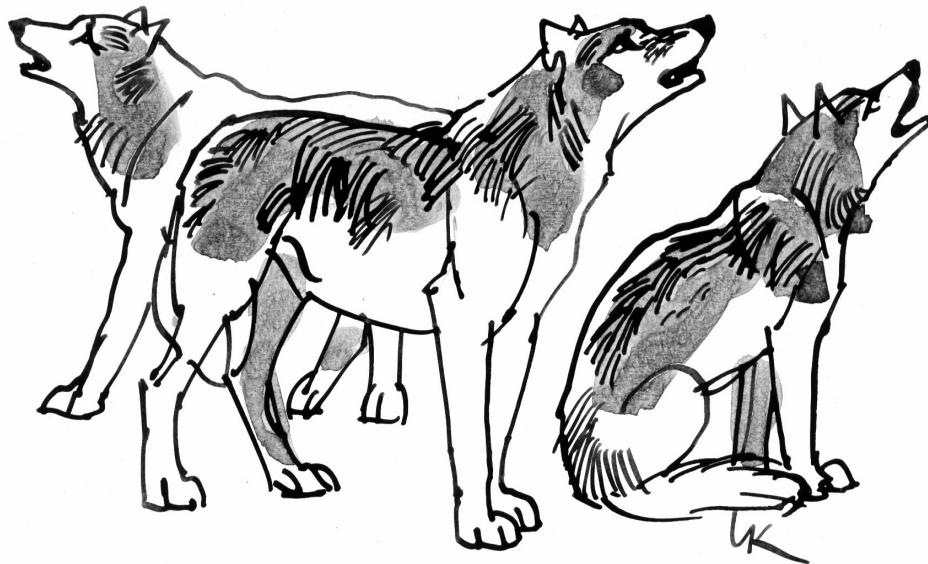




Hnutí DUHA
Friends of the Earth Czech Republic

Perspectives of wolves in Central Europe



Proceedings from the conference held on 9th April 2008
in Malenovice, Beskydy Mts., Czech Republic

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Proceedings from the conference held on 9th April 2008 in Malenovice,
Beskydy Mts., Czech Republic

Edited by Miroslav Kutal and Robin Rigg

Hnutí DUHA Olomouc, Olomouc, Czech Republic, 2008

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Presented lectures:

D. Mech: A fifty-year Career of Wolf Research

L. Bufka: The wolf occurrence in the Czech Republic during last 50 years

J. Uhlíková: A management plan for large carnivores in the Czech Republic

M. Kotal: A public awareness campaign as part of a management plan for large carnivores in the Czech Republic, current conservation activities and problems

R. Rigg: Current status of wolves in Slovakia

S. Findo & M. Skuban: The Wolf in Slovakia

S. Nowak & R. Mysłayek: Wolves in Poland - distribution, ecology, threats and conservation activities

A. Kecskés: Some questions regarding wolves in Romania

P. Sürth: Experiences of the Carpathian Large Carnivore Project and Way of the Wolves

P. Sürth: Current status of wolves in Germany

Presented posters:

N. Šebková, J. Jedlička, K. Hartl³ & F. Hrach: Is hybridization with dogs a threat to free-living wolves in the Czech Republic?

H. Dungler: Frame conditions for a possible recovery of wolves in Austria.

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A 50-year career of wolf research

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Abstract

This presentation will provide an overview of basic wolf ecology, behavior and interactions with prey such as moose, deer, caribou, elk and muskoxen, featuring this scientist's 50 years of research on wolves in Isle Royale National Park; Minnesota; Denali National Park; Ellesmere Island; and Yellowstone National Park. The Isle Royale studies focused on wolf hunting of moose from 1958 to 1962 and resulted in the publication "The Wolves of Isle Royale" in 1966. Studies of wolves and white-tailed deer in the Superior National Forest of northeastern Minnesota began in 1966 and continue through the present, based on radio-tracking some 700 wolves. Research on wolves and caribou was carried out in Denali National Park, Alaska, from 1986 through 1994 and was summarized in the book, "The Wolves of Denali." Studies of the wolves and muskoxen on Ellesmere Island in Canada's High Arctic also began during summer 1986 and have continued through summer 2007. In 1995, the author also participated in reintroducing wolves to Yellowstone National Park and has been studying them and their main prey, elk, since then. Based on these studies, wolf packs have been found to be territorial families with a high annual turnover rate due to dispersal and mortality. They tend to prey primarily on hoofed mammals in poor condition, which minimizes danger to themselves. Thus wolves make many attempts to kill prey and have a low success rate. Wolves are controversial because they also prey on livestock and occasionally on humans. Thus much misinformation about wolves is disseminated by both wolf advocates and wolf enemies, and the author founded the International Wolf Center in Minnesota to help promote accurate, science-based information about wolves.

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A management plan for large carnivores in the Czech Republic

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According to the Czech Act on Nature and Landscape Protection (No. 114/1992 Coll.), nature protection authorities shall provide management plans for the protection of specially protected plant and animal species, with the aim of creating conditions enabling an increase of the populations of these species such as would lead to a reduction of the degree to which they are endangered.

A management plan for large carnivores was prepared by governmental organization the Agency for Nature Conservation and Landscape Protection, the Institute of Vertebrate Biology of the Academy of Sciences and by NGO Friends of the Earth. The management plan is currently prepared for submission to the Ministry of Environment. All the above mentioned organizations will be participants of the project, the duration of which is expected to be 10 years (2008/9–2017/8).

Within the management plan the major threats facing large carnivores in the Czech Republic were defined as follows:

Threat	Impact of threat		
	Brown bear	Gray wolf	Eurasian lynx
Poaching	high	high	high
Mortality caused by traffic	medium	medium	medium
Negative public opinion	low	high	medium
Genetic isolation	medium	medium	medium
Fragmentation of habitats	medium	medium	medium
Disturbance	medium	low	low

Environmental changes	medium	low	very low
Hybridization	-	medium-low	-
Decrease in prey number	very low	very low	very low
Diseases	unknown	unknown	unknown

The aim of the management plan is to ensure long-term occurrence of wolf, brown bear and Eurasian lynx as wild-living animals in the Czech Republic at the same time as minimizing the damage and conflicts caused by these large carnivores. Several goals have been set out:-

- To achieve at least the area of distribution and population abundance of Eurasian lynx, that would correspond to the recent maximum in the years 1995 – 1996
- To preserve the actual area of distribution and population abundance of wolf and brown bear in the ČR and, in case of their further expansion, to ensure the protection of these animals in newly occupied areas
- To reduce the negative impact of poaching on large carnivores populations
- To change negative public attitudes to large carnivores and involve the public in the protection of large carnivores

Activities that will lead to the achievement of these goals:-

- A public education campaign
- Maintaining bio-corridors
- Protection of large carnivores through Natura 2000 sites
- Cross-border cooperation
 - Creation of a common program of monitoring and research
 - Initiation of discussions about enlargement of the area with year-round protection of the wolf in Slovakia
- Detailed monitoring of populations status
 - Detailed monitoring in selected areas
 - Mapping carnivore distribution in the whole of the Czech Republic using questionnaires
 - Collecting data about dead individuals
- Increasing the effectiveness of the damage compensation system
 - Modification of legislation concerning financial compensation
 - Education of employees of the state administration, veterinarians and

authorized experts

- Editing the methodology for damage assessment
- Creation of a system for monitoring damage and a central database
- Cooperation with the police on the procedure for investigating poaching.
- Elimination of individual problem animals
- Research
 - Effects of large carnivores on forest ecosystems
 - The genetic structure of the populations

The creation of a management plan for large carnivores in the Czech Republic was financially supported by grant MŽP ČR VaV 620/1/03

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A public awareness campaign as part of a management plan for large carnivores in the Czech Republic, current conservation activities and problems

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Abstract

A public awareness campaign about wolves, lynx and bears was prepared by Friends of the Earth Czech Republic (FoE) in cooperation with other NGOs and experts involved in large carnivore conservation in 2005–2006. The main objective is to suppress illegal hunting – the major threat for large carnivores in the Czech Republic – through a comprehensive system of educational and public awareness activities. The campaign will function on both national and local levels, consisting of numerous education activities aimed at different target groups. The most important measures are: media work, releasing and distributing information materials, discussion forums with local people, school education programs, voluntary so called “Wolf and Lynx Patrols” and a reward for information about poaching. Some activities were set for specific target groups – hunters, farmers, providers of accommodation for tourists and local opinion leaders. The campaign was prepared as part of a management plan for large carnivores, but it has not yet been approved by the Ministry of the Environment. Mainly education activities in large carnivore conservation have been conducted by FoE and other NGOs from late 1990s. Recently, migration corridors have become more threatened. A settled and tourist-exploited landscape with many free-ranging dogs provides difficulties for wolf monitoring since wolf and dog footprints can be easily confused. Classification of all tracks and signs has been developed for the objective evaluation of wolf presence in the Beskydy Mts.

As a part of a management plan for large carnivores in the Czech Republic (see Uhlíková, this issue), NGO Friends of the Earth CR (FoE) participated in the process and prepared a public awareness campaign. Since poaching and negative public attitudes were identified as major threats to large carnivores in the Czech Republic, the public awareness campaign is a major part of the whole management plan.

Preparation

FoE has dealt with large carnivore conservation since the second half of the 1990s, when wolves first returned to the Beskydy Mts. from Slovakia. In 2002, FoE founded a non-formal large carnivore platform of experts, representatives of NGOs, the State Nature Conservancy, the Ministries of the Environment and Agriculture, foresters and hunters. Thus the first phase of preparation resulted from previous experience (e.g. Bartošová & Genda 2001) and from discussions with other local NGOs and experts involved in the topic. After the first draft was developed (2005–2006), it was discussed within the large carnivore

platform, commented on and modified accordingly. The whole process was carried out transparently and was open for all comments.

Objectives

The main objectives are focused on suppressing poaching of large carnivores through pressure of public opinion:

- illegal hunting is not accepted by public
- large carnivores are considered as a natural and common part of Czech forests
- local people are involved in large carnivore conservation

National and local levels

The campaign has several parts and works at different levels: national, local (where large carnivores are present) and on specific target groups. Realization of most of the measures is coordinated from the national level: releasing education materials, translation and dubbing of suitable movies, media work and a website. One interesting point is a reward for information about poaching, that will help to expose poachers and discourage hunters from illegal hunting.

A number of activities are planned on the local level: media work, discussion forums in villages, school education programs, information material distribution, information panels, exhibitions and also monitoring and actions against poaching: so called “Wolf and Lynx Patrols”. A network of regional libraries and “travelling cinema” for local communities is also planned.

“Wolf and Lynx Patrols” are small groups of trained volunteers (Fig. 1) who oversee a selected area and act as guards against illegal hunting and trapping. Volunteers receive necessary training provided in cooperation with local experts and representatives of the State Nature Conservancy. Wolf Patrols are also an important source of local community involvement; volunteers help with the distribution of information materials, communicate with tourists and local people.

Specific target groups

Among the specific target groups, hunters are the key stakeholders. Their often negative attitudes towards large carnivores are based rather on emotions than on personal experience or scientific information. That is why seminars or discussion forums (Fig. 2), education materials and more cooperation are needed to explain the positive role of large carnivores in forest ecosystems. Several activities are planned to reinforce preventive measures for local farmers (advisory service, lending of electric fence), tourist accommodation providers and local opinion leaders.

Running conservation activities

Many measures proposed in the management plan have already been run in the Beskydy Mountains, where all three species of large carnivores live. The “Wolf Patrols” monitoring and the main public awareness campaign started in 1999, but because of a lack of finance, the campaign has not proceeded with the same intensity as it begun. Since 2002, the Wolf Patrols remain for several years almost the only, but important activity. The number of illegal baits discovered by volunteers decreased significantly between 2002-2007. About 50 new concerned people join the project annually. Since 2005, similar “Lynx Patrols” have monitored the Šumava region in South Bohemia. The public awareness and education campaign restarted in 2007 with a grant from the Ministry of the Environment. A school education program was developed, discussion forums for both local people and hunters were organized. New information materials and a scientific publication for hunters were released. A reward of 50000 Czech Crowns (\approx €2000) was announced in 2004. We have received some interesting information, but unfortunately no proof so far. The website www.selmy.cz is regularly updated and informs about all important actions and events (Kutal 2008a).



Fig. 1. Training session for new volunteers and monitoring.



Fig. 2. Discussion forum with hunters, Beskydy Mts.

In recent years, new motorways and the development of built-up areas in migration corridors of large carnivores have constituted a more serious problem. These corridors are generally not effectively protected by law, they are often situated outside protected areas and can markedly complicate migration or dispersal to other regions (not only for large carnivores). FoE participate in decision making processes to promote the maintenance of important migration corridors and to suggest the functional solutions for their restoration (Kutal 2007).

