

## Wolves living in proximity to humans



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**Autoren**  
**Auteurs**  
**Authors**

Jacqueline Huber, Manuela von Arx,  
Roland Bürki, Ralph Manz, Urs Breitenmoser

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Roland Bürki

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KORA  
Thunstr. 31  
CH-3074 Muri  
+41 (0)31 951 70 40  
[info@kora.ch](mailto:info@kora.ch)

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**Front cover picture**

© German tourist, who was sitting on a bench next to a meadow near Vättis, SG, Switzerland. He was playing on his harmonica when two wolves came out of the woods and passed 20 m in front of him. They did not flee, but simply continued on their way, also when he stopped playing and took out his camera to take pictures.

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Summary of a first enquiry on wolf behaviour  
near humans in Europe

Jacqueline Huber, Manuela von Arx,  
Roland Bürki, Ralph Manz, Urs Breitenmoser

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**Abstract** – A change in the behaviour of the Calanda pack, eastern Switzerland, led to an increase in observations of (i) wolves during daytime, (ii) wolves approaching or passing humans or staying close to humans, (iii) wolves next to barns and stables at the edge of villages, and (iv) wolves entering the village of Vättis. These reports sparked a public debate about “increasingly tame wolves” and the danger they may represent to humans. To better assess the “normality” and danger of the observed behaviour, we enquired amongst the members of the IUCN/SSC Large Carnivore Initiative for Europe (LCIE) whether similar observations had been made elsewhere in Europe. The questions were aimed at the presence of resident wolf packs, whether the persons contacted knew of observations in their country of wolves repeatedly approaching human residences or people, and whether they had reports of wolves showing aggressive behaviour towards humans. Answers were received from all 31 contacted countries, with 28 having resident wolf packs. All those 28 countries reported that at least some of their packs had established their territory close to or even including settlements, and had reports of wolves approaching habitations. 14 countries also had reports of wolves approaching people. Often these were exceptional cases, or witness reports that could not be independently verified. Aggressive behaviour towards humans was reported from 12 countries. The vast majority of such behaviour was assessed by the contacts to originate either from rabid wolves, or wolves that had to defend themselves. Only one contact from Spain reported the occurrence of unprovoked attacks of wolves on humans, the last of which had occurred in 1975. In no case was confirmed aggression towards humans directly related to the observation of wolves repeatedly showing up in/near settlements or repeatedly approaching humans. Our preliminary inquiry however also revealed that, without a very strict definition of behavioural terms, communication about wolf behaviour is confusing and leaves considerable room for interpretation. Most observations related to “bold” wolves have been reported by local media, which makes a standardised and objective assessment of such events very difficult. We suggest improving the research and international exchange of information on the habituation of wild wolves (e.g. based on a standardised protocol), i.e. the process(es) leading to habituation, the resulting behavioural responses in wolves, and the necessity of managerial measures in response to such observations.

**Zusammenfassung** – Eine Verhaltensänderung des Calandarudels, Ostschweiz, führte zu einer Zunahme von Beobachtung von (i) Wölfen am helllichten Tag, (ii) Wölfen, die sich Menschen annäheren, an ihnen vorbei gehen, oder in ihrer Nähe bleiben, (iii) Wölfen in der Nähe von Scheunen und Ställen an Dorfrändern, und (iv) Wölfen im Innern des Dorfes Vättis. Dies führte zu einer öffentlichen Debatte über „zunehmend zahme Wölfe“ und deren möglicher Gefährlichkeit für den Mensch. Um besser beurteilen zu können, ob das beobachtete Verhalten tatsächlich „abnormal“ und gefährlich ist, haben wir die Mitglieder der IUCN/SSC Large Carnivore Initiative for Europe (LCIE) befragt, ob in ihrem Land ähnliche Beobachtungen gemacht wurden. Die gestellten Fragen handelten von der Präsenz von Wolfsrudeln im Land, ob der Person Vorkommnisse bekannt sind von Wölfen, die sich wiederholt Personen oder Gebäuden annäheren, und ob Vorkommnisse bekannt sind von aggressivem Verhalten von Wölfen gegenüber Menschen. Von allen 31 kontaktierten Ländern wurde eine Antwort erhalten und 28 davon verfügten über residente Wolfsrudel. Aus allen diesen 28 Ländern wurde berichtet, dass sie zumindest einzelne Wolfsrudel haben, deren Territorium sich in der Nähe von Siedlungen befindet oder solche sogar einschliesst, und dass sich Wölfe wiederholt Gebäuden annäheren. In 14 Ländern gab es Vorkommnisse von wiederholter Annäherung von Wölfen gegenüber Menschen. Dies waren meist Ausnahmefälle, oder Zeugenberichte, die nicht unabhängig verifiziert werden konnten. In 12 Ländern kam es zu Fällen von Aggression von Wölfen gegenüber Menschen. Die

