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ANALYSING STAKEHOLDERS' PERCEPTIONS OF THE WOLF IN THE SILA NATIONAL PARK AREA, ITALY

*Análisis de las percepciones de los stakeholders sobre el lobo en la zona del Parque
Nacional de Sila, Italia.*

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ABSTRACT

Although coexistence between wolves and humans is possible and desirable, especially in protected areas such as the Sila National Park, nevertheless it is often a source of tension. The debate on cohabitation and conflicts between humans and wolves remains open and controversial, suggesting the importance of taking into account the perceptions of all stakeholders. The study analyzes the perceptions of 3 groups of stakeholders (general public, experts, farmers) in relation to different factors and investigates which interventions can mitigate conflicts related to coexistence. Among the results, we noted that the majority of respondents consider positive the presence of the wolf in the Park area; but only the experts considers positive this presence in the territory in general, while the other two groups express opposite or neutral opinion.

KEY WORDS: Large Carnivores; attitudes; wolf management; human-nature relationship; Sila National Park

RESUMEN

Aunque la coexistencia entre lobos y humanos es posible y deseable, especialmente en áreas protegidas como el Parque Nacional de Sila, a menudo es una fuente de tensión. El debate sobre la convivencia y los conflictos entre humanos y lobos sigue siendo abierto y controvertido, lo que sugiere la importancia de tener en cuenta las “percepciones” de todas las partes interesadas. Este estudio analiza las percepciones de 3 grupos de partes interesadas (público general, expertos, criadores) en relación con varios factores, e investiga qué intervenciones pueden mitigar los conflictos relacionados con la coexistencia. Entre los resultados, notamos que la mayoría de los encuestados considera positiva la presencia del lobo en el área del Parque; pero solo los expertos consideran positiva esta presencia en el territorio en general, mientras que los otros dos grupos expresan opinión contraria o neutra.

PALABRAS CLAVE: Grandes carnívoros; actitudes; manejo del lobo; relación naturaleza- gestión humana; Parque Nacional de Sila

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1. Introduction ↗

Achieving and maintaining a coexistence between humans and large carnivores, especially the wolf, is a critical component of wildlife conservation and a pressing challenge to global conservation efforts and those tasked with managing human-carnivore conflicts (Olson *et al.*, 2015; Morehouse *et al.*, 2020; Peterson *et al.*, 2010; Chapron *et al.*, 2014; Decker & Chase, 1997; Ripple *et al.*, 2014). Although the importance of the wolf and other carnivores is known in the scientific community, there are conditions that determine the possibility of conflicts between wolves and humans. In the last decades the question took new dimensions, especially as a result of the protection of the species. In fact, the wolf, once considered “harmful” and persecuted until disappeared in various regions of Italy, has now begun to reappear in some areas it had been missing for some time. The increase in the wolf population was allowed for many reasons, including: favourable regulations, greater availability of prey, the possibility of inhabiting territories that humans has freed, a greater awareness of the importance of wildlife for the environment by scholars. But the same increase in the wolf population also increased conflicts with humans, which have always existed and are now exacerbated by a number of factors: presence in production-oriented landscapes (territorial competition) (Loveridge *et al.*, 2010); predation of livestock (Olson *et al.*, 2019; Ugarte *et al.*, 2019); fear for humans and their pets security (Butler *et al.*, 2013; Kruuk, 2002); amplification of risk perception by social media (Nanni *et al.*, 2020); presence in human-dominated landscapes (Kuijper *et al.*, 2019), such as urban suburbs. The social and media world often overestimates the wildlife negative impacts, and sometimes overlook some possible positive factors;

for example, the presence of large carnivores could be used to promote nature tourism, and to disseminate an image of the territory linked to the protection of wildlife (Rode *et al.*, 2021).

Public opinion is a fundamental factor in the acceptance of coexistence with the wolf, as is the perception of the risks related to coexistence by the various stakeholders, which has been the subject of numerous studies. These studies show the strong link between this perception and some factors, such as age, work activity, level of education, place of residence, relationship to nature (van Heel *et al.*, 2017; Chapron *et al.*, 2014; Glikman *et al.*, 2011; Manfredo *et al.*, 2003) or having suffered predation of livestock (Olson *et al.*, 2019; Ugarte *et al.*, 2019). A higher level of education and residence in urban areas, for example, facilitate the acceptance of the wolf (Kleiven *et al.*, 2004), as well as expecting the risk or having already contact with wildlife (Røskoft *et al.*, 2003, 2007; Vittersø *et al.*, 1999). However, often “the deeply rooted hostility to this species in human history and culture” changes stakeholders’ perceptions of the wolf and makes his acceptance difficult (Chapron *et al.*, 2014). The aim of this study is to investigate the wolf perceptions of stakeholders, identifying connections and relationships between the aforementioned factors and the acceptance of the coexistence between humans and wolves in a specific area of Calabria, region of Southern Italy particularly important in the history of the wolf. Another objective of this study is to understand which interventions can mitigate conflicts related to coexistence, which is in some way obliged in the area of investigation. The presence of the wolf in Calabria has historical roots. The region represents the optimal range of the wolf, where it is distributed over the whole mountain area ranging from 800 to 1800 meters above sea level with a population that survived many vicissitudes. The regional wolf range, which in the past included the Pollino massif, the Sila and part of the Coast Chain, has now expanded to include the Aspromontano massif, with its National Park (Bocedi & Bracchi, 2004). The study concerned the Sila National Park, an area in which the predator is significantly present (3-4

packs of 5-6 specimens each, according to the most recent data provided by the Park Authority). The survey was carried out by collecting the opinions of different stakeholders distributed in 3 groups, depending on their job and their degree of specialization (as explained in the methods). Furthermore, together with the opinions related to various aspects about the presence of the wolf, the relationship between humans and nature, which is considered intimately linked to the different attitudes on the level of acceptance of large carnivores, was also investigated.

2. Theoretical framework π

Between the end of the XIX century and the beginning of the XX century in Italy, as in much of Europe, wolf populations fell sharply, (Bocedi & Bracchi, 2004; Chapron *et al.*, 2014; Salvatori & Linnell, 2005), because wolf was considered as “harmful” and persecuted until disappeared in various territories. It is estimated that the 70s of the last century was the period of lesser presence of the wolf in Italy, when remained only 100 specimens, distinguished in 4 small separate groups, including a small surviving population in the area of the Sila National Park (Boitani, 1992; Piscopo *et al.*, 2017). After that, protectionist organisations and researchers, stressing the danger of extinction for the species, have raised awareness among legislators, who have finally enacted laws for its protection (Boceda & Bracchi, 2004). Several conventions, directives and initiatives were issued to protect wolves and wildlife. The first were two regulatory interventions: the Ministerial Decree “Natali” of 1971 and the Ministerial Decree “Marcora” of 1976. The former, by eliminating the wolf from the list of “harmful animals”, prohibited its hunting and banned the use of poison, thus marking a drastic turnaround, while the latter represented the definitive decree for the wolf protection and prohibited its hunting

