

Large carnivore's monitoring in the Czech Republic

Martin Strnad

Nature Conservation Agency of the Czech Republic
Species Conservation Department
Eger, 15.10.2018





- all species of large carnivores endangered
- according to the **Red List of Vertebrates**:
wolf and bear listed as Critically Endangered, lynx as Endangered
- All these species listed among specially protected animals – **Act No. 114/1992 Coll.** (wolf, bear – critically endangered, lynx – highly endangered) and also protected as game by the **Act No. 449/2001 Coll.**
- Designation of **SCIs** in order to protect large carnivores in the CR: Beskydy (Carpathians) – all the 3 species; Šumava, Boletice and Blanský les (SW Bohemia) - lynx
- Damages on livestock compensated according to **Act No. 115/2000 Coll.**





- National parks, Protected Landscape Areas (NCA)
- Universities / Research Institutes:
 - Institute of Vertebrate Biology in Brno
 - Faculty of Forest management in Prague
 - Charles University in Prague
 - Czech University of Life Sciences Prague - Faculty of Environmental Sciences Prague
 - Mendel University in Brno
- NGO's: Friends of the Earth, ALKA Wildlife

Why

NCA CR responsible for **LC status report according to the Habitats Directive** (6 year period) / scientific purposes





- Almost all PLA´s / NP with known LC occurrence have some **cameratraps** (opportunistic camera trapping)
- Intensive monitoring by cameratraps in NP Šumava and Beskydy (Carpathians)
- **Snow tracking**, a signs of occurrence (scats, hair, dead animals) for DNA analyses are collected intensively in NP Šumava, PLA Blanský les, PLA Beskydy, PLA Kokořínsko-Máchův Kraj, PLA Broumovsko (wolf samples – Charles University (Senckenberg protocol), lynx samples Institute of Vertebrate biology in Brno)
- Lynx patrols in Šumava organized by Friends of the Earth each winter (volunteers search for signs of LC / illegal activity)
- NCA CZ subcontracts a team of prof. Jaroslav Červený (Faculty of Forest management in Prague) to do the monitoring in selected areas (also data from hunters, foresters) + Questionnaires to hunting grounds (5 year period)



- Monitoring of large carnivores in PLA Beskydy (CZ) / PLA Kysuce (SK) transboundary activity together with Wolf patrols (Friends of the Earth)

once a year, joint action during one week, PLA/NCA employees and volunteers of NGO's are going to track large carnivores (footprints, scats, hairs, other signs of occurrence)

- **The majority of the data are inserted into Species occurrence data database managed by NCA (ndop.nature.cz)**
- Database is Accessible on a request for Nature Conservation Authorities (District/town administrations), above mentioned institutions/bodies/museums/researchers



Species occurrence data database (NCA CR)

portal.nature.cz / ndop.nature.cz



https://portal.nature.cz/nd/find.php?akce=seznam&opener=&vztazne_id=0

google Seznam - Najdu tam, ... Google Scholar Portál AOPK ČR WND login AOPK intranet http://www.nature.cz/... Evropsky významné lo... Informace o parcele-K... Wilderness and Large ...

Nálezová databáze ochrany přírody
AGENTURA OCHRANY PŘÍRODY A KRAJINY ČR

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Strnad Martin RNDr.
plný přístup

Filtr nálezových dat ▲ Skrýt podmínky filtru Skrývat trvale

Druh	<input type="text" value="Lynx lynx"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Datum od/do	<input type="text" value="1.1.2014"/> / <input type="text" value="31.12.2018"/> <small>formát: d.m.rrr</small> <input type="checkbox"/>	<input type="checkbox"/> Zvláště chráněné druhy
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Lokalizace	<input type="text"/>	<input type="checkbox"/> O - ohrožený
Autor	<input type="text"/>	<input type="checkbox"/> Druhy červeného seznamu
Zdroj	<input type="text"/>	<input type="checkbox"/> CR - kriticky ohrožený
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Zapsal	<input type="text"/>	<input type="checkbox"/> NT - téměř ohrožený
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Nálezy	<input checked="" type="checkbox"/> pozitivní <input checked="" type="checkbox"/> pouze v ČR	<input type="checkbox"/> Druhy evropských směrnic
Kategorie	<input type="text"/>	<input type="checkbox"/> HD II - Habitats Directive, příloha II
Čeď	<input type="text"/>	<input type="checkbox"/> HD IV - Habitats Directive, příloha IV
Hranice území	<input type="text" value="-katastry, chráněná území-"/>	<input type="checkbox"/> HD V - Habitats Directive, příloha V
Kraj	<input type="text"/>	<input type="checkbox"/> BD I - Birds Directive, příloha I
Působnost AOPK	<input type="text"/>	<input type="checkbox"/> Nepůvodní druhy
Pole síťového mapování	<input type="text"/>	<input type="checkbox"/> BL - černý seznam: výskyt omežován
Nálezy s přesností lokalizace	<input type="text"/> <input type="text"/> <small>výběr maximální velikosti zářezů</small>	<input type="checkbox"/> GL - šedý seznam: výskyt tolerován
Nerozlišovat malá/VELKÁ písmena	<input type="checkbox"/>	<input type="checkbox"/> WL - varovný seznam: výskyt možný
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Online/mobile app BioLog for inserting occurrence data (www.biolog.nature.cz)