jeweiligen Länderkontakte führten die überragende Mehrheit dieser Fälle entweder auf Tollwut oder auf Selbstverteidigung der Wölfe zurück. Einzig einer der Länderkontakte in Spanien berichtete von unprovokierten Angriffen auf Menschen, wovon der letzte aus 1975 stammt. In keinem Fall wurde aggressives Verhalten gegenüber Menschen auf vorherige Beobachtungen von wiederholter Annäherung an Menschen oder Gebäude zurückgeführt. Unsere Umfrage zeigte aber auch, dass, ohne eine klare Definition von Begriffen über das Verhalten, die Diskussion über das Verhalten von Wölfen sehr schwierig ist und viel Spielraum für unterschiedliche Interpretationen besteht. Viele Beobachtungen von „dreisten“ Wölfen wurden von lokalen Medien berichtet, was eine standardisierte und objektive Beurteilung der Vorkommnisse stark erschwert. Wir schlagen vor, dass die Untersuchung der Habituation, und der internationale Austausch von Informationen zu diesem Thema verbessert werden sollte (z.B. basierend auf einem standardisierten Protokoll zu Beobachtungen). Dies betrifft vor allem den/die Prozess/e, welche zu Habituation führen, deren Auswirkungen auf das Verhalten der habituierten Wölfe, und die Notwendigkeit von Massnahmen als Reaktion auf solche Beobachtungen.

**Résumé** – Un changement de comportement de la meute du Calanda, en Suisse orientale, a conduit à une augmentation d’observations de loups (i) durant la journée, (ii) s’approchant, passant ou restant proches des humains, (iii) se trouvant à côté de granges ou d’étables aux bords des habitations, et (iv) même entrant dans le village de Vättis. Ces rapports ont suscité un débat public sur les loups de « plus en plus apprivoisés » et le danger qu’ils peuvent représenter pour les êtres humains. Afin de mieux situer la « normalité » et évaluer le danger de ces comportements observés, nous nous sommes renseignés auprès des membres de l’IUCN/SSC Large Carnivore Initiative for Europe (LCIE) pour savoir si des observations similaires avaient été faites ailleurs en Europe. Les questions visaient à savoir si les personnes contactées connaissaient, dans leurs pays, des cas d’observations de loups approchant des propriétés ou des personnes à répétition, ou de comportements agressifs envers les humains, pour des cas de meutes de loups résidentes. La totalité des 31 pays contactés, dont 28 ayant des meutes de loups résidentes, répondirent. Ces 28 pays reportèrent tous qu’au moins quelques-unes de leurs meutes avaient établi leurs territoires proches voire même incluant des habitations et que certains individus s’en approchaient. 14 pays ont également reporté que des loups ont approché des personnes. Ces cas étaient soit exceptionnels, soit les rapports des témoins ne permettaient pas d’être clairement vérifiés. Un comportement agressif vis-à-vis des humains a été reporté par 12 pays. Une vaste majorité d’un tel comportement, évalué par les personnes contactées, provenait soit de loups enragés, soit d’individus qui devaient se défendre. Un seul contact en Espagne nous a reporté un événement d’attaques de loups sur des humains, sans que ceux-ci ne les aient provoqués, la dernière datant de 1975. En aucun cas il n’a été confirmé que des agressions envers des humains aient été directement en relation avec l’observation répétée de loups arrivant dans/près de villages ou liées au rapprochement répété d’humains. Notre enquête préliminaire a cependant aussi révélé que, sans une définition précise des termes comportementaux, la communication concernant le comportement des loups est confuse et laisse la porte ouverte pour toute interprétation. La plupart des observations liées à des loups « audacieux » a été reportée par des médias locaux, rendant toute évaluation standardisée et objective de tels événements très difficile. Nous proposons d’améliorer la recherche et les échanges d’information sur le plan international concernant l’habituation de loups sauvages (e.g. basé sur un protocole standardisé), i.e. le/s processus conduisant à cette habituation, les réponses comportementales résultant chez les loups, et la nécessité de mesures d’encadrement en réponse à de telles observations.

## 1. Introduction

Close-up encounters between humans and wolves in eastern Switzerland, in the territory of the Calanda pack, have triggered a public debate on the danger that wolves represent for humans. The discussion was a consequence of observations indicating that the Calanda wolves were changing their behaviour towards humans and human dwellings. The observations were (i) increasing wolf sightings during daytime, (ii) wolves approaching or passing humans or staying close to humans, (iii) wolves next to barns and stables at the edge of villages, and (iv) wolves entering the village of Vättis. Some of the close-up observations were related to bait sites used for red fox hunting, in other cases, dogs or livestock (in stables) were involved. Dogs, even when accompanying their owners, can be a common attractant to wolves. Several (but clearly not all) of these observations concerned young wolves. In no case, so far, have the wolves shown aggressive behaviour towards humans. However, people have expressed fear and the events in the Calanda area have led to a nationwide discussion about wolves “losing their natural fear of humans“, with the concern that this increases the risk they pose for humans.

The increasing number of close encounters with wolves and the rising discontent of local people prompted the authorities of the cantons of Grison and St. Gallen to request the permission from the federal institution in charge to shoot two of the wolves when approaching or entering settlements (Amt für Natur, Jagd und Fischerei St. Gallen 2015, Bau-, Verkehrs- und Forstdepartement Graubünden 2015). The Federal Office for the Environment approved the removal under clearly defined conditions (BAFU 2015). WWF Switzerland filed complaints against the culling of the two young wolves with the administrative courts of the two cantons (WWF 2016). To date (August 2016), none of the Calanda wolves has been removed under the respective permit.

