

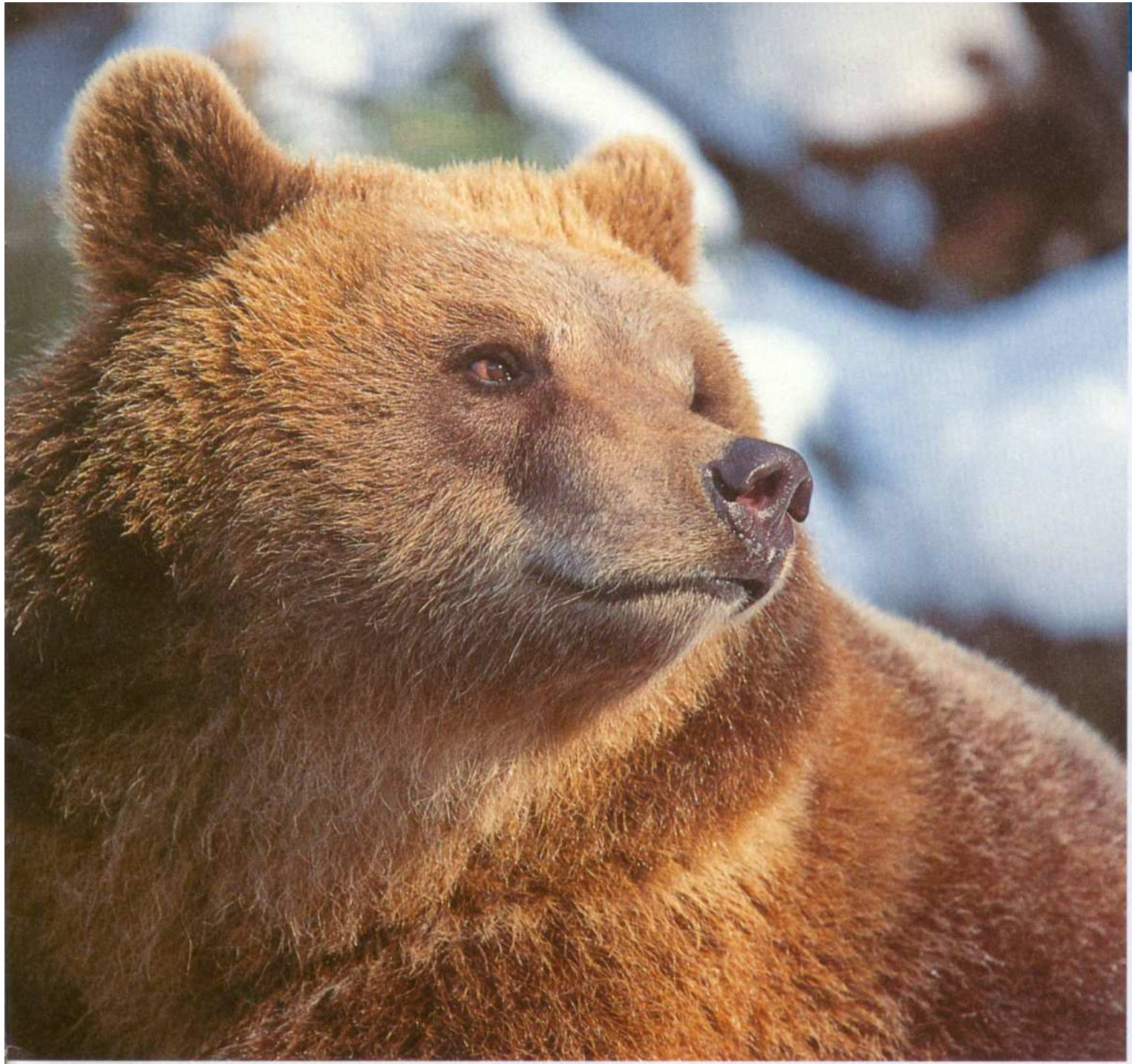
Management of Large Carnivores in Romania