Problems concerning wolf monitoring: identification of wolf tracks

The settled landscape and high level of tourism exploitation in the Beskydy Mountains complicates the monitoring of the wolf in these areas. Both factors are responsible for quite a high number of dogs in the forest, not only on tourist paths. Wolf and dog footprints can be easily confused and field workers and experts have to be very careful with any statement of wolf presence.

From experience in “Wolf Patrols” monitoring, we have suggested a system of classification of all tracks, based on the SCALP criteria, developed for lynx monitoring in Alpine countries (Molinari-Jobin et al. 2004). Since the SCALP was developed for lynx, whose presence is not so difficult to prove, we added one additional criteria (C3 – subjective evidence) facilitating the finer resolution of uncertain evidence. Thus four categories were suggested (Kutal 2008b):

C1 (hard evidence) is represented by dead animals, good photographs or genetic evidence from scats, hairs or urine documented or collected by an experienced or trustworthy person.

C2 (objective evidence) is represented by faeces, prey remains or howling, documented by an experienced or trustworthy person, where the possibility of a mistake is practically negligible

C3 (subjective evidence):

- objective and hard evidence reported by an experienced person but not documented
- objective and hard evidence documented by the public
- wolf-like track lines or tracks in combination with other favourable circumstances, which notably decrease the possibility of mistaking them for those of a dog

C4 (insufficient evidence) is represented by all indistinct evidence and all unverifiable reports from the public

Acknowledgements

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The wolf in Slovakia

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Abstract

The wolf (*Canis lupus*) in Slovakia is both a game species and a partly protected species of European importance. Restrictions on hunting from 1975 along with an increase in prey base and expansion of forest cover allowed a natural recovery. Both numbers and occupied range increased until the 1980–90s. On a broad scale, current distribution is closely linked to forest cover; on a finer scale, wolves use a wide variety of habitats from sub-montane field-meadow-forest mosaics to sub-alpine and alpine vegetation zones. Wild ungulates constitute more than 90% of biomass consumed by wolves. The main prey species is the red deer (*Cervus elaphus*), resulting in competition with human hunters. Livestock accounts for less than 5% of the spring-autumn diet, although losses of sheep can be locally high, especially where preventive measures are insufficient. Farms with well-raised and correctly used livestock guarding dogs report significantly fewer losses than other farms and have not suffered from surplus killing. Compensation for damage to livestock caused by wolves has been available from the state since 2003 but farmers and shepherds still tend to have the most negative attitudes. Official game statistics have been found to over-estimate numbers of wolves by 5–7 times. Using four different quantitative methods, the Slovakia Wolf Census Project estimated there to be 270–405 individuals in autumn 2005 and 166–255 individuals in early spring 2006 living wholly or partially in Slovakia. Of these, c.40% had territories that spanned an international border, predominantly with Poland, which confirms the importance of international cooperation to prepare management plans at the population level. These results also imply that published criteria for favourable conservation status in Slovakia are only fulfilled if juvenile wolves and those with cross-border territories are included in population estimates. Legal hunting is by far the largest cause of known mortality. The rapid development of the road network and other infrastructure is currently the most important indirect threat to the wolf population due to the fragmentation, degradation and loss of suitable habitat. Measures should be taken to ensure that hunting pressure does not increase, that core habitats, connectivity and prey supplies are preserved and conflicts with human interests are adequately addressed.

Introduction: persecution, recovery and public acceptance

Historically, the wolf was regarded as vermin and was persecuted to the brink of eradication from Slovakia. With the exception of a brief respite provided by the Second World War, the wolf's decline continued until 1975, when it was first given legal protection. A closed season was introduced from 1st March to 16th September and all hunting methods other than firearms were prohibited. These measures, in combination with an increase in prey base and expansion of forest cover, allowed the wolf to recover. Trends in hunters'

estimates of wolf numbers and reported numbers of wolves shot legally per year indicate that the population increased in numbers until the 1980–90s. Since then it appears to have stabilised or slightly declined (Fig. 1).

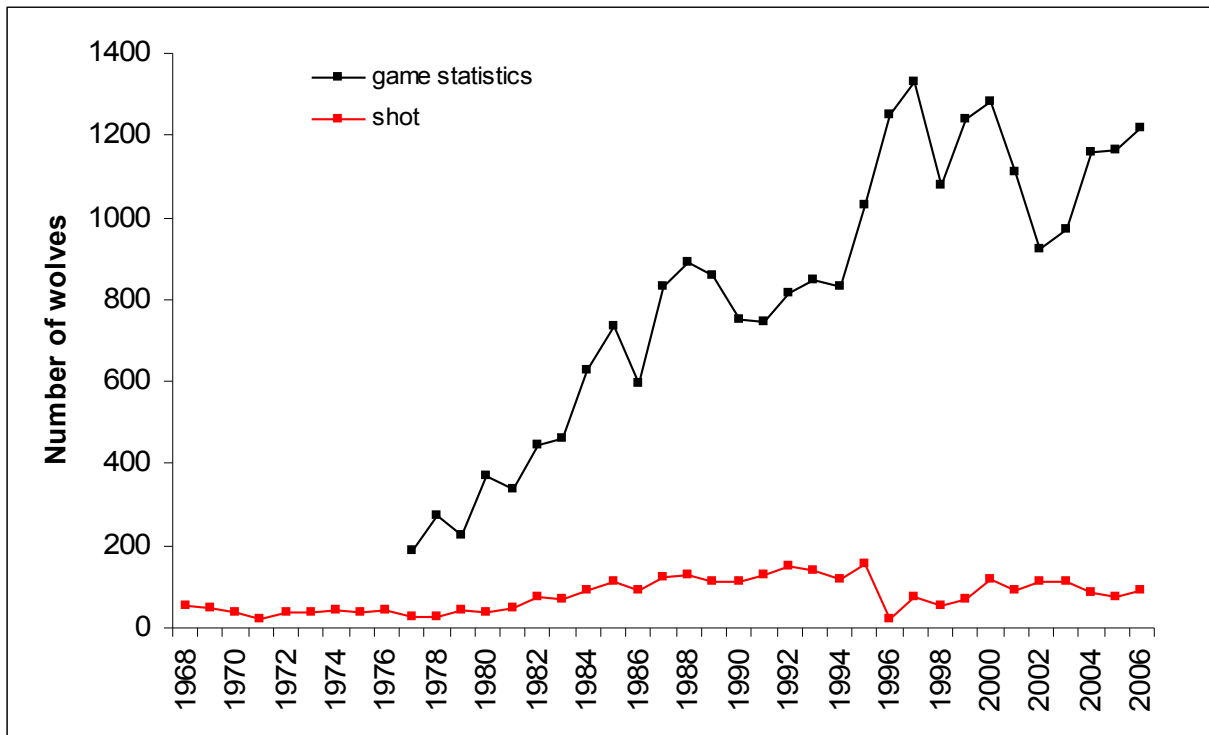


Fig. 1. Hunters' estimates of wolf numbers and reported legal hunting (Source: NLC Zvolen).

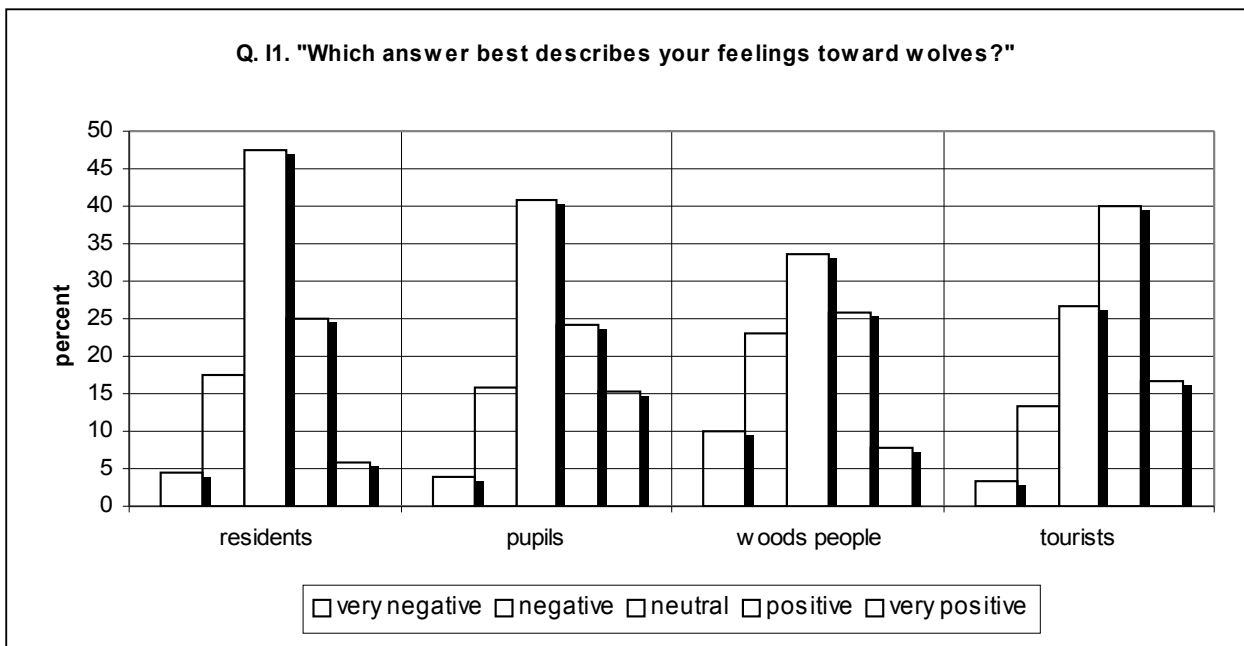


Fig. 2. Feelings of questionnaire survey respondents (n = 1,178) toward wolves by target group (Source: Wechselberger et al. 2005).

Although most Slovaks hold neutral to positive attitudes toward large carnivores, the wolf is the least accepted species, with fewer people having positive feelings towards it than towards the bear or lynx (Wechselberger *et al.* 2005). People most directly affected by carnivores have less positive attitudes than others such as town residents, school pupils and tourists (Fig. 2). Shepherds and farmers tend to have the most negative attitudes due to predation on livestock. Its choice of prey also brings the wolf into conflict with human hunters who perceive it as a competitor for game that must be controlled. Hunting and poaching continue to be the most prevalent causes of known mortality.

Current distribution

With the increase in numbers came an expansion in occupied range. Currently, the wolf inhabits approximately 40% of Slovakia; for various reasons, the rest of the country is generally considered to be unsuitable for its existence. Wolves are widespread in upland areas of northern, central and eastern Slovakia, where the population is contiguous with that in the Polish Carpathians. They are absent from most lowland areas bordering Hungary to the south and are also missing, or occur only sporadically, in several mountain ranges of western Slovakia (Fig. 3).