In order to assess the observations in Switzerland, we wanted to learn whether comparable observations of “increasingly tame wolves” have been made elsewhere in Europe where wolves are making a comeback in human-dominated landscapes or have been living in the vicinity of humans a long time. The question at hand is if such (change in) behaviour is “abnormal” and whether it may lead to an increased risk of aggression of wolves towards humans. Therefore, we made an enquiry amongst the members of the IUCN/SSC Large Carnivore Initiative for Europe (LCIE) and further contacts from countries not covered by the LCIE network in autumn 2015.

The intention was to learn if wolves had been observed elsewhere repeatedly approaching humans (or not retreating when people approached) or repeatedly showing up close to inhabited houses or even within settlements. We asked our contacts the following questions:

1. Do you have resident wolves in your country?
2. Do you have packs whose territories include permanently occupied houses or settlements?
3. Do you know of any observations regarding wolves that have repeatedly approached human neighbourhood/residences or people?
4. Do you know of any aggressive behaviour from wolves towards humans? If yes – what was the stimulus for such behaviour?

After a first overview investigation, contacts answering positively to questions 3 and 4 were asked to provide more details. Furthermore, we asked about specific reports on fearless or habituated wolves available (also in local languages) and about contacts with specific experience with regard to habituated wolves in the respective country. The enquiry covered 31 European countries (including Switzerland).



land). We received feedback from all country contacts, and we are grateful to all colleagues listed in Appendix I for providing the information summarised in this report.

## 2. Results

In the following sections, we compile the answers of our contacts per question and country. As this compilation is inevitably a mixture of observations and interpretations, we refer to the respective contact (Appendix I) for quotes that are not meant to be a general statement.

### 2.1. Wolf pack territories near permanently inhabited houses or settlements

Of the 31 countries considered (Appendix I), only *Luxembourg* and *the Netherlands* had no wolves at the time of the enquiry, and *Austria* had only single wolves but no packs. The correspondents from the *Netherlands* and *Austria* however reported that transient wolves had been observed near human settlements. In all of the 28 countries with resident wolf packs (Table 1), pack territories were next to permanently inhabited dwellings or in the majority of cases even included human settlements within their territory (Table 1).

### 2.2. Wolves approaching human settlements or humans

We distinguished between (a) approaches of human settlements and (b) approaches of humans as individuals. All correspondents of the 28 countries with wolf packs confirmed that wolves approached human dwellings (Table 1), and from 14 countries, wolves were reported to have approached also people (Table 1).

Some of the correspondents provided additional information and anecdotal observations along with the answers, which we hereafter summarise. We try to separate approaches to permanently inhabited buildings or settlements from approaches to people, although these two behavioural traits are interlinked and approaches of dwellings ultimately leads to close encounters with people. Furthermore, “approach to humans” (Table 1) depends on the interpretation of the observer or of any subsequent interpreter of the report and cannot be standardised and objectivised in such a broad overview enquiry.

In *Romania*, wolves regularly visit human neighbourhoods and sometimes depredate livestock there. Some bear feeding stations are located close to settlements and wolves visit such places, too. There are some old reports of wolves repeatedly approaching humans, but no recent observations. In *Portugal*, all pack territories include human settlements, and some of the wolf den sites regularly occupied for more than 30 years are situated less than 3 km from villages. Most of the frequent approaches of humans involved juvenile wolves and usually happened at night and during wintertime. There are occasional records of wolves captured alive within villages or in barns, but this refers mostly to pups or old individuals. Besides *Portugal*, also the *Ukraine* mentioned such incidences despite wolves being persecuted due to livestock depredation. In contrast *Spain*, under similar conditions, reported wolves to always flee when approached by humans. In *Belarus* and *Slovakia*, where wolves are regularly hunted in winter, approaches of human settlements are still common, whereas humans are rarely approached. Wolves are hunted all year round in *Bulgaria* and apparently fear humans (D. Zlatanova) and do not approach them. Nevertheless, they often venture into human neighbourhood, especially hamlets and the outskirts of villages in the mountains.

**Table 1.** Summary of experiences with wolf behaviour towards people from 28 European countries with resident wolf packs. Population refers to the delineation of European wolf populations as used by the LCIE (Kaczensky et al. 2013): Alpine (Alp), Baltic, Carpathian (Carp), Central-European lowland (CEL), Dinaric-Balkan (DiBa), Iberian (including NW Iberian and Sierra Morena populations), Karelian, and Italian Peninsula (IP). Habitations include villages and permanently occupied single houses. Brackets indicate exceptional, unconfirmed observations, unclear information or discrepancies between the answers of contacts from the same country. Lacking answers are labelled “n.a.”.

