunting, were the most in agreement with reintroducing lynxes in their region (V-Cramer = 0.172; \( p < .05 \); Table S2). After lynx releases, the support to lynx reintroduction remained high for both general public and hunters (average values in a 1–5 scale: \( M_{\text{public}} = 4.43 \pm 0.95 \); \( M_{\text{hunters}} = 4.11 \pm 1.17 \); \( t = 4.859, p < .001 \)). The support slightly decreased for the general public (average values in a 1–5 scale: \( M_{\text{before}} = 4.58 \pm 0.76 \); \( M_{\text{after}} = 4.43 \pm 0.95 \); \( t = 3.402, p = 0.001 \)), while it remained stable for the hunters (average values in a 1–5 scale: \( M_{\text{before}} = 4.16 \pm 1.12 \); \( M_{\text{after}} = 4.11 \pm 1.17 \); \( t = .686, p = 0.548 \)).

**FIGURE 3** Benefits and concerns associated with the support of lynx reintroduction by the general public

**FIGURE 4** Benefits and concerns associated with the support of lynx reintroduction by hunters
3.2  |  Perceived impacts before and after lynx reintroduction

3.2.1  |  Before lynx reintroduction

Within the general public, those who supported the reintroduction of the lynx believed that it was important to maintain lynx populations for future generations, and that thanks to species such as the lynx, nature, and landscapes are preserved (Figure 3). In addition, they also believed that lynxes control population of other carnivores (e.g., fox, genet, and mongoose), and that tourism in the region would be increased having lynxes in Andalusia (Figure 3).

Overall, among those who supported lynx reintroduction, few stated concerns that reintroducing lynxes could heavily affect rabbit populations (24.5%), or that could be detrimental to hunting (15.7%; Figure 3). These concerns increased among those who did not support lynx reintroduction (Figure 3).

Nearly half (49.4%) of hunters who supported the reintroduction responded that there were some benefits in reintroducing lynxes (Figure 4). Some of these hunters did not perceive benefits (23.2%), did not know or did not respond (27.4%). Considering all hunters, repopulation of rabbits (17.1%), species recovery in the area (5.9%), and controlling other predators (6.4%) were the most frequently benefits mentioned (see a full list of perceived benefits in Table S3).

Half (50.9%) of those hunters who supported the reintroduction of lynx (n = 340), did not see any concerns associated with reintroducing the lynx. Among those who did (37.1%; Figure 4), the concerns most frequently mentioned were the reduction in number of rabbits (15.6%), the perception of restriction on hunting (12.1%), and the increase of presence on the ground of rangers in the area (5.9%) (for a full list, see Table S4). Finally, regarding those who did not see any benefits in reintroducing lynxes, few of them (n = 42) also did not see any concern (Table S4).

Several (64.2%) of those who did not support lynx reintroduction (n = 53), mentioned at least one concern associated with the reintroduction of lynxes. The concerns most frequently mentioned were the reduction in number of rabbits (34%), and the perception of restriction on hunting (22.6%) (for full list, see Table S4).

**FIGURE 5** Benefits and concerns associated with lynx reintroduction by general public before and after the reintroduction

**FIGURE 6** Benefits and concerns associated with lynx reintroduction by the general public and hunters after the reintroduction
3.2.2 | After lynx reintroduction

The perception of the general public toward the majority of benefits and concerns did not change after lynx reintroduction (Figure 5). Indeed, among the benefits, only the beliefs that it is important to maintain lynx populations for future generations and that nature and landscapes are preserved thanks to the occurrence of species such as the lynx slightly decreased after reintroduction (Figure 5).

Nearly half (43.3%) of the interviewees within the general public perceived that the reintroduction of lynxes brought tourism in their area (Table S5). However, the perceptions were more uncertain if there had been an improvement in economic activities in their region with nearly 39.7% stating that it was as before, and 33.7% that did not improve at all (Table S5). The support of lynx reintroduction was higher among those who perceived that there were benefits in tourism than among those who did not perceive such benefits (average values in a scale 0–10: \( M_{\text{benefits}} = 8.84 \pm 1.72, M_{\text{no\_benefits}} = 7.53 \pm 2.61; F = 37.372, p < .001 \)). Similarly, those who perceived there were improvements in economic activities (21.4%) showed a higher support of lynx reintroduction than those who did not perceive benefits (average values in a scale 0–10: \( M_{\text{improve\_economy}} = 8.91 \pm 1.65; M_{\text{no\_improve\_economy}} = 7.73 \pm 2.46; F = 24.084, p < .001 \)).