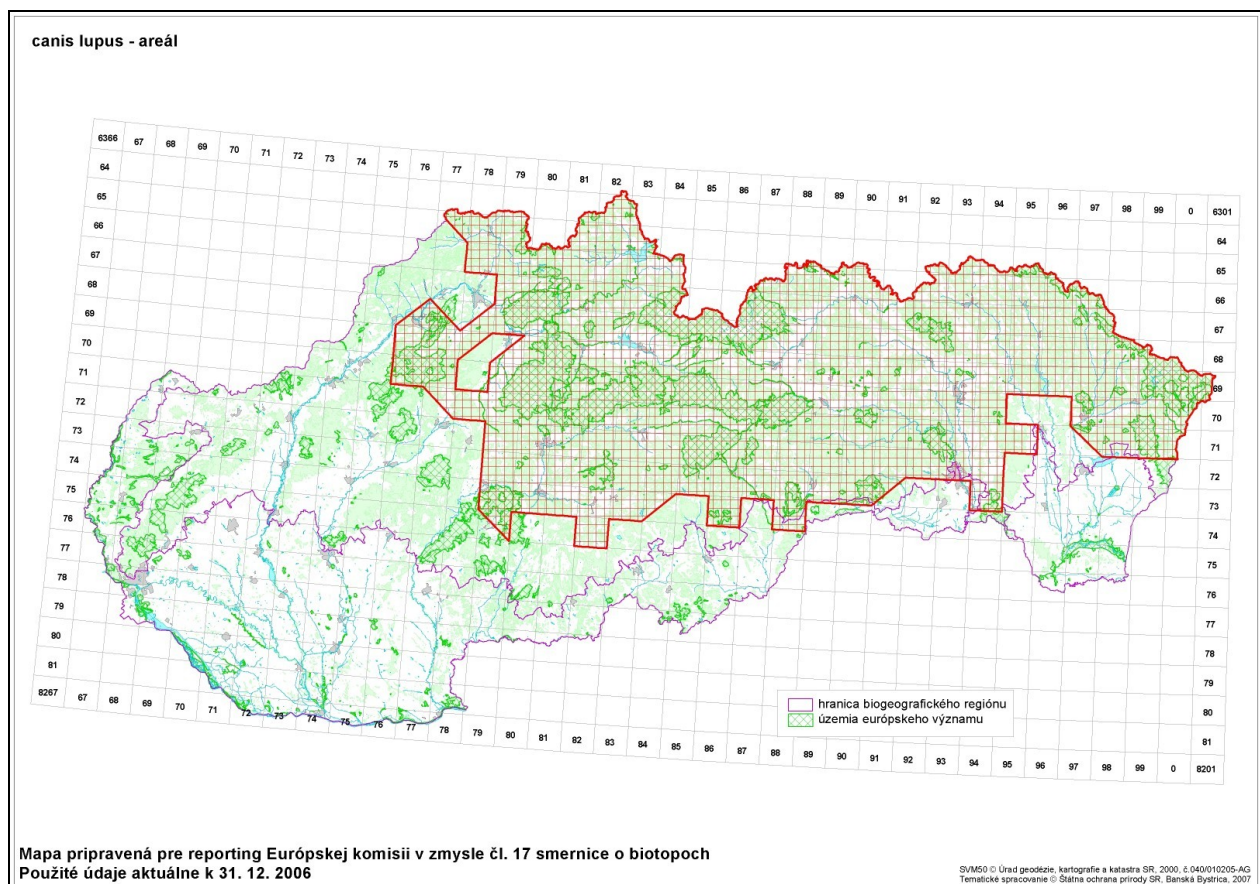


Fig. 3. Wolf distribution in Slovakia (red hatching) and Natura 2000 sites (dark green) as reported by the State Nature Conservancy to the European Commission in 2007 (Source: SNC).



Fig. 4 (left). Wolf distribution in Slovakia is closely linked to forest cover (Photo: R. Rigg).

Fig. 5 (right). Typical wolf habitats in central Slovakia (Photo: R. Rigg).

On a broad scale, the current distribution is closely linked to forest cover in mountain areas (Figs. 3–4). On a finer scale, wolves use a wide variety of habitats from sub-montane field-meadow-forest mosaics to sub-alpine and alpine vegetation zones (Fig. 5). The most important indirect threat to the wolf population, as well as other mammalian species, is the loss, degradation and fragmentation of suitable habitat due to rapid development of the road network and other infrastructure.

Predator-prey relations

Wild ungulates constitute more than 90% of biomass consumed by wolves in Slovakia (Find'o 2002a, Rigg 2004). The main prey species is the red deer (*Cervus elaphus*), followed by wild boar (*Sus scrofa*) and roe deer (*Capreolus capreolus*). The proportion of wild boar in the diet is higher in periods of snow cover and this species is the principle food item in some areas of eastern Slovakia. Livestock accounts for less than 5% of the spring–autumn diet. Wolves occasionally take smaller species such as hare (*Lepus europaeus*), voles and mice, as well as carnivores including the fox (*Vulpes vulpes*), badger (*Meles meles*) and domestic dog.

In 1994–2002, two wolf packs in the Western Carpathians were studied using radio-telemetry. A pack of 7 in the Tatras National Park used a home range of 146 km² and a pack of 5 in the Nízke Tatry used an area of 191 km² (MCP 100%). The nuclei of the wolves' main activity were situated in areas where red deer aggregated, e.g. winter yards, at lower elevations, especially around feeding stations (Find'o and Chovancová 2004).

Long-term research has been focused on landscape use and anti-predatory behaviour of red deer in the mountains of central Slovakia. Here, red deer share habitat with not only the wolf but also the bear and lynx. A total of 21 red deer (13 males and 8 females) have been radio-collared so far (Find'o 2002b). As in other mountainous areas, many individuals migrate between winter yards and summer grazing areas at timberline and on alpine meadows. A minority of the population is sedentary. Home range sizes were found to be 77–87 km² for migratory individuals and 5–13 km² for sedentary individuals. Research on anti-predatory

behaviour is ongoing.

In the 1990s, an epidemic of classical swine fever broke out in the free-living wild boar population and domestic breeds of pigs. Piglets and sub-adult individuals less than 1.5 years old (84% and 95% respectively) are most susceptible to this serious infectious disease. The epidemic caused major economic losses in domestic pig breeds and resulted in a decline in wild boar numbers in large parts of the country. Data reported monthly by the State Veterinary Institute indicate that, in areas where wolves and wild boar share the habitat, classical swine fever either did not occur at all or the centre of infection soon disappeared (Fig. 6). As wolves most often prey on piglets and yearlings, i.e. the age cohorts most liable to infection, it has been proposed that they limit the spread of the epidemic by eliminating infected individuals (Strnádová 2000, Findo 2002).

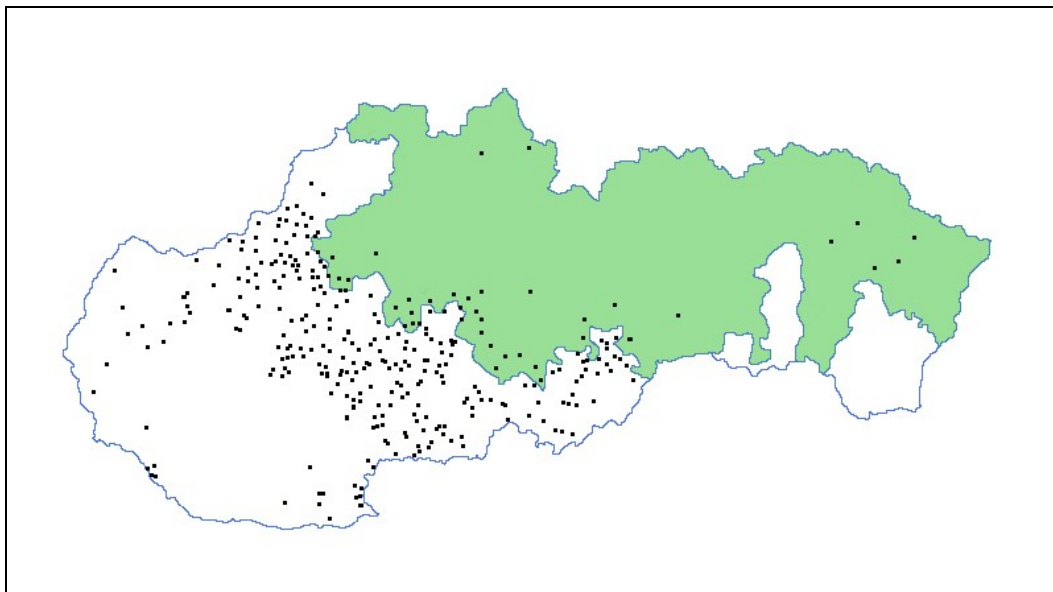


Fig. 6. Locations of confirmed classical swine fever infections in wild boar (black dots) and wolf distribution in Slovakia (green shading) in 1994–2003 (Source: redrawn from Strnádová 2000 with more recent data added).

Conflict mitigation

The proportion of livestock in the diet of wolves is small, but attacks on livestock, especially sheep, are quite common during the grazing season. Although only a small minority of farms suffer significant problems, losses can be high locally, especially where preventive measures are insufficient (Fig. 7). Farms with well-raised and correctly used livestock guarding dogs tend to report significantly fewer losses than other nearby farms and have not suffered from surplus killing (Rigg and Gorman 2006). Compensation for damage caused by wolves has been available since 2003 but farmers and shepherds still tend to have the most negative attitudes (Wechselberger *et al.* 2005).

The most widespread method used to protect flocks on summer pastures is chaining up dogs in the vicinity of a mobile sheepfold, with shepherds sleeping in a trailer or cabin nearby. This system often fails to ward off predators. Thus the Carpathian and Slovak

Wildlife Societies launched the Protection of Livestock and Conservation of Large Carnivores project to revive the traditional use of livestock guarding dogs (LGDs). During the period 2000–04 a total of 67 pups (mostly Slovensky Čuvač and Caucasian Shepherd Dogs) were given to shepherds at selected farms, who were provided with information and assistance in raising them to be attentive to livestock, trustworthy and protective. LGDs were considered the best method, as dogs have been used traditionally in Slovakia and are still widely available. Their presence with flocks also provides the potential for continuous protection, which is important as, unlike bears, wolves often attack flocks when they are grazing on pastures during the day.

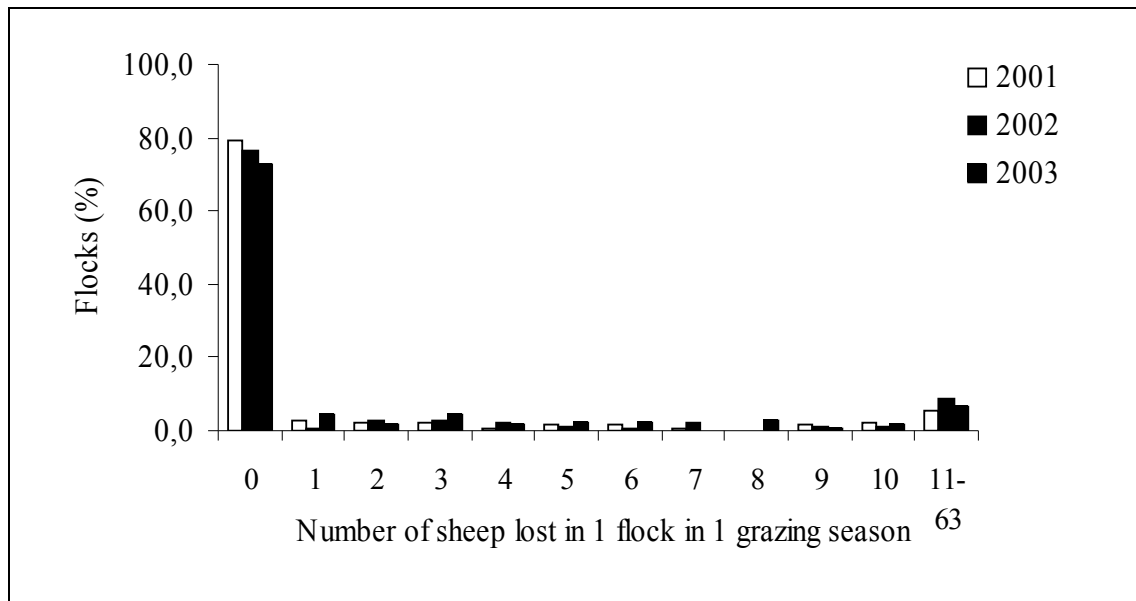


Fig. 7. Most sheep flocks are largely unaffected by wolf predation. However, a small minority lose more than 10 sheep to wolves in a year, accounting for the majority of all losses and resulting in negative publicity for the wolf (Source: Rigg 2004, Rigg and Gorman 2006).

Many unforeseen difficulties were encountered, including alcoholism and negligence of shepherds, bankruptcy of farms, hunters shooting dogs and farm visitors provoking them with inappropriate behaviour, resulting in shepherds chaining up dogs. Nevertheless, several dogs were raised successfully and regularly accompanied flocks. The maximum total loss reported at trial flocks with free-ranging, sheep-socialised LGDs was only 14% of that among control flocks in the same regions (Rigg 2004).

During the project, contact was established with around 300 farmers by site visits as well as written questionnaires and telephone surveys. This was beneficial for both sides, as farmers provided information about predation on their livestock whilst receiving guidelines on how to raise LGDs. The aim was to encourage a gradual revival of this traditional method among stockmen grazing their flocks in areas with large carnivores. This has happened in some cases, though not yet to the extent that was hoped.

Legal status: species and habitat protection

According to national hunting legislation, the wolf is a game species. In 1995–99 there was an attempt to introduce year-round protection, but this was rejected by hunters and subsequently an open hunting season has been set from 1st November to 15th January with no quota. In national legislation on nature protection, the wolf is a partly protected species of European importance with a closed season from 16th January to 31st October. It is included in the Red List of mammals of Slovakia as LR:nt (Low Risk: near threatened).

Slovakia is a signatory to the Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention), Annex II of which includes the wolf as a strictly protected species. However, Slovakia made a reservation for the wolf and brown bear, reasoning that, “*the present level of their population in the Slovak Republic permits the regulation of their numbers without detriment to their survival and to the functions of these species in the natural ecosystems.*”

Slovakia has been a member of the European Union since May 2004 and is therefore bound by EU legislation. This includes Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (the Habitats Directive), which lists the wolf in Annex II (species of Community interest whose conservation requires the designation of special areas) and Annex IV (species in need of strict protection). Slovakia has a derogation allowing hunting.