Ministry - Gratiela Gavrilescu
Ovidiu Ionescu

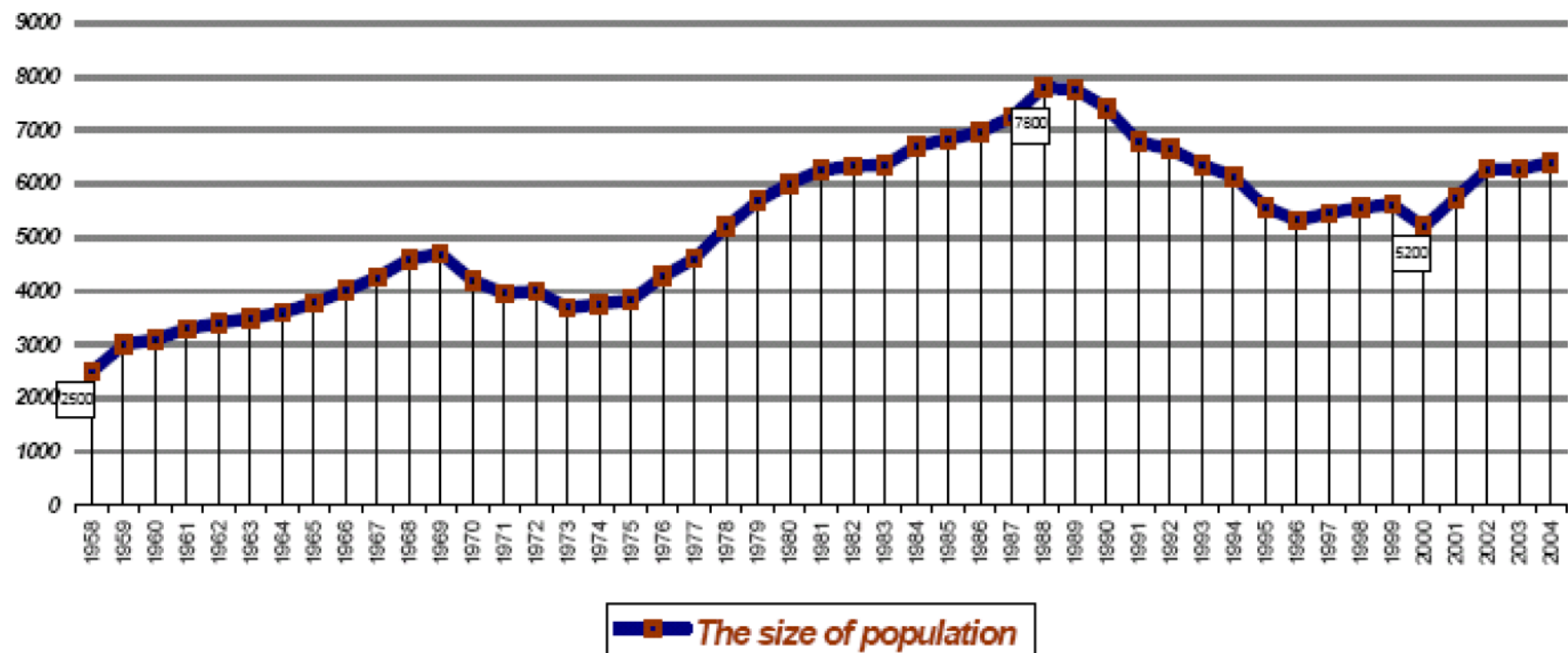


Bulgaria – Pravet
- April - 2015 -

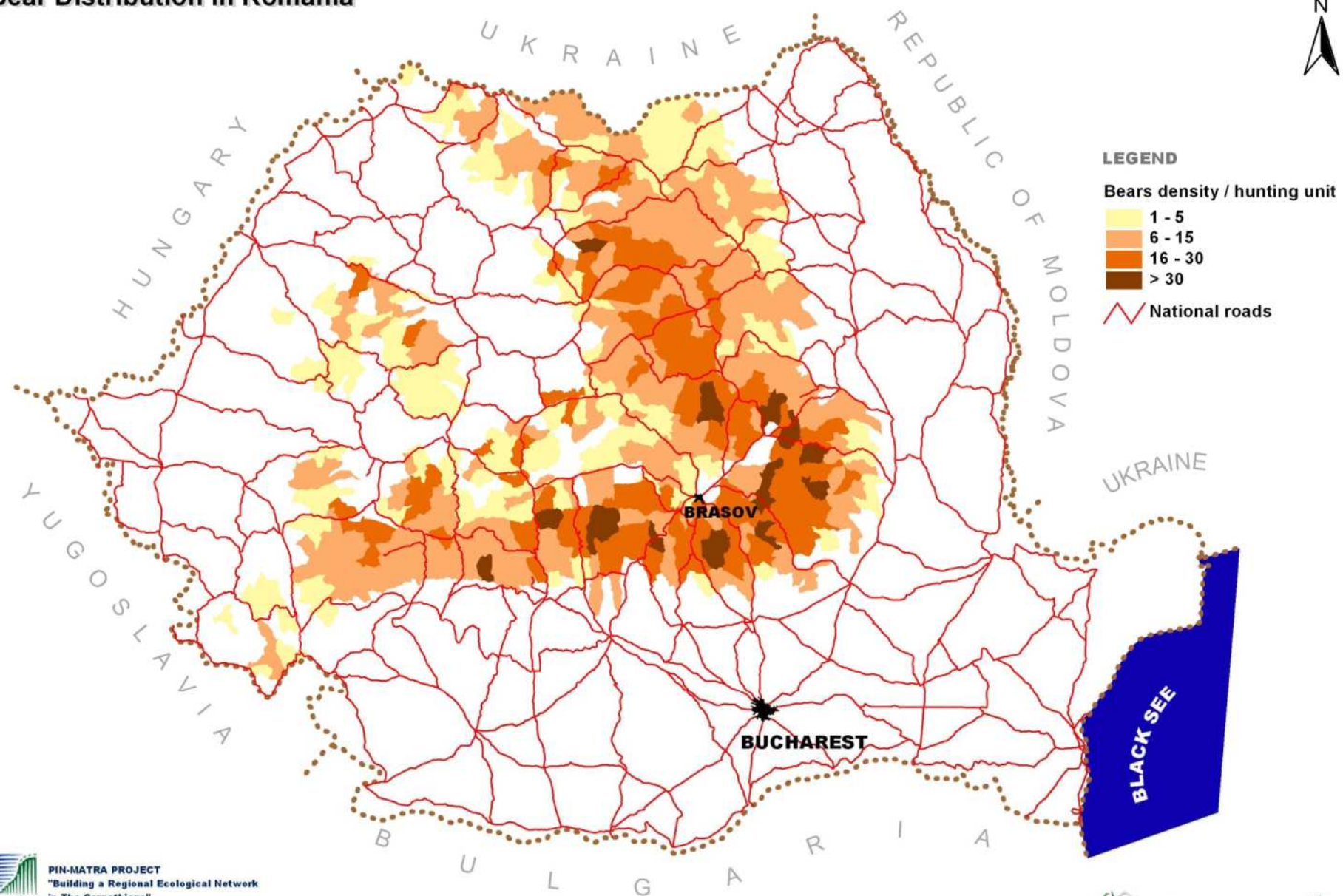


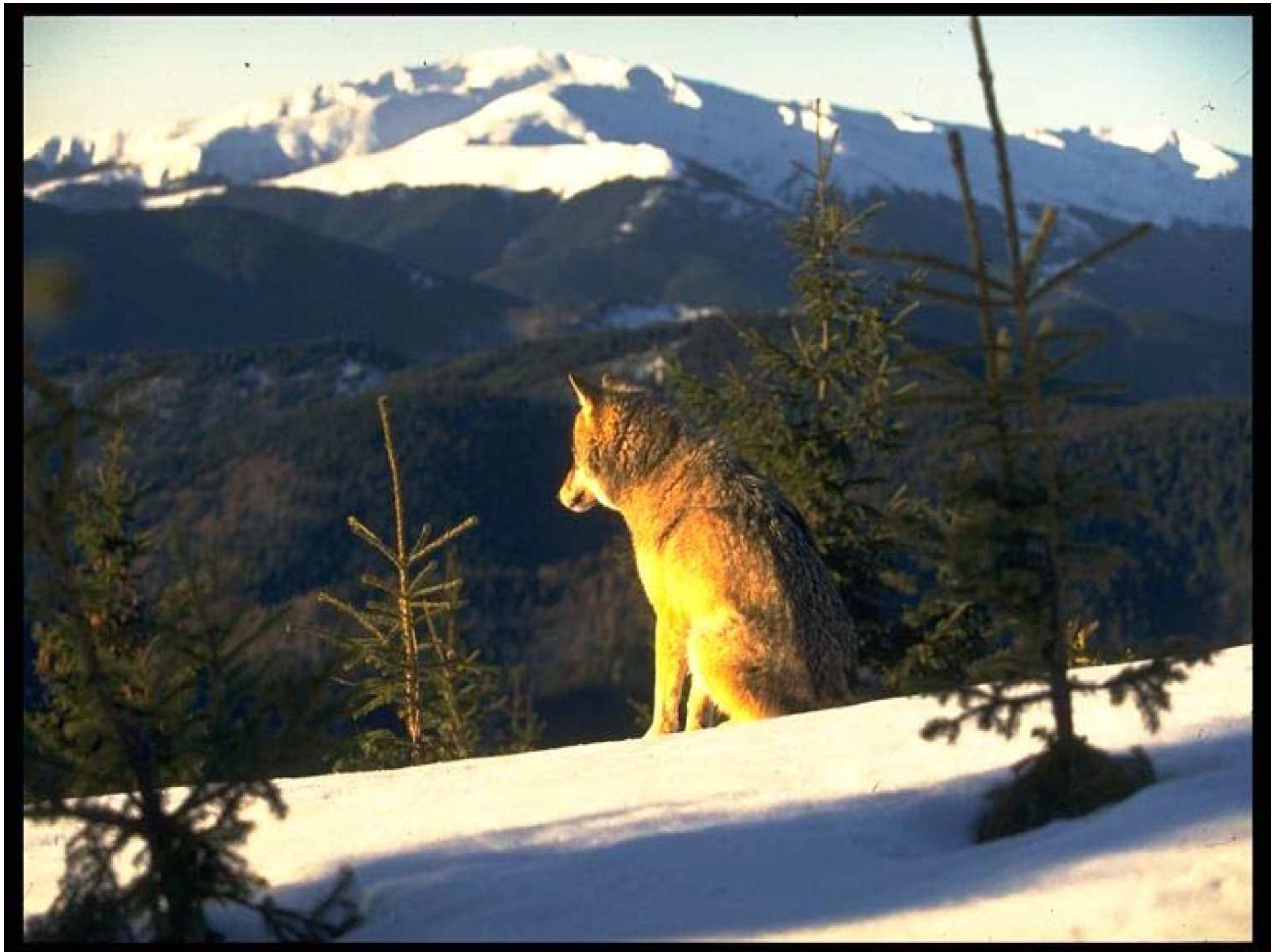


Romanian bear population in the last 50 years

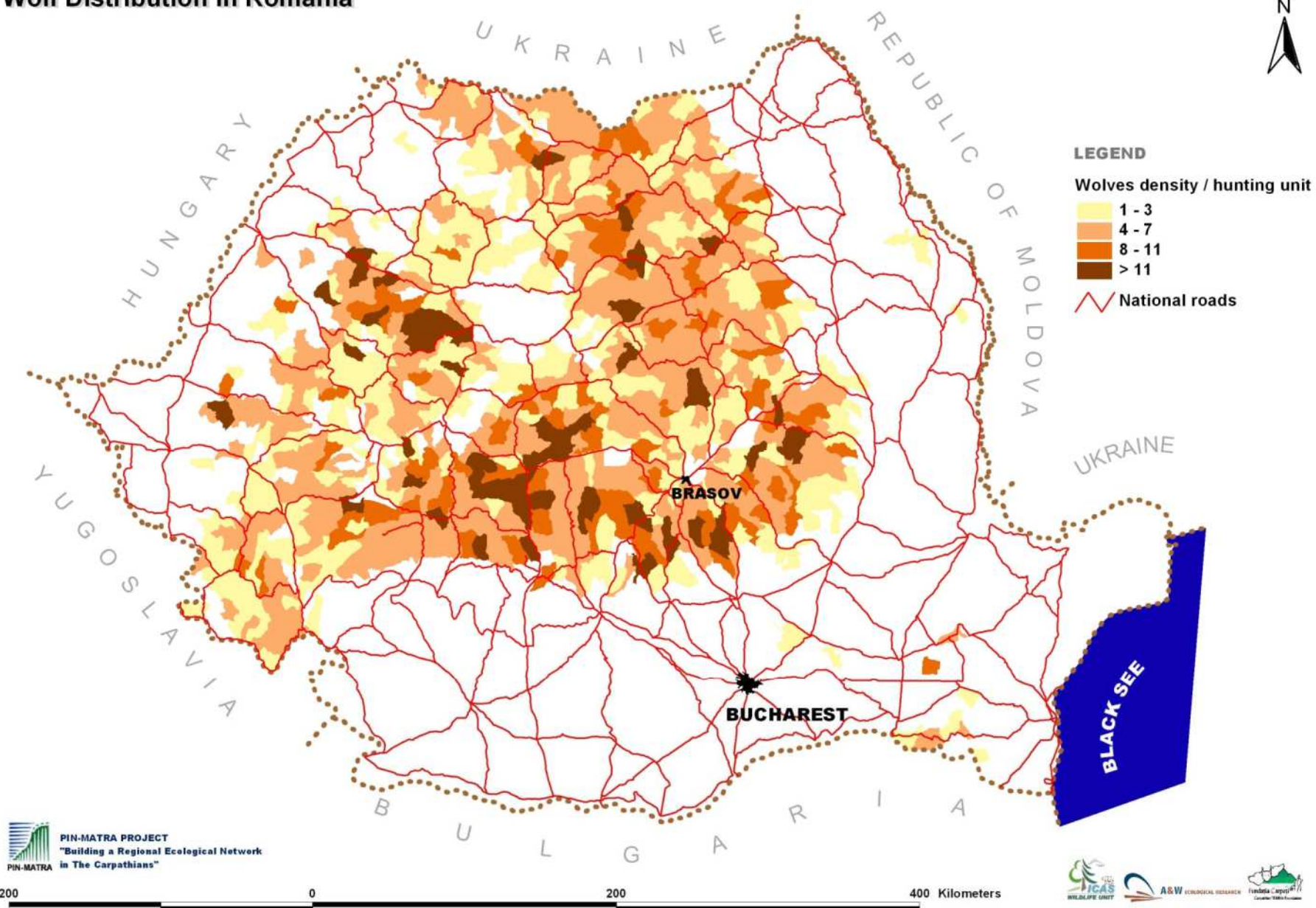


Bear Distribution in Romania



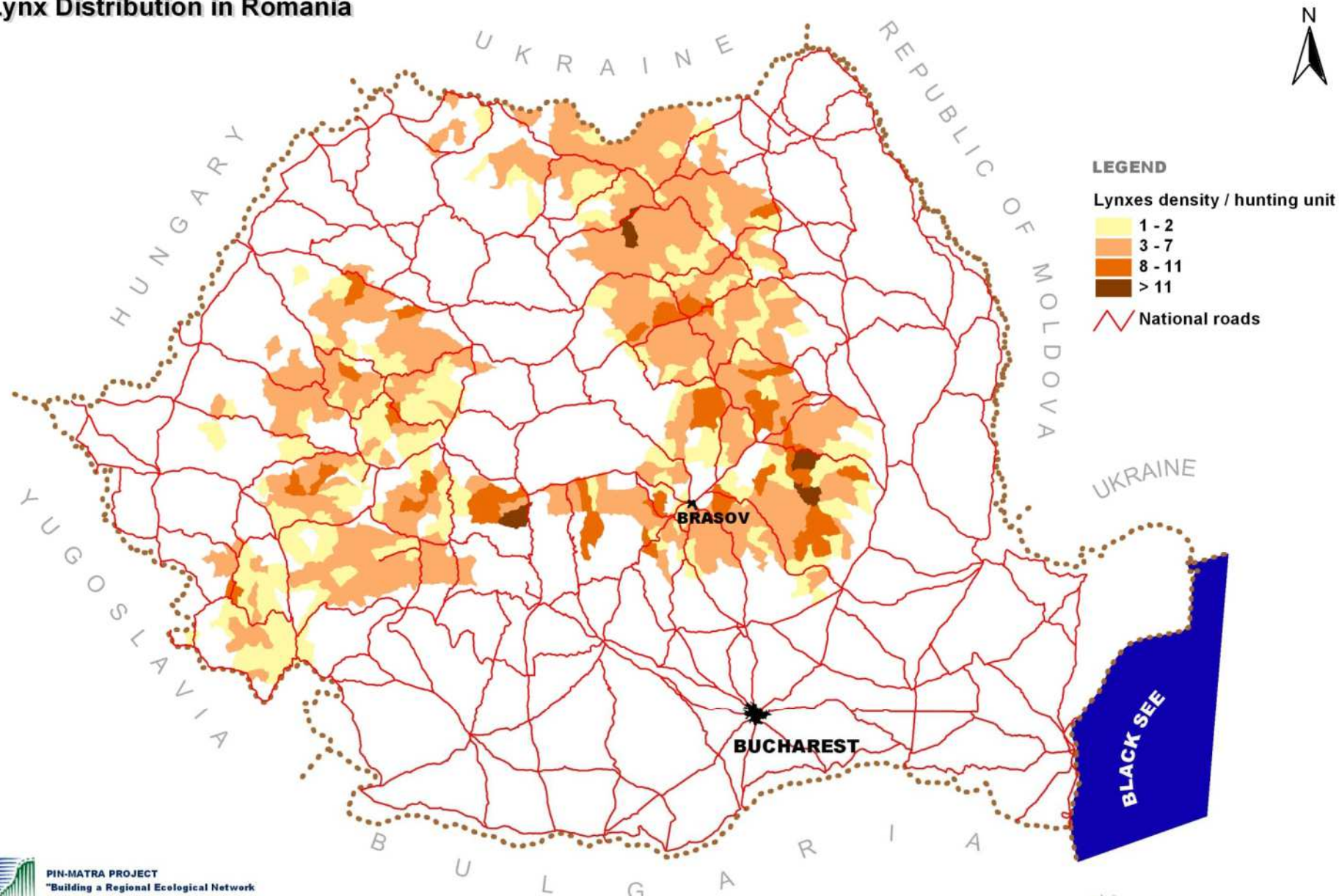


Wolf Distribution in Romania





Lynx Distribution in Romania



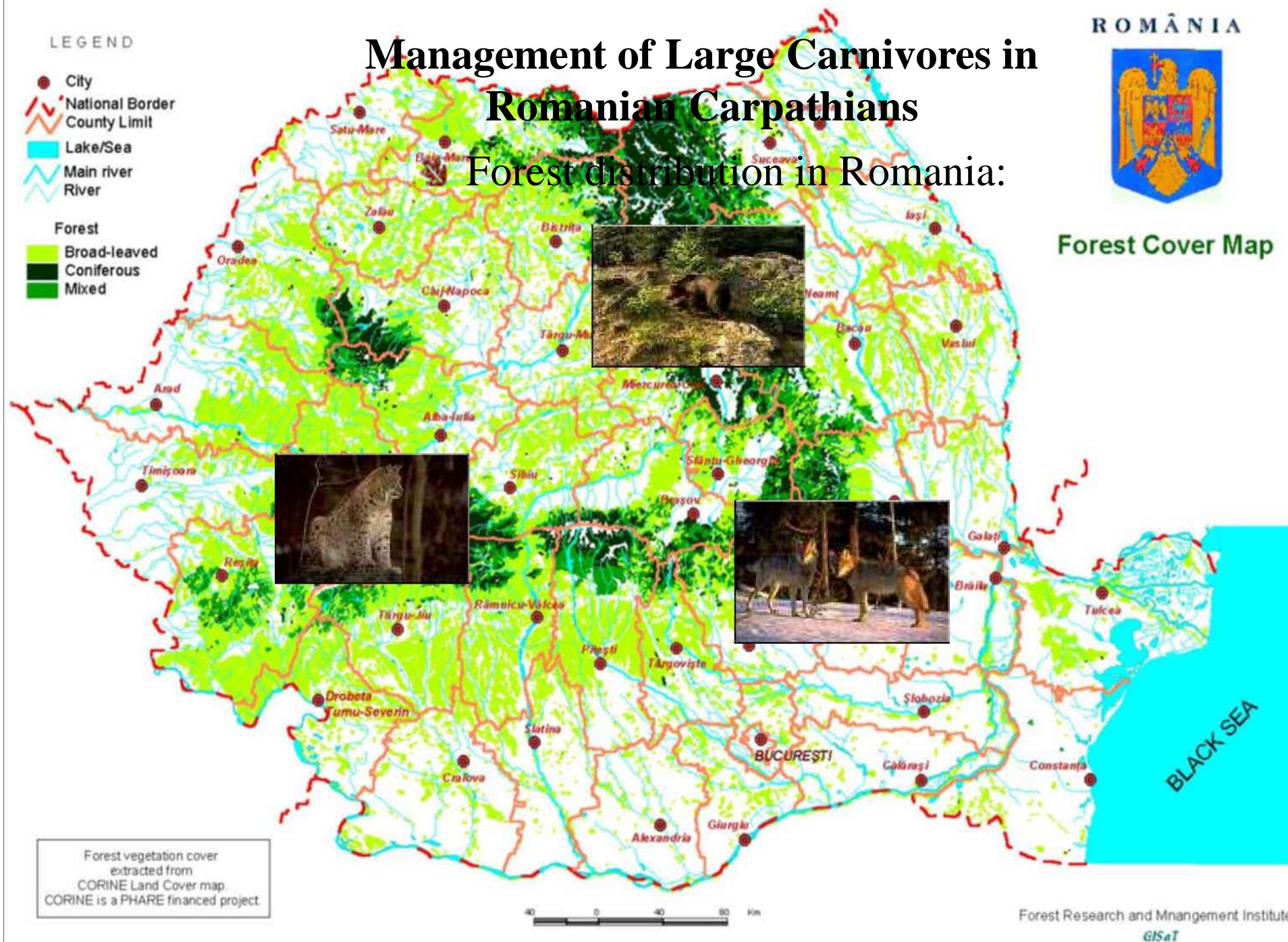
Management of Large Carnivores in Romanian Carpathians

Forest distribution in Romania:

ROMÂNIA



Forest Cover Map





Distribution of brown bears, wolves and lynxes:

- 🌲 With few exceptions, areas above 500 m high;
- 🌲 Areas covered by coniferous forests, mixed forests and beech and oak forests;
- 🌲 Bear population is located mainly in the mountains (83%), with only 17% living in the hills,
- 🌲 lynx – 92% in the mountains and 8% living in the hills and
- 🌲 wolves 64% in the mountains and 36% living in the hills

POPULATION ESTIMATION



Basic methods for brown bear population estimation
The estimation of brown bear population size by:

- (1) Footprints measurement, territory size and avoidance of double registration
 - (2) Reproductive units method (COY)
 - (3) Direct observation to the feeding sites
 - (4) Registration of footprints on transects
- Methods calibrations.
 - training for methods application
 - correlation of estimation results on different hunting areas with independent estimations
 - assessment of sex and age population structure
 - Conflict assessments.

