

***CONSERVATION OF  
IMPERIAL EAGLE  
IN THE SLOVAK PART  
OF THE CARPATHIAN BASIN***



Layman's report LIFE03NAT/SK/000098

2003-2007



## What is LIFE?

LIFE is the financial instrument supporting projects that contribute to the development, updating and implementation of Community environmental policy and legislation and simultaneous to integrate environmental concerns into other EU policies. It was established in 1992 by a European Council order (No. 1973/93). While many other EU funding programmes have environmental components, LIFE has been the only programme devoted entirely to supporting the development and implementation of environmental policy in the Member States of the European Union, in candidate countries who are associated to LIFE and in certain third countries bordering on the Mediterranean and the Baltic Seas. LIFE-Nature contributes to the implementation of the "Birds" (79/409/EEC) and "Habitats" (92/43/EEC) Community directives and to the establishment of the European network of protected areas "NATURA 2000" aiming at the on-site management and conservation of the most valuable fauna and flora species and habitats.

[www.ec.europa.eu/environment/index\\_en.htm](http://www.ec.europa.eu/environment/index_en.htm)



## Imperial Eagle (*Aquila heliaca*)

is essential element of the Slovak nature. In Carpathian ecosystems, it belongs to the top predators with great importance. World over this raptor species is classified as VULNERABLE and in European scale as ENDANGERED. The population is declining, in Europe it is estimated to be 400-500 pairs. In Slovakia, there are approximately 40 pairs nesting predominantly in southeast, less in the southwest part of country.

In spite of belonging to be the protected species, the fate of Imperial Eagle has never been regal. The population is threatened by many human activities, whether intended or not.

- Lead pellets were found in the majority of carcasses or in injured Imperial eagles examined in the nature.
- The serious danger to Imperial Eagle, which also is a partially necrophagous, is posed by illegal installing of poison baits (with aim to eliminate the so-called „pests“).
- Disturbing nests often causes the insufficient incubation of eggs or death of the young because of lack of delivered food.
- The young are objects of the nest robbers and dealers interest.
- The injuries and kills often happened to eagles by the electricity current on 22 kV pylons with horizontal console (known as the „death pylons“).
- Excessive logging of lowland forest stands or windbreaks causes destruction of suitable breeding habitats .
- Intensification and failure of pasture utilization caused a dramatic decline of suslik, the main prey of Imperial Eagle.



The distribution of Imperial Eagle in Slovakia.





## *Project „Conservation of Imperial Eagle in the Slovak part of the Carpathian basin“*

The attention of members of Raptor Protection of Slovakia (RPS) has been always aimed towards the Imperial Eagle – from the seventies when the first breeding was noticed, through gradual population increase until watching pairs reoccupying their original lowland territories.

The project focusing on Imperial Eagle protection has been the culmination of much of endeavour of RPS members. It has been one of three successful Slovak projects which has won financial support from the European Union in within the program LIFE-Nature. The projects aims are also related to Hungarian partner project of MME, many of these activities were areas of joint cooperation.

### ***Project objective***

The main objective of the project was to conserve the existing population of the Imperial Eagle in the Carpathian basin, encourage range expansion and increased productivity through reducing mortality and factors limiting expansion and productivity.

In order to achieve the given objective, all the actions were designed in accordance with the threats determined at the beginning of the project and were carefully planned to be reasonable and effective. Following aims were identified to establish the conditions necessary for long-term conservation of the species:

- Habitat alternation reduced
- Individual mortality on foraging grounds, temporary settlement areas and migration routes reduced
- Breeding failure reduced
- Public awareness raised





## *LIFE03NAT/SK/000098*

As the threats for Imperial Eagle are varied, the conservation management of the present population and its support required a comprehensive approach. The project activities incorporated many spheres.

