European Commission

Status, management and distribution of large carnivores

– bear, lynx, wolf & wolverine –

in Europe

DECEMBER 2012

- Part 2-

This document has been prepared with the assistance of Istituto di Ecologia Applicata and with the contributions of the IUCN/SSC Large Carnivore Initiative for Europe (chair: Luigi Boitani) under contract N°070307/2012/629085/SER/B3.

Status, management and distribution of large carnivores – bear, lynx, wolf & wolverine – in Europe

Petra Kaczensky[1], Guillaume Chapron[2], Manuela von Arx[3], Djuro Huber[4], Henrik Andrén[2], and John Linnell[5] (Editors)

[1]Research Institute of Wildlife Ecology,University of Veterinary Medicine, Vienna, Savoyenstrasse 1, A - 1160 Vienna, AUSTRIA

[2]Grimsö Wildlife Research Station, Department of Ecology, Swedish University of Agricultural Sciences (SLU), SE - 73091 Riddarhyttan, SWEDEN

[3]Coordinated Research Projects for the Conservation& Management of Carnivores in Switzerland (KORA), Thunstrasse 31, CH-3074 Muri, SWITZERLAND

[4]University of Zagreb, Biology Department, Veterinary Faculty, Heinzelova 55, HR - 10000 Zagreb, CROATIA

[5]Norwegian Institute for Nature Research (NINA), Tungasletta 2, NO-7047 Trondheim, NORWAY

Contributors (in alphabetical order):

Michal Adamec, Francisco Álvares, Ole Anders, Henrik Andrén, Linas Balciauskas, Vaidas Balys, Peter Bedo, Ferdinand Bego, Juan Carlos Blanco, Luigi Boitani, Urs Breitenmoser, Henrik Brøseth, Ludek Bufka, Raimonda Bunikyte, Guillaume Chapron, Paulo Ciucci, Alexander Dutsov, Thomas Engleder, Christian Fuxjäger, Claudio Groff, Miklós Heltai, Katja Holmala, Bledi Hoxha, Djuro Huber, Yorgos Iliopoulos, Ovidio Ionescu, Gjorge Ivanov, Jasna Jeremić, Klemen Jerina, Petra Kaczensky, Ilpo Kojola, Ivan Kos, Miha Krofel, Jakub Kubala, Sasa Kunovac, Josip Kusak, Miroslav Kutal, John Linnell, Peep Mannil, Ralph Manz, Eric Marboutin, Francesca Marucco, Dimce Melovski, Kujtim Mersini, Yorgos Mertzanis, Robert W. Mysłajek, Sabina Nowak, John Odden, Janis Ozolins, Guillermo Palomero, Milan Paunovic, Jens Persson, Hubert Potočnik, Pierre-Yves Quenette, Georg Rauer, Ilka Reinhardt, Robin Rigg, Andreas Ryser, Valeria Salvatori, TomažSkrbinšek, Aleksandra Skrbinšek-Majić, Aleksandar Stojanov, Jon Swenson, Aleksandër Trajçe, Elena Tzingarska-Sedefcheva, Martin Váňa, Rauno Veeroja, Manuela von Arx, Manfred Wölfl, Sybille Wölfl, Fridolin Zimmermann, Diana Zlatanova

Cover: Photo composition by Alessandro Montemaggiori

Table of contents

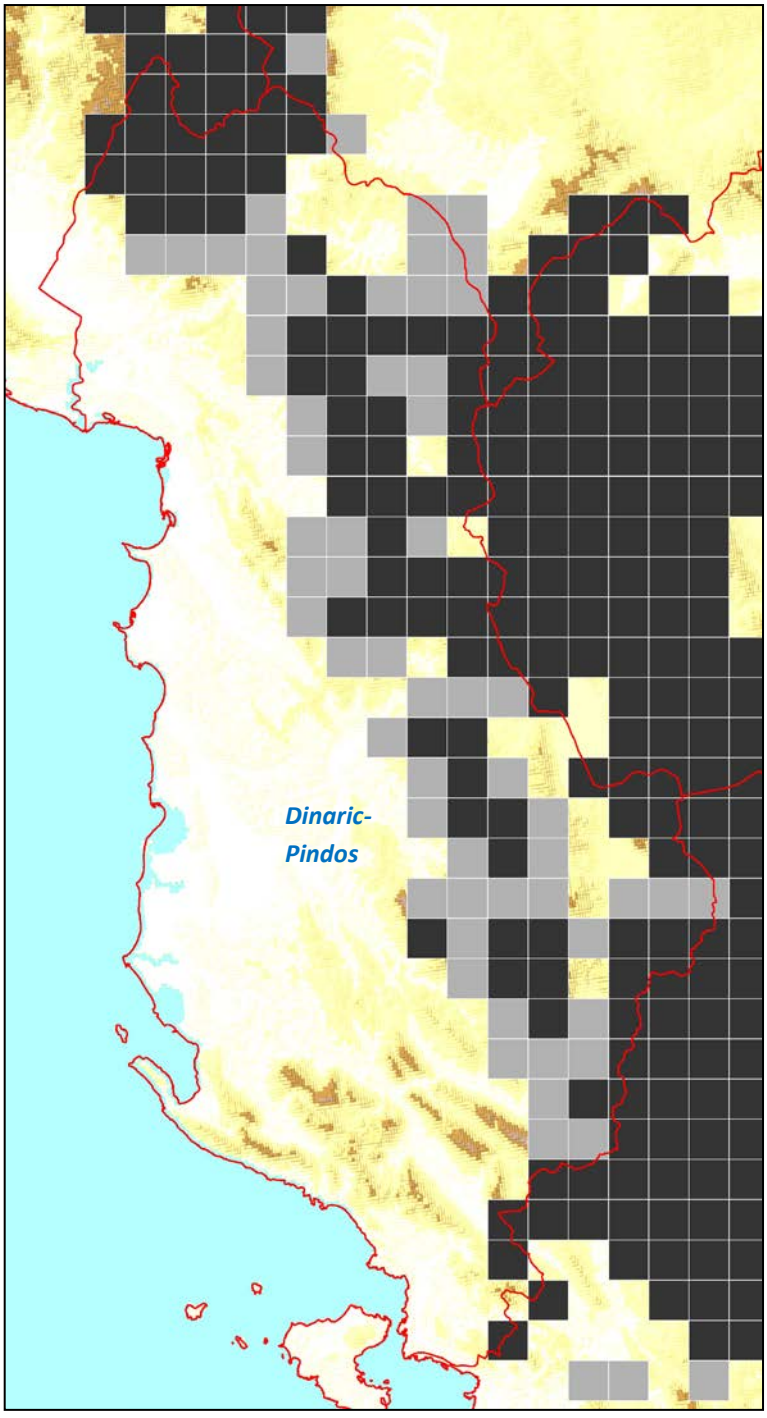
Part 2:

V. Species Country Reports:

V. Country Species Summaries

Bear - Albania

Aleksandër Trajçe



Bear distribution in Albania 2006-2010.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The brown bears in Albania are distributed in the mountainous regions of North, East and South-East Albania, usually in high-forest habitats of altitudes 600 m a.s.l. They are found in the Albanian Alps (Bjeshkët e Nëmuna - Prokletije mountains), central-north mountanious region (Pukë, Mirditë, Lurë, Balgjaj), Korab-Koritnik range in the east, central mountanious region (Qafështamë, Martanesh, Shebenik), central-south region (Shpat, Polis, Valamarë) and southeastern mountanious areas (Prespë, Moravë, Tomorr, Ostrovicë, Hotovë, Shelegur). They seem not to be present in the southwestern mountanious region of the country.

The Albanian brown bear distribution is part of the larger Dinaric-Pindos population that spreads from Slovenia in the north to Greece in the south and thus the country's geographical location is of crucial importance for maintaining the connectivity of this population.

2. Population estimates & monitoring

Proper monitoring and research on brown bears in Albania have been largely lacking in the past, thus information on their numbers is mostly based on expert estimations. In the past 6 years more solid data on bear presence has been collected, mainly through the work of various projects undertaken by non-profit organizations. Recent camera-trapping surveys, tracking and sign identification as well as questionnaire surveys have generated a good amount of knowledge on the status of brown bears in the country (Trajçe et. al. 2008; Ivanov et. al. 2008; Keçi et. al. 2008; Trajçe & Hoxha 2011).

Currently, experts estimate that some 180 – 200 bears might be roaming the mountains of Albania. There is however a clear discrepancy between the official information given by state authorities and experts' evaluations in regard to the bear population size. The latest official estimation of the bear population in Albania is presented at the Annual Report on the State of Environment for 2009 as consisting of 686 individuals (MoE, 2010). There is however no detail given on the rationale behind this assessment and according to experts' opinion and field evidence so far, this is a gross overestimation.

3. Legal status & relevant management agencies

The brown bear is classified as Vulnerable (VU) according to the Red List of Albania (Red List of Flora & Fauna, 2007) and enjoys a full legal protection status sanctioned by the new Law on Wildlife Protection (2008) and Law on Hunting (2010). The species has been considered as fully protected at least since 1956 as it is sanctioned on the respective governmental decrees at the time. In the National Biodiversity Strategy and Action Plan (Bego et al. 1999) the brown bear is selected as a priority species and the development of an action plan for its conservation is recommended as an immediate action to take. In 2007 an action plan was compiled (Bego 2007) and adopted by the Ministry of Environment, however no concrete action has been seen so far in accordance to the document. The institution responsible for brown bear management is the Ministry of Environment, Forestry and Water Administration.

4. Population goal and population level cooperation

There are no explicit population goals for brown bears in Albania. Information on the population trend is lacking, however increased incidences of poaching, habitat degradation and general human encroachment, indicate that the bear population has been facing a dramatic decrease in the past decades and is nowadays at an all time low.

Population level cooperation for conservation is good among researchers and non-governmental institutions of the range countries. Unfortunately, up to date, on the GO level there has not been any major initiative of cooperation in regard to brown bear conservation and management.

5. Conflicts and conflict management

The wildlife baseline survey conducted by PPNEA in 2006-07 gives primary insights on the conflicts existing between humans and brown bears in Albania. Human-brown bear conflicts seem to be widespread in the country and bears were reported to cause significant damage on crops, fruit trees, and big livestock and to a lesser extent on beehives (Trajce et. al. 2008, Keci et. al. 2008). Human-brown bear conflicts are believed to explain to a certain extent the reasons for illegal killing of brown bears. However, a human dimension study recently conducted by PPNEA to determine public attitudes of the rural population towards large carnivores reveals that the general public opinion

towards bear is predominantly positive, the support for their conservation is high and conflicts that brown bears cause are generally tolerated by the local population (Trajce 2010).

Currently, there is no form of compensation system and there are no prevention or mitigation measures undertaken by management authorities for addressing the issue of livestock depredation. Traditional livestock herding with presence of shepherd and guarding dogs remain still in place in large parts of the country – particularly in the mountainous regions where also LC species occur. A few initiatives have been implemented in recent years by local NGOs to promote traditional breeds of livestock guarding dogs and donate pure bred animals to a number of shepherds in central and south Albania.

6. Threats

The recent work of PPNEA, confirms that the main threats to brown bears in Albania are linked to human persecution and habitat destruction. In addition, one of the main conservation concerns for brown bears in Albania seems to be their use for human entertainment and public attraction objects. Brown bears are increasingly being used either dead or alive by roadside restaurants or other private enterprises as attraction animals, possibly to attract more clients in their premises. This phenomenon seems to be quite widespread and relatively new for the country, having its beginnings only after the 1990s and, as evidence suggests, is spreading at an alarming rate in many restaurants and cafés across Albania. As of August 2011, 28 illegally kept captive bears have been documented and there are indications of at least 20 more cases that need further verification. Captive bears are usually taken from the wild as cubs after their mother is poached and they are sold for relatively high sums of money. This means that for every one or two bears that are kept in captivity, one reproductive female had been shot dead in the wild. This practice acts as a proper population "sink", by taking away reproductive females from the wild and immediate measures should be taken against it.

7. Summary table

Population size	estimated 180 – 200
Trend	at present trend is stable to decreasing; historically it has been steadily decreasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 66 Sporadic: 66
Range trend	unknown
Depredation costs / year	unknown – not estimated
Number of cases / year	unknown
3 Most important threats	illegal killing, habitat destruction, illegal capturing and exhibiting

References:

Bego, F. & Koni, M. (1999) eds. *Biodiversity Strategy and Action Plan – National Report*. National Environmental Agency, Tirana, Albania

Bego, F., Peja, N., Pllaha, S. (2002). Large Carnivores in Albania (Bear, Lynx and Wolf), in: *Psaroudas, S. (Ed.), Protected Areas of the Southern Balkans – Legislation, Large Carnivores, Transborder Areas*. Arctouros, DAC Project, Thessaloniki, pp. 73-81.

Bego, F. (2007). *The Brown Bear (Ursus arctos) Action Plan for Albania*. Final Report, Ministry of Environment, Forestry and Water Administration, Tirana, Albania.

Ivanov G., Stojanov A., Melovski D., Avukatov V., Keçi E., Trajçe A., Shumka S., Schwaderer G., Spangenberg A., Linnell D. C. J., von Arx M. & Breitenmoser U. (2008): Conservation status of the critically endangered Balkan lynx in Albania and Macedonia. *Proceedings of the III Congress of Ecologists of the Republic of Macedonia with International Participation, 06-09.10.2007*. pp. 249-256. Struga, Macedonia: Special issues of Macedonian Ecological Society, Vol. 8, Skopje.

Keçi, E., Trajçe A., Mersini K., Bego F., Ivanov G., Melovski D., Stojanov A., Breitenmoser U., von Arx M., Schwaderer G., Spangenberg A. & Linnell J.D.C (2008): Conflicts between lynx, other large carnivores, and humans in Macedonia and Albania. *Proceedings of the III Congress of Ecologists of the Republic of Macedonia with International Participation, 06-09.10.2007*, pp. 257-264. Struga, Macedonia: Special issues of Macedonian Ecological Society, Vol. 8, Skopje.

Ministry of Environment, Forests and Water Administration (2010). Report on the State of Environment 2009. Tirana, Albania
www.moe.gov.al/upload/publikimet/raporte%20te%20gjendjes%20mjedisit/Raporti%202009.pdf

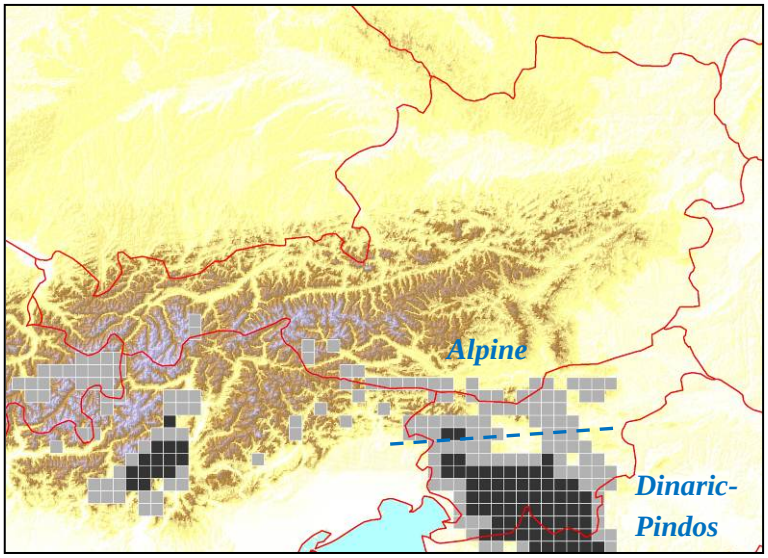
Trajçe, A., Keçi, E., Mersini, K. & Shumka, S. (2008). *Final Report on the Baseline Survey for Lynx, Prey and other Large Carnivores in Albania, 2006-07*. PPNEA, Tirana, Albania

Trajçe, A. (2010). Conservation planning for guilds or individual species? The relative perceptions of wolves, bears and lynx among the rural Albanian public. *M.Sc Thesis, University of Oxford*. Oxford, UK.

Trajçe, A. & Hoxha, B. (2011). Report on camera-trapping activities in Albania during winter 2010-11. PPNEA, Tirana, Albania

Bear – Austria

Compiled by Petra Kaczensky with input from Georg Rauer



Bear distribution in Austria 2007-2011.

Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

Bears in Austria are part of the Alpine bear population, but are presently only found in southern and western Austria along the border to Slovenia, Italy and Switzerland. No reproduction has been confirmed prooved in this area and so far all animals that were individually identified have been males, either originating from the Slovenian or the re-introduced Trentino bear population.

Between 1989-1993 three bears (2 females and 1 male) were re-introduced to the central limestone Alps in Austria where a single migrant male bear had settled in 1972. Between 1991 until 2006 a minimum of 31 cubs was produced. However, genetic monitoring which was started in 2000 finally revealed that the population never reached more than 12 individuals (1999) and that most cubs disappeared already as a yearling or two-year-old bear (Krukenhauser et al. 2008). By 2011 the last decendent of the released bears had finally disappeared and the population is now formally considered extinct. The most likely explanation for the disappearance of this small population are illegal killings in combination with the small population size.

2. Population estimates & monitoring

Population size of the bear occurrence in Austria is difficult to provide as long-distance dispersers from both the Slovenian and the Trentino bear population seem to move in and out of the border region. It is probably realistic to assume that ~5 different male bears may visit the southern Alps of Austria within the course of a year. Presumably no bear is staying permanently in Austria; the offical estimate for Carinthia has been 6-8 bears for the last couple of years, but this is an guestimate rather than based on hard facts.

Bear signs reported by third parties are inspected and documented by three wildlife professionals, the so called “bear advocates”. All bear signs, except from the province of Carinthia, are entered into a central database and rated according to the re-fined German SCALP criteria (Kaczensky et al. 2009). Bear monitoring is heavily based on genetic monitoring since 2000 (Krukenhauser et al. 2008).

3. Legal status & relevant management agencies

In Austria the bear is mainly subject to the hunting law, but enjoys a year-round closed season. Responsibility for protecting species in accordance with the Habitats Directive lies with the hunting and natural conservation authorities of the provinces. A Coordination board for bear, wolf and lynx management in Austria (KOST) - composed of representatives of the hunting and natural conservation authorities of the provinces, the bear advocats and representatives of selected stakeholders - meets twice a year to review and discuss management issues regarding large carnivores in Austria.

The first bear management plan for Austria was published in 1997 and revised in 2005 (Coordination board for Bear Management in Austria 2005). The target of the Austrian bear management is "to protect brown bears in Austria and to establish and maintain a viable population in a favourable conservation status, with special emphasis on a peaceful coexistence of humans and bears and the creation of necessary conditions to connect existing populations to allow the bears to expand into suitable habitats" (Coordination board for Bear Management in Austria 2005).

4. Population goal and population level cooperation

There are no explicite population goals for bears in Austria. Habitat modelling shows a high habitat suitability of the Eastern Alps (Austria, NE Italy, Germany & N Slovenia) and suggests a habitat capacity for a minimum of 518-686 mature bears (1228-1625 individuals; Marucco 2011).

Monitoring within Austria is coordinated by the bear advocats. Genetic monitoring is closely coordinated with the neighboring countries so that individual bears can be identified and backtracked to the respective source population (Karamanlidis et al. 2009). Furthermore, there is and always has been close cooperation on the technical level with collaegues from neighboring countries e.g. cross-border tracking of radiocollared animals. On the political level cooperation is happening within the framework of the Alpine Convention. However, there is no formal population level management or even a commonly expressed goal.

5. Conflicts and conflict management

The main conflicts with bears are over 1) damages caused by bears to bee-hives and to free-ranging livestock on Alpine pastures (~130,000 sheep / goats and ~300,000 cattle graze with minimal supervision on Alpine meadows over the summer months) and 2) actual or perceived impacts on hunting (bears visiting ungulate feeding sites spooking game and raiding feed, bears killing red deer in winter enclosures or at feeding sites, hunters risking close encounters).

Damage compensation is paid for destroyed beehives and confirmed livestock kills. However, compensation payments are "voluntarely" (no legal right for compensation) and in most provinces they are covered by the hunting associations through the hunting insurance. Compensation payments do not cover additional labor costs and the burden of proof is with the livestock owner. Because of the expansion of the wolf population in the Alps, a pilot project for damage prevention has been launched in 2012. The program includes the testing of fencing, herding, livestock guarding dogs etc. in 5 pilot areas (in one area the program has been started so far).

Game killed by bears or damages to hunting infrastructure (e.g. feeding sites) are nor reimbursed.

Re-introduced bears seem to have been perceived by local people as "artifical" and "belonging to WWF". The offical policy by the Austrian hunters associations is that they oppose any re-introductions, but welcome bears that arrive naturally.

6. Threats

The re-introduced bear population in central Austria became extinct, the situation in Carinthia is stagnant, but dispersing male bears from Trentino are increasingly reaching Austria. Illegal killings seem a problem, although prove is extremely difficult to obtain (Krukenhauser et al. 2008). The latest and best documented case was the radiocollared male bear *Rožnik* who dispersed from Slovenia into the Austrian province of Carinthia in May 2009. Three days after having crossed the border into Austria for the first time the collar stopped. Twelve days later the carcass was found by locals and an autopsy confirmed the bear had been shot (Kaczensky et al. 2011).

7. Summary table

Population size	~5 different animals may move in and out of the Austrian Alps within the course of a year
Trend	Decreased / stangnant
Distribution range (# cells in the 10 x 10 km EEA grid)	23 sporadic
Range trend	Decreased (loss of the re-introduced central Austrian bear population)
Depredation costs / year	Highly variable from year to year, no common database
Number of cases / year	Highly variable from year to year: ~10-100 sheep ~0-2 other livestock (e.g. cattle, rabbits) ~10-30 beehives ~0-25 canisters with rape-seed oil
3 Most important threats	Illegal killings, low acceptance by local hunters & farmers, lack of political will & fragmentation of management

References:

Coordination board for Bear Management in Austria. 2005. Bears in Austria – a management plan. Revised version 2005. WWF Austria, Vienna, Austria. http://www.lcie.org/docs/Action%20Plans/Austrian%20bear%20management%20plan%20E.pdf

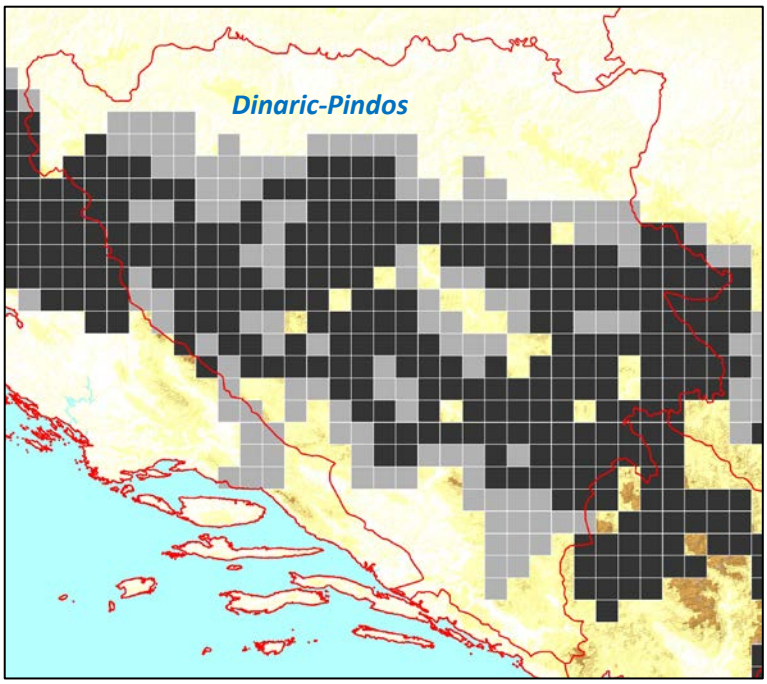
Kaczensky, P., K. Jerina, M. Jonozovic, M. Krofel, T. Skrbinšek, G. Rauer, I. Kos, B. Gutleb. 2011. The case of the bear Rožnik – are illegal killings an underestimated threat for brown bear recovery in the Eastern Alps? Ursus, 22(1):37-46.

Karamanlidis A.A., De Barba M., Georgiadis L., Groff C., Jelenčič M., Kocijan I., Kruckenhauser L., Rauer G., Sindičić M., Skrbinšek T., Huber D. 2009. Common guidelines for the genetic study of brown bears (*Ursus arctos*) in southeastern Europe. http://bib.irb.hr/datoteka/428845.Common_Guidelines_Genetic_Research.pdf

Krukenhauser, L., G. Rauer, B. Däubl, and E. Haring. 2009. Genetic monitoring of a founder population of brown bears (Ursus arctos) in central Austria. Conservation Genetics 10:1223–1233.

Bear – Bosnia and Herzegovina

Compiled after material provided by Saša Kunovac



Bear distribution in Bosnia and Herzegovina 2000-2012.

Dark cells: permanent presence
Grey cells: sporadic occurrence

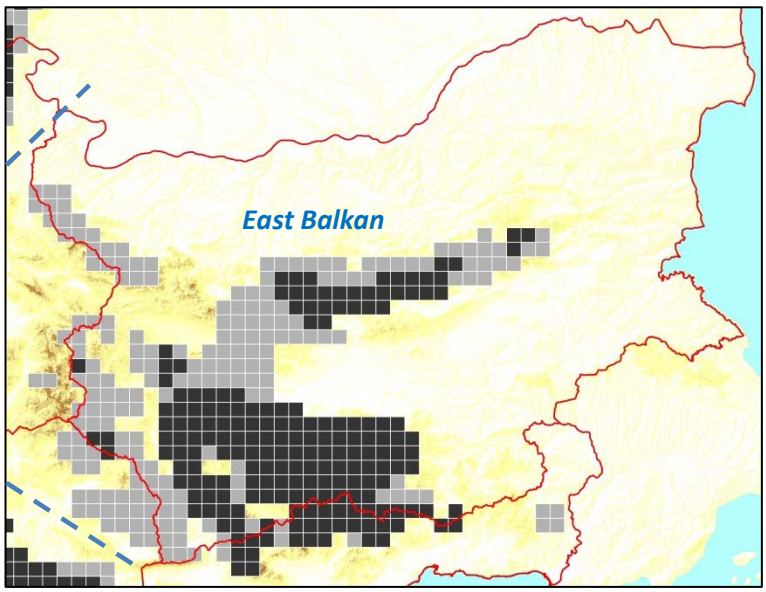
[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

Summary table

Population size	(2005): 550
Trend	increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 216, sporadic: 116
Range trend	increase
Depredation costs / year	No information
Number of cases / year	(2007-2011): 42 sheep, 20 cattle/horse/pig, 23 beehives, 5 orchards
3 Most important threats	Poor management structure, infrastructure development, livestock depredation

Bear – Bulgaria

Diana Zlatanova and Alexander Dutsov



Bear distribution in Bulgaria 2000-2012.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Bears in Bulgaria are found in 2 presently connected population segments, the Central Balkan and the Rilo-Rhodopean, both autochthonous.

In Central Balkan the area of stable presence seems to cover2372 km² of suitable habitat (~2721 km² total area), additionally divided into 2 sub-segments as the larger one is a source segment for the smaller. This population segment (especially the larger sub-segment) is mainly covered by Central Balkan National Park and its buffer. Although the trend cannot be assessed yet because standardized monitoring is applied only recently, there is little evidence for a range expansion due to suitable habitat limitations.

In Rilo-Rhodopean segment the area of stable presence is unfragmented and covers 8419 km² of suitable habitat (~9916 km² total area), as part of it is covered by two National Parks (Rila and Pirin). The resident range is stable, the range of the dispersers increasing.

Both population segments are connected as proven by recent genetic study through areas of seasonal/occasional presence. The total area of occasional presence is ~8722 km².

2. Populations estimates & monitoring

The Central Balkan population segment was estimated at 100-130, based on extrapolations based on individual track counts on transects during yearly monitoring conducted by the Ministry of Environment and Waters. Additional monitoring has been done by telemetry. It is not possible to provide a trend as previous guesstimates (up to 2008) were highly inaccurate or of low precision (MOEW, 2008).

The Rilo-Rhodopean population segment was estimated at 430-460, based also on extrapolations of individual track counts on transects during yearly monitoring conducted by the Ministry of Environment and Waters. Additional monitoring also has been done by telemetry.

The monitoring in both populations is done by individual experts, park staff and Forestry service personnel, coordinated by the Ministry of Environment and Waters (through Executive

Environmental Agency). In the National parks and Smolyan district the assessment for 2010 and 2011 is co-funded by EU program Life + (LIFE07/NAT/IT000502 - EX-TRA).

Additionally, the species is part of the annual monitoring system of the National Forestry Agency (Ministry of Agriculture and Foods).

3. Legal status & relevant management agencies

The bear in Bulgaria is listed as fully protected by the Bulgarian Biodiversity Act with an annual quota. Bear management in Bulgaria is centralized and is conducted by the Ministry of Environment and Waters (MOEW). Local management actions are applied through the Regional Inspectorates of Environment and Waters (RIEW) and National Parks authorities, which are under the Jurisdiction of MOEW. Since 2010, with amendment of Hunting and Game Conservation Act the management of the bear and the conduct of the Brown Bear Action Plan are shared between MOEW and Ministry of Agriculture and Foods.

An Action plan for the Brown Bear in Bulgaria (on the level of management plan) was prepared in fully open process (2006-2007) with participation with all interest groups and endorsed by MOEW in 2008. The public and interest groups were involved in two stages: 1. In the processes of Action Plan preparations through representatives and 2. At the final stage before approval through organized public hearings. Since the endorsement of this Action plan in 2008, all management decisions are taken according to it.

All management decisions including annual quota are taken through National Bear Committee, which consists of representatives from both Ministries, conservation NGOs, academic/research institutions and National Hunting Association. These decisions then are endorsed by the Minister of Environment and Waters.

4. Population goal and population level cooperation

There is no official goal for the size and distribution of the population of the bear in Bulgaria. The main goal of Action plan for the Brown Bear in Bulgaria is: “To maintain at least the same range and size of the population as it was when the management plan created, allowing the population of bears to develop naturally, being managed by the people for damage reduction”. There are no any specific zoning policies or different management systems in two population segments due to the centralized management.

5. Conflicts and conflict management

Conflicts exist over livestock depredation and destruction of beehives in both population segments.

All compensations are paid by the Ministry of the Environment and Waters, after assessment of every damage by local commission/expert, under the jurisdiction of Regional Inspectorates of Environment and Waters or National Parks authorities (in the National Parks). Only documented losses are compensated. If confirmed 100% of the market value is paid.

Prevention measures (electric fences) are recently distributed to households with substantial losses, funded by Life + project (LIFE07/NAT/IT000502 - EX-TRA).

6. Threats

The main threats for the bears in Bulgaria are:

- Large-scale wood/non-timber plantations and conversion of beech, oak, mix forests into coniferous forests through changing food base (especially valid for Rhodopi part of Rilo-Rhodopean segment);
- Large- scale non-woody vegetation collection (herbs and mushrooms), through disturbance and encounters posing to people direct risk for injuries/death resulting in bad acceptance and further revenge actions for the bears;
- Quick development of land transport (highways/speedroads/railways), creating habitat/population fragmentation due to lack of enough permeability through the infrastructures
- New dams and dam cascade construction, creating habitat/population fragmentation and diminishing the gene exchange
- Supplementary feeding of game species and illegal garbage dumps, causing habituating the bears and further increase of livestock/beehive damages (especially valid for Rhodopi part of Rilo-Rhodopean segment)
- Direct mortality of bears by shooting during hunting of other species or poisoning/trapping/shooting as vengeance for killed livestock or destroyed beehives
- Changes in native foodbase dynamics due to environmental conditions, causing increase of damages and thus decrease of acceptance
- Low acceptance due to fear for personal safety and due to fundamental conflict of values about the species presence in modern landscapes (especially valid for Rhodopi part of Rilo-Rhodopean segment which is the area of highest numbers of damages and even cases of human injuries and death)

7. Summary table

Population size	Central Balkan (2011): 100-130 Rio-Rhodopean (2011): 430-460
Trend	Central Balkan: unclear, but likely stable Rio-Rhodopean: stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Central Balkan: Permanent: 133 Rio-Rhodopean: Permanent: 34 Total: Permanent: 167 Sporadic: 161
Range trend	Central Balkan: unclear, but likely stable Rio-Rhodopean: stable, dispersal range increasing
Depredation costs / year	2007-2011: ~81,850 €, increasing tendency due to better informed locals for the opportunity for compensation
Number of cases / year	2007-2011: ~ 249 sheep; 18 goats; 27 cattle; 6 horses/donkeys; 12 pigs; 3 dogs; 533 beehives; 58 fruit trees; others - black chokeberry (Aronia melanocarpa) - 325 kg
3 Most important threats	large-scale wood/non-timber plantations and conversion of forests, supplementary feeding of game species, illegal killing, low local acceptance

References:

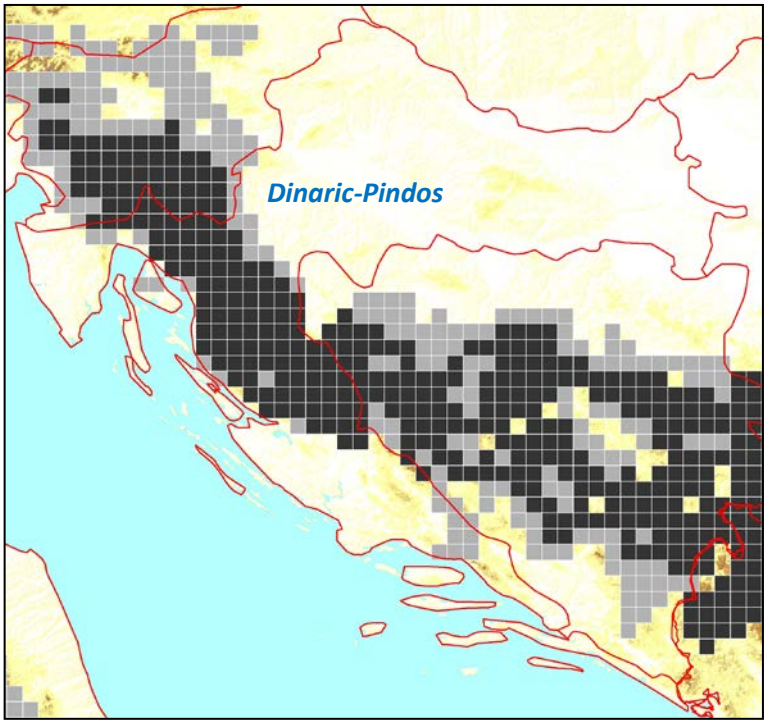
Ministry of Environment and Waters. 2008. Action plan for the Brown Bear in Bulgaria. 86 p.

Zlatanova, D., Racheva V., Fremuth W. 2009: Habitatverbund für den Braunbären in Bulgarien - Grundlage für die Schaffung Transeuropäischer Wildtiernetze (TEWN) auf dem Balkan. Naturschutz und Landschaftsplanung 41, (4). (In German).

Zlatanova, D. 2010: Modelling the habitat suitability for the bear (Ursus arctos L.), the wolf (Canis lupus L.) and the lynx (Lynx lynx L.) in Bulgaria. PhD thesis. Sofia University „St. Kliment Ohridski", Faculty of Biology, Department of Zoology and Anthropology, 287. (In Bulgarian).

Bear – Croatia

Djuro Huber



Bear distribution in Croatia 2005-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Total bear distribution area in Croatia extends over 11.824 km^2. The permanent bear presence habitat extends over 9.253 km^2, while the occasional bear presence habitat extends over 2.570 km^2. Bears are distributed over the entire Gorski Kotar and Lika regions, the western and southern part of the Karlovac county, the Učka and Ćićarija mountains in Istria, the central and northern part of the island of Krk, the Žumberak mountains, the coastal part from Bakar to Maslenica and the area surrounded by the Kamešnica, Mosor and Biokovo massifs.

The best habitats in Gorski Kotar, Velika Kapela, Mala Kapela and Velebit, have an average density of 1 or more bears per 10 km². Due to such population density, migration of younger males to neighbouring peripheral areas of the bear range (Učka, Ćićarija, Pokuplje, Priobalje, etc.) occurs. 94,2% of the permanent bear presence areas are hunting units, while 5,8% thereof are parts of national parks. Bears are permanently protected in national parks.

Permanent bear presence habitats are areas in which bears satisfy all their food, water, space, peace, cover, breeding and denning needs and are present during year round. In those areas all prescribed protective measures are implemented in order to ensure the stability of the population. Local inhabitants accept bears as part of their natural environment.

Occasional bear presence habitats are areas with a sporadic presence of bears or areas in which the number of bears does not guarantee the continued existence of the species, or where bears do not den regularly. These are habitats to which bears are returning and which are on most places connected to permanent bear presence areas in Croatia, Slovenia or Bosnia and Herzegovina. Bears occasionally cause damage in these areas. Within occasional bear presence habitats there are areas in which bear presence is acceptable and areas in which bear presence is unacceptable which is reflected in the management regime.