Within the hunters, after lynx reintroduction, there was a perception that there were less rabbits (74.7%). When asked what were the causes of this decline, 84.6% perceived that the first cause was a higher incidence of rabbit diseases. In comparison to the general public, hunters perceived that, after the reintroduction, there was more poaching control (44% general public and 56.3% hunters, respectively, \( V\text{-Cramer} = 0.188, p < .001 \)), there was not more poaching (23% general public and 45.1% hunters; \( V\text{-Cramer} = 0.260, p < .001 \)) and that the monitoring of lynx did not affect hunting activities (35.7% general public and 54.9% hunters, \( V\text{-Cramer} = 0.221, p < .001 \)) (Figure 6).

4 | DISCUSSION

Our results revealed a strong social support to Iberian lynx reintroduction in southern Spain, which is in agreement with previous assessments of attitudes toward the reintroduction of other large felids like the jaguar (Panthera onca) in Argentina (Caruso & Jiménez Pérez, 2013). In contrast, the support to the return of other large predators, and particularly wolves, is generally much lower (Notaro & Grilli, 2021; Williams et al., 2002). A possible reason explaining positive attitudes toward the return of the Iberian lynx is that cats are species with particular public appeal (Macdonald et al., 2015), although this is something that could be investigated in further research. In addition, the Iberian lynx is likely seen as an emblem by local people in the Iberian peninsula, as it was noticed in Portugal (Lopes-Fernandez et al., 2018) and also in our study area (authors’ unpublished data). Indeed, most participants in our study pointed at the need to preserve the last lynx populations for future generations (Figure 3), suggesting that people may see the conservation of emblematic wildlife species bearers of intrinsic value and representative of common identity and cultural heritage as an obligation (Rode et al., 2021; Smith, 2016). Nevertheless, the economic and ecological value of the lynx was also acknowledged by a considerable proportion of the interviewees (Figure 5), which may have also contributed to the observed strong support to lynx reintroduction. The ecological argument was also used in favor of wolf reintroduction in Colorado, as it was thought that the canid would restore balance to ecosystems or enhance ecosystem health (Niemiec et al., 2020).

As regards the economic value of the lynx, in both study periods many respondents believed that tourism would be increased as a consequence of the return of the felid (Figure 5), and this was particularly evident for those who supported the reintroduction (Figure 3). In this sense, the reintroduction of Eurasian beaver (Castor fiber) in England led to an increase in visitors resulting in economic benefit for local businesses (Auster et al., 2020). Importantly, several studies have pointed at predator tourism as an effective strategy to increase tolerance for predators (e.g., Ohrens et al., 2021; Romañach et al., 2007). A recent report of the Spanish Ministry of Environment indicated that, although lynx tourism is still incipient, its economic impact in our study area already exceeds wolf and bear tourism in northern Spain (MAPAMA, 2017). Therefore, its promotion could contribute to increase lynx recognition by local people. Although a higher development of lynx-based ecotourism could generate conflicts with other human activities such as hunting, the truth is that most hunters do not see the lynx as a big threat for game species like the rabbit (Figure 5) neither believe that lynx monitoring affects negatively hunting activities (Figure 6). Besides this, another source of potential conflict could be the access of ecotourism companies to private fenced lands in which most lynxes occur (Simón, Arenas, et al., 2012). Similar conflicts between environmental tourists and the owners of the land are frequent in other areas (e.g., Lewandowicz, 2018). Ideally, ecotourism and landowners’ partnership should be promoted to mitigate such conflicts. For instance, in Brazil voluntary donations...
from tourists have been proposed to compensate cattle losses induced by jaguars (Tortato et al., 2017). Furthermore, it is important to notice that ecotourism may impact predator behavior, physiology and ecology as well as influence human-predator interactions (Penteriani et al., 2017), and therefore the development of a lynx-based tourism industry may cause detrimental impact on lynx populations.