One of them was to monitor eagles population (Action D.1), that was followed by creating a protected zone around each active nest to eliminate disturbance (D.2). The population was watched year by year, in the nest the chicks were ringed, microchipped and blood samples were taken. As nest robbery is effecting breeding success markedly, the most endangered pairs were guarded (D.3). Satellite and radio telemetry have been used for the protection of birds of prey for the first time in Slovak history, with the aim to get data about eagles occurrence, their migration routes and habitat preferences (D.4). The next activity was focused on evaluation of habitat quality in relation to land-use practices (A.1). Artificial nests have been installed and natural nests have been reconstructed when needed (D.5). The mortality of birds were regularly monitored along dangerous power lines during the whole project, deterrents and barriers designed to prevent the electrocution of the birds were installed at the most dangerous power lines. (A.2, C.1). Another partial goal was to ensure the areas holding at least 2 pairs of Imperial Eagles to be designated as Special Protected Areas (A.4). The capture and reintroduction of suslik has been implemented on suitable sites (A.3, C.2). During the entire project special attention was given to the public awareness and dissemination of the project's aims and results (E.1, E.2, E.3). The cooperation with similar Hungarian and Spanish projects has been planned (F.3.).

Total budget of 492 000 EUR was planned for this project with 75 % of EC contribution.

The protection of the globally endangered Imperial Eagle and its habitat contributes to the need of implementation of measures for network of protected sites NATURA 2000 and so contributes to its main goal - to preserve the natural heritage of EU.



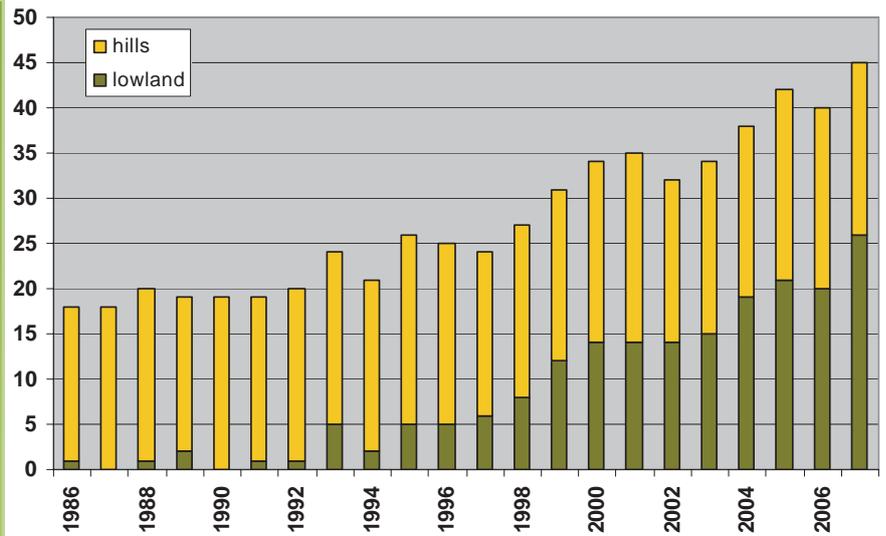
# Monitoring

During the breeding seasons 2004-2007 39, 42, 40, 45 territories were checked. During the survey of potential distribution areas, within the frame of project, 13 new territories have been identified. Negative factors influencing the breeding and causes of the unsuccessful breeding have been analysed.

The death pylons were identified as the biggest threat - the electrocution presents 38 % of all know causes of death. The second most serious cause is the poisoning with 26 %.

During rescue operations, 11 young have been saved.