indefinitely. Thus, the wolf became a fully protected species in Italy (Bocedi & Bracchi, 2004). Subsequently, the law of 11 February 1992, n. 157 was enacted, that places the wolf among the particularly protected species, also under the sanction profile (MA, 2021). In support of this development, various European regulations were transposed in Italy in the 1990s, such as the Berne Convention, the Washington Convention and the Habitats Directive (92/43/CEE). Once protection started, it was soon understood that the species, even with minimal conservation interventions, showed an interesting resilience (Ciucci & Boitani, 2011). Although today there are no unitary censuses for the whole national territory, it is estimated that in Italy there are almost 2000 specimens of wolf (ISPRA, 2020). Moreover, the resilience of the wolf is well known: specialized in the predation of big wild herbivores such as deer and wild boars, as well as small mammals such as hares, mice and various reptiles, it is also extremely versatile, being able to feed on fruit, berries and carcasses, thus managing to survive even in the absence of prey. This great adaptability of the animal then reaches its extreme consequences in the attacks of domestic animals on pasture, which, in fact, are found to constitute a component, sometimes relevant, of the predator's diet (Mattiello *et al.*, 2010). The current system of protection, articulated on territorial (in the case of parks), regional, national, community and international level (Ciucci & Boitani, 2005), has led to an expansion of the areas recolonized by the animal, rewarding the efforts of scholars and environmentalists. At the same time, however, it has heightened the tension between various stakeholders, generating the destabilization of the coexistence between the wolf and the communities, especially in the newly settled areas (García-Lozano *et al.*, 2015; Mech *et al.*, 2000; Mech, 2001; Fritts *et al.*, 2003; Harper *et al.*, 2005; Berger, 2006). In fact, it has been noted that, while the areas historically affected by the wolf showed a good capacity to recover the balance between wolf and human activity, the same does not happen in the newly occupied areas, for fear of unknown risks (Salvatori & Linnell, 2005). The coexistence

between wolves and humans is a real challenge (Ciucci & Boitani, 2005; Graham *et al.*, 2005; Treves *et al.*, 2006; Dressel *et al.*, 2015; Morehouse *et al.*, 2020; Rode *et al.*, 2021), as is the relationship between wolf and livestock (Chapron *et al.*, 2014; Grossmann *et al.*, 2020). But it is an unequal challenge, in which the wolf did not consciously choose to participate. Wolf can only be the object of a conflict, but not a party to it, as animals do not consciously enter into a conflict in a human sense (Peterson *et al.*, 2005, 2010; Bouwma *et al.*, 2010 a,b; Linnell, 2013). It often finds itself a victim of one-sided, violent and repressive human behaviour. Examples are the accidents and causes of wolf mortality even within protected areas, very frequent and often unjustifiable (Piscopo *et al.*, 2017; Olson *et al.*, 2015; Loveridge *et al.*, 2010). Humans must find a way to resolve this challenge, mitigate conflicts and finally achieve peaceful coexistence, that is an ethical stance that, in our opinion, should be applied from a regulatory point of view. Furthermore, we must not forget that, in addition to human and wolf, conflicts also arise between humans (indirect conflicts), when different stakeholders have different motives, knowledges, priorities, values or level of affectedness (Grossman *et al.*, 2020; Olson *et al.*, 2015; Madden, 2004). All these conflicts should also be mitigated, and all stakeholders, at least, should negotiate and try to facilitate and stimulate a fruitful dialogue. Finally, a greater understanding/knowledge of the scenarios and landscapes in which these conflicts occur can promote risk avoidance and encourage management interventions; these are critical steps toward coexistence (Olson *et al.*, 2015). These considerations indicate the need to better investigate our understandings of stakeholders' perceptions towards wolf and its conservation management. Different stakeholders have different ways of seeing the wolf and the conflicts related to it; that is, they have different "perceptions" of the relationship between wolves and humans. Various researches suggest several factors to be important in the perception of large carnivores: demographic and personal variables as age, gender, education, occupation, place of residence, habit to recreate in

nature and how people perceive the human-nature relationship (van Heel *et al.*, 2017; Røskft *et al.*, 2003, 2007; Treves & Karanth, 2003; Treves *et al.*, 2013), emotions such as fear or curiosity (Kaltenborn & Bjerke, 2002; Røskft *et al.*, 2007), perceived or experienced risk, personal or economic (Kleiven *et al.*, 2004; Vittersø *et al.*, 1999). The negative perceptions can be mitigated by tools such as: establishing or improving compensation programs for damage (Nyhus *et al.*, 2003; Boitani *et al.*, 2011; Dickman *et al.*, 2011, 2013; Marino *et al.*, 2016), increasing the level of knowledge of stakeholders, even if this does not work in the same way for all the people involved (Hovardas, 2018), promoting management practices that reduce predation risk (Boitani, 2000; Boitani *et al.*, 2011; Gazzola *et al.*, 2008), calming the debate on social media, which is often spoiled by fake news that increase fear for the wolf (Nanni *et al.*, 2020); when necessary, implementing management actions for the species, e.g. preventing hybridization with stray or feral dogs.

3. Study area π

The study area was the Sila National Park (Figure 1). The Park covers an area of 763.95 km², with an elongated shape from North to South and includes 3 of the 5 Calabrian provinces: Catanzaro, Cosenza and Crotona. The park was definitely established in 2002, after a long political process. The Sila National Park contains one of the most significant biodiversity systems, so much so that it was classified in 2014 as 10th Italian Biosphere Reserve in the World Network of Sites of Excellence, based on *MaB - Man and the Biosphere Programme*, by UNESCO.