Although hunters were less supportive of lynx reintroduction than the general public, the majority of this group showed a positive attitude toward reintroduction. Similar findings were observed with wolves in Utah (Bruskotter et al., 2007) and Colorado (Niemiec et al., 2020). Nevertheless, Bruskotter et al. (2007) alerted that, still, such slight differences may have implications for the conservation of wolves. Their argument was that hunters interact with predators more frequently than other people and, if such interactions were proven predominantly negative, opinion among hunters could become more negative, potentially leading to decreased support of predator conservation (Bruskotter et al., 2007). However, our study demonstrated that the support of reintroduction did not decrease among hunters after some years of sharing land with restored lynxes, suggesting that hunters did not notice major impacts of lynx reintroduction. In fact, the sharp decline experienced by rabbit populations in the 2010s was not attributed by hunters to lynx predation but to diseases, which is in accordance with scientific studies (e.g., Delibes-Mateos et al., 2014; Guerrero-Casado et al., 2016). Importantly, most people among general public were also supportive after lynx reintroduction, although, overall, support slightly decreased. We can only speculate about the reasons why this occurred. One potential explanation is that people’s expectations in terms of economic return of reintroducing the lynx were likely not accomplished, as our result suggest (Table S5), and as a consequence some of them might become less supportive.

Our results showed a higher support of lynx reintroduction among men. However, previous studies are not consistent regarding the effect of gender on attitudes toward large carnivores and their reintroduction: some did not detect any effect (e.g., Caruso & Jiménez Pérez, 2013), others revealed a higher support among women (e.g., Williams et al., 2002), and others showed that men were more supportive (e.g., Bath et al., 2008). In addition, elder people show often more negative attitudes toward the reintroduction of large carnivores (Williams et al., 2002). This agrees with our results for the general public but not for hunters; highest support was found in the middle ages (Table 3). Public values regarding wildlife are thought to be associated with people attitudes toward wildlife-related issues (e.g., Cerri et al., 2017; Jacobs et al., 2014), and several studies have revealed a broad shift in such values with people increasingly seeing wildlife as part of their social’s community and deserving of rights like humans (Manfredo et al., 2021). In this context, the higher support of youngsters among the general public is not surprising. In contrast, we do not know the reason of the lower support of younger hunters, and therefore further studies are needed to address this point. Furthermore, a positive relationship between attitudes toward large carnivore reintroduction and education level has been observed in previous studies with wolves (Williams et al., 2002) and large felids (Caruso & Jiménez Pérez, 2013), which is consistent with our findings regarding the Iberian lynx. This is likely because people with higher studies are often more aware of wildlife and the environment (Kellert, 1980).

Our results revealed a link between support toward lynx reintroduction and its perceived impacts with those supporting reintroduction perceiving more benefits, and opponents being more concerned (Figures 3 and 4). This is likely not surprising as perceptions of costs and benefits shape also attitudes toward the reintroduction of other large carnivores like the grizzly bear (Ursus arctos) in California (Hiroyasu et al., 2019). However, understanding these correlates of attitudes may have relevance for effective large carnivore conservation in the sense that educational campaigns should aim to persuade opponents to reintroduction to realize of the benefits associated with predator restoration (Zajac et al., 2012). This is particularly important because wildlife management decisions are generally made in a context in which people have low awareness of wildlife (Casey et al., 2005; Valente et al., 2020). Nevertheless, education alone may not be effective to change behavior, and therefore wildlife managers may have to consider also ways to mitigate the possible livelihood and recreational effects before attitudes toward reintroduction become entrenched (Hiroyasu et al., 2019).

Although there existed a favorable social context for lynx reintroduction, as our study demonstrated, poaching is still an important source of lynx mortality in our study area (Table 1) and even a third of the participants in our study responded that poaching had increased after lynx reintroduction (Figure 6). This suggests that general assessments of attitudes may not be enough in reintroduction projects of large predators to ensure their conservation, and that in depth analyses of the views of key actors (e.g., those with capacity of making decisions in the territory) are likely also needed. For example, in our particular case study, we would recommend investigating through a qualitative approach the attitudes of stakeholders involved in wildlife management to better
understand the drivers of poaching and the extent of this problem. In fact, in an ethnographic study conducted in Portugal some game managers positioned against lynx reintroduction because they perceived the lynx as a damaging wildlife species (Lopes-Fernandez & Frazão-Moreira, 2017).