Population trend in 1986 - 2007



## Breeding success

	Year	2004	2005	2006	2007
No. of observed pairs		39	42	40	45
No. of pairs with active nests		38	42	40	45
No. of incubating pairs		33	39	38	40
No. of pairs with chicks		28	33	36	32
No. of pairs with fledglings		26	28	35	29
No. of fledglings		45	42	67	51
No. of ringed chicks		41	35	61	35+9*
	<i>aluminium rings</i>	41	35	60	35+9*
	<i>plastic with alphanumeric code</i>	-	35	59	35+9*
No. of microchipped chicks		40	35	39	0
No. of fledglings per nests		9x1	16x1	10x1	11x1
		15x2	10x2	18x2	17x2
		2x3	2x3	7x3	2x3
Breeding success per all active nest		1,18	1,00	1,68	1,13
Breeding success per successful nest		1,73	1,50	1,91	1,76



An injured young eagle found in Serbia was, after successful rehabilitation with co-operation with Hungarian colleagues, released in Heves, Hungary. It was tagged with a transmitter, which means we could monitor movements of this bird for certain time.



During the project realization 130 nestlings have been ringed with conventional ornithological rings and 138 nestlings with plastic ones, enabling remote reading. Use of plastic rings has been realised in accordance with the international ringing programme. In line with that agreement, we used orange rings with black codes assigned for Slovakia.

114 nestlings has been marked with microchips. During the nest controls prey remains have been collected and analysed. Obtained data, together



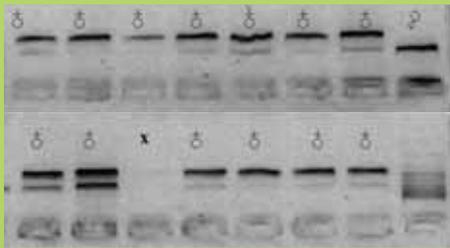
with historical data about diet, have been summarized in scientific study about Imperial Eagle, published in Slovak Raptor Journal focused on the Imperial Eagle.



## Practical protection

### DNA Analyse

Analysis of the DNA structure is one alternative protection in the action against nest robbing. Unique DNA „finger-prints“ of each individual eagle is usable not only for its identification, but also for detection of the relationship among individuals and in case of young bird theft or confiscation of illegally kept individuals makes it possible to prove their place of origin. During three years blood samples taken from 128 nestlings and blood samples obtained from the feathers of 132 adult eagles were analysed (but we have not obtained enough data from all). It was found out that the number of young males and females fledged yearly is relatively constant. DNA analysis and comparison of population relationships have been provided by the Hungarian Institute of Haematology in Budapest. Results confirmed the fact, that the distance between The western and eastern Slovak subpopulation is too small to consider these as the different ones with a distinct genetic structure.



### Guarding of the endangered nests

Nest robbing is one of the most damaging factors influencing the declining eagle population. This kind of crime can result in the permanent abandonment of the breeding site by the eagle. Robbed nestlings are also the object of illegal trading and most probably are smuggled abroad. For that reason there have been significant efforts to guard the most endangered nests. Advanced equipment was used; nests were monitored by closed-circuit television (CCTV) providing direct, live transmission of picture and sound; a GSM System (motion sensitive) recorded any movement around the nest and where this equipment could not be used the nest was guarded by volunteer rangers. In the areas where the nests were guarded no attempt to steal birds was detected. In one area, where CCTV camera was used, three young birds were rescued after being observed as they fell out from nest during heavy storm.

The guarding of eagle nests is very important all the time, because of the fact, that in 2004 two young birds were robbed from a non-guarded nest.

