Status and Trends for Large Carnivores in Europe

LCIE report for the UNEP-WCMC project
"Biodiversity Trends and Threats in Europe"

by the Large Carnivore Initiative for Europe

February 2004

Status and Trends for Large Carnivores in Europe

LCIE report for the UNEP-WCMC project
“Biodiversity Trends and Threats in Europe”

by the Large Carnivore Initiative for Europe

requested and funded by the UNEP World Conservation Monitoring Centre and the Netherlands Environment Assessment Agency (RIVM)

February 2004

Further copies of this report can be obtained from the UNEP-WCMC

For information about the Large Carnivore Initiative for Europe please contact:

Agnieszka Olszanska
LCIE coordinator
Institute of Nature Conservation PAS
Al. Mickiewicza 33, 31-120 Krakow, Poland
e-mail: olszanska@iop.krakow.pl

Table of contents:

1. Background of the UNEP-WCMC "Biodiversity Trends and Threats in Europe" project

At the 2002 World Summit on Sustainable Development in Johannesburg a target was set to reduce the rate of loss of biodiversity by 2010. In various EU and Pan-European policies similar or even more ambitious targets were set. However, it is still difficult to properly quantify the impact of human pressures on the status and trends of European ecosystems. Scientists and conservationists agree that pressures on European biodiversity have significantly increased in the last decades, but most of such statements are rather estimations and beliefs, than based on proper scientific studies.

The project 'Biodiversity Trends & Threats in Europe' aims to address this problem, by developing a policy-relevant, species-based biodiversity indicator for Europe and test it by mobilising existing data. Key to this indicator is the idea that biodiversity can be assessed through a core set of species. The average trend in the abundance of these species reflects the trend in biodiversity. The year 1970 is chosen as a starting point in time for the trends. To test the indicator data will be brought together for various species groups: breeding birds, butterflies, mammals and vascular plants. The reliability of the indicator values will be assessed by looking at the amount and quality of the data. Finally the project will make some suggestions on how the data can be improved in the future by setting up regular monitoring programmes.

2. Introduction and methods

The Large Carnivore Initiative for Europe (LCIE) offered the realisation of the "Large carnivore" part of the UNEP-WCMC project "Biodiversity Trends and Threats in Europe. Detailed information on the profile and activities of the Large Carnivore Initiative for Europe and LCIE Core Group members are listed in the appendices 1, 2, 3. Presented data have been consulted and corrected by LCIE experts.

Because of the significance of the species in European ecosystems, carnivore species have been chosen as representative and suitable for the project. Large carnivores are also species of particular economic importance and in many cases their presence influences nature conservation policy at local, national and international level. However, it should also be noted that large carnivores species are not "easy" indicators, due to their biological and ecological features (relatively big home ranges, in most cases transboundary, long dispersal rate, elusive behaviour, in many cases vulnerability to ecosystem changes), and also due to the numerous difficulties with data gathering (no regular census in many European countries, no monitoring systems).

2.1. Species

Data has been gathered for five European large carnivore species:

1. Brown bear (*Ursus arctos*)
2. Wolf (*Canis lupus*)
3. Wolverine (*Gulo gulo*)
4. Eurasian lynx (*Lynx lynx*)
5. Iberian lynx (*Lynx pardinus*)

2.2. Population numbers and population trend data

Population numbers

The study addresses large carnivores species numbers in the European countries for two time periods, 1970s (i.e. the period around the year 1970) and present (1995-2000) . In some cases data is also presented for intermediate or earlier years. Data has been presented per country. At the first stage of project designing, UNEP-WCMC proposed to present trends in species abundance 'per species, per habitat type*biogeoregion*country' but this condition was considered not feasible for large carnivores.

Most of data have been based on the Pan-European Action Plans for large carnivores elaborated by the LCIE experts for the Council of Europe and published in 2000 in the Council of Europe *Nature and Environment* series. All the data have been corrected and commented by LCIE experts. Other sources are listed below the resulting tables. The major difficulty with providing reliable and consistent data has been the fact that in last decades there were no coherent monitoring systems in almost none of European countries. Even currently, there are countries where data on population number are rather estimations than based on a proper census.

For the "present" situation most of data was given for 1995-2000 period, when gathered for "Action Plans". As mentioned above, all the data have been corrected by LCIE experts and in case of Eurasian lynx, Iberian lynx and wolverine it was possible to represent 2001-2003 census (data supported by KORA Switzerland and Spanish, Norwegian and Swedish LCIE experts). In case of brown bear and wolf, data are given as in "Action Plans", with corrections where necessary. For the period of 1970s data represent different previous censuses, also gathered in "Action Plans", yet in few cases data have not been consistent (thus, when possible, there are additional data series for given period). For the Eurasian lynx a set of data is given according to Kratochvil census from mid-1960s (Kratochvil et al. 1968).

Data on large carnivores are gathered by using standard methods for such field research – snow tracking, round year observations of animals' presence, recently telemetry and coordinated counts. Yet, as it was mentioned above, most of the figures on population numbers are estimations. Due to various counting methods, there can be significant differences between the numbers given by national

or local administration, by hunting associations, by environment protection organisations and researchers. There is no consistency in how the data have been gathered in particular countries. The considerable differences emphasise the need of further research.

Data quality

For each of the figures on population size an indication of the data quality is given, according to the following scale:

1 – reliable quantitative data – e.g. indices from well-designed monitoring schemes; total population counts

2 – limited quantitative data, some corrections and interpretations applied – e.g. indices from incomplete or biased counts, adapted with some expert judgement; atlas data, corrected for research intensity

3 – limited quantitative data, no corrections and interpretations applied – as category 2, but without corrections and interpretations

4 – extensive expert judgement – general agreement on the estimated figures

5 – limited expert judgement – no general agreement (no effort made, or no consensus)

6 – combination of quantitative data and expert judgement – This class can be applied when no explicit data for 1970 and present are given, but rather a trend estimate at once, based on a mix of quantitative data and expert judgement.

Population trend

From the population sizes in the 1970s and the present period the population trend can be calculated. In addition to this, also the short-term trend at the time of the census is given. The following categories are used: S – stable, I – increasing, D – decreasing, E – expanding.