2. Populations estimates & monitoring

Current estimate of the number of bears in the Croatian segment of the Dinara-Pindos population is about 1000 individuals. (Kocijan and Huber, 2008)

The number has been obtained by genotyping 547 bear scat samples collected in 3 study areas: 9378 km^2 Gorski kotar North, 1000 km^2 Gorski kotar South, 998 km^2 Velebit (about 30% of bear range in Croatia), where a minimum of 210 different individuals were genetically determined. Those data were extrapolated to the entire range and then Mark – recapture calculation and "Rarefaction" curve calculations were applied, all showing relatively large margin of error but also that at least 1000 bears were present.

In addition to the genetic approach, coordinated bear counts from high stands at feeding sites are done during certain days in spring and autumn. These counts are envisioned in the Bear Action Plan and are used to determine population trends. Monitoring also includes full record and samples of each dead specimen (from hunting, traffic mortality and other causes of death), and data from satellite telemetry research.

3. Legal status & relevant management agencies

Brown bear in Croatia is currently a game species. With accession to EU in 2013 it will have to become a "strictly protected" species. The main management agency for bears in Croatia is the Hunting unit within the Ministry of Agriculture. When the bear will become a protected species, the management will be shared with the Directorate for Nature Protection within the Ministry for Protection of Environment and Nature.

The operational management follows the Brown bear management plan for the Republic of Croatia. The Brown bear management committee prepares the yearly Action plan and supervises the implementation. The Bear emergency team helps with the actions in the field including the management of bears showing problem behaviour.

In the last four years quota for bear hunting has been set to 100 bears plus up to 40 individuals expected to be lost due to other reasons including the intervention removal of problem ones. However, on average only 74% of hunting quota has been fulfilled and other losses were also lower than potentially anticipated (~80%).

4. Population goal and population level cooperation

According to the management plan the total habitat capacity is around 1100 bears and the social capacity (acceptance) may be around 900. Currently both have been reached and active management has to keep the population within the given limits.

Bears in Croatia are part of the Dinaric-Pindos population and are directly shared with neighboring Slovenia, Bosnia and Herzegovina. With Slovenia there is full cooperation on the level of scientists while the political agreement on management is expected to develop when the Slovenian side will accept the process. With Bosnia and Herzegovina the main difficulty is in the lack of capacity and in political situation in that country.

5. Conflicts and conflict management

Current conflict levels are surprisingly low. The acceptance of bears is in on average very good. The extensive surveys in 2002 and 2008 showed that 86% and 72%, respectively, respondents living in the bear range would agree with increasing bear numbers in Croatia (Majić et al 2011). That is mainly related to the status of bears where maintenance of large population secures income through

hunting. Continued tradition of living with bears makes coexistence easier as local inhabitants know how to minimize the livestock depredation and destruction of bee-hives. The damages that occur are compensated by hunting organizations that are in most cases comprised by local inhabitants as well. Hence the total amounts paid per year are very low, on average about 6000 €, or only 6 € /bear/year. Comparably low bear damages can only be found in Sweden (3.6 €/bear/years), while on the other extreme is Norway where one single bear causes twice as much damage as 1000 bears in Croatia (12,666 €/year/bear).

The Brown Bear Management Committee and the Bear Emergency Team are the bodies that care for the implementation of the Brown Bear Management plan (Huber et al 2008) and the implementation of the yearly Bear Action Plans. That work includes decisions on the size and distribution of hunting quotas and on emergency removals of problem bears after other measures have failed.

6. Threats

The current situation with bear population segment that lives in Croatia is very favorable and the potential threat may only be the events that would change something in the ever fragile balance between any large carnivore and humans. The big immediate problem is the forced change of bear status from "game" to "strictly protected" by EC decision. Efforts are under way to mitigate the negative effect on the public acceptance and to prevent the explosion of damage compensation requests. The major negative outcome may be the significant increase in the number of removed bears from the population.

Another issue is to prevent the habituation of bears to human sources of food by timely actions such as negative conditioning and removal of habituated individuals.

There was a construction of mayor infrastructure (highways) in the bear habitat in the previous decade but these seem to have been satisfactory mitigated by numerous crossing structures including big green bridges (Kusak et al 2009). A future threat may be the planned construction of "wind power parks" in the core bear habitat, especially in the critical denning zones (Huber and Roth 1997).

7. Summary table

Population size	~1000
Trend	Increase (annual growth ~ 4%)
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 104 Sporadic: 29
Range trend	Stable / slight increase
Depredation costs / year	6000 €
Number of cases / year	~32 (range 6 – 90 in the last 8 years; few livestock, some bee hives, orchards, automatic feeders, cars)
3 Most important threats	- Acceptance may go down by change from "game" to "strictly protected" - Conditioning to garbage and other human sources of food - Planned "Wind power parks" construction in core bear range

References:

Frković, A., Huber, D., Kusak, J. 2001. Brown bear litter sizes in Croatia. Ursus 12:103-106.

Huber, D., Roth, H.U. 1997. Denning of brown bears in Croatia. Int. Conf. Bear Res. and Manage. 9 (2): 79-83.

Huber, D., Kusak, J., Frkovic, A. 1998. Traffic kills of brown bears in Gorski kotar, Croatia. Ursus 10: 167-171.

Huber, Đ., Kusak, J., Majić-Skrbinšek, A., Majnarić,D., and Sindičić,´ M. 2008. A multidimensional approach to managing the European brown bear in Croatia. Ursus 19:22-32.

Kaczensky, P., Huber, D., Knauer, F., Roth, H., Wagner, A., Kusak, J. 2005. Activity patterns of brown bears (*Ursus arctos*) in Slovenia and Croatia. Journal of Zoology 269: 474-485.

Kocijan, I. and Huber, Đ. 2008. Conservation genetics of brown bears in Croatia. Final report. Project Gaining and Maintaining public acceptance of Brown bear in Croatia (BBI-Matra/2006/020 through ALERTIS).

Kusak, J., Huber, D. 1998. Brown bear habitat quality in Gorski kotar, Croatia. Ursus 10: 281-291.

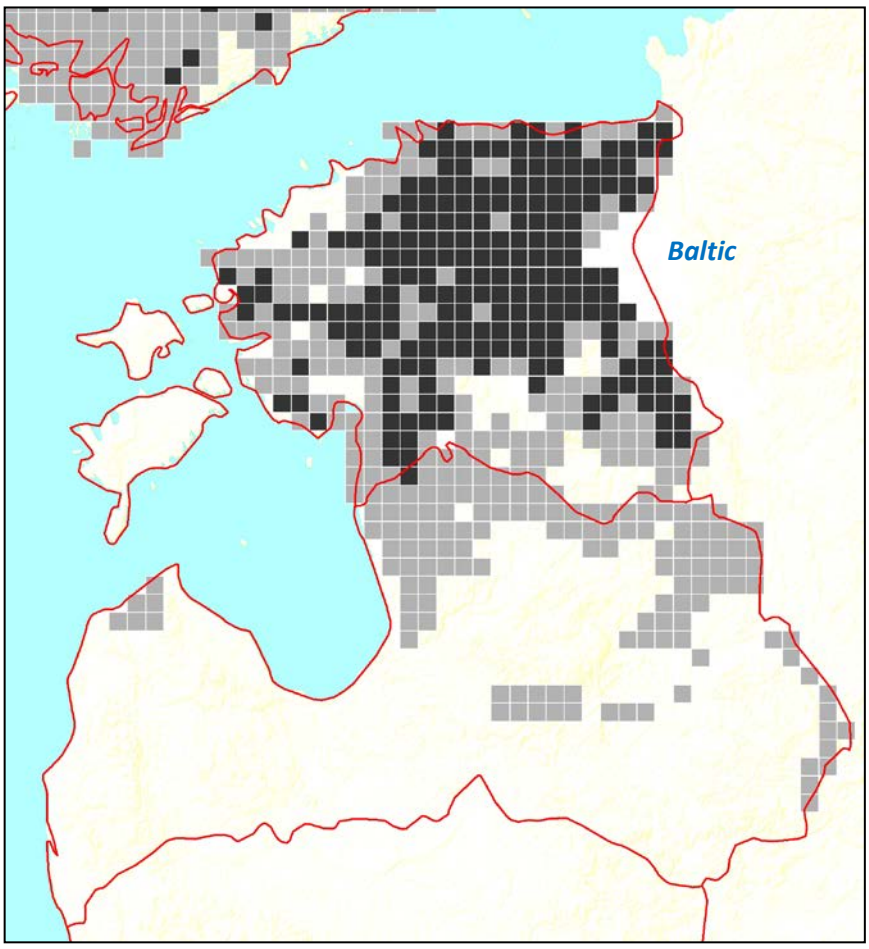
Kusak, J., Huber, D., Gomerčić, T., Schwaderer, G., Gužvica, G. 2009. The permeability of highway in Gorski kotar (Croatia) for large mammals. European Journal of Wildlife Research 55:7-21.

Majić, A., de Bodonia, A.M.T., Huber, Đ., Bunnefeld, N. 2011. Dynamics of public attitudes toward bears and the role of bear hunting in Croatia. Biological Conservation 144: 3018–3027.

Swenson, J.E., Adamič, M., Huber, D., Stokke, S. 2007. Brown bear body mass and growth in northern and southern Europe. Oecologia 153: 37-47.

Brown bear – Estonia

Peep Männil



Bear distribution in Estonia 2007-2010.
(Distribution in Russia and Belarus not shown).

Dark cells: reproduction
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Bears in Estonia are found all over the mainland and resident, reproductive females are missing only in two (most southern) out of the 13 total counties. The bears in Estonia are part of the large Baltic bear population that extends into Russia and Belarus.

2. Populations estimates & monitoring

Population size is estimated 700 as of autumn 2010. Population size is estimated by number of unique females with cubs-of-the-year. Number of unique annual reproductions is based on mapping of all year round sight (including trapped with cameras) and track observations all over Estonia.

Basic monitoring data are collected by hunters and personnel of protected areas and are analyzed in Estonian Environment Information Centre. Additionally, monitoring includes the data (site, sex, age, reproductive status) of harvested/dead individuals and data of damage cases.

3. Legal status & relevant management agencies

Bear is on the list of game species in Estonia with open season from 1.08. to 31.10. In accordance with derogations under the habitat directive and the national hunting law, hunting is only allowed following the objective to reduce damages . There is a valid national management plan (for 2012-2021) signed by the Minister of the Environment.

Management of bear falls to the Environmental Board under the jurisdiction of Ministry of the Environment. There is a Working Group for Large Carnivore Management in the Ministry of the Environment. Working group consist of different stakeholders and advises ministry to establish and implement the LC policy.

Estonian Environment Information Centre under the Ministry of the Environment is responsible for bear monitoring. The annual monitoring reports consists proposals for establishment of annual conservation measures and sustainable harvest quotas.

4. Population goal and population level cooperation

Following the current national management plan the goal is to: keep the number of females with cubs-of-the-year at least 60; keep the distribution over the country equal in suitable habitats; support to expand the bear range southwards.

There is no permanent bear range in Latvia. Despite of that we have close cooperation with Latvia sharing the information about reproductive bear occurrences near the Estonian-Latvian border. One of the Estonian bear management goals is to predispose the bear southwards spreading.

There is continuous bear population in Russia beyond the Estonian eastern border. Through the personal contacts the information about trends in both sides are shared.

5. Conflicts and conflict management

Conflicts exist over destruction of beehives while damage to livestock is very rare in Estonia.

Since 2007 the compensations are paid by the state: responsible body is Environmental Board and the source is Environmental Investment Centre. All the cases should be inspected by the trained experts of Environmental Board and if confirmed 100% of the market value is paid.

Additionally, subsidies for prevention measures such as electric fences are paid on up to 50% of proved real costs.

Environmental Board may issue certain licenses to shoot nuisance individuals outside of open season. Regarding of bear this legal opportunity hasn´t been used in last 10 years.

6. Threats

There are no foreseen any significant threat for favourable conservation status of bear population in predictable future. Still, there are some aspects that should be under highlighted attention: legal harvest, selective hunting and disturbance.

7. Summary table

Population size	Autum 2010: 700
Trend	Increasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Reproduction: 208 Sporadic: 162
Range trend	Increasing
Depredation costs / year	13’200 € in 2011
Number of cases / year	95 cases in 2011 (almost all beehives)
3 Most important threats	None

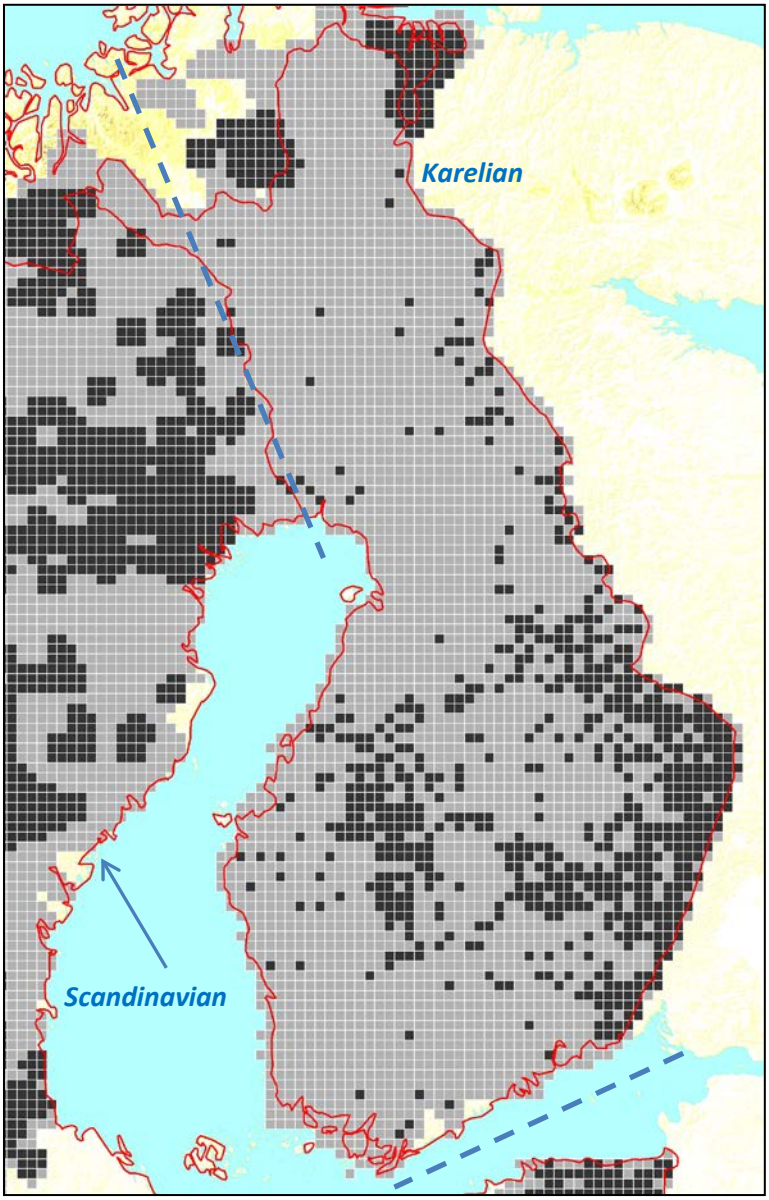
References:

Männil, P., Veeroja, R. & Tõnisson, J. 2011. Status of Game populations in Estonia and proposal for hunting in 2011 (in Estonian with English summary and figures). Estonian Environment Information Centre. http://www.keskkonnainfo.ee/failid/ULUKITE_SEIREARUANNE_2011.pdf

Männil, P. & Kont, R. (editors) 2012. Action plan for conservation and management of wolf, lynx and brown bear in Estonia in 2012-2021 (in Estonian). Ministry of the Environment. http://www.keskkonnainfo.ee/failid/SK_tegevuskava_2012-2021_lopp.pdf

Bear – Finland

Ilpo Kojola



Bear distribution in Finland 2009-2012.
(Distribution in Russia not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Bears are found everywhere in the mainland of Finland. Density of adult females is highest in southeastern Finland and central Finland. In southwestern Finland density is low and practically all bears are sub-adult males (Kojola & Heikkinen 2006). In the northern segment bears are concentrated at the Finnish-Russian border. Elsewhere in the north only a few adult females are found.

The number of bears decreased down to 150 animals, the lowest level for hundreds of years, in the late 1960s and started to increase again in early 1970s when local hunting associations in eastern Finland decided to stop all hunting for several years. The return to central Finland was supported by translocating two females from the east in the early 1980s. Genetic analyses indicate that these translocations have been critically important for the establishment of a reproductive bear population in central Finland (Saarma & Kojola 2007).

2. Population estimates & monitoring

The Finnish Game and Fisheries Research Institute (FGFRI) collects bear observations from a voluntary network of 1700 trained local experts who nowadays report observations to the Institute using an internet link system called 'TASSU' ('PAW' in English). Observations concerning litters-of-the-year are filtered out and used for the count of independent litters by using dates, geographic positions and paw width of the mother in the observations and data on movements and home range sizes from GPS collared female bears as primary criteria for estimation of the number of litters. A rough estimate for a total population size can be achieved by multiplying the number of litters by ten. The overall estimate for the Finnish bear population in 2012 was 1600 – 1800. The winter population is pronouncedly smaller (around 1000 – 1200 bears as a guesstimate) because most males that are moving around easternmost Finland in summer, spend the winter on the Russian side.

To obtain effort corrected data on trends in the Finnish bear population, FGFRI has been looking into bear observations (per hunter day) that moose hunters have recorded on observation cards during the annual moose hunting. Time spent in hunting is marked in the card, giving a chance to develop an index that is comparable over the years. Such an index is available from 2002 onwards. Genetic monitoring has been tried in two eastern provinces. It did well in the first area, but sampling was not intensive enough in the second area.

3. Legal status & relevant management agencies

In Finland the decrees concerning the protection of the bear population are written in the hunting law. The potential hunting season is opened on August 20 and lasts until the end of October. The Ministry of Agriculture and Forestry annually issues 5 quotas, one for each management zones (the zone of the established population in the southeastern Finland, the zone of expansion in the south-central Finland, the zone of developing population in southwestern Finland and the eastern and western segments of the reindeer management area in northern Finland). There are two different types of licenses in the quota, licenses for population management and licenses reserved for problem bears. The primary goal in licenses issued for population management is to regulate the population in regions where bear densities are highest (the zone of established population) or where bears cause most damage (the area of reindeer management). With the licenses reserved for problem bears, the license has to be applied for from the Finnish Wildlife Agency and the applicant has to document damages or problematic behavior of bear(s) for which she/he is applying for a license. This can be done at any time of the year. Before setting quotas, the ministry requests an estimate of the number of bears that can be harvested in each province and management zone without reducing the population from the Finnish Game and Fisheries Research Institute. After the plan is drafted it is distributed to NGOs, the Finnish Wildlife Agency, the Ministry of Environment and the Game and Fisheries Research Institute for comments. The mean annual legal harvest level has been 8% from 1996 through 2012, assuming population estimates are correct.

The management plan for Finland's bears was published in 2007 at the Ministry of Agriculture and Forestry (in Finnish, an English media release at http://www.mmm.fi/en/index/frontpage/Fishing,_game_reindeer/hunting_game_management/managementplans/managementplanforthebearpopulation.html).

4. Population goal and population level cooperation

No official goal for the size of Finland's bear population exists. Trans-boundary cooperation has mostly consisted of joint genetic research among Estonian, Scandinavian, Russian and Finnish scientists. The primary focus in these studies has been to clarify population subdivision and connection levels between different regions (Tammeleht et al. 2010; Kopatz et al. 2012; Schregel et al. 2012).

5. Conflicts and conflict management

In monetary terms the primary conflict is depredation on reindeer herds, especially losses of calves to bears. Bears also destroy beehives and silage packed in plastic for cattle, and kill some livestock. Every year some bears search for food, or on some occasions perhaps also shelter from cannibalistic males, in villages and suburbs. When the berry crop is poor, like in the very hot summer of 2010, the problem caused by bears that look for food in gardens and backyards can be a pronounced, especially in regions where bear densities are high.

The principal goal in the compensation system is full compensation for the damage. Because only a small portion of reindeer calves killed by bears can be found, the sum of money paid to reindeer herding associations as compensation for calf losses is determined by the herd size and the estimated level of predation by large carnivores. Compensation for losses of adult reindeer is based on documented bear-killed reindeer. Bears that move into villages and suburbs are usually removed with short reaction time by using licenses that are issued by local police officer.

Public funding is provided for electric fences to protect livestock and beehives. Before the management plan (2007) was drafted, a public debate session was organized in each province, in order to take into account views and opinions of different stakeholders.

6. Threats

In the foreseen future it is not possible to find threats that could incur any serious risks on the viability of Finland's bear population. Harvest by humans is strictly controlled and regulated. Poaching occurs and it might have some role locally but overall poaching is not a considerable threat to bears in Finland. In the early summer of 1998 a female bear killed a man who was jogging and ran toward a female and her young in southeastern Finland (Nyholm 1998). Although 50% of Finns still regard bears as a threat to human safety, public attitudes toward bears have somewhat improved over the last 10 years.

7. Summary table

Population size	1600-1800
Trend	Increaseed but now stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 668, sporadic: 2911
Range trend	Increase
Depredation costs / year	(2007-2011 mean): 750'000 € for reindeer & 172'700 € other depredation
Number of cases / year	(2007-2011 mean/range): 681 reindeer, 30 – 100 sheep, 0-5 other livestock (cattle, horses), 0-4 dogs, 150-250 beehives, hundeds packages of silage some damage in oatfields (not quantifiable from records)
3 Most important threats	None

References

KOJOLA, I. & HEIKKINEN, S. 2006: Structure of expanded brown bear population at the edge of range in Finland. – Annales Zoologici Fennici 43: 258 - 262.

KOJOLA, I., HALLIKAINEN, V., PESONEN, M., NYGREN, T. & RUUSILA, V. 2006: Trends and harvest in Finland's brown bear population. – Ursus 17: 18 - 21.

KOPATZ, A., EIKEN, H. G., HAGEN, S. B., RUOKONEN, M., ESPARZA-SALAS, R., SCHREGEL, J. KOJOLA, I., SMITH, M. E., WARTIAINEN, I., ASPHOLM, P. E., WIKAN, S., RYKOV, A. M., MAKAROVA, O., POLIKARPOVA, N., TIRRONEN, K. F., DANILOV ,P. I. & ASPI, J. 2012: Connectivity and population subdivision at the fringe of a large brown bear (Ursus arctos) population in North Western Europe. - Conservation Genetics 13: 681-692.

Nyholm, K. E. 1998: Bear attack in Finland. – International Bear News 7(3): 30.

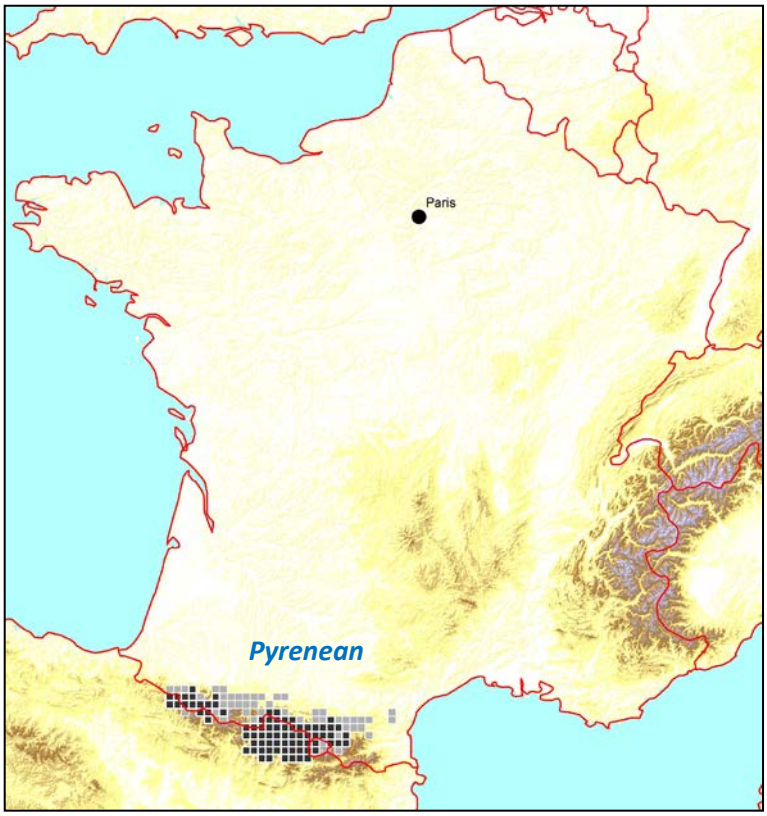
Saarma, U. & Kojola, I. 2007: Matrilinear genetic structure of the brown bear population in Finland. – Ursus 18: 30-37.

SCHREGEL, J., KOPATZ, A., HAGEN, S. B., BRØSETH, H., SMITH, M. E., WIKAN, S., WARTIAINEN, I., ASPHOLM, P. E., ASPI, J., SWENSON, J. E., MAKAROVA, O., POLIKARPOVA, N., SCHNEIDER, M., KNAPPSKOG, P. M., RUOKONEN, M., KOJOLA, I., TIRRONEN, K. F., DANILOV, P. I. & EIKEN, H. G. 2012: Limited gene flow among brown bear populations in far Northern Europe? Genetic analysis of the east-west border population in the Pasvik Valley. – Molecular Ecology 21: 3474-3488.

TAMMLEHT, E., REMM, J., KORSTEN, M., DAVISON, J. TUMANOV, I. SAVELJEV, A., MÄNNIL, P. KOJOLA, I. & SAARMA, U. 2010: Genetic structure in large, continuous mammal populations: the example of brown bears in northwestern Europe. - Molecular Ecology 19: 5359 – 5370.

Bear – France

Pierre-Yves Quenette



Brown bear distribution in France 2007-2011.

Dark cells: permanent presence
(in 3 out of 5 years detected)
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. **Monitoring**

Population monitoring relies both on a systematic and opportunistic sampling design to collect presence signs throughout the year. A network of 360 trained field experts is in charge to collect any presence signs which are sent to a central state agency (ONCFS) for validation. Genetic CMR analysis is performed to estimate population bear. Similar protocols are used in adjacent Spain and Andorra.

2. Distribution

Bear in France are found only in Pyrenees Mountains. The last autochthonous bear disappeared in 2010. The present population is the result of the translocation of 8 bears from Slovenia to the French Pyrenees. For the period 2007-2011, the regular and sporadic presence in France are estimated to be 3400 km^2 and 4800 km^2 respectively.

3. Population estimates

In 2011 the minimum number of detected individuals was 22, based on genetic monitoring, camera traps and opportunistic observations. Most of the individuals identified are both located on the Spanish and French side of the Pyrenean range. The genetic CMR analysis for the entire bear presence area was estimated at 19 (95%CI: 13-29).

4. Legal status and management

Brown bears are a fully protected species in France (Bern Convention, Habitat Directive, National Law). Management of the bear population and its habitat falls under the jurisdiction of the Ministries of Ecology and Agriculture. The bear management plan is included in the Pyrenean Biodiversity Strategy (PSVB). A committee with all stakeholders from the Pyrenees mountains was set to evaluate the strategy. (Dreal 2011).

5. Population Goal

There is no explicit population limit. The main objective is to restore a viable population in co-existence with human activities. The last population viability analysis from 2010 concluded that this population was not viable (i.e extinction probability >5% for 50 years)

6. Conflicts

The main conflict is with sheep husbandry. Several systems are available to improve the cohabitation with the predator: financial compensation for damages, financial help for attacks prevention on livestock (guarding dog, electric fencing, extra-herding costs) and financial help to transport the material useful for the shepherds present in bear area during summer.
An awareness campaign to hunters for large game species is achieved to avoid accidents during hunting.

7. Threats

Poaching (at least 2 cases between 1995-2010), accident during hunting (shooting error or shooting for self-defence, 3 cases for the period 1997-2008) and traffic accident (2 cases in 2007 and 2009).

8. Summary table

Population size	2011: 22 individuals (minimum count including Spanish side)
Trend	Increasing (+7.8% per year on average)
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 34 Sporadic: 50
Range trend	stagnant
Depredation costs / year	2006-2011: mean of 103'000 €
Number of cases / year	2006-2011: mean of 200 sheep / goats, 31 beehives
3 Most important threats	Poaching, hunting accidents, small population size.

References:

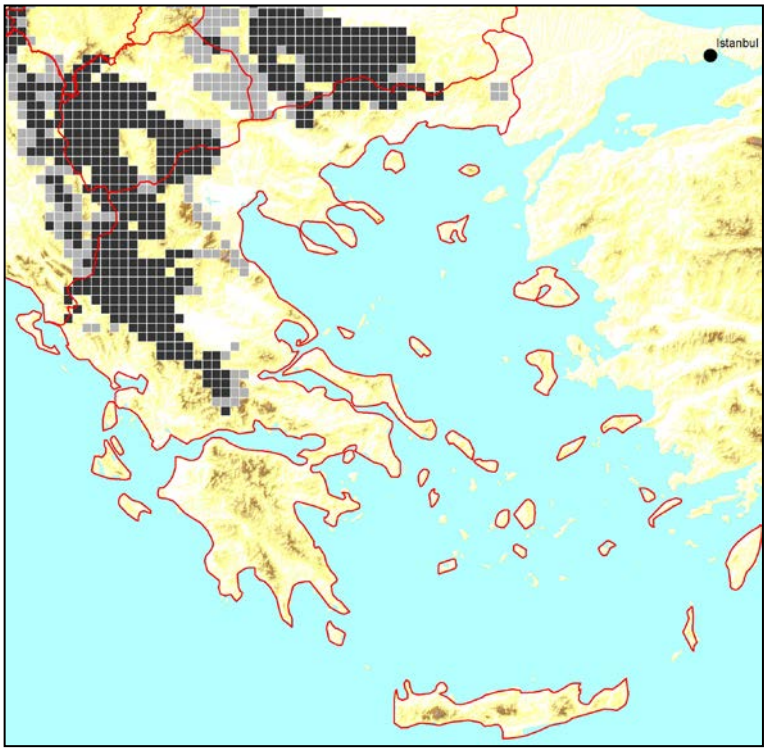
Decaluwe F, Camarra JJ, Sentilles J & Quenette PY. 2011. Le statut de la population d'ours brun dans les Pyrénées: bilan 2010 et actualités 2011. Faune Sauvage, 292: 48-50.

DREAL MP. 2011. www.midi-pyrenees.developpement-durable.gouv.fr/la-concertation-actuelle-au-niveau-r3225.html

Camarra JJ, Decaluwe F, Quenette PY, Jato R, Larumbe Arricibita J, Palazon S & de la Torre JS. 2011. What's Up in the Pyrenees? Disappearance of the Last Native Bear, and the Situation in 2011. Int. Bear News, 20(4): 34-35.

Bear – Greece

Yorgos Mertzanis



Bear distribution in Greece 2006-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Bears in Greece are found in two main core populations separated by a distance of circa 250 km (Mertzanis et al. 1994, Mertzanis 1994, Mertzanis 1999, Mertzanis et al. 2009):

- the Pindos population covering a range surface of circa 11,000km^2 which is the southernmost part of the large Dinaric- Pindos bear population (Linnell et al. 2007)
- the Rodopi population covering a range surface of circa 2,500km^2 which is the southernmost part of the Eastern Balkan bear population (Linnell et al. 2007).

Moreover during the recent decade (2002-12) a range expansion is underway (Mertzanis et al. 2009) and bears have been observed in areas of the species historical range where it had disappeared 40 and even 60 years ago. It seems that in many cases of re-colonized areas range expansion is not only related to vagrants but also to a meta-population process as in several areas there is evidence of reproduction:

- Voras-Tzena-Pinovo-Paiko-Vermio Mountains
- Southern Pindos range
- Andixassia Mountains
- Mount Olympos

The overall species range (including re-colonized areas) covers circa 21,500 km^2. The overall brown bear range in Greece includes four National Parks totalling 4,750 km^2(Rodopi Mountain Range NP with 1,750 km^2, Lakes Prespa NP with 200km^2, Northern Pindos (Vikos-Aoos) NP with 2,000 km^2 and -Tzoumerka NP with ~800 km^2).

2. Populations estimates & monitoring:

Actually the total bear population size in Greece appears generally stabilized with positive trends at a local (sectorial scale) observed mainly in the Pindos population nucleus. Population estimates have been and are based on two different and complementary methods:

- spring surveys of females with cubs of the year (FWCY) (1994-95 (overall range), 1997-99 (overall range), 2000-02 (part of Pindos and Rodopi nuclei), 2004-2009 (part of N. Pindos nucleus), 2010-11 (part of N. Pindos): according to this method minimum population size has been estimated at 190-260 individuals (Mertzanis et al. 2009, Red Data Book),
- genetic fingerprinting (sectorial 2003-2005, overall 2008-2010, sectorial 2011) (Karamanlidis 2011, Karamanlidis et al. 2012, Tsaparis et al. 2012): more accurate, this method has estimated the minimum bear population in Greece at 350-400 individuals.

Recently referred re-colonization of areas of the historical distribution clearly indicate positive population trends at local scale (Mertzanis et al. 2009). Monitoring in both Pindos and Rodopi populations is actually performed mainly through telemetry, genetic fingerprinting, IR cameras and spring surveys of FWCOY. These methods and protocols are mainly implemented under LIFE projects such as: (LIFE93NAT/GR/001080, LIFE96NAT/GR/003222, LIFE99NAT/GR/006498, LIFE07NAT/GR/000291, LIFE07NAT/IT/000502, LIFE09NAT/GR/00333) and in some cases National Parks personnel (wardens) start getting involved.

3. Legal status & relevant management agencies

According to National Law 86/69 (articles 258§e) the brown bear is declared as a strictly protected species for which killing, capture, trade of parts and exposure are strictly forbidden acts. In the EU Habitats Directive (92/43 of 21.5.1992) (European Union members only) the brown bear is listed in Appendix II as a priority species. The brown bear is considered as an "endangered" species according to the Greek Red Data Book on Threatened Wildlife species (Mertzanis in *Legakis and Maragou, 2009 eds.*).Since 2009 brown bear management falls under the jurisdiction of the Ministry of the Environment, Energy and Climate Change as well as under the regional administration and local forestry services.

A National Bear Management-Action Plan was issued in 1996 as a deliverable of LIFE Project LIFE93NAT/GR/001080. This Action Plan has never been officially validated by the competent state authorities. However specific guidelines and data such as bear presence in critical zones were taken into account as basic environmental criteria in EIA studies in the cases of large and medium scale infrastructure projects construction. Bears critical areas were also the criterion for the horizontal implementation of specific measures officially endorsed by the competent authorities. One example is the seasonal closure of forest roads in pre-selected bear habitat units during the hunting season for minimization of bear disturbance. Very recently (beginning of fall 2012) the Ministry of Environment, Energy and Climate Change has announced its intention for an update (2013-14) and "re-activation" of a Bear Action-Management Plan and asked the two competent national NGO's on the matter for consultation, cooperation and input.

4. Population goal and population level cooperation

So far and despite the existence of an old Bear Management Plan there are no officially established and set population goals. Unofficially we could set the following major goals:

- maintain the two core populations nuclei at viable levels
- ensure connectivity between source populations and meta-populations in recolonized areas at a country scale
- ensure viability of meta-populations
- ensure trans-border connectivity between the two core populations nuclei (Pindos and Rodopi) with neighboring countries (Albania, "The Former Yugoslav Republic of Macedonia", and Bulgaria respectively).

5. Conflicts and conflict management

Bear- human conflicts related to damage caused on livestock, cultivations and beehives occurs over the total species range in the country. The national compensation system endorsed by the National Farmer's Insurance Organization (ELGA) covers damages over a market value of 200 euros per attack (ELGA 2011) and is uniform across all the bear range at a country scale.

Killed livestock is compensated at 100% of their market value following inspection by qualified veterinarians and agronomists. Damage of market value below €200 is considered cumulatively and farmers are compensated in the end of the season provided that total cumulated damage reaches a minimum of €200. In the cases of beehives, the honey value is not compensated and in cases of cultivations, only the production loss is compensated and not the damaged trees. Still a certain percentage of damages remain unreported as bureaucratic procedures and a high rejection rate of compensation claims discourage farmers to make use of it.

The use of preventive measures such as electric fencing and livestock Guarding Dogs (LGD's) is systematically promoted and there use has become widespread amongst farmers also thanks to the efforts through the aforementioned LIFE projects. Moreover systematic efforts to restore traditional LGD's dog breed (Greek sheepdog) are ongoing from national NGO's under LIFE projects. It is worth mentioning that local dog breeders and farmers show great interest in maintaining and enforcing this type of preventive measure which has been traditionally known and used for decades.

Recently the Ministry of Environment ,Energy and Climate Change has issued a relevant common Ministerial Decision in order to incorporate in the near future under the CAP agro-environmental measures the support, propagation and subsidizing of electric fencing as a standard preventive measure. This agro-environmental measures frame also foresees the subsidization of the 10% of cultivations production with trophic interest for bears to remain un-cropped as a bear food resource. Unfortunately the LGD's use has not been included for the time being in the aforementioned agro-environmental measures frame.

Mitigation of large scale transportation infrastructure has been a major issue to deal with and from 2002 to 2009 specific monitoring programs have been implemented focusing mainly on two critical parts of the Egnatia highway cutting through bear core habitat in Pindos range (Mertzanis et al. 2011).