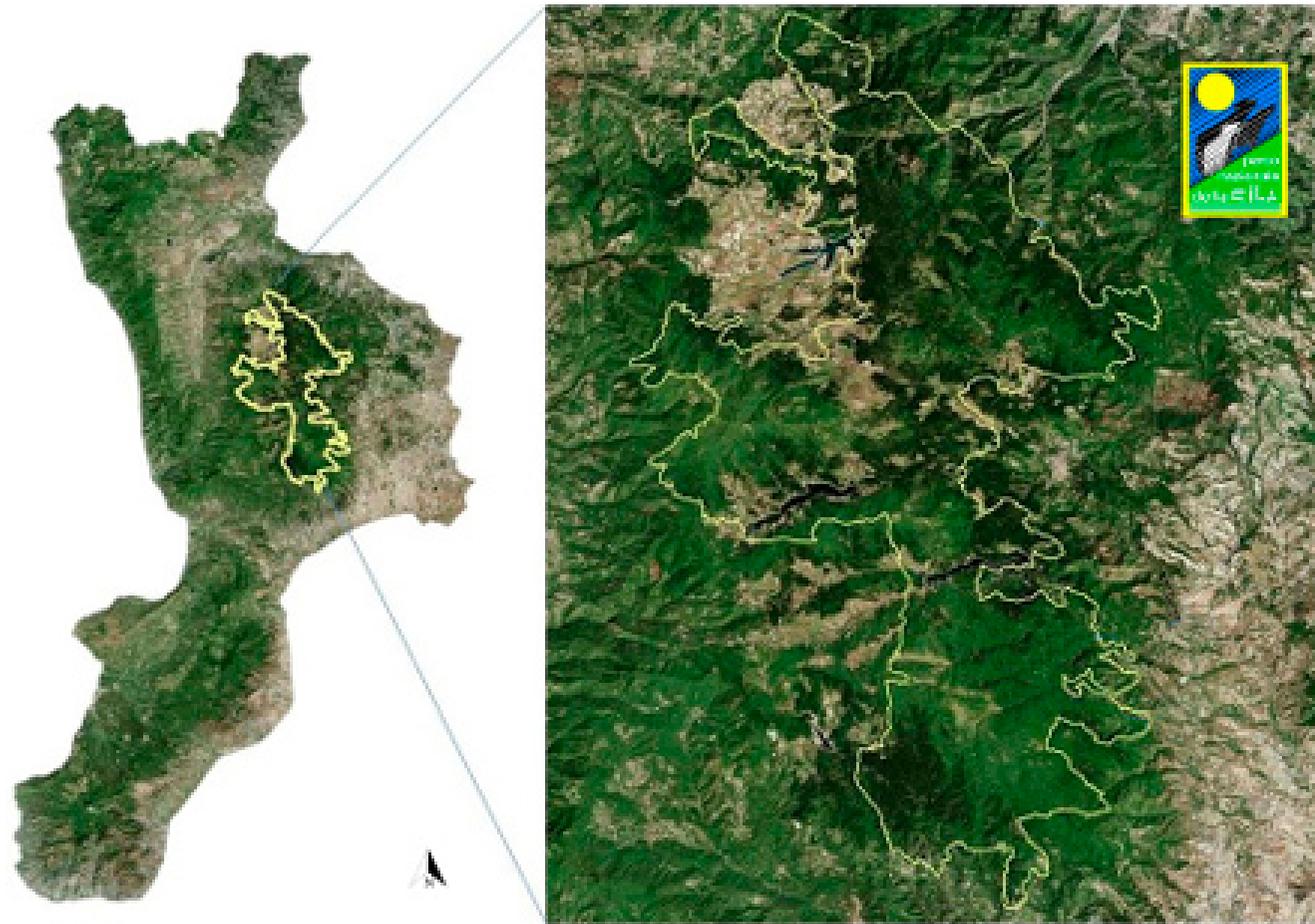


Figure 1. Location of the study area in Calabria, Italy (Source: Mazzei *et al.*, 2017, prepared by the authors).

Figura 1. Localización del área de estudio en Calabria, Italia. (Fuente: Mazzei *et al.*, 2017, elaboración propia).

Inside the Park there are 3 of the 6 artificial basins present on the Silane plateau and its wooded area is very large, so much so that among the Italian National Parks is the one with the highest percentage

of wooded area, about 80% of the total, composed mainly of beech and pine forests of the typical silane pine (*Pinus nigra laricio*). Wide are the valleys that open along the ridges of the Park where traditional sheep farming is practiced, with forms of transhumance¹ and pasture that resist still today (Di Gregorio *et al.*, 2021). The territorial boundaries of the Sila National Park were redesigned several times, due to strong contrasts between the municipalities falling within the Park. Today (2020) there are nineteen municipalities that fall within the territory of the protected area, of which 9 in the Province of Cosenza (Acri, Aprigliano, Bocchigliero, Casali del Manco, Celico, Corigliano - Rossano, Longobucco, San Giovanni in Fiore, Spezzano della Sila), 6 in the Province of Catanzaro (Albi, Magisano, Petronà, Sersale, Taverna, Zagarise) and 4 in the Province of Crotona (Cotronei, Mesoraca, Petilia Policastro, Savelli).

4. Methods ↗

4.1. Sampling ↗

We devised a survey to measure the perceptions of different stakeholder groups on the presence of wolves and to evaluate their relationship with nature. Since we carried out the same survey in the Aspromonte National Park (Fasone *et al.*, 2020), we decided to repeat the study also in the Sila National Park, using the same methodology but with some variations, and collect the opinions of different involved stakeholders distributed in 3 groups, depending on their job and their degree of specialization. We used snowball sampling to disseminate the questionnaire among the first group of

stakeholders: “general public”, that is people living and doing any kind of work in municipalities within the Sila National Park area. A few respondents were firstly contacted among university students residing in the area and were asked to fill in a questionnaire sent by e-mail (test surveys); all respondents were explicitly asked to recommend survey participation to other potential stakeholders living and working in the Sila National Park area and to share the survey with them by e-mail (Grossmann *et al.*, 2020). With the snowball sampling we were able to reach interested people; 107 persons agreed to participate in the survey. The second group, named “experts”, was approached directly by e-mail to participate in the survey, and asked to complete the questionnaire; we used official e-mail addresses, taken from institutional sites, and accompanied the email with a phone call to recommend the survey. In total, we contacted 19 representative people doing a specialized work in the agricultural, forestry or environmental sector, such as researchers, professors, veterinaries, master’s degree students, park managers, nature guides. Lastly, we reached in their farms the third group: “farmers”, 15 people working exclusively with livestock. We gave them a paper questionnaire with some additional questions concerning their work. In total, 141 people participated in this study. The survey was distributed between the 6th December 2019 and the 10th January 2020. The demographic composition in terms of stakeholder groups of the respondents is shown in [Table 3](#).

4.2. Questionnaire structure ↗

Although it is not normally considered appropriate to investigate the knowledge of the respondents, we asked closed questions to test the stakeholder’s level of knowledge of the wolf, its behaviour, and its presence in Italy and in the Park; this is because, in our opinion, knowledge can influence

perceptions (for example, knowing that in a herd there is only one breeding pair can lead to an easier acceptance of the presence of the wolf). Then, we asked closed questions to understand what their attitude was towards the wolf and its management. Our next step was to ask the stakeholders what they thought about various statements concerning the relationship between wolves and nature, wolves and humans, and wolves and farmers (for example: if it is possible coexistence humans-wolves; whether wolves should be protected inside or outside the park; whether wolves should be killed after preying on livestock). This to understand what is the general point of view of stakeholders. Additionally, since the stakeholder's view of nature in general is relevant to understanding their perceptions of the wolf, and can predict their preferred management strategies (Verbrugge *et al.*, 2013), we used the so-called Human and Nature scale (HaN scale; Van den Born, 2006, 2008) to evaluate this aspect. In order to categorize the respondents' view of nature and of the human/nature relationship, we asked the respondents to choose one to three statements with which they agreed, on a list of 16. Each statement represents one of the 3 images of the human/nature relationship, and each relationship is accounted for by between four and seven different statements (see Table 1). After the choice, we attributed each respondent to one of the images based on their responses. When the chosen statements belonged to different group of statements, we attributed them to more than one image.

Table 1. Human and Nature scale (HaN-scale) statements (van den Born, 2008; De Groot *et al.*, 2011; van Heel *et al.*, 2017), representing images of the human-nature relationships.

Tabla 1. *Declaraciones a escala Hombre y Naturaleza (HaN-scale)* (van den Born, 2008; De Groot *et al.*, 2011; van Heel *et al.*, 2017),

representando imágenes de las relaciones hombre-naturaleza.