Attaching collar with GPS-transmitter

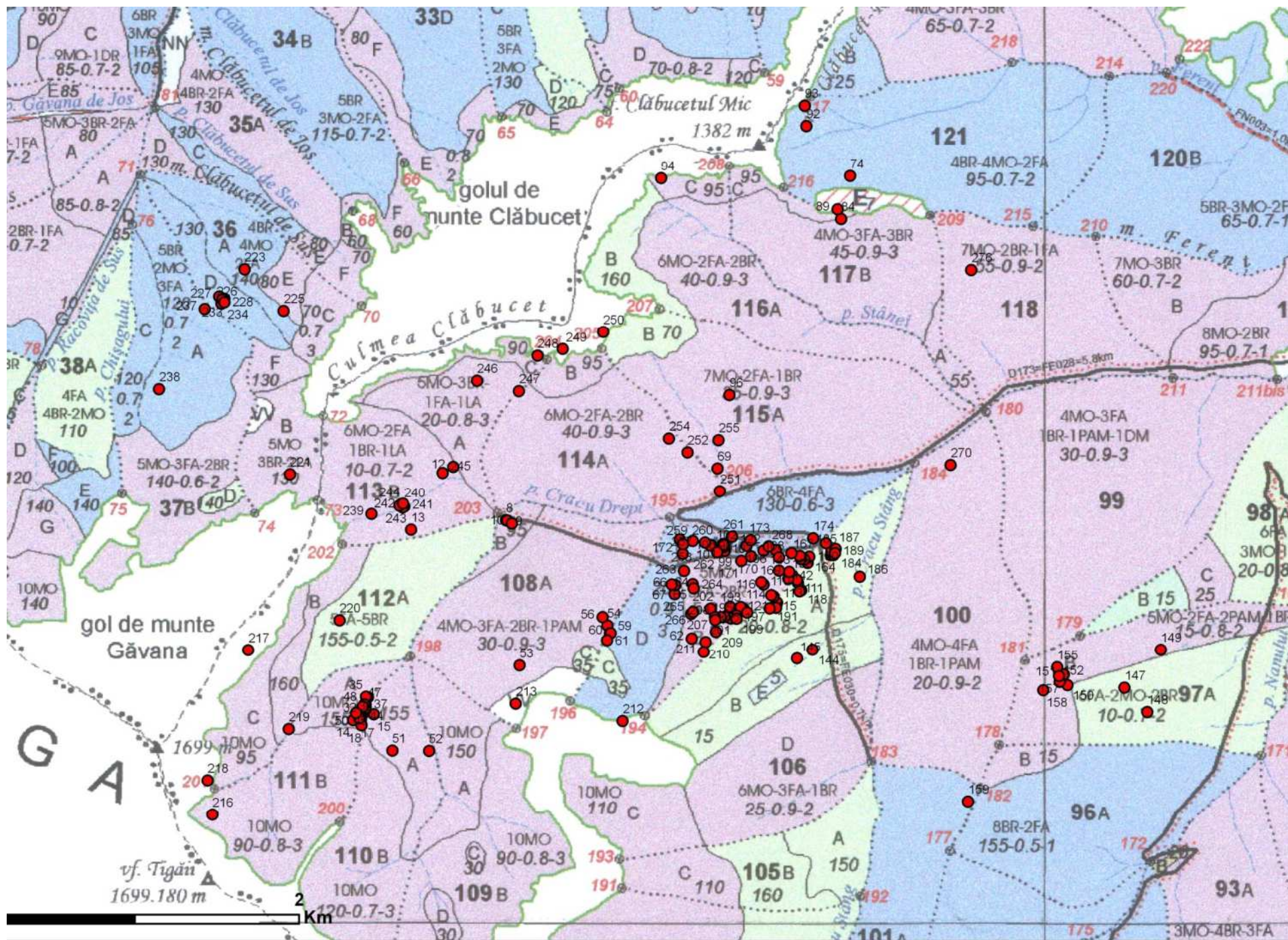




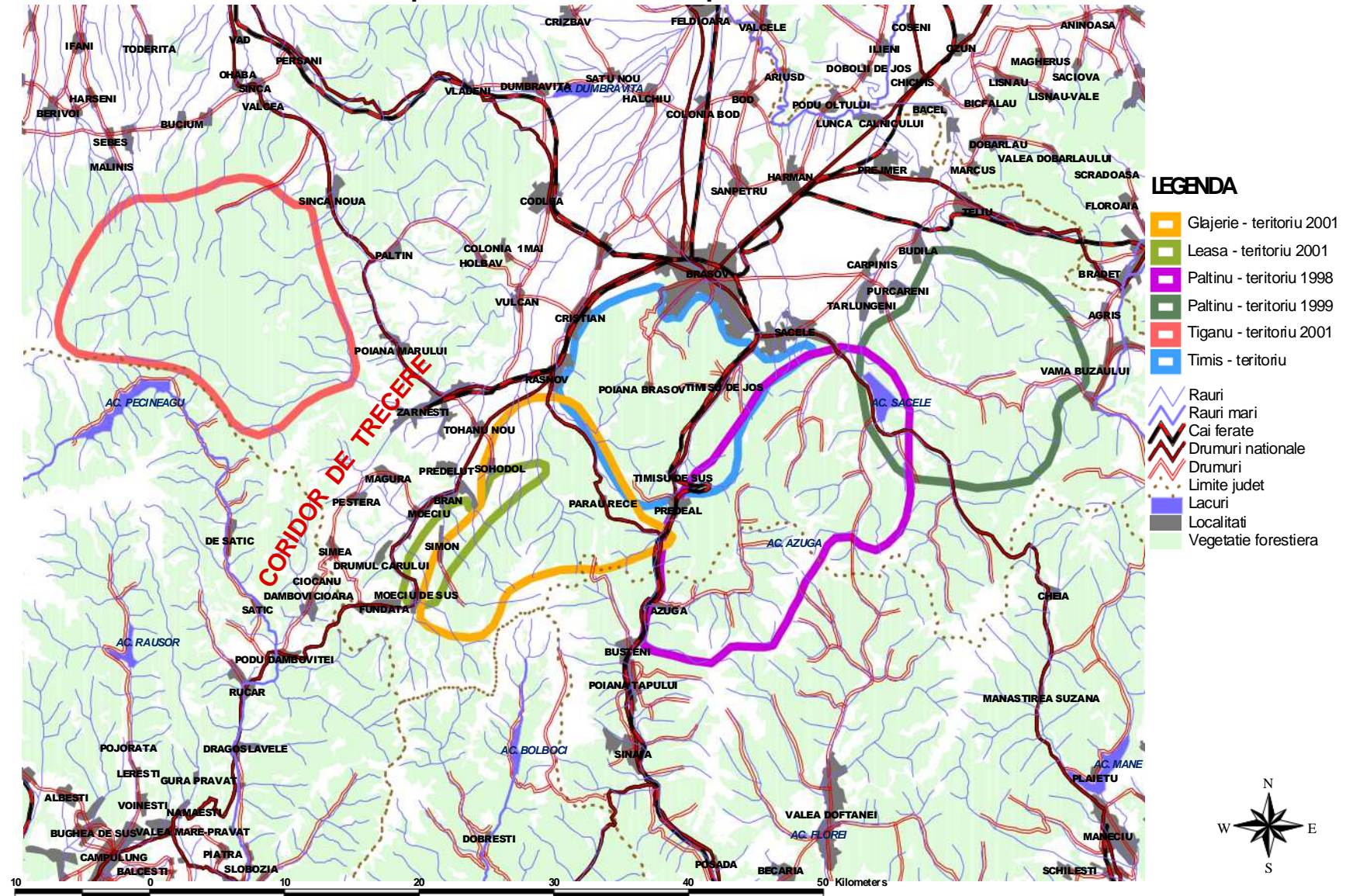








Distributia spatiala a haiticurilor de lupi din zona Brasov



***Home range sizes of five radio-collared wolf packs
in the Romanian Carpathians***

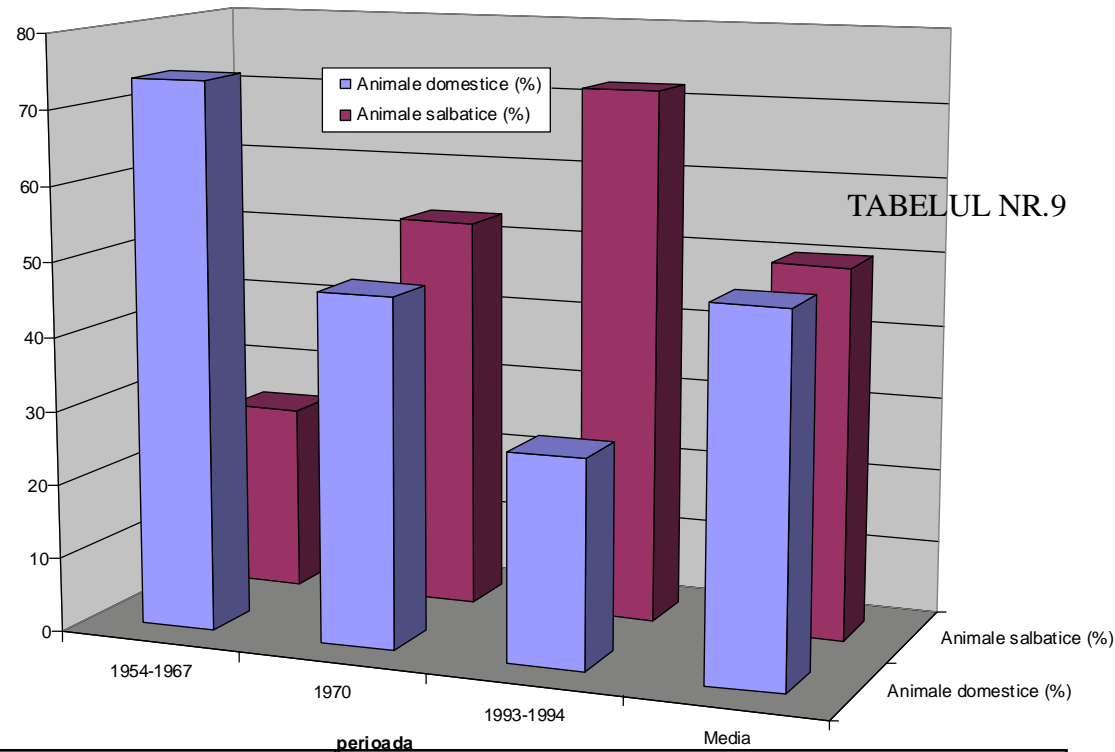
	Minimum Convex Polygon [sqkm]		Kernel [sqkm]			N
	100%	95%	95%	75%	40%	
Downtown	120,6	107,7	83,8	25,2	5,4	545
Zânoguta	153,0	99,8	116,7	44,2	12,1	86
Sebesh main pack	219,2	171,8	154,3	56,7	17,6	120
Paltinu	153,7	123,6	119,4	53,7	9,5	115
Sebesh pair	207,7	108,3	157,7	62,5	22,4	84

Management of Large Carnivores in Romanian Carpathians



Wolf diet

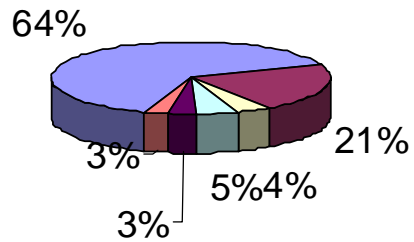
Proportia animalelor domestice si salbatice in hrana lupului



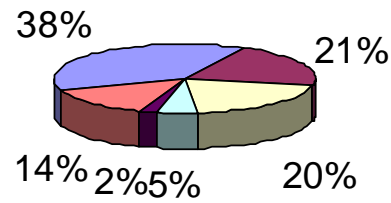
Anul	Mamifere	
	Animale domestice (%)	Animale salbatice (%)
1954-1967	74,6	25,4
1970	47,0	53,0
1993-1994	28,0	72,0
Media	49,87	50,13

Wolf diet

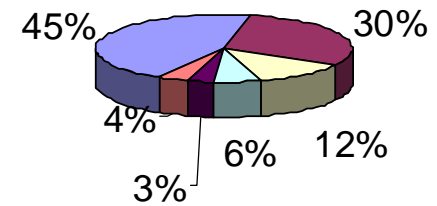
1954-1967



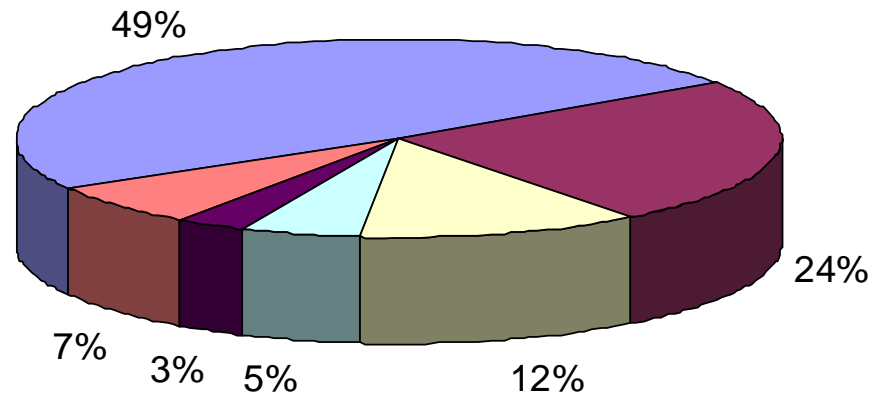
1970



1993-1994



media



Oi(%)
 Ciini(%)
 Porci(%)
 Capre(%)
 Cai(%)
 Vaci(%)

Management of Brown Bear Population and Bear-Human Conflicts in Romania

Characteristics of shepherd camps in south-east area of Brasov

Species	Range	Average
Sheep per camp	50 – 1.200	407
Cows per camp	0 - 55	28
Horses per camp	0 - 10	2.5
Pigs per camp	0 - 39	10
Dogs per camp	2 - 14	7
Relation dog/sheep	1:8 – 1:133	1:55
Shepherds per camp	2 - 9	5
Relation shepherd/sheep	1:29 – 1:114	1:73
Losses of sheep to bears per camp	1 - 11	1.62
Losses of sheep to bears in % per camp	0 – 1.5	0.40
Losses of sheep to wolves per camp	1 - 32	6.95
Losses of sheep to wolves in % per camp	0 - 10	1.70
Total losses of sheep to carnivores per camp	0 - 33	8.57
Total losses of sheep in % per camp	0 – 4.7	2.10

Management Plans and Medium Term Strategies

Main actors:

MMAP – Romanian public authority;

AGVPS, RNP – Game administrators;

Research institute and Universities – research, expertise and technical assistance

Environmental NGO's – projects implementation, evaluation and support.

Main activities:

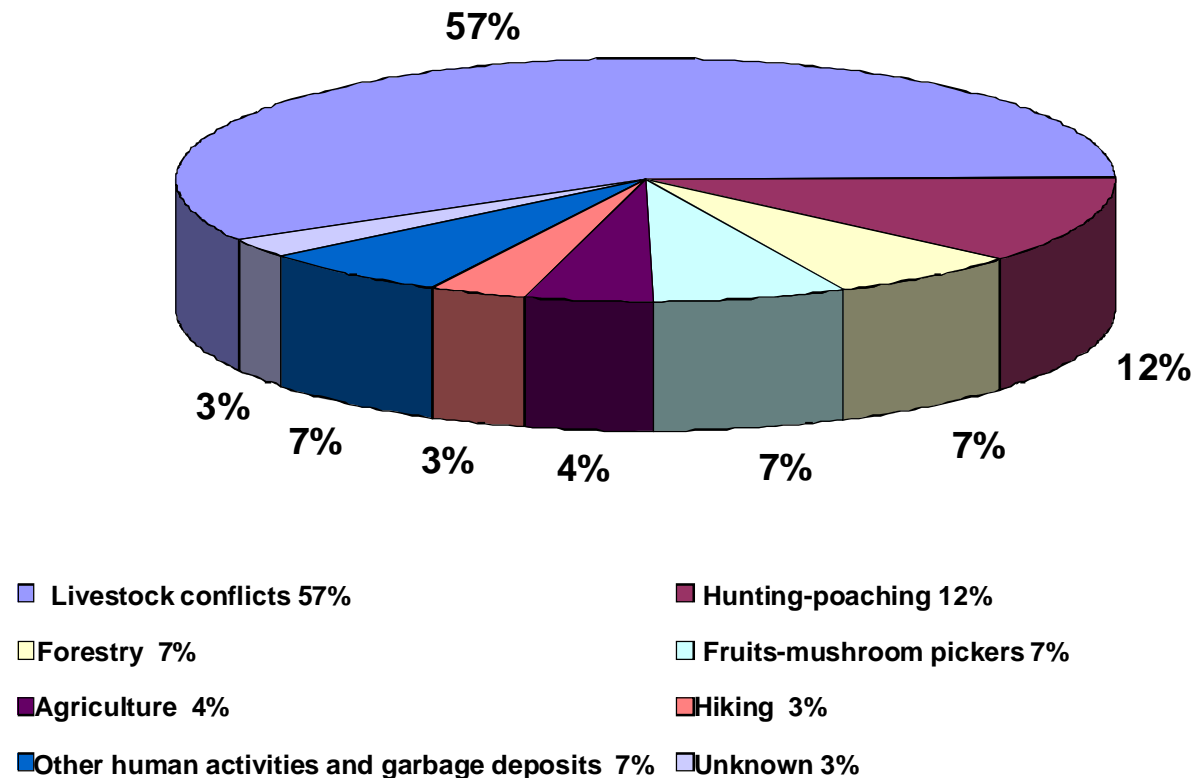
National Wildlife Strategy – management plans for large carnivores - implementation of a comprehensive document.

Wildlife Management Units Planning – policy on local level.

Public Awareness and Education – regional and local info.

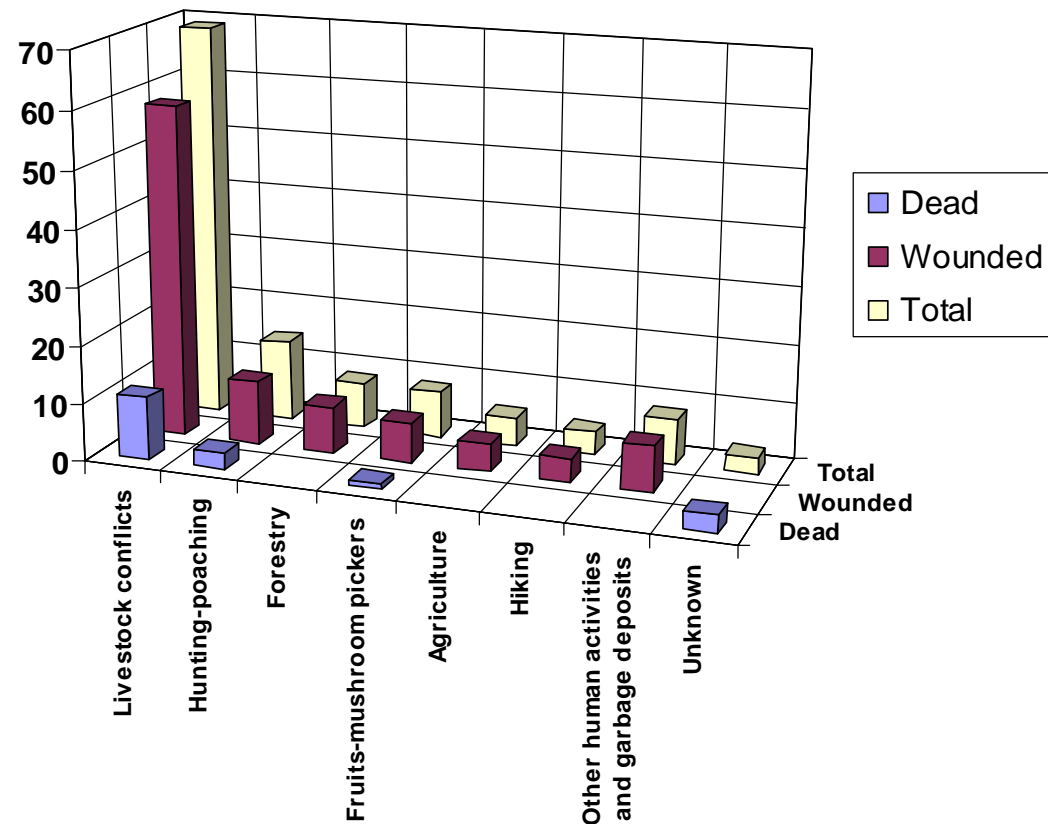
Management of Brown Bear Population and Bear-Human Conflicts in Romania