Another aspect of human-bear conflict to be managed is the rising problem of "habituated" and/or food conditioned bears approaching human settlements located within bear habitat. For this a Bear Emergency Team has been established since 2009 under the aforementioned LIFE projects and is dealing with all incidences with a case by case scenario. Moreover a complete Protocol with Guidelines and methods to deal with these cases has been elaborated by National NGO's and has been recently submitted to the Ministry of Environment Energy and Climate Change for official approval and implementation.

6. Threats

As major threats we may consider:

- Human-caused mortality (poaching, proactive killing, use of poison baits) which is still affecting the bear population at critical levels (5-7%).
- Traffic fatalities due to large scale transportation infrastructure development which is a new and serious problem affecting detrimentally the bear populations with no less than 17 accidents on only two segments of the Egnatia highway over the last three years (2009-2012).
- Large infrastructure construction has also an impact on bear habitat quality and connectivity.

7. Summary table

Population size	350-400
Trend	Pindos: stable with localized increase Rodopi: stable to slight decrease
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 203 Sporadic: 47
Range trend	Pindos: expansion (southwards and eastwards) Rodopi: stable
Depredation costs / year	140'725 € for all bear damages combined
Number of cases / year	~200 sheep/goats, ~220 cattle/horses, ~535 beehives/swarms
3 Most important threats	illegal killing, traffic fatalities, lack of local acceptance

References:

Karamanlidis A (2011): First Genetic Census of brown bear (*Ursus arctos*) population in Greece. Final Report, Arcturos, Hellenic Ministry of Rural Development and Food & Hellenic Ministry of Environment, Energy and Climate Change (Thessaloniki,).1-87pp (in greek).

Karamanlidis AA, Straka M, Drosopoulou E, De Gabriel Hernando M, Kocijan I, Paule L and Scouras Z (2012) Genetic diversity, structure, and size of an endangered brown bear population threatened by highway construction in the Pindos Mountains, Greece. *European Journal of Wildlife Research* 58:511–522.

MERTZANIS (G.), GRIVAS (C.), IOANNIDIS (Y.), BOUSBOURAS (D.), GIANNATOS (G.), PAPAIOANNOU (H.), POIRAZIDIS (C.), & GAETLICH (M.) (1994): The status of brown bear (Ursus arctos L.), in Greece. Biologia Gallo-Hellenica (22): 225-232

MERTZANIS (G) (1994): Brown bear in Greece: distribution, present status-ecology of a northern Pindus subpopulation. Proc. Int. Conf. Bear Res. and Manage. 9(1): 187-197.

MERTZANIS G. (1999): Status and management of the brown bear in Greece. Pp: 72 – 81, in: Status survey and Conservation Action Plan – BEARS, (Servheen, Herrero, Peyton eds.), IUCN/SSC Bear Specialist Group.

Mertzanis Y., Giannakopoulos Al. , Pilidis Ch. (2009). Brown Bear status, Pp: 387-389, *in*: Greek Red Data Book. Greek Zoological society, (Legakis and Maragou, eds), 525 pp.

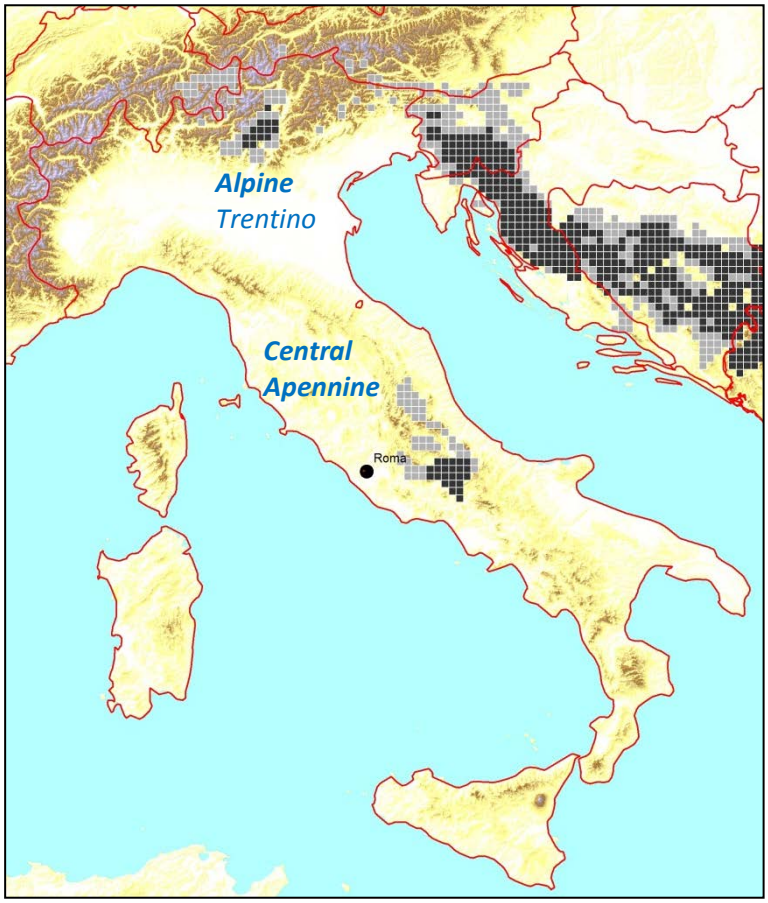
Mertzanis G., Korakis G., Tsiokanos K., Aravidis Il. (2009): Expansion of brown bear range in the course of rural abandonment during the 20th century - a case study from the Pindos mountain range. Pp 330-337 in: "Woodland Cultures in Time and Space - Tales from the past, messages for the future". (Saratsi E., Burgi Mat., Johann El., Kirby K., Moreno D., Watkins Ch.eds.); Embryo Publ. 2009, ISBN 978-960-8002-53-1., 400 pp.

MERTZANIS G, MAZARIS ANT. , SGARDELIS ST. , ARAVIDIS EL. , GIANNAKOPOULOS AL. **,** GODES C., RIEGLER S. , RIEGLER A., TRAGOS Ath. (2011).Telemetry as a tool to study dispersal ability, habitat suitability and distribution patterns of brown bears as affected by the newly constructed Egnatia highway – N. Pindos - Greece. Pp: in "Telemetry", (InTech editors) ISBN 978-953-307-415-3, pp 307-328. <http://www.intechopen.com/articles/show/title/telemetry-as-a-tool-to-study-spatial-behaviour-and-patterns-of-brown-bears-as-affected-by-the-newly>

Tsaparis D., Karaiskou N , Mertzanis Y, Triandafyllidis Al (2012): Genetic study of the brown bear (*Ursus arctos*, L.) population in NW Greece (region of Kastoria). Project LIFE09NAT/GR/000333 (NGO "Callisto") - 12th International Congress on the Zoogeography and Ecology of Greece and Adjacent Regions **(**Athens, Greece, June 18 –22, 2012). J. of Natural History. (subm).

Bear – Italy

Paolo Ciucci, Luigi Boitani and Claudio Groff



Bear distribution in Italy for Central Apennine (2004-2008) and the Alps (2011).

Dark cells: reproduction / permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

Bears in Italy are found in 2 populations, the autochthonous Central Apennine and the re-introduced Alpine population in Trentino.

In Central Apennine the area of stable presence seems to cover ~1.300 km² in and around the Parco Nazionale d'Abruzzo Lazio e Molise (PNALM). Although the trend cannot be assessed due to non-standardized monitoring, there is no evidence for a range expansion.

In Trentino the female area covers 863 km² in and around Adamello-Brenta National Park. The resident range is more or less stable, the range of the dispersers increasing.

2. Populations estimates & monitoring

The Central Apennine bear population was estimated at 40 (95%CI: 37-52 in spring-summer 2008 (Gervasi et al. 2012) based on estimates genetic CMR analysis from the core area (stable presence & reproducing females, ~1.300 km²). Additional monitoring has been done by telemetry. It is not possible to provide a trend as previous guesstimates (1970-2004) were highly inaccurate or of low precision (Ciucci and Boitani 2008).

The minimum estimate for the Trentino bear population is 33-36 bears based on genetic monitoring in the female area (Groff et al. 2011) and the population trend is clearly positive. Monitoring in both populations is done by park staff and Forestry service personnel, coordinated by

an academic/research center. In Central Apennine, population assessment for 2011 and 2014 is co-funded by EU program Life ARCTOS.

3. Legal status & relevant management agencies

Bear management in Italy is fully decentralized at regional and local (i.e. provincial and park) level.

The Central Apennine bear population falls under the jurisdiction of the Ministry of the Environment, the Regions of Abruzzo, Lazio and Molise, and the National Park of Abruzzo Lazio and Molise. The bear is fully protected in Italy. A management plan was drafted by a team of experts (neither the public, nor stakeholders have been involved) for the Ministry on Environment, the Regional governments and the authorities of the protected areas, but has no legal or jurisdictional value.

The Trentino population falls under the jurisdiction of the Forest and Wildlife Department of the Provincia Autonoma di Trento. Management involves the public and all stakeholders on the highest level possible. The management of bears in Trentino is not depending on single projects; it is carried out since the 1970' as part of ordinary wildlife management.

4. Population goal and population level cooperation

The Ministry of the environment and all regional and local administrations signed a memorandum of understanding for the conservation of the Apennine brown bear, even though it has not been put into practice up to now. Population goals for the Central Apennine bear population are a 25% population increase by 2020 and, with respect to the previous decade (2000-2010), a concomitant 50% reduction in known mortality due to human causes.

The goal for the Trentino population is a MVP of ~60 individuals and to connect the small and isolated Alpine population with the large Dinarico-Pindos population. International cooperation occurs through the Alpine Convention and other international networks.

5. Conflicts and conflict management

Conflicts exist over livestock depredation and destruction of beehives in both populations.

Inside Abruzzo park compensation is paid by the Park Authority with funds from the Ministry of the Environment; outside parks it is paid by the Provincial governments with funds from the Regional governments. Only documented losses are compensated. All suspected kills are inspected by Government vets and/or park wardens and, if confirmed, 100% of the market value is paid. Prevention measures are only opportunistically funded when project money is available (e.g. Life projects).

In Trentino, compensation is paid by the Forestry and Wildlife Department after inspection and confirmation by own, specifically trained personnel. 100% of the market value is paid. Additional funds are available by the Forestry and Wildlife Department for prevention measures such as electric fences, livestock guarding dogs and shelters for shepherds in the mountains.

6. Threats

Central Apennine: Despite its full protection this bear population seems to be stagnant at the best, despite regular reproduction events (1-7 females with cubs have been censuses annually from 2006 to 2011). Documented mortalities from 2006-2011 have been 16 (3 poisoned, 3 infanticide, 1 traffic mortality, 1 predation and 8 of unknown causes).

The population has been small over a long time and shows marked difference from other European populations, genetically, morphologically and behaviorally. Although there is very little genetic variability, signs of potential inbreeding depression are not apparent yet.

Management authorities are chronically unable to cope with renewed conservation strategies, and most relevant national NGO's are practically out of the scene. The future of this population appears to be very poor if the past/current management continues.

Trentino: Despite the positive trend, livestock depredation and the occurrence of problem bears (bears approaching human infrastructure & settlements in search of food) is still challenging local acceptance of bears. Thus the importance and necessity to improve: 1.) quantity and quality of information, and 2.) efficiency in removing problem bears is regarded a critical success factor.

7. Summary table

Population size	Central Apennine (2008): 40 (95%CI: 37-52) Alps: 33-36 (minimum estimate)
Trend	Central Apennine: unclear, but likely stagnant Alps: increasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Central Apennine: 23 reproduction & 41 sporadic Alps: 14 reproduction & 41 sporadic
Range trend	Central Apennine: unclear, but likely stagnant Alps: resident range stagnant, dispersal range increasing
Depredation costs / year	Central Apennine (2006-2011): ~50,000€ but increasing tendency for livestock Alps (2006-2011): 17.000€ for sheep and goats, 4.000€ for rabbits & chickens, 27.000€ for beehives
Number of cases / year	Central Apennine (2006-2011): ~140 sheep / goats, ~50 cattle / horses, ~150 rabbits, ~517 poultry, ~265 beehives Alps: no information
3 Most important threats	illegal killing, small population size, local acceptance

References:

AA.VV.2011. Piano d'azionenazionale per la tuteladell'Orsobrunomarsicano (PATOM). Quaderni di ConservazionedellaNatura n. 37. http://www.minambiente.it/home_it/showitem.html?lang=&item=/documenti/biblioteca/biblioteca_0016.html

AA.VV., 2010 - Piano d'Azioneinterregionale per la Conservazionedell'OrsobrunonelleAlpicentro-orientali – PACOBACE. Quad. Cons. Natura, 33, Min. Ambiente - ISPRA. http://www.regione.fvg.it/rafvg/export/sites/default/RAFVG/ambiente-territorio/ARG5/allegati/Pacobace_2010.pdf

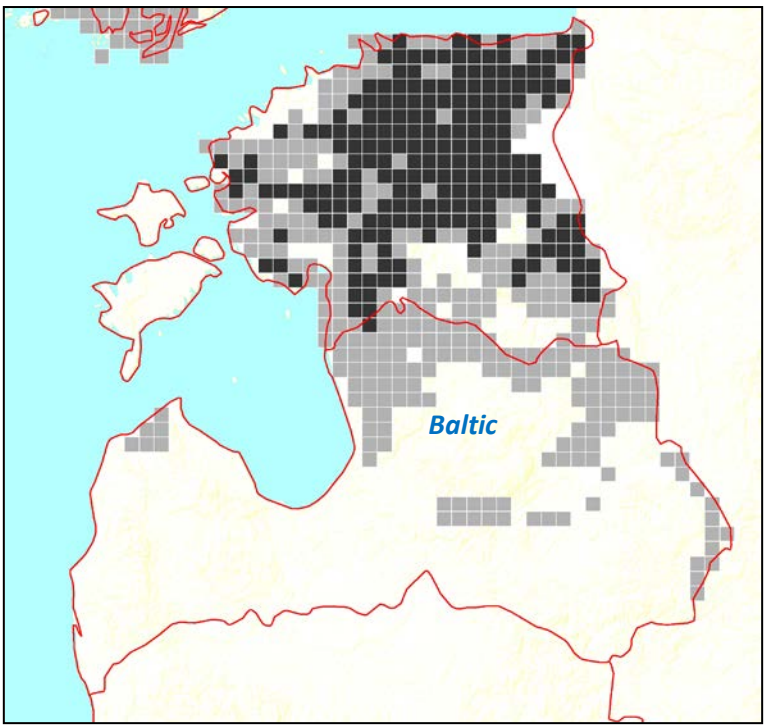
Ciucci, P. and L. Boitani. 2008. The Apennine Brown Bear: A Critical Review of Its Status and Conservation Problems. Ursus, 19(2):130-145.

Gervasi, V., P. Ciucci, J. Boulanger, E. Randi and L. Boitani. 2012. A multiple data source approach to improve abundance estimates of small populations: The brown bear in the Apennines, Italy. Biological Conservation 152:10-20.

Groff C., D. Dalpiaz, R. Rizzoli, P. Zanghellini P. (editors). 2012. 2011 Bear Report. Forestry and Wildlife Department of the Autonomous Province of Trento, Italy. http://www.orso.provincia.tn.it/binary/pat_orso/rapporto_orso/BearReport2011.1334146370.pdf

Bear – Latvia

Janis Ozolins



Bear distribution in Latvia 2006-2009. (Distribution in Russia and Belarus not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Bears in Latvia belong to the Baltic population, but are rare. Occurrences are most common in the eastern and northern part of the country along the Estonian and Russian border. There is no evidence of bear breeding in the territory of Latvia. Distribution of the bears is relatively unchanged since the 1970s.

2. Population estimates & monitoring

Only sporadic appearance is recorded. The number of bears in Latvia is thought to be about 10-15 individuals. They are single occasional observations reported to the State Forest Service. Although there have been several reports of finding bear hibernation dens in Latvia (Pilāts, Ozoliņš 2003), no one did succeed in checking and documenting those cases until January 2005, when during wild boar hunting with beaters a big male was disturbed in its den (Ozoliņš 2005). Even though bear distribution in Latvia in the last 20 years can be regarded as stable, it is unclear how their distribution is related to the number of individuals, i.e., whether the number of resident bears in Latvia has remained stable. It is still unknown whether bear dispersal into Latvia is related to an increase in the bear density within the country or whether bears observed in the central and western part of Latvia are immigrants from the neighbouring countries that have crossed eastern Latvia on the way.

3. Legal status & relevant management agencies

The brown bear is a specially protected species in Latvia. The fine for killing or injuring a brown bear is 40 minimum salaries for each individual. Until 2007, records of bear occurrences were summarized by the State Forest Service. Since 2008, the only information on bear presence has been documented within the framework of monitoring Natura 2000 sites. The National Action Plan for the Conservation of the Bear (2003) has been updated in 2009. Further updates are liability of the Nature Protection Board under the Ministry of Environment and Regional Development.

4. Population goal and population level cooperation

There are no explicit population goals for the bear in Latvia. Species conservation objective is not to disturb natural processes happening in the joint Baltic brown bear population, including natural dispersal of bears into the territory of Latvia while at the same time not undertaking any special measures in order to artificially support bear distribution in Latvia or to establish a local breeding population.

5. Conflicts and conflict management

Problems with damages to livestock are absent. Damage to beehives are comparatively common. There is a legal order in which land users can be compensated for damages caused by specially protected non-game species icluding bears, however, this system has failed because after economic recession funds never have been appointed within state budget for this aim.

6. Threats

Considering that Latvia is on the periphery of the Baltic bear population of nearly 7000 individuals, the most relevant are those factors that prevent bears from staying after coming to Latvia from elsewhere. Hunting, intensive forestry and developing transport infrastructure are main factors that threaten resident and ranging individual bears.

7. Summary table

Population size	10-15
Trend	Stagnant
Distribution range (# cells in the 10 x 10 km EEA grid)	Sporadic: 14
Range trend	Stagnant
Depredation costs / year	None
Number of cases / year	None
3 Most important threats	Direct disturbance in the period when bears are looking for a den as well as during the wintering period; developing transport infrustructure; insufficient institutional capacity and budget.

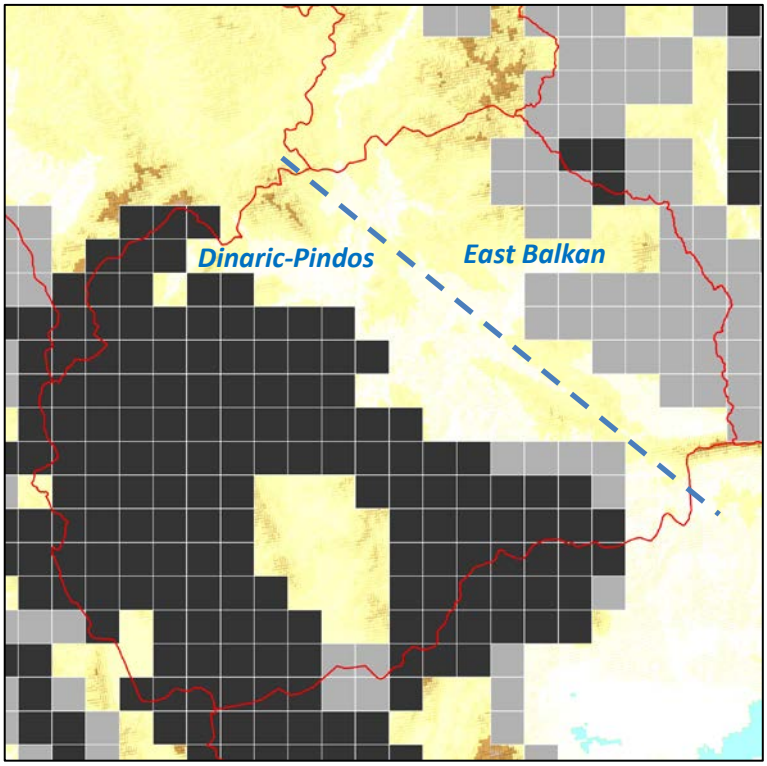
References:

Ozoliņš J. 2005. Brūnā lāča *Ursus arctos* ziemošanas pierādījumi Latvijas ziemeļaustrumos. [Winter denning evidences of a brown bear in the north-east of Latvia] – Ziemeļaustrumlatvijas daba un cilvēki reģionālā skatījumā. Latvijas Ģeogrāfijas biedrības reģionālā konference. Alūksne, 2005. gada 22.-24. jūlijs. (sast. Grīne I., Laiviņa S.), Rīga: Latvijas Ģeogrāfijas biedrība, 125.-127. lpp. (in Latvian)

Pilāts V., Ozoliņš J. 2003. Status of brown bear in Latvia. – *Acta Zoologica Lituanica,* Vol. 13, No. 1: 65-71.

Bear – "The Former Yugoslav Republic of Macedonia"

Compiled after material provided by Gjorge Ivanov, Aleksandar Stajanov & Dime Melovski



Bear distribution in "The Former Yugoslav Republic of Macedonia" 2006-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

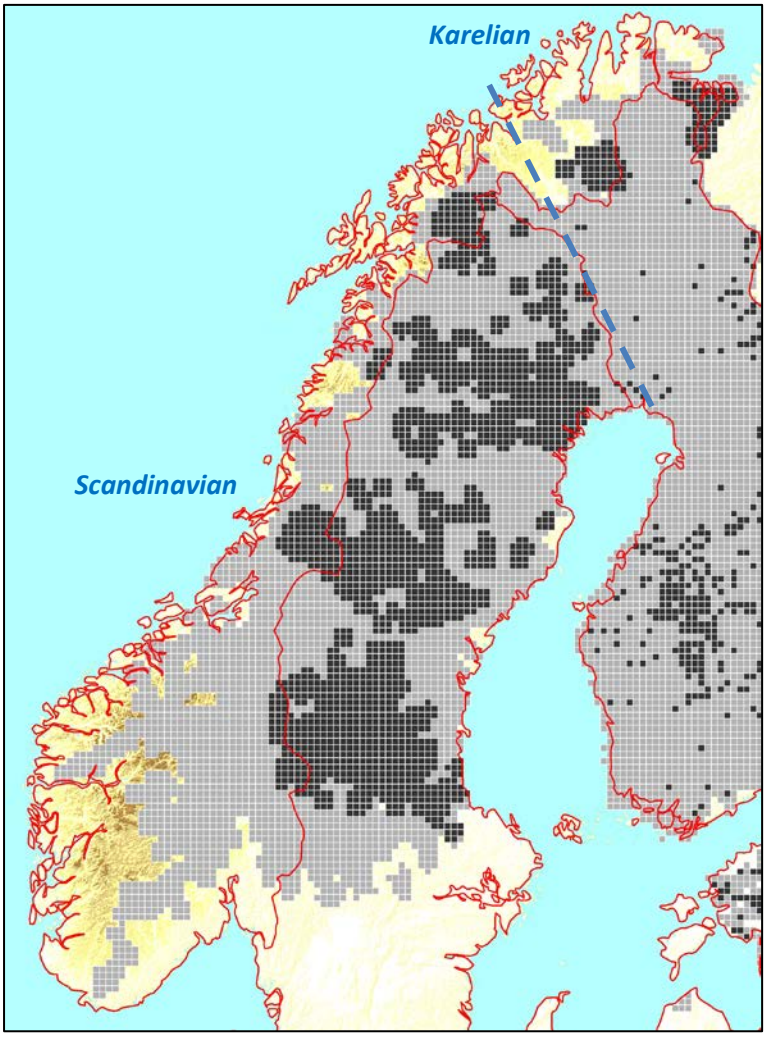
[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

Summary table

Population size	160-200
Trend	stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 135, sporadic: 37
Range trend	increase
Depredation costs / year	No information
Number of cases / year	(2007): 53 sheep/goat, 167 cattle/horse/donkey/pig, 152 beehives
3 Most important threats	Poaching, low acceptance, poor management structure

Bear – Norway

John D. C. Linnell & Jon Swenson



Brown bear distribution in Norway 2007-2011.

Dark cells: reproduction presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Brown bears are mainly found along the Norwegian border with Sweden, Finland and Russia. Female bears are almost exclusively found very close to the border – within some tens of kilometers – although dispersing male bears can be found more than a hundred kilometers from the nearest known reproduction. Bears in Norway fall into two populations. The bears on the border to Sweden fall into the Scandinavian population.

Female bears are found in 4 discrete areas that constitute the edges of the Swedish distribution. The bears in the northernmost county of Finnmark fall into the Karelian population and occur in two discrete clusters, one bordering onto Finnish Lappland, the other bordering onto both Finland and Russia (Murmansk oblast).

2. Populations estimates & monitoring

Bear numbers are estimated based on annual collections of bear scats by the public (mainly moose hunters). DNA is extracted from the scats and used to identify the number of individuals. In autumn 2011, the year with most recent data, a total of 1208 scats were collected. Of these 757 tested positive for bear DNA and full genetic profiles could be extracted from 593 of them. Among these it was possible to detect 151 unique bear individual profiles. Forty-six were found in the Karelian population and 105 among the various clusters that are included in the Scandinavian population. Most of these bears are likely to occupy home ranges that include parts of Sweden.

Population goals are expressed in terms of an annual number of reproductions which is calculated statistically from the observed number of unique DNA profiles. In 2010 there were an estimated 6.2 reproductions.

In addition, data on distribution is available from any bears shot or found dead, and from confirmed cases of livestock depredation. Observations of tracks and dens made by the public are also collected, many of which are verified. Efforts are underway to establish a "bear observation" index based on observations made by moose hunters during the autumn moose hunt.

3. Legal status & relevant management agencies

All species are protected by default under Norwegian law unless there is a specific opening for hunting within certain seasons. Within this framework, bears are subject to a restricted form of license hunting which is designed to enforce a strict zoning policy. Hunters who register and have passed the necessary tests may take part in the annual hunt which is limited by area specific quotas between 21st August and 15th October. Because regional population goals have not yet been reached the quotas are set by the Directorate for Nature Management, however, as soon as regional goals are met the power will be delegated to a committee (appointed by the Ministry of the Environment) drawn from elected politicians in the county parliaments. These committees are assisted by employees of the relevant county administration. The monitoring data on the status of the bear population which determines if the regional committees have authority is provided by the national level Norwegian Institute for Nature Research. In addition, a number of bears are killed in each year in response to acute livestock damage situations. In recent years from 13 to 18 bears have been killed each year, with only 3-4 being shot by hunters in the license hunt.

4. Population goal and population level cooperation

The Norwegian parliament has set management goals for bears in Norway. The goal was set in 2004 at 15 annual reproductions, but this was down-graded to 13 by a new parliamentary decision in 2011. The goal from 2004 was then distributed between the 8 large carnivore management regions, although it has not yet been decided where the cut from 2011 will be made. Regional goals vary between 2 and 6 annual reproductions for the 4 regions that have a goal. The current population is below the goals. The national level Directorate for Nature Management coordinates management between regions. There is no formal transboundary management plan with Sweden, Finland or Russia, with whom Norway share the two populations. However, there is frequent dialogue between the respective national wildlife management agencies for Norway and Sweden. A common research project, the Scandinavian Bear Project, coordinates Norwegian and Swedish bear research activity. It is anticipated that monitoring methods will be harmonized in 2013.

5. Conflicts and conflict management

The major conflicts in Norway are with free ranging, unguarded domestic sheep in summer and with free-ranging semi-domestic reindeer throughout the year. Compensation is paid for all animals documented (examined by wardens from the State Nature Inspectorate) as being killed by bears and for many others which are assumed (based on knowledge of so-called "normal" loss in the absence of lynx) to be killed by lynx. Typically, 95% of the animals compensated have not been confirmed, or even found. Annually compensation is paid for 3000 to 7000 sheep and 4 to 75 semi-domestic reindeer. The extent of depredation on semi-domestic reindeer is very uncertain. The main mitigation measure is to limit the distribution of the bear population using lethal control. To a very limited extent sheep farmers have begun to adapt their husbandry system to include electric fences or converting from sheep farming to other activities. There are few practical mitigation measures for reindeer.

6. Threats

The bear populations in Norway are very small and under present policy will never be allowed to increase dramatically. However, because they are part of the much larger Scandinavian and Karelian populations there future seems secure as long as nothing changes in their neighbors' policies. The main long term threat is low public acceptance caused by sheep and reindeer depredation. There is an urgent need to adapt sheep farming to bear compatible husbandry systems in areas with predictable bear presence rather than depending on lethal control. Illegal killing also occurs.

7. Summary table

Population size	Autumn 2012: 151 unique DNA profiles were detected in scats (46 from the Norwegian part of the Karelian population and 105 from the Norwegian part of the Scandinavian population)
Trend	Slowly increasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 386 Sporadic: 1556
Range trend	Stable
Depredation costs / year	up to 2 M € for sheep and recently up to 35'000 € for semi-domestic reindeer
Number of cases / year	3800 – 7000 sheep, 4-75 semi-domestic reindeer
3 Most important threats	Lack of acceptance due to depredation on livestock, illegal killing, disturbance.

References:

Annual monitoring reports are available at www.rovdata.no

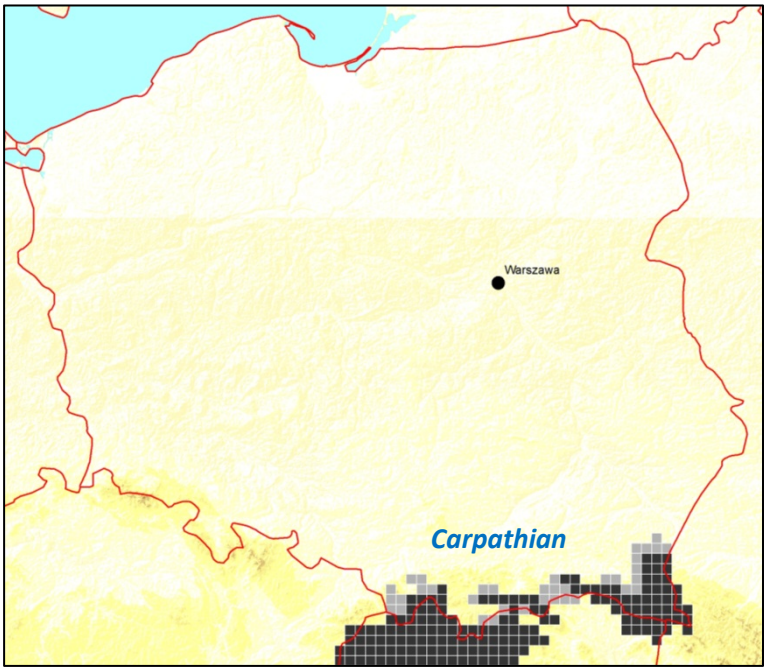
Scandinavian Bear Project www.bearproject.info/

Swenson, J.E., Sandegren, F., Bjärvall, A. & Wabakken, P. (1998) Living with success: research needs for an expanding brown bear population. *Ursus, International Conference on Bear Reserach and Management,* **10,** 17-23.

Swenson, J.E., Wabakken, P., Sandegren, F., Bjärvall, A., Franzén, R. & Söderberg, A. (1995) The near extinction and recovery of brown bears in Scandinavia in relation to the bear management policies of Norway and Sweden. *Wildlife Biology,* **1,** 11-25.

Bear – Poland

Sabina Nowak & Robert W. Mysłajek



Bear distribution in Poland 2008-2011. (Distribution in Ukraine not shown).
Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Currently brown bears in Poland occur exclusively in the Carpathians, along the state border with Slovakia and Ukraine. Jakubiec (2008) estimated brown bear range in Poland to be 6500 km^2, but Fernández et al. (2012), based on observations collected in 1985-2005, and using data assignment to 5 × 5 km^2 grid, only detected bear presence on 5400 km^2 of which breeding was recorded on 3250 km^2. Apart from that, a habitat suitability model (Fernández et al. 2012) showed, that a total of 68,790 km^2 (*ca*. 20% of the country) is suitable for brown bears within Poland. However, only 29'000 km^2 (*ca*. 9% of the country) were predicted as being suitable for reproduction. The most suitable areas are distributed in several patches – in the Carpathians and in the northwestern and northeast parts of the country (Fernández et al. 2012). Current resident area, based on 10 × 10 km^2 grid, is estimated at *ca.* 6600 km^2, with an additional *ca.* 3800 km^2 visited occasionally by vagrants.

2. Populations estimates & monitoring

The Polish State Statistical Office reported that in 2006-2010 Poland was inhabited by 119-164 brown bears. Official data, published by the State Statistical Office, are based on information provided by the General Directorate of Environmental Protection, but methodology is not described. Expert estimations (Jakubiec 2008), based on questionnaires send to state forest divisions and national parks, reported 95 individuals in 2007. Preliminary data from the genetic monitoring (see Selva et al. 2011 for further details) suggest that population size has been overestimated.

3. Legal status & relevant management agencies

The brown bear in Poland is listed under Annex II and IV of the Habitats Directive and 17 Natura 2000 sites located in the Carpathians protect bear habitat. The brown bear has been strictly protected in Poland since 1952. Furthermore, it is listed among species requiring active protection. Consequently, a seasonal protection zone encompassing a radius of 500 m may be established around bear winter dens from 1st November to 30th April. However enforcement of the law is very

weak. The Ministry of Environment along with General Directorate for Environmental Protection and its regional branches are responsible for bear management.

4. Population goal and population level cooperation

According to the Polish report on the main results of the surveillance under article 11 for annex II, IV and V species (Annex B) favorable reference range was estimated at 10,000 km^2 and favorable reference population at more than 80 individuals.

The Polish-Slovakian large carnivore working group had a first meeting in June 2012. The preliminary agreement on creating buffer zones along the Polish-Slovakian border to protect transborder populations of wolves and bears was achieved. It included a 10 km buffer zone without culls of bears in Slovakia, and a 46 km zone of close cooperation and data exchange about LC on both sides of the borderline. A final decision by the Slovakian government is still pending.

5. Conflicts and conflict management

Conflicts between people and brown bears are mostly connected with livestock depredation and destruction of beehives. Property damage and attacks on humans are very rare. Regional directorates for environmental protection are responsible for estimation and compensation of damage caused by bears and for reporting of accidental mortality in every province, but directors of national parks are responsible for damage compensation within their respective national park. In areas of highest level of conflicts the regional directorates for environmental protection equip farmers with electric fences and install bear-resistant garbage containers.

6. Threats

The main threat is the regular and intensive culling of bears from transboundry populations in countries bordering with Poland (especially in Slovakia). Exploitation can potentially cause source-sink effects, when the protected bear population in Poland serves as a source of bears which migrate to adjacent countries to re-populate vacant territories, from which bears were extirpated. The rapid building of weekend and year round houses, development of recreation centers (ski resorts) and off road activities (cross country motorbikes, quads, snowmobiles) in the whole of the Carpathian Mts. negatively influence the bear breeding and resting areas, through habitat loss, fragmentation and direct disturbance (Mysłajek and Nowak 2011, Selva et al. 2011).

7. Summary table

Population size	~80
Trend	stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 66 Sporadic: 38
Range trend	stable
Depredation costs / year	7,193 € (2007), 19,259 € (2008), 31,558 € (2009), 61,555 € (2010)
Number of cases / year	2007 (2 cattle, 70 other), 2008 (5 sheep, 201 other), 2009 (8 sheep, 3 goats, 16 rabbits, 323 other), 2010 (556 other). [other means mostly beehives]
3 Most important threats	exploitation of bears in neighbouring countries, habitat fragmentation and habitat loss due to development of transport infrastructure, urbanization and recreation.

References:

Fernández N., Selva N., Yuste C., Okarma H., Jakubiec Z. 2012. Brown bears at the edge: modeling habitat constrains at the periphery of the Carpathian population. Biological Conservation 153: 134-142.

Jakubiec Z. 2008. 1354 Niedźwiedź *Ursus arctos*. In: Monitoring gatunków i siedlisk przyrodniczych ze szczególnym uwzględnieniem specjalnych obszarów ochrony siedlisk Natura 2000. Wyniki monitoringu. Unpublished report for the Główny Inspektorat Ochrony Środowiska, Warszawa (in Polish).

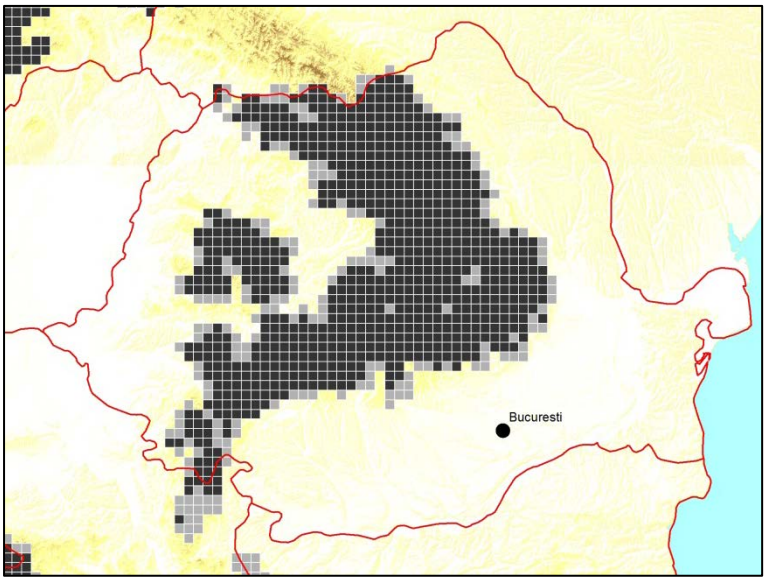
Mysłajek R. W., Nowak S. 2011. Brown bear refugees threatened by ski investments in the Western Carpathians (S Poland). International Bear News 20 (1): 23–24.