Original image of relationship

Master

1. Nature should not hamper economic progress
2. The ability to think puts humans above nature
3. Nature is there for me, not the other way around
4. We have the right to change nature if humans benefit from it

Steward

5. Our generation has to take care that nature will be preserved for future generations
 6. Because humans have the ability to think, we should take care of nature
 7. Every human being is responsible for the conservation of nature
 8. We are part of nature and therefore we are responsible to take care of it
 9. I feel obliged to protect nature
-

Original image of relationship

Partner/participant

- 10.** Human beings are inextricably connected with nature
 - 11.** Nature should be given the possibility to develop, just like humans
 - 12.** Humans and nature are of equal value
 - 13.** Humans and nature are entitled to an equal consideration
 - 14.** I feel at one with life on earth
 - 15.** I consider nature as a good friend
 - 16.** Nature must always take its course
-

All of the statements used were directly derived from those of [Van den Born \(2008\)](#), [De Groot \(2011\)](#), and [van Heel *et al.*, \(2017\)](#), although some were slightly reworded in order to fit our specific research context. We also unified the “partner” and “participating” groups, as we did in our previous study, because, from a few test surveys, we saw that the respondents had difficulty in grasping the difference between them. The description of the various classifications is reported in [Table 2](#). We also asked respondents if they were members of associations that dealing with the environment (such as WWF, Greenpeace, FAI-Italian environment fund, LIPU-partner of Birdlife, Italian Alpine Club, etc.) or members of hunting club.

Table 2. Classification of the human-nature relationship ([van den Born, 2008](#); [De Groot *et al.*, 2011](#); [van Heel *et al.*, 2017](#)), as modified.

Tabla 2. *Clasificación de las relaciones hombre-naturaleza (van den Born, 2008;De Groot et al., 2011;van Heel et al., 2017), modificadas.*

<i>Master over nature</i>	Humans stand above nature and are allowed to maximize exploitation of nature for the benefit of human society, as detrimental effects of human actions can easily be overcome by economic growth and technology.
<i>Steward of nature</i>	Humans stand above nature but have a responsibility to take care of nature towards God (religious version) or future generations (secular version).
<i>Partner/participant with nature</i>	An equal relationship exists between humans and nature, who work together in a dynamic process of interaction and mutual development. Humans are part of nature, not just biologically but also spiritually.

The survey concluded with questions regarding gender, age, class, educational level, and job. In the case of the questionnaires distributed to farmers, we added some additional questions specific to their activities. Specifically, we asked how many animals they have, and of which type. We also asked whether they adopt any measures to protect their animals and of what nature, for example the use of fences, night shelters, sheepdogs, etc. Finally, we asked if they had ever suffered damage caused by wolves, and if so, whether they had asked for and received compensation.

5. Results ⌵

5.1. Description of the stakeholders groups ⌵

As shown in Table 3, 107 respondents were considered as members of the “general public”, 19 as “experts”, and 15 as exclusively “farmers”. The sample consisted predominantly of males, among all the groups (70.09%, 94.74% and 66.67% respectively). These percentages, compared to the Calabrian population, is much higher (in Calabria: 49%, ISTAT 2020), but we used all the questionnaires received without making any selection. The respondents were classified according to 3 age groups: less than 30 years, 30 to 55, and over 55 years old. Among all the groups, the middle age prevailed, even if to a lesser extent in the general public group (55.14% vs 73.68% among the experts and 80% among the farmers). In addition, among the general public the other ages are equally represented (24.30% the younger, 20.56% the older), but in the other groups the older age is more represented than the younger (21.05% vs 13.33% among the experts, 5.26% vs 6.67% among the farmers).

Table 3. Description of the stakeholders groups (Source: our elaboration from direct investigations).

Tabla 3. Descripción de los grupos de stakeholders (Fuente: elaboración propia a partir de investigaciones).

	General public	Experts	Farmers
Total respondent	107	19	15
Male	75 (70.09%)	18 (94.74%)	10 (66.67%)
Female	32 (29.91%)	1 (5.26%)	5 (33.33%)
Age (years)	< 30: 26 (24.30%) 30-55: 59 (55.14%) >55: 22 (20.56%)	< 30: 1 (5.26%) 30-55: 14 (73.68%) >55: 4 (21.05%)	< 30: 1 (6.67%) 30-55: 12 (80%) >55: 2 (13.33%)
Education*	Lower 50 (46.73%) Average 46 (42.99%) Higher 12 (11.21%)	0 4 (21.05%) 15 (78.95%)	6 (40%) 7 (46.67%) 2 (13.33%)

	General public	Experts	Farmers
Members of environmental associations or similar**	--	4 (21.05%)	--
Members of hunting club	--	--	--

* (Lower education= only finished primary school; average education= only finished high school; higher education= university degree or more).

** (WWF, Greenpeace, FAI - Italian environment fund, LIPU-partner of Birdlife, Italian Alpine Club, etc.)

Regarding the educational level of respondents, among the general public 46.76% had a lower level education, like as 40% of the farmers; in contrast, none of the experts fall into this group, as expected. Average and higher educational level are equally represented among general public and farmers (42.99% and 46.67% for the average level, 11.21% and 13.33% for the higher level, respectively). In the case of experts, the vast majority attained a higher educational level (78.95), while relatively few hold an average educational level (21.05%). In total, only 21.05% of the experts are members of environmental organizations, while none of the respondents is member of a hunting club or go hunting in their free time. Even though hunters are an important stakeholder group when researching attitudes towards large carnivores (Andersone & Ozolins, 2004); in that sense, we chose not to include hunters as a group in the survey for two reasons (e.g. van Heel *et al.*, 2017): wolves are protected throughout Italy and especially within the park, our study area, and hunting them is forbidden; hunting is generally

a secondary activity to another profession, therefore we classified the interviewees according to their profession and not according to their secondary activities.

5.2. Farmers' characterization ^π

As detailed in Table 4, the vast majority of the investigated farmers rear cattle (93.33%), while only one rears sheep (6.67%). During the day, they put the animals to graze, and most of them bring their animals into sheds overnight (86.67%). All of the farmers have sheepdogs, ranging in number from 2 to 8 (4.3 on average) to protect their herds; these are specialised working dogs, the Maremmano sheepdog, native to Italy and/or crossbreed sheepdogs. Other methods used to protect the flocks are pastoral (80%) or electric (20%) fences.

Table 4. Farmers' characterization (n=15) (Source: our elaboration from direct investigations).

Tabla 4. Caracterización de los agricultores (n = 15) (Fuente: elaboración propia a partir de investigaciones).

Cattle farmers	14 (93.33%)
Sheep farmers	1 (6.67%)
Sheepdogs	2-8 (average 4.3)

Protections	
<i>Pastoral fences</i>	12 (80%)
<i>Electric fences</i>	3 (20%)
<i>Sheds (during the night)</i>	13 (86.67%)
Use of pasture	15 (100%)
Suffered wolf damage	7 (46.67%)
Requested a refund for wolf damage	3 (20%)
Had a refund for wolf damage	--

Almost half of the farmers (46.67%) have suffered wolf damage, namely, wolves killing their animals, at least once, but only 20% of them requested the compensation provided for by the Park and none received a payment.