Bear – Human Conflicts

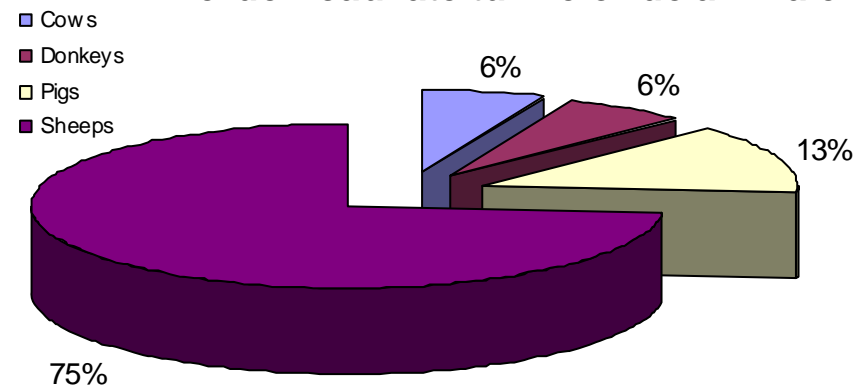


Management of Large Carnivores in Carpathians

Bear – Human conflicts



Pierderi cauzate turmelor de animale

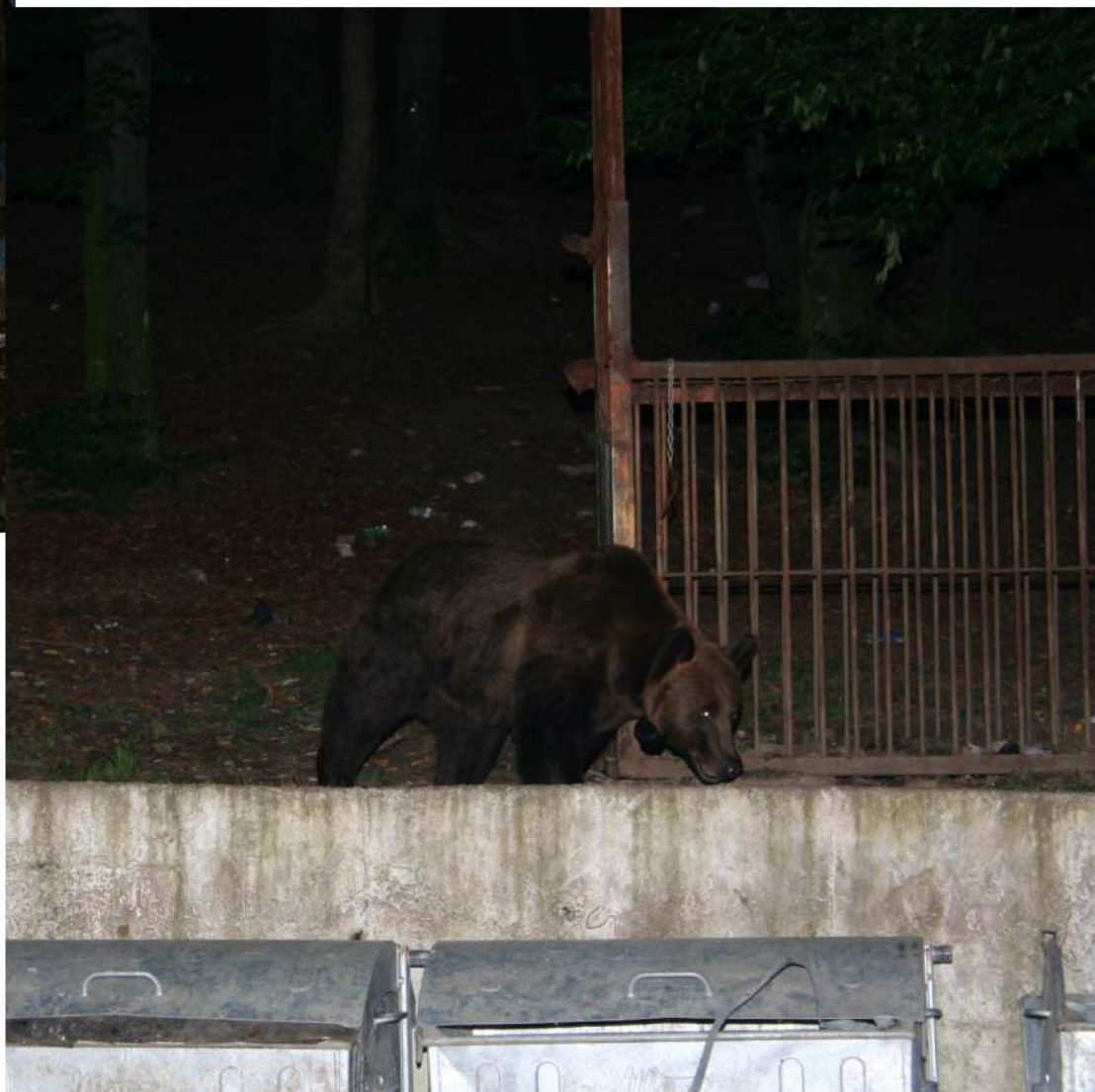










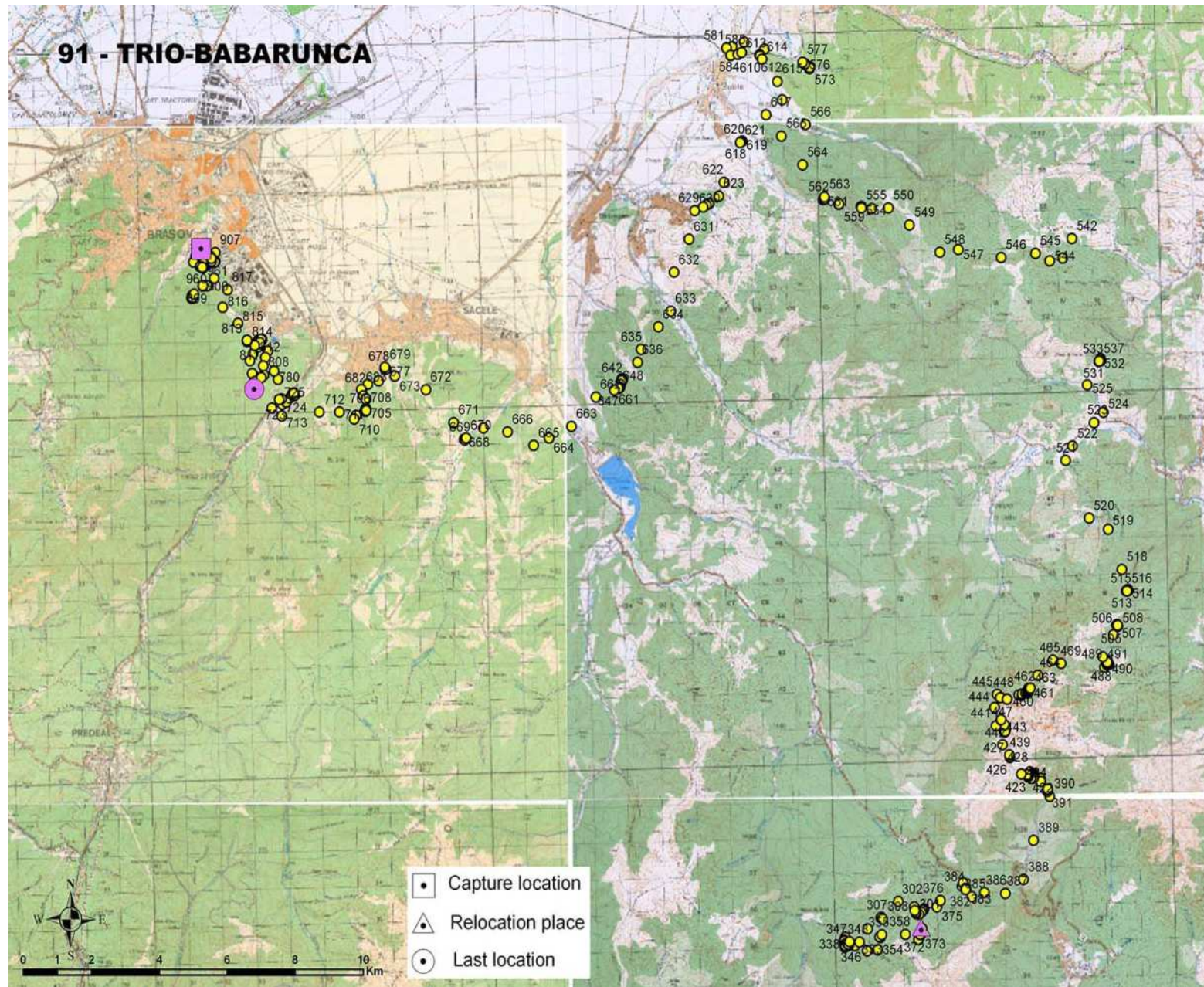








Babarunca trip to Brasov





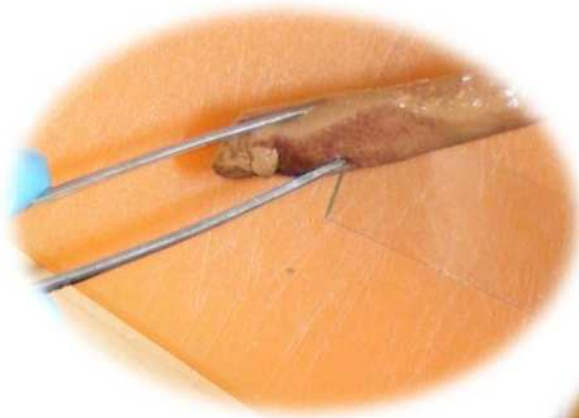
Comparison of heterozygosities (H_e) with other world populations

Population	n	H_e
Eastern and Southern Carpathians (Romania)	117	0.77
Kluane, Yukon	50	0.77
Scandinavia NS	108	0.70
Kuskokwim Range, Alaska	55	0.70
Scandinavia NN	29	0.69
Scandinavia S	156	0.68
Western Carpathians (Slovakia)	135	0.66
Scandinavia M	88	0.66
Yellowstone	57	0.54
Kodiak Island	34	0.22