Report on the main results of the surveillance under article 11 for annex II, IV and V species (Annex B) http://cdr.eionet.europa.eu/Converters/convertDocument?file=pl/eu/art17/envrlf_pg/species-ursus-arctos.xml&conv=rem_24

Selva N., Zwijacz-Kozica T., Sergiel A., Olszańska A., Zięba F. 2011. Program ochrony niedźwiedzia brunatnego *Ursus arctos* w Polsce - projekt. Szkoła Główna Gospodarstwa Wiejskiego, Warszawa (in Polish).

Bear – Romania

Ovidio Ionescu



Bear distribution in Romania 2006-2011/12. (Distribution in Ukraine not shown).

Dark cells: permanent
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The brown bear population in Romania occupies a surface of around 69'000 km^2, which represents about 30% of the surface of Romania. This implies a density of bears of 0.9 bears/10 km^2 within its distribution area. The highest densities can be found in the northeastern and central parts of the Carpathians, in the counties of Harghita, Covasna, Bistriţa, Braşov, Buzău, Mureş and Neamţ.

Particularly high local densities of bears can be found in autumn, where bears concentrate in large numbers to feed in fruit plantations. The two most outstanding cases are: Dealul Negru – Bistriţa, where each year, around 70-75 bears can gather to feed in a fruit plantation of 650 ha and Domneşti – Argeş, where up to 80 bears have been counted entering the fruit plantation of about 300 ha.

The Romanian bear population is distributed all over the forested range of the Romanian Carpathians, 93% are located mainly in the mountains, and the remaining 7% live in the foothills. (Isuf and Ionescu 1997). A smaller subpopulation of 250-300 bears is present in the Apuseni Mountains. Although the data reported from the hunting areas suggested a gap between the population in the Apuseni Mountains and the main Carpathian population, there is little doubt that the two populations are still connected. The recent studies done in the area have shown that there are connectivity corridors between the southern part of the Apuseni Mountains and the rest of the Carpathians.

2. Population estimates & monitoring

Currently, the Romanian bear population consists of about 6000 bears, which represents about 35-40 % of the European population west of Russia. This number exceeds the optimum number of bears which is estimated at 4000. This optimum is based on an estimate of what the natural habitat would sustain under natural conditions, and on levels of tolerance for their socio-economic impact, The bear population's conservation is regulated by the provisions of the Nature Conservation Law no. 462/2001, regarding the conservation of natural habitats and protection of wild species of flora and fauna, the Law for Game Protection and Hunting 407/2006, Ministerial Orders, and by the provisions of the Hunting Units Management Plans.

According to the aforementioned provisions, the number of bears is estimated based on footprints and measurements of the footprints, observation of bears from the high stands at feeding sites, and counts of females with cubs. The number is expressed by sex and age structure. At the end of the spring time, the hunting unit leaseholders are required to provide annual estimates of brown bear numbers on their game management units. These estimations are compiled over large areas, calibrated with genetical and camera trap studies for population densities. The data are centralized and analysed on regional and national levels. Direct observations are applied in Romania for population estimation and studies of bear ethology. In some area radiotelemetry is used as an additional tool.

3. Legal status & relevant management agencies

Romania joined the Convention on the Wildlife and Natural Habitat Conservation in Europe, issued in Bern on the 19th of September 1979, by Law no. 13/1993. After 2007 Romania became part of the EU and, regardless of the size of the bear population, bears became strictly protected. Because of the great number of conflicts, including humans killed or injured, a certain number of bears are removed each year using Habitat Directive derogations.

The hunting is only allowed for certain bears under specific conditions, places, and periods, and with the means established by the law. Hunting of brown bears is done only in the limit of the maximum number of individuals allowed by the derogations. Deduction of this maximum number of individuals for each administrator and game management unit is approved by ministerial order of the specific central public authority now in the Ministry of Environment and Forestry.

4. Population goal and population level cooperation

A comprehensive analysis of the "suitable" bear habitat in Romania (~69'000 km^2) base on a diagnostic key, indicates that the natural possible size of the bear population (biological capacity) is around 4000 bears. The desirable capacity from a social - economic point of view is around 4000 bears as well. This number is based on current knowledge; however, it is possible that new monitoring results and future experiences in bear-human coexistence will change the desirable capacity for bear population in Romania.

The Romanian brown bear population is part of the Carpathian population shared with Ukraine Poland, Slovakia, and eastern Serbia. There are no obstacles to the free movements of the bears between the countries and such a situation should also be ensured in the future. With an understanding that the actions of bear population management in Romania can influence the bear populations in neighboring countries, Romania has committed, under the umbrella of the "Carpathian Convention", to such management that will keep the population in balance – so that approximately an equal number of bear migrations across the borders in both directions can be expected. Romania expects a similar approach to bear management from the neighboring countries and will support Ukraine in the efforts related to bears management.

Straka et al. (2012) suggested: "human caused isolation and fragmentation of bear populations in the Western and Eastern Carpathians resulted in evident genetic differentiation. Therefore, future management efforts should be aimed at securing and restoring the connectivity of forested habitats in order to preserve the genetic variation of Carpathian brown bear subpopulations and to support the gene flow between them".

5. Conflicts and conflict management

During the 1980s when bear numbers increased to a peak, the damage to orchards reached an extremely high level: between 1987 and 1992, the equivalent of 35 million euro of damage was reported. Correlating to the most frequently found fruit trees, bears feed mainly on apples and plums. They cause damage not only by picking fruits but also because they climb on trees and break branches or whole trees. Although the damage reported has decreased with the decreasing number of bears, it is still common to see damage from bears in almost every orchard close to a forest within bear range.

During the period of 1987 to 1992, the losses of livestock were estimated to be the equivalent of 19 million euro. A survey done on an area of 1000 km^2 around Brasov, showed that the vast majority (91%) of livestock killed by large carnivores are sheep. The rest are occasional cases of cattle, donkeys, horses and pigs being killed. About 2% of all sheep grazing in the area are killed by large carnivores each year. 35% of the kills are made by bears. In Romania traditional livestock protection methods are still relatively well preserved. The sheep are always accompanied by shepherds and by livestock guarding dogs, and they are penned during the night. However, the livestock is not always optimally guarded due to several economic reasons: (1) The sheep are left free to graze also in the night in order to produce more milk, (2) dogs are expensive, and there are not always good guarding dogs in the camp, (3) often there is not enough money to hire a sufficient number of shepherds, (4) the dogs are not well fed and often search for additional food, leaving the flock unattended. Through hunting these dogs might have a negative influence on prey numbers. Hunters might think bears, wolves and lynx are responsible for prey animals killed, which were actually hunted by livestock guarding dogs. Also, straying in the forest, the dogs can transmit diseases (parvoviroses, distemper, tuberculoses) to wildlife species.

In Romania conflicts are solved with: a plan for the prevention of damage and compensation; gather and distribute instructions on how to prevent damage; supplemental feeding of bears (with the purpose of keeping the bears away from conflict areas); reporting damages to the hunting unit leaseholders; proper implementation of protective measures. In addition, a compensation / insurance system exist, as well as criteria related to justification of the compensation claims.

6. Threats

The poaching of bears has decreased to less than 20 documented cases per year. Most poaching occurs using snares. If bears are found still alive, they are tranquilized by bear specialists and released. Cases in which the bear are killed in “legitimate defense” during drive hunts account for 1 or 2 per dead bears per year. In general, illegal killing is rare and poses no threat to the large bear population in Romania.

Bears that do not flee from humans are potentially dangerous. Some people will try to get closer to such a bear to get a better look or picture, while others will shoot and wound it. In both cases the bear may respond with an active aggressive defense. Besides, frequent sightings of a single bear habituated to humans often make people think that bears have multiplied beyond reasonable numbers. Some bears habituated to humans will start causing regular damage in their search for food from human sources, and thus become problem bears. Such bears usually end up getting killed in traffic, shot in so-called self-defense, or killed through planned culling.

7. Summary table

Population size	6000
Trend	Stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 720 Sporadic: 179
Range trend	Stable
Depredation costs /year	No recent information
Number of cases /year	No recent information
3 Most important threats	None

References:

Georgescu, M. 2002. Drumuri de toamna ale ursilor. Revista „Vânatorul si Pescarul Sportiv", nr. 1, p. 16-17. Bucuresti.

Ionescu, O. 2002. Bear status and management in Carpathians, ICAS.

Jurj, R. Predoiu, G., Ionescu, O., Popa, M., Ionescu, G., Sarbu, G. 2006. Un urs hranit de om, este un urs condamnat la moarte! Asguard Trading.

Jurj, R., Ionescu, O., Ionescu, G., Predoiu, G., Popa, M., Sarbu, G. 2008. Habituated Bears Behavior and human – bear conflicts în Racadau area, Brasov, Romania, during period 2004-2007.

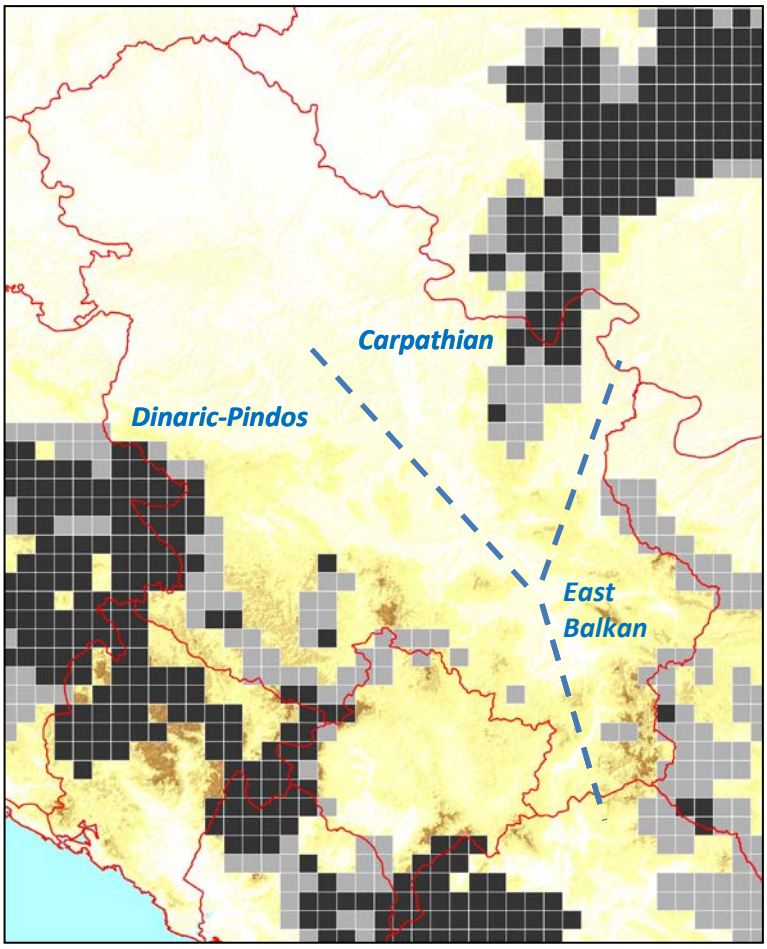
Laurenson C., Sillero-Zubiri M. K., 2001. Interactions between carnivores and local communities: conflict or co-existence? Cambridge University Press, Cambridge.

Mertens A. Ionescu O. 2001. Ursul – ecologie, etologie, management. Haco International.

Straka, M., Paule, L., Ionescu, O., Stofik, J., Adamec, M. 2012. Microsatellite diversity and structure of Carpathian brown bears (Ursus arctos): consequences of human caused fragmentation. Conservation genetics, 13(1): 153-164.

Bear – Serbia

Milan Paunovic



Bear distribution in Serbia 2012.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The bears in Serbia belong to 3 different populations - the Dinaric-Pindos, the East Balkan and the Carpathian, all are autochthonous.

The Dinaric-Pindos population segment in Serbia consists of an area of permanent presence – about 3400 km², and an area of sporadic presence which is larger – about 4800 km². It is connected with corresponding areas in eastern Bosnia, southeastern Montenegro, and northern Albania. This population segment contains a few protected areas of which the most important are Tara NP and Sarplanina NP. Although the trend cannot be assessed because standardized monitoring has only been recently applied, there is little evidence for a range expansion due to limits in suitable habitat.

The Carpathian population segment consists of an area of permanent presence of 900 km^2 and sporadic presence on 1900km^2, while the East Balkan segment has just areas of sporadic presence on 1400 km^2.

Carpathian and East Balkan population segments are partially interconnected as proven by recent genetic study through areas of seasonal/occasional presence. The Dinaric-Pindos population segment is completely separated from the other two at present although it believed they were connected in the recent past. The total area of brown bear presence in Serbia is ~12'400 km².

2. Populations estimates & monitoring

The Dinaric-Pindos population segment was estimated at 60±10, based on experts' genetic sampling, extrapolations and camera-trapping. The trend was estimated as stable, maybe with a slight increase.

The Carpathian and East Balkan population segments were estimated together at 8±2 specimens, based also on experts' genetic sampling, guestimates, and extrapolations. Additional monitoring also has been done by GPS-GSM telemetry of a few individuals.

The monitoring in the Dinaric-Pindos and the Carpathian population segments is done by individual experts and the staff of protected areas.

3. Legal status & relevant management agencies

The bear in Serbia is listed as strictly protected by the both Law on Protection of Nature and the Law on Game and Hunting. As a protected species it is under the centralized jurisdiction of the Ministry of Energy, Development and Environmental Protection (MEDEP). Local management actions, which are usually lacking, are applied mostly through the public enterprise Srbijašume, which is under the jurisdiction of the Ministry of Agriculture, Forestry and Water Management (MAFWM). In the national parks and other protected areas the bear is under the jurisdiction of the MEDEP. A strategic part of an action plan was prepared in 2007, but the document still does not have any official status.

4. Population goal and population level cooperation

There is no official goal for the size and distribution of the population of bears in Serbia. The main goal of the strategic part of action plan for the bear in Serbia was to increase monitoring activity and improve knowledge of key population parameters, and to apply active and appropriate management of it. There are no specific zoning policies or different management systems in the three population segments due to the centralized management. Zoning is present only inside the protected areas, such as national parks.

5. Conflicts and conflict management

Conflicts exist over livestock depredation, destruction of beehives and orchards in all three population segments.

Compensation is paid by MEDEP and the municipality where damage occurs. Assessment of each damage claim is made by a local commission/expert group that consists mostly of hunters, veterinarians, or national park staff. Only documented losses are compensated. If confirmed 50-100% of the market value is paid.

6. Threats

The main threats for the bears in Serbia are:

- Poor management structures (all three population segments)
- Lack of knowledge (all three population segments)
- Low acceptance due to fear for personal safety and due to conflict with livestock and overprotection, as well as due to fundamental conflict of values about the species presence in modern landscapes (especially valid for the Dinaric-Pindos and the Carpathian population segments, but in smaller scale also for the East Balkan population segment)
- Wildfire and human caused fire (all three population segments)
- Intrinsic factors - population fluctuation (Dinaric-Pindos and Carpathian population segments), poor reproduction and inbreeding (Carpathian population segment), low densities (Carpathian and East Balkan population segments)
- Direct mortality of bears by shooting during hunting of other species or poisoning/trapping/shooting as vengeance for killed livestock or destroyed beehives (all three population segments)
- Habitat loss and its degradation due to extraction of different natural resources – wood, non-woody vegetation collection (herbs and mushrooms), small scale wood-plantation, tourism and recreation (all three population segments)

7. Summary table

Population size	Carpathian and East Balkan segment (2008): 8 Dinaric-Pindos segment excl. Kosovo* (2010): 60
Trend	Carpathian segment: stable? Dinaric-Pindos segment incl. Kosovo* (2010): slight increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Carpathian segment: Permanent: 9, sporadic: 17 Dinaric-Pindos segment incl. Kosovo*: Permanent: 22, sporadic: 43 East Balkan: Sporadic: 5 Total (including Kosovo*): Permanent: 31, sporadic: 65
Range trend	Carpathian segment: stable? Dinaric-Pindos segment incl. Kosovo* (2010): stable, may be slight increase
Depredation costs / year	No central database
Number of cases / year	No central database
3 Most important threats	Poor management structure, lack of knowledge, Illegal killing, habitat loss due to clear cutting

*This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo declaration of independence.

References

Paunović, M., Ćirović, D. (2006). Increase viability and recovery of the brown bear population *Ursus arctos* L. 1758 (Mammalia: Carnivora) in northeastern Serbia. Ministry of science and environmental protection of the Republic of Serbia, Directorate of Environmental Protection and Faculty of Biology Univ. in Belgrade, 1-52, Belgrade.

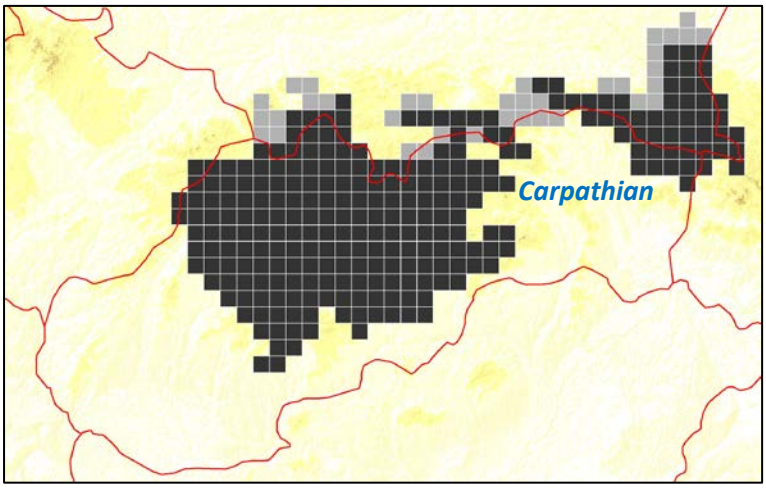
Paunović, M. (2004). Damages caused by Large Carnivores in Serbia – Compensation and insurance schemes – Implementation of preventing measures (Eco Net 3). Report to the Council of Europe, Wildlife Conservation Society «Mustela», 1-35, Belgrade.

Paunović, M., Ćirović, D., Milenković, M. (2007). Action plan on conservation of brown bear *Ursus arctos* (L., 1758) in Serbia, Phase 1 – Strategic plan. Natural History Museum in Belgrade and Ministry of environmental protection of Republic of Serbia, 1-46, Belgrade. (in Serbian).

Paunović, M., Ćirović, D., Milenković, M. (2008). Status and Conservation of Carnivores in Serbia. CIC Proceedings of the Symposium «Coexistance of man and carnivores: Threat or Benefit?», 111-117, May 1st, 2007, Belgrade.

Bear – Slovakia

Compiled after material provided by Robin Rigg, Jakub Kubala & Miha Adamec



Bear distribution in Slovakia ~1990-2011. (Distribution in Ukraine not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

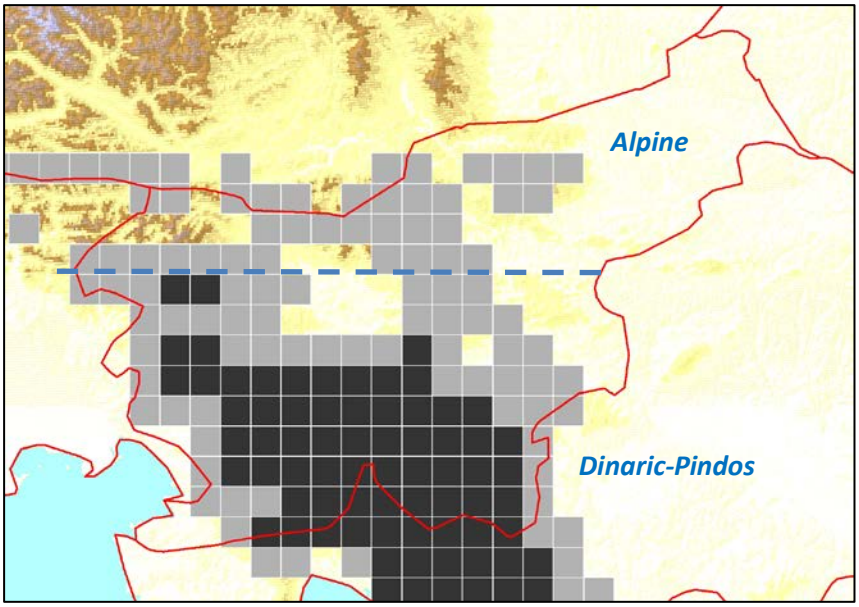
[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

Summary table

Population size	Expert estimate: 800-1100 (official in 2010: 2001)
Trend	Assumed stable or increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 212
Range trend	Assumed stable
Depredation costs / year	(2006-2010 mean): ~20'000 €
Number of cases / year	(2006-2010 mean): 160 sheep/goat, 0-15 cattle, 200 beehives
3 Most important threats	Lack of information, change of hunting tradition (from long-term local to short term high income external people), low acceptance

Bear – Slovenia

Aleksandra Majić Skrbinšek



Bear distribution in Slovenia 2007-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Bear in Slovenia are the northern edge of the large Dinaric-Pindos population. The majority of bears in Slovenia are found in the south of the country, next to Croatian border, south of Ljubljana – Trieste motorway and Sava river. The population density of bears NW of this highway is considerably lower, but some bears are permanently present, and there are frequent occurrences of bears in the Julian Alps and the pre-alpine regions. North of Ljubljana and Sava river bears appear rarely, and are typically dispersing juvenile males.

2. Populations estimates & monitoring

The population size was last estimated in a high-intensity noninvasive genetics CMR study in 2007 which covered the entire area of permanent bear presence in Slovenia. The population size in winter, after the yearly cull and before the new generation of bears was born in the spring (the lowest yearly number), was estimated at 440 (396-480 95%CI). A new estimate using noninvasive genetic sampling is planned for the near future.

Bears are also routinely monitored through yearly systematic observations at feeding places (352 feeding places monitored simultaneously) and through population reconstruction using age data of culled bears. The population is considered stable.

3. Legal status & relevant management agencies

Bear is considered a strictly protected species in Slovenia, and its management and conservation is the responsibility of the Ministry of Agriculture and Environment (reorganized since 2012, previously Ministry of Environment and Spatial Planning). There is a yearly cull quota which is based on expert opinion by Slovenia Forest Service, which is discussed and modified by the Large carnivore management advisory board, which consists of representatives of various stakeholders. On basis of this the “exceptional cull” is allowed through a decision by the competent minister.

4. Population goal and population level cooperation

The management goal is to keep the population size stable and minimize conflicts with humans. The population is conserved mainly in the bear core area, except potentially in some "corridors" towards Austria and Italy, if decided so (not precisely defined what this means). However, bears are not supposed to be permanently present in this "corridors" according to official management strategy, although at present there is no regular hunting there (only so called management removals of problem individuals).

Considerable efforts have been made to improve transboundary cooperation in bear management. In 2012 there was official meeting organized by research institutions, which was attended by the government representatives of Slovenia and Croatia. Plans were made to form an international board for planning large carnivore management with a first meeting scheduled for the winter 2012. In past the years there were also several other meetings on large carnivore management in the Dinaric and Eastern Alps region with official representatives from different countries. Managers and researchers in Slovenia and Croatia are in regular informal contact. There is also regular communication among researchers in Slovenia, Austria and Italy. A recent project proposal for bear management in the Slovenia-Austria-Italy triangle was unfortunately rejected. A new application is currently considered.

5. Conflicts and conflict management

There are regular conflicts with agriculture and occasional bears wandering into villages or even cities which create considerable fear among local residents. There have been infrequently injuries of humans, however no fatalities have happened in the last couple of decades. Damages to property are being systematically compensated, but the compensation system has been criticized as it does not stimulate people to invest in protection (compensations usually exceed commercial value of the destroyed property). A "Bear response team" has also been organized which deals with problem bears and immediately reacts to concerns expressed by people in the bear area. However, any other actions preventing conflicts (e.g. bear-friendly garbage management, removal of "bear attractants" from the environment etc.) are sorely lacking.

6. Threats

The main threats are habitat fragmentation/loss through urban sprawl and development of traffic infrastructure. A considerable threat is also traffic (automobile or train collisions) which causes significant bear mortality on a yearly basis. An indirect but very serious threat are conflicts with humans and destruction of their property, as this increases demands for high cull quotas. These are currently reasonable, but have been very high in the past.

7. Summary table

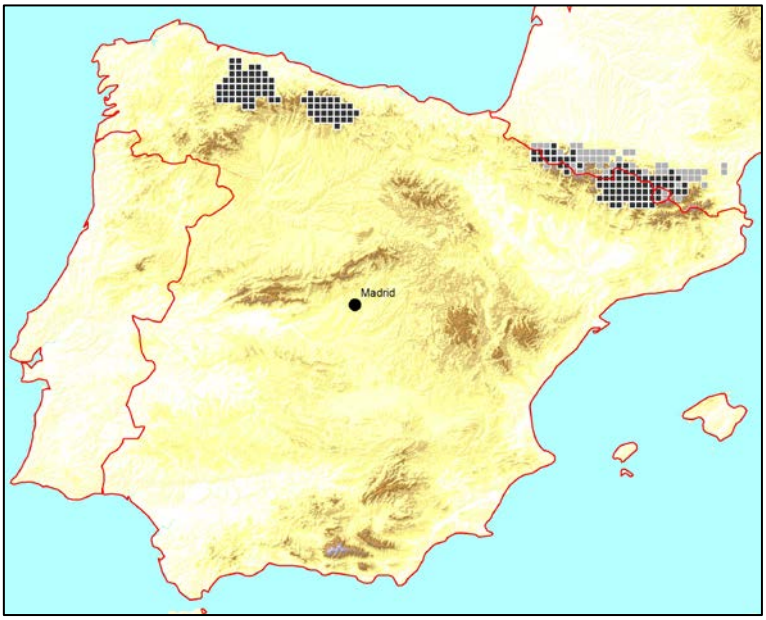
Population size	2007 (after cull and before birth): 440 (396-480 95%CI)
Trend	Stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 58 Sporadic: 79
Range trend	Increase
Depredation costs / year	(2006-2011 average): 156'000 € for all bear damages (beehives, livestock, etc.)
Number of cases / year	(2006-2011 average): 521
3 Most important threats	Human acceptance, habitat fragmentation, vehicle collisions

References

http://www.medvedi.si/

Bear – Spain

Guillermo Palomero and Juan Carlos Blanco



Bear distribution in Spain - Cantabria (BOIS 2005[1]) for Pyrenees 2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Bears in Spain are found in 2 populations, the autochthonous population of the Cantabrian Mountains and the Pyrenean population, re-introduced when the autochthonous population was almost extinct.

In the Cantabrian Mountains, there are two populations segments, the western one (mainly in the autonomous regions of Asturias and Castilla y León, but also in Galicia) and the eastern one (mainly in Castilla y León, but also in Cantabria and Asturias regions). Both segments are separated by some 50 km. The main areas of the western and eastern segments cover ~2800 and ~2100 km^2, respectively. The range in the Cantabrian Mountains is more or less stable.

The Pyrenean bear population lives in Spain, France and Andorra. In the Spanish Pyrenees there are a few bears in the western area (between Navarra and Aragón regions), but most bears live in the central population (between Aragón and Catalonia). The main Spanish bear range covers ~4,200 km^2. Five Slovenian bears were released in 2006, the range at that time was not consolidated yet, so the comparison with the area in 2007 is not possible.

2. Populations estimates & monitoring

Cantabrian Mountains

In 2010, 25 females with cubs of the year in the western and 3 in the eastern subpopulation were detected. To obtain total estimates, these figures might be multiplied by 8. An unpublished genetic study carried out by the Oviedo University and Doñana Biological Station found 195- 210 bears in the Cantabrian Mountains in 2006. These figures reveal an increase in the western subpopulation since 2007 and stability in the eastern one. In the longterm, the western population segment has shown an obvious increase (from 3 females with cubs of the year deteced in 1994 to 25 in 2010) while the eastern one is stable or has slightly increased (Fundación Oso Pardo web page). In recent years, the

[1] BOIS = Bear Online Information System (http://www.kora.ch/sp-ois/bear-ois/index.htm)

presence of bears in the area between both populations has also increased, and genetic studies have detected at least one case of crossbreeding between a western male and an eastern female.

In order to monitor the population, from the late 1980s on, females with cubs of the year are counted both in the western and in the eastern population segments. The coordinated census is carried out mainly by technicians and wardens of the four autonomous regions (Galicia, Asturias, Cantabria and Castilla y León) and the NGO Fundación Oso Pardo (Palomero et al. 2007).

Pyrenees

The original Pyrenean bear population was reduced to only 5 bears by 1995. From 1996 to 2006, 8 bears coming from Slovenia were released in the Pyrenees. In 2011, there are around 2 bears (males) in the western Pyrenees (Navarra, western Aragón and the French side) and 20-25 bears in the central Pyrenees (eastern Aragón, Catalonia, Andorra and the French side), including at least 6 adult females. All the bears from the original population seem to have disappeared. The population has increased since 2007.

The monitoring of the population is mainly based on genetic sampling, but other methods are also used, mainly camera-trapping and monitoring of females with cubs of the year. Monitoring is done by autonomous regions staff and hired experts (Palazón et al. 2011a).

3. Legal status & relevant management agencies.

Bears in Spain are fully protected and its management is fully decentralized at regional level. The role of the Ministry of the Environment is to coordinate the autonomous regions.

In the Cantabrian Mountains, bear population falls under the jurisdiction of the autonomous regions of Galicia, Asturias, Cantabria and Castilla y León.

In the Spanish Pyrenees, bears are managed by Navarra, Aragón and Catalonia autonomous regions. In Catalonia there is an autonomus area, the Val d'Aran, which carries out the management of the bears by their own.

Since bears are considered Endangered in the National list of protected species in Spain, the autonomous regions must approve management plans. In addition, the Ministry of the Environment and the autonomous regions approved two National Strategies for Bear Conservation. However, these documents have no binding legal value.

4. Population goal and population level cooperation.

Cantabrian Mountains

There are four recovery plans (one from each autonomous region) and a National Action Plan coordinated by the Ministry of the Environment (Estrategia Nacional para la Conservación del Oso). The recovery plans and the National Plan have no quantitative population goals, but rather aim to recover the population as much as possible. The recovery plans delineate the critical areas, which are particularly protected. They usually include the best forests and the areas with concentration of winter dens.

Pyrenees.

In Spain there is an Action Plan for Pyrenean bears approved by the Ministry of the Environment in 2006. In addition, there is a Recovery plan for bears in Navarra autonomous region. The Ministry of Environment has the role of coordinating among the autonomous regions and with France and Andorra.

There is a formal cooperation agreement among the governments of Spain, France and Andorra. In addition, there are informal cooperation activities between the Spanish autonomous regions and France in order to use common methods in the monitoring, to use the same markers in the genetic analysis (but samples are processed in different laboratories). In addition, there is a technical coordination meeting every year with experts of the three countries.

5. Conflicts and conflict management

Conflicts exist over livestock depredation and destruction of beehives in both populations. Both in the Cantabrian Mountains and the Pyrenees, all the damages are fully compensated by the autonomous regions.

Cantabrian Mountains

In 2010, there were 606 cases of damages caused by bears to livestock, beehives and agriculture, 70% in Asturias, 26% in Castilla y León and the remaining in Cantabria and Galicia autonomous regions. Most of the damages were caused to beehives. In 2010, the four autonomous regions paid 321'000 € in compensations. In the Cantabrian Mountains, the main prevention measures, funded by the autonomous regions, are the electric fences to protect the beehives from bears.

Pyrenees.

In 2010, 25'500 € were compensated by the Spanish autonomous regions for 70 sheep killed and 29 beehives destroyed. After many conflicts with farmers in the past, in recent years the autonomous regions are spending a lot of money supporting farmers in bear range. The preventive measures include electric fences, livestock guarding dogs, cabins in the meadows for shepherds, a program to manage together the sheep scattered in high meadows, a subsidy for flocks grazing in bear area, etc. To implement these measures, the Catalonian regional government alone spends 200'000 € every year (Palazón et al. 2011b).

6. Threats

Cantabrian Mountains

From 2006 to 2011, 7 cases of bear mortality have been detected. Two bears shot, 2 poisoned, 1 killed by traffic and 2 dead for unknown causes. The recovery of the eastern population segment is now the first priority. To stop non-natural mortality and habitat degradation are the main conservation needs. The translocation of females from the western population segment into the eastern one has been proposed

Pyrenees

From 2006 to 2011, one bear was killed in traffic collision. The reintroduction of bears in the Pyrenees triggered opposition in rural people, mainly farmers. The new actions to support farmers and other stakeholders are improving these attitudes, but a lot of work still has to be done. The release of bears in the Pyrenees in coming years is needed to have a self-sustainable population.

7. Summary table

Population size	Cantabrian Mountains: 28 females with cubs of the year (2010). Genetic study (2006): 195- 210 bears Pyrenees (2011): 22-27 bears
Trend	Cantabrian Mountains: Increasing Pyrenees: Increasing after reintroduction
Distribution range (# cells in the 10 x 10 km EEA grid)	Cantabrian Mountains: Permanent: 77 Pyrenees: Permanent: 51
Range trend	Cantabrian Mountains: stable Pyrenees: Unclear
Depredation costs / year	Cantabrian Mountains (2010): 321,000 € Pyrenees (2010): 20,500 €
Number of cases / year	Cantabrian Mountains (2010): 606 cases of damages Pyrenees (2010): 70 sheep and 29 beehives
3 Most important threats	Cantabrian Mountains: small population size (eastern subpopulation), illegal killing, habitat disturbance Pyrenees: local acceptance, small population size, opposition to new re-introductions

References:

Fundación Oso Pardo web page. Cuántos osos hay y dónde viven. http://www.fundacionosopardo.org/ficha.cfm?idArticulo=151

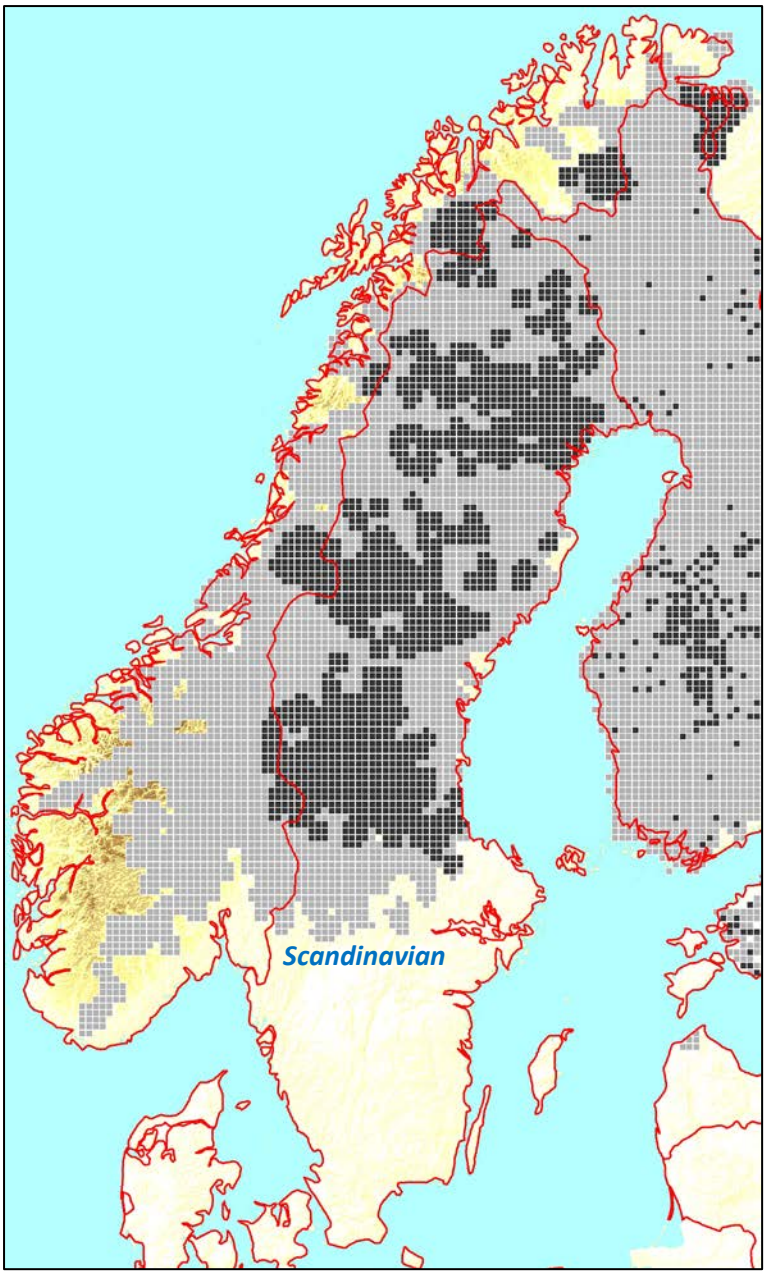
Palazón S., Ruiz-Olmo J., Batet A., Alfonso I., Sastre N. y Francino O. y (2011a). El oso en Cataluña: La población se consolida. Quercus 304: 16-23.

Palazón S., Ruiz-Olmo J., Batet A., Alfonso I. y Fernández F. (2011b). Osos y humanos: del conflicto a la coexistencia. Quercus 304: 24-31.