5.3. Stakeholders' vision of nature ↗

Questionnaires were analysed to collect initial information from a study which will have to be further developed.

The data regarding the respondents' view of the human-nature relationship are reported in Table 5. More or less a quarter of general public and experts and 40% of the farmers choose three statements belonging to one vision of the human-nature relationship, considering humans as "master" only in one case (general public), as "steward" in most cases (14.95%, 21.05% and 33.33%, respectively in the three groups) and as "partner/participant" in the remaining cases (8.41% in general public, only one case in farmers).

Table 5. Stakeholders' vision of nature, according to the images of the human-nature relationship (Source: our elaboration from direct investigations)

Tabla 5. Visión de la naturaleza por parte de los stakeholders, de acuerdo a las imágenes de la relación hombre-naturaleza (Fuente: elaboración propia a partir de investigaciones).

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
Master	1 (0.93%)	--	--
Steward	16 (14.95%)	4 (21.05%)	5 (33.33%)
Partner/participant	9 (8.41%)	--	1 (6.67%)

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
Master + Steward	16 (14.95%)	4 (21.05%)	--
Steward + Partner	43 (40.19%)	10 (52.63%)	6 (40%)
Master + Partner	8 (7.48%)	--	1 (6.67%)
Master+Steward+Partner	14 (13.08)	1 (5.26%)	2 (13.33%)

However, most of all the stakeholders surveyed chosen statements that can be linked to two or three images: above all steward + partner (respectively 40.19%, 52.63% and 40%), but also master + steward (14.95% and 21.05% in general public and experts) or master + partner (7.48% and 6.67% in general public and farmers) and even master + steward + partner (about 13% in general public and farmers, only one respondent in experts).

5.4. Stakeholders' knowledge of the wolf π

We asked the stakeholders how they would rate their general knowledge of the wolf and its behaviour, and whether they had ever seen a wolf, either in the wild or in captivity, as well as whether they had ever seen a wolf hybrid. We summarised this knowledge through 3 very simple questions: if they knew how many wolves there are in the park; what they thought the average weight of a wolf is; and if it is

true that only one pair of wolves reproduces in every pack. Responses are reported in Table 6. Most of the general public surveyed defined their knowledge of the wolf as being “sufficient” (35.51%) or “good” (26.17%); a few of them think their knowledge is “excellent” (9.35%) and the others think that is “poor” (17.76%) or “nothing” (11.21%). About a half of general public had seen a wolf at least once, either in captivity (52.34%) or in the wild (45.79%). Almost 25% had also seen a hybrid wolf-dog. A similar picture emerges in regard to the experts and the farmers, with most having seen a wolf at least once, in the wild (68.42% and 66.67%, respectively) or in captivity (78.95% and 53.33%), although with fewer (15.79% and 29%) having encountered a hybrid. In regards to their knowledge of the wolf, however, the expert’s response was slightly different: 52.63% of them defined it “good”, and a lower percentage of “sufficient” (26.32%) or “excellent” (21.05%).

Table 6. Stakeholders’ knowledge of the wolf (Source: our elaboration from direct investigations)

Tabla 6. Conocimiento del lobo por los stakeholders (Fuente: elaboración propia a partir de investigaciones).

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
<i>I think my knowledge about wolf is...</i>			
nothing	12 (11.21%)	--	--
poor	19 (17.76%)	--	--

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
sufficient	38 (35.51%)	5 (26.32%)	10 (66.67%)
good	28 (26.17%)	10 (52.63%)	4 (26.67%)
excellent	10 (9.35%)	4 (21.05%)	1 (6.67%)
<i>At least once, I saw...</i>			
a wolf in the wild	49 (45.79%)	13 (68.42%)	10 (66.67%)
a wolf in captivity	56 (52.34%)	15 (78.95%)	8 (53.33%)
a hybrid	27 (25.23%)	3 (15.79%)	3 (20%)
<i>I think in the park there are ...</i>			
< 10 wolves	18 (16.82%)	1 (5.26%)	--
10-50 wolves	60 (56.07%)	14 (73.68%)	11 (73.33%)
> 50 wolves	29 (27.10%)	4 (21.05%)	4 (26.67%)
<i>I think the average weight of a wolf is...</i>			

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
< 10 kg	9 (8.41%)	--	--
10-50 kg	78 (72.90%)	19 (100%)	13 (86.67%)
> 50 kg	20 (18.69%)	--	2 (13.33%)
<i>I think there is only one breeding pair inside a pack</i>			
I agree	23 (21.50%)	16 (84.21%)	5 (33.33%)
I do not agree	32 (29.91%)	1 (5.26%)	4 (26.67%)
I do not know	52 (48.60%)	2 (10.53%)	6 (40%)

On the other hand, the farmers defined their knowledge of the wolf “sufficient” in two-thirds of the cases, “good” in 26.67% and “excellent” only in one case (6,67%). In respect to the estimation of the number of wolves within the Park, the majority of all the three groups thought there to be between 10 and 50 wolves (respectively, 56.07%, 73.68% and 73.33%), while a few among general public and experts thought there to be less than 10 wolves (respectively, 16.82% and 5.26%); none among the farmers underestimated this data. On the other hand, about a quarter among all the groups hold an exaggerated view of the reality, thinking that there are more than 50 wolves running wild. In reality, the maximum carrying capacity of the territory lies between 3 and 4 wolf packs, each one of about 3-4

individuals. In regard to a wolf's estimated weight, we indicated very general weight bands so as to reduce the possibility that respondents would skip the question. The options given were less than 10 kg, from 10 to 50 kg, and more than 50 kg. In all the categories of respondents, almost everyone indicated the correct weight, i.e. between 10 and 50 kg (experts 100%; the others, respectively, 72.90% and 86.67%). Only a minority within general public and farmers believe the average weight of the wolf be more than 50 kg, and only a minority within general public believe it be less than 10 kg. In regards to the final question, when asked whether it is true that there is only one breeding pair of wolves in each pack, the response from the general public was "I don't know" in about half of the cases (48.60%). In the other half, they were more or less equally divided between the 2 options namely "I agree" and "I don't agree" (being 21.50% and 29.91%, respectively). Also, among farmers, in many cases (40%) they did not know, almost a third (33.35%) did agreed, and 26.67% did not agreed. In general, then, we can say that general public and farmers appear to be not well informed in regard to this very important aspect. The experts, on the other hand, appear well informed, given that the large majority (84.21%) responded correctly "I agree", as we might have expected. Only one of them did not agree and only a small percentage responded "I don't know" (10.53%).

5.5. Stakeholders' attitude towards the wolf π

We asked closed questions to find out if the interviewees considered the presence of wolves in the area to be positive or negative, and if they were in favour or against the wolf in general (Table 7). Both among the general public and the farmers, many respondents believed the presence of wolves in the Park area to be generally "positive" (49.53% and 40%, respectively); almost all the experts had the

same opinion (94.74%). Only one expert (5.26%), and about a third of the other groups (34.58% of the generic public and 26.67% of the farmers) remained “indifferent” toward the presence of wolves, and only about 20% of all the respondents (33.33% and 15.89%, respectively for farmers and generic public) considered it “negative”.