BioLog

Help us map the nature



ABOUT PROJECT

VIEW DATA

NEW OBSERVATION

LOG IN

View data

Year

2018

Taxonomy Cz / Lat

Mammalia

Species Cz / Lat

-- Select taxon --

Author

-- Write down author --



DISPLAY

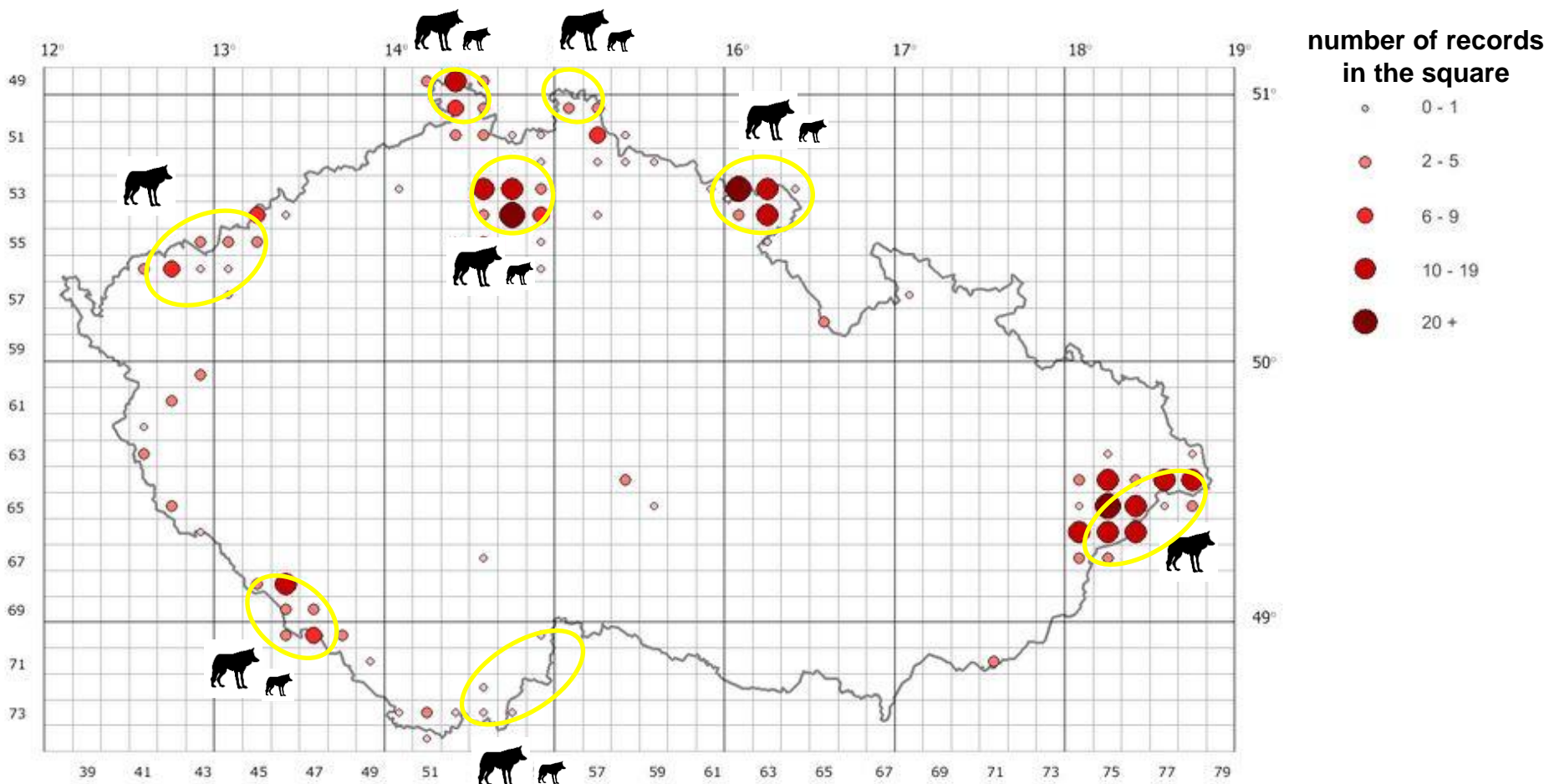
DATA

MAP

PHOTO

Date	Species	Quantity	Location	Author	Note	Photo
12.10.2018	<i>Vulpes vulpes</i> liška obecná	mrtví jedinci 1	Lažany, 35	Petra Ebermannová		
11.10.2018	<i>Sciurus vulgaris</i> veverka obecná	jedinci 2	Český Krumlov, Zámecká zahrada	Ondřej Vítek	obě šedé	
11.10.2018	<i>Sciurus vulgaris</i> veverka obecná	jedinci 1	Modřanská rokle	Petra Kuchařová		