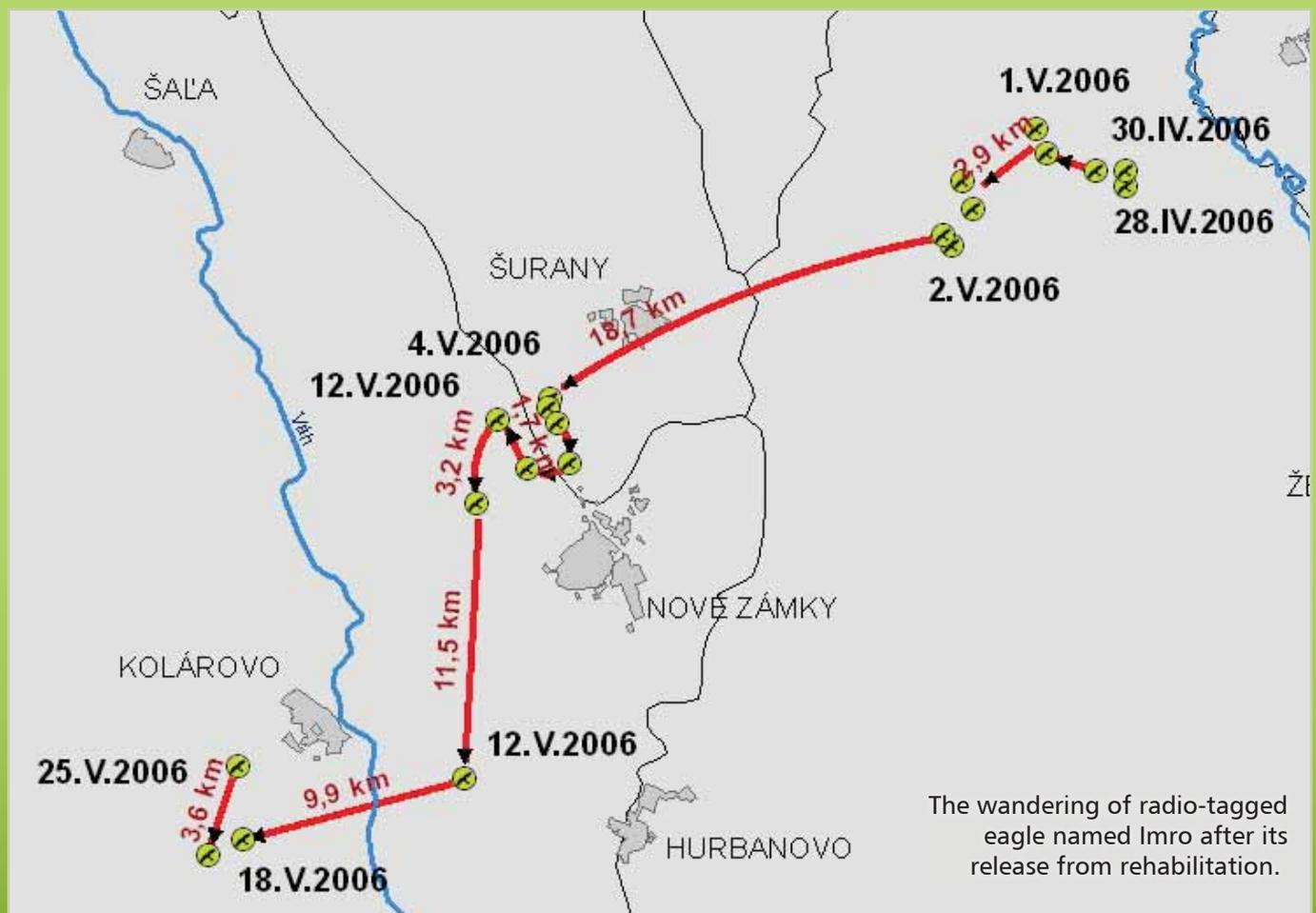


## Satellite and radio telemetry

Telemetry (radio and satellite) can answer many questions for us. For example, it can explain causes of high mortality of young birds and provide data about the varied movements of adult eagles in non-breeding season. With this data we can see potential new threats to the Imperial Eagle and can influence the actions we take to counteract them and continue with its conservation. The Imperial Eagle population in Slovakia is primarily threatened by: poisons (1-3 cases annually), illegal shooting and electrocution on electricity pylons.

Small, battery-powered satellite-telemetry tags (wt. 40 g) transmitted signals about the birds' position. Five tags were fixed on the backs of young specimens, these were fitted to one male (Michal) and four females (Štefánia, Gabika, Monika, Jozefína) before they flew from their nests. Signals were recorded for 4-9 months and during this time the juveniles moved between neighbouring countries or travelled further into parts of Serbia, Greece or Turkey.