Table 7. Stakeholders' attitudes towards the wolf (Source: our elaboration from direct investigations).

Tabla 7. Actitud de los stakeholders hacia el lobo (Fuente: elaboración propia a partir de investigaciones).

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
<i>I think wolf presence in the Park area is...</i>			
Positive	53 (49.53%)	18 (94.74%)	6 (40%)
Negative	17 (15.89%)	--	5 (33.33%)
Indifferent for me	37 (34.58%)	1 (5.26%)	4 (26.67%)
<i>I am...</i>			

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
Completely/partially against the wolf*	21 (19.62%)	1 (5.26%)	8 (53.33%)
Neutral	46 (42.99%)	3 (15.79%)	3 (20%)
Partially/completely in favour ¹	40 (37.38%)	15 (78.95%)	4 (26.67%)

* The data derives from the aggregation of the two indicated classes.

In regards to the wolf in general, the large majority of the experts (78.95%) and intermediate percentages of the other groups (37.38% and 26.67% for general public and farmers, respectively) defined themselves “partially or completely in favour of the wolf”. Among the general public, a large percentage defined themselves as “neutral” (42.99%), like as the 15.79% of the experts and the 20% of the farmers. In contrast, farmers declared themselves to be “partially or completely against” the wolf in 53.33% of cases, while only one expert (5.26%) and 19.62% of the general public declared the same.

5.6. Stakeholders' attitude towards the management of the wolf. ↗

We analysed the stakeholder's attitude towards the management of wolves (Table 8), asking them if they believe human/wolf coexistence to be possible. The overwhelming majority of all the groups

believe it is (63.55%, 84.21% and 53.33%, respectively), while a lower percentage in all the groups believe it is not (14.95%, 10.53% and 26.67%). About 20% of generic public and farmers did not know, like as only one expert (5.26%). Most of the respondents believe it is important to completely protect wolves, both in Italy as a whole (57.94%, 94.74% and 53.33%) and moreover within the area of the park (76.64%, 94.74% and 73.33%).

Table 8. Stakeholders' attitude towards the management of the wolf
(Source: our elaboration from direct investigations).

Tabla 8. Actitud de los stakeholders hacia la gestión del lobo (Fuente: elaboración propia a partir de investigaciones).

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
<i>Coexistence human/wolf is possible</i>			
I agree	68 (63.55%)	16 (84.21%)	8 (53.33%)
I do not agree	16 (14.95%)	2 (10.53%)	4 (26.67%)
I don't know	23(21.50%)	1 (5.26%)	3 (20%)
<i>Wolves should be completely protected in Italy</i>			
I agree	62 (57.94%)	18 (94.74%)	8 (53.33%)

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
I do not agree	16 (14.95%)	1 (5.26%)	5 (33.33%)
I don't know	29 (27.10%)	--	2 (13.33%)
<i>Wolves should be completely protected in the Park</i>			
I agree	82 (76.64%)	18 (94.74%)	11 (73.33%)
I do not agree	4 (3.74%)	1 (5.26%)	3 (20%)
I don't know	21 (19.62%)	--	1 (6.67%)
<i>It is important to have a healthy wolf population in the Park</i>			
I agree	74 (69.16%)	19 (100%)	8 (53.33%)
I do not agree	14 (13.08%)	--	3 (20%)
I don't know	19 (17.76%)	--	4 (26.67%)
<i>Hunting wolves outside the park must be possible</i>			

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
I agree, always	11 (10.28%)	1 (5.26%)	7 (46.67%)
I agree, according to hunting calendar	9 (8.41%)	--	2 (13.33%)
I do not agree	53 (49.53%)	17 (89.47%)	4 (26.67%)
I don't know	34 (31.78%)	1 (5.26%)	2 (13.33%)
<i>Hunting wolves even in the park must be possible</i>			
I agree, always	6 (5.61%)	--	3 (20%)
I agree, according to hunting calendar	3 (2.80%)	--	1 (6.67%)
I do not agree	73 (68.22%)	19 (100%)	5 (33.33%)
I don't know	25 (23.36%)	--	6 (40%)
<i>Killing wolves in any way must be possible</i>			
I agree	4 (3.74%)	--	--
I do not agree	83 (77.57%)	19 (100%)	12 (80%)

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
I don't know	20 (18.69%)	--	3 (20%)

Otherwise some respondents, above all farmers, believe that the wolf must not be protected, either in Italy (14.95%, 5.26% and 33.33%, respectively) or in the park (3.74%, 5.26 and 20%, respectively). In any case, the majority of the respondents believe it is important for the wolf population to be at a healthy level (69.16%, 100% and 53.33%, respectively). In response to the statement "hunting wolves must be possible outside the park" or "even in the park", the options given were "yes, always", or "yes, according to the hunting calendar", or "no", or "I don't know". The general public and the experts responded "no" both within and outside the park in most cases (49.53% and 89.47% outside; 68.22% and 100% inside the park). In contrast, the point of view is completely different for the farmers, who believe that hunting wolves should always be allowed, outside (46.67%) and even within the park (20%). A few farmers would accept the limitation of the hunting calendar, outside or even within the park (13.33% and 6.67%, respectively). However, some of them are against hunting: 26.67% without, 33.33% within the park. Nevertheless, also a minority of generic public would like hunting outside and within the park, with or without a hunting calendar (10.28% and 8.41 without the park, without or with the calendar; 5.61% and 2.80% inside the park, without or with the calendar). Lastly, some respondents in all the groups did not give a personal opinion on hunting (31.78%, 5.26% and 13.33%, respectively, outside the park; and 23.36% of general public and 40% of farmers within the park; no experts without opinion). Almost all the respondents did not agree with the statement that "killing wolves in any way must be possible" (77.57%, 100% and 80%), while 3.74% of generic public and 20% of farmers did not know and only 3.74% of generic public agreed.

5.7. Stakeholders' perception of the wolf/nature and wolf/humans relationship x

The next questions (Table 9) regarded the perceived relationship between the wolf and nature, and between the wolf and humans. In response to the assertion that a wolf would attack a human if they encountered one, almost all the respondents disagreed, above all among the first two groups (72.48% and 100%, and 53.33% in the farmers group). Instead, among the general public a small percentage of respondents believed that it would, like as the 40% of the farmers. None of the experts believed this assertion and none had any doubts, while around one in five of the general public and one farmer (20.19% and 6.67%) did not know the answer. In relation to the assertion that wolves are present throughout the Calabria region, the majority (52.34% of the general public, 73.68% of experts, and 100% of farmers) answered "I agree", as well as to the assertion that wolves are protected throughout the Region (respectively, 61.68%, 94.74% and 73.33%). Regarding the presence of wolves throughout the Calabria region, the other respondents were more or less equally divided between the responses "I don't agree" and "I don't know": 26.17% and 21.50% among general public and 15.79% and 10.53% among the experts. Regarding the protection of the wolf, instead, as opposed to 12.50% of general public that did not agree, the other respondents answered "I don't know" (26.17%, 5.26% and 26.67%, respectively for the three groups). In regards to the statement that "Wolves have been repopulated throughout Italy", the general public didn't show a clear idea, since responses were equally divided between the 3 options given (51.40%, 22.43% and 25.23% respectively for "I agree", "I don't agree" and "I don't know"). The majority of experts and farmers believe that wolves have been repopulated throughout Italy (73.68% and 86.67, respectively), in contrast with only a 10.53% of experts that don't

believe in this assertion, while about the same percentage of experts and farmers (15.79% and 13.33%) don't know the response.