In its manual for a programme of care of Natura 2000 sites and species (Polák and Saxa 2005), the State Nature Conservancy of the Slovak Republic (SNC) has defined favourable conservation status for the wolf in Slovakia as at least 300 individuals at a density of 1.5–3.0 ind./100 km² in main habitats, with an average pack size of at least 4–6 individuals.

The national list of proposed Natura 2000 sites of Community importance prepared as part of the implementation of the Habitats Directive in Slovakia includes 72 sites identified for wolf protection covering a total area of c.4,300 km². Several core areas of wolf occurrence are included, such as the Tatras, Low Tatras, Veľká Fatra, Malá Fatra, Muránska planina and Beskyd. However, connectivity of protected areas is not necessarily ensured by the Natura 2000 network. Habitat fragmentation may be an important concern in the future due to increased traffic volume and enlargement of the transport network as well as residential, recreational and industrial development. Considering the distributions of eight target species, including the wolf, 32 road segments, together comprising 42% of the country's 659 km of motorways and 49% of the 1,108 km of dual carriageways, have been identified by researchers as critically important in relation to habitat fragmentation and traffic accidents (Findo *et al.* 2007).

Population size and hunter harvest

It is widely acknowledged that official game statistics (Fig. 1) over-estimate the number of large carnivores, primarily due to the same individuals being counted in more than one hunting ground. In addition, official numbers of hunted wolves reported by the Ministry of Agriculture under-estimate total human-caused mortality, because they do not include

poached animals or all those hit by vehicles. Other estimates of population size are usually either restricted to individual protected areas or are based on expert opinion, lacking clear and objective methodology.

Since 2005, the Slovakia Wolf Census Project has aimed to produce estimates of population size that are national in scope but verifiable locally (Rigg 2007). Four different quantitative methods have been used: 1) mapping the distribution and size of wolf packs; 2) extrapolating from estimated winter mortality; 3) recalibrating game statistics from tracking in model areas; and 4) extrapolating from densities observed in model areas. Using these methods, it was estimated that in 2005–06 there were c.270–405 wolves in autumn and c.166–255 wolves in spring living wholly or partially in Slovakia (Tab. 1). Around 40% of packs had trans-border territories, which shows the importance of international cooperation to prepare management plans at the population level.

Combining the results of the Slovakia Wolf Census Project with an annual survey of wolves and lynx in Poland coordinated by the Mammal Research Institute of the Polish Academy of Sciences suggests that the average of 88 individuals shot legally per annum in Slovakia represents c.20% of all wolves in the Czech Republic, Slovakia and the Polish Carpathians (Rigg 2007). This is lower than estimates of mortality rates likely to achieve population control or sustainable harvest (cf. Fuller *et al.* 2003). However, the population is also subject to illegal killing in Slovakia as well as in Poland, where it has been asserted (Okarma 2005) that illegal killing has prevented population growth, despite a complete ban on hunting since 1998.

Method	Estimated number of wolves		
	Autumn	Winter	Spring
1. Mapping wolf pack territories	234–384	234	84–234
2. Extrapolating from winter mortality	270–405	-	170–255
3. Recalibrating official game statistics	-	-	166–233
4. Extrapolating from model area density	-	308	-

Tab. 1. *Estimates of the number of wolves in Slovakia in 2005–06 according to the Slovakia Wolf Census Project (Source: Rigg 2007).*

Conclusions and recommendations

Results of the Slovakia Wolf Census Project suggest that the wolf is only at a favourable conservation status in Slovakia as defined by the State Nature Conservancy if pups of the year and wolves shared with neighbouring states are included in population estimates. The very large proportion of wolves shared with neighbouring states emphasises the importance of cross-border cooperation in order to plan management at the population level, as encouraged by several recommendations adopted by the Standing Committee of the Bern Convention.

Taking the whole population in Slovakia, Poland and the Czech Republic into consideration, legal hunting in Slovakia seems to be below the level likely to prevent

population growth. However, the population is also subject to illegal killing which is difficult to quantify but believed to be considerable. Measures should be taken to ensure that hunting pressure is not allowed to increase, that core habitats, connectivity and prey supplies are preserved and conflicts with human interests are adequately addressed.

An apparent downward trend in wolf numbers over the last decade emphasises the need for careful, ongoing monitoring. Large disparities between game statistics and tracking surveys show the importance of developing more accurate methods to assess population size. Non-invasive genetic sampling and telemetry could help to improve population estimates by refining measurements of density, home range size and mortality as well as the ability to distinguish reliably between individuals and packs.

There is no doubt that the wolf is a highly controversial and contradictory animal: admired by some people, hated by others. Animosity towards wolves fostered over hundreds of years poses a major obstacle to those striving to increase its acceptance. Clearly, while some useful work has been done, more research is needed to improve scientific knowledge of the wolf in Slovakia. Awareness-raising campaigns, including documentary films and high-quality publications, are very important in improving the image of the species and transmitting knowledge to the public, stakeholders and decision makers. Ultimately, it is these groups who will determine the future of the wolf in Slovakia.

Acknowledgements

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Wolves in Poland - distribution, ecology, threats and conservation activities

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Abstract

In Poland wolves have been fully protected since 1998. According to the Polish Animals Protection Act (2004) wolves are strictly protected and require a temporary (from 1st April to 15th July) 500 m protection zone around dens where pups are raised. The Minister of Environment can allow the killing of individual wolves that are responsible for regular damage to livestock or pose a threat to humans. Damage caused by wolves is compensated by the State. Heads of Nature Conservation Departments in every Polish province are responsible for the damage assessment and the payment of compensation to livestock owners.

Scientific research on wolves started in Poland in the mid 1980s. Population densities, territory size, diet, impact on prey populations, and various aspects of wolf behavior were studied in Białowieża Primeval Forest (BPF, NE Poland) and the Carpathians (Bieszczady Mountains, SE Poland, and Beskidy Mountains, S Poland). Furthermore, since 2000, the National Census of Wolves has been conducted and data collected by scientists as well as forestry and national park services has formed the basis of country-scale studies on numbers, population genetics, and habitat use of wolves.

The total number of wolves in Poland is currently estimated at about 600 individuals. The range of the species is restricted to northern, north-eastern and southern parts of the country. Analyses of the current wolf distribution and a GIS-based modeling of suitable habitats showed that there is a great potential for development of the wolf range and population size. At present, wolves occupy about one-third of suitable habitats, but large, continuous patches of optimal habitats with abundant prey resources are still available in western Poland.

The average density of wolves varies between large forests from 2 to 4 individuals/100 km². The mean pack size is 4.9 wolves (range 1-12), and most packs include from 4 to 6 wolves. Wolf territories (studied by radio-telemetry and intensive snow tracking) range from 150 km² in the Carpathian Mountains to 250-300 km² in lowlands. Very little overlap (on average 7%) of neighboring territories has been observed. In lowlands, wolf pups are born in excavated dens, whereas in mountains, where ground is stony, in dense thickets or under roots of fallen trees and stumps. Wolves in Poland prey mainly on wild ungulates (85-98% of biomass eaten); livestock constitute less than 4% of the wolf food biomass. Red deer is the main prey species (42-80% of biomass), followed by the roe deer (up to 33% of biomass) and the wild boar (up to 17% of biomass). In both species of deer, wolves prefer females and

juveniles. In wild boar, mainly young individuals are eaten.

Analyses of wolf DNA, extracted from feces collected over the whole of Poland in 2004-2007, showed a clear separation of the Carpathian wolf population from the lowland population, and suggested that wolves colonizing the western part of the country come mostly from the north-eastern part of wolf range.

The main threats to wolves in Poland are: habitat fragmentation and disruption of migration corridors due to transportation infrastructure and linear urbanisation; poaching; disturbance in refuges caused by intensive logging and recreation; and wolf/human conflicts which result in an aversion of rural communities towards wolves and proposals for the change of the legal status.

Since 1996, the Association for Nature "Wolf" (AfN WOLF) has conducted various activities focused on wolf conservation. In co-operation with the Mammal Research Institute of the Polish Academy of Science in Białowieża (MRI PAS), we have proposed a network of migration corridors linking the most important forest habitats in Poland. As this network is seriously threatened with disruption by the building of new motorways, AfN WOLF is involved in extensive negotiations with road planners and investors concerning the proper distribution, density, design and dimensions of different types of wildlife crossing structures suitable for wolves, but also for other terrestrial animals. We have prepared with our colleagues from MRI PAS two editions of a handbook for environmentalists, road planners and investors entitled, *Animals and roads. Methods of mitigation of the roads' negative impact on wildlife*, in which the wildlife corridors network, conflicts with transportation infrastructure and recommended mitigation measures are presented. Recently we have developed a project to monitor wildlife passages for the Ministry of Infrastructure. In order to minimize damage to livestock we have successfully introduced guarding dogs and fladry into sheep and cattle farms afflicted by wolf attacks in the Beskidy Mountains (S Poland). We have published two handbooks for farmers (in 1999 and 2006), where the most efficient methods of livestock protection have been promoted. Furthermore, we are involved in designation of areas important as wolf habitats for the Natura 2000 network and we also prepare recommendations for forest management plans and spatial planning in these areas.

Some questions regarding wolves in Romania

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Abstract

We analyzed some important information which could give a proper overview about the lack of existing knowledge about wolves in Romania. Our goal was to present information which could be used to prepare a proper basis for effective conservation and related problem management issues in central and western European counties where wolves could recover naturally in the coming years. The research was concerned with questions related to population size, legal and conservation status, wolf population distribution and habitat protection, conflicts, damage, public opinion and hybrids as threatening factors.

Introduction

The wolf is one of the most widespread carnivores in the Northern hemisphere, although it was totally exterminated from most European states. According to the official estimates, Romania is home to about 4000 individuals. Due to double counting of several individuals more realistic estimate could be 2500–3000. The interest of biologists in wolves and also in other game species in Romania is still low. The reason for this is that the game species are relatively well studied animals and we already possess some knowledge of them. On the other hand, hunters, game keepers and biologists have often very contrary points of view and therefore collaboration is difficult.

Legal and conservation status

According to estimates, after World War II there were more than 5000 wolves in the forests of Romania. Due to the damage they caused, organized extermination of wolves began in the 1950s. At the end of the 1960s the number of wolves had fallen to around 1500 individuals. The introduction of a ban on weapons favored the recovery of prey species and of the wolf population alike. In 1991, a total ban on the use of poison and, later, the acceptance of the Bern Convention (in 1993) were important steps towards the conservation of wolves as well as other species. Today, the legal framework for wolf conservation is ensured by:

- EU Habitat Directive (Annex II, IV)
- Law no. 407 / 2006 (Hunting Law) – wolves are protected, hunting is forbidden, hunting just is allowed only with permission of the Ministry of the Environment and Sustainable Development and the Ministry of Agriculture and Rural Development

- Law no. 13 / 1993 (Annex II.) - the acceptance of the Bern Convention
- Law no. 96 / 1994 (Annex I and II) – the acceptance of the Washington Convention
EU Wildlife Trade Regulation

According to these laws, wolves are protected but at the same time hunted in a limited number. We do not have a proper overview to find out if hunting is a real factor affecting long-term survival or not. Official data about hunted animals (such as age, sex, etc.) is not always correct. The hunting of wolves is mainly occasional and they are usually hunted with other animals. For example in areas where the wild boar or brown bear are hunted and carcasses are used as bait. Although using carcasses or meat as bait for bears is forbidden, this practice is still widely used by hunters. It is hard to plan a wolf hunt: permission is usually given after the hunter has already killed the wolf. It is possible that more wolves are killed than are presented in official data.

There are 12 national parks in Romania with a total area of 3075 km² as well as 10 natural parks with a total area of 5398 km². There are only a few studies on the size of wolf pack territories in Romania, but it is clear that it is related to food availability. The wolf territory sizes also depend on the density of livestock. In Romania, wolves may use territories from 150 km² to 300 km², as was shown by CLCP project (Sürth, personal communication)

The national parks can host 10–20 wolf packs, which is around 47–94 animals, representing 1.6 %–3.8 % of all wolves in Romania (assuming an average pack size of 4.7 individuals, as observed in Poland (Nowak et al 2005)). In the case of natural parks, the number of wolf packs might be approximately 18–35, which is around 85–165 animals, representing 2.8–6.6 % of the total.