Palomero G., Ballesteros F., Nores C., Blanco J.C, Herrero J., and García-Serrano, A. (2007). Trends in number and distribution of brown bear females with cubs-of-the-year in the Cantabrian Mountains, Spain. Ursus 18(2):145-157.

Bear – Sweden

Jon E. Swenson



Bear distribution in Sweden 2008-2011.

Dark cells: reproduction presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The Swedish brown bears constitute the majority of the Scandinavian bear population. They are distributed throughout the northern two-thirds of Sweden. Within this area, there are 3 subpopulations where most of the females occur. These are genetically distinct and probably represent relict populations from the near extinction of bears in the early 1900s (Manel et al. 2004).

2. Populations estimates & monitoring

Brown bears are censused at the county scale based on detection of individuals from DNA in scats collected by hunters, primarily moose hunters (Bellemain et al. 2005, Solberg et al. 2006). These occur at irregular intervals. The trend of the population is monitored based on effort-corrected annual observations of bears by moose hunters (Kindberg et al. 2009).

The most recent estimates of the national population size and trend are from 2008. At that time, the population was estimated to be ca 3,300 bears (95% CI = 2,968-3,667). The trend during 1998-2007was estimated to be a 4.5% annual increase (Kindberg et al. 2011). However, increased harvest levels have reduced this trend since 2007, and the trend may be stable or even a slight decrease today.

3. Legal status & relevant management agencies

The bear is a protected species in Sweden, but hunting is allowed annually. The harvest is restricted by using quotas set at the county level. Hunters that kill a bear must report it to the authorities the same day. The relevant national management agency is the Swedish Environmental Protection Agency (Naturvårdsverket), but most of the management authority has been delegated to the county administrative boards (Länsstyrelser).

4. Population goal and population level cooperation

The official national population goal is a minimum of 1000 bears. There is no maximum goal. Each county adminstrative board sets its own population goal within this national goal. The Swedish Parliament will soon consider whether this goal should be changed.

5. Conflicts and conflict management

The brown bear causes relatively few conflicts in Sweden, with the notable exception of predation on free-ranging domestic reindeer calves, especially in forested calving areas. Other livestock are protected by electric fences and other effective methods, resulting in very small losses. Bears also kill a considerable proportion of the moose calves that are born each year, but this has little effect on the population dynamics of moose (Swenson et al. 2007, Gervasi et al. 2012). Bears rarely cause problems by coming close to settlements, but people's fear of bears has increased recently in areas with increasing bear populations (Ericsson et al. 2010).

6. Threats

The major threat to the bear population is illegal killing, which occurs in some areas, especially where the conflict regarding bear predation on reindeer calves is high. However, this is not a threat for the entire population, which is doing well in Sweden.

7. Summary table

Population size	3,300 (95% CI = 2,968-3,667)
Trend	Increasing at 4.5% annually (1998-2007), maybe stable now.
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 1498 Sporadic: 1665
Range trend	Increasing
Depredation costs / year	~30'000 € An additional ~190'000 € (figure from 2007) is paid to reindeer owners for the presence of bears, rather than compensating for losses.
Number of cases / year	50-100 sheep, 0-10 goats, 1-10 cattle, 1-5 dogs, 0-500 beehives. Reindeer are compensated by paying for their occurrence and not for depredation level.
3 Most important threats	illegal killing, local acceptance. However, the brown bear is generally well accepted in Sweden and the population is secure.

References:

Bellemain, E., J. E. Swenson, D. Tallmon, S. Brunberg and P. Taberlet. 2005. Estimating population size of elusive animals using DNA from hunter-collected feces: comparing four methods for brown bears. Conservation Biology 19:150-161.

Ericsson, G., Sandström, C., Kindberg, J. & Støen, O-G. 2010. Om svenskars rädsla för stora rovdjur, älg och vildsvin. Rapport 2010:1. Institutionen för vilt, fisk och miljö, SLU, Umeå. (In Swedish: The Swedes' fear of large carnivores, moose, and wild boar).

Gervasi, V., E. B. Nilsen, H. Sand, M. Panzacchi, G. R. Rauset, H. C. Pedersen, J. Kindberg, P. Wabakken, B. Zimmermann, J. Odden, O. Liberg, J. E. Swenson, and J. D. C. Linnell. 2012. Predicting the potential demographic impact of predators on their prey: a comparative analysis of two carnivore–ungulate systems in Scandinavia. Journal of Animal Ecology 81:443-454.

Kindberg, J., G. Ericsson, and J.E. Swenson. 2009. Monitoring rare or elusive large mammals using effort- corrected voluntary observers. Biological Conservation 142:159-165.

Kindberg, J., J. E. Swenson, G. Ericsson, E. Bellemain, C. Miquel, P. Taberlet. 2011. Estimating population size and trends of the Swedish brown bear (*Ursus arctos*) population. Wildlife Biology 17: 114-123.

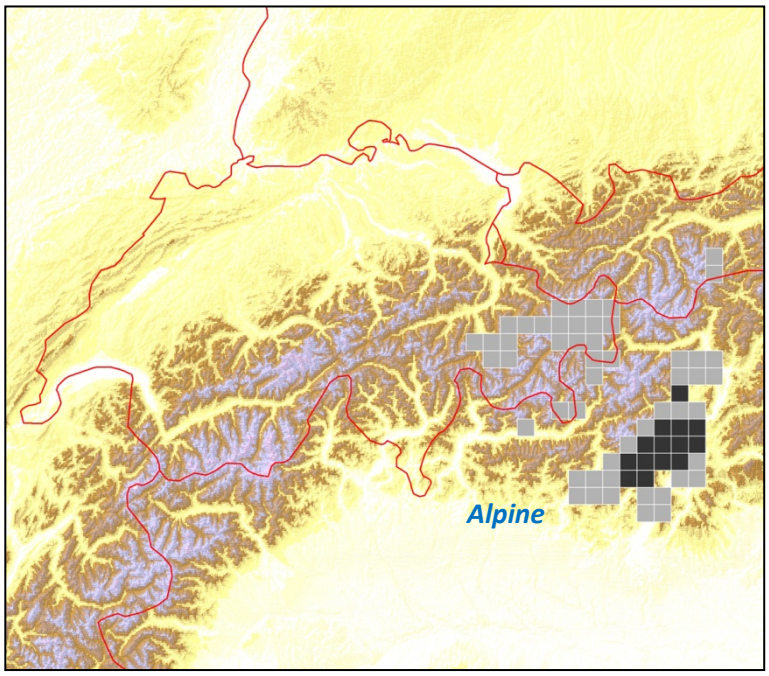
Manel, S., E. Bellemain, J. E. Swenson and O. François. 2004. Assumed and inferred spatial structure of populations: the Scandinavian brown bears revisited. Molecular Ecology 13:1327-1331.

Solberg, K. H., E. Bellemain, O.-M. Drageset, P. Taberlet and J. E. Swenson. 2006. An evaluation of field and non-invasive genetic methods to estimate brown bear (*Ursus arctos*) population size. Biological Conservation 128:158-168.

Swenson, J. E., B. Dahle, H. Busk, O. Opseth, T. Johansen, A. Söderberg, K. Wallin and G. Cederlund. 2007. Predation on moose calves by European brown bears. Journal of Wildlife Management 71:1993-1997.

Bear – Switzerland

Manuela von Arx & Andreas Ryser



Bear distribution in Switzerland 2006-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Since 1999 a bear re-introduction project has been running in the Trentino area in northern Italy, 50 km away from the Swiss border. Due to the increasing population, the chance for a natural immigration of bears to Switzerland became more and more realistic. In July 2005, the first brown bear since its eradication 150 years ago was observed in the Engadin, canton of Grisons. Since then, almost every year one to two bears, so far all young males, enter the Grisons. Up to now the visits were only temporarily and no bear has established a home range yet.

2. Population estimates & monitoring

The monitoring of bears is opportunistically by collecting all sightings and signs. Genetic samples are analysed for the determination of the individual. All young males identified in Switzerland so far were already known from the monitoring in the Trentino. Currently (2012) M13 is roaming the border regions of Switzerland and Italy.

In particular cases, especially if a bear is continuously approaching human settlements, the bear is captured and equipped with a GPS collar in order for precise location and for taking measures of aversive conditioning if necessary.

3. Legal status & relevant management agencies

The brown baer is fully protected by law. For its management a Concept was developed in 2006 and adapted in 2009. The Concept defines rules for livestock prevention and the removal of bears if they are approaching settlements regularly and are thus posing a potential danger to humans. The Federal Office for the Environment (FOEN) is responsible for the overall management of the species. However, for the implementation of the Concept, the cantons are in charge.

4. Population goal and population level cooperation

In transboundary workshops "Brown bears in the Alps" issues concerning bear monitoring and management are discussed. Furthermore, in 2009, the Alpine countries signed a transboundary arrangement under the Alpine Convention called platform WISO (Wildlife and Society). The intention is to develop a common strategy for the management of the Alpine populations of lynx, bear and wolf.

5. Conflicts and conflict management

Damages vary annually, depending on the number and duration of bear presence and individual behavioural characteristics. Often sheep are killed and beehives plundered. In 2012, the killing of a female donkey caused polemics in the region concerned. Killed livestock have to be examined by an official person and are compensated to 100% if predated by bear. The state (Federal Office for the Environment) pays 80% of the amount, the rest is paid by the canton concerned. Electric fencing, livestock guarding dogs and shepherds are the main prevention methods applied in Switzerland. They are financially supported by the FOEN. The canton can ask for a permission for removing a bear if the criteria defined in the Concept are met. In 2008, male JJ3 was therefore legally shot.

6. Threats

If killing domestic animals and approaching human settlements, the acceptance of local people for the bear can become negative and requests for removing it are raised. Traffic fatalities have been the major cause of death for bears in the past few years. Two of M13's brothers were killed by cars and M13 himself only luckily survived a collision with a train this year. As the Trentino population is small, inbreeding also has to be monitored.

7. Summary table

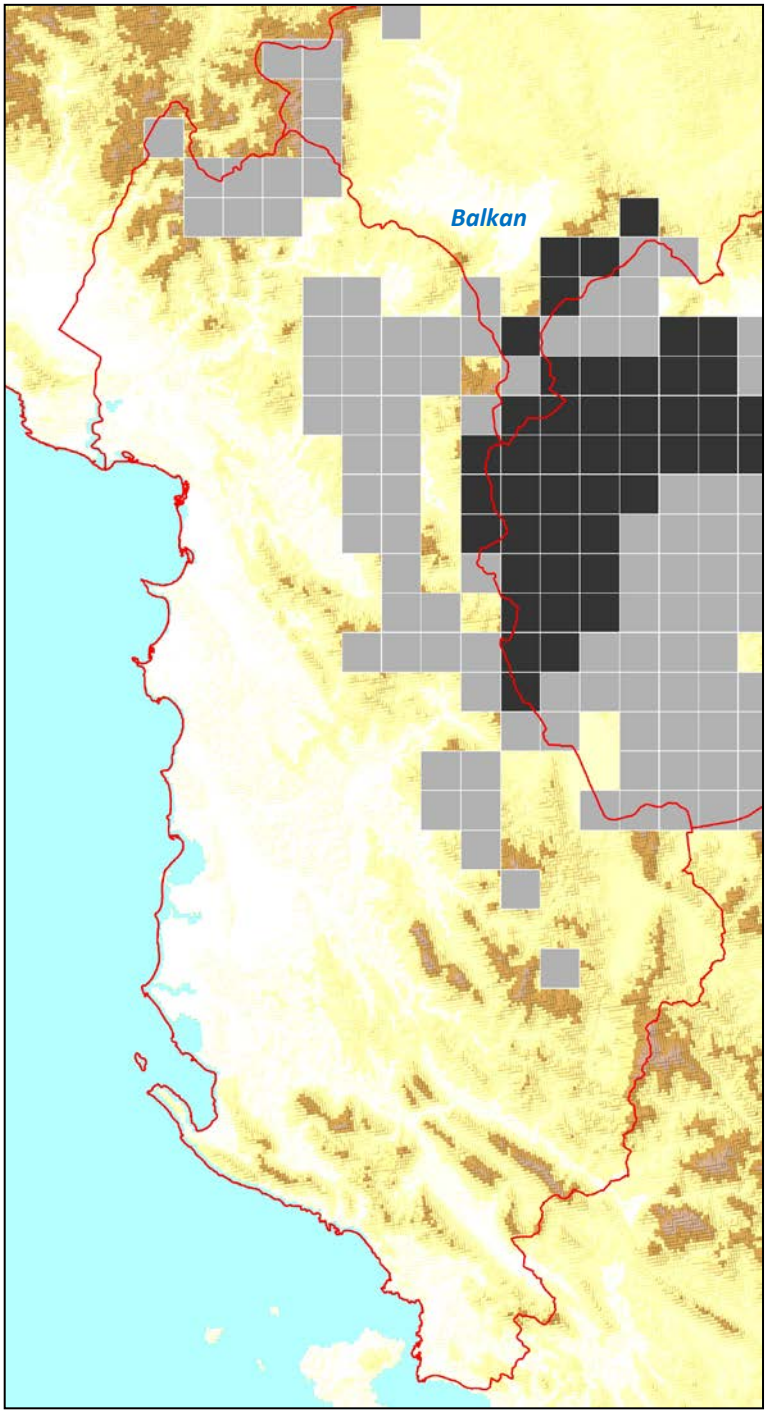
Population size	Since 2005: 0-2 individuals each year (so far all males)
Trend	Fluctuating numbers
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 0 Sporadic: 12
Range trend	Too early to talk about trend
Depredation costs / year	(2006-2011): highly variable (0-38'000 €)
Number of cases / year	Highly variable, maximum in 2007: 60 sheep and 4 beehives.
3 Most important threats	Traffic fatalities, Conflicts due to depredation on domestic animals and human-bear encounters, Inbreeding

References:

BAFU (2009). Konzept Bär. Managementplan für den Braunbären in der Schweiz. 23 pp. <http://www.sib.admin.ch/uploads/media/Konzept_Baer_-_Managementplan_fuer_den_Braunbaeren_in_der_Schweiz._2009.pdf>

Lynx – Albania

Aleksandër Trajçe



Lynx distribution in Albania 2006-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

There is no sign of a reproductive population of lynx found in the last 5 years, even after extensive monitoring with questionnaire surveys, snow tracking and camera-trapping in selected regions. There are a few hard evidences of lynx presence including camera-trapping photographs and lynx killed as trophies in the northern and eastern parts of the country. Single individuals of lynx in the wild have been recorded through camera-traps only in two mountainous regions; Munella mountain bordering the regions of Puka & Mirdita and in Shebenik-Jabllanica National Park near the border with "The Former Yugoslav Republic of Macedonia" (Trajçe & Hoxha 2011).

Past evaluations (ELOIS 2004[1]) have distinguished four nuclei of lynx distribution in Albania, namely: 1. Albanian Alps, 2. Central North & Central, 3. Central East and 4. Central South. These nuclei, considered in terms of sub-populations are not realistic anymore and recent extensive investigations have failed to prove the presence of live lynx in the Albanian Alps region and the Central South.

[1] Eurasian Lynx Online Information System (http://www.kora.ch/en/proj/elois/online/index.html)

2. Population estimates & monitoring

There is no definite estimate on the number of lynx living in Albania. Monitoring efforts through extensive camera-trapping during 2009-12, have identified at least three different lynx individuals roaming the country (two in Munella mountain and one in Shebenik-Jabllanica National Park) from only four camera-trap pictures in total. Thus far, there is no evidence of reproduction going on making it difficult to assess whether the remaining lynx individuals in Albania are part of a local sub-population or whether they consist of vagrant individuals from the adjacent core population at the Mavrovo National Park in Macedonia. Nonetheless, camera-trapping monitoring efforts are underway and more data generated in the future will help to assess better the situation of the population.

There is a clear discrepancy between the official information given by state authorities and experts evaluations in regard to lynx population size. The latest official estimation of the lynx population in Albania is presented at the Annual Report on the State of Environment for 2009 as consisting of 33 individuals (MoE, 2010). There is however no detail given on the methodology and rationale behind this assessment and according to experts' opinion and field evidence so far, this is a gross overestimation.

3. Legal status & relevant management agencies

The lynx is a strictly protected species in Albania. It is classified as critically endangered (CR) in the Red Data List of the country (Red List of Flora and Fauna, 2007). Its hunting is prohibited and sanctioned in the new laws: law on Wildlife Protection (2008) and on Hunting (2010). The species has had a non-game status (therefore fully protected by laws) since 1969. In the National Biodiversity Strategy and Action Plan (Bego & Koni 1999) the lynx is selected as a priority species and the development of an action plan for its conservation is recommended as an immediate action to take. The institution responsible for lynx management is the Ministry of Environment, Forestry and Water Administration.

Since 2006 a programme for the recovery of the Balkan lynx is being implemented by Albanian and Macedonian NGOs in collaboration with Swiss, German and Norwegian partners (Balkan Lynx Recovery Programme www.catsg.org/balkanlynx). Within the frame of the Balkan Lynx Recovery Programme a range wide strategy for the conservation of Balkan lynx has been developed, followed by country specific Action Plans for both Albania and Macedonia. These documents have been ratified by the Council of Europe and provide the basis for current and future actions in regard to lynx conservation and management in the range countries.

4. Population goal and population level cooperation

There are no explicit population goals for lynx in Albania. The current critical situation of the species both on country and range wide level imply that the recovery of the population in terms of numbers and range should have a crucial importance.

Population level cooperation for conservation is very good among researchers and non-governmental institutions of the range countries mainly within the frame of the Balkan Lynx Recovery Programme. On the GO level, there have been attempts to sign a Memorandum of Understanding (MoU) between Albania and Macedonia for lynx conservation and management from the two relevant ministries (Ministries of Environment in Albania and Macedonia), however, due to bureaucratic difficulties and political changes, the process has been blocked for several years.

5. Conflicts and conflict management

Lynx are not regarded as a major source of conflict among the rural population. This is probably due to the rarity and cryptic nature of the species and to the fact that the species remains largely unknown among locals in the country. Questionnaire surveys conducted during 2006-07 indicate that lynx depredation is a rare phenomenon (only 3 people out of 320 interviewed confirming on lynx depredation cases – Trajçe et. al. 2008, Keçi et. al. 2008). In addition, a human dimension study recently conducted by PPNEA to determine public attitudes of the rural population towards large carnivores reveals that the general public opinion towards lynx is predominantly positive and support for their conservation is high (Trajce 2010).

Currently, there is no form of compensation system and there are no prevention or mitigation measures undertaken by management authorities for addressing the issue of livestock depredation. Traditional livestock herding with presence of shepherd and guarding dogs remain still at place in large parts of the country – particularly in the mountainous regions where also LC species occur. A few initiatives have been implemented in recent years by local NGOs to promote traditional breeds of livestock guarding dogs and donate pure bred animals to a number of shepherds in central and south Albania.

6. Threats

Lynx in Albania are at an historical low. Illegal killings, loss of prey base and habitat degradation seem to be the main factors that have led to the drastic decrease and almost-extinction of the Balkan lynx in the country. During the last six years, extensive field research has not proved the existence of a remaining reproductive population. Only four lynx photographs taken from the extensive camera-trapping monitoring sessions from 2009-12 indicate that the species is still present in the country, but at the same time prove its critical situation. The threats that condition lynx presence need to be addressed as soon as possible, so that Albania can represent a recovery area for Balkan lynx in the near future.

7. Summary table

Population size	Estimated at less than 5-10; probably vagrants from the adjacent Mavrovo population in Macedonia
Trend	at present trend is unknown; historically and up to recent times it has been strongly decreasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Sporadic: 48
Range trend	unknown
Depredation costs / year	unknown
Number of cases / year	unknown
3 Most important threats	illegal killing, loss of prey base and habitat destruction

References:

Balkan Lynx Conservation Compendium; www.catsg.org/balkanlynx

Bego, F. & Koni, M. (1999) eds. *Biodiversity Strategy and Action Plan – National Report*. National Environmental Agency, Tirana, Albania

von Arx, M., Breitenmoser-Würsten, C., Zimmermann, F., Breitenmoser, U. (2004). *Status and conservation of the Eurasian lynx (Lynx lynx) in Europe in 2001 (No. 19)*. KORA, Bern

Ivanov G., Stojanov A., Melovski D., Avukatov V., Keçi E., Trajçe A., Shumka S., Schwaderer G., Spangenberg A., Linnell D. C. J., von Arx M. & Breitenmoser U. (2008): Conservation status of the critically endangered Balkan lynx in Albania and Macedonia. *Proceedings of the III Congress of Ecologists of the Republic of Macedonia with International Participation, 06-09.10.2007*. pp. 249-256. Struga, Macedonia: Special issues of Macedonian Ecological Society, Vol. 8, Skopje.

Keçi, E., Trajçe A., Mersini K., Bego F., Ivanov G., Melovski D., Stojanov A., Breitenmoser U., von Arx M., Schwaderer G., Spangenberg A. & Linnell J.D.C (2008): Conflicts between lynx, other large carnivores, and humans in Macedonia and Albania. *Proceedings of the III Congress of Ecologists of the Republic of Macedonia with International Participation, 06-09.10.2007*, pp. 257-264. Struga, Macedonia: Special issues of Macedonian Ecological Society, Vol. 8, Skopje.

Ministry of Environment, Forests and Water Administration (2010). *Report on the State of Environment 2009*. Tirana, Albania www.moe.gov.al/upload/publikimet/raporte%20te%20gjendjes%20mjedisit/Raporti%202009.pdf

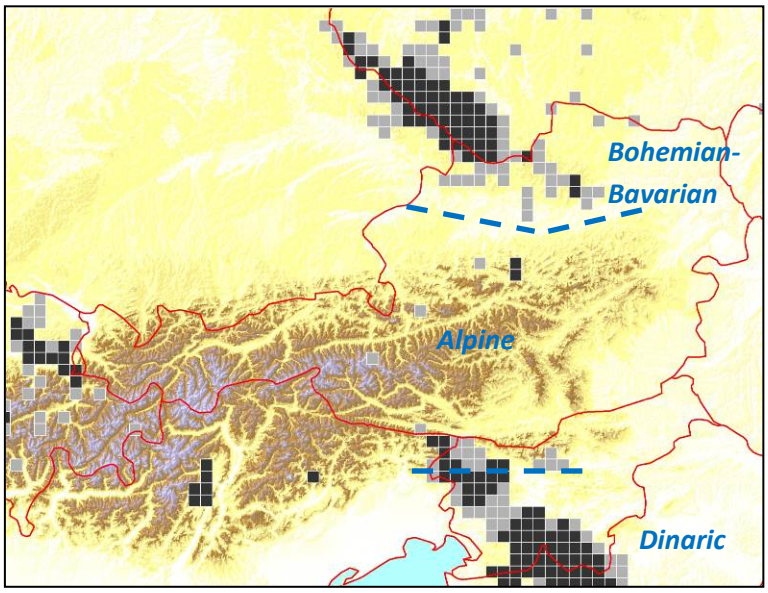
Trajçe, A., Keçi, E., Mersini, K. & Shumka, S. (2008). *Final Report on the Baseline Survey for Lynx, Prey and other Large Carnivores in Albania, 2006-07*. PPNEA, Tirana, Albania

Trajçe, A. (2010). Conservation planning for guilds or individual species? The relative perceptions of wolves, bears and lynx among the rural Albanian public. *M.Sc Thesis, University of Oxford*. Oxford, UK.

Trajçe, A. & Hoxha, B. (2011). Report on camera-trapping activities in Albania during winter 2010-11. PPNEA, Tirana, Albania.

Lynx – Austria

Compiled by Petra Kaczensky with input from Thomas Engleder and Christian Fuxjäger



Lynx distribution in Austria 2006-2010 (Alps) & 2008-2011/12 (Bohemia).

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx in Germany are found in two populationsDinaric the Austrian-Czech- German border which is part of the Bohemian-Bavarian population and one in the Alps. The lynx in the Bavarian Forest are part of the Bohemian-Bavarian population, which was established in the 1980s, with 17 Slovakian animals, in the Bohemian part of the boundary mountain range (Šumava, Czech Republic). That population's range currently covers the tri-border area where the territories of the Czech Republic, Austria and Germany meet. Until the mid-1990s, the population grew and enlarged its range but is presently believed to be stagnant or even decreasing.

After a failed re-introduction attempt in the 1970, lynx occurrence in the Austrian Alps has been entirely dependend on dispersers from Slovenia or northern Italy. However, recent evidence of lynx which escaped from captive facilities (e.g. Fuxjäger 2011) suggests that some of the past observations may also have been of captive origine. There has been no evidence of lynx reproduction anywhere in the Austrian Alps in recent years.

In 1998 a lynx settled in the Kalkalpen National Park and thereafter was annually confirmed by camera traps. In 2011 this lynx was supplemented with a femals lynx from the Swiss Alps and a male lynx from the Jura Mountains (Fuxjäger 2012). In 2012 the female lynx gave birth to two kittens.

2. Population estimates & monitoring

The Austrian part of the Bohemian-Bavarian population is estimated at 5-10 individuals. Occational reproduction has been confirmed and dispersers are registered south of the permanent range, but seem to fail to become resident. Population estimates are guestimates based on confirmed kills of wild ungulates, tracks, opportunistic camera trap pictures and chance observations and are rated according to the SCALP criteria by an regional lynx expert.

The Alpine population numbered a minimum of 3 individuals based on camera trapping in the Karkalpen NP and the released animals from Switzerland. There may be an additional 1-2 animals somewhere else in the Alps. In several areas, lynx occurrence is assumed but without ver producing C1 or C2 observations (“lynx phantoma”).

Monitoring in Austria is done by the collection and assessment of chance observations and opportunistic camera trapping. Lynx signs from the Alps are collected in a common database at the Kalkalpen NP and fed into the SCALP Monitoring Report (2011). Since 2011 the refined German monitoring standards have been adopted and large carnivore experts in Austria meet once a year to discuss the quality and distribution of lynx signs in Austria.

3. Legal status & relevant management agencies

In Austria the lynx is mainly subject to the hunting law, but enjoys a year-round closed season. Responsibility for protecting species in accordance with the Habitats Directive lies with the hunting and natural conservation authorities of the provinces. A Coordination board for bear, wolf and lynx management in Austria (COST) - composed of representatives of the hunting and natural conservation authorities of the provinces, the bear advocats and selected external experts - meets twice a year to review and discuss management issues regarding large carnivores in Austria. No management plan exists for lynx in Austria. The recent re-introduction of two lynx in the Kalkalpen Nationalpark was purely based on the decision and initiative of the NP.

4. Population goal and population level cooperation

There are no explicite population goals for lynx in Austria. Transboundary cooperation on the expert level concerning the monitoring of lynx in the Bohemian-Bavarian (see Aktuelles zum Luchs im Böhmerwald) and the Alpine lynx population (e.g. SCALP monitoring report 2008-2010) is well established.

5. Conflicts and conflict management

Sheep farming is not an important activity in the Auatrian-Bohemian-Bavarian border region, nor in the are around the Kalkalpen NP. In recent years no livestock was killed. In the case of damages, a "voluntarely" (no legal right for compensation) compensation covered by the hunting associations through the hunting insurance would be paid in most provinces.

The main conflict over lynx in Austria is with hunters over predation on wild ungulates. To encourage reporting, a "reporting premium" is paid by the hunters associations of the province of Upper Austria for confirmed lynx kills of wild ungulates.

6. Threats

Both lynx occurences in Austria are very small and stagnant. Losses are difficult to document, but illegal killings are believed to be a main threat. Although the majority of Austrians is in favour of the return of lynx, acceptance among hunters seems much lower. Poor control of captive facilities and the escape or illegal release of captive animals seems to lower the threshold for illegal killing of lynx (e.g. In 2012 a female lynx that had escaped in March from a zoo was found dead on a train track in October. However, post-morten analysis revealed that the animal had been shot and only subsequently placed on the tracks. The case is presently under investigation.

7. Summary table

Population size	Bohemian-Bavarian (Austrian part) (2006-2011): guestimate 5-10 Alps (2012): 3-5
Trend	Bohemian-Bavarian (Austrian part): stagnant Alps: stagnant / increase due to re-introduction
Distribution range (# cells in the 10 x 10 km EEA grid)	Bavarian-Bohemian (Bavarian part) (2008-2010/11): 6 reproduction & 26 sporadic Alps (2006-2010): 2 reproduction & 4 sporadic
Range trend	Bohemian-Bavarian (Austrian part): stagnant Alps: stagnant / increase due to re-introduction
Depredation costs / year	Bohemian-Bavarian (Austrian part): no confirmed damages Alps: no confirmed damages
Number of cases / year	Bohemian-Bavarian (Austrian part): no confirmed damages Alps: no confirmed damages
3 Most important threats	low acceptance by hunters & illegal killing, low political interest/awarness & lack of management, small population size

References:

Fuxjäger, C. 2012. Der Luchs im Nationalpark Kalkalpen 2011 Jahresbericht. http://npk.riskommunal.net/gemeindeamt/download/222823664_1.pdf

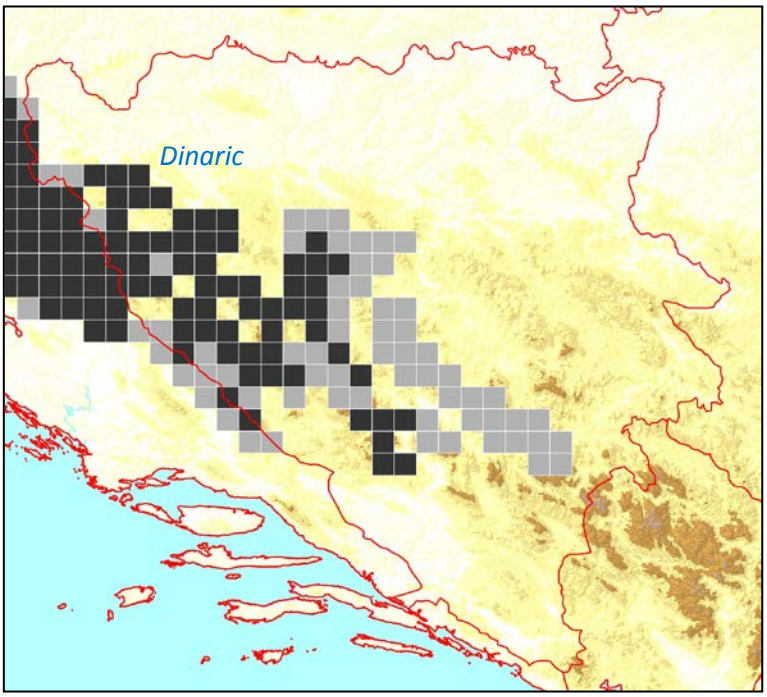
Fuxjäger, C. 2011. Der Luchs im Nationalpark Kalkalpen 2010 Jahresbericht. http://npk.riskommunal.net/gemeindeamt/download/222747102_1.pdf

SCALP Monitoring Report 2008-2010. 2011. http://www.kora.ch/en/proj/scalp/SCALP_monitoring_2008-2010.pdf

Aktuelles zum Luchs im Böhmerwald. http://luchs.boehmerwaldnatur.at/00_nebennavigation/aktuelles/index.html

Lynx – Bosnia and Herzegovina

Compiled with data provided by Sasa Kunovac



Lynx distribution in Bosnia and Herzegovina 2000-2012.

Dark cells: permanent presence
Grey cells: sporadic occurrence

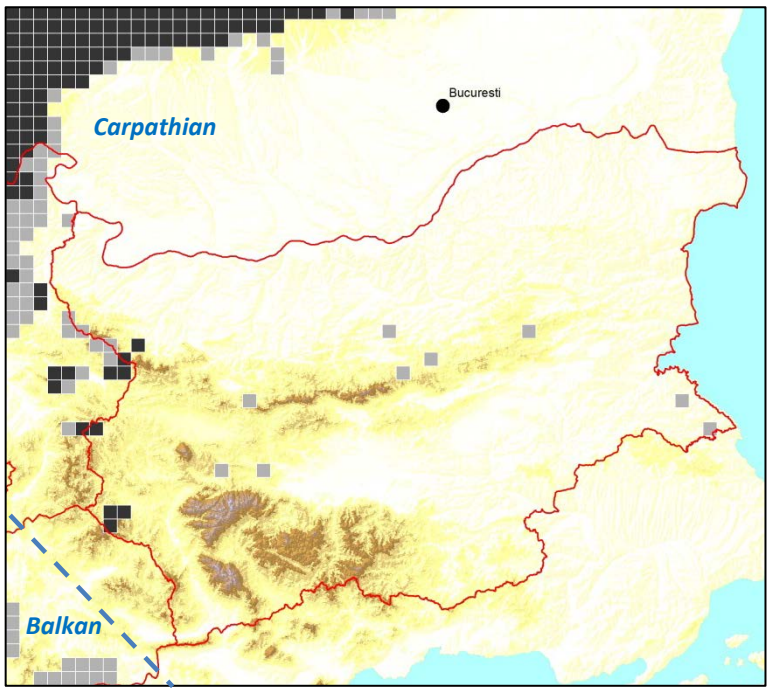
[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

Summary table

Population size	70 (may be overestimated)
Trend	Increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 59 Sporadic: 53
Range trend	Increase
Depredation costs / year	No information available
Number of cases / year	No information available
3 Most important threats	?

Lynx – Bulgaria

Diana Zlatanova



Lynx distribution in Bulgaria in 2000-2012.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

Lynx in Bulgaria is currently recolonizing back the country after more than 65 years of extinction. The last officially reported lynx was killed in 1941 and since the mid 1990s (before the fall of border fences) there were only occasional unconfirmed Quality 3 data. The first Q2 data in the country is from 2003 (Kraishte region) and first Q1 data – from 2008 in Osogovo mountain (Zlatanova *et al.,* 2009). There is still a small amount of hard data for lynx occurrence in the country, as also there is a big gap in the range between the observations. The trend is unclear, although most probably the range is expanding. The positive development of the Carpathian population in neighbouring Serbia and the availability of suitable habitat (56'992 km^2, around 50% of the country in continuous habitat) and a good prey density suggests that re-established lynx are of Carpathian origin. However, this has not been genetically confirmed and there is also the possibility for immigration from "The Former Yugoslav Republic of Macedonia", originating from the Balkan population. Potentially some individuals may have always remained in the rather isolated Strandza mountain (which is currently under study with cameratraps and where one Q2 data point and many Q3 data points suggests lynx presence).

2. Population estimates & monitoring

There is no official estimation of population size or monitoring for the species in the country. A current Natura 2000 project (2011-2013) is the first to try to assess the presence and conservation status of the lynx in Bulgaria and to set up the basis for species monitoring.

Currently the lynx occurrence in the country is estimated by experts at a minimum of 7 resident individuals and at least 2 reproducing pairs (Till Nov 2011). The trend is unclear, although most probably the number is increasing.

Between 2008-2011, 3 independent lynx were recorded in Osogovo mountain by camera trapping, 2 individuals recorded in Western Stara Planina (Balkan) Mountain (near the border with Serbia –

one by tracks and one illegally killed) and tracks of a mother with cub was found in the central part of Bulgaria (Nature Park Bulgarka, part of Central Balkan area). Other direct observations also exist.

3. Legal status & relevant management agencies

The lynx in Bulgaria is listed as fully protected by the Bulgarian Biodiversity Act. As a protected species it is under the centralized jurisdiction of the Ministry of Environment and Waters (MOEW). Local management actions are applied through the Regional Inspectorates of Environment and Waters (RIEW) and National Parks authorities, which are responsible to MOEW.

4. Population goal and population level cooperation

There are no explicite population goals for lynx in Bulgaria. Currently the species is allowed to "re-establish itself in all suitable habitats". A habitat suitability model and preybase availability analyses suggested that Bulgaria has suitable habitat to house up to 1250 resident lynx (Zlatanova, 2010).

5. Conflicts and conflict management

No conflict with livestock breeders has been detected till now. The main arising conflict with lynx in Bulgaria is with hunters over predation on wild ungulates, mainly the roe deer.

6. Threats

The lynx occurences in Bulgaria is of unclear trend which make threat difficult to assess. Losses are difficult to document, but illegal killings (in all forms – shooting, trapping, poisoning) are believed to be a main threat (1 case documented, many reported, but not confirmed). Although the majority of hunters are in favour of the return of lynx, acceptance for the presence of "another predator" seems low.

Other threats believed to be important are: over-harvesting of wild prey populations and direct competition for the prey, large-scale wood plantations or clear-cutting, change in native species dynamics (directly impacting habitat), pest control, limited dispersal and low densities (for Strandza mountain), lack of knowledge about species numbers, trends or species ecology, poor enforcement of legislation and lack of capacity in management structures.

7. Summary table

Population size	minimum estimate: 7 independent lynx, 2 reproduction pairs
Trend	unclear, most probably increasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 6 Sporadic: 9
Range trend	unclear, most probably expanding
Depredation costs / year	no costs
Number of cases / year	no cases documented
3 Most important threats	lack of knowledge of lynx (numbers & trends, ecology), illegal killing, over-harvesting of wild prey populations, poor enforcement of legislation

References:

Paunovic M. & M. Milenkovic 2004. Serbia and Montenegro - country report. In M. von Arx, Ch. Breitenmoser-Würsten, F. Zimmermann and U. Breitenmoser (Eds): Status and conservation of the Eurasian lynx (Lynx lynx) in Europe in 2001. KORA Bericht No. 19. http://www.kora.ch/en/proj/elois/online/

Zlatanova D., P. Tzvetkov, E. Tzingarska-Sedefeheva 2001. The lynx in Bulgaria: Present conservation status and future prospects. In Breitenmoser-Würsten, Ch.and Breitenmoser U (Eds): The Balkan Lynx Population – History, Recent Knowledge on its Status and Conservation Needs. KORA Bericht Nr. 7, p. 19-23.