Two eagles were fitted with radio tags (Imro and Diana) and for a period of about 2-6 months data about their movements in Slovakia has been collected. Obtained data provides spatial information about temporary occurrence of eagles, migration routes and habitat requirements.

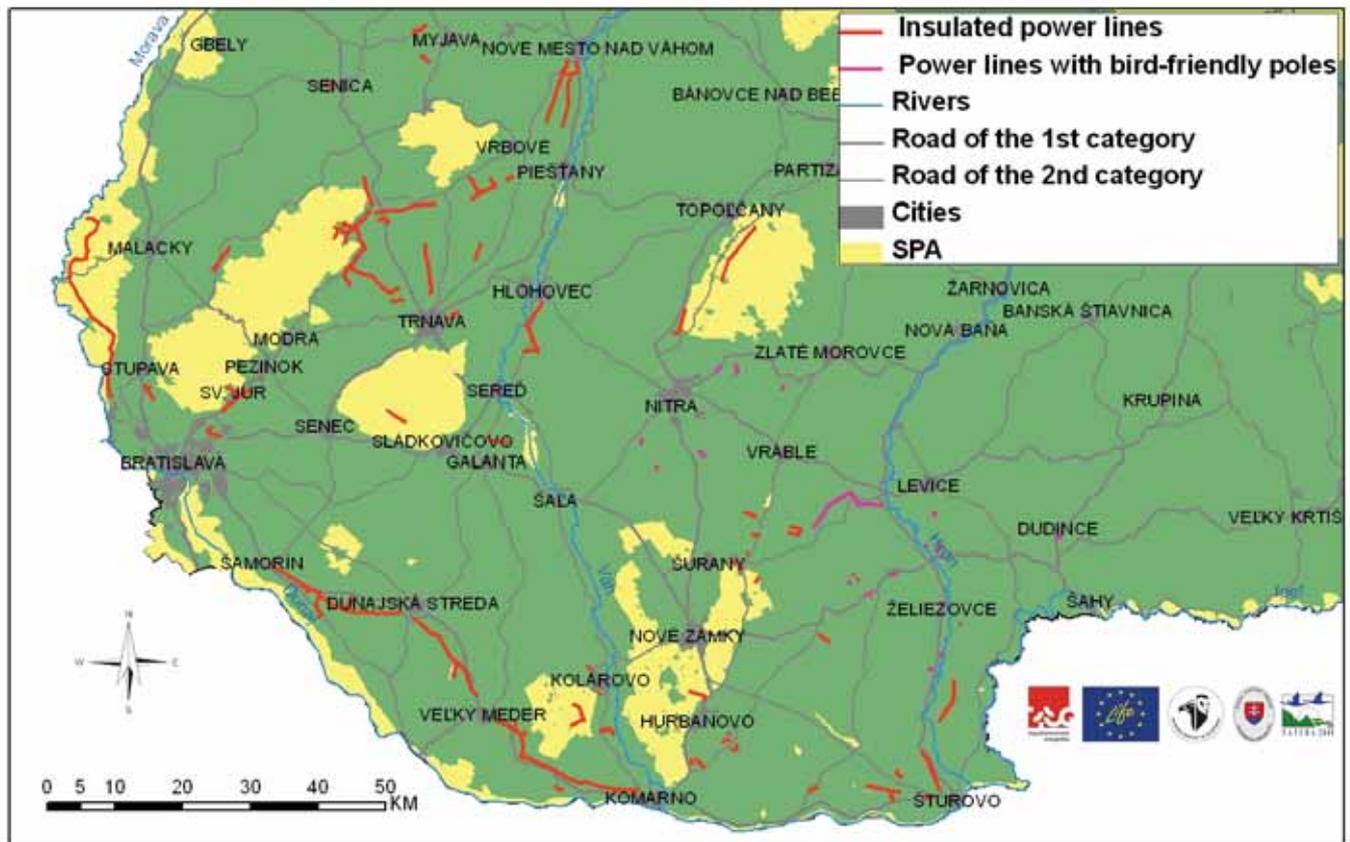


## Death pylons

A major factor of individual mortality is death by 22 kV current on pylons, and this is a problem not only for the Imperial Eagle, but for other bird species. The total length of the electricity network in Slovakia exceeds 30,000 km (about 210,000 poles). Considering the large size of this problem, we have solved it on two levels during the project. On the existing electric poles were fixed insulators in bird-friendly way. And where the new power pylons were mounted, new bird-friendly console have been used.