Country	Population	Packs near settlements	Wolves approach		Wolves show aggressive behaviour		
			habitations	humans	unprovoked	rabies	defence
France	Alp	yes	yes	(no) <sup>a</sup>	no	no	no
Italy	Alp + IP	yes	yes	(yes)	no	no	no
Switzerland	Alp	yes	yes	yes	no	no	no
Belarus	Baltic	yes	yes	yes <sup>b</sup>	no	(yes)	no
Estonia	Baltic	yes	yes	no	no	no	no
Latvia	Baltic	yes	yes	no	no	no	no
Lithuania	Baltic	yes	(yes)	(no)	(no)	no	no
Czech Republic	Carp + CEL	yes	yes	(no)	no	no	no
Romania	Carp	yes	(yes)	(yes)	no	(yes)	(yes) <sup>c</sup>
Slovakia	Carp	yes	yes	(yes)	no	yes	yes <sup>d</sup>
Ukraine	Carp + CEL	yes	yes	yes	no	yes	no
Germany	CEL	yes	yes	yes	no	no	no
Poland	CEL + Carp + Baltic	yes	yes	no	no	(yes)	(no)
Albania	DiBa	yes	yes	(yes)	(no)	(no)	(no)
Bosnia-Herzeg.	DiBa	yes	yes	no	no	no	no
Bulgaria	DiBa	yes	yes	no	no	no	no
Croatia	DiBa	yes	yes	no	no	yes	no
Greece	DiBa	yes	yes	(yes) <sup>e</sup>	no	no	(yes)
Kosovo	DiBa	yes	yes	yes	no	no	no
Macedonia	DiBa	yes	yes	no	no	no	no
Montenegro	DiBa	(no)	(yes)	no	no	no	(yes) <sup>f</sup>
Serbia	DiBa	yes	yes	no	no	yes	no
Slovenia	DiBa + Alp	yes	yes	no	no	no	no
Portugal	Iberian	yes	yes	yes	no	yes <sup>g</sup>	no
Spain	Iberian	yes	yes	yes	(yes) <sup>h</sup>	no	(no)
Finland	Karelian	yes	yes	n.a.	no	no	(yes) <sup>i</sup>
Norway	Scand	yes	yes	no	no	no	no
Sweden	Scand	yes	yes	yes	no	no	no

<sup>a</sup> One case, reported by 2 teenagers, who claimed that the whole of a big pack tried to attack one of them at night. Experts examined the case but found no evidence of wolf presence in the area (E. Marboutin).

<sup>b</sup> Refers specifically to the Chernobyl Reserve (V. Sidorovich).

<sup>c</sup> Only in relation to predation/protection on/of domestic livestock (S. Chiriac).

<sup>d</sup> In situation where shepherds tried to chase wolves from killed livestock.

<sup>e</sup> One case in 2000 concerning a park warden. He was tasked with regularly feeding black vultures with animal remains and dead livestock. Wolf approaches ceased after the feeding site was fenced (Y. Iliopoulos).

<sup>f</sup> A. Perovic (but not J. Koprivicia) referred to two cases from hearsay concerning situations during a wolf hunt.

<sup>g</sup> “Some confirmed records before 1970, all of them concerning wolves with rabies” (F. Alvares). The Iberian Peninsula remained however free of the wildlife rabies epizootic during the second half of the 20<sup>th</sup> century. There was however dog-mediated rabies known up to 1970 (Linnell et al. 2002).

<sup>h</sup> J.C. Blanco (but not L. Llana) mentioned the cases in the 1970s described e.g. in Linnell et al. 2002.

<sup>i</sup> A single case in 2015 speculated to have concerned a tame wolf from Russian Karelia.

In *Slovenia, Poland, Slovakia* and *Finland*, wolves are believed to approach human settlements because they (1) choose the easiest route for moving through their territory, (2) follow wild prey e.g. feeding on crop fields or pastures, or (3) attack livestock near human dwellings. Approaches in *Poland* and *Slovenia* happen mostly or exclusively at night time. In the frame of surveys of livestock husbandry and losses in *Slovakia*, several shepherds reported having observed wolves watching their livestock flocks from the forest edge during daylight. Some said that the wolves were waiting for an opportunity to attack, others that the wolves just watched doing nothing (R. Rigg). A female wolf attacking livestock in a barn in a Slovakian village during daytime in February 2015 was described as “being not afraid of humans”. It was killed and tested negatively for rabies (R. Rigg). Wolves in *Latvia, Lithuania, the Czech Republic, Macedonia, Montenegro* and *Serbia* are reported to approach human settlements in connection with livestock depredation. In *Latvia*, sick or injured wolves occasionally approach farmsteads in search for food such as livestock, dogs or garbage (J. Ozolins).

In *Croatia*, wolves approaching human settlements are usually single wolves, not packs. Observations of wolves approaching human neighbourhoods are common in *Albania*. However, these are reports from local people which were never verified. It is also not known if these observations refer to lone wolves or pack members. In *Estonia*, repeated approaches are not known, just some rare single episodes. In *Italy*, approaches to human dwellings are not unusual, but approaches to humans indicate special situations, such as the repeated presence and approaches by photographers to a particular pack, which might eventually result in the habituation of the wolves (F. Marucco).

*Sweden* has seen several wolves repeatedly approaching humans at a distance of less than 30 m. The people were adults as well as children involved in very different activities (hunting, walking) with or without dogs or other domestic animals (G. Chapron). The management responses were dissuasive measures such as by means of bangers (e.g. Karlsson et al. no date) or ultimately shooting wolves (G. Chapron). The decision to remove such wolves has triggered a controversial discussion in Sweden, but the option of lethal management has been confirmed by the Swedish environmental protection agency (Lindahl 2015) in a decision to decline the appeal by environmental NGOs against killing of wolves: “*Wolves of the territory have for over a year resided near the settlements and generated discomfort and anxiety for many people, with the greatest intensity during the winter seasons. This has led the residents in the area having deteriorated living conditions. The behaviour itself is not unnatural, but it becomes unwanted when the wolves are increasingly staying close to people. Although the current wolves are not intrusive according to Wildlife Damage Centres definition, the wolves affect people in the area by forcing them to adjust their behaviour and avoid entering the forests, not using ski trails, keeping pets inside and not letting the children walk alone to kindergarten. The situation is not sustainable in the long term. In view of the magnitude of problems and the character and the wide circle of residents affected, it is a question of such overriding reasons of a social nature that has an overriding public interest*” (English translation of parts of Lindahl 2015 by G. Chapron).