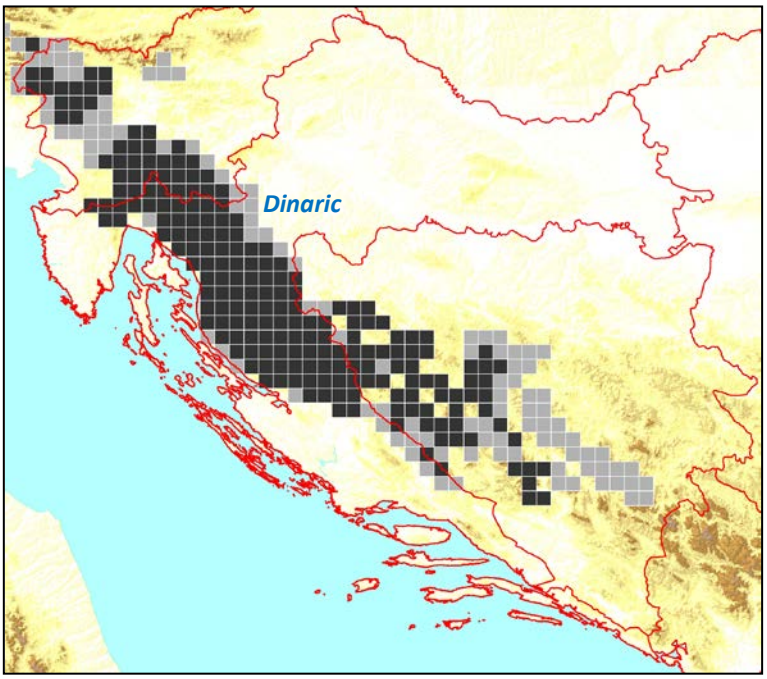
Zlatanova D. & P. Genov 2004. Bulgaria - country report. In M. von Arx, Ch. Breitenmoser-Würsten, F. Zimmermann and U. Breitenmoser (Eds): Status and conservation of the Eurasian lynx (Lynx lynx) in Europe in 2001. KORA Bericht No. 19. (http://www.kora.ch/en/proj/elois/online/)

Zlatanova D., V. Racheva, G. Gavrilov. 2008. Application of GIS model for assessment of the habitat quality and prediction of the potential distribution of carnivore species in local scale - lynx (Lynx lynx L.) in Strandza Mountain as example. Acta zool. bulg., Suppl. 2: 133-140

Zlatanova D., V. Racheva, D. Peshev, G. Gavrilov 2009. First hard evidence of lynx (*Lynx lynx* L.) presence in Bulgaria. Proceedings of XI Anniversary Scientific Conference 120 years Of Academic Education In Biology, 45 years Faculty of Biology. Biotechnol. & Biotechnol. Eq. 23/2009/Se. Special edition/on-line http://www.diagnosisp.com/dp/journals/view_pdf.php?journal_id=1&archive=0&issue_id=22&article_id=627

Lynx – Croatia

Djuro Huber



Lynx distribution in Croatia 2005-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Total lynx distribution area in Croatia extends over 12,332 km^2 (21.8% of terrestrial surface of Croatia). The permanent lynx presence extends over 9.573 km^2, while the occasional lynx presence extends over 1.749 km^2. Lynx are distributed over the entire Gorski Kotar and most of the Lika regions, thus spanning from the borders with Slovenia to and along the long border with Bosnia and Herzegovina. Lynx belong to the Dinaric population, founded by animals originating from the Slovak Carpathians and released in southern Slovenia in 1973.

2. Populations estimates & monitoring

Current estimate of the number of lynx in the Croatian segment of the Dinaric population is about 50 individuals (Sindičić et al, 2010). The number of lynx has been derived by combining data obtained from various monitoring techniques: telemetry tracking, genetics, snow tracking and photo traps, as well as by collecting the bodies of dead lynx. Body of each dead lynx is collected, measured and sampled (since 2001 N=14). Telemetry tracking of a total of 8 different lynx gave insight in the average sizes of individual territories: Genetic survey, photo traps and snow tracking are also used to help reveal the ranges.

However, the final population size estimate is still a partial guesstimate as well. Additional complicating factor in the population estimate is that many individual lynx have part of their range in neighbouring countries. Serious genetic surveys did show the heavy inbreeding of the whole population descending from only 3 pairs reintroduced in 1973 (Sindičić et al, 2012, Polanc et al 2012).

3. Legal status & relevant management agencies

Lynx in Croatia is strictly protected. No hunting quota neither other forms of removal are permitted.

The main management agency is the Directorate for Nature Protection within the Ministry for Protection of Environment and Nature. The operational management follows the Lynx management plan for the Republic of Croatia (Sindičić et al 2010). The Large carnivore committee in partnership with the State Institute for Nature Protection prepares the yearly Action plan and oversees its implementation. The Wolf and lynx emergency team helps with the actions in the field including the reporting of each lynx mortality. A team of damage evaluators examine each reported lynx damage. This serves as the basis for paying compensations, but is also used as part of the monitoring. However, no lynx damage has been reported since 2006.

4. Population goal and population level cooperation

According to the management plan the total habitat capacity is around 200 lynx, but the social capacity (acceptance) may be around 100. Currently both, biological and social capacity, have not been reached and active management has to help raise the population to the given numbers.

Lynx in Croatia are part of the Dinara population which Croatia directly shares with Slovenia and Bosnia and Herzegovina. With Slovenia there is full cooperation on the level of scientists while the political agreement on management is expected to develop when Slovenian side will accept the process. With Bosnia and Herzegovina the main difficulty is in the lack of capacity and in political situation in that country.

5. Conflicts and conflict management

Current conflict is very low with livestock and mild over game (natural lynx prey).

No livestock losses have been detected since 2006. This is partly due to low lynx numbers but also due to few livestock on the lynx range, backed with proper husbandry by locals who never lost the tradition of living with large carnivores. For hunters each roe deer taken by lynx is a loss for which they can not request compensation. The acceptance by hunters is the main socio-economic limiting factor for the increase of lynx population. Equally important from the biological side, is the low genetic diversity after 39 years of lynx breeding with close kin.

6. Threats

The current situation with the lynx population segment that lives in Croatia is below favourable conservation status, particularly when considering the fact that the whole population is under 100 animals in total. Population is isolated and heavily inbred for almost 40 years. Augmentation with new individuals is necessary and urgent.

Additional threats are poaching, low prey availability and to certain degree competition with bears that often take over the prey killed by lynx (kleptoparasitism).

There was a construction of mayor infrastructure (highways) in the lynx habitat in the previous decade but that seems to have been satisfactory mitigated by numerous crossing structures including big green bridges (Kusak et al 2009). The most recent threat is the planned construction of “wind power parks” in the core lynx habitat.

7. Summary table

Population size	~50
Trend	Stable or decreasing in the last 5 years
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 109 Sporadic: 28
Range trend	Has been reduced in the period 1990-2000. Seem stable in the last decade.
Depredation costs / year	0 € over the last 7 years
Number of cases / year	0 over the last 5 years
3 Most important threats	- Inbred population that needs urgent augmentation - Competition about prey (roe deer) with hunters (and bears after kill) - More construction in habitat like planned "Wind power parks"

References:

Sindičić, Magda, Ana Štrbenac, Patricija Oković, Đuro Huber, Josip Kusak, Tomislav Gomerčić, Vedran Slijepčević, Ivna Vukšić, Aleksandra Majić – Skrbinšek Želimir Štahan (2010). Plan upravljanja risom u Republici Hrvatskoj. Državni zavod za zaštitu prirode, Zagreb. 72 pp.

Gomercic, Tomislav; Sindicic, Magda; Gomercic, Martina Duras; Guzvica, Goran; Frkovic, Alojzije; Pavlovic, Dubravka; Kusak, Josip; Galov, Ana; Huber, Duro. 2010. Cranial morphometry of the Eurasian lynx (Lynx lynx L.) from Croatia. Veterinarski arhiv. 80, 393-410.

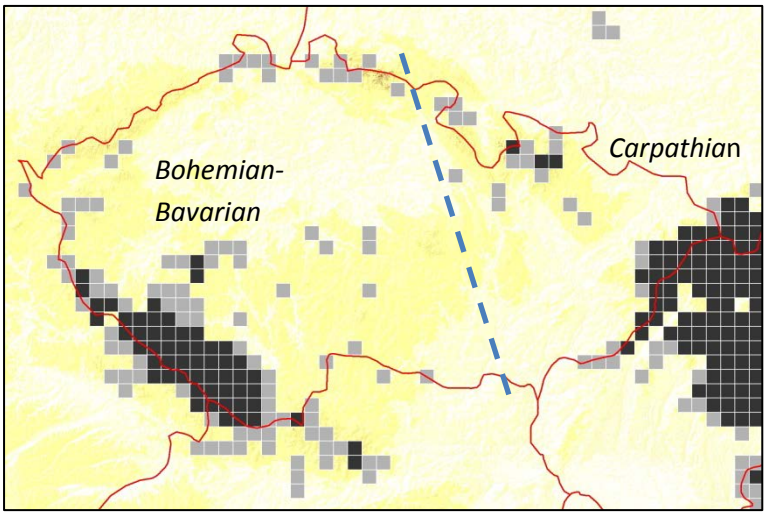
Polanc, Primož , Magda Sindičić, Mala Jelenič, Tomislav Gomerčić, Ivan Kos, Đuro Huber (2012), Genotyping success of historical Eurasian lynx (Lynx lynx L.) samples. Molecular Ecology Resources, 12, 293–298.

Sindicic, Magda; Gomercic, Tomislav; Galov, Ana; Polanc, Primoz; Huber, Duro; Slavica, Alen. 2012. Repetitive sequences in Eurasian lynx (Lynx lynx L.) mitochondrial DNA control region. Molecular Ecology Resources, 12, 293–298.

Kusak, Josip, Djuro Huber, Tomislav Gomerčić, Gabriel Schwaderer, Goran Gužvica. 2009. The permeability of highway in Gorski kotar (Croatia) for large mammals. European Journal of Wildlife Research, 55: 7-21.

Lynx – Czech Republic

Ludek Bufka



Lynx distribution in Czech Republic in 2009-2012.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx in Czech Republic are found in two populations, one in Bohemia along the Czech-German-Austrian border which is part of the Bohemian-Bavarian population and in the Beskydy Mountains which are part of the Carpathian population. The lynx in Bohemia go back to 17 Slovakian animals re-introduced in the 1980s. That population's range currently covers the three-border area where the territories of the Czech Republic, Austria and Germany meet. Until the mid-1990s, the population grew and enlarged its range but is presently believed to be stable.

The lynx in the Beskydy Mountains are the westernmost part of the large, authochtonous Carpathian population.

Additional animals occur in the Jeseníky Mountains and vagrants show up in the montaneous forested areas along the state border, namely the Labe-Sandstone area, the Giant Mountains., irregularly also in the western part of the Krušné hory Mts. and the area of the Czech-Moravian Highlands.

2. Population estimates & monitoring

The Czech part of the Bohemian-Bavarian population is estimated at 30 – 45 adults, in the Beskydy Mountains at 13 adults, in the Jeseníky Mountains at <10 adults. In the Bohemian-Bavarian population a transboundary camera trapping project has been initiated (Weingarth et al. 2011) and additionally some animals are followed by telemetry. Otherwise lynx is monitored by snow tracking in the Beskydy Mountains, collection of genetic samples, bi-annual questionnaire surveys of hunting grounds (for relative long-term trend analysis) and hunting ground estimates. Monitoring is done through a combined effort of government agencies, NGOs and academic/research centres.

3. Legal status & relevant management agencies

In Czech Republic the lynx falls under the jurisdiction of the Ministry of Environment (department of nature protection) and the Ministry of Agriculture (department of game management). The lynx is listed as “totally protected” and “heavily endangered” in the legislation of nature protection (Act No. 114/1992; Notice No. 395/1992) and as a game species, which cannot be hunted by legislation of game management (Act No. 449/2001).

A proposal for a lynx management plan has been drafted, but was never accepted or implemented.

4. Population goal and population level cooperation

There are no explicite population goals for lynx Czech Republic.

In the Bohemian-Bavarian population research and monitoring is coordinated on the expert level (e.g. Weingarth et al. 2011). Research for 2009-2012 has been supported by an EU grant (EU grant No. 18).

5. Conflicts and conflict management

Some damages on sheep occur.Thus damages are compensated by government funds via´the Ministry of Finance and paid by Regional Authorities. Only confirmed kills are compensated and consequently all kills have to be examined by a veterinarian and representative of the regionally relevant body of state nature protection. Compensation is paid as the average market price.

Prevention measures are only supported through individual programs / grants by NGOs. So far the focus of such programs has been on supporting electric fencing and livestock guarding dogs.

However, the main conflict over lynx in Czech Republic seems to be with hunters over predation on wild ungulates. A 2001 survey on hunters attitute towards lynx showed that "only 19.2% of the polled hunters believed the Eurasian lynx to play a positive role in ecosystems, 36.9% of them were aware of concrete cases of illegal hunting and 10.3% of them admitted to killing the Eurasian lynx illegally" (Cerveny et al. 2002).

6. Threats

Illegal killing probably occur regularely, but there are no recent confirmed cases. Traffic accidents also occur and have been documented.

7. Summary table

Population size	Bohemian-Bavarian (Czech part): 30-45 adults, Carpathian (Czech part): Beskydy Mountains 13 adults, Jeseníky Mountains <10 adults
Trend	Bohemian-Bavarian (Czech part): stable Carpathian (Czech part): decreasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Bohemian-Bavarian (Czech part): 51 permanent & 17 reproduction & 41 sporadic Carpathian (Czech part): 11 permanent & 3 reproduction & 7 sporadic
Range trend	Bohemian-Bavarian (Czech part): stable Carpathian (Czech part): stable
Depredation costs / year	Bohemian-Bavarian (Czech part): no information Carpathian (Czech part): no information
Number of cases / year	Bohemian-Bavarian (Czech part): no information Carpathian (Czech part): no information
3 Most important threats	illegal killing, poor law enforcement, fragmentation & road accidents

References:

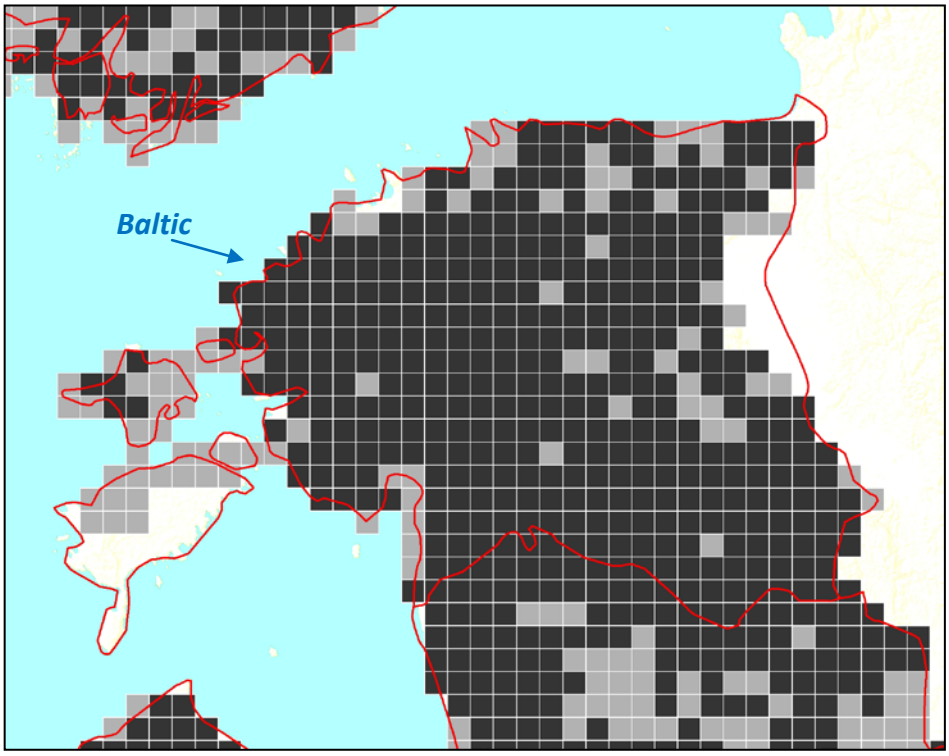
EU grant No. 18 Program “Objective III” Czech Republic – Bavaria 2009-2012. Ecology of the lynx (*Lynx lynx*) and roe deer (*Capreolus capreolus*) in mountain forest ecosystem. Bavarian Forest National Park and Sumava National Park Administrations.

Cervený, J., P. Koubek, and L. Bufka. 2002. Eurasian lynx (*Lynx lynx*) and its chance for survival in central europe: the case of the Czech Republic. Acta Zoologica Lituanica, 12(4):428-432.

Weingarth, K., L. Bufka, K. Daniszova, F. Knauer, P. Šustr & M. Heurich. 2011. Grenzüberschreitendes Fotofallenmonitoring - wie zählt man Luchse? <http://www.luchserleben.de/standardtext/berichte.html >

Lynx – Estonia

Peep Männil



Lynx distribution in Estonia 2008-2010.

Dark cells: reproduction
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx in Estonia are part of the large Baltic population and are found all around the country including bigger islands. Reproductions occurrs in all counties.

2. Populations estimates & monitoring

Population size was estimated at 790 in autumn 2010. Population size is estimated by number of unique annual reproduction units. Number of reproductions are based on the mapping of sight and track observations all over Estonia.

Additionally, monitoring includes the data (site, sex, age, reproductive status) of harvested/dead individuals and data collected from permanent winter-track count transects all over the country.

Basic monitoring data are collected by hunters and personnel of protected areas and are analyzed in Estonian Environment Information Centre.

3. Legal status & relevant management agencies

Lynx is in the list of game species in Estonia with an open season from 1.12. to 28.02. There is a valid national management plan for 2012-2021 signed by Minister of the Environment.

Management of lynx falls to the Environmental Board under the jurisdiction of Ministry of the Environment. There is a Working Group for Large Carnivore Management in the Ministry of the Environment. Working group consist of different stakeholders and advises ministry to establish and implement the LC policy.

Estonian Environment Information Centre under the Ministry of the Environment is responsible for lynx monitoring. The annual monitoring reports consists proposals for establishment of annual conservation measures and sustainable harvest quotas.

4. Population goal and population level cooperation

Following the current national management plan the goal is to keep 1) the number of annual reproductions between 100 -130 and 2) the distribution over the country equal in suitable habitats. Reduction of minimum target population up to 30 % is accepted when food base (roe deer population) are extremely reduced. Lynx number are regulated by hunting.

Population level management involves: 1) regular share of information on management (census, hunting bags) of lynx with Latvia, 2) common research with Poland and Latvia on genetics of Baltic lynx population, and 3) translocations of Estonian wild lynx to NE Poland.

5. Conflicts and conflict management

The main conflict over lynx is with hunters over predation on wild ungulates especially in periods of low roe deer density (consequences of harsh winters). Lynx depredation on livestock is rare in Estonia and doesn`t cause any remarkable conflict.

Since 2007 the compensations for livestock damages are paid by the state: responsible body is Environmental Board and the source is Environmental Investment Centre. All the cases should be inspected by the trained experts of Environmental Board and if confirmed 100% of the market value is paid.

6. Threats

There are no foreseen any significant threat for favourable conservation status of lynx population in predictable future. Still, there are some aspects that should be under highlighted attention: reduction of main wild food source (roe deer in Estonia). Lynx predation may seriously hinder the prey population recovery when it`s density is low and it may cause negative attitudes towards lynx followed by higher pressure to increase the hunting quotas and/or increase of illegal killing.

7. Summary table

Population size	Autumn 2010: 790
Trend	Increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Reproduction: 376 Sporadic: 92
Range trend	Stable
Depredation costs / year	2011: 2000 €
Number of cases / year	2011: 20 cases
3 Most important threats	None

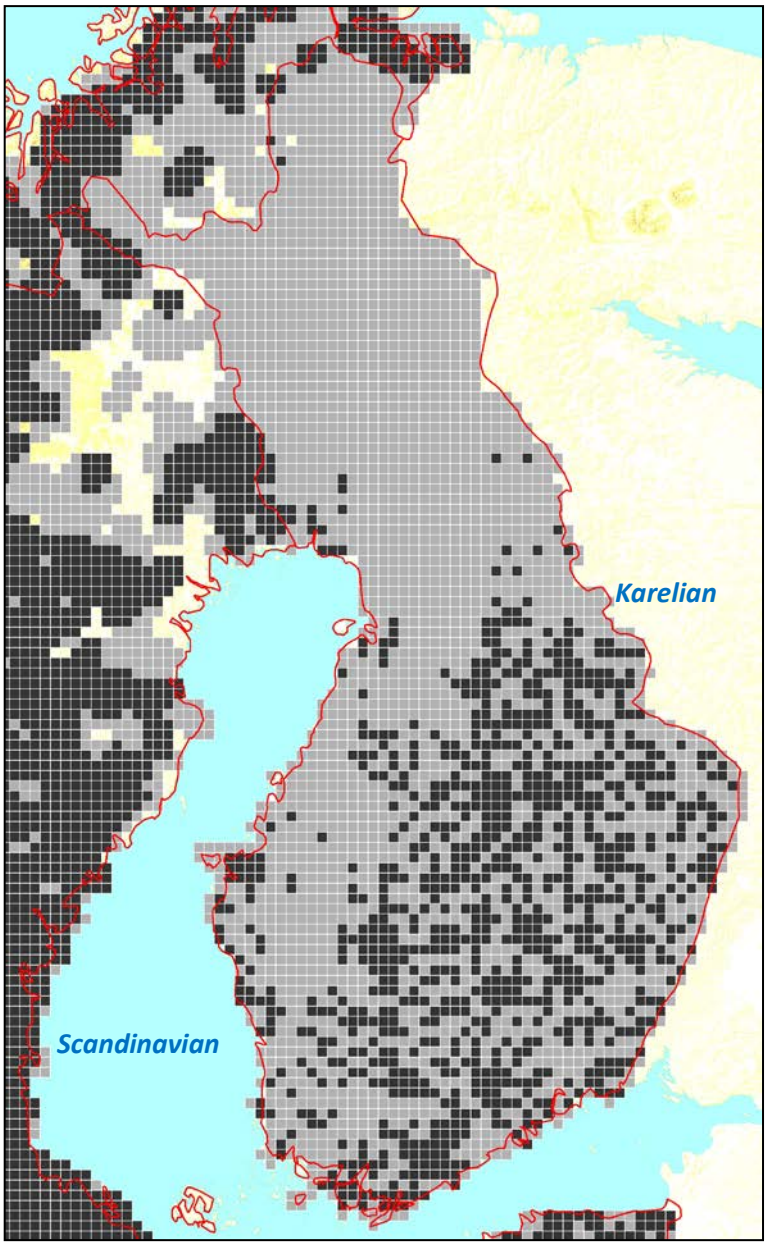
References:

Männil, P., Veeroja, R. & Tõnisson, J. 2011. Status of Game populations in Estonia and proposal for hunting in 2011 (in Estonian with English summary and figures). Estonian Environment Information Centre. http://www.keskkonnainfo.ee/failid/ULUKITE_SEIREARUANNE_2011.pdf

Männil, P. & Kont, R. (editors) 2012. Action plan for conservation and management of wolf, lynx and brown bear in Estonia in 2012-2021 (in Estonian). Ministry of the Environment. http://www.keskkonnainfo.ee/failid/SK_tegevuskava_2012-2021_lopp.pdf

Lynx – Finland

Katja Holmala and Ilpo Kojola



Lynx distribution in Finland 2009-2011. (Distribution in Russia and Belarus not shown)

Dark cells: reproduction presence (buffered by 10 km)

Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Due to long ongoing expansion, the whole country has now been occupied by lynx. The lynx population is fairly evenly distributed throughout the country, with the exception of the reindeer husbandry area. However, the species has never been abundant in the northern regions (see map; also Pulliainen 1992).

2. Population estimates & monitoring

In the mid-1950s the lynx was wiped out so completely that the present Finnish lynx population can be considered Swedish-Russian in origin.

In the 1950s and 1960s, lynx began to cross the border from the southeast and since the 1960s the Finnish lynx population has become stronger. In 1962 when lynx were given a partly protected status, there were about 30–40 lynx in Finland (Pulliainen & Rautiainen 1999). Protection from hunting together with cross-border dispersal strengthened the population. In the late 1980s, some 800 animals were estimated to roam the country.

The lynx population has grown steadily since 1978 and the minimum estimate in 2012 is 2340–2610 independent (> 1 year) lynx in Finland (Holmala 2012). In 2011 about 431- 487 litters were estimated as being born, and the mean number of cubs per female ranged from 1.2 to 1.8 (Holmala 2012). The long term trend of population increase seems to have slowed down (population growth 2009-2010: 21%, 2010-2011: 5%, 2011-2012 being -1%, Holmala unpublished).

Monitoring of the population is based primarily on records of lynx tracks reported by the contact persons, especially sightings of tracks from reproductive females accompanied by dependent kittens (family groups). Population size is estimated from observations done during snow tracking over the entire country. However, in northernmost Finland, in reindeer herding areas the network of contact

persons is sparse and snow tracking is less intensive. In some areas (mainly in southern Finland) GPS-telemetry is used.

3. Legal status & relevant management agencies

In Finland, the lynx is subject to the hunting law. The lynx is listed under Annex IV of the Council Directive 92/43/EC and therefore subject to strict protection. Exceptions to this obligation are only permitted on certain precisely defined conditions (derogation) (Ministry of Agriculture and Forestry 2007). Responsibility for the management and maintenance of the lynx population lies with the Ministry of Agriculture and Forestry. At the regional level, the responsible bodies for game animal management are the provincial units of the Finnish Wildlife Agency´s game management districts. The objectives set for lynx population management are to a certain extent conflicting, both on national and international levels. The Management Plan for the Lynx Population in Finland was published in 2007 applying the Convention on the Conservation of European Wildlife and Natural Habitats, Recommendations of the Standing Committee No 59 (1997) and No 74 (1999) as well as the IUCN's principle of sustainable use and on the obligations laid down in Council Directive 92/43/EC on the protection of natural habitats and wild flora and fauna (the Habitats Directive), so as to fulfill the international obligations placed on Finland. The lynx population management plan is part of the Natural Resources Strategy and its implementation under the heading of game management.

4. Population goal and population level cooperation

The main objectives of the conservation, management and regulation of Finland's lynx population have been stated in the population management plan (Ministry of Agriculture and Forestry 2007). The main goal is to maintain the favourable conservation status of the lynx population in the future. Finland has been divided into two large regions for lynx population management purposes: the reindeer husbandry area and the rest of Finland. The objective is not to increase the lynx population in the reindeer herding area, but to ensure the free movement of lynx between Scandinavia and Russia. In the management areas outside the reindeer husbandry area, the objective is to establish a lynx population that allows for natural spreading and the occupation of new habitats in harmony with specific regional features. The growth of the lynx population is to be limited, especially in areas where there is a population concentration, taking into account the principle of sustainable use and the objective of achieving a more even distribution of the lynx population.

5. Conflicts and conflict management

The compensations for large carnivore damages are paid in full. In 2011, the total compensation paid for depredated reindeer by all large carnivores was 4'960'000 Euro, out of which lynx caused losses of 554 reindeers totaling 827'122 Euro (Ministry of Agriculture and Forestry 2012, unpublished). Other lynx caused damage compensations paid elsewhere in Finland (outside reindeer husbandry area) totaled 15'600 Euro for 25 cases.

Although depredation by lynx is not as extensive as in Sweden and Norway (see respective reports), the harvest number has steadily increased since 1980. During 1980-1990 a total of 497 lynx were killed. During 1999–2005, on average 51 individuals/year (38–67 lynx/year) have been killed (Kojola 2004). Between years 2005-2012 (until end of February 2012) a total of 1539 lynx were killed and the yearly numbers have been increasing (season 2011/2012 404 killed lynx; Holmala unpublished).

According to previous estimates, sustainable harvest is about 10–13% of the population (e.g. Kojola 2004). Recent population model demonstrated that the yearly growth of the population has been on average 16% (range 2 to 28%) from 1998-2012 (Holmala & Rintala 2012). For the hunting season 2012-2013 the maximum number of permissible derogations was set to some 16% of the estimated minimum population, which should halt the population growth and lead to a stable lynx population (Ministry of Agriculture and Forestry 2012).

Outside the reindeer husbandry area lynx cause only a small number of domestic animal losses yearly. The main conflict over lynx in most of Finland (outside the reindeer husbandry area) is probably with hunters over predation on wild ungulates - roe deer and introduced white-tailed deer.

6. Threats

Lynx in Finland are not under any major immediate threat. The continued expansion and increase of the population indicates that in the past lynx harvest in Finland has been sustainable. Among the most common causes of death in wild lynx, apart from hunting, is traffic. Illegal killing of lynx occurs as well, but how commonly or widely it happens, is not known.

However, in the IUCN Red List Categories the status of the lynx in Finland was classified as vulnerable in an evaluation carried out in 2010 (near threatened in 2001). Changes in the interpretation affected the classification. Previously, lynx had been downgraded, since the risk of extinction was considered to have decreased in Finland due to populations living in and migrating from neighbouring countries. However, on the basis of current knowledge, migration has greatly decreased. The criterion used was D 1: population size estimated to number fewer than 1000 mature individuals and the threat factors included trapping, hunting and illegal killing (Rassi, et al. 2010).

7. Summary table

Population size	2012 minimum population estimate: 2340-2610 (>1 year old)
Trend	Increasing / stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 253 Sporadic: 1163
Range trend	Rest of Finland (outside reindeer husbandry area): increasing/stable Reindeer husbandry area: unclear
Depredation costs / year	Reindeer husbandry area (2011): 827'122 € Rest of Finland (outside reindeer husbandry area) (2011): 15'600 €
Number of cases / year	Reindeer husbandry area (2011): 554 reindeer Rest of Finland (outside reindeer husbandry area) (2011): 25 domestic animals
3 Most important threats	hunting, decreased migration from neighbouring countries, low acceptance by hunters in some areas

References:

Holmala, K. 2012: Status, increase and sustainability of Finnish lynx population. RKTL 434/401/2012, [in finnish]. http://www.mmm.fi/attachments/riistatalous/60fAz4k3v/MMM_asetus_935-2011_ilves_MUISTIO.pdf

Holmala, K. and Rintala, J. 2012: A scenario of the population development of lynx population until year 2015. RKTL 434/401/2012, [in finnish]. http://www.mmm.fi/attachments/riistatalous/60fAz4k3v/MMM_asetus_935-2011_ilves_MUISTIO.pdf

Kojola, I. 2004. Finland. In: von Arx, M. Breitenmoser-Würsten, C., Zimmermann, F. & Breitenmoser, U. (ed.) 2004: Status and conservation of the Eurasian lynx (*Lynx lynx*) in Europe in 2001. KORA Bericht No. 19, s. 78–85.

Ministry of Agriculture and Forestry 2007: Management plan for the lynx population in Finland. Vammalan Kirjapaino Oy, 2007.

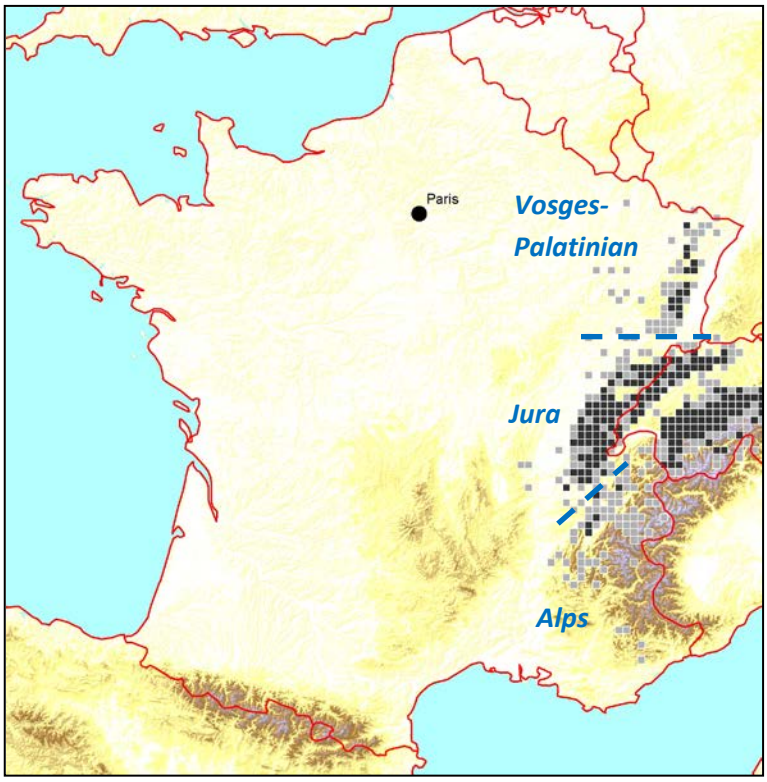
Pulliainen, E. 1992: From extinction to real life for the lynx. Finnish experiences. In: The situation, conservation needs and reintroduction of lynx in Europe, 17-19 October 1990, Neuchatel, Switzerland, Environmental Encounters No. 11, Council of Europe Press, Strasbourg: 17-18.

Pulliainen, E., Lindgren, E. & Tunkkari, P.S. 1995: Influence of food availability and reproductive status on the diet and body condition of the European lynx in Finland. *Acta Theriologica* 40 (2): 181-196.

Rassi, P., Hyvärinen, E., Juslén, A. & Mannerkoski, I. (eds.) 2010: The 2010 Red List of Finnish Species. Ympäristöministeriö & Suomen ympäristökeskus, Helsinki. 685 p.

Lynx – France

Eric Marboutin



Lynx distribution in France 2008-2010.

Dark cells: permanent presence (3 out of 5 year present)
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Monitoring

A network of ca. 1200 trained field experts is in charge of presence signs survey all along the year; any detected sign is described and sent to a central state agency (ONCFS) in charge of the validation process. Since 2010, CMR-based estimates of abundance and density are derived from 4 large study areas (several hundreds km²), intensively surveyed with photo-traps to identify individuals based on their coat patterns.

2. Distribution

Lynx in France are found in one main population segment (core area : Jura mountains), and two secondary population segments (Vosges massif, and northern-Alps massif). The core area originated in the early 1970s from restocking of the Swiss population; the Vosges unit was restocked in the 1980s, based on 10 founders. The northern Alps are currently colonized most probably based on connexion through forested corridors with the Jura massif. The area of regular rpesence is increasing over the Jura mountains, stable in the Alps, slightly decreasing in the Vosges.

2. Density & population size

Density has been estimated only in the Jura mountains so far (1 up to 1.5 / 100 Km² depending on the study area concerned). Using area with regular presence only and minimum density estimates yield conservative values of numbers: N_{Jura} = 76 min.; N_{Vosges} = 19 min.; N_{Alps} = 13 min (assuming density values estimated in the Jura area also fits to other regions with lynx regular presence).

3. Legal status and management

Lynx are a fully protected species (Bern Convention, HFF Directive, National Law). Management can be authorized based on HFF Directive art.16 to selectively removed stock raising individuals.

4. Population goal

No explicit population limit.

5. Conflicts

Mostly with sheep husbandry in the Jura area; on average less than 75 attacks / year during the last 10 years. Competition for roe-deers exploitation perceived by hunters.

6. Threats

Traffic accidents and poaching.

7. Summary table

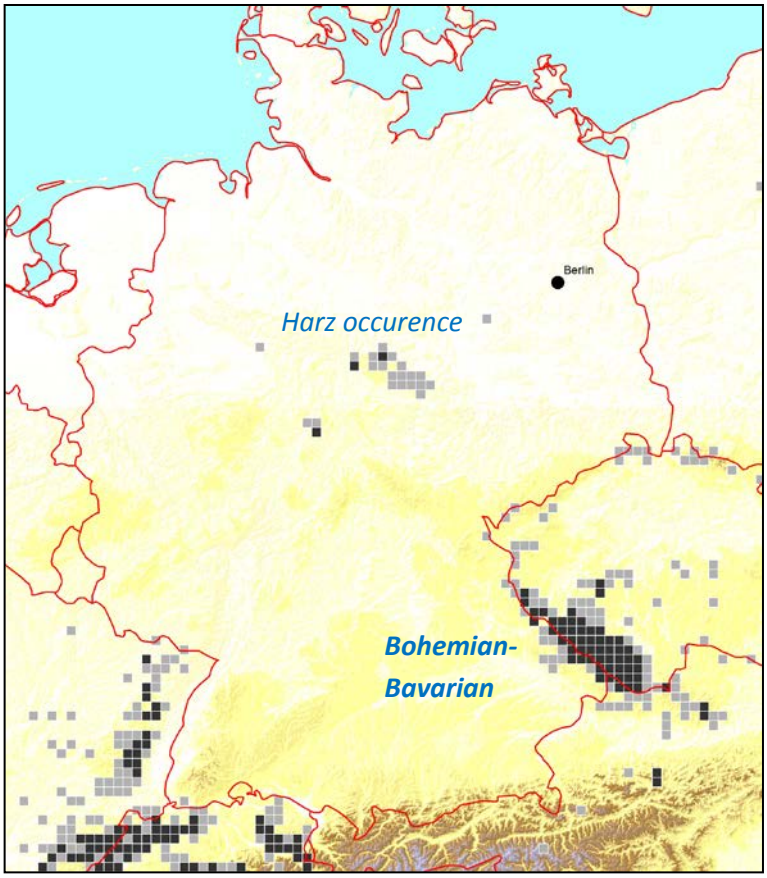
Population size	Jura: 76 (minimum count) Vosges: 19 (extrapolated from densities of the Jura pop.) Alps: 13 (extrapolated trom densities of the Jura pop.) Total: 108
Trend	stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Jura: expanding Alps: stable Vosges: stable/declining Total**:**
Range trend	Jura: Permanent: 64, sporadic: 61 Alps: Permanent: 5, sporadic: 67 Vosges: Permanent: 14, sporadic: 43 Total**:** Permanent: 83, sporadic: 171
Depredation costs / year	< 20,000 €
Number of cases / year	2000-2011 mean : 72
3 Most important threats	Traffic accidents, small numbers combined with demographic isolation (Vosges), poaching.