Research material

§ 1020 tissue samples



**Sampling was carried by
hunting administrators
under derogation
obligations**

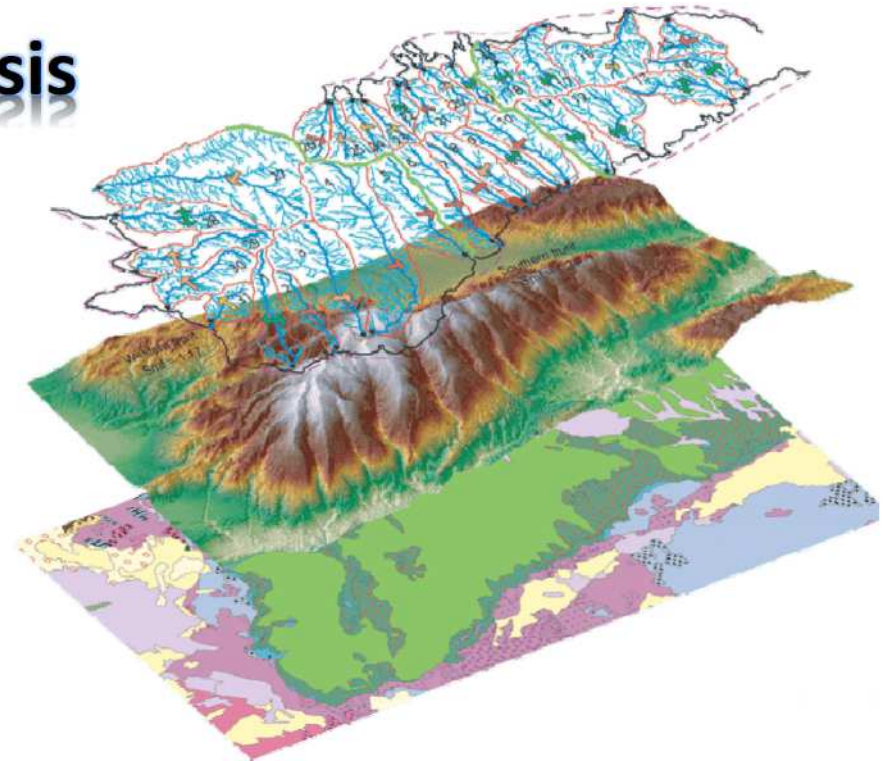


Research objectives

- 1. Evaluating genetic diversity using SSRs markers;**
- 2. Determining models of connectivity and the influence of natural/anthropogenic factors on gene flow (*landscape genetics*);**
- 3. Establishing management measures to mitigate the impact of infrastructure development over Romania's brown bear population and for species conservation;**

Landscape genetics analysis

- **Roads**
- Resistance: European roads with high traffic intensity
- **Human settlements**
- Resistance: big cities
- **Rivers**
- Resistance: big rivers and canals
- **Slope**
- Resistance: slope $>50^\circ$
- **Elevation**
- Resistance: < 500 m and >2000 m
- **Brown bear densities (no. ind/10000 ha)**
- **Forest cover**
- **Forest habitats**
- **Slope facing aspect**
- Resistance: South-eastern facing aspect
- Resistance: North-eastern facing aspect

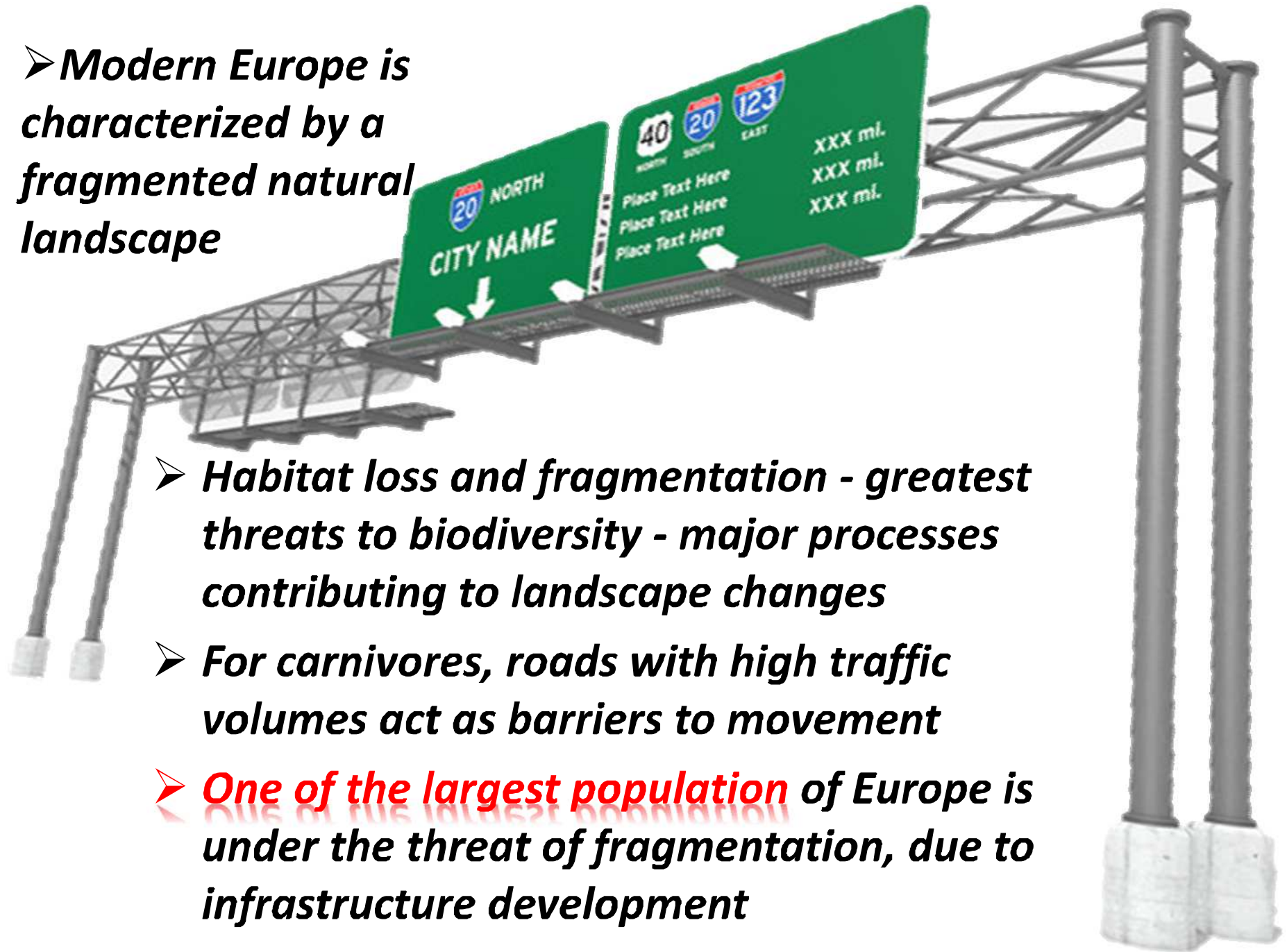


● Raster cell: 1km x 1km

● Power functions: $^{0.2}$,
 $^{0.4}$,
 $^{0.6}$,
 $^{0.8}$,
 lin ,
 2 ,
 3 ,
 4

● Resistance values: 100 to 1000

➤ ***Modern Europe is characterized by a fragmented natural landscape***

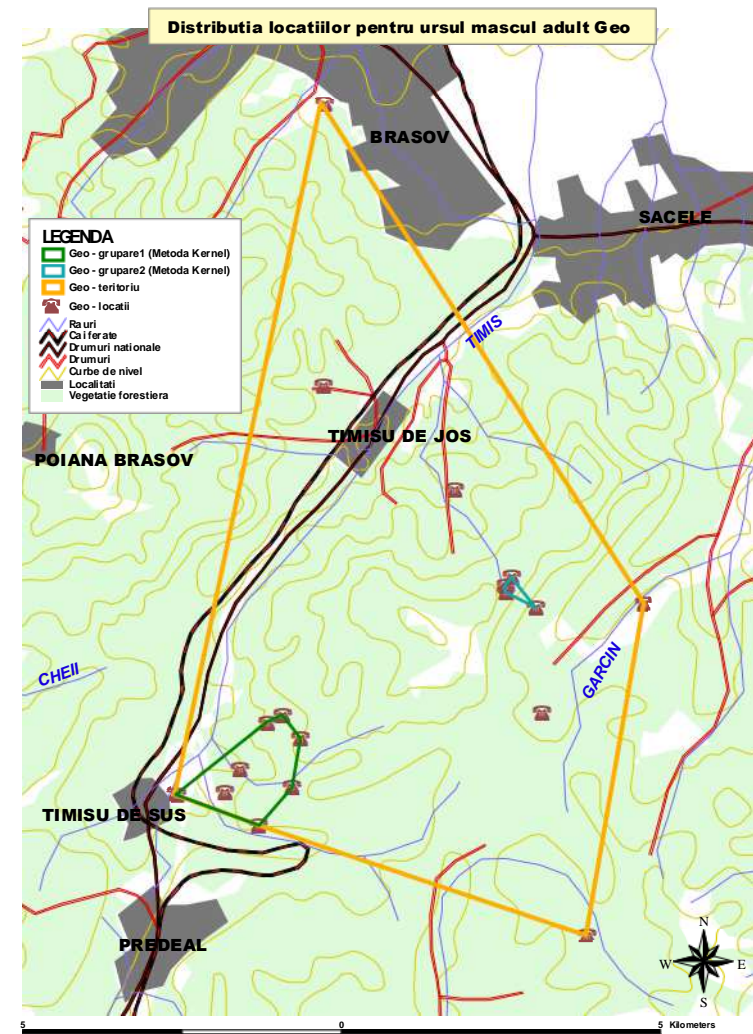


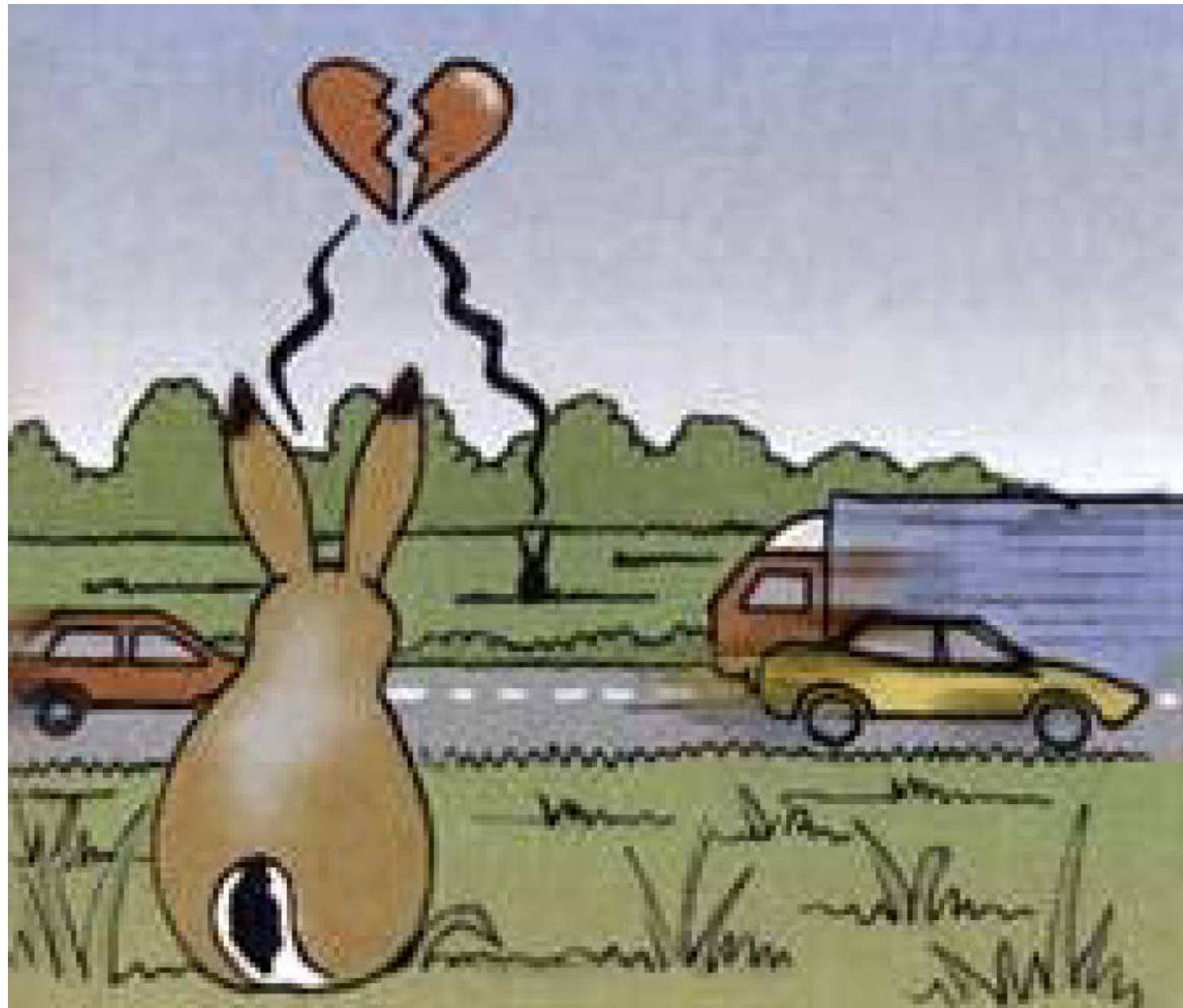
- ***Habitat loss and fragmentation - greatest threats to biodiversity - major processes contributing to landscape changes***
- ***For carnivores, roads with high traffic volumes act as barriers to movement***
- ***One of the largest population of Europe is under the threat of fragmentation, due to infrastructure development***