2.3. Study area

Data has been gathered from the following 31 countries:

Brown bear: Portugal, Spain, France, Italy, Switzerland, Austria, Germany, Norway, Sweden, Finland, Poland, Estonia, Lithuania, Latvia, Belarus, Ukraine, *European Russia,* Czech Republic, Slovakia, Slovenia, Croatia, Bosnia – Herzegovina, Serbia & Montenegro (*Yugoslav Federation*), *Former Yugoslavia,* Hungary, Romania, Moldavia, Bulgaria, Greece, FYR Macedonia*,* Albania

Iberian lynx: Spain, Portugal

Wolverine: Norway, Sweden, Finland, European Russia

Eurasian lynx: France, Italy, Switzerland, Austria, Germany, Norway, Sweden, Finland, Poland, Estonia, Lithuania, Latvia, Belarus, Ukraine, European Russia, Czech Republic, Slovakia, Slovenia, Croatia, Bosnia –Herzegovina, Serbia & Montenegro (*Yugoslav Federation*), *Former Yugoslavia,* Hungary, Romania, Moldavia, Bulgaria, Greece, FYR Macedonia*,* Albania

Wolf: Portugal, Spain, France, Italy, Switzerland, Austria, Germany, Norway, Sweden, Finland, Poland, Estonia, Lithuania, Latvia, Belarus, Ukraine, European Russia, Czech Republic, Slovakia, Slovenia, Croatia, Bosnia – Herzegovina, Serbia & Montenegro (*Yugoslav Federation), Former Yugoslavia,* Hungary, Romania, Moldavia, Bulgaria, Greece, FYR – Macedonia*,* Albania

Due to political and thus administrative changes in Europe between 1970s and 2000, there were difficulties with appropriate data presentation. In case of Yugoslavia, Soviet Union and Czechoslovakia, data for 1970s were given for the former countries (in few cases it was possible to distinguish data on population numbers for particular formerly 'federal' countries).

2.4. Biogeographical regions and habitats

For the BTTE project the study area is categorised by combining 11 biogeographical regions (alpine, arctic, atlantic, boreal, continental, mediterranean, pannonian, steppic, black sea, anatolian, macaronesian) with the 10 major habitat types from the EUNIS Habitat Classification: 1. woodland and forest habitat and other wooded land; 2. heathland, scrub and tundra habitats; 3. grassland and tall forb habitats; 4. inland unvegetated or sparsely vegetated habitats; 5. mire, bog and fen habitats; 6. inland surface water habitats; 7. coastal habitats; 8. regularly or recently cultivated agricultural, horticultural and domestic habitats; 9. constructed, industrial and other artificial habitats; 10. marine habitats.

For each of the five species it has been indicated in which combinations of regions and habitats the populations occur. In most of the cases more than one category is chosen. Apart from the Iberian lynx, a species endemic to the Iberian Peninsula, European carnivores are not restricted to only one habitat or biogeographical region type and can occupy various habitats and various biogeographical regions.

2.5. Ecological Characteristics

For each of the five species a number of ecological characteristics have been given: trophic level (position in food chain), guild (carnivore, omnivore, etc.), dispersal distance, seasonal movements (migratory, sedentary, etc.), Minimum Viable Population area, causes of change in population numbers and trends, policy relevance, endemism and economic importance. Ecological features and characteristics have been given according to current knowledge about species biology and ecology, with experts corrections and consultations.

3. Results

Data on population numbers and trends (tables 1 to 5), and on habitats and biogeographical regions where large carnivore populations occur (tables 6 to 10) are presented at the end of this report, respectively for all five species. Sometimes more than one estimate for the population size was found for a species in a country. In that case the best estimate was chosen, according to LCIE experts' best knowledge on reliability of data sources and data collection methods. The alternative estimate is still presented in the tables as a comment. Table 11 presents an overview of the ecological characteristics of the species.

All data are gathered in one general table in the Excel format (enclosed to the electronic version of this report; document "BTTE data table LCIE.xls").

4. Towards regular monitoring of European large carnivores

In most of the European countries there is no continuous monitoring system of large carnivores. There is a system of "official population estimates" whereby the local forestry or hunting units report annually on the estimated numbers of individuals of a range of species present in their unit. These data are then compiled and reported through to central (or local) ministries or agencies. This represents a large system of observers, and may well provide an adequate system for following general tendencies in the population, which may be suitable for general management. However, there are reasons to question the interpretation of the real number of carnivores that are derived from the observations. For example, the methodology is often poorly described and is not standardized, there is a large possibility for double counting, and there is no independent control of the quality or accuracy of the data. In some countries where the large carnivores are not regarded as being "game" species (for example Hungary, Austria or the Czech Republic) the collection of data follows similar pathways, but is organized by individual researchers rather than the state forest services. The challenge would be to build on this existing system to obtain data that is solid.

There is a clear need to continually monitor large carnivore populations development. Especially in harvested populations, where poaching pressure can be locally high, the existence of good monitoring data will allow adaptive management of the population, such that actions can be taken to reverse undesired trends. Although much management can be conducted with simple indices of trend, there is a need to have a good idea of the actual numbers of animals as well.

Creation of such a monitoring system would be a considerable challenge, because of the differences in size, number of countries, and general socio-economic situation of the different European eco-regions.

The LCIE experts propose a two-tiered system of monitoring:

(1) Total distribution area. Throughout the eco-regions (like Alps, Carpathians, etc.) we propose that the present country-based "official population estimates" systems should continue, as they provide a foundation for local management of the various species and are well established. However, we would like to see a set-up that allows concrete records of species presence (tracks in the snow, shot animals, depredation events on livestock, animals killed in traffic collisions, direct observations) to be recorded (with time and location) on special data-sheets and transmitted directly to a central, independent agency within each country. From here the data should be entered into a national database and made available for ecoregional level reporting. From this data it will be possible to extract a detailed overview of distribution (on a 10x10km grid) (similar to the SCALP system elaborated by KORA, Switzerland, Breitenmoser et al. 2000). Distribution data can be used to monitor gross changes in population size, and is very useful for conservation planning. Using knowledge of species home range size it will also be possible to obtain some approximate estimates of the number of animals present within the distribution area. It would be desirable to separate between observations of reproductive units and of single animals. Knowledge of distribution is the most basic level of knowledge that could be regarded as being acceptable.

(2) Reference areas – sampling sites. It would be highly desirable to augment this total distribution area monitoring with more detailed data from a network of sampling sites that represent the diversity

of habitats from the ecoregions. Within these areas it would be possible to set up some trend monitoring systems (for example track counts) along a fixed network of transects and to obtain more accurate counts or estimates of species density. For lynx and wolves the application of intensive snow-tracking can be accurate and cost-effective, and DNA based analysis of individual identity from scats can be especially useful for bears (and the other species). The interpretation of data from these sampling sites could also be helped if some small-scale telemetry studies were conducted. As well as building the foundation for a data series to follow changes over time, the availability of accurate density estimates from a range of sites would aid the extrapolation from distribution area to possible total population size.

Elaboration of such a complex monitoring system would require appropriate objectives and conditions. There should be funding provided, for data gathering, collection and finally coordinated interpretation. On-line data bases would be an ultimate goal of national/regional monitoring systems. Simple data sheets, suitable for the individual forestry / hunting units as well as instructions for their use should be designed. This would require obtaining a detailed GIS based map of all units, where monitoring would be carried out (to allow the unit's datasheet to be accompanied by an individual map to mark the location of observations). Data flow procedures should be established in each country. Simple field instructions for the sampling sites, presenting a range of methods that can be used under various conditions should be developed. A reporting and analysis system should be also developed.