References:

Vandel J.M. & Stahl P. (2005) - Distribution trend of the Eurasian lynx Lynx lynx populations in France. *Mammalia* 69(2): 145-158.

Lynx – Germany

Compiled by Petra Kaczensky with input from Manfred & Sybille Wölfl and Ole Anders



Lynx distribution in Germany in 2010.

Dark cells: reproduction
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx in Germany are found in two populations, one along the German-Czech-Austrian border which is part of the Bohemian-Bavarian population and one in the Harz mountains, which is still considered an occurence. The lynx in the Bavarian Forest are part of the Bohemian-Bavarian population, which was established in the 1980s, with 17 Slovakian animals released in the Bohemian part of the boundary mountain range (Šumava, Czech Republic). That population's range currently covers the tri-border area where the territories of the Czech Republic, Austria and Germany meet. Until the mid-1990s, the population grew and enlarged its range but is presently believed to be stagnant or even decreasing.

The Harz occurence was founded in Lower Saxony from 2000-2006 with 24 captive bred lynx (9 males and 15 females) of various genetic origine. In 2002 the first wild born litter was documented and the the population is presently streching over the Länder Lower Saxony, Saxony-Anhalt and Hessen (Nationalparkverwaltung Harz 2011).

During the past two decades, individuals of unknown origin have been sighted at numerous locations in Germany, many of the far away from existing populations and thus pointing towards animals escaped or released from captivity. Previously assumed occurences in the Black Forest, Palatinian Forest and Laberiver Sandstone Mountains could not be confirmed any more and were likely overestimates of single individuals.

2. Population estimates & monitoring

The Bavarian population is estimated at a minimum of 12 independent individuals (2010-2011; BfN unpublished data) based on CMR and systematic/opportunistic camera trapping. The population seems to be stagnant despite regular reproduction along the border region. Occational dispersers are registered south of the permanent range, but seem to fail to become resident. The area of permanent presence is covered by a systematic capture-mark-recapture (CMR) camera trapping grid (Wölfl & Schwaiger 2010, Weingarth et al. 2011). Systematic snow tracking is done by personnel of the Bavarian NP within the national park area (242 km²). In addition, several lynx have been followed by telemetry. Additional information comes from the collection of chance observations rated according to the refined SCALP criteria (C1 & C2) and opportunistic camera trapping.

The occurence in the Harz mountain was estimated at a minimum of 11 individuals based on opportunistic camera trapping and telemetry. However, robust CMR results are still missing and the trend is unclear. Although individuals are showing up in the surrounding, distribution in the former core area seems somewhat disjunct. Additional information comes from the collection of chance observations rated according to the refined SCALP criteria (C1 & C2) and opportunistic camera trapping.

One additional lynx of unclear origine has been documented in North Rein-Westphalia. Thus the total German lynx population is estimated to have a minimum of 24 animals.

All lynx signs reported by third parties are inspected and documented by a network of trained, mostly voluntary lynx inspectors. These documented records are evaluated by 1-2 “experienced persons” (a wildlife professional with documented large carnivore experience) for each federal state and rated according to the re-fined German SCALP criteria (Kaczensky et al. 2009). Since 2009 the experienced persons from the federal states meet once a year for a Germany wide large carnivore population and distribution range assessment. The meetings are organized by the Federal Agency for Nature Conservation (BfN) and serve as the basis for the FFH reporting. In 2011 the first national distribution map (10 x 10 km EEA grid) was produced showing lynx distribution in 2010 based on SCALP C1 and C2 records. For the purpose of this country summary, cells with reproduction were defined as “permanent”, all others as “sporadic” as there was only one year of data available. The 2011 map is presently under revison.

3. Legal status & relevant management agencies

In Germany the lynx is subject to the hunting law, but enjoys a year-round closed season. Responsibility for protecting species in accordance with the Habitats Directive lies with the natural conservation authorities of the federal states, but the respective hunting authorities also have a responsibility. So far only Bavaria has a lynx management plan. Additionally, there is a framework issued by the BfN on how to deal with management issues of lynx, wolf and bear in Germany (BfN 2010, unpublished final report).

4. Population goal and population level cooperation

There are no explicite population goals for lynx in Germany - neither for the Harz Mountains nor for the Bavarian Forest. Rather lynx should be allowed to “re-establish themselves in all suitable habitats”. A modelling exercise showed a rather large uncertainty depending on the model assumptions and suggested that Germany has suitable habitat to house 159 to 663 residente lynx outside of the Alps (Knauer et al. 2010, in BfN 2010 unpublished final report). Monitoring within Germany is coordinated via the annual meeting of the experienced persons. In the core area of the Bohemian-Bavarian population so far research and monitoring is coordinated between the two

neighbouring national parks (Weingarth et al. 2011). However, recent changes regarding the goals and management of the Sumava National Park and the surrounding Biosphere reserve have resulted in major cutbacks for research and conservation on the Czech side. Future closer cooperation across countries and administrations is planned in a INTERREG/Ziel3 project probabely beginning in December 2012 including all relevant interest groups**.**

5. Conflicts and conflict management

Sheep farming is not an important activity in the Bavarian-Bohemian border region, nor in the Harz mountain. Consequently livestock depredation is rare. Sometimes lynx kill deer kept in production enclosures. Bavaria and Lower Saxony have compensation payments for lynx, the other Länder have not had any damages yet. All kills have to be verified and documented by trained personel.

The main conflict over lynx in Germany is with hunters over predation on wild ungulates. To encourage reporting, a "reporting premium" is paid by the hunters associations of Bavaria and Lower-Saxony to hunters for confirmed lynx kills of wild ungulates.

6. Threats

Both lynx occurences in Germany are small and stagnant or of unclear trend. Losses are difficult to document, but illegal killings are believed to be a main threat. Although the majority of Germans is in favour of the return of lynx, acceptance among hunters seems much lower. The conflict is more about a clash of values, poor communication and a struggle for control by a group that feel marginalized by the rest of sociey, than about the lynx itself (Lüchtrath 2011).

In addition, over the past years, several lynx died in traffic accidents. A chronic threat is the low population size which makes lynx in Germany highly susceptible to stochastic effects.

7. Summary table

Population size	Bohemian-Bavarian (Bavarian part): minimum estimate 12 independent lynx Harz: minimum estimate 11 independent lynx
Trend	Bohemian-Bavarian (Bavarian part): stagnant Harz: unclear
Distribution range (# cells in the 10 x 10 km EEA grid)	Bohemian-Bavarian (Bavarian part): 5 reproduction & 37 sporadic Harz: 3 reproduction & 21 sporadic
Range trend	Bohemian-Bavarian (Bavarian part): stagnant Harz: unclear
Depredation costs / year	Bavarian Forest (1998-2009): ~400 €, but last 3 years no damages Harz (2010): 399 €
Number of cases / year	Bavaria Forest (1998-2009): ~4 sheep / goats, but last 3 years no damages Harz (2010): ~4 sheep / goats or enclosure deer
3 Most important threats	illegal killing, fragmentation & road accidents, small population size

References:

Bayrisches Staatsministerium für Umwelt, Gesundheit und Verbraucherschutz (StMUGV) 2008. Managementplan Luchse in Bayern. Munich, Germany [in German] <http://www.lcie.org/docs/Action%20Plans/managmentplan_luchs_bayern2008%5B1%5D.pdf>

Kaczensky, P., G. Kluth, F. Knauer, G. Rauer, I. Reinhardt & U. Wotschikowsky. 2009. Monitoring Large Carnivores in Germany. BfN – Skripten 251, Bundesamt für Naturschutz, Bonn, Germany.

Lüchtrath, A. 2011. Bewertung von Bestrebungen zum Schutz großer Beutegreifer durch betroffene Bevölkerungsgruppen am Beispiel des Luchses. Dissertation at the University of Freiburg, Germany. [in German] <http://www.freidok.uni-freiburg.de/volltexte/8347/pdf/Diss_Luechtrath_Freidok.pdf>

Nationalparkverwaltung Harz. 2011. Luchsprojekt Harz Bericht 2012/11. [in German] <http://www.luchsprojekt-harz.de/de/luchsprojekt/10_veroeffentlichungen/>

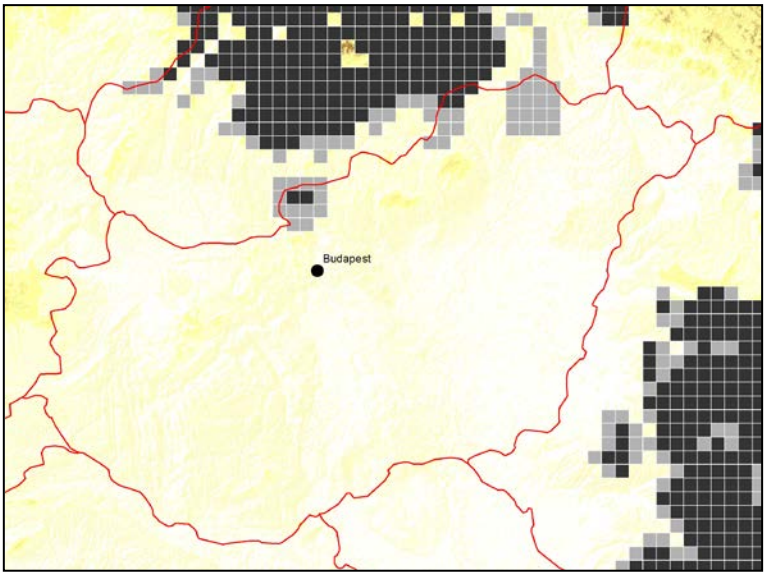
Website „Luchsprojekt Bayern“: <http://www.luchsprojekt.de/14_luchs_nutztiere/popup_ausgleichszahlungen.html>

Weingarth, K., L. Bufka, K. Daniszova, F. Knauer, P. Šustr & M. Heurich. 2011. Grenzüberschreitendes Fotofallenmonitoring - wie zählt man Luchse? [in German] <http://www.luchserleben.de/standardtext/berichte.html >

Wölfl, S. and M. Schwaiger M. 2010. Luchs-Monitoring mittels Fotofallen im Bayerischen Wald. Wintereinsatz 2010. Unpublished report. Bayerischen Landesamts für Umwelt. [in German]

Lynx – Hungary

Compiled with data provided by Miklós Heltai and Peter Bedo



Probability of lynx distribution in Hungary 2002-2006.

Grey cells: probability of presence[1]

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

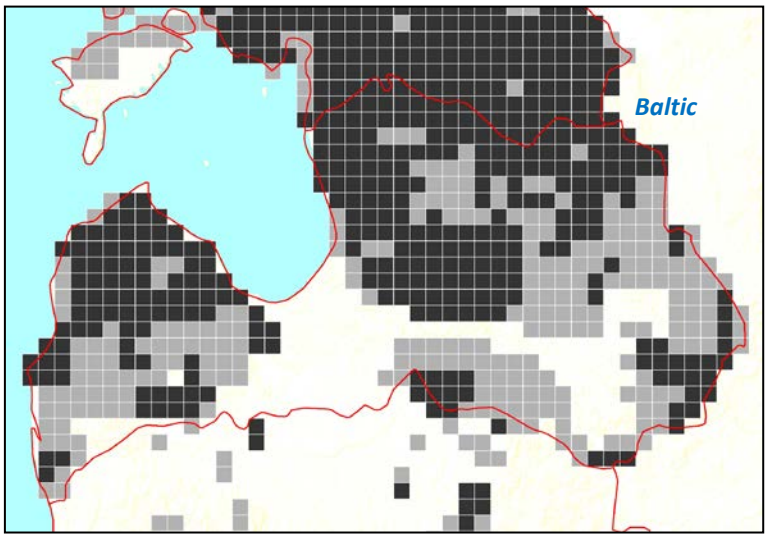
Summary table

Population size	2011: 1-2 (occasional occurrence)
Trend	Unknown
Distribution range (# cells in the 10 x 10 km EEA grid)	Sporadic: 41
Range trend	Stagnant
Depredation costs / year	No information available – also no compensation system
Number of cases / year	No information available – also no compensation system
3 Most important threats	Few animals only, infrastructure development

[1] Dark grey cells of permanent presence are from grid provided for Slovakia

Lynx – Latvia

Janis Ozolins



Lynx distribution in Latvia 2006-2012.

Dark cells: reproduction presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx in Latvia belong to the Baltic population and are found in the whole territory. However the middle part of the country near the capital Riga and further southwards to the Lithuanian border lynx occurrence becomes more sparce and the local lynx population seems to be split into two groups with distribution centres in the north-west and north-east of the country. The distribution of the breeding population is closely correlated with the occurrence of continuous woodlands. Solitary animals, mostly orphans and yearlings, can be occasionally found everywhere, including towns and backyards of the farms. Since the 1960s, the population grew and enlarged its range. Since the 1980s, the range has stabilized in particular afterwards restricted harvest in 2004 (Andersone et al. 2003).

2. Population estimates & monitoring

The lynx population in Latvia is estimated at a minimum of 600 individuals based on cohort analysis of hunting bags from 1998 to 2010. The population seems to be slightly growing, taking into account increasing cull and good evidences of following recruitment resulting in a stable range.

All legally shot or found dead lynx are reported to the State Forest Service hence the national distribution maps (10 x 10 km EEA grid) can be produced based on these records. Cells with kills of reproductive females and/or kittens were defined as “permanent” while the kills of other age and sex groups are defined as “sporadic”. In addition, 40-50% of annual hunting bag is examined for exact animal age and female fecundity in laboratory (Ozoliņš et al. 2008). Thus, cohort analysis can be carried out by mutual comparison of age structure, birth and survival rates in annual samples.

3. Legal status & relevant management agencies

In Latvia, lynx has the status of a protected species that can be exploited to a limited extent by sports hunting. The hunting season is open from the 1st December until the 31st of March. Quotas are set and controlled by the State Forest Service under the Ministry of Agriculture. According to circumstances, quota can be generally used for entire territory or divided into local sub-quotas accounting for uneven population densities. As soon as the general quota is fulfilled, lynx hunting is

stopped in the whole country until the next season. So far, hunting had been limited up to 150 individuals. The fine for poaching (incl. a hunted animal not reported to the State Forest Service in line with Hunting Regulations) is 5 minimal monthly wages or 10 minimal monthly wages if poaching occurred during the closed season or in a protected area. National Action Plan for the Conservation of the Lynx (2002) has been updated in 2007. Further updates are liability of the Nature Protection Board under the Ministry of Environment and Regional Development.

4. Population goal and population level cooperation

There are no explicite population goals for the lynx in Latvia. Species conservation objective is to maintain a minimum population of least 600-650 individuals in Latvia for the future ensuring (1) continuous species distribution, (2) an adequate environmental carrying capacity and (3) natural ecological functions (namely predator-prey relationships) of the species in the ecosystem.

If necessary, the hunting quota is set considering local and seasonal hunting limitations or bans in those hunting areas (districts, forestry units) where lynx are rare or where they have been over-hunted to the extent that can threaten the local population's renewal as well as in cases when lynx distribution and density is especially important for the existence of the continuous Baltic lynx population and improvement of its status. Thus, quotas have been set locally higher in the north along Estonian border with abundant lynx population while they were diminished in central and southern districts along Lithuanian border.

5. Conflicts and conflict management

Problems with damages to livestock are absent or minor. Attitudes based on hunters' observations that lynx is their competitor for ungulates, mostly roe deer (Valdmann et al. 2005) and especially during deep snow conditions (actually winters in 2009 and 2010) are main reason for predator control. The problem needs permanent mitigation using broad methods of raising public awareness and involvement of hunters in research activities – reporting and providing lynx carcasses for monitoring.

6. Threats

Hunting is and has been the main factor limiting lynx population in Latvia. However, harvest has been sustainable and the future of the population depends on success of adaptive management based on comprehensive monitoring and spatial continuity of the Baltic lynx population.

7. Summary table

Population size	≥ 600
Trend	slight increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 306, sporadic: 306
Range trend	stable
Depredation costs / year	None
Number of cases / year	1-3 (sheep and rabbit)
3 Most important threats	low acceptance by hunters, spatial gap in distribution in middle part of the country, limited institutional capacity for population monitoring

References:

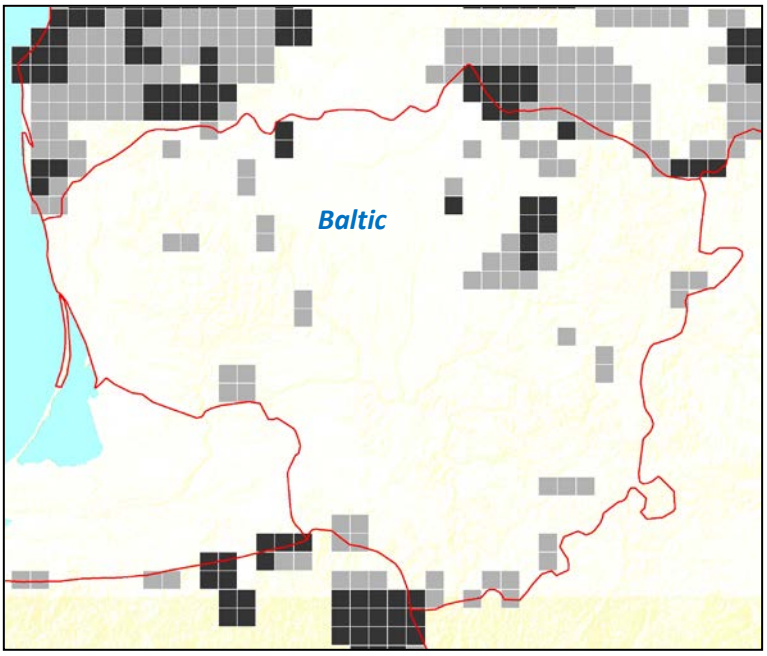
Andersone Z., Ozolins Ya., Pupila A., Bagrade G. 2003. The East European and Caucasian parts of lynx range (the western group of regions): Latvia. – In: Matyushkin Ye.N., Vaisfeld M.A. (eds.) The Lynx: Regional Features of Ecology, Use and Protection. Moscow: Nauka, pp. 92 – 104. (in Russian/English).

Ozoliņš, J., Pupila, A., Ornicāns, A., Bagrade, G. 2008. Lynx management in Latvia: population control or sport hunting? In: Economic, social and cultural aspects in biodiversity conservation (eds: Opermanis, O., Whitelaw, G.). Riga: Press of the University of Latvia. P.p. 59-72.

Valdmann H., Andersone-Lilley Z., Koppa O., Ozolins J., Bagrade G. 2005. Winter diets of wolf *Canis lupus* and lynx *Lynx lynx* in Estonia and Latvia. – *Acta Theriologica* 50 (4): 521-527.

Lynx – Lithuania

Compiled with data provided by Linas Balciauskas



Lynx distribution in Lithuania 2006-2011. (Distribution in Russia and Belarus not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

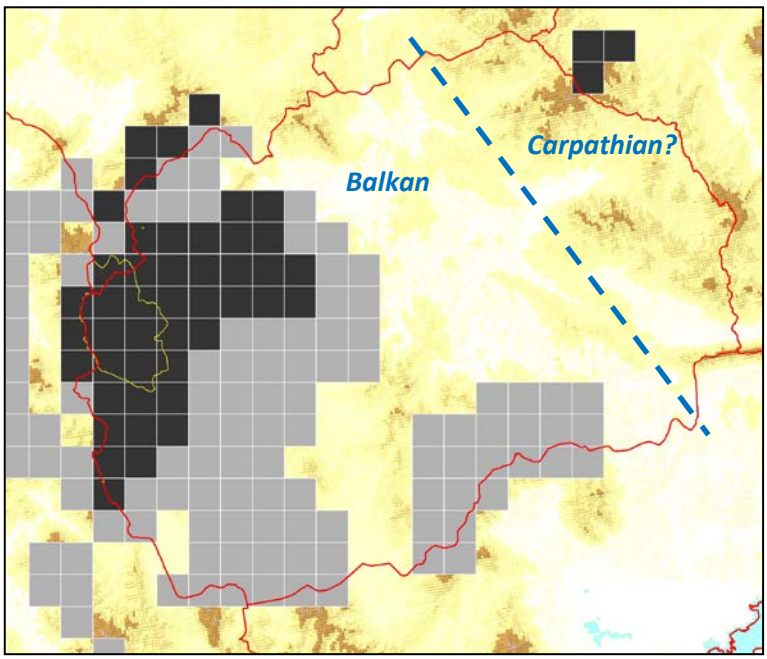
[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

Summary table

Population size	March 2011: 50 (±10) (differs from official "sum of hunting ground counts")
Trend	Decrease
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 15 Sporadic: 52
Range trend	Increase
Depredation costs / year	no depredation registered in Lithuania
Number of cases / year	no depredation registered in Lithuania
3 Most important threats	Small population, lack of acceptance

Lynx - "The Former Yugoslav Republic of Macedonia"

Dime Melovski, Gjorge Ivanov & Aleksandar Stojanov



Lynx distribution in "The Former Yugoslav Republic of Macedonia" 2006-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The distribution of the Balkan lynx in Macedonia is mainly based on 3 data sets, all of which indicate a strong lynx presence in the Mavrovo National Park (map yellow outline) and its surroundings:

1. A baseline survey covered the whole western region of the country in the years 2007-2009 and was based on interviewing the local community about lynx presence. The results were concentrated inside the Mavrovo NP, Shar Planina Mt., Stogovo-Karaorman Mts. and Jasen PA.
2. During the intensive camera-trapping study in Mavrovo NP in 2008 and 2010, the first signs of reproduction for the entire distribution range of the Balkan lynx were confirmed. The population density inside the park was calculated to be 0.80-0.84 individuals per 100 km^2. With the same method, lynx presence was confirmed in Jablanica Mt. as well as Suva Gora and Karadzica Mts. and part of the Jasen Protected Area in the central-west part of Macedonia. These areas are in a relatively close distance from the Mavrovo NP's border and the existing corridors are still in a good condition, potentially allowing for good connectivity. Despite efforts no lynx have been photographed using camera traps in Galichica NP in the south-west part of the country.
3. An ongoing radio-telemetry study in Macedonia has resulted in 3 live-caught and GPS-tagged individuals: one spending most of the time inside the Mavrovo NP borders, one in the adjacent mountains south of the park and one in its eastern edge.

More studies are needed to investigate lynx presence in the Nidze-Kozhuf region and Pelister NP on the border with Greece. Also, lynx presence was recently confirmed on the Bulgarian side of Osogovo Mt. Our extensive camera-trapping efforts did not confirm any lynx presence to date on the Macedonian side of the border. This sub-population or vagrant individuals is most probably made up of dispersing Carpathian lynx from the southeastern parts of Serbia on the border with Romania.

2. Population estimates and monitoring

The literature data on the Balkan lynx population size are generally overestimated. Mirić (Mirić, 1981), estimated the population size of 280 individuals in the whole range. The last estimates from State Statistical Office of Republic of Macedonia in 2010 estimated the population at 39 individuals in the country (Forestry, 2010).

During the monitoring programme of the Balkan Lynx Recovery Programme, the population size of the Balkan lynx has been estimated in the past 6 years taking 2 data-sets into account: the Baseline Survey questionnaire in the western part of the country and the camera-trapping method in the reference area (Mavrovo NP). The baseline survey questionnaire helped us in mapping the most recent distribution of the Balkan lynx by outlining the SCALP category 1 and 2 data (Molinari et al. 2003) and thus assessing the minimum Area of Occupancy (IUCN, 2008), as well as category 3 data which resulted in an assessment of the maximum area of occupancy. By knowing the population density (number of lynx individuals per 100 km^2) in the investigated area (Mavrovo NP), we have extrapolated the data over the distribution range of the Balkan lynx for Macedonia using the simple equation: (X*Y):100, where X is the **minimum** or **maximum** area of the Area of Occupancy (AoOmin or AoOmax, respectively) and Y is the population density taken from the camera-trapping findings, in order to calculate the population size. The minimum, mean and maximum values of the population density in Mavrovo NP (0.8 ± 0.3 in 100 km^2) in 2010 is 0.5, 0.8 and 1.1 individual per 100 km^2 (Melovski, 2012). Taking only Macedonia into account, the AOOmin is 2100 km^2, thus the minimum population size of the Balkan lynx is stretching from 11 to 23 mature individuals with a mean estimate being 17. The AOOmax for Macedonia only is 7946 km^2 and thus the population size would stretch from 40 to 87 (mean estimate = 64) mature individuals.

3. Legal status & relevant management agencies

The lynx in Macedonia is a strictly protected species and its hunting is permanently prohibited. As Macedonia was a part of Yugoslavia, the species protection goes back to 1949. Newer laws have also been implemented where lynx is considered a strictly protected species by the Macedonian Law on Hunting (Official Gazette of RM 26/09) and the List of Strictly Protected Species (Official Gazette of RM 139/11) according to the Law on Nature Protection (Official Gazette of RM 67/04) (Melovski, 2012).

Since 2006 a programme for the recovery of the Balkan lynx is being implemented by Albanian and Macedonian NGOs in collaboration with Swiss, German and Norwegian partners (Balkan Lynx Recovery Programme www.catsg.org/balkanlynx). Within the frame of the Balkan Lynx Recovery Programme a range wide strategy for the conservation of Balkan lynx is being developed, followed by country specific Action Plans for both Albania and Macedonia. These documents have been drawn up under the auspices of the Council of Europe and provide the basis for current and future actions in regard to lynx conservation and management in the range countries.

4. Population goal and population level cooperation

The population goal in the midterm is to down-list the population status of the Balkan lynx from Critically Endangered to Endangered. According to IUCN (2008) criteria, a taxon may be moved from a higher to a lower threat-category if none of the criteria of the higher category has been met for five years or more.

A cooperation has been established with the relevant ministries (Ministry of Environment and Physical Planning and Ministry of Agriculture, Forestry and Water Management) in the country. Various stakeholder groups have been included in survey and monitoring activities and are being organised into a monitoring network. This network has been created in both countries and its main actors are hunters, foresters, game-wardens, veterinarians, shepherds and journalists. The goal was

to strengthen the capacity for wildlife research in the region and the raise the public awareness within the key institutions and organizations.

5. Conflicts and conflict management

According to a human-dimension study performed in both, Macedonia and Albania in 2008, as well as the Baseline Survey in 2006-07 we have concluded that few conflicts are associated with lynx in Macedonia. Only several cases of livestock depredation by lynx are reported from Macedonia. The same studies revealed a general lack of knowledge about the lynx's existence and its ecology, thus indicating that the future conflict management must focus on education activities which are part of the tasks in the second phase of the ongoing Balkan Lynx Recovery Programme. The general attitude that the rural community have towards the lynx is positive and most of the people are in the favour of its existence.

A compensation system in Macedonia is in place and the damage is compensated only from the strictly protected species. However, the implementation of this law is very poor and in the recent past only a few cases of brown bear damage where compensated. One of the possible problems is again the lack of education and people being unaware of the system in general (results from the Baseline Survey). Furthermore, the Macedonian Ecological Society has initiated a few projects where livestock guarding dogs were given to the shepherds in the southern part of the country in an effort to reduce the occurrence of poisoning.

6. Threats

The main threats to the Balkan lynx population in Macedonia are: small population size, poaching, depletion of prey base and degradation of habitats. Consulting various literature on this topic, as well as our own perspective, we have generated the following overview of threats table (Melovski, 2012), these include; poaching, a reduction in their prey base, limited range and small size of the population, habitat fragmentation and degradation, disturbance and vehicle collisions. Whether the competition from other carnivores living in the area – wolf and fox for instance are a real threat to the Balkan lynx, is yet to be discovered.

7. Summary table

Population size	November 2011: 23
Trend	Decrease
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 40 Sporadic: 87
Range trend	Decrease
Depredation costs / year	No information
Number of cases / year	No information
3 Most important threats	small population size, poaching, depletion of prey base and degradation of habitats

Literature

Forestry, 2010 - Skopje : State Statistical office of the Republic of Macedonia, 2011. - 28 pp. Statistical review / State statistical office of the Republic of Macedonia, ISSN 0580-454X. Agriculture, ISSN 1857-520X; 5.4.11.02 (688)

IUCN Standards and Petitions Working Group 2008: Guidelines for Using the IUCN Red List Categories and Criteria. Version 7.0. Prepared by Standards and Petitions Working Group of the

IUCN SSC Biodiversity Assessment Sub-Committee in August 2008. Downloadable from http://internet.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf.

Lescureux, N., Linnell, J.D.C., Mustafa, S., Melovski, D., Stojanov, A., Ivanov, G., Avukatov, V., Von Arx, M. & Breitenmoser, U. (2011) Fear of the unknown: local knowledge and perceptions of the Eurasian lynx *Lynx lynx* in western Macedonia. *Oryx,* **45,** 600-607.

Melovski, D. 2012: Status and distribution of the Balkan lynx (*Lynx lynx martinoi* Mirić, 1978) and its prey. Master thesis, University of Montenegro, Podgorica, 85 pp.

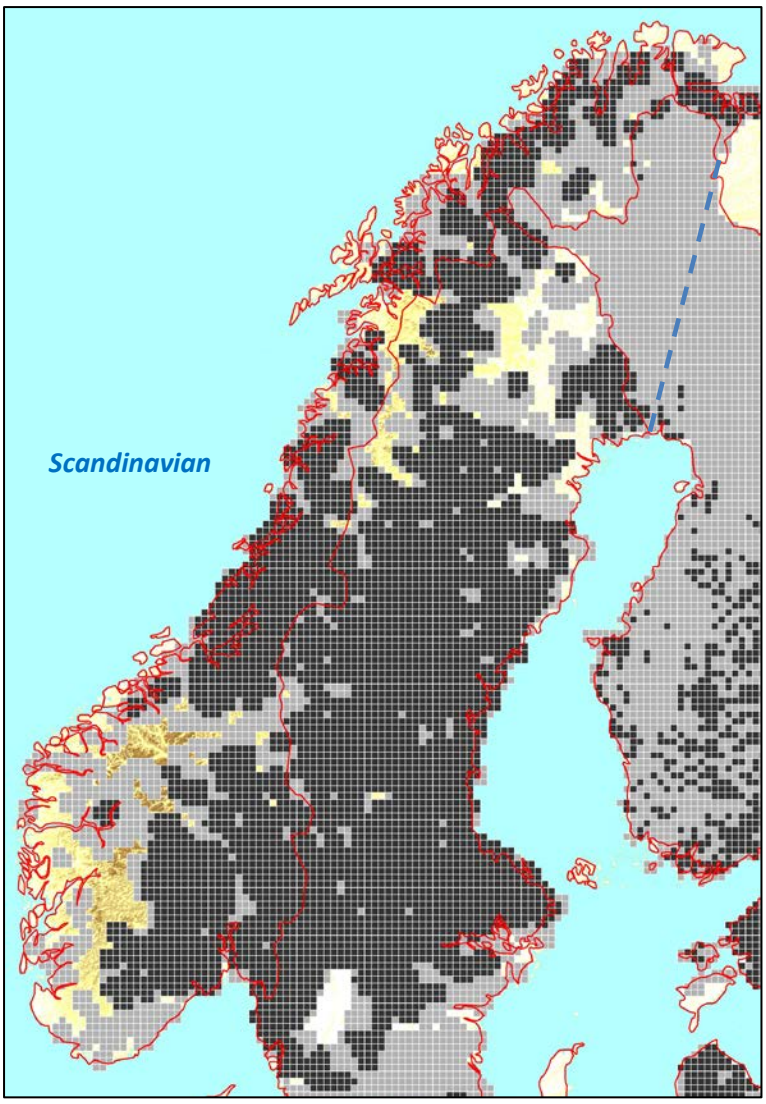
Mirić, Dj. 1981: The lynx populations of the Balkan Peninsula (*Lynx lynx martinoi* Mirić*,* 1978). – Pos. izd. SANU 139, Odel prir.-mat. nauka 55:1-154, sl. 1-15, dijagr. 1-2, karte 1-12, tab. 1-15, Beograd (in Serbian).

Molinari-Jobin, A., Molinari, P., Breitenmoser- Würsten, Ch., Woelfl, M., Stanisa, C., Fasel, M., Stahl, P., Vandel, J.-M., Rotelli, L., Kaczensky, P., Huber, T., Adamic, M., Koren, I., & Breitenmoser, U. 2003: Pan-Alpine Conservation Strategy for the Lynx. No. 130 , 25 p, 2003, 1-19. 2003. SCALP, Council of Europe. Nature and Environment.

von Arx M., Breitenmoser-Würsten Ch., Zimmermann F. & Breitenmoser U. (Eds). 2004: Status and conservation of the Eurasian lynx (*Lynx lynx*) in Europe in 2001. KORA Report Nr. 19*e*. KORA, Bern. 330 pp.

Lynx – Norway

John D. C. Linnell, John Odden & Henrik Brøseth



Eurasian lynx distribution in Norway 2007-2011.

Dark cells: reproduction presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx are found throughout a large part of Norway with the exception of the extreme west and southwest. Although the areas with reproduction can appear to fall into a series of discrete clusters, when viewed together with the neighboring Swedish population and taking into account the documented dispersal distances and high degree of landscape permeability it can be considered as part of one more or less continuous population (Scandinavian). The distribution has been stable for the last 10 years.

2. Populations estimates & monitoring

The lynx population is censused each year using counts of reproductive events (family groups). Presence data including intensive snow-tracking, camera-trapping, and the collection of all lynx shot or found dead are collected and a distance rule based on extensive radio-telemetry data is applied to derive an estimate of the number of family groups. This can then be extrapolated to an estimate of total population size for visualization purposes, although all goals and practical management are based on the number of family groups. All field data are quality controlled by wardens from the State Nature Inspectorate, and are analyzed by the Rovdata unit at the Norwegian Institute for Nature Research. In January 2012 the population was estimated at 65 to 69 family groups in Norway, which corresponds to between 384 and 408 lynx. Since 2005, the population has fluctuated between 65 and 92 family groups depending on the intensity of harvest. The politically determined population target is 65 family groups, and management aims to use hunting with adaptive quota setting to keep the population at this target. In addition, a national network of 1948 transects of 3 km each are surveyed each winter by local hunting associations to look for tracks that produce an index of

abundance as well as records of family groups. Camera trapping is being tested out in some coastal areas with limited snowfall.

3. Legal status & relevant management agencies

All species are protected by default under Norwegian law unless there is a specific opening for hunting within certain seasons. Within this framework, lynx are managed as a normal game species. An annual quota is set and hunting is allowed between February 1st and March 31st. Quotas are assigned on a fine scaled regional basis, and most areas also include female sub-quotas to prevent over-harvest of this important demographic group. Hunting can be conducted using a range of methods that usually involve large hunting teams and dogs to drive lynx. Live capture box traps are also permitted. Lynx are managed by the Ministry of the Environment's Directorate for Nature Management. If a regional population is at or above its regional goal then quota setting is delegated down to a committee (appointed by the Ministry of the Environment) drawn from elected politicians in the county parliaments. These committees are assisted by employees of the relevant county administration. The monitoring data on the status of the lynx population which determines if the regional committees have authority is provided by the national level Norwegian Institute for Nature Research. If a region is below its goal then authority reverts to the Directorate for Nature Management. In addition to lynx shot under the annual quota hunting, a number of permits may be issued for the removal of specific animals in response to acute conflicts with sheep or semi-domestic reindeer during any season. Between 65 and 154 lynx have been shot annually by hunters during the last 7 years. Very few lynx are killed under problem animal permits.

4. Population goal and population level cooperation

The Norwegian parliament has set management goals for lynx in Norway. The goal was set in 2004 at 65 annual reproductions (family groups). This overall goal was then distributed between the 8 large carnivore management regions. Regional goals vary between zero and 12 family groups. The national level Directorate for Nature Management coordinates management between regions. There is no formal transboundary management plan with Sweden, with whom Norway share the Scandinavian lynx population. However, there is frequent dialogue between the respective national wildlife management agencies. A common research project, Scandlynx, coordinates Norwegian and Swedish lynx research activity. A working group has recently (2012) delivered a report designed to harmonize monitoring methods, interpretation criteria, and reporting in both Norway and Sweden.