Not only there is an increased recognition that the public is a major piece of the reintroduction landscape (Glikman et al., 2021), but also that community engagement activities (e.g., monitoring activities, conservation outreach) support the maintenance of a conservation outcomes (Hazzah et al., 2014). Our study demonstrated a strong public support toward lynx reintroduction. However, a recent study found out that every case of human-felid conflict is different (Zimmerman et al., 2021), suggesting that future Iberian lynxes’ reintroduction in other Iberian areas should not only consider friendly habitats (Garrote et al., 2020), but also include a priori assessments of the social context. In addition, our study stresses the importance of conducting longitudinal studies about attitudes toward predator reintroduction, which is very rarely done. Such approach is essential to assess whether public perceptions and attitudes change after predator reintroduction, which is particularly relevant in a period of shift in wildlife values (Manfredo et al., 2021). Furthermore, longitudinal studies like the one presented in this study allow to assess whether local people’s expectations as regards reintroductions (i.e., benefits and costs) are accomplished. This may be helpful to design awareness campaigns aimed at improving attitudes toward predator reintroduction. Information gathered through longitudinal studies is also critical to informing decisions where public opinion plays a major role, as with large predator policy (Bruskotter et al., 2007). In particular, these studies may be useful to evaluate if policy aimed at reducing conflicts caused by predator damage to human livelihood is effective to improve attitudes toward predator conservation, as observed with wolves in Croatia (Majić & Bath, 2010).

ACKNOWLEDGMENTS

Special thanks go to Professor Steve Redpath, an inspirational scientist who provided helpful ideas during earlier discussions on the issues addressed in this manuscript. We are grateful for the comments of an associate editor and two anonymous reviewers. This study would not have been possible without the kind participation of the respondents in our surveys. This study was funded by the Environmental Agency of the Andalusian Ministry of Environment and Spatial Planning under the projects LIFE 06NAT/00209 and LIFE 10NAT/ES/00570 and contributes to the project RTI2018-096348-R-C22 (MCI/AEI/FEDER, UE).

CONFLICT OF INTEREST

Jenny Anne Glikman is a Senior Editor for the CSP journal, to which this article is part of, but she was not involved in the peer review and decision making process for this manuscript. There are no other conflicts of interest.

AUTHOR CONTRIBUTIONS

Fernando E. Garrido, Regina Lafuente, Rafael Villafuerte & Miguel Delibes-Mateos: conceptualization. Fernando E. Garrido, Regina Lafuente & Rafael Villafuerte: methodology. Fernando E. Garrido & Regina Lafuente: Data gathering. Regina Lafuente & Jenny A. Glikman: formal analysis. Miguel Delibes-Mateos, Fernando E. Garrido & Jenny A. Glikman: Writing—original draft; Fernando E. Garrido, Jenny A. Glikman, Regina Lafuente, Rafael Villafuerte & Miguel Delibes-Mateos: Writing-review and editing; Fernando E. Garrido: Funding acquisition.

DATA AVAILABILITY STATEMENT

Data used in this manuscript are available upon reasonable request to the authors.

ETHICS STATEMENT

Our study complied with both Spanish legislation on data protection in force when data were collected (Organic Law on Data Protection 15/1999 of December 15) and current Organic law 3/2018, of 5 December, on personal data protection and warranty of digital rights, and adhered to the basic ethical principles for conducting research that involves human subjects described in the Belmont report (https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html). At the time of data collection, CSIC projects were not required to undergo formal evaluation by an ethics committee. However, we were granted with an approval by the Andalusan Regional Government for collecting and analyzing hunters’ data (Ref: DGGMNYEP/IACPC/IRM/MCC).

ORCID

Miguel Delibes-Mateos https://orcid.org/0000-0002-3823-5935
Jenny Anne Glikman https://orcid.org/0000-0002-0208-5488
Regina Lafuente https://orcid.org/0000-0002-2623-9373
Rafael Villafuerte https://orcid.org/0000-0001-7582-4299
Fernando E. Garrido https://orcid.org/0000-0003-1742-7142
REFERENCES

Arbieu, U., Mehring, M., Bunnefeld, N., Kaczensky, P., Reinhardt, I., Ansorge, H., Böhning-Gaese, K., Glikman, J. A., Kluth, G., Nowak, C., & Müller, T. (2019). Attitudes towards returning wolves (Canis lupus) in Germany: Exposure, information sources and trust matter. *Biological Conservation*, 234, 202–210.