Table 9. Stakeholders perception of the wolf/nature and wolf/humans relationship (Source: our elaboration from direct investigations).

Tabla 9. Percepción de los stakeholders de las relaciones lobo/naturaleza y lobo/humanos (Fuente: elaboración propia a partir de investigaciones).

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
<i>Wolves attack humans if they meet them</i>			
I agree	35 (7.34%)	--	6 (40%)
I do not agree	47 (72.48%)	19 (100%)	8 (53.33%)
I don't know	25 (20.19%)	--	1 (6.67%)
<i>Wolves are present throughout the Calabria region</i>			

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
I agree	56 (52.34%)	14(73.68%)	15 (100%)
I do not agree	28 (26.17%)	3 (15.79%)	--
I don't know	23 (21.50%)	2 (10.53%)	--
<i>Wolves are protected throughout the Calabria region</i>			
I agree	66 (61.68%)	18 (94.74%)	11 (73.33%)
I do not agree	13 (12.15%)	--	--
I don't know	28 (26.17%)	1 (5.26%)	4 (26.67%)
<i>Wolves have been repopulated in Italy</i>			

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
I agree	55 (51.40%)	5 (21.32%)	13 (86.67%)
I do not agree	24 (22.43%)	11 (57.86%)	--
I don't know	27 (25.23%)	3 (15.79%)	2 (13.33%)
<i>Wolves kill domestic livestock only if there are not enough wild prey</i>			
I agree	40 (37.38%)	15 (78.95%)	4 (26.67%)
do not agree	38 (35.51%)	1 (5.26%)	8 (53.33%)
I don't know	29 (27.10%)	3 (15.79%)	3 (20%)
<i>I would be happy if the number of wolves in the Park increased</i>			

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
I agree	46 (42.99%)	15 (78.95%)	5 (33.33%)
I do not agree	33 (30.84%)	1 (5.26%)	8 (53.33%)
I don't know	28 (26.17%)	3 (15.79%)	2 (13.33%)
<i>The environmental managers can make the right decisions about the wolf</i>			
I agree	59 (55.14%)	15 (78.95%)	9 (60%)
I do not agree	10 (9.35%)	1 (5.26%)	5 (33.33%)
I don't know	38 (35.51%)	3 (15.79%)	1 (6.67%)

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
<i>Training courses and awareness campaigns could help the population to better orientate themselves in the human-wolf relationship</i>			
I agree	64 (59.81%)	16 (84.21%)	8 (53.33%)
I do not agree	12 (11.21%)	2 (10.53%)	2 (13.33%)
I don't know	31 (28.97%)	1 (5.26%)	5 (33.33%)

The general public showed the same uncertainty about the next statement, “wolves kill livestock only if there are not enough wild prey”, with responses equally divided between the 3 options given (37.38%, 35.51% and 27.10% respectively for “I agree”, “I don't agree” and “I don't know”). In contrast, the majority of experts (78.95%) and the 26.67% of the farmers agreed with this statement, while the majority of farmers (53.33%) and only one expert (5.26%) didn't agree. About the same percentage of these two groups don't know if believe it or not (15.79% and 13.13%, respectively for experts and farmers). Most of the general public and the experts would be happy if the number of wolves in the

park increased (42.99% and 78.95%), whilst most farmers (53.33%) would not. But also, in this case there was a percentage of undecided that preferred to respond "I don't know".

This said, there was almost universal agreement from all three stakeholder groups (55.14%, 78.95%, and 60% respectively) that environmental managers can make the right decisions concerning the wolf and its management where necessary. Only a small number of respondents in the first two groups (9.35% and 5.26%) and about a third of the farmers actively disagreed with this statement. However, we ever had a percentage of undecided: 35.51%, 15.79% and 6.67%, respectively, in the groups. As to whether training courses and awareness campaigns could help the population to better orientate themselves in the human-wolf relationship, there was the same agreement in the groups: 59.81%, 84.21% and 53.33%, respectively, though a few respondents believed they could not (11.21%, 10.53% and 13.33%). Some respondents of the generic public and the farmers did not respond (28.97% and 33.33%), like as only one expert (5.26%).

5.8. Stakeholders' perception of the wolf/farmers relationship ^π

For the following questions (Table 10), we hypothesised some situations that are chiefly of interest to farmers. We asked if a wolf should be killed if he killed livestock.

Table 10. Stakeholders' perception of the wolf/farmers relationship
(Source: our elaboration from direct investigations).

Tabla 10. Percepción de los stakeholders de la relación
logo/agricultores (Fuente: elaboración propia a partir de

investigaciones).

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
<i>If a wolf kills livestock, the wolf should be killed</i>			
I agree	29 (27.10%)	1 (5.26%)	9 (60%)
I do not agree	59 (55.14%)	18 (94.74%)	2 (13.33%)
I don't know	19 (17.76%)	--	4 (26.67%)
<i>If a wolf kills livestock, farmers should always be compensated</i>			
I agree	79 (73.83%)	13 (68.42%)	14 (93.33%)
I do not agree	7 (6.54%)	4 (21.05%)	--
I don't know	21 (19.62%)	2 (10.53%)	1 (6.67%)

	General public (n = 107)	Experts (n = 19)	Farmers (n = 15)
<i>Farmers should not receive compensation for losses caused by wolves if they do not use livestock protection methods</i>			
I agree	31 (28.97%)	13 (68.42%)	3 (20%)
I do not agree	43 (40.19%)	4 (21.05%)	8 (53.33%)
I don't know	33 (30.84%)	2 (10.53%)	4 (26.67%)
<i>Farmers should be insured against losses caused by wolves.</i>			
I agree	67 (62.62%)	14 (73.68%)	11 (73.33%)
I do not agree	6 (5.61%)	1 (5.26%)	1 (6.67%)
I don't know	34 (31.78%)	4 (21.05%)	3 (20%)

Most of the general public and the experts didn't agree (55.14% and 94.74%), like as a minority of the farmers (13.33%). On the contrary, most of the farmers (60%) and about a third of the generic public (27.10%) would like to kill a wolf in this event; only one expert (5.26%) agreed with this. Anyway, both among generic public and farmers met a percentage who didn't know what to do (17.76 and 26.67, respectively). In any case, a huge majority of all the respondents broadly agreed that farmers should always be compensated if a wolf kills their livestock (73.83%, 68.42 % and 93.33%) and this compensation should always be made available, whether livestock protection methods are used or not (40.19%, 21.05% and 53.33%, respectively). This view is not so strongly held by the experts (68.42%) and the other groups (28.97% and 20%, respectively generic public and farmers); they think that farmers must employ forms of protection if they want to be compensated in case of losses caused by wolves. However, the majority of respondents among all the groups think that farmers should be insured against losses caused by wolves (62.62%, 73.68% and 73.33%).