Map of the insulated power lines and new lines with bird-friendly poles "Antibird" carried out by ZSE, a.s. within the project LIFE2003NAT/SK/000098



During the project we have organized the joint monitoring of 22 kV pylons. 244 volunteers (including representatives of the electric companies) have found 313 electrocuted bird victims under the pylons. The total assigned theoretical value of the dead animals amounted to nearly 106,000 EUR.

Maps of the most dangerous power lines were sent to electric utility companies for insulation.

During the project duration new types of insulators were created and tested in collaboration with the producers. Newly designed deterrents enable bird perching in safe areas, but immediately reduce electrocutions.

851 km of power lines were insulated by the ZSE and VSE electric utility companies.

In Slovakia we successfully sourced a producer to cooperate with us in development of bird-friendly pylon deterrents called „Anti bird“ and „Bird friendly“.

In 2006, after many negotiations with electric utility companies, the first lines with “Anti bird” pylons were installed. During the project 29,5 km of power lines have been fitted with the new console by SSE company.

In a seminar (held in November 22, 2006) with representatives of electric utility companies, the newly designed “Bird friendly” pylon was presented as the optimal solution in the lowland while the „Anti bird” pylon is optimal for use in forest aisles.

## ***Construction of artificial nests and reparations of unstable nests***

During the project 45 hand made artificial nests with a 1 meter diameter have been constructed in suitable sites in western Slovakia. These locations have been chosen after examine the requirements of birds in these areas; they were also selected on the grounds of geographical, biotope and breeding importance. Nests have been constructed and installed predominantly outside the breeding season, so as to cause the least amount of disturbance to the species. Drawing on data that has been carefully gathered, nests have been situated in areas where the bird population is anticipated to increase. A side benefit of this program has been the potential use by other raptors and owls of the newly constructed nests.

Unstable natural nests have been repaired; this was especially required after strong storms badly affected nesting areas. In some cases the nests and the young were blown from trees, in this situation any surviving young were placed back in the repaired nests or taken to a rehabilitation centre. As a matter of course, all unstable nests were repaired annually.



## *Reintroduction of suslik*

Suslik, one of the main components of the food of the Imperial Eagle, has disappeared from many parts of its original distribution range. As the suslik is a protected species in Slovakia it was very important to be well prepared in the administration process for the repatriation of the suslik to designated areas. It was essential to acquire necessary permissions and to show clearly the approved method for trapping and releasing of individuals to the sites for reintroduction. The chosen areas for returning uslik are: the Slovak Karst National Park (sites Silická ľadnica and Nylaše), Protected Landscape Area (PLA) Small Carpathians (site Kuchyňa) and PLA Ponitrie (site Cibajky). During the project period, susliks have been trapped primarily in the airfields of airports in Bratislava and Košice, where populations are naturally stable. In this time 892 individuals were released on new pastures. Positive results of this activity have promoted to decision to continue with reintroduction in the future.