Auster, R. E., Barr, S. W., & Brazier, R. E. (2020). Wildlife tourism in re-introduction projects: Exploring social and economic benefits of beaver in local settings. *Journal for Nature Conservation*, 58, 125920.

Bath, A., Olszański, A., & Okarma, H. (2008). From a human dimensions perspective, the unknown large carnivore: Public attitudes toward Eurasian lynx in Poland. *Human Dimensions of Wildlife*, 13, 31–46.

Bruskotter, J. T., Schmidt, R. H., & Teel, T. L. (2007). Are attitudes toward wolves changing? A case study in Utah. *Biological Conservation*, 139, 211–218.

Caruso, F., & Jiménez Pérez, I. (2013). Tourism, local pride, and attitudes towards the reintroduction of a large predator, the jaguar Panthera onca in Corrientes, Argentina. *Endangered Species Research*, 21, 263–272.

Casey, A. L., Krausman, P. R., Shaw, W. W., & Shaw, H. G. (2005). Knowledge of and attitudes toward mountain lions: A public survey of residents adjacent to Saguaro National Park, Arizona. *Human Dimensions of Wildlife*, 10, 29–38.

Cerri, J., Mori, E., Vivarelli, M., & Zaccaroni, M. (2017). Are wildlife value orientations useful tools to explain tolerance and illegal killing of wildlife by farmers in response to crop damage? *European Journal of Wildlife Research*, 63, 70.

Červený, J., Krojerová-Prokesová, J., Kušta, T., & Koubek, P. (2019). The change in the attitudes of Czech hunters towards Eurasian lynx: Is poaching restricted lynx population growth? *Journal for Nature Conservation*, 47, 28–37.

Corlett, R. T. (2016). Restoration, reintroduction and rewilding in a changing world. *Trends in Ecology and Evolution*, 31, 453–462.

De Rada, V. D., & Portilla, I. (2015). Encuestas telefónicas: Estrategias para mejorar la colaboración. *Revista Perspectiva Empresarial*, 2, 97–115.

Delibes-Mateos, M., Delibes, M., Ferreras, P., & Villafuerte, R. (2008). Key role of European rabbits in the conservation of the Western Mediterranean Basin Hotspot. *Conservation Biology*, 22, 1106–1117.

Delibes-Mateos, M., Ferreiro, C., Carro, F., Escudero, M., & Gortázar, C. (2014). Ecosystem effects of variant rabbit hemorrhagic disease virus emergence, Iberian Peninsula. *Emerging Infectious Diseases*, 20, 2166–2168.

Ericsson, G., & Heberlein, T. A. (2003). Attitudes of hunters, locals, and the general public in Sweden now that the wolves are back. *Biological Conservation*, 111, 149–159.

Ferrer, M., & Negro, J. J. (2004). The near extinction of two large European predators: Super specialists pay a price. *Conservation Biology*, 18, 344–349.

Garrote, G., Fernandez-Lopez, J., Rojas, E., Lopez, G., & Simón, M. A. (2020). Planning the peninsula-wide recovery of the Iberian lynx: Identification of favourable habitat areas. *Mammalia*, 84, 413–420.

Gastón, A., Blázquez-Cabrera, S., Mateo-Sánchez, M. C., Simón, M. A., & Saura, S. (2019). The role of forest canopy cover in habitat selection: Insights from the Iberian lynx. *European Journal of Wildlife Research*, 65, 1–10.

Gaywood, M., Ewen, J., Hollingsworth, P., & Moehrensclager, A. (2021). *Conservation translocations*. Cambridge University Press.

Glikman, J. A., Frank, B., Sandström, C., Meysohn, S., Bogardus, M., Madden, F., & Zimmermann, A. (2021). The human dimensions and the public engagement spectrum of conservation translocation. In M. Gaywood, J. Ewen, P. Hollingsworth, & A. Moehrensclager (Eds.), *Conservation translocations*. (chapter 12). Cambridge University Press.

Grima, N., Brainard, J., & Fisher, B. (2021). Are wolves welcome? Hunters’ attitudes towards wolves in Vermont, USA. *Oryx*, 55, 262–267.