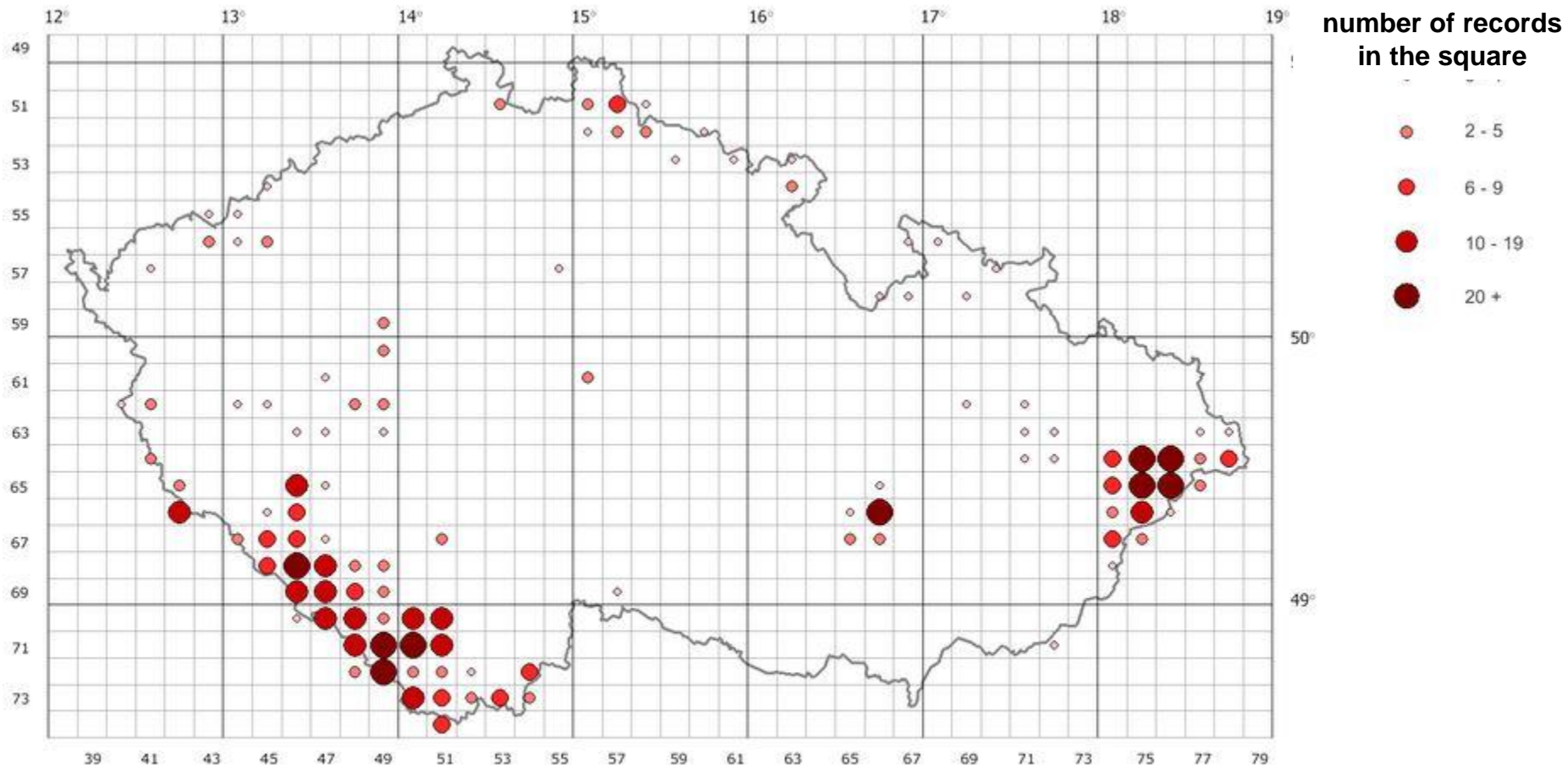
Wolf occurrence 2014-2018



© AOPK ČR 2017, podkladová data © ČÚZK



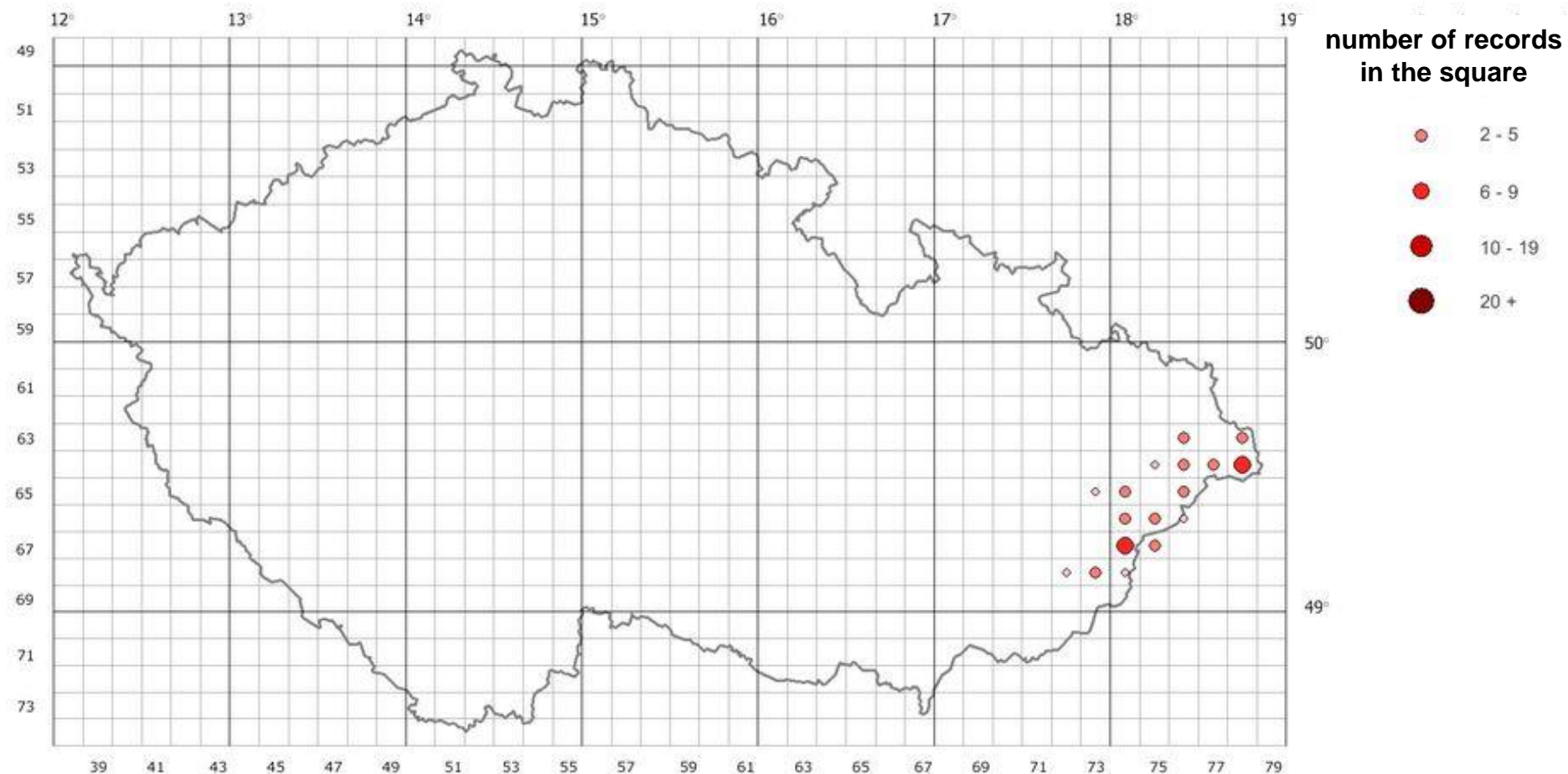
Lynx occurrence 2014-2018



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Bear occurrence 2014-2018



Monitoring of large carnivores in the Western Carpathians



Miroslav Kutal

Ústav ekologie lesa

LDF Mendelova univerzita v Brně

& Hnutí DUHA Olomouc

&



Lesnická
a dřevařská
fakulta



Hnutí DUHA
místní skupina Olomouc

Michal Bojda, Martin Duřa, Martin Váňa, Leona Kutalová, Jiří Beneš,
Barbora Turbaková, Jarmila Krojerová, Pavel Hulva, Dušan Romportl

Organizations involved in monitoring



Hnutí DUHA
místní skupina Olomouc



**Lesnická
a dřevařská
fakulta**



**UNIVERZITA
KARLOVA**

- Friends of the Earth Czech Republic (Olomouc branch)
- Administration of PLA Beskydy (Nature Conservation Agency)
- Institute of Vertebrate Biology
- Faculty of Forestry and Wood Technology, Mendel University Brno
- Faculty of Science, Charles University
- Good established cooperation also with Slovakian organizations (state nature conservancy, local volunteers)

Development of monitoring



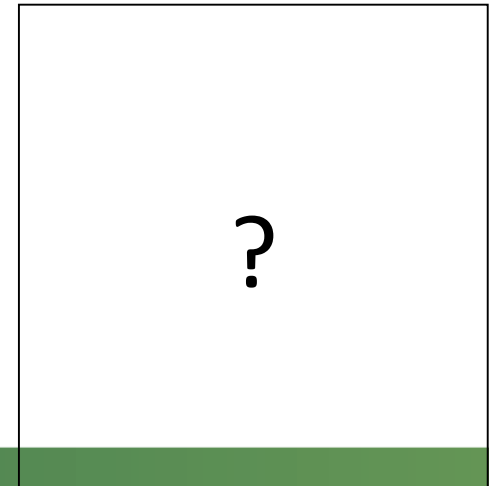
- Since 1970's each year large-scale tracking event organized by Administration of PLA Beskydy
- Since 1999 systematic tracking conducted by trained volunteers of „Wolf Patrols“, organized by Friends of the Earth CZ
- Since 2011/2012 winter – systematic use of camera traps for robust estimation of lynx abundance, population density and reproduction, organized by Friends of the Earth CZ
- Non-invasive genetic analyses used since 2009 by scientific institutions





Data quality

- Classification based on possibility of verification of findings/observation (SCALP criteria):
 - **C1** – „hard“ facts (pictures, dead animals, genetics)
 - **C2** – objective data (documented signs of presence)
 - **C3** – insufficient data (non-verifiable)