5. References

ARCTUROS. 2002. Protected areas in the Southern Balkans. ARCTUROS, Greece.

Boitani L. 2000. Action Plan for the conservation of wolves in Europe. CoE EE No. 113.

Breitenmoser U. and Breitenmmoser-Wursten Ch. 1990. Status, conservation needs and reintroduction of the lynx in Europe. CoE NE No. 45

Breitenmoser U., Breitenmoser-Würsten Ch., Okarma H., Kaphegyi T., Kaphygyi-Wallman U., Müller U. M. 2000. Action Plan for the conservation of Eurasian lynx in Europe. CoE NE No. 112

Council of Europe. 1989, Workshop on the situation and protection of the brown bear in Europe. CoE EE No. 6.

Council of Europe. 1990. The situation, conservation needs and reintroduction of lynx in Europe – Proceeding of the seminar in Neuchâtel, Switzerland, 17-19 October 1990. CoE EE No. 11.

Council of Europe. 1992. Status and conservation of the pardel lynx (*Lynx pardina*) in the Iberian peninsula, 1992 ICONA report. CoE NE No. 55

Delibes M., Rodríguez A., Ferreras P. 2000. Action Plan for the conservation of the Iberian lynx in Europe. CoE NE No. 111

European Wolf Network. 1992. Wolves in Europe – current status and perspectives. Proceedings of the workshop. Obermmergau, Germany.

Ginsberg J.R., Macdonald D.W. (eds.). 1990. Foxes, Wolves, Jackals, and Dogs – An Action Plan for the Conservation of Canids. IUCN/SSC Canid Specialist Group, IUCN Publications, Gland, Switzerland.

Glittelman J.L., Funk S. M., Macdonald D.W., Wayne R.K. (eds.). 2001. Carnivore conservation. Cambridge, UK.

Hell P. 1968. Population density of the lynx in the Czechoslovakian Carpathians. Acta Sc. Nat. Brno 5/6: 57-66.

IUCN. 1975. WOLVES – Proceedings of the 1st Working Meeting of Wolf Specialists of the 1st International Conference on conservation of the Wolf.

Jędrzejewski W., Nowak S., Schmidt K., Jędrzejewska B. 2002. Wilk i rys w Polsce - wyniki inwentaryzacji w 2001 roku. [Wolf and lynx in Poland – inventory census results in 2001]. Kosmos, 51 (4): 491-499. in Polish with English summary

KORA. 2004. Status and distribution of the Eurasian Lynx (Lynx lynx) in Europe in 2001. KORA, Muri, Switzerland (in print).

Koubek P., Červeny J. 1996. Lynx in the Czech and Slovak Republics. Institute of Landscape Ecology, Brno, 1-78

Kratochvil, J. et al. 1968. Recent distribution of the lynx in Europe. Acta Sc. Nat. Brno, 2 (5/6): 1-74.

Landa A., Lindén M., Kojola I. 2000. Action Plan for the conservation of wolverines in Europe. CoE EE No. 115.

Okarma H., Dovhanych Y., Findo S., Ionescu O., Koubek P., Szementhy L. 2000. Status of the carnivores in the Carpathian Ecoregion. WWF Carpathian Ecoregion Initiative.

Proceedings of the "International Seminar on Iberian lynx", Andújar (Spain), 29-31 October 2002 (in preparation).Rodríguez A. and Delibes M. 1992. Current range and status of the Iberian lynx (*Felis pardina* Temminck, 1824) in Spain. Biol. Conserv., 61: 189-196.

Rodríguez A., Delibes M. 1990. El lince ibérico (*Lynx pardina*) en España. Distribución y problemas de conservación. ICONA, Colección Técnica, Madrid.

Servheen C., Herrero H., Peyton B. (eds.). 1998. Bears: Status, Survey and Conservation Action Plan. IUCN/SSC Bear and Polar Bear Specialist Groups, IUCN Publications, Gland, Switzerland.

Swenson J. E., Gerstl N., Dahle B., Zedrosser A. 2000. Action Plan for the conservation of the brown bear in Europe (*Ursus arctos*). CoE NE No. 114.

Zimen E., Boitani L. 1975. Number and distribution of wolves in Italy. Z. Saugetierkunde 40: 102-112.

T-PVS (2001) 73 "Status of Large Carnivore Conservation in the Baltic States" Council of Europe

Results tables:

Tab. 1. Number of wolves (*Canis lupus*) in Europe and populations trends (1970s and present situation).

Population estimates are presented according to best available data. In some cases alternative population estimates are presented in the comments.

1 – reliable quantitative data, 2 – limited quantitative data, some corrections and interpretations applied, 3 – limited quantitative data, no corrections and interpretations applied, 4 – extensive expert judgement, 5 – limited expert judgement, 6 – combination of quantitative data and expert judgement

S – stable, I – increasing, D – decreasing, E – expanding

country	number of individuals - present	population trend – present	data quality - present	number of individuals - 1970	data quality - 1970	number of individuals - other years (late 1980s census)	data quality - other years	comment – present	comment – 1970
Portugal	200-300[1]	S	4	?	?	150[2]	4		
Spain	1700-2500[1]	I	2	?/(200-600)[2]	?	1500-2000[5]	4		
France	30-40[1]	I	2	0[2], [3]	?	0	4		Extinct since 1939
Italy	400-500[1]	I	2	100[2], [4]	?	250[5]	3		acc. to Zimen & Boitani 1973 census; other estimations 200-300
Switzerland	0[1]	-	2	0[2]	?	?	5	sporadic migrants from Italy (due to current Swiss law regularly killed)	
Austria	0[1]	-	5	0[2], [3]	?	?	5		extinct in Austrian Alps since XIX c.
Germany	10-15[1]	I	1	0[2], [3]	?	0	4		extinct since 1847
Norway	13-18[1]	I/S	1	?/0[2], [3]	?	<10[5]	4		extinct since 1940
Sweden	50-70[1]	I	3	few[2]	?	?	5		
Finland	100[1]	I/S	3	10[2]	?	<100[5]	4		
Poland	600-700[1], [6]	I	2	100[2]	?	900[5]	3	460-570 acc. to 2001 census by Jedrzejewski et al.	
Estonia	<500[1]	D/S	2	*(Soviet Union at time) few*[2]	?	*Soviet Union at time*	5		few in Estonia in 1970s
Lithuania	600[1]	I	2	*Soviet Union at time*	?	*Soviet Union at time*	5		
Latvia	750[1]	S	2	(*Soviet Union at time*) 50[9]	?	*Soviet Union at time*	5	conservation of the Wolf. IUCN 1975	50 in Latvia in 1970s
Belarus	2000-2500[1]	I/S	5	*Soviet Union at time*	?	*Soviet Union at time*	5		
Ukraine	2000[1]	I/S	5	*Soviet Union at time*	?	*Soviet Union at time*	5		
European Russia	no data/?	no data	?	*Soviet Union at time* -10000[2]	?	*Soviet Union at time* - 20000[5],[7]	5		acc. to D.I.Bibikov census from late 1960s: 1450 - Western population, 4500 - pre- and Caucasus population, 600 - Volga region population, 1150 - Central Russia region population, 1300 - North-West region population, 800 - Ural population