Guerrero-Casado, J., Carpio, A. J., & Tortosa, F. S. (2016). Recent negative trends of wild rabbit populations in southern Spain after the arrival of the new variant of the rabbit hemorrhagic disease virus RHD2. *Mammalian Biology*, 81, 361–364.

Guzmán, J. N., García, F. J., Garrote, G., Pérez de Ayala, R., & Iglesias, C. (2004). El lince Ibérico (Lynx pardinus) en España y Portugal. In *Censo-diagnóstico de sus poblaciones*. Direcció General para la Biodiversidad.

Hawkins, S. A., Brady, D., Mayhew, M., Smith, D., Lipscombe, S., White, C., Eagle, A., & Convery, I. (2020). Community perspectives on the reintroduction of the Eurasian lynx (Lynx lynx) to the UK. *Restoration Ecology*, 28, 1408–1418.

Hazzah, L., Dolrenry, S., Naughton, L., Edwards, C. T., Mwebi, O., Kearney, O., & Frank, L. (2014). Efficacy of two lion conservation programs in Maasailand, Kenya. *Conservation Biology*, 28, 851–860.

Hiroyasu, E. H. T., Miljanich, C. P., & Anderson, S. E. (2019). Drivers of support: The case of species reintroductions with an ill-informed public. *Human Dimensions of Wildlife*, 24, 401–417.

IPBES (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. IPBES secretariat.

IUCN (1998). *Guidelines for re-introductions*. Prepared by the IUCN/SSC Re-introduction Specialist Group. IUCN.

Jachowski, D. S., Millspaugh, J. J., Angermeier, P. L., & Slotow, R. (2016). *Reintroduction of fish and wildlife populations*. University of California Press.

Jacobs, M., Vaske, J. J., & SJïtsma, M. T. J. (2014). Predictive potential of wildlife value orientations for acceptability of management interventions. *Journal for Nature Conservation*, 22, 377–383.

Kellert, S. R. (1980). Americans’ attitudes and knowledge of animals. *Transactions of the North American Wildlife and Natural Resource Conference*, 45, 111–124.

Lewandowicz, E. (2018). Spatial conflicts in areas particularly attractive to tourists. International Multidisciplinary Scientific Geo Conference Surveying Geology and Mining Ecology Management, SGEM, 18, 575–582.

Lopes-Fernandez, M., Espírito-Santo, C., & Frazao-Moreira, A. (2018). The return of the Iberian Lynx to Portugal: Local voices. *Journal of Ethnobiology and Ethnomedicine*, 14, 3.

Lopes-Fernandez, M., & Frazao-Moreira, A. (2017). Relating to the wild: Key actors’ values and concerns about lynx reintroduction. *Land Use Policy*, 66, 278–297.

López-Bao, J. V., Rodríguez, A., & Palomares, F. (2010). Abundance of wild prey modulates consumption of supplementary food in the Iberian lynx. *Biological Conservation*, 143, 1245–1249.

Macdonald, E. A., Burnham, D., Hinks, A. E., Dickman, A. J., Malhi, Y., & Macdonald, D. W. (2015). Conservation inequality...
and the charismatic cat: Felis felis. *Global Ecology and Conservation*, 3, 851–866.

Majic, A., & Bath, A. J. (2010). Changes in attitudes towards wolves in Croatia. *Biological Conservation*, 143, 255–260.

Manfredo, M. J., Teel, T. L., Berj, R. E. W., Bruskotter, J. T., & Kitayama, S. (2021). Social value shift in favour of biodiversity conservation in the United States. *Nature Sustainability*, 4, 323–330.

MAPAMA (2017). El Turismo de Naturaleza en España - Serie AyP. Serie Medio Ambiente, n 9. Ministerios de Agricultura y Pesca, Alimentación y Medio Ambiente (MAPAMA). https://www.mapa.gob.es/es/Ministerio/servicios/analisis-y-prospectiva/Medio_Ambiente.aspx.

Moreno, S., & Villafuerte, R. (1995). Traditional management of scrubland for the conservation of rabbits *Oryctolagus cuniculus* and their predators in Doñana National Park, Spain. *Biological Conservation*, 73, 81–85.

Moreno, S., Villafuerte, R., Cabezas, S., & Lombardi, L. (2004). Wild rabbit restocking for predator conservation in Spain. *Biological Conservation*, 118, 151–161.