In *Germany*, wolves of one specific pack, the so-called Munster pack, have repeatedly approached or followed humans. This particular behaviour seems to have been a consequence of people feeding the pack and recurrently approaching young wolves. This led to the decision of the responsible authorities of Lower Saxony (Niedersachsen) first to capture the particularly obtrusive young male MT6 and transfer it into an enclosure (Niedersächsisches Umweltministerium 2016a), then to remove it lethally (Niedersächsisches Umweltministerium 2016b). The wolf was shot on 27.04.2016 (Niedersächsisches Umweltministerium 2016c). The members of all other wolf packs behave “normally”: They are relaxed towards vehicles, pass near settlements and very few occasionally approach humans (I. Reinhardt).

*Slovakia* reported a single case from about 15 years ago in Velka Fatra National Park, where a recreational cross-country skier fell behind his group of friends. Eventually, he lost his way in heavy snowfall and was overtaken by nightfall. He reported that a pack of wolves approached. Although they did not behave aggressively, they followed him when he tried to leave. He was afraid and retreated to the picnic table/open shelter where he spent the night. After several hours they left. A mountain rescue professional supposedly confirmed the story after examining the tracks in the snow (R. Rigg).

In *France*, there was a claim of a whole pack approaching humans at night after having tried to kill cattle. Despite local evaluation by trained state employees, the case could not be verified (Table 1; E. Marboutin).

In *Greece*, only one exceptional case of a wolf pack approaching a park warden in Dadia National Park in the year 2000 is known. The warden was feeding carrion and carcasses to black vultures for conservation purposes and wolves frequently visited the place, too. After the feeding site was fenced, wolves abandoned the site.

The *Czech Republic* reported that occasionally, cases of wolves approaching people were told, but only one could be verified: a woman lying in a sleeping bag in the forest filmed a young wolf approaching her in 2014. At a distance of about 8 metres, the wolf noticed her and immediately retreated. It then observed her from distance for about a minute before leaving.

*Lithuania* reported "some cases of wolves being rather close to humans, but without clear indication of deliberate and/or repeated approach" (V. Balys). None of these rumours however were verified.

In March 2015, a young wolf wandered for some days into the *Netherlands* from Germany before moving back to Germany. It repeatedly approached human neighbourhoods and did not seem to be afraid of people. But it was not aggressive. A shepherd managed to chase it away from a sheep attacked and injured by the wolf. The young wolf subsequently died in a car accident and DNA analyses revealed that it came from the Munster pack (see above).

### 2.3. Aggressive behaviour of wolves towards humans

Twelve countries reported cases of aggression of wolves towards humans (Table 1). *Unprovoked attacks* by assumedly healthy wolves are known only from *Spain*. There were several episodes of wolf attacks documented in Spain which even involved human casualties after 1957, the last case occurred in 1975. These episodes are described and discussed in Linnell et al. 2002). Contacts from eight countries reported cases of aggressions or attacks by rabid wolves (*Belarus, Croatia, Poland, Portugal, Romania, Serbia, Slovakia, and Ukraine*). However, many older cases lacked a formal rabies diagnosis in a qualified laboratory, and it is therefore impossible to judge whether an observed aggressive behaviour was indeed rabies-related. Aggressive behaviour of wolves defending themselves against humans, e.g. in relation to livestock attacks or wolf hunting was reported from four countries<sup>1</sup>: *Greece, Montenegro, and Slovakia*. The cases of Montenegro and Finland were considered uncertain. The contacts from *Lithuania, Poland, Albania, and Spain* referred furthermore to anecdotes too vague to be considered. In no case was confirmed aggression towards humans directly related to the observation of wolves repeatedly showing up in/near settlements or repeatedly approaching humans (Chapter 2.2).

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<sup>1</sup> Aggression from wolves in self-defence was also mentioned for *Romania* in Linnell et al. 2002; but this was an error in the report, as confirmed by J. Linnell and our Romanian contacts.