[1] Boitani L. 2000. Action Plan for the conservation of wolves in Europe. CoE EE No. 113 (census 1995-2000)
[2] WOLVES proceedings of the 1st Working Meeting of Wolf Specialists of the 1st International Conference on conservation of the Wolf. IUCN 1975
[3] J.L. Glittelman, S. M. Funk, D. Macdonald, R.K. Wayne (ed.). 2001. Carnivore conservation, Cambridge, UK
[4] Zimen E., Boitani L. 1975, Number and distribution of wolves in Italy.Z. Saugetierkunde 40 (1975) 102-112
[5] J.R. Ginsberg and D.W. Macdonald (ed.) 1990. Foxes, Wolves, Jackals, and Dogs - An Action Plan for the Conservation of Canids. IUCN/SSC Canid Specialist Group. IUCN Publications, Gland, Switzerland
[6] Jedrzejewski et al. 2002, "Wilk i rys w Polsce - wyniki inwentaryzacji w 2001 roku" Kosmos, 51 (4): 491-499 in Polish with English summary
[7] "Wolves in Europe - current status and perspectives" - proceedings of the workshop, Obermmergau, Germany, 2-5 April 1992, European Wolf Network

Czech Republic	<20[1]	I	3	*Czechoslovakia at time* - 100[2]	?	(*Czechoslovakia at time*)100[5]	5	
Slovakia	350-400[1]	S	3	*Czechoslovakia at time*	?	*Czechoslovakia at time*	5	
Slovenia	30-50[1]	I	3	*40*	?	*Yugoslavia at time*	5	
Croatia	130-170[1]	I	3	*50*	?	*Yugoslavia at time*	5	
Bosnia - Herzegovina	400?[1]	D/S	2	*800*	?	*Yugoslavia at time*	5	
Serbia & Montenegro	500?[1]	?	2	*500*	?	*Yugoslavia at time*	5	
Former Yugoslavia	1000[1]	I/S	2	-	?	*Yugoslavia at time >2000*[5]		only kill rates available: 1345 in 1970, 1913 in 1969
Hungary	<50[1]	S	4	23[2]	?	? extinct[5]	5	
Romania	3000[1]	S	3	1500[2]	?	2000[5]	3	
Moldavia	no data	no data	?	*Soviet Union at time*	?	*Soviet Union at time*	5	
Bulgaria	800-1000[1]	S	4	?	?	100[5]	4	official estimates are 1670-1800
Greece	1500-2000[1], [8]	S	4	300-500[2]	?	>500[5]	4	1000-1200 acc. to [8] 800 in 1970s; 3000 animals acc. to Min. of Agriculture 1980 census [8]
FYR - Macedonia	800[1]	I/S	6	*Yugoslavia at time*	?	*Yugoslavia at time*	5	
Albania	250[1]	I	6	?	?	? no data	5	900-1200 acc. to [8] no data at time (no monitoring system)

[8] "Protected areas in the Southern Balkans" 2002, ARCTUROS
[9] Council of Europe T-PVS (2001) 73 "Status of Large Carnivore Conservation in the Baltic States"

Tab. 2. Number of brown bears (*Ursus arctos*) in Europe and populations trends (1970s and present situation).

Population estimates are presented according to best available data. In some cases alternative population estimates are presented in the comments.

1 – reliable quantitative data, 2 – limited quantitative data, some corrections and interpretations applied, 3 – limited quantitative data, no corrections and interpretations applied, 4 – extensive expert judgement, 5 – limited expert judgement, 6 – combination of quantitative data and expert judgement
S – stable, I – increasing, D – decreasing, E – expanding

country	number of inds - present	population trend - present	data quality - present	number of inds - 1970	population trend	data quality	comment - present	comment – 1970	comment - other years
Portugal	0[1]			?[4]	?	5			
Spain	70-85[1]	S/D	2	?	?	5	50-65 - W Cantabrian Mts., 20 E - Cantabrian Mts., few - W Pyrenees	in lowland Spain extinct since XVII century[2]	1982 census[6]: 29 - Eastern Cantabrian Mts.; 82-89 - Western Cantabrian Mts.; ? - Pyrenees
France	8-10[1]	S/I	2	23-30/(?)[4]	?	5	15-18 Western Pyrenees ; 8-12 Eastern Pyrenees		
Italy	40-80[1]	I/?	5	80-100[4]	?	5	Decreasing in Southern Alps; Increasing in Alps-Dinana-Pindos range	45-80 in Abruzzi NP, 10 in Trentino, 110 - data from 1979 International Council for Game and Wildlife Conservation (CIC) census	1985 census: 80-90 whole population, with 49 in Abruzzi NP and 10 in Trentino province [Abruzzi population: 1970 - 70-100; 1981 - 45-80; 1983 – 50[5]
Switzerland	0[1]		4	0[2]	?	4		extinct since 1916	
Austria	23-28[1]	I	3	sporadic migrants[2]	?	4		only sporadic after extermination in XIXth century	
Germany	0[1], [2]		2	0[2]	?	4		extinct since 1912	
Norway	26-51[1]	S/I	3	few[4]	?	4		almost extinct after 1920; in late 80s 10-20 bears	
Sweden	1000[1]	I	3	400-600[4], [5]	?	4			
Finland	800-900[1]	I	4	400[4]	?	4	430-600 acc. to IUCN Action Plan for bears (1998)		
Poland	100[1], [3]	S	3	30-40[4]	?	4		10-14 in 1960s ; 60 in 1980s ; 40 in 1979 International Council for Game and Wildlife Conservation (CIC) census	
Estonia	440-600[1]	S	3	*Soviet Union at time*	?	?			
Lithuania	0[1]		4	*Soviet Union at time*	?	?			
Latvia	4-10[1]	S	3	*Soviet Union at time*	?	?			
Belarus	250 (120?)[1]	?	5	*Soviet Union at time*	?	?			
Ukraine	400 (970?)[1], [3]	D	5	*Soviet Union at time*	?	?			

[1] Swenson et al. 2000. Action Plan for the conservation of the brown bear in Europe (Ursus arctos). CoE NE No. 114

[2] J.L. Glittelman, S. M. Funk, D. Macdonald, R.K. Wayne (ed.). 2001. Carnivore conservation, Cambridge, UK

[3] Okarma et al. 2000. Status of the carnivores in the Carpathian Ecoregion, WWF Carpathian Ecoregion Initiative

[4] C. Servheen, H. Herrero and B. Peyton. 1998. Bears: Status, Survey and Conservation Action Plan. IUCN/SSC Bear and Polar Bear Specialist Groups, IUCN Gland, Switzerland.