One of the site of suslik reintroduction - a pasture near Kuchyňa settlement (Záhorie region)

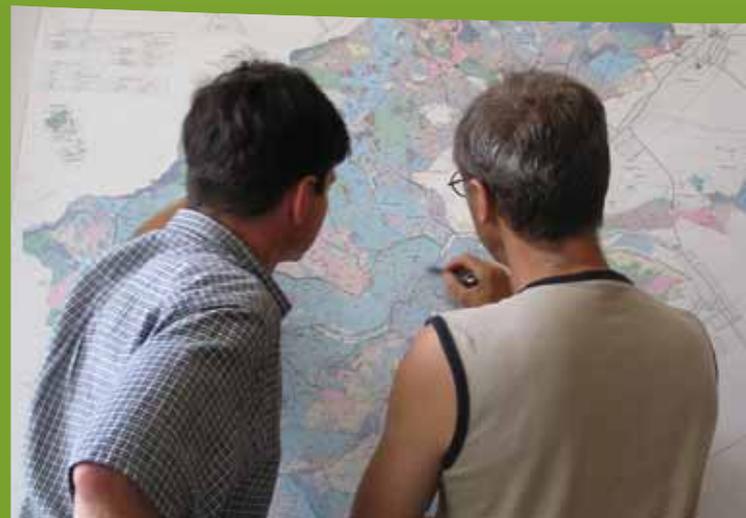
## *Habitat protection*

With the aim to obtain data needed for a comprehensive conservation plan for the Imperial Eagle, nearly 669 km<sup>2</sup> of eagles' habitats have been mapped during the three years. In 4 selected territories the mapping of the land structure and land use pattern was conducted in a 5 km radius around the nests following the methods developed in the cooperation with Hungarian colleagues.

The habitat management guideline apart from all important background information on the biology, ecology and threats affecting the Imperial Eagle population, consist of the practical conservation measures as well as the habitat management recommendations and identification of suitable farming practices.

Data obtained within the similar project in Hungary were incorporated into the management guideline.

Detailed comprehensive study was distributed to the relevant scientific institutions. The practical use of this study represents the habitat management guideline, which is designed for the land users, stakeholders, organizations and institutions of nature conservation and agriculture as well as for the public.



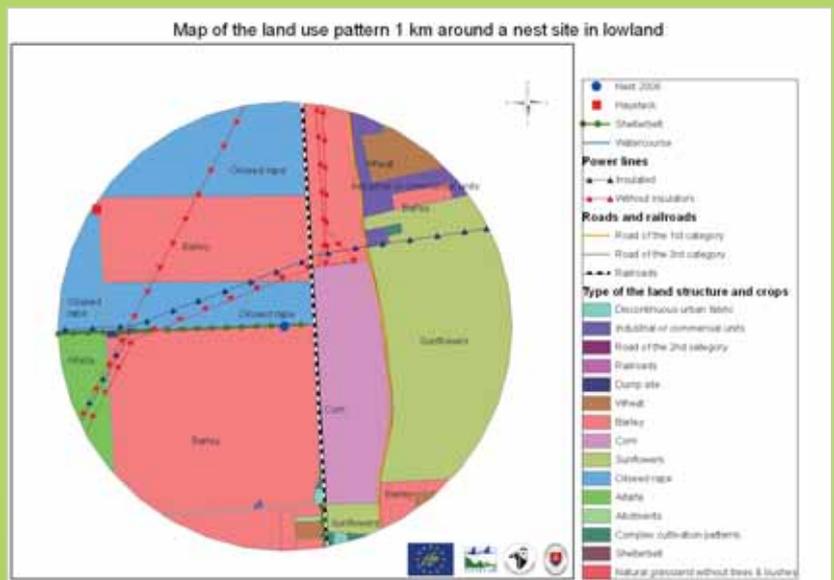
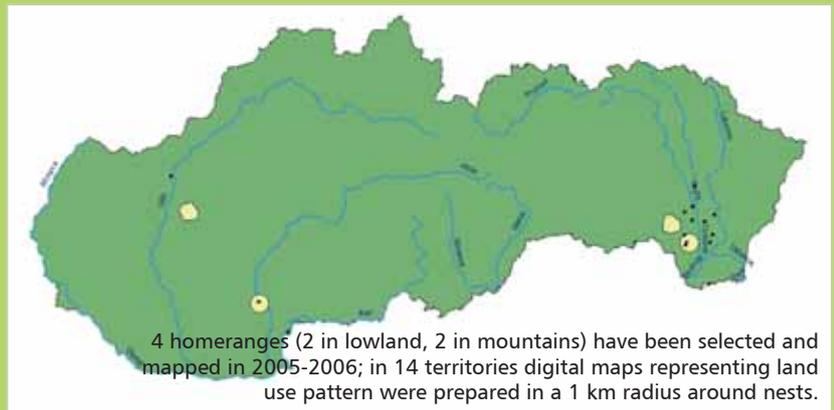
## Declaration of protected zones around the nests