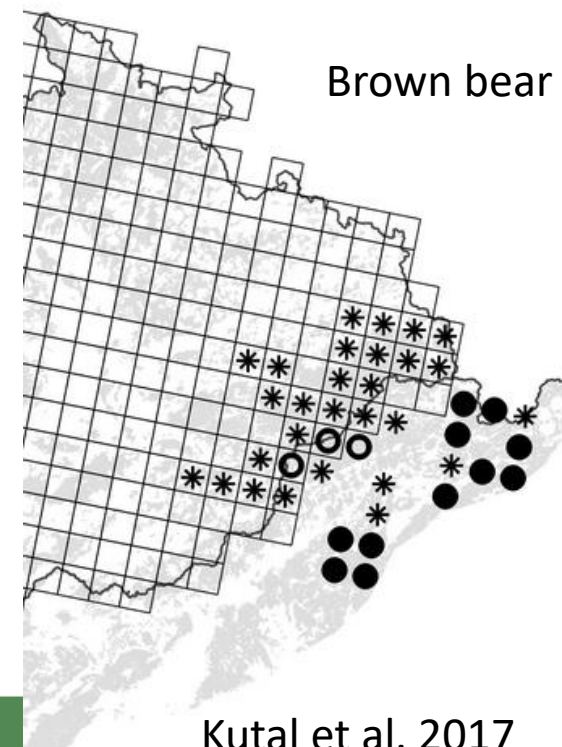
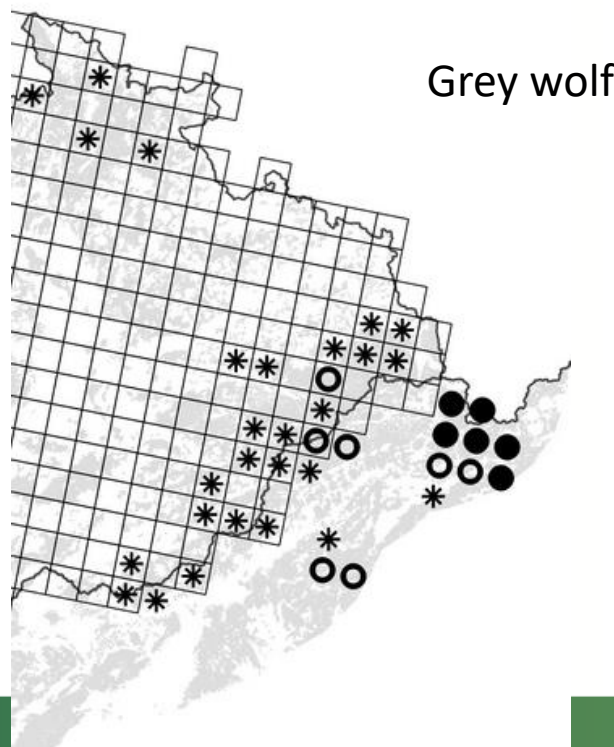
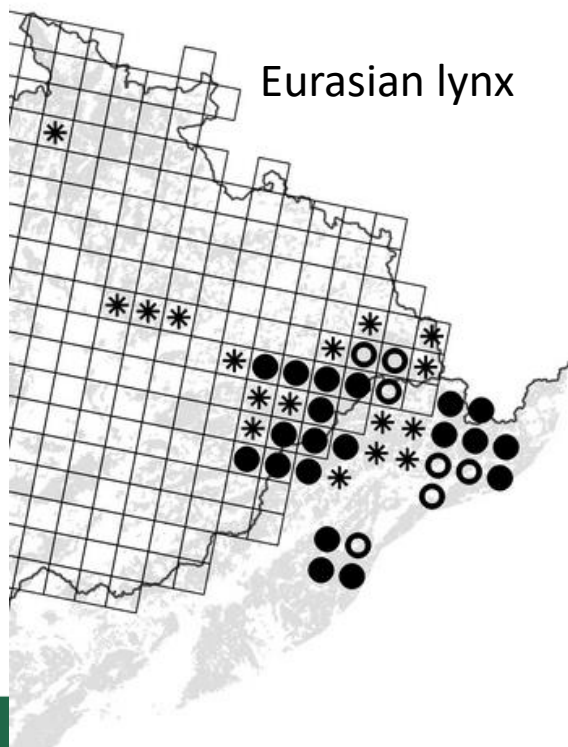


Current status of LCs – distribution



- Distribution maps based on C1+C2 only
- period 2012–2016
- EEA 10 x 10 km grid
- status based on LCIE monitoring standards