European Russia	36000[1], [4]	I/?	5	*Soviet Union at time*	?	5			
Czech Republic	2-3[1]	?	5	*Czechoslovakia at time* - 400[4]	?	4			
Slovakia	700[1], [3]	I	4	*Czechoslovakia at time*	?	4			
Slovenia	500[1]	S	3	300	I	4			
Croatia	600[1]	S	3	400	I	4			
Bosnia - Herzegovina	600[1]	D/?	5	1200	S	4			
Serbia & Montenegro	300[1]	D/?	5	400	S	5			
Former Yugoslavia	?			2000	?	4		2000[5]; 2600 - data from 1979 International Council for Game and Wildlife Conservation (CIC)	
Hungary	0[1], [3]	?	2	?	?	?	only sporadic occurrence		
Romania	6600[1], [3]	D	4	4200[4]	?	4		1970 - 4200 ; 1975 - 3850 ; 1980 - 6000 (National Forest Service data)	
Moldavia	no data	?	5	*Soviet Union at time*	?	5			
Bulgaria	700[1]	D	4	400-500[4]	?	4	500 - Rila-Rhodope Mts.; 200 - Stara Planina Mts.		450 inds. in 1950s, 600 inds. in 1980s
Greece	110-145[1], [6]	D	4	?	?	5	130-160 [6]	no data at the time (no monitoring system)	
FYR Macedonia	100[1], [5], [6]	D/?	5	100	S	5	160-200 [6]	1	
Albania	250[1]	S	5	30[4]	?	5			

[5] Proceedings of the "Workshop on the situation and protection of the brown bear in Europe" 1989 CoE EE No 6

[6] "Protected areas in the Southern Balkans" 2002, ARCTUROS

Tab. 3. Number of Eurasian lynx (*Lynx lynx*) in Europe and populations trends (1970s and present situation).

Population estimates are presented according to best available data. In some cases alternative population estimates are presented in the comments.

1 – reliable quantitative data, 2 – limited quantitative data, some corrections and interpretations applied, 3 – limited quantitative data, no corrections and interpretations applied, 4 – extensive expert judgement, 5 – limited expert judgement, 6 – combination of quantitative data and expert judgement

S – stable, I – increasing, D – decreasing, E – expanding

country	number of inds - (2001 census)	population trend 1996-2001	data quality - present	number of inds - 1970	population trend	data quality	number of inds - (mid 1960s)	trend mid 1960s	comment - present	comments – 1970s and other years
France	70-130[1]	E	2	0[2, 3]	?	4	?	?	? - Western Alps; 50-150 Jura Mts. Population ; 10-50 - Vosges Mts. Population; few - Palatinian Forest; few - Metz occurrence; population decreasing in Northern Vosges	extinct in French Pyrenees since 1960; extinct in French Alps since 1900-1950 acc. [3], yet in both locations there was probability of still existing populations (?) ; French Jura Mts. recolonised from re-established Swiss Jura population (after 1974); Vosges Mts. - reintroduction programme started in 1988, 14 lynx released.
Italy	14[1]	S/I	2	0[2, 3]	?	4	?	?	Alpine eastern sub-pop.: 10; Alpine western sub-pop.: 3; Trentino occ.: 1; Abruzzi occ.: ?; Alpine Eastern sub-pop.: increasing & expanding; Alpine Western sub-pop.: stable	Extinct in Italian Alps since 1930 acc. [3]; reintroduction attempt in 1974 (Gran Paradiso, 2 lynx released) ; in early 1980s spontaneous re-immigrations occurred both from Switzerland and Slovenia.
Switzerland	90-95[1]	S/E	1	0[2]	?	4	?	?		
Austria	24[1]	?	2	0[2, 3]	?	4	?	?	Alpine pop.: 20; Bohemian-Bavarian pop.: 4; Alpine pop.: trend depends on area; Bohemian-Bavarian pop.: decreasing	Extinct since XVIII/XIX century acc. [3]; reintroduced to Austria in 1976 [2]. 9 lynx were released in Styria district.
Germany	28-31[1]	D	4	0[2, 3]	?	4	?	?	Bohemian-Bavarian pop.: 12; Vosges-Palatinian pop.: 3-4; Laberiver Sandstone Mts. occ.: 1-3; Black Forest occ.: a few individuals; Harz occ.: 12; population trends : unknown for Black Forest and increasing in Harz Mts. (Re-introductions since 2000)	extinct since XIX century acc. [3]; in German Democratic Republic - only sporadic observations occurred along the Czech border ; in Federal Republic of Germany - reintroduced in 1970 (clandestine reintroduction) 5 individuals, Bavarian Forest NP.
Norway	330[1]	S/D	1	150[2]	I	4	150[4]	E/I	There are evidences of intensive hunting.	
Sweden	1400-1800[1]	S/E	4	500-1200[2]	?	5	250[4]	E/I		
Finland	870[1]	I/E	4	?[2]	?	?	30-40[4]	E/I	850-1000 - official estimation	
Poland	180[1, 5]	D	2	250[2]	?	4	250-330[4]	?	200 acc. to 2001 census by Jedrzejewski et al.	
Estonia	900[1]	D	2	200[2, 10] (*Soviet Union at time*)	?	?	100[4]	D	1200 - hunters' estimation	200 in 1970s [T-PVS (2001) 73 "Status of Large Carnivore Conservation in the Baltic States" Council of Europe]

[1] Breitenmoser et al. 2000. Action Plan for the conservation of Eurasian lynx in Europe. CoE NE No. 112 (1995 census) ; corrected by KORA "Status and distribution of the Eurasian Lynx (Lynx lynx) in Europe in 2001", KORA (2004, in preparation) (2001 census)
[2] Breitenmoser U. and Breitenmmoser-Wursten Ch. 1990. Status, conservation needs and reintroduction of the lynx in Europe. CoE NE No. 45
[3] J.L. Glittelman, S. M. Funk, D. Macdonald, R.K. Wayne (ed.). 2001. Carnivore conservation, Cambridge, UK
[4] Kratochvil et al. 1968: Recent distribution of the lynx in Europe. Acta sc. nat. Brno, 2 (5/6): 1-74.
[5] Jedrzejewski et al. 2002, "Wilk i rys w Polsce - wyniki inwentaryzacji w 2001 roku" Kosmos, 51 (4): 491-499 in Polish with English summary