During the breeding cycle the Imperial Eagle is very sensitive to disturbance. This can be one of the main reasons for unsuccessful breeding. Most important impacts are disturbance caused by forestry and agricultural works. Therefore we requested Local Authorities of the Environment for the declaration of protected zones. The aim of this activity was not only the prevention of disturbance during the breeding season, but also providing protection of the nest and the surrounding area all the year round. 121 zones of protection were secured around the active nests.

As the act participants, we actively engaged in administrative procedures respecting licensing of activities (for example aerial application of crop spraying, tree cutting), which could have a negative impact on eagle breeding or to their habitat.

## Declaration of zones with minimum of two pairs of the Imperial Eagle as SPA

Special Protected Area (SPA), is one type of the areas of the NATURA 2000 network, and is aimed to provide favourable conservation status of the bird species and to regulate the economic actions as the best way to not disturb this favourable conservation status. The Imperial Eagle was the criteria species in five proposed SPAs (national list defines 38 SPAs). Small Carpathians SPA was proposed in order to provide the Imperial Eagle protection and in 2005 it was one of the first declared areas. Approximately 60 % of the breeding areas of the Imperial Eagle are to be proposed as SPAs. All the areas with higher density of breeding pairs are listed in the National list of SPAs. Because of preparing "The Programme of the Development of Slovak country side for 2007-2013," we



worked out the proposal of agri-environmental and forestry-environmental schemes to support the raptors protection as well as the Imperial Eagle.

## Cooperation

Although the project on conservation of the Imperial Eagle in Hungary started in 2002, vital cooperation between Slovak and Hungarian ornitologists has existed for years. During the project, 22 meetings and 3 workshops have been organized. Despite great efforts we were not able to establish cooperation with Spanish colleagues, who implemented a project on conservation of *Aquila adalberti*.



## Education and dissemination of the project results



The public awareness is the key factor for the protection of the Imperial Eagle, as it is a lowland species and is therefore often jeopardized by human activities. Information providing helps us to increase the awareness.

For supplying the project with publicity material and for the protection of the Imperial Eagle there were designed and produced 3 000 informative leaflets, 6 000 stickers, 5 000 postcards, 1 000 posters and 740 T-shirts.

There was great public interest in an exhibition entitled "The Eagle – uncrowned and yet the king", which travelled for two and half years. Thousands of visitors have seen it as it was exhibited in 11 different cities in whole Slovakia.

Problems encountered with the protection of this globally endangered species are highlighted in the 26 minutes documentary entitled „Returning the Crown.“ Project activities were presented at 11 film festivals not only in Slovakia, but also abroad and in two Slovak TV broadcasts as well.

Informative boards are the next type of the publicity. They have been placed in the Bojnice ZOO, Košice ZOO and in Slovak Karst National Park, just before the entrance to the Zádielska tiesňava gorge.

During the project we have informed the public of significant events through 3 press conferences, 32 press releases, approximately 61 articles in local magazines and newspapers, 20 radio and 26 television broadcasts and 108 reports on the websites. There were various presentations at conferences and meetings, as well.

Project information is available in Slovak and English on the website [www.dravce.sk](http://www.dravce.sk).

# Acknowledgment

This project could not have been so successfully implemented without the considerable efforts of all our colleagues, researchers, volunteers, supporters and institutions; our team would like to openly express gratitude for this incredible support.

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