● Permanent with reproduction ○ Permanent without reproduction ✱ Sporadic

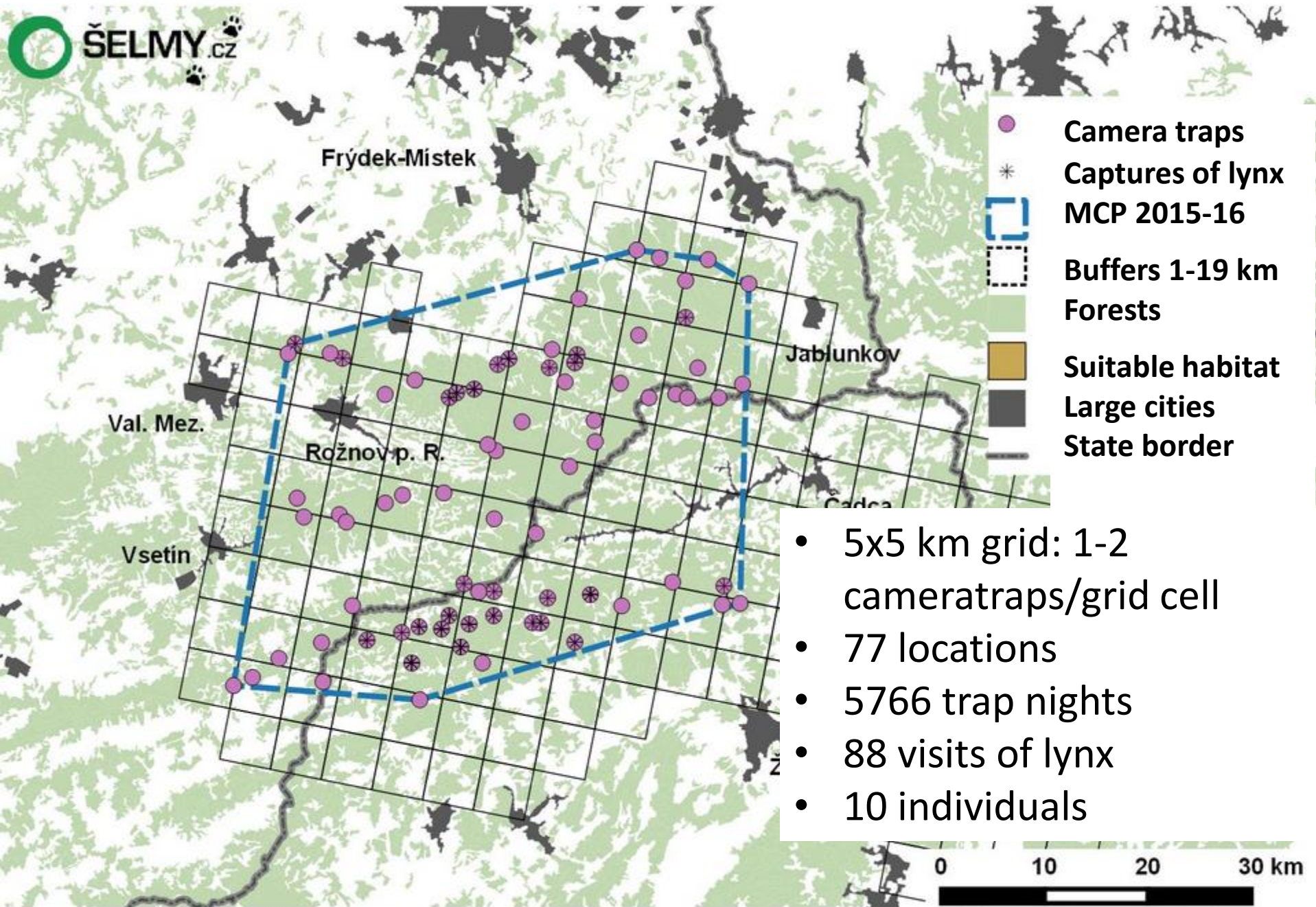


Deterministic camera trapping



- white flash camera traps for individual identification
- accurate estimation of abundance and population density using Capture-Mark-Recapture and Spatially Explicit Capture-Recapture models





- 5x5 km grid: 1-2 cameratraps/grid cell
- 77 locations
- 5766 trap nights
- 88 visits of lynx
- 10 individuals

Lynx abundance in the Czech-Slovak bordeland (Moravskoslezské Beskydy, Javorníky) winter 2015/2016



Král



Olda



Ľubo



Heřmína



Hortenzia



Licous



Dražá



Žofka



Jiří



Kamila

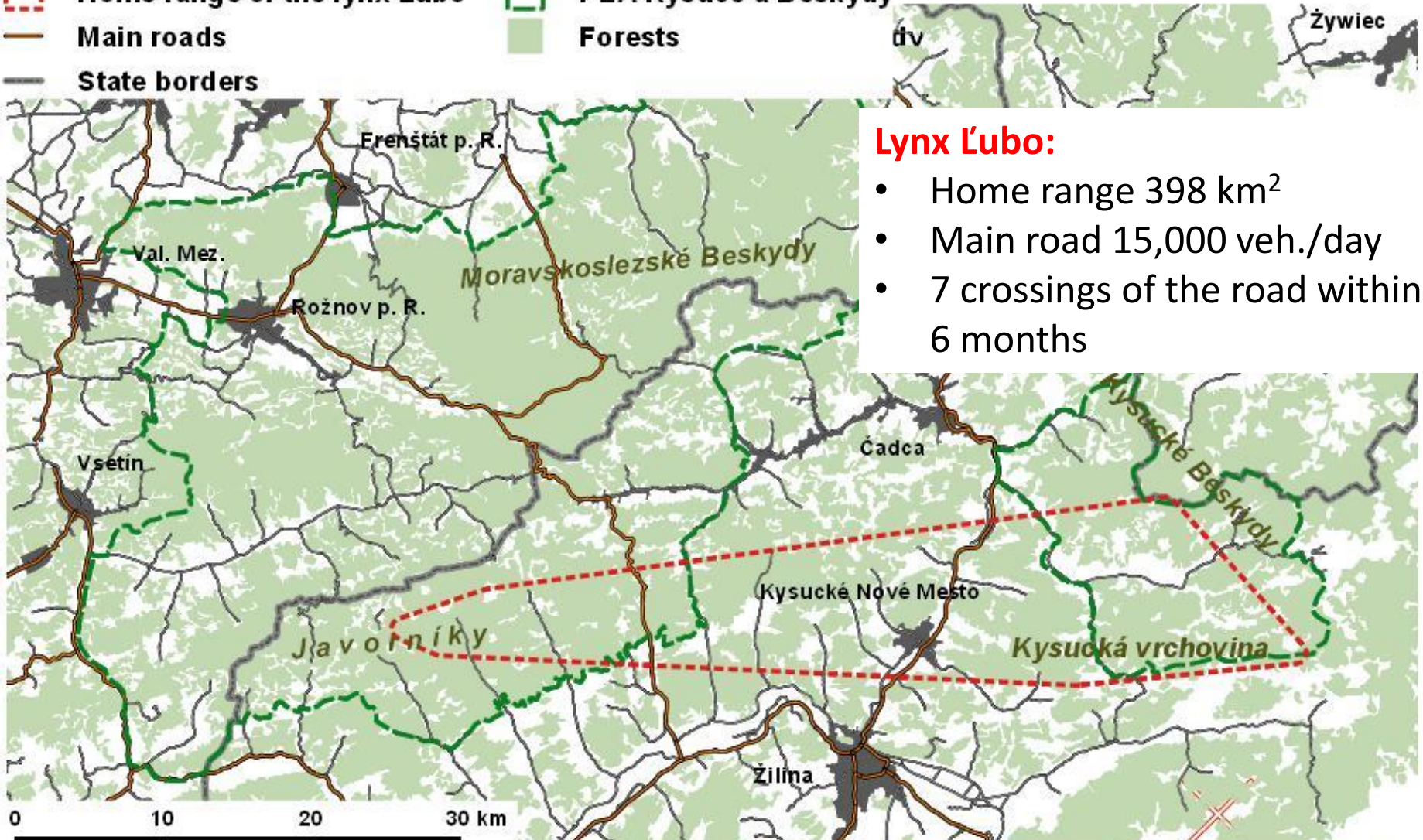
- **10 independent lynx**
- **0,45 (0,39–0,54) lynx / 100 km²**



Movement activity of lynx in the Western Carpathians

-  Home range of the lynx Ľubo
-  Main roads
-  State borders

-  PLA Kysuce a Beskydy
-  Forests



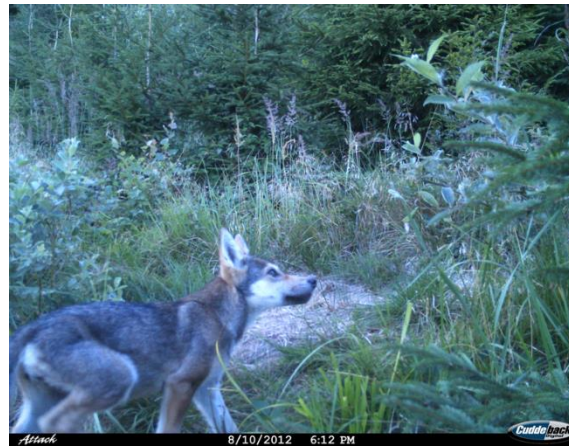
Lynx Ľubo:

- Home range 398 km²
- Main road 15,000 veh./day
- 7 crossings of the road within 6 months

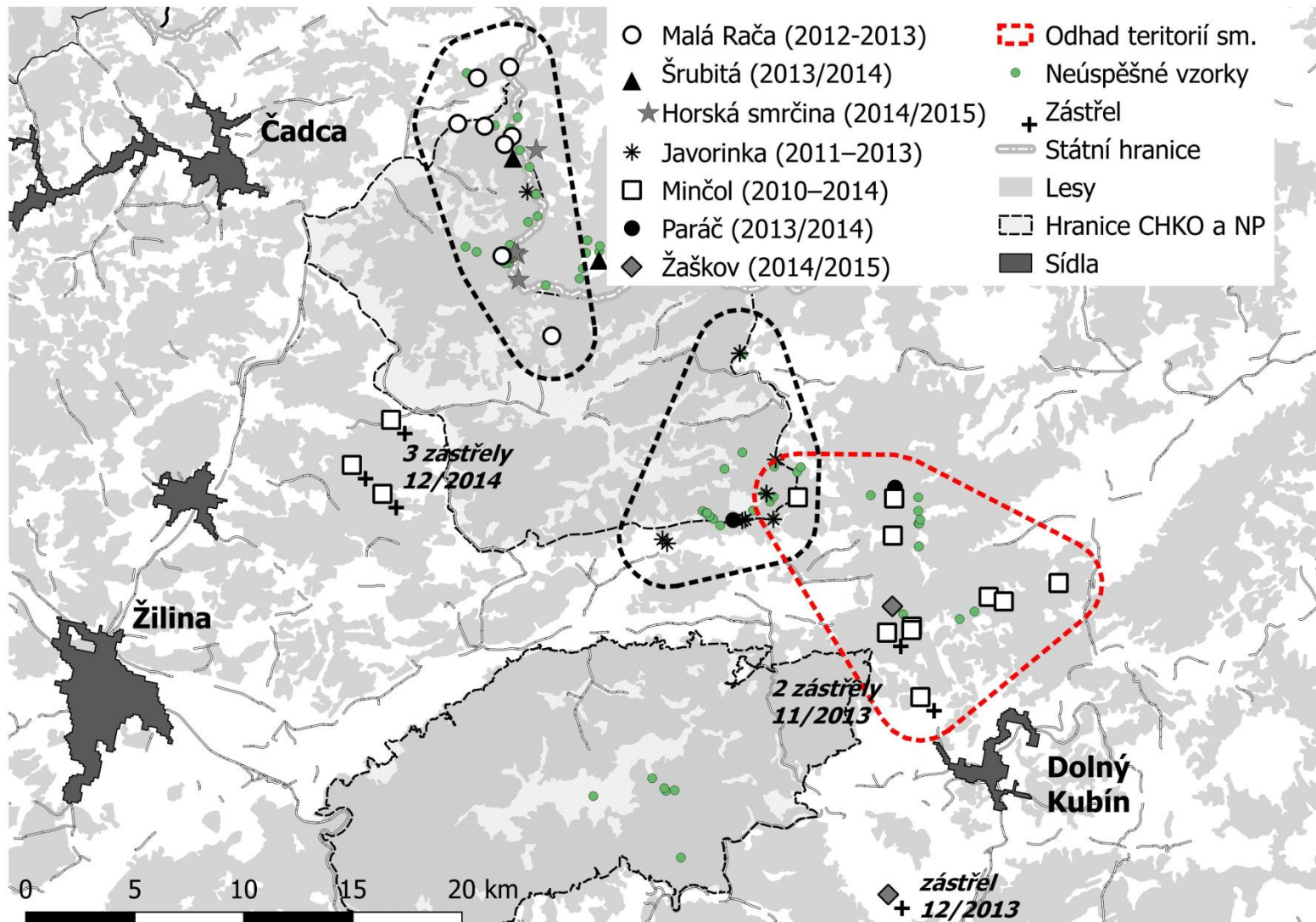
Monitoring of wolf packs



- Snow tracking during winter
- Howling simulation & pack localization during summer
- Camera trapping on wolf paths
- Confirmation of wolf territories based on genetic analyses



Wolf packs localized during 2012-2016 and confirmed by genetics



RESEARCH ARTICLE

Trans-Boundary Edge Effects in the Western Carpathians: The Influence of Hunting on Large Carnivore Occupancy

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Abstract

The conservation and management of wolves *Canis lupus* in the periphery of their distribution is challenging. Edges of wolf distribution are characterized by very low and intermittent occurrences of individuals, which are modulated by multiple factors affecting the overall population such as human-caused mortality, management targets and food availability. The knowledge of population dynamics in the edges becomes crucial when hunting takes place nearby the edges, which may preclude population expansion. Here, using as example the occurrence of wolves in the Beskydy Mountains (Czech-Slovak border), which is the edge distribution of the wolf and Eurasian lynx *Lynx lynx* populations in the West Carpathians, we explored how food availability and hunting in the Slovakian core area affected the dynamics of wolves in the edges of this population. During 2003–2012, we monitored large carnivore occurrence by snow-tracking surveys and tested potential differences in the occurrence of these species in Beskydy Mountains and potential mechanisms behind detected patterns. Despite the proximity to the core area, with several wolf reproductions being confirmed at least in recent years, the wolf was a very rare species in Beskydy and was recorded 14 times less often than the lynx. The expected abundance of wolves in the Beskydy Mountains was inversely related to prey availability in the Slovakian core area. Wolf hunting the year before influenced the expected abundance of wolves in Beskydy area. We discuss how different life histories and legal status of both species probably account for most of the observed difference of occurrence at range margins.

Introduction

Over the last few decades, we have witnessed a recovery of large carnivores throughout human-dominated Europe [1]. For example, out of the ten wolf (*Canis lupus*) populations currently recognized in the old continent, almost all populations show a stable or increasing trend [1]. Only



Sheep and wolves: Is the occurrence of large predators a limiting factor for sheep grazing in the Czech Carpathians?