Lithuania	103[1]	D	2	150[10] (*Soviet Union at time*)	?	?	45[4]	S/D	150 in 1970s [T-PVS (2001) 73 "Status of Large Carnivore Conservation in the Baltic States" Council of Europe]
Latvia	648[1]	S	1	(*Soviet Union at time*)	?	?	39[4]	D	
Belarus	? [250][1]	D/?	5	(*Soviet Union at time*)	?	?	23-52[4]	I	
Ukraine	250-260[1]	D	5	(*Soviet Union at time*)	?	?	90-100[4]	D	
European Russia	?	?	?	(*Soviet Union at time*)	?	?	?	?	36000-40000 in late 1980s acc. [6] Murmansk: 11 lynx; Karelia: 500; Leningrad: 400; Novgrorod: 600-700; Pskov: 83
Czech Republic	120[1]	D/S	4	*Czechoslovakia at time* - 500-600[2]	?	3	(*Czechoslovakia at time*) 300[4]	D	Bohemian-Bavarian pop.: 60; Carpathian pop.: 40; Jeseniky Mts. occ.: 10; Laberiver Sandstone Mts. occ.: 10 ; population trends: decreasing: Bohemian-Bavarian pop. & Laberiver Sandstone Mts. occ.; stable: Carpathian & Jeseniky Mts. occ.	1962/63 census - 800 [7]; 10-20 Czech Republic, 500-600 Slovakia (482 according to the Forest Administration in 1972) [8]
Slovakia	400[1]	D	4	*Czechoslovakia at time*	?	3	*Czechoslovakia at time*	?	800-1000 hunters' estimation
Slovenia	50[1]	S/D	4	*Yugoslavia at time* - ?[2]	I (after 1973)	5	?	?	Dinaric part: 40; Alpine part: 10	1980s estimation of autochthonous population is 200 animals. ; In Slovenia, 6 individuals were re-introduced in 1973. In late 1980s the number of lynx is believed to be 150-300.
Croatia	40-60[1]	D	4	*Yugoslavia at time*	I (after 1973)	5	?	?	150-200 - hunters' estimation
Bosnia - Herzegovina	40[1]	S	5	*Yugoslavia at time*	I (after 1973)	5	?	?	
Serbia & Montenegro (*Yugoslav Federation*)	80[1]	E/D	4	*Yugoslavia at time*	?	5	?	?	Carpathian pop.: 45; Balkan pop.: 30; Western Serbia occ.: 5 ; population trend: Carpathian pop.: increasing & expanding; Balkan pop.: decreasing; Western Serbia occ.: increasing & expanding
Former Yugoslavia	?	?	?	*Yugoslavia at time*	?	?	50-70[4]	I	40 - Eastern Serbia; 30 - Balkan population
Hungary	1-5[1]	?	2	0[2]	?	5	?	?	eradicated in XIX century; occasional immigrants were observed
Romania	2050[1]	S	4	800[2]	?	4	1000[4]	S	1620 - official estimation
Moldavia	?	?	?	*Soviet Union at time*	?	?	?	?	
Bulgaria	single indiv.[1], [9]	?	2	0/?[2], [9]	?	5	?	?	probably extinct since 1940 acc. to "Protected areas in the Southern Balkans" 2002, ARCTUROS

[6] "The situation, conservation needs and reintroduction of lynx in Europe" proceeding of the seminar in Neuchâtel, Switzerland, 17-19 Oct. 1990. CoE Environmental Encounters No. 11.
[7] Hell P. 1968. Population density of the lynx in the Czechoslovakian Carpathians.. Acta Sc. Nat. Brno 5/6: 57-66.
[8] Koubek P., Cerveny J. 1996. Lynx in the Czech and Slovak Republics. Institute of Landscape Ecology, Brno, 1-78
[9] "Protected areas in the Southern Balkans" 2002, ARCTUROS
[10] T-PVS (2001) 73 "Status of Large Carnivore Conservation in the Baltic States" Council of Europe

Greece	0[1]	?	6	0[2], [3]	?	5	?	?	no confirmed evidence, only a few unconfirmed observations	probably extinct since 1970 acc. [3]
FYR Macedonia	35[1]	D	4	40/? [2]	D	5	?	?	50-60 acc. to "Protected areas in the Southern Balkans" 2002, ARCTUROS	Yugoslavia at time - 120 acc. to "Protected areas in the Southern Balkans" 2002, ARCTUROS
Albania	15-25[1]	unknown	5	? [2]	?	5	?	?	no data at time (no monitoring system)	

Tab. 4. Number of Iberian lynx (*Lynx pardinus*) in Europe and populations trends (1970s and present situation).

Population estimates are presented according to best available data. In some cases alternative population estimates are presented in the comments.

1 – reliable quantitative data, 2 – limited quantitative data, some corrections and interpretations applied, 3 – limited quantitative data, no corrections and interpretations applied, 4 – extensive expert judgement, 5 – limited expert judgement, 6 – combination of quantitative data and expert judgement
S – stable, I – increasing, D – decreasing, E – expanding

country	number of inds - present	population trend - present	data quality - present	number of inds - 1970	data quality	number of inds - other years	data quality - other years (1988 census)	comment - 1970
Spain	150-200[1],[2]	D	2	1000-5000[3]	5	880-1150[2],[4]	2	distribution area in 1970s app. 57000 km^2
Portugal	0	D	2	?	?	40-53[4]	2	

[1] Delibes et al. 2000. Action Plan for the conservation of the Iberian lynx in Europe. CoE NE No. 111
[2] Proceedings of the "International Seminar on Iberian lynx", Andújar (Spain), 29-31 October 2002
[3] "Status and conservation of the pardel lynx (Lynx pardina) in the Iberian peninsula". 1992 ICONA report. CoE NE No. 55
[4] [data originally published in: (1) Rodríguez A., Delibes M.1990. El lince ibérico (Lynx pardina) en España. Distribución y problemas de conservación. ICONA, Colección Técnica, Madrid. 116 pp., (2) Rodríguez A., Delibes M. 1992. Current range and status of the Iberian lynx (Felis pardina Temminck, 1824) in Spain. Biol. Conserv., 61: 189-196.]

Tab. 5. Number of wolverines (*Gulo gulo*) in Europe and populations trends (1970s and present situation).

Population estimates are presented according to best available data. In some cases alternative population estimates are presented in the comments.

1 – reliable quantitative data, 2 – limited quantitative data, some corrections and interpretations applied, 3 – limited quantitative data, no corrections and interpretations applied, 4 – extensive expert judgement, 5 – limited expert judgement, 6 – combination of quantitative data and expert judgement
S – stable, I – increasing, D – decreasing, E – expanding

country	number of inds - present	population trend - present	data quality - present	number of inds - 1970	data quality	comment - present	comment - 1970
Norway	245[1]	S/I	1	few[1]	2	2003 census; decreasing in Northern Norway	almost extinct from Norway in early 1970s due to hunting. Protected in Southern Norway since 1973, in Northern Norway since 1982.
Sweden	325[1]	S/I	1	?	?	2003 census	only one small population in the mountains along Swedish-Norwegian border. Protected since 1969.
Finland	110-120[1]	S/I	4	?	?		
European Russia	1500[1]	D?	4	?	?		
Estonia	0		5	0	5		
Latvia	0		5	0	5		
Lithuania	0		5	0	5		

[1] Landa et al. 2000. Action Plan for the conservation of wolverines in Europe. CoE EE No. 115 (census 1995-2000, corrected by LCIE experts)

Tab. 6. Wolf population presence (combination of habitat types and biogeographical regions of Europe).