So, national and natural parks together could be home only to 4.4–10.4 % of all wolves in Romania. Of course wolves do not respect the boundary of the areas. In reality, wolves can not use all protected areas or all parts of them. In this context, protected areas are insular and lack a real network (Even after the designation of the Natura 2000 sites in Romania – according to the most optimistic estimation – protected area could cover only about 20% of whole wolf territory).

Wolves and humans in Romania

Attacks on humans

In Romania there are no realistic data about wolf attacks on humans. According to a study by Linnell et al. (2002), 41 such cases were known in Romania. Of these 41 cases, 33 were proven to be false and just 8 seemed to be real. Two of these happened during a group hunt when the hunters were trying to stop the wounded animal with a stick (alternatively, the hunter tried to kill the trapped wolf with a stick). The other 6 attacks happened when shepherds were trying to kill a cornered wolf. In all 8 cases, the “attack” was actually just a defensive bite.

Predation on wild and domestic animals

There is no official report about the losses of wild and domestic animals to wolves because a damage compensation system does not exist and aggrieved people rarely report the damage. The following is an overview of wolf-related losses obtained during our study in Mures County in 2004 (Tab.1).

	Total number of goats and sheep	Number of animals killed	Number of animals eaten	The highest surplus killing in one case
Included in the survey	6 996	79	25 - 45	34
Extrapolated total for all of Mures County	339 843	3837	1 279 – 2 303	-

Tab. 1. The damage evaluation in Mures County (according to our study in 2004)

We visited 32 shepherd camps where wolf damage occurred. Of a total of 6996 sheep and goats at these camps, 79 were killed by wolves (including those badly injured which had to be destroyed). Usually, shepherds were able to recover the killed animals and wolves consumed only 25 - 45. Surplus killing in a single attack usually resulted in less than 10 killed animals but in one case the highest surplus killing was of 34 sheep. The average loss in the case of shepherd camps with damage was 1.12 % of the flock.

Wolf impact on prey populations

The only available scientific study on wolf diet in Romania (H. Almășan et al., 1970) found that wolves consumed predominantly domestic animals (75,8%) such as sheep (64%), dogs (21%), goats (5%), pigs (4%), horses (3%) and cattle (3%), with only 24.2 % of the diet comprised of wild animals: roe deer (56%), hare (25%), wild boar (14%) and red deer (5%).

First of all, we do not know if the research by Almășan was done objectively. In the 1960s and 1970s the wolf was regarded as a pest animal and that could influence the conclusion of the study. Anyway, in the 1960s and 1970s, wolves were killed because of a high level of damage even in case of a lower number of wolves. Smaller wild prey (roe deer, hare) occurred in relative high number – this leads us to believe that wolves were distributed not in remote mountainous areas but in hilly areas. We suppose that wolves lived in small groups or alone due to permanent loss of pack members.

During our preliminary research on wolf damages and winter wolf diet of one pack in Bistra Valley (Calimani Mountains), in the period from 20.12.2005 to 1.03.2006 we found the following prey: 7 red deer and 2 wild boar, and possibly 1 dog, 1 goat and 1 sheep. This quantity of food may be sufficient for 3-4 wolves for an approximately 70-day period.

According to the results of snow-tracking, this pack could have had a minimum of 3 and maximum of 5 members. The summer damage and diet study shows that wolves consume mostly sheep and goats (according to damage to livestock in the supposed wolf territory; found excrements).

In 2007 we studied livestock damage in the supposed territory of the wolf pack in Bistra Valley. We obtained on average data from 46 days for each shepherd camp. In this period the average damage was approximately 0.48% of the flock (Tab 2).

Damaged shepherd camps	Loss in 2007 (1.May – 7.Aug)
No. 1	1 lamb + 1 goat
No. 2	7 lambs
No. 3	1 sheep
No. 4	3 lambs + 1 sheep
No. 5	6 lambs + 2 sheep
No. 6	4 lambs + 4 sheep
Total	8 sheep + 21 lambs + 1 goat

Tab.2. The damage evaluation in Bistra Valley (according to our study in 2004)

Coexistence close to humans

In some cases we find that wolves approach very close to human settlements relatively frequently without being observed and without negative consequences. Of course, a fence near the house is necessary to keep dogs or other domestic animals safe. Moreover in our study area, wolves hunt red deer close to villages. We observed villagers who found killed deer and collected the remaining meat.

Public opinion

We conducted a public opinion study in a wolf area to find out what problems can arise because of them. The study was titled “Opinions of pupil's parents from some villages in Mureş County (Romania) about wolves”. It is important to mention that this public opinion survey was carried out with the goal of collecting arguments against an alarming reaction of the media in another county, where wolves reappeared after a 20-year long absence (2 wolves were sighted there). The media induced fear in the general public, suggesting that the presence of wolves meant a danger for children going to school from one village to the other. Villages included in our public opinion survey were chosen only with the consideration of the presence of wolves in their vicinities. The results of this public opinion survey demonstrate that the presence of wolves does not necessarily mean that local people are terrified of these carnivores or that they perceive them as a real danger (Fig. 1–5).

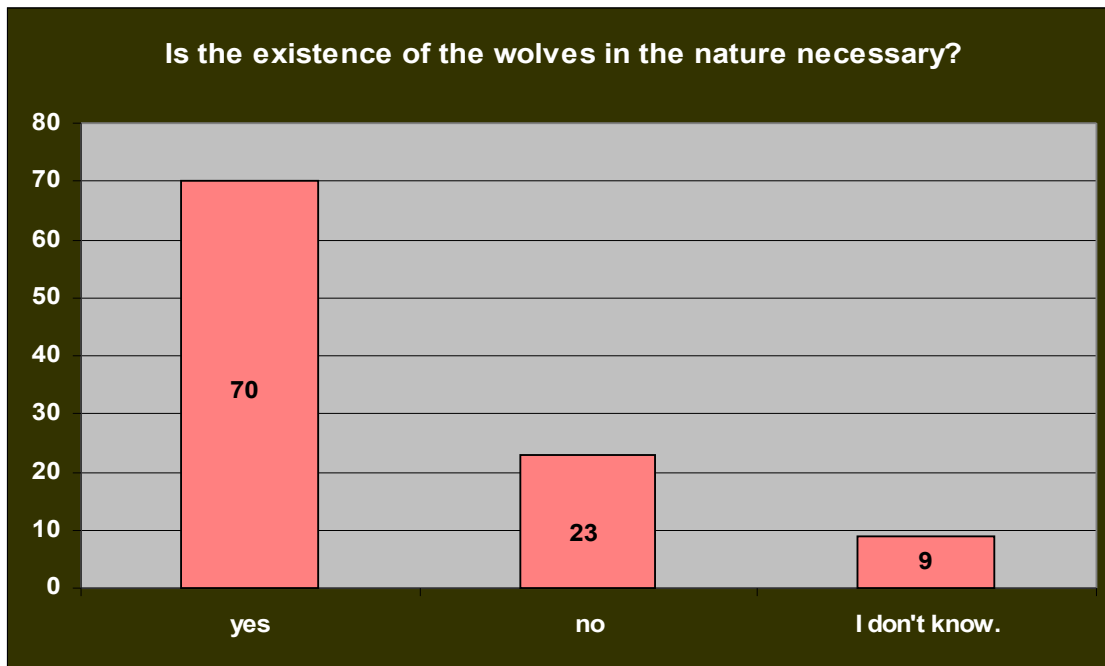


Fig. 1. Results from public opinion research in Mureş County.

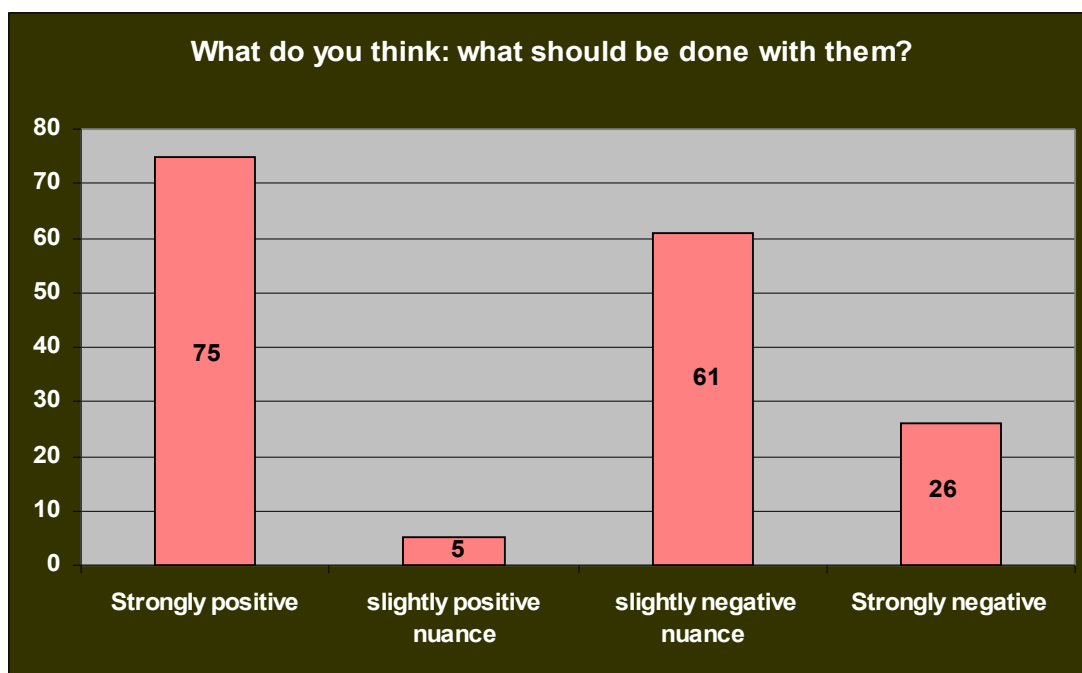


Fig. 2. Results from public opinion research in Mureş County. A **slightly positive** nuance means answers such as the following: “We must assure large areas for wolves where they can live freely without compromising the existence of people and domestic animals.” A **slightly negative** nuance mean answers such as the following: “We must keep wolves in a big enclosure so as not to let them come close to people and domestic animals.”

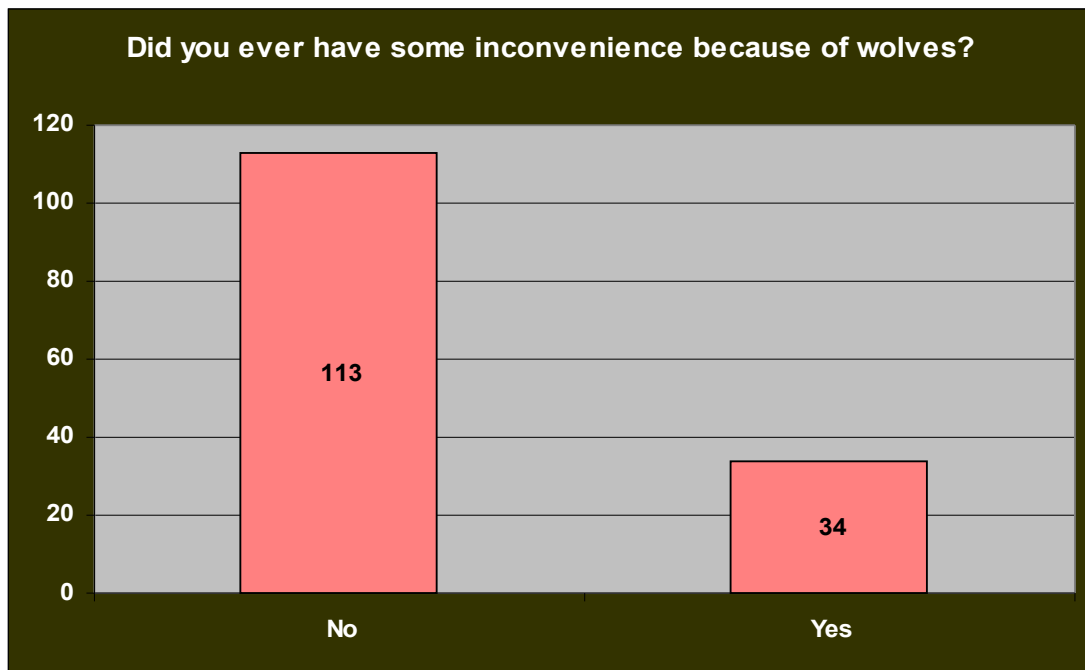


Fig. 3. Results from public opinion research in Mureş County. As a large proportion of villagers keep animals, the “*inconvenience because of wolves*” was the loss of livestock.