Murdoch, M., Simon, A. B., Polusny, M. A., Bangerter, A. K., Grill, J. P., Noorbaloochi, S., ... Partin, M. R. (2014). Impact of different privacy conditions and incentives on survey response rate, participant representativeness, and disclosure of sensitive information: A randomized controlled trial. *BMC Medical Research Methodology*, 14, 90.

Niemiec, R. M., Sekar, S., Gonzalez, M., & Mertens, A. (2020). The influence of message framing on public beliefs and behaviors related to species reintroduction. *Biological Conservation*, 248, 108522.

Nilsen, E. B., Milner-Gulland, E. J., Schofield, L., Mysterud, A., Stenseth, N. C., & Coulson, T. (2007). Wolf reintroduction to Scotland: Public attitudes and consequences for red deer management. *Proceedings of the Royal Society B*, 274, 995–1002.

Notaro, S., & Grilli, G. (2021). Assessing tourists’ preferences for conservation of large carnivores in the Italian Alps using a discrete choice experiment. *Journal of Environmental Planning and Management*, 1–20. https://doi.org/10.1080/09640568.2021.1924124

Ohrens, O., Tortalo, F. R., Hoogestijn, R., Sarno, R. J., Quigley, H., Goic, D., & Elbroch, L. M. (2021). Predator tourism improves tolerance for pumas, but may increase future conflict among ranchers in Chile. *Biological Conservation*, 258, 109150.

Olson, K., Smyth, J. D., & Ganshert, A. (2019). The effects of respondent and question characteristics on respondent answering behaviors in telephone interviews. *Journal of Survey Statistics and Methodology*, 7, 275–308.

Palomares, F., Delibes, M., Revilla, E., Calzada, J., & Fedriani, J. M. (2001). Spatial ecology of Iberian Lynx and abundance of European rabbits in south-western Spain. *Wildlife Monographs*, 148, 1–36.

Palomares, F., Gaona, P., Ferreras, P., & Delibes, M. (1995). Positive effects on game species of top predators by controlling smaller predator populations: An example with lynx, mongooses and rabbits. *Conservation Biology*, 9, 295–305.

Pate, J., Manfredo, M. J., Bright, A. D., & Tischbein, G. (1996). Attitudes towards reintroducing the gray wolf into Colorado. *Wildlife Society Bulletin*, 24, 421–428.

Penteriani, V., López-Bao, J. V., Bettega, C., Dalerum, F., Delgado, M. M., Jerina, K., Kojola, I., Krofel, M., & Ordiz, A. (2017). Consequences of brown bear viewing tourism: A review. *Biological Conservation*, 206, 169–180.

Pettorelli, N., Durant, S. M., & Du Toit, J. T. (2019). Rewinding (ecological reviews). Cambridge University Press.

Piedallu, B., Quenette, P. Y., Mounet, C., Lescurieux, N., Borelli-Massines, M., Dubarry, E., Camarra, J. J., & Gimenez, O. (2016). Spatial variation in public attitudes towards brown bears in the French Pyrenees. *Biological Conservation*, 197, 90–97.

Riley, S. J., & Sandström, C. (2016). Human dimensions insights for reintroductions of fish and wildlife populations. In D. S. Jachowski, J. J. Millsbaugh, P. Angermeier, & R. Slottow (Eds.), *Reintroduction of fish and wildlife populations* (pp. 55–77). University of California Press.

Ripple, W. J., Estes, J. A., Beschta, R. L., Wilmers, C. C., Ritchie, E. G., Hebblewhite, M., Berger, J., Elmhagen, B., Letnic, N., Nelson, M. P., Schmitz, O. J., Smith, D. W., Wallach, A., & Wirsing, A. J. (2014). Status and ecological effects of the world’s largest carnivores. *Science*, 343, 1241484.

Rode, J., Flinzberger, L., Karutz, R., Berghöfer, A., & Schröter-Schlaack, C. (2021). Why so negative? Exploring the socioeconomic impacts of large carnivores from a European perspective. *Biological Conservation*, 255, 108918.

Rodriguez, A., & Delibes, M. (1992). Current range and status of the Iberian lynx *Felix pardina* Temminck, 1824 in Spain. *Biological Conservation*, 61, 189–196.