HABITATS CONSERVATION

Prioritary scientifically studies

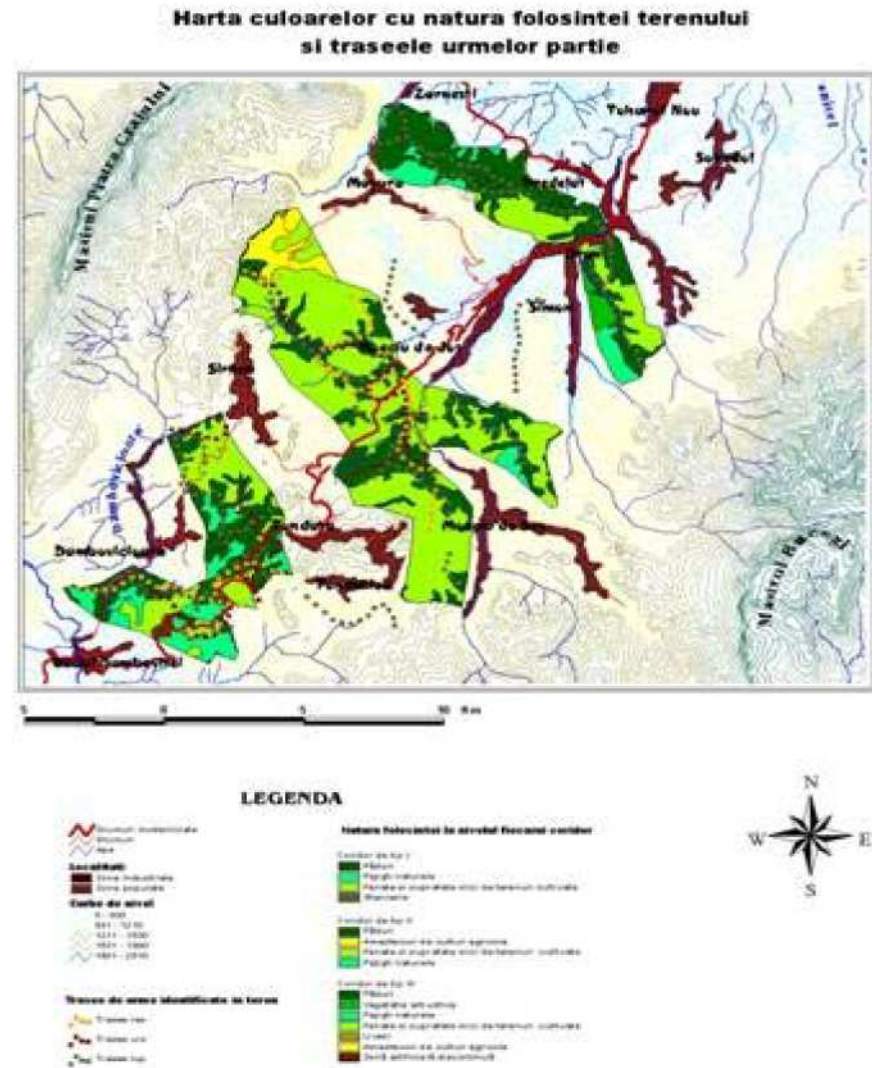
- type of habitats use, core areas and corridors
- ecological network for L.C.
- size of territory and overlapping
- ecological particularity of the population (birth rate, death rate, annual increase, etc.)
- genetic studies.





Avoidance of the habitat fragmentation

- all activities with potential negative impact for the L.C. habitats will be made under supervise and control of MMAP (Governmental Ordinance no. 195/2005)

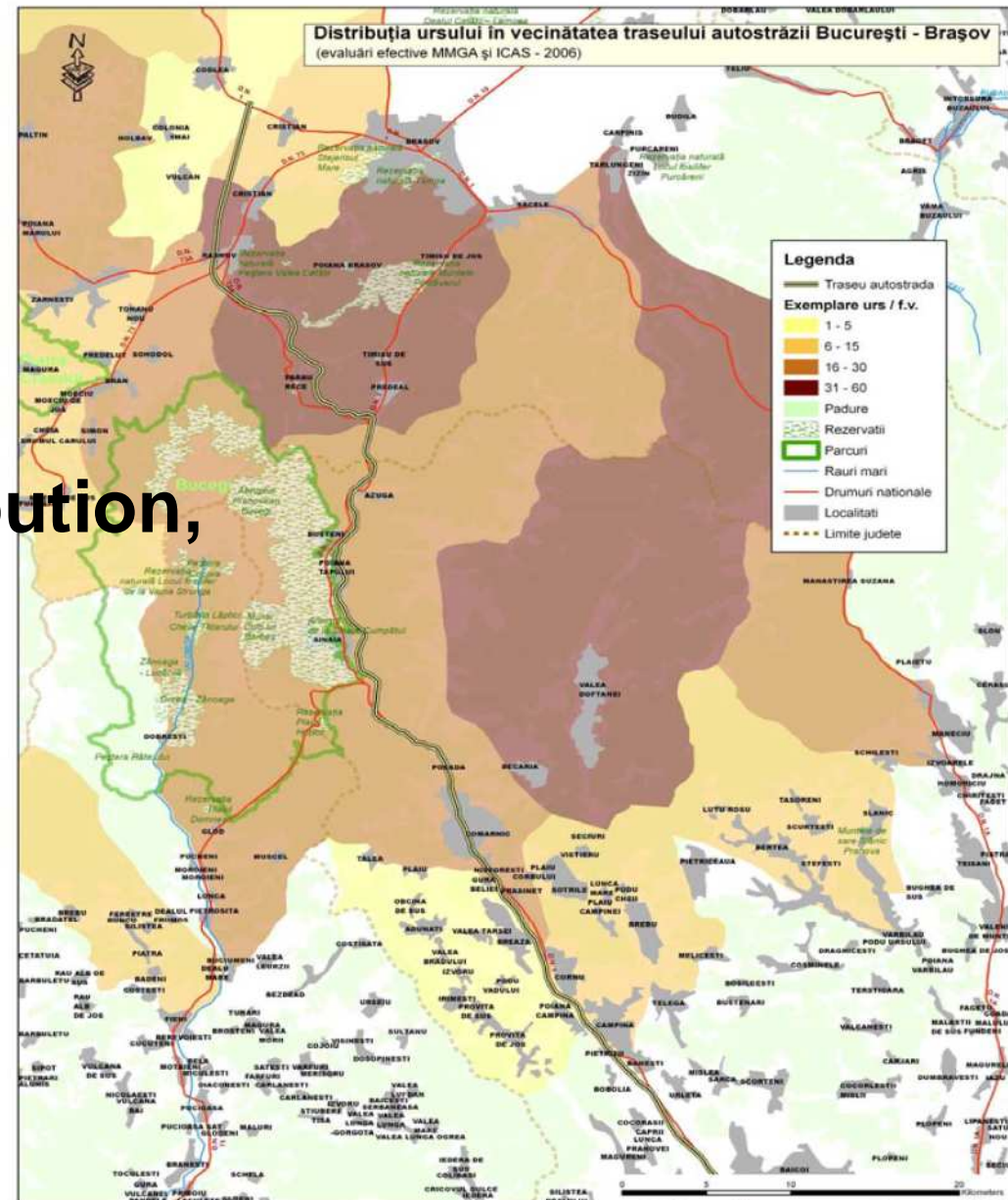




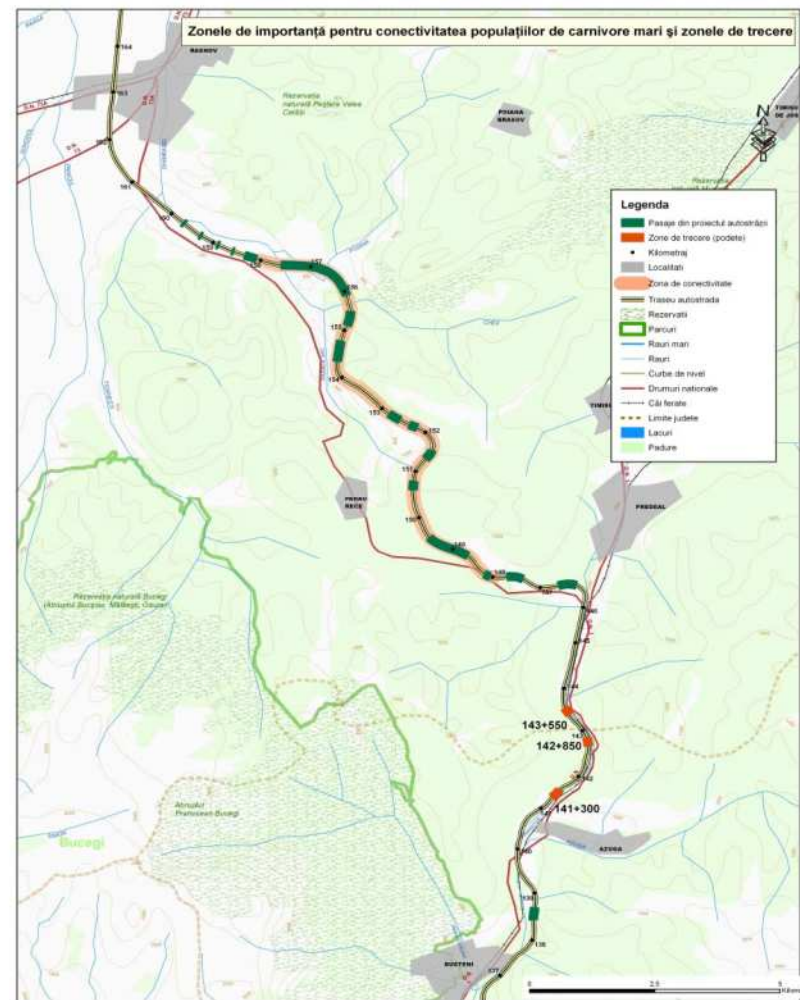
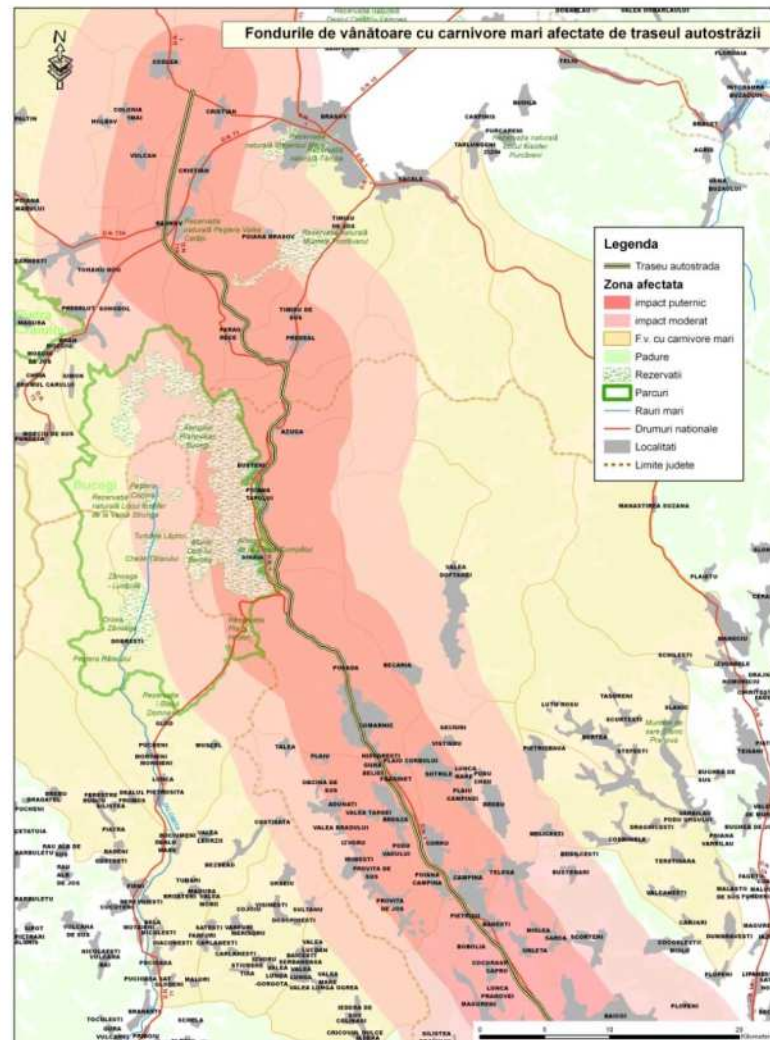
**Crossing corridors resulted from
predictive modeling validated by
telemetry dataset**