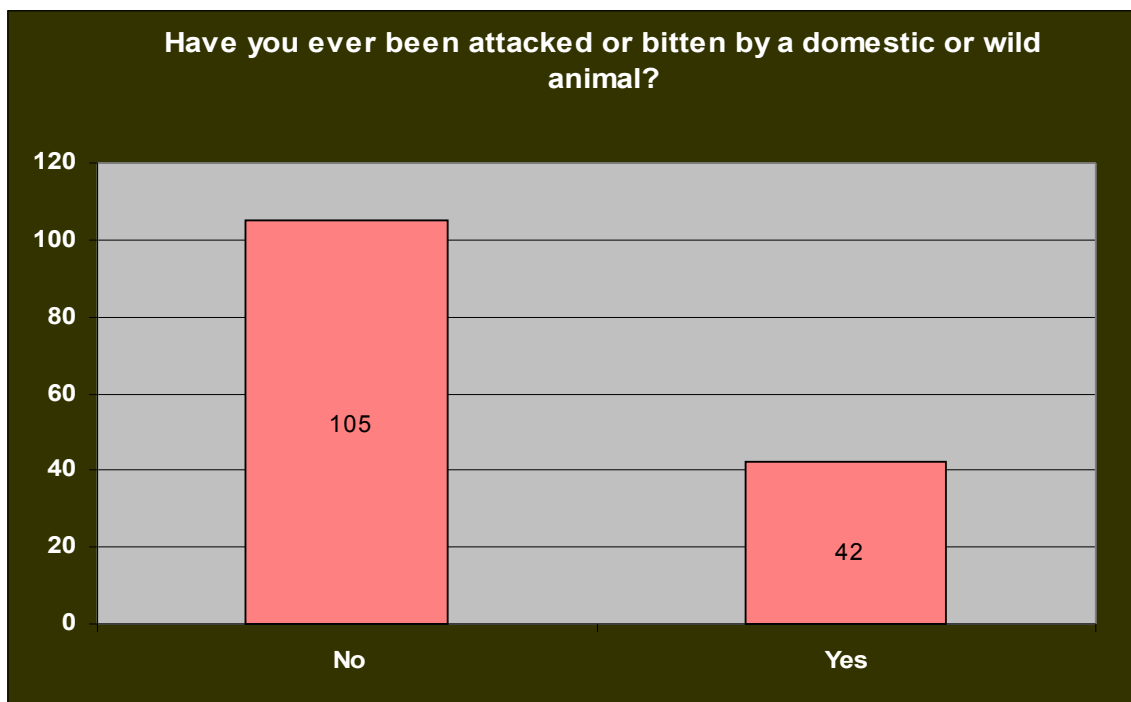


Fig. 4. Results from public opinion research in Mureş County.

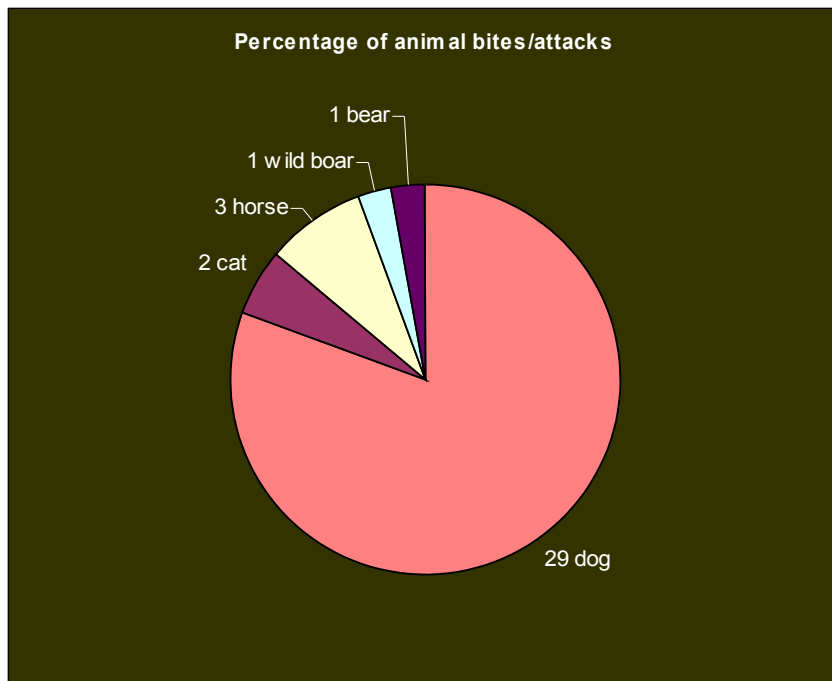


Fig. 5. Percentage of animal bites or attacks in Mureş County.

Another public opinion study had the aim of finding how people who have had conflicts think about wolves, otters and bears. We asked only aggrieved persons to uncover the most negative scenarios. In spite of the fact that healthy wild wolves almost never attack or kill humans, animal keepers showed an almost total lack of sympathy toward them, while there was more sympathy towards bears, even though every year there are cases of bear attacks, some of which even claim human lives.

Feral dogs and wolf-dog hybrids

In the last few years, we have collected information about direct wolf observations taken by shepherds or hunters. In the first years we believed that shepherds' observations of wolves could not be "usable" for us due to their poor explanation or exaggeration. However, they can contain some valuable information. Hunters and foresters consider the possibility of wolf-dog hybridization in nature as unreal. They base their arguments on the "well known fact" that dogs are the most preferred prey of wolves. However, the existence of wolf-dog hybrids or crossbreeds in the wild is not just a myth. The existence of wolf-dog hybrids and their backcrosses have been recorded in several countries.

Wolf-like animals, which show some strange characteristics (tail position/shape, body conformation, coloring, lack of shyness) are considered by shepherds and hunters as wolves or simply as feral dogs. This means that an analysis of wolf trophies would not be sufficient. In this way, data about wolf-dog hybrids or crossbreeds could be lost.

Taking into account the points mentioned above, we try to make a data selection about wolves described by shepherds and hunters to gain a picture about the abundance of strange colored animals.

Except for finding the perpetrator of damage at shepherds' camps, it is an increasing challenge for us to find out the number of feral dogs, wolf-dog crossbreeds and backcrosses present in the Romanian wolf population.

We possess information about 149 specimens, including stuffed specimens (16) or skins of shot animals (4). Of these 149, 10 were black or very dark colored, 81 were probably "normal" colored and 2 were brown. We have also noticed observations of hunters about a "wolf" specimen which was lactating in late August and other observations of wolves not afraid of humans.

Wolves observed under different visibility conditions and in different phases of molting could show a large range of fur color from darker through reddish or grayish to yellowish or even white. However, in a group of several wolves, strangely colored specimens can be sufficiently conspicuous to attract the observer's attention.

Taking into account the above facts, we think that the animals described and categorized as not of "normal" coloration could have been wolf-dog hybrids, crossbreeds or simply feral dogs.

However, a research about hybrids can be done only by genetically research, When ever a stable wolf population is present, it is unlikely the hybrids are common or represent a threat. Only if they come from captivity.

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12 years of experience with large carnivores

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I studied international courses on “animal management” with a focus on wildlife management, public relations and policy in Holland. From 1996 until 2003 I worked as a field research technician for the Carpathian Large Carnivore Project (CLCP) in Romania and was hired for leading CLCP excursions and supporting local ecotourism development.

During the last 12 years of field research, telemetry and expeditions I have worked and improved my experience with 6 different wolf packs and more than 27 wolves, with two lynx and many brown bears. The most important goal was to increase experience and knowledge about the adaptability of large carnivores towards human activities, human infrastructure and humans themselves.

The research I did from 1996–2003 was for the CLCP. Unfortunately, there have been no scientific papers published by the CLCP. The project finished at the end of 2003. I do not have all the data nor permission to publish it. So, all I can do is to present my experience and knowledge, without using the scientific data.

One of the most important lessons I learned was that not only Timis and her “Downtown Pack” visited settlements (Brasov). All radio-tracked wolves I was able to follow occasionally or regularly visited settlements (Fig. 1). Wolf packs with a territory in very remote areas visited villages at the edge of their territory, though not very often. Other wolf packs in less remote areas visited settlements regularly, sometimes almost every night. In some cases the den site or the rendezvous site was less than 1 km from the nearest settlement. I believe this is normal behaviour for wolves, if they have food sources in town. Wolves are able to learn to coexist with humans. In my opinion, it is important to take care that people don’t feed large carnivores and that no artificial food sources for wolves and brown bears are available in or near settlements. In no case did I recognise any risk to people from wolves which were crossing or visiting settlements. But there is a risk to pet and farm animals. Still, it is important to explain to people, that coexistence with wolves is not without risk, but that the risk is extremely small and very much dependent on the behaviour of people.

Way of the wolf

The Way of the Wolf project can be divided into several different modules:

- (a) Increasing the experience and knowledge about the situation of large carnivores in the Carpathian Mountains up to the Alps and



Germany. Highlights are “current situation of the populations and population dynamics, migration routes with barriers and corridors”. The first step is to collect information with the help of expeditions in all target areas and communicating with local people.

- (b) Public awareness and educational programmes for children and for adults.
- (c) Initiating and supporting new wildlife management programmes and projects regarding large carnivores on local, national and international levels.

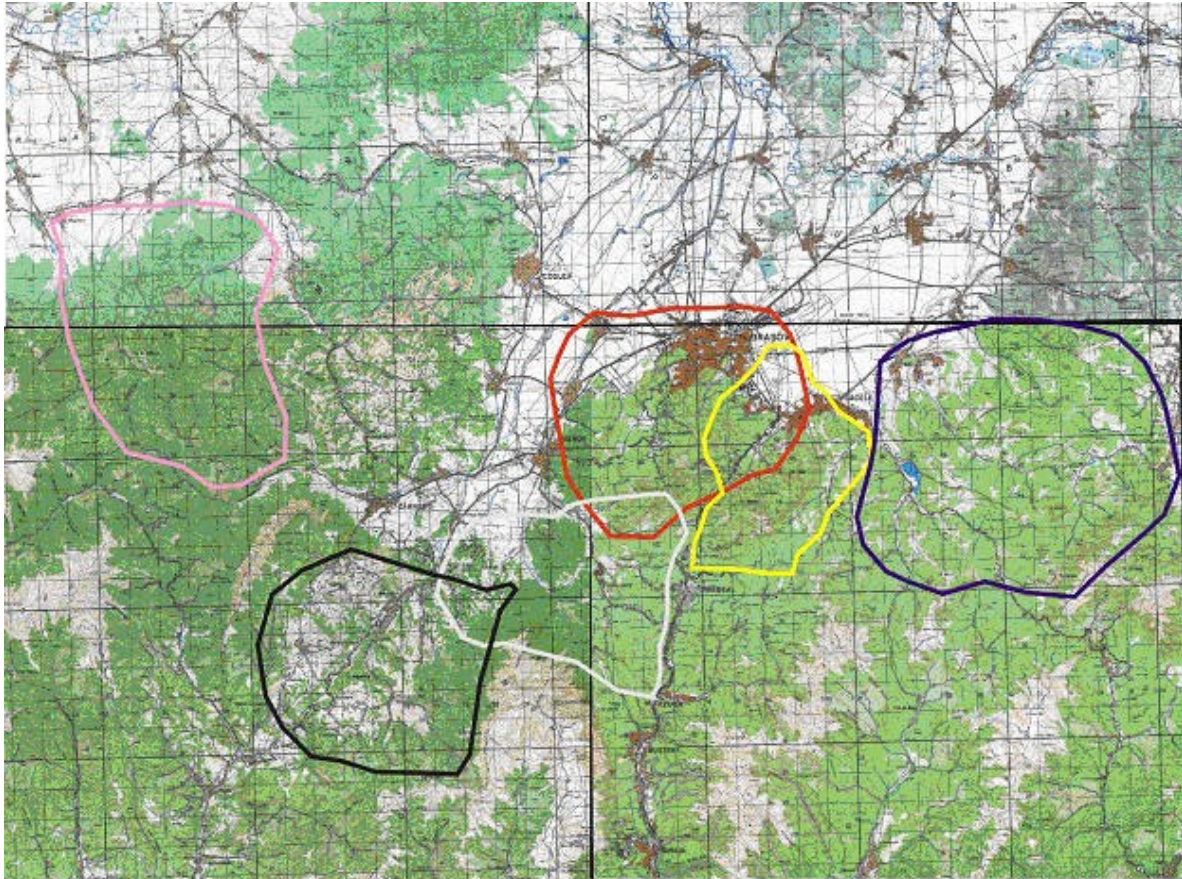


Fig 1. Six wolf packs around Brasov. These are not all the wolf packs which were there. The circled areas only represent my experience and estimates of territories, not actual territories based on scientific data from radio telemetry. The size of the territories is between 150 and almost 300km². In the same area live on average about 200P/km².