Our contacts provided several anecdotal observations and details with regard to aggressive behaviour of wolves towards humans: *Belarus* reported that during fladry hunting of wolves, wounded individuals escape without any aggression. In *Finland*, a documented case of a lone wolf “showing its teeth” when officers tried to chase it away from a yard was considered so unique that it was speculated that the wolf was one of the captive-born wolves released by a Russian game biologist near the Finnish boarder some years earlier (I. Kojola). The contacts from *Slovenia* and *Spain* mentioned that reports on aggressive wolves (e.g. by the media) had turned out to be fabricated when examined closer. However, many of the claims of wolf aggression were never investigated, leaving the answers to this question somewhat ambiguous. The findings during a comprehensive baseline survey in *Macedonia*, *Albania*, *Montenegro* and *Kosovo* in the frame of the Balkan Lynx Recovery Programme may illustrate the difficulties of gaining reliable information: During the survey, local people were also asked about wolf attacks on humans. In all four countries, stories of wolf attacks were told, but always as hearsay, and the investigators were not able to backtrack and verify a single case (e.g. Trajçe et al. 2008, Melovski et al. 2008). In *Montenegro*, all attacks were claimed to have occurred during organised hunting sessions (A. Perovic). In *Albania*, a spectacular fatal wolf attack on an armed soldier was reported some years ago, but several attempts to verify the case failed. Statements from local respondents on the case were so vague, obscure and contradictory that the Albanian contact considered its occurrence to be highly unlikely (hence the “(no)” in the column on aggressive behaviour for Albania in Table 1; see also Trajçe et al. 2008). It should be noted that the myth of the soldier or postman being attacked by wolves is widespread across Europe and goes back for more than a century. None of the cases have ever been verified (J. Linnell). Similarly, spectacular stories of fatal attacks are told in *Slovakia*, but never with specific names or places. The contact from Slovakia has never seen any records or other evidence and does not consider them credible. *Greece* reported “some anecdotal incidences” of aggression towards shepherds and when humans approached wolf kills (Y. Iliopoulos). No wolf attacks to humans with physical contact were reported recently.

#### **2.4. Written reports referring to human-wolf encounters**

Several contacts mentioned that unusual wolf observations or wolf observations in unusual places get a lot of media attention, and that the validity of such reports are difficult to assess. The media stories dealt mostly with wolves approaching humans or wolves attacking pets or livestock. Most contacts indicated that the stories tended to be biased against wolves, with the consequence that people subsequently were more afraid of wolves. One special example was reported by *Luxembourg*, which has no extant wolf population. Back in 1883, a newspaper reported the case of a three-legged wolf entering a house, in particular a room where a baby was sleeping. The animal was heard entering by the father of child who chased it away. However, it is impossible to assess whether the animal in question really was a wolf (L. Schley). A contrasting story was reported from *Italy*, where an old female wolf rested in a village after heavy snowfall. The media loved this incidence and reported it in a way not creating fear (F. Marucco).

The mostly emotive media attention given to wolves showing up in the vicinity of people contrasts with the lack of objective, scientific reports on such incidences. *Sweden* has an undated report on a trial in 1999 to deter a habituated female wolf by means of bangers (Karlsson et al. no date), and in Switzerland, the wildlife management authorities of the cantons of Grisons and St. Gallen (hosts of the Calanda wolf pack referred to in the introduction) have produced summary reports describing and assessing the wolf observations near or in settlements (Amt für Jagd und Fischerei Graubünden

& Amt für Natur, Jagd und Fischerei St.Gallen 2015). Otherwise, only press releases or media contributions have covered the recent observations of “tame” wolves in several European countries.

### 3. Discussion and preliminary conclusions

A first difficulty one meets when dealing with the phenomenon of an “increasing number of close encounters of humans and wolves” is the proper terminology for describing the presumed change of behaviour or attitudes of the wolves. Terms such as “unshy”, “bold”, “fearless”, or “unafraid” imply that a normal wolf is shy and fearful. But this has yet to be understood and demonstrated (see below). Besides – what is a “normal” wolf? We consider a normal wolf to be an intelligent animal with a plastic behaviour able to adapt to its (changing or new) environment based on individual learning and group experiences. In so far, learning to integrate into a human dominated world may be rather “normal” – though obviously not welcome from the perspective of humans. However, it would appear that much of the public has the expectation of wolves as being elusive, shy residents of distant wilderness. This discrepancy between expectation and experience may explain a lot of the public’s reaction.

In the following, we use the term “habituation” for the phenomenon of wolves showing up in the vicinity of humans or not actively avoiding the proximity to humans (without speculating about the behavioural mechanisms behind “habituation”). It for example implies that there is indeed a development or a change in the behaviour of the wolves, and not just an increasing awareness of people leading to more reports and media coverage. It is quite obvious that the events in Sweden, Germany and Switzerland – where wolves have returned recently and first were rather unobtrusive – may indeed indicate a change at the level of individual wolves, possibly even of certain packs. (However, all but one of the wolf packs e.g. in Germany remained unobtrusive; I. Reinhardt.) As people in these countries are not familiar with the presence of wolves, this triggered fear. “People in Spain are used to live with wolves and almost nobody is afraid of them. The fear of wolves seems to be a cultural characteristic of countries of Northern and Central Europe recently recolonised by wolves” (J.C. Blanco). However, even in Portugal, where wolves were always present, public perception seems to be changing: “The growing number of media news concerning close encounters between wolves and a more “urban” public enjoying outdoors, in which there was always a very negative, hysteric and biased description of the event triggering a public debate on the potential danger of wolves for humans” (F. Alvares).

In either case, the situation has to be managed because coexistence of wolves and humans depends as much on the perception of people (see e.g. the arguments of the Swedish Environmental Environment; Lindahl 2015) as on the behaviour of wolves. We nevertheless need a proper understanding of the wolf perspective, because management measures aiming at (re-)changing the behaviour (e.g. through aversive conditioning) are difficult to apply and easily fail to reach the goals.