Case study
–high-way impact–
- Prahova valley -

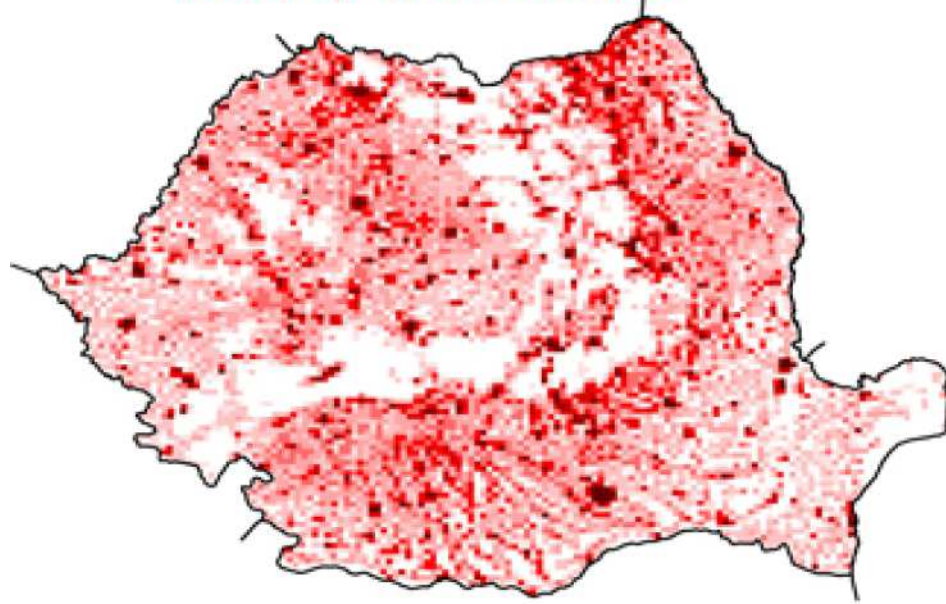
Large carnivore distribution,
Protected areas and
Infrastructure



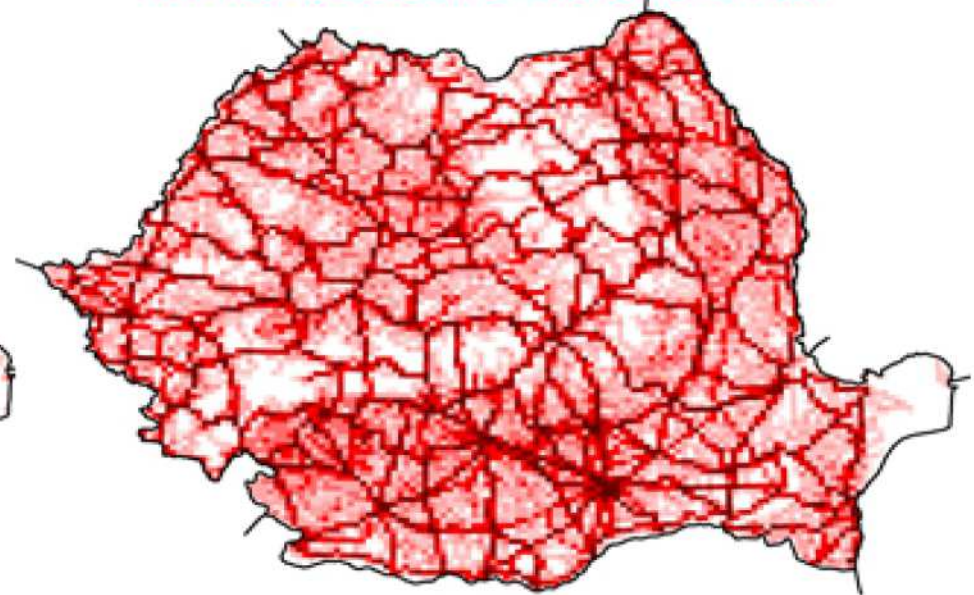
Establishment of the main connectivity areas in direct correlation with existent permeability conditions.



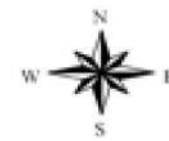
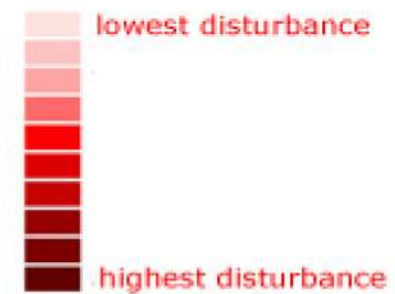
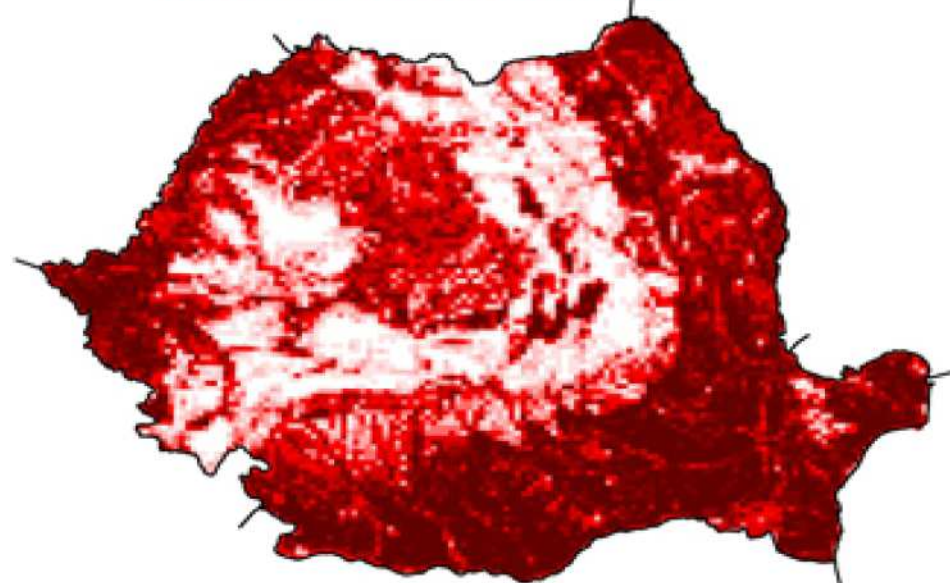
locality disturbance



infrastructure disturbance



habitat disturbance

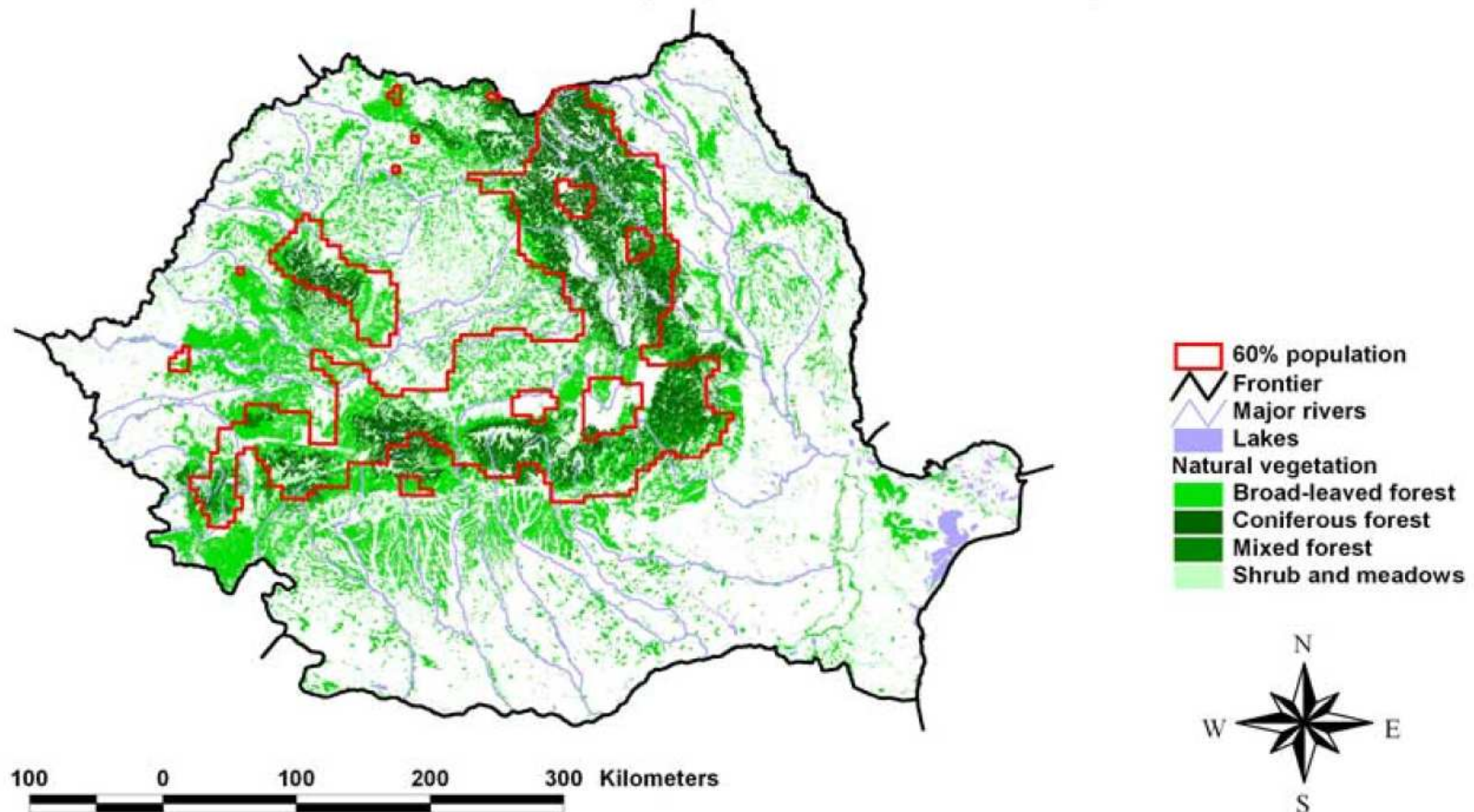


100 300 Kilometers

60% scenario

Marxan Results

Protects 60% of the population in clumps



Public and NGO's information





Ministry of Agriculture,
Forestry and Rural
Development



Ministry of Environment
and Water Management

Management and Action Plan for The Bear Population in Romania



The goal:
***To maintain, in
coexistence with
people, viable
populations of
large carnivores
as an integral
part of functional
ecosystems and
landscapes,
across
Carpathians***

Thank you for your attention