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ABSTRACT

Extensive sheep grazing in the West Carpathians is a very important management tool for the protection of the traditional landscape character of the Central European countryside, as well as providing biologically valuable habitats of pastures and meadows. In this paper we describe the main characteristics of sheep farming in the Beskydy region and test the hypothesis that large carnivores are a limiting factor for sheep grazing management of landscapes in this region, the only area of the Czech Republic where all three species of large European carnivores – the Eurasian lynx (*Lynx lynx*), grey wolf (*Canis lupus*) and brown bear (*Ursus arctos*) – occur. Data obtained from the monitoring of large carnivores and a questionnaire-based survey of the perspective of sheep farmers in the Beskydy region were analysed. Although the lynx is the most abundant large predator within the study area, the highest number of attacks on sheep was attributed to wolves. However, the annual frequency of attacks was very low and, moreover, an important number of the attacks could have been committed by dogs rather than wolves. From the perspective of sheep breeders, the major economic factor is a low consumer demand for sheep products, and not the presence of large carnivores. However farmers expressed a view that some level of safeguarding was needed and this should come in the form of financial compensation for damage resulting from attacks on sheep by large predators and a modification of the current system of agricultural subsidies. Subsidies for sheep breeders should respect the regional specificities including the risk arising from the presence of large carnivores and provide support for active measures to protect the livestock against them. Regarding the protection of populations of large carnivores in the Beskydy Mountains, it will be necessary to continue to monitor their presence.

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Introduction

In the cultural landscape of Central Europe, sheep breeding has traditionally been an important way of farming, which still helps maintain the typical character of foothill and mountain areas (Halliday & Cullum 1995). Extensive sheep grazing also contributes significantly to preserving the non-forest biotopes of pastures and meadows that facilitate high gamma-biodiversity in the landscape (Metzger et al. 2010). However, sheep farming has nearly disappeared from many areas of Central Europe during recent decades (Martini et al. 2008; Narukowski et al. 2006). A

reduction or removal of sheep grazing in the Czech Republic will lead to the further degradation of valuable grassland biotopes and the disappearance of a wide range of habitats of rare plant and animal species of European importance (Chytrý et al. 2010; Krahulec et al. 2001).

One of the regions in the Czech Republic which still preserves the traditional landscape character and high biodiversity owed to sheep grazing (and other livestock) are the Beskydy Mountains, situated at the edge of the West Carpathians (Weismannová 2004). The Beskydy Mountains are also the only region in the Czech Republic where it is possible to come across all three species of European large carnivores – the Eurasian lynx (*Lynx lynx*), grey wolf (*Canis lupus*) and brown bear (*Ursus arctos*) – which pose an element of risk to the livestock (Kuzmický 1990). All three species cause a small degree of loss of domestic animals, but the extent of

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Kolik u nás žije vzácných šelem? Monitoring velkých šelem a kočky divoké nejen v Beskydech

Miroslav Kutal, Martin Váňa

Rozsivky ve výzkumné oblasti Beskydy a sledování vzácných šelem a kočky divoké nejen v Beskydech. Účastníci projektu a členové redakce časopisu sledují monitoring vzácných šelem a kočky divoké nejen v Beskydech.

V současnosti době jejich monitoring umožňuje poznání povahy a dohledání vzácných šelem a kočky divoké nejen v Beskydech.



Ob: 1. Běhání velkých šelem v Beskydech. Fotografie: Miroslav Kutal, Martin Váňa

Acta Mus. Bred. 5: 121–136, 2013
ISSN 1803-960X

Výskyt rysa ostrovidra (*Lynx lynx*) v širší oblasti CHKO Beskydy v letech 2003–2012

Eurasian lynx (*Lynx lynx*) occurrence in the broader area of the Beskydy PLA in years 2003–2012

Miroslav KUTAL^{1,2}, Martin VÁŇA³, Michal BOJDA³ & Leona MACHALOVÁ³



Velké šelmy na Moravě a ve Slezsku

Miroslav Kutal, Josef Suchomel a kol.



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ISSN 978-80-972895-0-8

RECENTNÍ VÝSKYT A DYNAMIKA VLKA OBEČNÉHO (*CANIS LUPUS*) V ZÁPADNÍCH KARPATECH

RECENT OCCURRENCE AND DYNAMICS OF GREY WOLF (*CANIS LUPUS*) IN THE WESTERN CARPATHIANS

MIROSLAV KUTAL^{1,2}, BARBORA ČERNÁ BOLEKOVÁ³, MARTIN DUEA^{1,2}, LEONA KUTALOVÁ³, MICHAL BOJDA³, MICHAL KALAS^{4,5}, TOMÁŠ PLAŠ^{4,5}, LUBOSLAV HRDÝ^{4,5}, PETER DRENGUBIAK⁶, SABINA NOWAK⁷, ROBERT W. MYSLAJEK⁸, MICHAL FIGURA⁹ & PAVEL HULVA¹⁰
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⁷Špišucký národní park, P. O. Hrádková 116, 8183 Vavřín, SR
⁸Instytut Genetyki i Biologii, Uniwersytetu Warszawskiego, Żwirki i Wigury 13, 02-093 Warszawa, Poland
⁹Přirodovědecká fakulta Univerzity Karlovy, Hlavní 7, 128 43 Praha, ČR
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Abstract

Grey wolf (*Canis lupus*) has recovered its population in Kyuce and Orava region in the Western Carpathians, Slovakia, in 1980's, but the species has not been locally studied in detail, although it is a subject of legal hunting in the region. Field mapping of tracks and scat, howling records, extensive camera trapping and genetic monitoring was used to assess the species distribution, reproduction and pack dynamics in years 2011–2017. Reproduction was confirmed in 10 of 15 squares of 10 × 10 EEA grid, two squares were evaluated as permanently occupied without reproduction and one square as sporadically occupied. In total, 13 reproduction events were recorded since summer 2012. Number of pups in six well-documented litters varied between 2 and 6 (avg. 3.7 ± 0.5). We identified 55 unique genotypes in 60 successfully analysed samples using genetic profiles on 18 microsatellite loci (55 scat and 10 tissue samples mostly from hunted individuals). Kinship analyses revealed seven on closely related groups of 2–12 individuals, most likely corresponding to pack members. The members of the same packs were sampled 1–3 years before they were replaced by other unrelated individuals. Although number of 6 samples analysed during 5-year period (2011–2015) was rather low, preliminary results indicate a high turn-over in the population. Since hunting was the main source of the known mortality in the study area, we discuss the impact of hunting on pack dynamics. More intensive sampling of population is needed to assess the pack structure and its study processes taking place at local and regional level.