Habitat	ALPINE	ARCTIC	ATLANTIC	BOREAL	CONTINENTAL	MEDITERRAENAN	PANNONIAN	STEPPIC	BLACK SEA	ANATOLIAN	MACARONESIAN
woodland and forest habitat and other wooded land	+		+	+	+	+	+				
heathland, scrub and tundra habitats	+		+	+							
grassland and tall forb habitats	+		+	+	+	+	+				
inland unvegetated or sparsely vegetated habitats	+		+	+	+	+	+				
mire, bog and fen habitats	+		+	+	+	+					
inland surface water habitats											
coastal habitats											
regularly or recently cultivated agricultural, horticultural and domestic habitats					+	+					
constructed, industrial and other artificial habitats					+	+					
marine habitats											

Tab. 7. Brown bear population presence (combination of habitat types and biogeographical regions of Europe).

Habitat	ALPINE	ARCTIC	ATLANTIC	BOREAL	CONTINENTAL	MEDITERRAENAN	PANNONIAN	STEPPIC	BLACK SEA	ANATOLIAN	MACARONESIAN
woodland and forest habitat and other wooded land	+		+	+	+	+					
heathland, scrub and tundra habitats	+			+							
grassland and tall forb habitats	+				+						
inland unvegetated or sparsely vegetated habitats											
mire, bog and fen habitats											
inland surface water habitats											
coastal habitats											
regularly or recently cultivated agricultural, horticultural and domestic habitats	+				+	+					
constructed, industrial and other artificial habitats											
marine habitats											

Tab. 8. Eurasian lynx population presence (combination of habitat types and biogeographical regions of Europe).

Habitat	ALPINE	ARCTIC	ATLANTIC	BOREAL	CONTINENTAL	MEDITERRAENAN	PANNONIAN	STEPPIC	BLACK SEA	ANATOLIAN	MACARONESIAN
woodland and forest habitat and other wooded land	+	+		+	+	+	+				
heathland, scrub and tundra habitats	+	+		+							
grassland and tall forb habitats											
inland unvegetated or sparsely vegetated habitats											
mire, bog and fen habitats		+		+							
inland surface water habitats											
coastal habitats											
regularly or recently cultivated agricultural, horticultural and domestic											
constructed, industrial and other artificial habitats											

Tab. 9. Iberian lynx population presence (combination of habitat types and biogeographical regions of Europe).

Habitat	ALPINE	ARCTIC	ATLANTIC	BOREAL	CONTINENTAL	MEDITERRAENAN	PANNONIAN	STEPPIC	BLACK SEA	ANATOLIAN	MACARONESIAN
woodland and forest habitat and other wooded land						+					
heathland, scrub and tundra habitats											
grassland and tall forb habitats						+					
inland unvegetated or sparsely vegetated habitats											
mire, bog and fen habitats											
inland surface water habitats											
coastal habitats											
regularly or recently cultivated agricultural, horticultural and domestic						+					
constructed, industrial and other artificial habitats											
marine habitats											

Tab. 10. Wolverine population presence (combination of habitat types and biogeographical regions of Europe).

Habitat	ALPINE	ARCTIC	ATLANTIC	BOREAL	CONTINENTAL	MEDITERRAENAN	PANNONIAN	STEPPIC	BLACK SEA	ANATOLIAN	MACARONESIAN
woodland and forest habitat and other wooded land	+			+							
heathland, scrub and tundra habitats	+			+							
grassland and tall forb habitats											
inland unvegetated or sparsely vegetated habitats											
mire, bog and fen habitats	+			+							
inland surface water habitats											
coastal habitats											
regularly or recently cultivated agricultural, horticultural and domestic											
constructed, industrial and other artificial habitats											
marine habitats											

Tab. 11. Ecological characteristics of the species

ecological characteristics	brown bear	wolf	wolverine	Iberian lynx	Eurasian lynx
position					
producer					
consumer	+	+	+	+	+
reducer					
food					
herbivore					
carnivore	+	+	+	+	+
pescivore					
insectivore					
ominivore	+				
dispersion					
0-3 km					
3-15 km					+
> 15 km	+	+	+	+	+
movements					
sedentary					
migratory					
variable	+	+	+	+	+
Minimum Viable Population area					
0-100 ha					
100-500 ha					
500-2000 ha					
>2000 ha	+	+	+	+	+
general causes of population status change					
habitat loss (transformation of natural area in agricultural or urban area)	+			+	+
land use change (eg. change in type of agricultural management, change in crops etc.)	+	+	+	+	+
climate change					
fragmentation (due to patches of natural area becoming smaller, the distance between them bigger, and barriers between them)	+	+	+	+	+
disturbance (eg. due to tourism, traffic, etc.)	+	+	+	+	+
exploitation (forestry, fishery, hunting etc.)	+	+	+	+	+
nature management (changes in the management of nature areas)	+	+	+	+	+
other				+ (collapse of prey population)	
policy relevance					
Habitat Directive	+	+		+	+
IUCN Red List		VU	VU	CR	NT
Bern Convention	+	+	+	+	+
preferences					
endemic species				+	
economic importance	+	+	+	+	+
flagship species	+	+		+	

Appendix 1 – The Large Carnivore Initiative for Europe (LCIE)

The LCIE – background and structure

The political development within Europe, particularly within the European Union, created new, encouraging opportunities for large carnivore management and conservation on a wider, pan-European scale. In response to this challenge, WWF International, together with partner organizations and experts in 17 European countries launched the Large Carnivore Initiative for Europe (LCIE) in June 1995. Since its foundation, the Initiative has grown rapidly with experts from 25 countries actively involved and many others expressing interest. The LCIE goal is, since the very beginning of the Initiative, "*to maintain and restore, in coexistence with people, viable populations of large carnivores as an integral part of ecosystems and landscapes across Europe*". The aim of the LCIE is to support and build on existing initiatives or projects across the continent, avoid duplication of effort and make the most efficient use of the available resources. From 1995 till 2002 the WWF NL and WWF International supported LCIE financially and technically.

The LCIE is an advisory, international and interdisciplinary board consisting of scientists, researchers, conservation and law specialists from all over Europe, made up of among the best available expertise in its field. The LCIE consists of two main bodies - a Core Group and the wider LCIE Network. The LCIE Network consists of people from a wide range of institutions and from 29 countries in Europe. Membership of this Network is by invitation and it (at present numbering almost 100 individuals) gives the LCIE legitimacy throughout Europe (regional representation) and is critical for dissemination of LCIE policies and products and for reporting back on important issues. The members represent Governments, NGOs, land managers, scientists, supra-national organisations, and conventions. The current LCIE Core Group consists of 18 members, representing a wide range of top expertise and geographical aspects (see app. 3). It is an advisory body on large carnivore conservation issues working at the Pan-European level. The Core Group has a think-tank function and provides the best scientific advice available for the conservation of carnivores and their habitat. The advisory capacity of the Core Group is open to interested parties, and even though the LCIE is officially geographically restricted to Europe, the experts involved can still advise on non-European issues upon request. The Core Group meets twice a year, the Network meetings are organized every two years.