6. Discussion ^π

The stakeholders surveyed were people living and working in municipalities within the Sila National Park area. The area has a long tradition of coexistence with wolves, as they have always been present in the area. Consequently, we can say that cohabitation with the wolf is part of their experiential baggage, as well as their cultural heritage. Moreover, all the respondents had the experience of seeing a wolf, in the wild or in captivity, that is very important in forming positive attitudes towards wildlife, according to [van Heel et al. \(2017\)](#). In addition, all respondents on average showed a rather ecocentric vision of the human's relationship to nature, that is, they attribute to humans the role of "steward" or

“partner/participant” or “steward+partner”. So, we expected an averagely open attitude also towards the wolf (Røskaft *et al.*, 2007), even by the farmers, who know and implement important coexistence strategies. Overall, those participated in the survey are cattle farmers, less susceptible to predation than sheep (Meriggi & Lovari, 1996; Gazzola *et al.*, 2008; Dondina *et al.*, 2015). Furthermore, according to Røskaft *et al.* (2003, 2007), Treves & Karanth (2003), Kleiven *et al.* (2004), Treves *et al.* (2013), some socio-demographic characteristics of the respondents such as gender, mainly male, and age, mainly under 55, led to expect a positive attitude towards the wolf by all groups of respondents. The level of education instead differentiates the 3 groups, with a medium-low level in the general public and in farmers, compared to a medium-high level in the experts. The level of knowledge of the wolf also follows the same trend: higher in the experts, medium-low in the other two groups; this could justify a more favourable perception of the wolf by the experts (e.g. Glikman *et al.*, 2011). Another reason why experts are more positive towards the wolf could be that they view potential conflicts from a “rational” perspective, taking into consideration benefits of improved ecosystem functioning (van Heel *et al.*, 2017). All three groups of respondents consider positive the presence of the wolf in the area of the Park; on the contrary, only the group of experts considers positive this presence in the territory in general, while the other two groups express opposite or neutral opinion. This attitude could be called a NIMBY effect in reverse: respondents show a greater acceptance of the wolf in their territory as a protected area. Overall, a majority of the general public and experts think that coexistence with humans is possible, that the wolf should be completely protected, both within and outside the Park; know that hunting or killing wolves is forbidden and agree with these regulations. They would be happy if the number of the wolves in the Park increased. On the contrary, despite the farmers think that the wolfs presence in the Park area is positive, about half of them claim to be against the wolf and don't believe that coexistence is possible. Moreover, most of them are favourable

to hunting, at least outside the park. The same percentage of farmers would not be happy if the number of wolves in the park increased. However, we can note that the majority of farmers, as well as the majority of experts and general public, trust environmental managers can make the right decisions. This is a positive result and can absolutely be helpful for a constructive dialogue. A negative perception on the part of farmers was also found in other studies; and seem a direct result from the impact the wolf may have on their livelihood (Naughton-Treves *et al.*, 2003; Kalterborn & Bjerke, 2002; van Heel *et al.*, 2017), and may related to possible damage to their livestock (Kaltenborn & Bjerke, 2002). In addition, many of the participating farmers have already experienced the damage and the risk, and this could also lead them to have, according to Kleiven *et al.* (2004) and Vittersø *et al.* (1999), a more negative perception. Stakeholders' general knowledge of the wolf and its relationship with nature and humans is generally good, despite some deficiency. For example, most of the respondents (excepted the experts) don't believe that only the "alpha pair" reproduces (Mech, 1999), which can affect the life of the pack. The (illegal) killing of an alpha wolf does not eliminate the alleged danger to livestock, but on the contrary creates unrest and uncontrolled behaviour by surviving individuals (Mech & Boitani, 2007). They often turn to livestock for food, being temporarily unable to organize for hunting wild prey. Moreover, the farmers maintain that the wolf prefers livestock in any case, even if they have wild prey available; therefore, they display negative attitudes towards the predator, such as the desire to kill every wolf that has killed their animals. Another element of contention is the use of the compensation tool; in fact, the experts would like it conditional on the presence of adequate protection methods, including insurance, while the general public and farmers would like it unconditionally. In our view, and in agreement with Naughton-Treves *et al.* (2003) and Røskaft *et al.* (2007), it is quite normal to find such opinions in breeders; indeed, according to these authors, they did not become more tolerant even after receiving compensation for the damage.

Nevertheless, all respondents identify compensation payments as a strategy of conflicts mitigation. The majority of respondents believe that training courses and awareness campaigns could help the population to better orientate themselves in the human-wolf relationship, as these tools can improve knowledge and allow a more objective view of the issues. But this does not always happen and does not happen in the same way for everyone. In fact, the knowledge deficit model presupposes that learners are passive receptors of knowledge and use the same knowledge in the same way, which is not the case, since all the stakeholders have a different socio-cultural background and an active role in interpreting any new knowledge and information (Hovardas, 2018).

7. Conclusions π

Our survey covered people living and working in the area of the Sila National Park, where the presence of the wolf is historical. For this area, the wolf can be defined a real “cultural heritage”, so much so that the logo of the park portrays it. This context allowed us to photograph a particularly favourable situation, with a perception of the wolf that can be summarized in a substantial acceptance even by breeders. In our study we found that all the respondents showed a rather ecocentric vision of the relationship between humans and nature, that is, on average, they all adhere to the position of “stewardship” of humans with respect to nature, which could be in line with a more positive perception towards wolf. Moreover, the data obtained show that joining stewardship is also important because it makes people open to dialogue and gives them trust in environmental managers.

To further improve wolf perceptions, personalized communication strategies could be adopted for different stakeholder groups, acknowledging each group the different knowledge-spheres, including

those based on personal experiences, culture and tradition, and science (Sjölander-Lindqvist *et al.*, 2015). Framing messages from a steward point of view may also provide ground for stakeholder groups to understand each other and agree a common view for wolf management, as suggested by Reimer *et al.* (2012). Customizing the actions according to the different stakeholders may not give the desired results; however, in our opinion, giving up “education” towards the population would be an even greater mistake. In our opinion, the stakeholders who live in the Park area could take an active role in raising awareness-raising strategies towards the rest of the population, including through social media, contributing with their testimony and experience to improve the general perception.

In line with the suggestion, coordinated measures have been launched between research and field activities, such as the “*Wolfnet Sila*” project developed by the Sila National Park Authority for the protection and promotion of the wolf in its territory. The project is developed in the context of a research activity for management purposes, which makes possible the concrete, shared and large-scale implementation of a monitoring, conservation and management system capable of ensuring long-term conservation of the wolf in the Park area, and the containment of any conflicts that may arise on the territory.

After all, finding solutions for a peaceful coexistence was one of the objectives that we set ourselves in the study.

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Note ^π

- 1 Transhumance: seasonal migrations over a wide territorial range, and with an accentuated vertical drop, with which large or medium-sized animals move from the lowland regions to the mountain regions and vice versa, spontaneously or with human consent, along particular natural routes (*tratturi*) or transported on ordinary roads with special trucks.

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