Key Words

large carnivores, population dynamics, wolf reproduction, hunting, population turn-over

Úvod

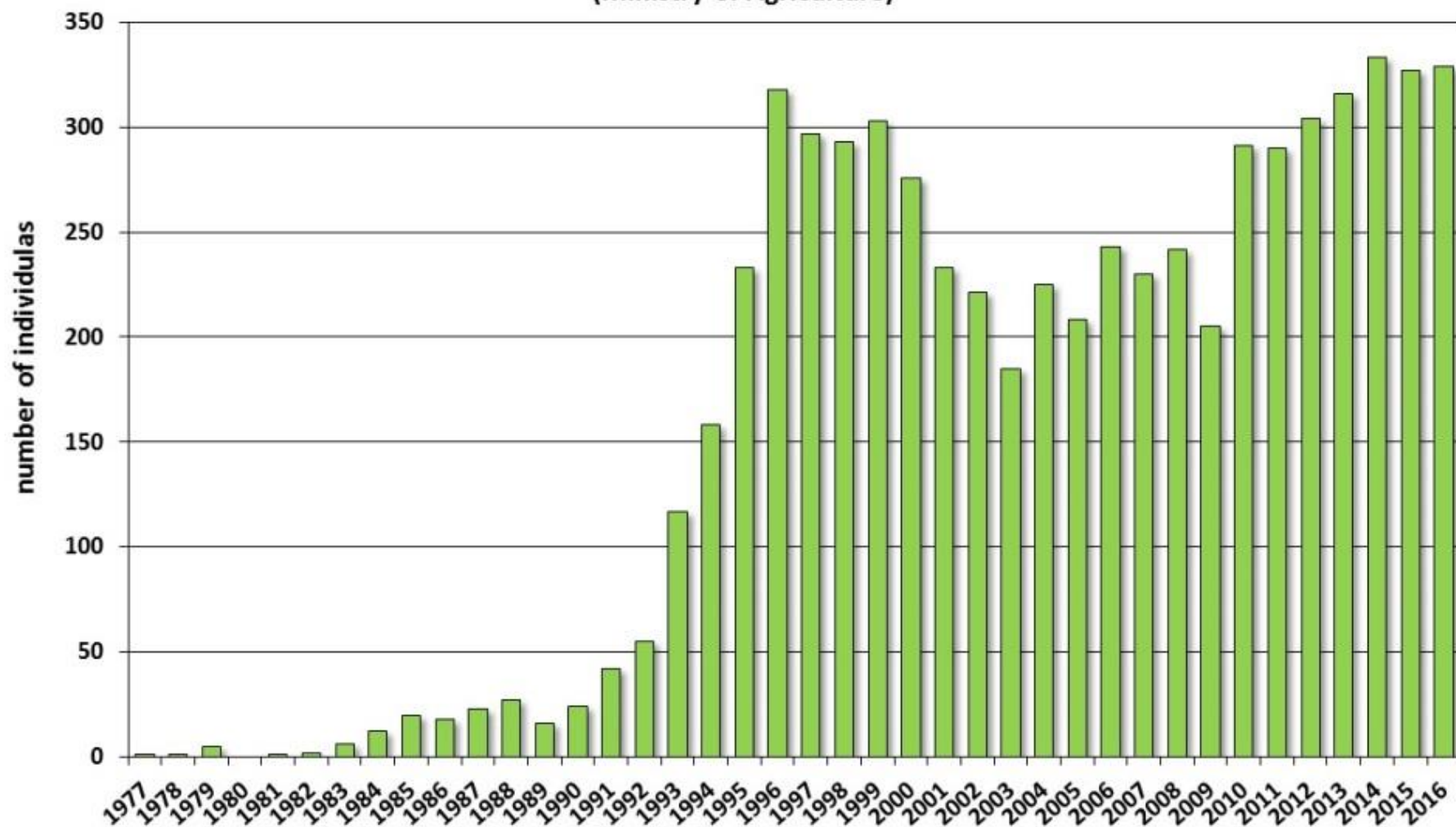
Průběh výskytu velkých šelem a zejména pak vlka obecného v západních Karpatech je sledován již od 1980. let. V současnosti se v této oblasti opět začíná obnovovat populace vlka obecného. Vzhledem k tomu, že vlk je ohrožený druhem antropogenních faktorů včetně legálního lovu, je monitoring založený na vědeckých datech nezbytnou podmínkou managementu, aby bylo možné sledovat jeho populaci. V rámci výzkumu v letech 2011–2017 byla sledována populace vlka obecného v západních Karpatech pomocí kombinace tradičních i moderních metod, jako je nezavisitní vzorkování populace, molekulární genetická analýza a výskyt lovců. Tímto způsobem bylo získáno 60 úspěšně analyzovaných vzorků (55 vzorků z výkalmů a 10 vzorků z tkání). Analýza kinship ukázala sedm skupin vzájemně souvisejících jedinců či pomatřebných vztahů v populaci.

Trvalá přítomnost vlka je v oblasti Západních Slovenska zaručena díky jeho populaci v Kyuce a Orava regionu. Vzhledem k tomu, že vlk je ohrožený druhem antropogenních faktorů včetně legálního lovu, je monitoring založený na vědeckých datech nezbytnou podmínkou managementu, aby bylo možné sledovat jeho populaci. V rámci výzkumu v letech 2011–2017 byla sledována populace vlka obecného v západních Karpatech pomocí kombinace tradičních i moderních metod, jako je nezavisitní vzorkování populace, molekulární genetická analýza a výskyt lovců. Tímto způsobem bylo získáno 60 úspěšně analyzovaných vzorků (55 vzorků z výkalmů a 10 vzorků z tkání). Analýza kinship ukázala sedm skupin vzájemně souvisejících jedinců či pomatřebných vztahů v populaci.

Counting of spring population bag by hunters



Population numbers of lynx according to official hunting statistics
(Ministry of Agriculture)





Large carnivores: Bear, Wolf, Lynx (+ Beaver, Otter, Moose)

Conditions to be met:

1) Animals (sheep, goat, cattle, pig, horse, donkey and their crossbreed) should be kept in closed object / in electric pasture fence / if free - under the supervision of shephard or guarding dog, beehives also compensated

- Damage should be reported until 48 h to responsible Nature protection Department (Protected Landscape Area / Municipality with extended power) – zoologist/responsible person will issue protocol
- Veterinarian should inspect the status of animals, issue a protocol which is obligatory
- Application for damage compensation should be submitted to District Administration until 10 days

Shortcomings:

- a fee for veterinarian protocol is not covered
- a fee for dead animals removal is not covered

Process of money reimbursement is too long

(from Ministry of finance to the District Administration and than to the farmer)

The amount of damages caused in CZ (2017)



month	wolf	bear	lynx	Total (EUR)
January	1 692,61	0,00	85,60	1 778,21
February	0,00	0,00	875,49	875,49
March	7 082,72	0,00	434,82	7 517,55
April	951,75	0,00	0,00	951,75
May	4 730,12	0,00	2 089,49	6 819,61
June	2 137,16	0,00	778,21	2 915,37
July	466,93	0,00	264,59	731,52
August	3 581,01	0,00	0,00	3 581,01
September	2 512,45	0,00	507,78	3 020,23
October	791,75	0,00	1 295,91	2 087,67
November	2 786,03	0,00	833,66	3 619,69
December	3 932,41	0,00	0,00	3 932,41
Total	30 664,94	0,00	7 165,56	37 830,51

LC were responsible for **4,07%** from the total SUM reimbursed according to the Law 115/2000

Otter	70,01%
Beaver	25,53%
Wolf	3,30%
Lynx	0,77%
Moose	0,39%

Data were provided by Ministry of Finance

Thanks for your attention

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Volunteers of Wolf Patrol



Thank you for your attention

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