Rodriguez, A., & Delibes, M. (2004). Patterns and causes of non-natural mortality in the Iberian lynx during a 40-year period of range contraction. *Biological Conservation*, 118, 151–161.

Romaña, S. S., Lindsey, P. A., & Woodroffe, R. (2007). Determinants of attitudes towards predators in Central Kenya and suggestions for increasing tolerance in livestock dominated landscapes. *Oryx*, 41, 185–195.

Rakui, R., Tsunoda, H., Enari, H., Siemer, W. F., Uehara, T., & Stedman, R. C. (2020). Factors affecting reintroduction of wolves in Japan. *Global Ecology and Conservation*, 22, e01036.

Simón, M. A., Arenas, R., Báñez, J. A., Bueno, J. F., Cadenas, R., de Lillo, S., del Rey, M. T., Delgado, M. P., Fernández, L., Franco, J. A., García, R., García, J., Garcia, M. I., Garrote, G., Gil, J. M., Gómez, A. M., Leiva, A., López, M., López, G., ... Valenzuela, G. (2012). Ten years conserving the Iberian lynx. Consejería de Agricultura, Pesca y Medio Ambiente, Junta de Andalucía.

Simón, M. A., Gil-Sánchez, J. M., Ruiz, G., Garrote, G., Mccain, E. B., Fernandez, L., López-Parrá, M., Rojas, E., Arenas-Rojas, R., del Rey, T., Garcia-Tardío, M., & López, G. (2012). Reverse of the decline of the endangered Iberian lynx. *Conservation Biology*, 26, 731–736.

Smith, I. A. (2016). *The intrinsic value of endangered species*. Routledge.

Svenning, J. C., Pedersen, P. B. M., Donlan, C. J., Ejrnæs, R., Fahrby, S., Galetti, M., Hansen, D. M., Sandel, B., Sandom, C. J., Terborgh, J. W., & Vera, F. W. M. (2016). Science for a wilder Anthropocene: Synthesis and future directions of trophic rewilding research. *Proceedings of the National Academy of Sciences of the United States of America*, 113, 898–906.

Tortato, F. R., Izzo, T. J., Hoogestijn, R., & Peres, C. A. (2017). The numbers of the beast: Valuation of jaguar (*Panthera onca*)...
tourism and cattle depredation in the Brazilian Pantanal. *Global Ecology and Conservation, 11*, 106–114.

Treves, A., Naughton-Treves, L., & Shelley, V. (2013). Longitudinal analysis of attitudes toward wolves. *Conservation Biology, 27*, 315–323.

Valente, A., Acevedo, P., Figueiredo, A. M., Martins, R., Fonseca, C., Torres, R. T., & Delibes-Mateos, M. (2020). Dear deer? Maybe for now. People’s perception on red deer (*Cervus elaphus*) populations in Portugal. *Science of the Total Environment, 748*, 141400.

Williams, C. K., Ericsson, G., & Heberlein, T. A. (2002). A quantitative summary of attitudes towards wolves and their reintroduction. *Wildlife Society Bulletin, 30*, 575–584.

Zajac, R. M., Bruskotter, J. T., Wilson, R. S., & Prange, S. (2012). Learning to live with black bears: A psychological model of acceptance. *The Journal of Wildlife Management, 76*, 1331–1340.

Zimmerman, A., Johnson, P., de Barros, A. E., Inskip, C., Amit, R., Cuellar Soto, E., Lopez-Gonzalez, C. A., Sillero-Zubiri, C., de Paula, R., Marchini, S., Soto-Shoender, J., Perovic, P. G., Earle, S., Quiroga-Pacheco, C. J., & Macdonald, D. W. (2021). Every case is different: Cautionary insights about generalisations in human-wildlife conflict from a range-wide study of people and jaguars. *Biological Conservation, 260*, 109185.

**SUPPORTING INFORMATION**

Additional supporting information may be found in the online version of the article at the publisher’s website.

---

How to cite this article: Delibes-Mateos, M., Glikman, J. A., Lafuente, R., Villafuerte, R., & Garrido, F. E. (2022). Support to Iberian lynx reintroduction and perceived impacts: Assessments before and after reintroduction. *Conservation Science and Practice, 4*(2), e605. [https://doi.org/10.1111/csp2.605](https://doi.org/10.1111/csp2.605)