The replies to our simple investigation (summarised in Table 1) revealed that

- (1) In all countries (possibly with the exception of Montenegro), wolf pack territories include human settlements – “almost impossible for them not to in Europe” (J. Linnell) – and hence have easy access to an anthropogenic environments;
- (2) Almost everywhere, wolves regularly pass close to or approach permanently settled habitations, and in about 40% of the countries, close encounters between wolves and humans are known;

- (3) Aggression and/or attacks (confirmed or unconfirmed) were reported from 12 countries. Unprovoked or non-rabies related attacks occurred only in Spain before 1976. In no country in Europe has “habituation” been observed to lead to “aggression”.

We should expect that habituation as recently observed in Switzerland, Germany or Sweden will happen over and over again, as wolves continue reintegrating into the human-dominated landscapes of Europe. Such events will trigger fear in the part of the population not accustomed to the presence of wolves, especially, but probably not exclusively, in areas recently colonised by wolves. This leads to the questions whether it is (1) necessary to avoid further habituation, and – if this is considered a goal of our wildlife management – (2) how habituation can be prevented. Neither of these two questions can be answered from our crude overview, but we can draw some preliminary conclusions and make some recommendations:

*1. Understanding habituation:* We have a very limited scientific understanding of the phenomenon of “unshy” wolves. The behavioural traits and stimuli are not clear, it is not known if it is a consequence of “curiosity” of young wolves at a certain point of their ontogenesis (observations from Finland indicated that after dispersal from the natal pack, subadult wolves visit farmyards more often than adult wolves; Kojola et al. 2016), if it is subsequently lost or generally reversible, if it is based on individual or group (pack) experience or if in contrast “shyness” is the result of selection. Such questions need to be addressed with regard to prevention of habituation or managing habituated individuals. But even a simple comparison of cases is presently impossible because we lack standardised objective reports. While it will be impossible to avoid that people who have experiences with bold wolves report those with a personal bias, we should at least assure that wildlife managers and/or researchers investigate and record such cases based on a standardised protocol.

*2. Understanding the risk of habituation:* It is often assumed that habituated wolves pose a higher risk to humans than “wild” wolves. Our preliminary enquiry has not revealed any connection between “habituation” and “aggressive behaviour”, but does also not allow understanding the process(es) leading to “habituation”. Different processes may result in different behavioural expressions. However, a fatal wolf attack on an adult man in a remote miner’s camp in Saskatchewan, Canada, in 2005 was likely related to food-conditioned wolves (McNay 2007, Linnell & Alleano 2016). The risk of aggressive encounters may increase simply because habituated wolves become more frequent in the future. But if there is no difference between the potential risk posed by a “tame” versus a “wild” wolf, this risk would increase parallel to an increasing wolf population regardless of individual wolf behaviour. On the other hand, there is also the risk that inappropriate human behaviour triggers an aggressive encounter (Penteriani et al. 2016), and the chance for such an event occurring is certainly higher with habituated wolves. This topic may seem unimportant, but in fact, it is important with regard to the question where to invest our efforts to prevent undesired encounters between man and wolf.

*3. Understanding the management of habituation:* If the decision is to prevent habituation, we need to identify the most efficient and practical management options. There are presently three lines of approaches proposed: (1) Exclude wolf access to anthropogenic food resources in the vicinity of human dwellings. This is the strategy proposed for example by WWF Switzerland (WWF 2016) as an alternative to killing wolves. It assumes that habituation is mainly a result of attractive feeding sites near villages. Indeed, members of the Calanda pack were repeatedly observed at bait sites for fox hunting rather close to a village. Yet, there is so far no evidence that removing food resources would prevent habituation. (2) Aversive conditioning of habituated wolves by means of dissuasive measures. Such an approach was considered for the members of the Calanda pack, but there was no

opportunity for implementation. Frustrating experiences with habituated bears in the Grisons have reduced the expectations for success both of the public as well as of the wildlife managers. Although we assume that from an ethological perspective, wolves might be more responsive to aversive condition measures than brown bears, we agree that the practical and meaningful application of aversive measures is extremely difficult, and the very limited experience e.g. from Sweden (Karlsson et al. no date) is not really encouraging. (3) Removing (by lethal or non-lethal methods) of habituated wolves was proposed not only to eliminate a problem animal (e.g. wolf MT6 in Lower Saxony), but also to prevent further habituation (e.g. in the case of the Calanda pack). The hope is that shooting two young wolves within or close to a settlement would teach the other pack members to avoid this place or human dwellings in general. While such an effect would require a learning process that can likely not be achieved with one or two “trainings”, the basic idea behind it seems to be widely accepted. J. C. Blanco for instance stated: “In Spain, like in other Mediterranean countries, wolves live close to people. They are frequently seen but they are not fearless; they always flee when approached by people. Wolves are hunted in much of Spain, and this may help to keep them "wild" (but this has never been scientifically tested)”. Indeed, many of our contacts in the survey (Appendix I) have related shyness or lack of shyness of wolves to the presence or absence of hunting/persecution. However, there is no scientific evidence for such a relationship, and we failed to detect such relationship in our crude data set (Table 1). Some of the national wolf populations in Europe have rather recently been legally protected, and this protection is probably not everywhere fully implemented. Although it is likely that a certain hunting pressure keeps wolves “shy” (meaning that they actively avoid people), proposing such a strategy as a conservation management approach raises two further questions: (1) Would “shyness” be the result of selection through continuous removal of the least shy individuals?, (2) How much “hunting pressure” would be needed to achieve such an effect?, and (3) Do different hunting methods lead to different responses?