An important indicator of the Initiative's importance, as well as that of the rapid increase in people involved, is the political platform given through the active involvement of the Council of Europe through the Bern Convention Secretariat. In December 1999, the Bern Convention agreed to constitute a Large Carnivore Group of Experts in partnership with the LCIE. One of the main activities was the elaboration of the Action Plans for the five European large carnivore species.

LCIE has already produced a scientific basis and background for the carnivore protection and conservation. Now it stands before another challenge – to implement, through marketing and communicating, the work that has already been produced, by supporting the regional Initiatives that have been set up and by expanding its human dimensions work. Furthermore there will be an increased focus on working more with the EU accession process and on concentrating on the most endangered species and populations, within the European regions.

Appendix 2 – LCIE publications and reports – selected issues

(most to find at http://large-carnivores-lcie.org)

(1) Action Plan for the conservation of the Iberian lynx in Europe (*Lynx pardinus*), 2000; No. 111 Council of Europe *Nature and Environment* series

(2) Action Plan for the conservation of the Eurasian lynx in Europe (*Lynx lynx*), 2000; No. 112 Council of Europe *Nature and Environment* series

(3) Action Plan for the conservation of wolves in Europe (*Canis lupus*), 2000; No. 113 Council of Europe *Nature and Environment* series

(4) Action Plan for the conservation of the Brown bear in Europe (*Ursus arctos*), 2000; No. 114 Council of Europe *Nature and Environment* series

(5) Action Plan for the conservation of wolverines in Europe (*Gulo gulo*), 2000; No. 115 Council of Europe *Nature and Environment* series

(6) The Pan-European Conservation Strategy for the Lynx, 2003; No. 130 Council of Europe *Nature and Environment* series

(7) Hofer D. and Promberger Ch. 1998. Guidelines for developing large carnivore management plans.

(8) Bath A. 2000. Human Dimensions in Wolf Management in Savoie and Des Alpes Maritimes, France – Results targeted toward designing a more effective communication campaign and building better public awareness materials. [Report produced by: Dr. Alistair Bath, Memorial University of Newfoundland, Department of Geography, St. John's, Nfld, Canada. A1B 3X9; Funding provided through the France LIFE-Nature Project and LCIE.]

(9) Bath A. and Majic A. 2001. Human Dimensions in Wolf Management in Croatia, a report about understanding attitudes and beliefs of residents in Gorski kotar, Lika and Dalmatia towards wolves and wolf management.

(10) Promberger Ch. 2001. The Integrated Management Approach in Wildlife Conservation Field Projects.

(11) Savelli A.G., Antonelli F and Boitani L. 1998. The impact of livestock support on carnivore conservation – Draft discussion paper for the LCIE.

(12) Carnivore Damage Prevention News – http://www.kora.unibe.ch/main.htm?ge/publics/cdpnews.htm

(13) Report from the visit of the International Committee for the follow-up of Iberian lynx conservation actions to Spain (17-19 March 2003), prepared by IUCN/SSC Cat Specialist Group, LCIE and Council of Europe. http://carnivorecology.free.fr/pdf/lynxreport.pdf

Appendix 3 – LCIE Core Group members

Mr. Fred Baerselman e-mail: fbaerselman@wwf.nl; c/o WWF NL PO box 7, NL-3700 AA ZEIST, The Netherlands

Mr. Alistair J. Bath e-mail: abath@morgan.ucs.mun.ca; Memorial University of Newfoundland, ST.-JOHNS NEWFOUNDLAND, Canada A1B 3X9

Mr. Juan Carlos Blanco e-mail: jc.blanco@eresmas.net; Proyecto Lobo, C/Manuela Malasaña 24, 4° C-I, E - 28004 MADRID, Spain

Mr. Luigi Boitani (LCIE Chairman) e-mail: boitani@pan.bio.uniroma1.it; Dept. of Animal Biology, University of Rome "La Sapienza", Viale dell'Università 32, 00185 ROME, Italy

Mr. Urs Breitenmoser e-mail: urs.breitenmoser@ivv.unibe.ch; KORA, Thunstrasse 31, CH-3074 MURI, Switzerland

Mr. Eladio Fernández-Galiano e-mail: eladio.fernandez-galiano@coe.int; Natural Heritage and Biological Diversity Division, Council of Europe, F- 67075 STRASBOURG, France

Mr. Norbert Gerstl e-mail: Norbert.Gerstl@wwf.at; WWF-Austria, Postfach 1, A - 1162 WIEN, Austria

Mr. Djuro Huber e-mail: duro.huber@zg.tel.hr; Veterinary Faculty, University of Zagreb, Heinzelova 55, ZAGREB 1000, Croatia

Mr. Arild Landa e-mail: arild.landa@nina.no; Norwegian Institute for Nature Research, Tungasletta 2, N - 7485 TRONDHEIM, Norway

Mr. John Linnell e-mail: john.linnell@nina.no; Norwegian Institute for Nature Research, Tungasletta 2, N - 7485 TRONDHEIM, Norway

Mr. Ovidiu Ionescu e-mail: oi@icas.ro; Ministry of Agriculture, Food and Forestry, Bdul. Carol 1 Nr.24 Sect. 3, BUCURESTI, Romania

Mr. Yorgos Mertzanis e-mail: mertzanis@arcturos.gr; ARCTUROS, 3 v. Ougo St., 546 25 THESSALONIKI, Greece

Mr. Henryk Okarma e-mail: okarma@iop.krakow.pl; Institute of Nature Conservation PAS, al. Mickiewicza 33, 31-120 KRAKOW, Poland

Mrs. Agnieszka Olszańska (LCIE coordinator) e-mail : olszanska@iop.krakow.pl; Institute of Nature Conservation PAS, al. Mickiewicza 33, 31-120 KRAKOW, Poland

Mr. William Pratesi-Urquhart e-mail: wpratesi@wwfmedpo.org; c/o WWF Mediterranean Programme Office, via Po 25 C, ROMA 00198, Italy

Mr. Christoph Promberger e-mail: christoph@clcp.ro; Carpathian Large Carnivore Project, Str. Dr. Ioan Senchea 162, RO – 2223 ZARNESTI, Romania

Mrs. Lotta Samuelson e-mail: lotta.samuelson@wwf.se; WWF-Sweden, Ulriksdals Slott, S – 170 81 SOLNA, Sweden

Mr. Jon Swenson e-mail : jon.swenson@ibn.nlh.no; IBN, NLH, Postboks 5014, 1432 Ås, Besøksadresse: Rom 260, URBYGNINGEN, Norway