Summary of the main project activities since 2005

- May-July 2005: 2000km walking expedition from Piatra Craiului (near Brasov in Romania) to East Germany.
- May 2006: 550km walking expedition from the High Tatras in Slovakia towards Mariazell in Austria passing through the corridor between the Carpathian Mountains and the Alps.
- September/October 2006: 650km walking expedition through the western and southern parts of the Carpathian Mountains in Romania.
- 2006-2007: supporting the bear project of ICAS Brasov with help in telemetry work

and a TV documentary with SZ-TV, a German TV programme.

- February 2008: a monitoring expedition in the Czech Republic from Beskidy Mountains to the Bavarian Forest.
- Development of “Kids for the Wolf”, a school programme. Since 2005 I have been able to visit many schools in Germany to talk and to work with the children mainly about the comeback of wolves and bears to Germany.
- July 2006: first big art event in cooperation with the school for art in Filderstadt. I used art as a tool for educational work mainly with children. We had an exhibition with more than 200 presentations by children and partly adult art work.
- September 2007: leading the workshop “the comeback of wolves” for the “Schüler-Uni” (educational programme) programme of the Ministry of Environment.
- All expedition and research work was open for everybody to join and to learn more about large carnivores, migration and corridors and man-made barriers. That is part of my educational work for adults.
- Wildlife Management Seminar for BUND (the biggest German NGO).
- Planning for 2009: “The Alps Expedition”.

Status of wolves in Germany

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About 8 years ago wolves bred in Germany for the first time in 130 years, near the border with Poland in Sachsen. In 2007, there were 3 breeding packs plus a pair of wolves and several lone wolves roaming around (Fig 1). During the last 10 months alone, wolves have been monitored in many different areas between the current location of the wolf packs and Hamburg, which is about 400km from the location of the breeding packs (Fig. 2). From 2001 until 2007 about 61 wolf pups are known to have been born in Germany. Some were killed or died, but 39 young wolves are still unaccounted for. Perhaps most of them died as well. Usually, wolves are able to migrate in any direction from their family location. But only dispersals in a north-easterly direction have been recognised. It is unknown if wolves migrate back to Poland or towards the Czech Republic or towards Bavaria in a south-easterly direction. Every year some new wolves arrive in Germany from Poland. Based on genetic research, wolves in Germany come originally from east Poland.

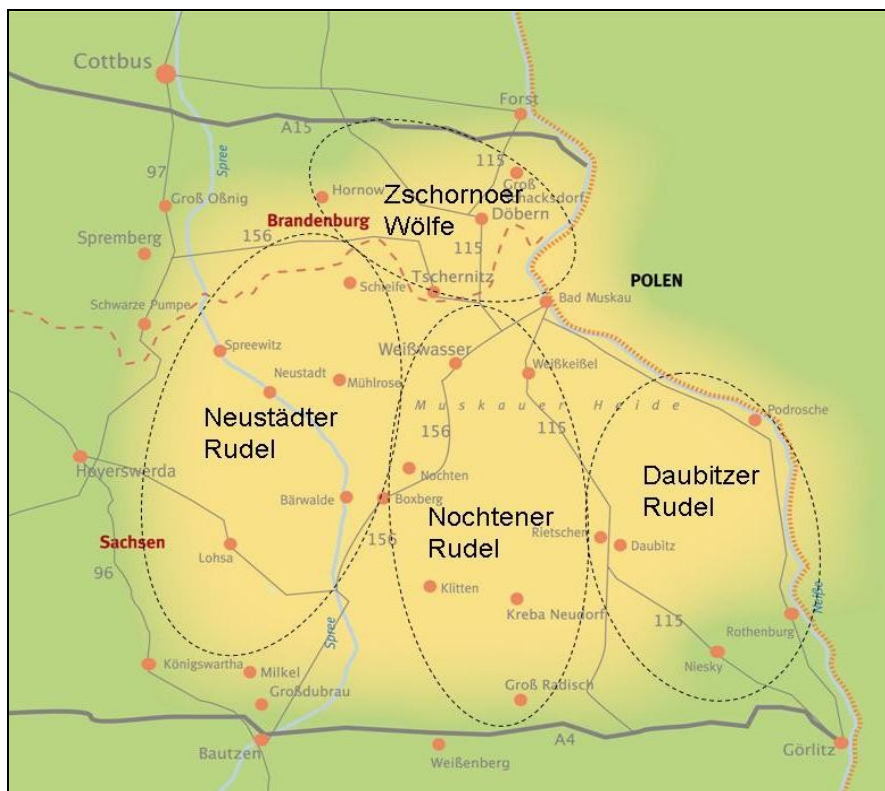


Fig 1. Three wolf packs plus one pair in Germany. The circled areas do not show actual territories, only approximations. Copyright: Office Lupus Germany.

Since we don't have samples for genetic research from all locations where wolves have been recognised during the last year, it is unknown where they all come from.

For many years, wolves have been showing up very irregularly in the Bavarian Forest. It is still unknown where these wolves come from. The Carpathians (Beskidy Mountains) are about 400km away. Wolves could cover this distance in a short time without big problems. My expedition in February showed me that wolves should be able to cross the Czech Republic from east to southwest.

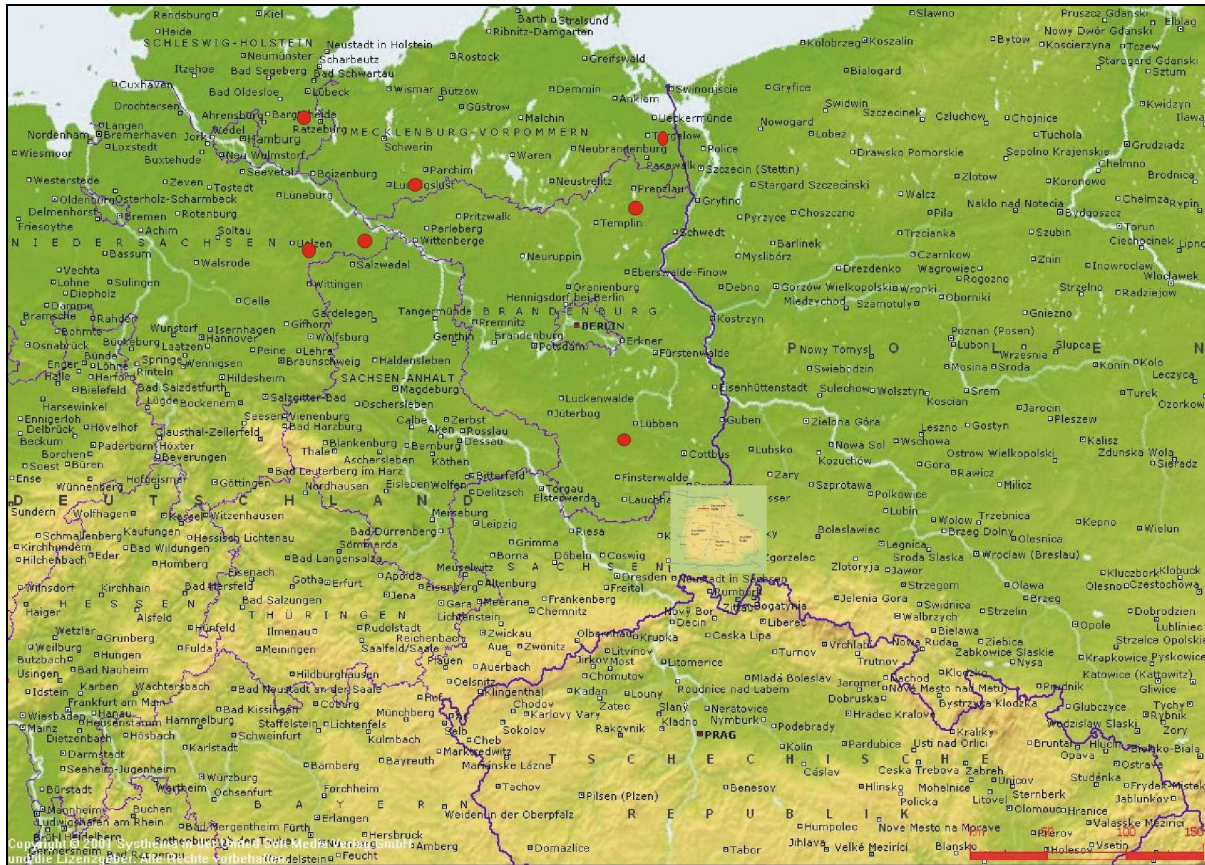


Fig. 2. The red dots show where wolves were reported during the last 10 months. It is unclear if all wolves came from the three breeding packs but it demonstrates two things. First, the distances wolves are migrating and, second, that we have information about wolves which were migrating only in northerly and northwesterly directions. So it seems there is a lack of monitoring or information (or migration) in the other directions.

Conclusion

I think it is very important to develop a strategy for more efficient cooperation between the Czech Republic and Slovakia, Poland, Germany and Austria, in terms of research and monitoring, in terms of education and public awareness programmes and in terms of conflict management.

In the end I hope that all countries elaborate wildlife management plans for all three species of large carnivores.

Frame conditions for a possible recovery of wolves in Austria

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Austrian wilderness is traditional wolf country. Many old names show the historic existence of these fascinating animals. In 1882 the breeding population of wolves was eradicated by hunting, trapping and poisoning. Single animals have migrated into Austria since then, but so far a breeding population has not become re-established.

The geographic position of Austria is very important for the genetic fitness of central European wolf populations. The Carpathian population, the Balkan population and the Southwest Alpine-Appeninic population come together here. Protected areas like Austrian National Parks are possible breeding places. The European green belt at the borders of Austria is a possible migration area (Fig. 1).

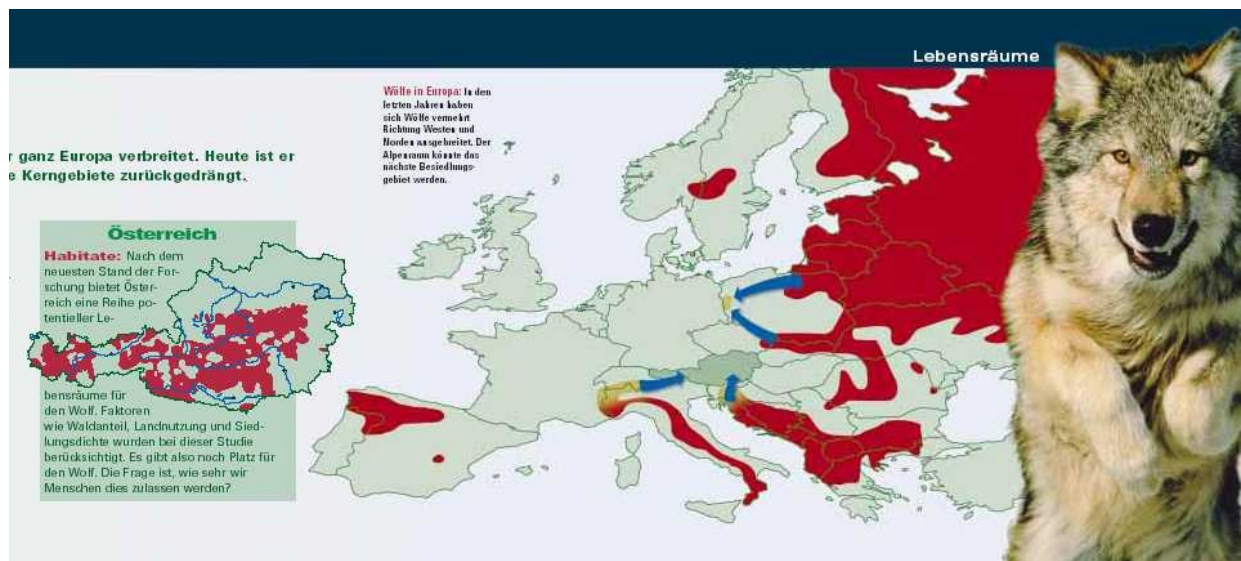


Fig. 1. Wolves in Europe. Wolf populations are spreading towards Austria. The Alps could be the next population area. Austria: A habitat analysis based on density of woodland, land use and human population shows that there is space for wolves in Austria (source: WWF 1999).

Whether the recovery of wolves will be successful depends on the attitude of Austrian people. Discussions will grow. Livestock has to be protected. New hunting conditions bring new challenges for hunters. The economic value of wolves is not documented.

Recovery and protection of wolves in Austria require progressive concepts and support. The Austrian Federal Ministry of the Environment is running a small project to prepare frame conditions for a possible recovery if wolves return to Austria.

- A trans-boundary network of persons who work together on wolf issues: scientists,

protected area and forest managers, organisations for sport, outdoor recreation and tourism.