Wildlife managers and authorities have no option other than to actively manage situations with habituated wolves, especially in areas where wolf packs are newly established after a long absence and where the tolerance of local people is at stake. Such events instantly prompt demands from local people, wolf advocates and wolf opponents and urge the authorities to take immediate action. Management measures would be most promising and most sustainable if they were informed by best practice experience and scientific understanding. But such support is presently not available due to lack of information. The first measure to improve our understanding is to compile a Europe-wide pool of data, based on standardised protocols and an agreed terminology. This requires the involvement of local and national wildlife institutions and an international coordination, e.g. under the lead of the LCIE. Compiling a data set allowing scientific analyses and assessments will take a while. But even a small collection of well-documented case studies would immediately facilitate the exchange of experience and the distribution of best practice experience. Our simple survey across Europe has revealed that presently, almost no information is readily available.



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## Appendix I: Correspondents per country

Country	Correspondents (E-mail)
Albania	A. Trajçe, PPNEA, alextrajce@gmail.com
Austria	G. Rauer, Research Institute of Wildlife Ecology, University of Vienna, georg.rauer@fiwi.at
Belarus	V. Sidorovich, National Academy of Sciences of Belarus, vadim.sidorovich@gmail.com
Bosnia-Herzegovina	S. Kunovac, Faculty of Forestry, University of Sarajevo, sasakunovac@gmail.com
Bulgaria	D. Zlatanova, Sofia University, zlite2@mail.bg
Croatia	D. Huber, Veterinary Faculty, University of Zagreb, huber@vef.hr
Czech Rep.	M. Kotal, Friends of the Earth, miroslav.kotal@hnutiduha.cz
Estonia	P. Männil, Estonian Environment Agency, peep.mannil@gmail.com
Finland	I. Kojola, Luke – Natural Resources Institute Finland, ilpo.kojola@luke.fi
France	E. Marboutin, ONCFS - Office National de la Chasse et de la Faune Sauvage, eric.marboutin@oncfs.gouv.fr
Germany	I. Reinhardt, Lupus Consulting, ilka.reinhardt@wolves-germany.de U. Wotschikowsky, Consultant, wotschikowsky@t-online.de M. Wöfl, Bavarian Ministry of the Environment, manfred.woelfl@lfu.bayern.de
Greece	Y. Iliopoulos, Callisto, yiliop2@gmail.com
Italy	F. Marucco, Centro Conservazione e Gestione Grandi Carnivori c/o Parco Alpi Marittime, francesca.marucco@centrograndicarnivori.it
Kosovo	A. Ramadani, NGO Finch, azemi7@yahoo.com
Latvia	J. Ozolins, Latvian State Forest Research Institute "Silava", janis.ozolins@silava.lv
Lithuania	V. Balys, Association for Nature Conservation "Baltijos vilkas", vbalys@gmail.com
Luxembourg	L. Schley, Administration de la nature et des forêts, Gouvernement du Grand Duché de Luxembourg, laurent.schley@anf.etat.lu
Macedonia	D. Melovski, Macedonian Ecological Society, melovskidime@yahoo.com
Montenegro	J. Koprivica, Environmental Protection Agency of Montenegro, jelena.koprivica@epa.org.me A. Perovic, CZIP, aleksandar.czip@t-com.me
Netherlands	A. Trouwborst, Department of European and International Public Law, Tilburg University, a.trouwborst@uvt.nl L. Linnartz, Wolven in Nederland, leo.linnartz@ark.eu
Norway	J. Linnell, Norwegian Institute for Nature Research, john.linnell@nina.no
Poland	S. Nowak, Association for Nature "Wolf", sabina.nowak@polishwolf.org.pl
Portugal	F. Alvares, CIBIO Research Center in Biodiversity and Genetic Resources, Porto University, falvares@cibio.up.pt
Romania	S. Chiriac, Environmental Protection Agency Vrancea County, silviu_chiriac@yahoo.com O. Ionescu, Transylvania University, Forest Faculty, o.ionescu@unitbv.ro
Serbia	M. Paunovic, Natural History Museum, milannhmbeo@yahoo.com
Slovakia	R. Rigg, Slovak Wildlife Society, info@slovakwildlife.org
Slovenia	A. Majic, Biotechnical Faculty, University of Ljubljana, almajic@gmail.com K. Jerina, Department of Forestry and Renewable Forest Resources, University of Ljubljana, klemen.jerina@gmail.com
Spain	J.C. Blanco, Proyecto Lobo, jc.blanco2503@gmail.com L. Llana, A.RE.NA. Asesores en Recursos Naturales, S.L., llaneza@arenatural.com
Sweden	G. Chapron, Grimsö Wildlife Research Station, gchapron@carnivoreconservation.org C. Wikenros, Department of Ecology, Swedish University of Agricultural Sciences, camilla.wikenros@slu.se
Switzerland	R. Manz, KORA, r.manz@kora.ch
Ukraine	M. Shkvryria, Schmalhausen Institute of Zoology, shkvryria@gmail.com