- Information and education of interest groups that could be involved
- Consideration and information of the Ministry in wolf issues.

The head of the Austrian wolf project is Heinrich Dungler. He is a wildlife biologist and is responsible for Sports Ecology at the Department of Sports Sciences, Salzburg University. He has studied wolves in the Alps, the Carpathians and North America.

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Is hybridization with dogs a threat to free-living wolves in the Czech Republic?

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Abstract

This paper describes difficulties and problems arising from attempts to obtain F1 generation wolf hybrids in captivity. We base our findings on experimental crossbreeding carried out in the Czech Republic during the last fifty years. There are ethological barriers associated with the crossing of dogs and wolves that mean it is very difficult to obtain progeny. On the basis of these findings and our experiments we can exclude the possibility of an accidental origin of wolf hybrids in the wild in the Czech Republic.

All canines (*Canis lupus*, *C. lupus familiaris*, *C. aureus*, *C. adustus*, *C. mesomelas*, *C. latrans*, *C. rufus*, *C. simensis* and also *C. dingo* – if we regard it as a separate species) have the same number of chromosomes: 78. They are phylogenetically very closely related and several *Canis* species can hybridize with each other. But does it happen in practice?

Experience from Border Guard dogs

First we will introduce our experience with wolf-dog hybrids. The authors are among the few people in the Czech Republic to have kept and bred wolves and F1 wolf-dog hybrids. There is practically no literature about wolf hybrids in the Czech Republic. The first reliable documentation about crossing dogs and wolves is from the 1950s to 1980s Biometrical data and photographic documentation from experimental crossbreeding of wolves with Border Guard dogs exist in military archives. The aim of crossing was to verify the possibility of crossing between different species and observe the endogeny of dogs, wolves and their hybrids. The hybrids were regularly measured and weighed and their character traits were observed. The project of experimental crossbreeding was led by col. Ing. Karel Hartl.

Four Eurasian wolves (*Canis lupus lupus*) were used in the experimental crossing: two males (Argo and Šarik) and two females (Brita and Lejdy). They were mated with German Shepherd Dogs at the kennels of the Border Guard. This experiment started in the 1955 but the first hybrids were born to Brita at the kennels in Libějovice after three years, in 1958. Brita refused the mating, even though only experienced stud dogs, firm in character, were chosen. Although the male dogs were sturdy and answered to the female wolf in size, she fought and injured them. Mating was achieved by chance. An aggressive and dominant stud dog, very unmanageable and dangerous, was at the kennels when the she-wolf was in heat.

He attacked his handler and later had to be destroyed. Ing. Hartl had a tray to put him in Brita's pen. The dog jumped on the she-wolf, grabbed her neck and she suddenly became willing to mate (Fig. 1). The first hybrids of the above mentioned she-wolf and the German Shepherd Dog *Cézar z Březového háje* were born on May 26, 1958.

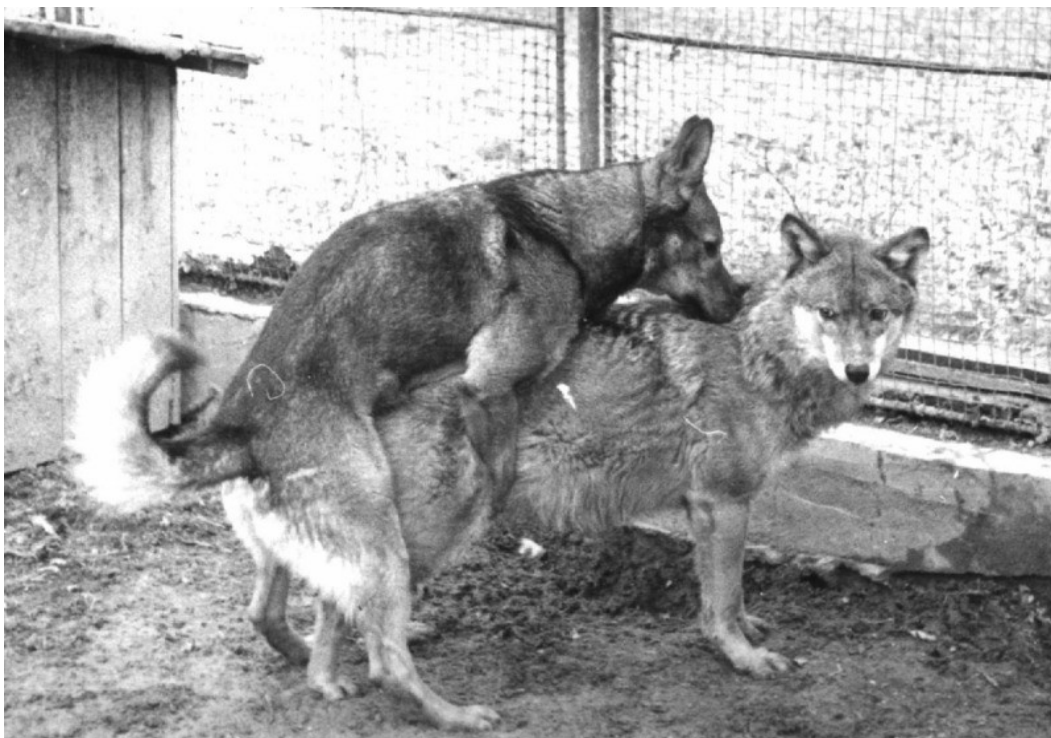


Fig. 1. First Mating in Czechoslovakia, 1958

Breeding wolf-dog hybrids is not easy even with long-term effort of experts. There has been successful mating and breeding of a female dog and male wolf in the police kennels in Býchory (1968) and in kennels near Malacky, which belonged to the Bratislava section of the Border Guard (1974). In both cases, the animals had been acquainted for a long time.

F1 Kazan born in 1983

Since experimental crossing at the kennels of the Border Guard was stopped, similar crossbreeding has been realized by Stanislav Maršálek from Vodňany. In 1983, his she-wolf *Lejdy* gave birth to pups. Their father was G. Sh. *Bojar von Schotterhof* (Fig. 3). *Bojar von Schotterhof* was a very well trained, all-purpose dog also used as a guide dog. The she-wolf, *Lejdy*, was placid, very well adapted to humans, not wild. She managed to travel with Mr. Maršálek by train. Stanislav Maršálek worked at the kennels in Libějovice, where *Bojar von Schotterhof* was kept. *Kazan z Pohraniční stráže* (F1), born from this mating, was a huge dark crossbreed, similar to German Shepherd Dogs (Fig. 2). He took service exams (Kazan passed ZM and ZVV1: Czech national examining rules, that include tracking, obedience, defense): he was very good at following trails and, surprisingly, he also managed obedience and defense. He was used directly in breeding the "Czechoslovak Wolfdog". Kazan proved that

some F1 hybrids can be trained, but they are an exception. All his siblings had a wolf's phenotype: they were shy and wild, unsuitable for training (Mr. Maršálek verbal communication). The F1 hybrids of the litter were not uniform.



Fig. 2 (left). Kazan - F1 hybrid from Mr. Stanislav Maršálek from Vodňany, born 26.4.1983

Fig. 3 (right). Father of Kazan, German Shepherd Dog Bojar von Schotterhof, born 13.3.1975

The authors' experience

After 20 years, breeders František Hrach and Naďa Šebková were successful in crossing dog and wolf. František Hrach owns she-wolf Lupina (*Canis lupus occidentalis*), born in 1993 in Brno Zoo. At the time of mating, she-wolf Lupina was already 8 years old. By this time she had lived in a yard (30 x 30 m), near the town of Písek, together with German Shepherd Dog, Armin. He was five years old. They had never mated. Similarly they had never mated while on walks together, when the she-wolf was on a long lead and the dog tried to mate her. She refused his attempts strongly and wounded him many times. Once when the dog and she-wolf were walking with Naďa Šebková, they mated (Fig. 4). The dog had to cope with the extra height of the she-wolf (10 cm), her twisting and snapping of teeth. During this rut they mated three times, every time when the she-wolf was on a long lead while out walking (on 14.3.2002 at 17 – 18 h, 15.3.2002 at 20 h, 17.3.2002 at 17 h). Three pups, two bitches and a male, were born on May 14, 2002 (Fig. 5). The male was left with his mother, the she-wolf Lupina. Mr. Jindřich Jedlička took one of the female hybrid pups (light haired Eva, Fig.6) The other female pup (dark haired Audrey, Fig. 7) was taken by Ms. Naďa Šebková. They were removed from their mother at the age of 18 days.

The appearance of the F1 hybrids can be seen in the photographs. The F1 generation is not uniform. Each sibling was different in color and character. Also any heterotic effects didn't approve. Their size was intermediate between dog and wolf. Female hybrids first came into heat at the age of 18 months. They came into heat regularly, once a year, in autumn, during the whole of November. This time is different in comparison with that of a wolf's. A she-wolf kept together with female hybrids came into heat throughout February and into early March. Both she-wolves followed this pattern, so we can assume that the timing of receptivity to mating is determined genetically.



Fig. 4. Mating of she-wolf Lupina (*Canis lupus occidentalis*) and male German Shepherd Dog Armin



Fig. 5. Wolf-dog hybrid F1 generation pups, 5 days old



Fig. 6. F1 Eva



Fig. 7. Eva's full sister F1 Audrey

Conclusions

We tried to describe problems and complications arising from attempts to obtain wolf-dog hybrids. Stringent efforts and optimal conditions are no guarantee of success. This was the case of breeder Vladimír Mádle, who kept she-wolf Akila and a male German Shepherd Dog together for 14 years. They have never mated.

In the wild, there are usually sexual partners of own species exist and the mating of dog and she wolf do not come into account. At any time sexual partner of own species will be prefer. In addition the ethological barriers are very effective, even in captivity they are overruled with difficulty.

We conclude based on experience we had with she-wolf in captivity and with F1 – hybrids that conservationist not to need to be afraid of mating packs of wolfs with dogs in area of Czech Republic. However, we can do the final statement about hybrid presence only on base of genetic research.

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Conclusion

Miroslav Kutal & Robin Rigg

As well as a unique opportunity to exchange experience and knowledge with one of the most acclaimed wolf biologists of all time, L. David Mech, the conference was a fruitful workshop for people dealing with wolf issues in Central and Eastern Europe.

Experts from the Czech Republic, Slovakia, Poland, Germany and Romania, representing both governmental and non-governmental organizations, presented comprehensive overviews of their national situation, current problems and plans for the future. Following the presentations, several topics for further cooperation were identified:

- 1) School education programs
- 2) Genetics
- 3) Migration/movement corridors
- 4) Field monitoring
- 5) Management in trans-border areas
- 6) Information flow

Genetic research has not been synchronized and results from various studies are often incomparable. Migration/movement corridors are well identified and analyzed in Poland, but not at all in other countries. This has become a problem especially in the Czech Republic and Slovakia. New motorways and built-up areas are rarely assessed in terms of the needs of large carnivore movements. In the rare cases of building green bridges or underpasses, the locations are not discussed with nature conservationists, field workers and hunters.

Among the issues in field monitoring is insufficient cooperation among neighbouring countries. Moreover, monitoring wolves is quite complicated in human-dominated landscapes, where their tracks can be easily confused with those of dogs. Common reliability criteria should be set in all countries concerned.

Some aspects of management differ among neighbouring countries sharing the same wolf population, which causes problems in trans-border areas, where wolves are hunted on one side of the border (e.g in Slovakia, Ukraine, Romania) and protected on the second side of the mountain range (Poland, Czech Republic, Hungary). Finding solutions is complicated, since changing the policy of each country is a very slow process.

Discussion and the exchange of information are crucial for research and management of the wolf, which frequently crosses the borders of neighbouring countries. Communication among our countries in connection with conservation of the wolf, as well as other large carnivore species, should be improved and a session like this conference was very useful for

all the participants. Hopefully we will meet again within the next two years and, until then, a new email list has been established at CEwolves-1@hnutiduha.cz to help facilitate contact and cooperation. The way is now open to take this initiative forward by organizing the next meeting, establishing a shared website and developing joint projects to secure the future of the wolf in the rapidly changing landscapes of Central and Eastern Europe.

Participants of the conference:



Back row: S. Findo, L. Bufka, L. Steimeyes. D. Mech, G. Firmánszky, A. Szabó, R. Mysłajek, M. Fapso
Middle row: A. Kecskes, M. Skuban, R. Rigg, F. Steffens, P. Sürth, S. Nowak, J. Lehký, M. Kotal, Z. Dluhošová, V. Trulik, J. Jedlička (and his hybrids)
Front row - standing: N. Šebková (with her hybrid), sitting: M. Janča, D. Bartošová