5. Conflicts and conflict management

The major conflicts in Norway are with free ranging, unguarded domestic sheep in summer and with free-ranging semi-domestic reindeer throughout the year. Compensation is paid for all animals documented (examined by wardens from the State Nature Inspectorate) as being killed by lynx and for many others which are assumed (based on knowledge of so-called "normal" loss in the absence of lynx) to be killed by lynx. Typically, 95% of the animals compensated have not been confirmed, or even found. Annually compensation is paid for 7000 to 10'000 sheep and 3000 to 8000 semi-domestic reindeer. The main mitigation measure is to limit the size of the lynx population using annual quota hunting. To a very limited extent sheep farmers have begun to adapt their husbandry system to include electric fences.

In addition, there is a lot of conflict with roe deer hunters over shared quarry. Research has shown that in marginal areas lynx can have a serious impact on the potential roe deer harvest.

6. Threats

In the short term there are few threats to lynx in Norway as there are clear goals, good monitoring, and a form of adaptive management that adjusts quotas to observed changes in population size. The fact that Norwegian lynx are part of a large Scandinavian population implies that there are few risks associated with this harvest. New models are being developed to try and reduce the time lags in management response to observe changes in population size to reduce the oscillations in population size that have been observed recently. In the long term the major problem is public acceptance due to conflicts with sheep, semi-domestic reindeer and roe deer hunters. Because of these conflicts there are several groups campaigning for a reduction in the size of the lynx population, placing constant pressure on parliament to reduce the goals. Illegal killing occurs, but does not threaten the population, although it introduces further uncertainty into the quota setting process.

7. Summary table

Population size	January 2012: 65-69 family groups (384 - 408 lynx)
Trend	More or less stable (slight decline from year before is part of a planned reduction to return population to the goal of 65 family groups)
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 1773 Sporadic: 1209
Range trend	Stable
Depredation costs / year	2.1 – 2.9 M€ for sheep. 1.1 – 3.4 M€ for semi-domestic reindeer.
Number of cases / year	7000 – 10000 sheep, 3000 – 8000 semi-domestic reindeer.
3 Most important threats	Lack of acceptance due to depredation on livestock and competition with roe deer hunters

References:

Annual monitoring reports are available at: www.rovdata.no

Scandinavian lynx project scanlynx at: http://scandlynx.nina.no/scandlynxeng/Home.aspx

Herfindal, I., Linnell, J.D.C., Moa, P.F., Odden, J., Austmo, L.B. & Andersen, R. (2005) Does recreational hunting of lynx reduce depredation losses of domestic sheep. *Journal of Wildlife Management,* **69,** 1034-1042.

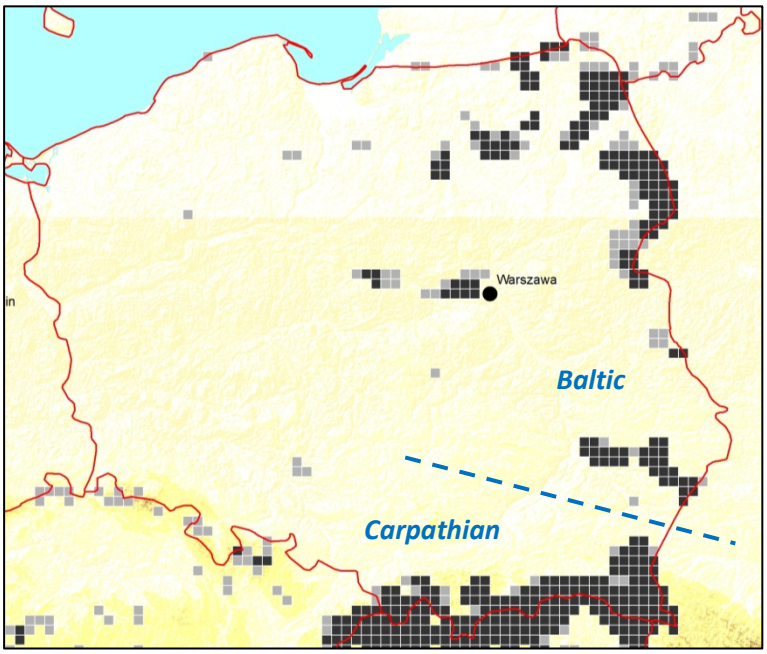
Linnell, J.D.C., Breitenmoser, U., Breitenmoser-Würsten, C., Odden, J. & von Arx, M. (2009) Recovery of Eurasian lynx in Europe: what part has reintroduction played? *Reintroduction of top-order predators* (eds M.W. Hayward & M.J. Somers), pp. 72-91. Wiley-Blackwell, Oxford.

Linnell, J.D.C., Brøseth, H., Odden, J. & Nilsen, E.B. (2010) Sustainably harvesting a large carnivore? Development of Eurasian lynx populations in Norway during 160 years of shifting policy. *Environmental Management,* **45,** 1142-1154.

Mattisson, J., Odden, J., Nilsen, E.B., Linnell, J.D.C., Persson, J. & Andrén, H. (2011) Factors affecting Eurasian lynx kill rates on semi-domestic reindeer in northern Scandinavia: can ecological research contribute to the development of a fair compensation system? *Biological Conservation,* **144,** 3009-3017.

Lynx – Poland

Sabina Nowak & Robert W. Mysłajek



Lynx distribution in Poland 2008-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence
(Distribution in Ukraine, Belarus and Russia not shown)

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx occur mainly in the Carpathian Mountains and in the large forests of the north-eastern and eastern parts of Poland. There is also a small reintroduced population inhabiting the Kampinoska Forest and its neighborhoods in central Poland (Niedziałkowska et al. 2006). Dispersing individuals are occasionally recorded in north-western Poland and in the Sudetes region along the state border with the Czech Republic (Schmidt 2011). The sum of areas of 10 x 10 km square grids permanently inhabiting by lynx gives an estimate of 25,400 km^2, but is probably too optimistic as forest cover varies greatly among grid cells. Schmidt (2011) estimated the extent of the current lynx range in Poland at 10,800 km^2 of forest, but there are more suitable habitats in western Poland where lynx arestill scarce (Huck et al. 2010).

2. Populations estimates & monitoring

The Polish State Statistical Office reported that in 2006-2010 Poland was inhabited by 217-285 individuals. Official data, published by the State Statistical Office, are based on information provided by the General Directorate of Environmental Protection, but methodology is not described. Data from the National Lynx Census, co-ordinated by the Mammal Research Institute Polish Academy of Sciences in Białowieża, for the last several years provides only an assessment of the minimum population size, which was 115-128 individuals for 2006-2009.

3. Legal status & relevant management agencies

The lynx in Poland is on Annexes II and IV of the Habitats Directive and 35 Natura 2000 sites in eastern Poland and the Carpathians protect lynx habitat. These sites are connected with ecological corridors defined within a project "Ecological corridors linking Natura 2000 sites" (Jędrzejewski et al. 2005).

Lynx have been strictly protected in Poland since 1995. Furthermore, it is listed among species requiring active protection. Consequently, a seasonal protection zone encompassing a radius of 500 m may be established around lynx kittens-rearing areas from 1st April to 31st August.

The Ministry of Environment along with the General Directorate for Environmental Protection and its regional branches are responsible for the species management.

4. Population goal and population level cooperation

According to the Polish report on the main results of the surveillance under article 11 for annex II, IV and V species (Annex B) favorable reference range was estimated at 16,600 km^2, while the favorable reference population was indicated to be more than 190 individuals.

5. Conflicts and conflict management

There are only a few cases of lynx depredation on livestock. Regional Directorates for Environmental Protection are responsible for the estimation and compensation of damage caused by lynx and for reporting of accidental mortality in every province, but directors of national parks are responsible for damage compensation within their respective national parks.

6. Threats

The most important threats for lynx in Poland are connected with habitat fragmentation, habitat loss, and disruption of ecological corridors suitable for dispersal. Locally also simplifying of the forest structure (lack of fallen trees and undergrowth), overhunting of potential prey, and human caused mortality (poaching, vehicle collisions) may be important (Podgórski et al. 2008, Schmidt 2011).

7. Summary table

Population size	ca. 200
Trend	stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 254 Sporadic: 86
Range trend	stable
Depredation costs / year	Negligible
Number of cases / year	1-2
3 Most important threats	Habitat fragmentation, habitat loss, disruption of ecological corridors

References:

Huck M., Jędrzejewski W., Borowik T., Miłosz–Cielma M., Schmidt K., Jędrzejewska B., Nowak S., Mysłajek R. W. 2010. Habitat suitability, corridors and dispersal barriers for large carnivores in Poland. Acta Theriologica 55: 177–192.

Niedziałkowska M., Jędrzejewski W., Mysłajek R. W., Nowak S., Jędrzejewska B., Schmidt K. 2006. Habitat requirements of the Eurasian lynx in Poland – large scale census and GIS mapping. Biological Conservation 133: 63–69.

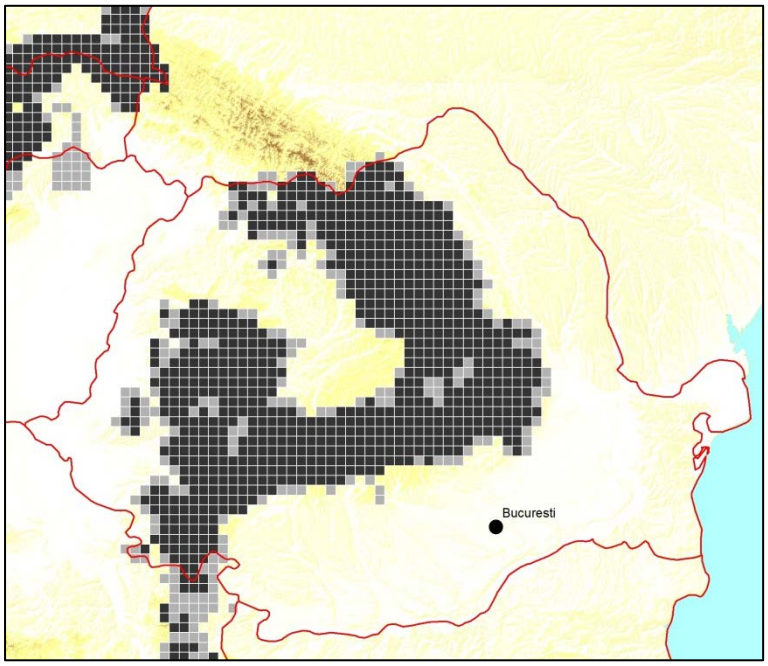
Podgórski T., Schmidt K., Kowalczyk R., Gulczyńska A. 2008. Microhabitat selection by Eurasian lynx and its implications for species conservation. Acta Theriologica 53: 97–110.

Report on the main results of the surveillance under article 11 for annex II, IV and V species (Annex B) http://cdr.eionet.europa.eu/Converters/convertDocument?file=pl/eu/art17/envrlf_pg/species-lynx-lynx.xml&conv=rem_24

Schmidt K. 2011. Program ochrony rysia *Lynx lynx* w Polsce - projekt. Szkoła Główna Gospodarstwa Wiejskiego, Warszawa (in Polish).

Lynx – Romania

Ovidio Ionescu



Lynx distribution in Romania 2006-2011/12. (Distribution in Ukraine not shown).

Dark cells: permanent
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The Romanian lynx population covers an area of 69,000 km² throughout the whole range of the Romanian Carpathians, and is therefore the biggest in Europe outside of the Nordic countries. The highest population density are found in the eastern Carpathians (Mures, Harghita), areas with high density are also found in the southern Carpathians (Bucegi, Fagaras) and in Retezat mountains, Tarcu, Poiana Rusca and in Semenic and Apuseni mountains.

Because of intense hunting and the decrease of ungulate populations, the number of individuals had decreased to about 100 individuals in 1933. Because of that, in 1940, the lynx was declared a natural monument, so in the 1950s the population increased to about 500 individuals and in 1961 the population was estimated at about 1000 individuals.

2. Population estimates & monitoring

The present population estimate for lynx in Romania is 1200-1500. The estimation of the population is done in winter and in spring, identifying the tracks, particular of family groups. The population is structured by sex and by age. By the end of spring, the administrators of hunting units are required to provide an annual estimation of the lynx numbers in their leasehold. These estimations are compiled on large areas, and the data are centralized at regional and national level giving a population range. Taking in consideration the habitat features, the density and the biological characteristics of this species, the majority of the intensive methods currently used in small populations, are not aplicable on the large scales in the Carpathians.

3. Legal status & relevant management agencies

Romania joined the Convention on the Wildlife and Natural Habitat Conservation in Europe, ratified in Berne on the 19th of September 1979, by Law no. 13/1993. After 2007 Romania became part of the EU and, regardless of the size of the tynx population, the species became strictly protected under the Habitats Directive. Currently, a limited number of lynx are killed under derrogation.

From studies and researches made by ICAS and other institutes, and taking into consideration the recent legislation, a series of measures have been adopted by consulting with stakeholders, such as the Ministry of Environment and Forestry, universities,National Administration of Forest (RNP), NGOs, hunting organisations and others. These measures which are fundaments of the national management plan of Romania include:

- The clasification of the areas in which lynx are present.
- The evaluation of existing or planned infrastucture impact, regarding the impact on lynx and the adoption of measures in order to decrease the impact
- The protection of lynx by law, including the prevention and the compensation of damages.
- The initiation of an information and education campaign, focused on some specific target groups, at local and national levels.
- Consultation with the interest groups for the management actions establishment, needed in the conservation of the species.
- Improving the monitoring program.
- Establishment of some special areas for lynx conservation, with a minimum size of 300 – 400 km² each, with reduce human activity, designed to ensure the population stability.

4. Population goal and population level cooperation

A detailed analysis of lynx habitat has shown the potential for a population of around 1200 individuals. With an understanding that the actions of lynx population management in Romania can influence lynx populations in neighboring countries, Romania has committed, under the umbrella of the “Carpathian Convention”, to such management that will keep our population in balance – so that approximately equal numbers of lynx migrating across the borders in both directions can be expected. Romania expects a similar approach to lynx management from the neighbouring countries.

5. Conflicts and conflict management

Romania provides compensation payments for damage caused by lynx. All kills have to be verified and documented by trained personel. One of the most important step in helping mitigate the conflict between farmers and lynx is a system of compensation of the damages. The poaching of lynx has declined with less than 5 documented cases per year and does not threaten the population in any way. So far traffic accidents are rare over the entire lynx range. The main roads that pass through lynx habitat are between Bucharest and Brasov through high density lynx areas in the Prahova Valley.

6. Threats

The lynx population in Romania is large and viable. The habitat is suitable for this species and largly unfragmented by major traffic corridors. In the future this will be a serious problem if the habitat becomes more fragmented. Poaching occurs, but at a low level not affecting the population. Over the past years, several lynx have died in traffic accidents.

7. Summary table

Population size	1200-1500
Trend	Stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 746 Sporadic: 180
Range trend	Stable
Depredation costs / year	No recent information, but much lower than for bear and wolf
Number of cases / year	No recent information, but much lower than for bear and wolf
3 Most important threats	None now. In the future: habitat fragmentation

References:

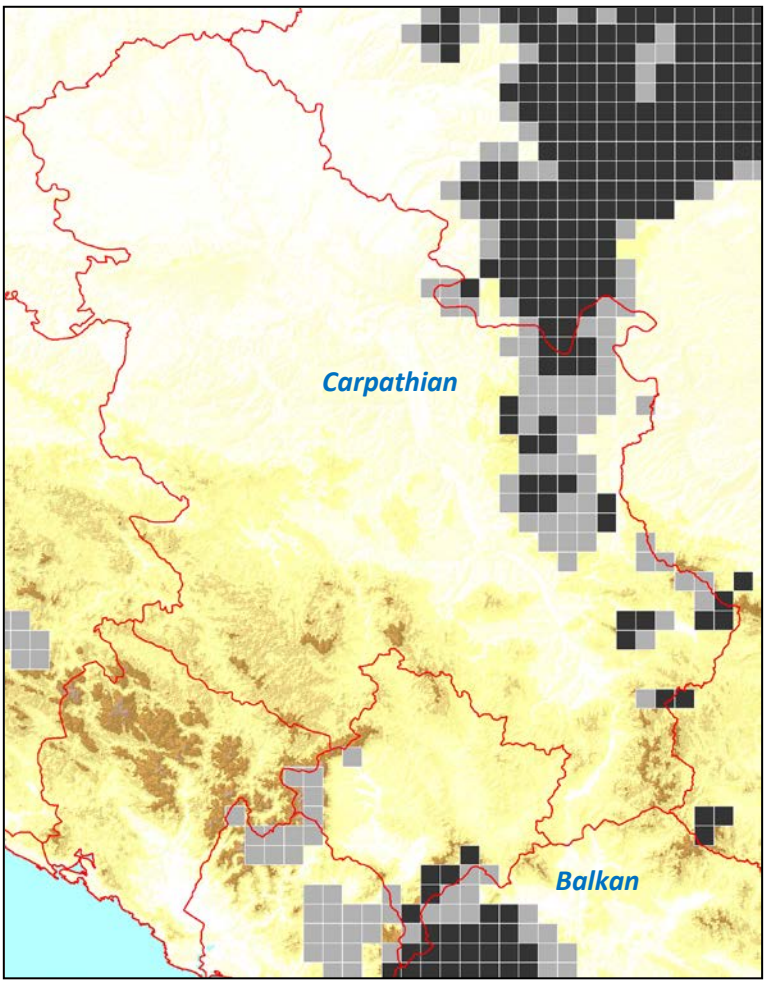
Botezat, E. 1997. Calitatea vânatului românesc. Revista vânatorilor, (10-12): 99-101. Bucuresti, Romania.

Predoiu, G., Ionescu, O., Popa, M. , Jurj, R., Ionescu, G., Negus, S. 2006. Safeguarding the Romanian Carpathian ecological network – A vision for large carnivores and biodiversity in Estern Europe – PIN MATRA 2002/019.

Mertens, A., Ionescu, O. 2001. Rasul– ecologie, etologie, management. Haco International.

Lynx – Serbia

Milan Paunovic



Lynx distribution in Serbia 2007-2012.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx in Serbia are part of the large Carpathian population. The total area of presence in Serbia seems to cover ~8'000 km². Although the trend cannot be assessed due to non-standardized monitoring, there is evidence of a stable range with permanent expansion from 1978 up to now. The Balkan lynx population of southern province of Kosovo and Metohija will not be reported here because of agreement with compilers due to a data concentration only at the territory of the province which designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo declaration of independence.

2. Population estimates and monitoring

There is no official estimation of population size or monitoring for the species in the country. The best available guestimate has been made by experts from research institutions, NGOs as well as independent individuals, based on density extrapolation and some limited camera trapping. Currently the Carpathian lynx occurrence in the country is estimated by experts at 40 – 60 individuals (2010). Calculated density is about 1 individual per 100 km^2. The trend is stable or maybe slightly increasing. An ongoing national project "Geographical aspects of lynx populations in Serbia" (2010-2012) is the first to try to assess the distribution and conservation status of the lynx in Serbia and to set up the basis for species monitoring. Current status and trend is a consequence of recovery of habitats and prey base due to large rural depopulation in eastern Serbia, the disappearance of large

livestock herds, afforestation of pastures and the reduced human presence in lynx habitats. The range remains almost same in size, but habitat quality is improving.

3. Legal status and relevant management agencies

The lynx in Serbia is listed as strictly protected by both the Law on Protection of Nature and the Law on Game and Hunting. As a protected species it is under the centralized jurisdiction of the Ministry of Energy, Development and Environmental Protection (MEDEP). Limited local management actions are mainly applied through the Public Enterprise Srbijašume, which is under the jurisdiction of Ministry of Agriculture, Forestry and Water Management (MAFWM). In the National Parks and other protected areas the lynx is under the jurisdiction of the MEDEP. An Action Plan was prepared in 2007, but it still does not have the status of an official document.

4. Population goal and population level cooperation

There is no official goal for the size and distribution of the lynx population in Serbia. The main goal of the Strategic part of Action plan for the Lynx in Serbia was to increase monitoring and knowledge of regular population parameters and to apply active and appropriate management of it.

5. Conflicts and conflict management

The conflict between lynx and livestock breeders is almost unknown in Serbia. There is just one reported case of chicken killing by a lynx in 2010. If the current positive trend in the lynx population will continue the main conflict with lynx in Serbia could be with hunters over predation on wild ungulates, mainly the roe deer and chamois.

6. Threats

The lynx presence in Serbia is still relatively poorly known, so it is difficult to assess the threats. Losses are difficult to document, but illegal killings (in all forms – shooting, trapping, poisoning) are believed to be one of main threats (a few cases have been documented during the last 10 years, many more have been reported but not confirmed). Although the majority of hunters are in favour of the return of lynx, acceptance for the presence of "another but overprotected predator" seems low. There are also voices, based oo the current estimations of population trend, to put it on the list of game animals protected with a closed season, but these arguments are still weak as it is clear that basic population parameters are still unknown.
Other threats believed to be important are: over-harvesting of wild prey populations and direct competition for the prey, wood cutting, wildfire, collision with vehicles, change in native species dynamics (directly impacting habitat), limited dispersal and low densities, lack of knowledge about species numbers, trends and species ecology, poor enforcement of legislation and lack of capacity in management structures.

7. Summary table

Population size	2010: 50 (±10)
Trend	Stabile, maybe slight increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 24 Sporadic: 51
Range trend	Slight increase
Depredation costs / year	No information
Number of cases / year	No information
3 Most important threats	Persecution, lack of knowledge, poor managment structure

References:

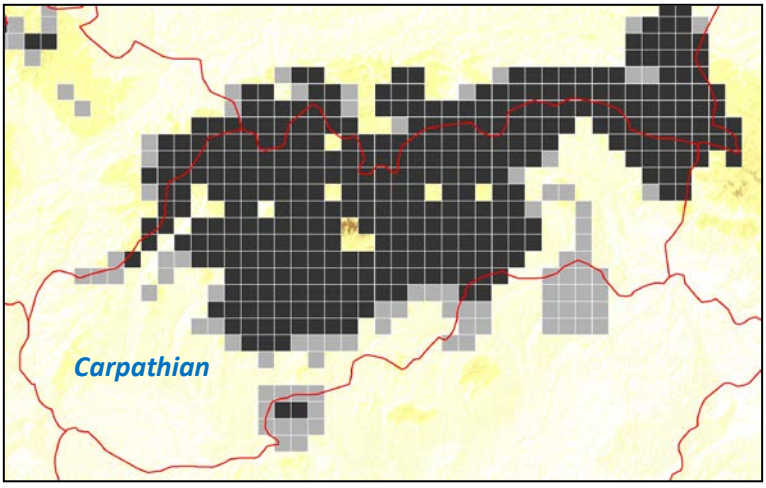
Ćirović, D., Paunović, M., Milenković, M. (2007). Action plan on conservation of lynx *Lynx lynx* (L., 1758) in Serbia, Phase 1 – Strategic plan. Faculty of Biology, Univ. of Belgrade and Ministry of environmental protection of Republic of Serbia, 1-32, Belgrade. (in Serbian).

Paunovic, M., Milenkovic, M. & Ivanoviæ-Vlahovic, C. (2001) The lynx populations in the Federal Republic of Yugoslavia. *The Balkan lynx population - history, recent knowledge on its status and conservation needs* (eds C. Breitenmoser-Würsten & U. Breitenmoser), pp. 12-17. KORA Bericht 7e, Bern, Switzerland.

Paunović, M., Ćirović, D., Milenković, M. (2008). Status and Conservation of Carnivores in Serbia. CIC Proceedings of the Symposium «Coexistence of man and carnivores: Threat or Benefit?», 111-117, May 1st, 2007, Belgrade.

Lynx – Slovakia

Compiled with data provided by Jakub Kubala



Lynx distribution in Slovakia 2006-2009. (Distribution in Ukraine not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

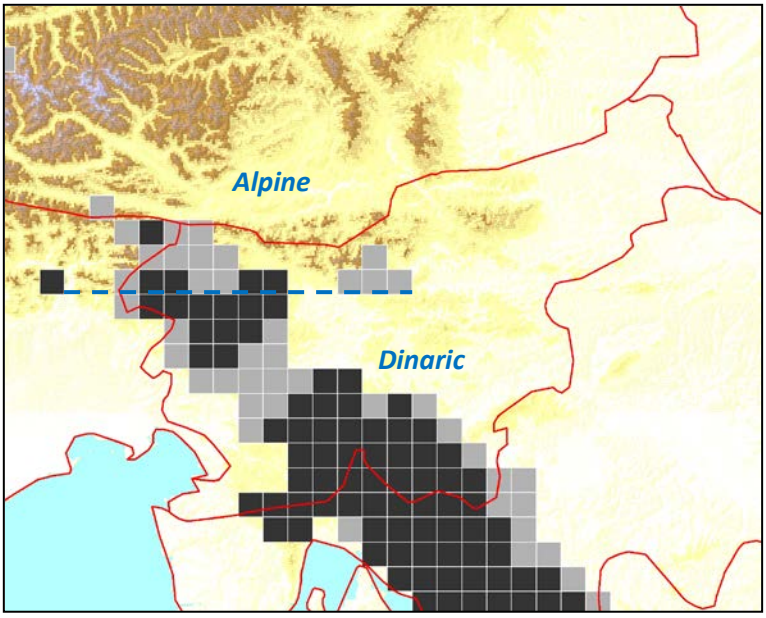
[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

Summary table

Population size	2012: 300-400 (±50-100)
Trend	No information due to lack of standardized monitoring
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 272 Sporadic: 36
Range trend	Likely increase – but lack of standardized monitoring
Depredation costs / year	2010: 1766 € (registered but not compensated, likely due to lack of prevention)
Number of cases / year	2010: 14 sheep/goats, 1 cattle (registered but not compensated, likely due to lack of prevention)
3 Most important threats	??

Lynx – Slovenia

Compiled with data provided by Kos Ivan and Hubert Potočnik



Lynx distribution in Slovenia 2008-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The Slovenian lynx population is arbitrary divided among the Dinaric and the Alpine populations. Motorway Jesenice – Ljubljana – Trieste marks the border between the two populations. Majority of Slovenian lynx belong to the Dinaric population and its range covers Kočevska and Notranjska regions of Slovenia, along the border with Croatia. The lynx population is shared with Croatia (and Bosnia and Herzegovina). Since 2005 reports from the field indicate that there has been substantial reduction in the density of individuals as in some territories previously permanently occupied by lynx, there are no signs of lynx presence.

2. Population estimates & monitoring

Monitoring is carried out by Slovenia Forest Service using SCALP methodology in an opportunistic matter in the Special Purpose Hunting Grounds. Samples for genetic analysis are also collected and analyzed by the University of Ljubljana in order to further investigate population inbreeding. Current population estimate is 15-25 individuals (5-10 in the Alpine part and 10-15 in the Dinaric part of the population). The estimate is not based on a robust methodology.

3. Legal status & relevant management agencies

In Slovenia, lynx enjoys complete legal protection. Provisions for lynx protection are included in national legislation in Nature Conservation Act (adopted 17.06.2004), Environment Protection Act (adopted 31.03.2004), Hunting Act (adopted 20. 2. 2004) and Forest Act (adopted 25.6. 1993). Slovenia has yet to develop a lynx management plan.
Responsible for management is the Ministry of Agriculture and Environment (since 2012), before it was Ministry of Environment and Spatial Planning. Responsible for population monitoring and damage estimations is Slovenia Forest Service. Advisory "Expert opinion" is produced also by the Institute of the Republic of Slovenia for Nature Conservation on a yearly basis.

4. Population goal and population level cooperation

Currently there is a wide consensus among the relevant agencies and experts that the population needs an augmentation in order to deal with the inbreeding problem. First steps towards developing

such a project have been taken through organization of workshops and meetings with lynx experts from neighboring countries. At the same time, there is an initiative to develop a national lynx management plan which is expected to develop and formalize the management goals and facilitate implementation of the population augmentation project. While informal cooperation and exchange of information and cooperation within the frames of joint conservation projects is already well established among experts from Slovenia with those in neighboring countries, formal cooperation is currently being established only with Croatia.

5. Conflicts and conflict management

Due to the very small population size, conflicts with agriculture have become insignificant. Any damages caused by lynx are being systematically compensated by the government. Recently a public debate on population augmentation has started. So far, opposing parties could not be identified. However, due to the absence of a proactively led dialogue with concerned interest groups, a conflict over the proposed management action is likely to arise.

6. Threats

Population is small, isolated and inbred. Although there is no culling of the population, any mortality (traffic, disease, poaching) can have significant effects on the population's survival chances.

7. Summary table

Population size	March 2012: 15-25
Trend	Decrease
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 48 Sporadic: 31
Range trend	Decrease
Depredation costs / year	2011: 975 €
Number of cases / year	2011: 9 sheep
3 Most important threats	Small population, low genetic variability, lack of acceptance

References:

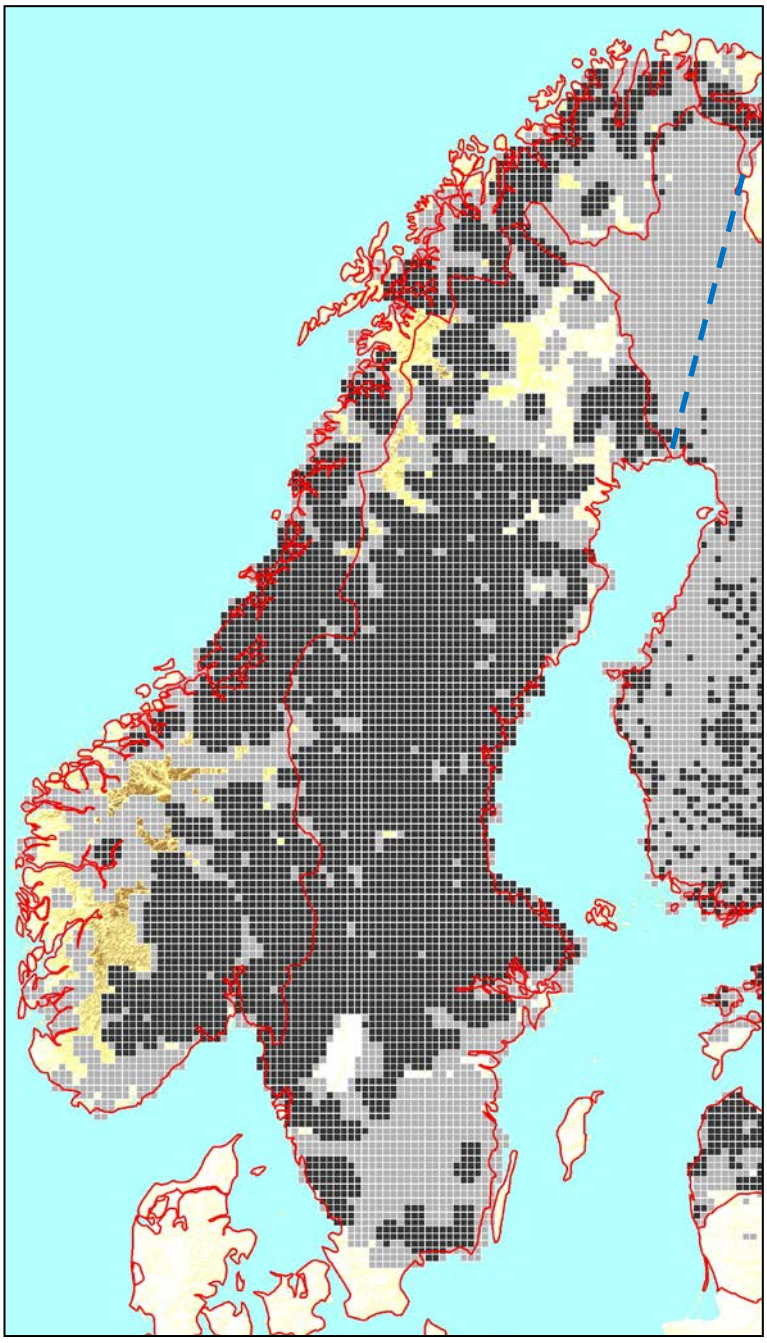
DinaRis project (INTERREG IIIA) reports: http://dinaricum.si/sl/projekti-meni/dinaris.html

Analiza odškodninskih zahtevkov za škodo, ki so jo povzročile živali zavarovanih vrst (Analysis of damage compensation claims – yearly reports by the Agency of the Republic of Slovenia for Environment). http://www.arso.gov.si/narava/poro%C4%8Dila%20in%20publikacije/

Yearly reports on the status of the population (Ministry of Agriculture and Environment): http://www.mko.gov.si/si/delovna_podrocja/narava/velike_zveri/

Lynx – Sweden

Henrik Andrén



Lynx distribution in Sweden 2006-2011.

Dark cells: reproduction
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Lynx are found in almost all of Sweden and lynx are expanding southwards. The population trends and densities vary within Sweden.

2. Population estimates & monitoring

The Swedish population consists of about 1400-1900 individuals and has been stable over the last 10 years. The yearly surveys in Sweden are performed by rangers from the County Board Administrations together with reindeer herders, hunters and other volunteers. The County Board Administrations evaluate the surveys and Wildlife Damage Center compiled the data. The lynx are

surveyed annually in January-February by snow tracking and identification of family goups (adult female with her 8-9 months old kitten).

Distribution maps are based on identified family groups (permanent) and other signs (sporadic). All signs were buffered by a 10 km radius and intersected with the 10 x 10 km EEA grid.

3. Legal status & relevant management agencies

The lynx is protected according to Swedish law and the Habitat directive. The Swedish Environmental Protection Agency is working on a new management plan to replace an old action plan from 2003.

Sweden is divided into three large carnivore management regions, each with its own management goal. If the management goals is fulfilled for a region, then the County Board Administrations within that region are responsible the management decisions (like harvest quotas). Otherwise the Swedish Environmental Protection Agency are responsible the management decisions (like harvest quotas). The County Board Administrations are responsible for the yearly lynx surveys in Sweden.

4. Population goal and population level cooperation

There is a national population goal of a minimum of 250 family groups (approximately 1300 - 1700 individuals) in winter. In addition the national population goal is divided into 3 regional goals; a minimum of 75 family groups for the northern region, 137 family groups for the middle region and 38 family groups for the southern region.

There is no formal common population level management plan for Sweden and Norway. But the national agencies (the Swedish EPA and the Directorate for Nature Management) have regular meetings. The new Swedish carnivore policy has acknowledged the idea of population management and civil servants at the national political level meet to discussion large carnivore management questions. At the moment there is a working group led by the national agencies to develop a common survey methodology and common status reports for Sweden and Norway.

5. Conflicts and conflict management

The main human-lynx conflict is lynx depredation on semi-domestic reindeer and to a smaller extent depredation on domestic sheep. Other conflict is the competion for a common prey (the roe deer) between lynx and hunters. The government pays compensation for lynx kill domestic animals. The costs are between 3 - 3.5 M€ per year for reindeer and between 10’000 – 25’000 € per year for sheep. The system to compensate for reindeer depredation is based on a risk based system where compensation is paid a priori based on the presence of lynx family groups. Whereas the system to compensate for sheep depredation is paid ex post facto based on documented losses (verified the personel for the County Board Administration).

An important management issue is the high poaching that lowers the growth rate in the lynx population, but the lynx population is more or less stable. An important management issue in northern Sweden is that the current lynx population is above the management goal and therefore the harvest quotas are set quite high in order to reduce the population.

There is a long-term research project on lynx in northern Sweden and new lynx project in southern Sweden. These research projects have a tight cooperation and focus on collecting basic ecological data on lynx, studying the impact of lynx on semi-domestic reindeer, the lynx-roe deer interaction, exploring the potential interactions lynx-wolverine and lynx-wolf and the colonization and establishment of lynx in southern Sweden. There is a tight research co-operation between Sweden and Norway, called Scandlynx.

6. Threats

In the past the main threats were over-harvest and poaching. Today a threat is poaching. The risk of over-harvest is much lower today, as the harvest quotas are set in relation to management goals and the effects are evaluated by yearly surveys. The management system is coming closer to an adaptive management approach which means that any undesired reductions in population size can be addressed by reducing harvest quotas.

A chronic threat is the low population goals set because of conflict with semi-domestic reindeer herding. The reindeer husbandry system has advocated certain tolerance levels for the total losses of reindeer to all predators, based on economically acceptable losses. These "acceptable" losses are much lower than the estimated losses today. Thus, if the politicians decide to follow these tolerance levels, then the management goals for all predators, including lynx, would have to be lower than today.

7. Summary table

Population size	Survey 2011: 277 lynx family groups, which correspond to approximately 1400-1900 individuals
Trend	More or less stable
Distribution range (# cells in the 10 x 10 km EEA grid)	3079 permanent 1208 sporadic
Range trend	Expanding southwards and have established in the southern 1/3 of Sweden
Depredation costs / year	3 - 3.5 M€ paid as economic incentive to reindeer herders for lynx presence 10'000 – 25'000 € for sheep depredation
Number of cases / year	20'000 – 40'000 reindeer (estimated from lynx kill rate) 70 - 150 sheep (documented)
3 Most important threats	Poaching, Depredation of reindeer resulting in low acceptance

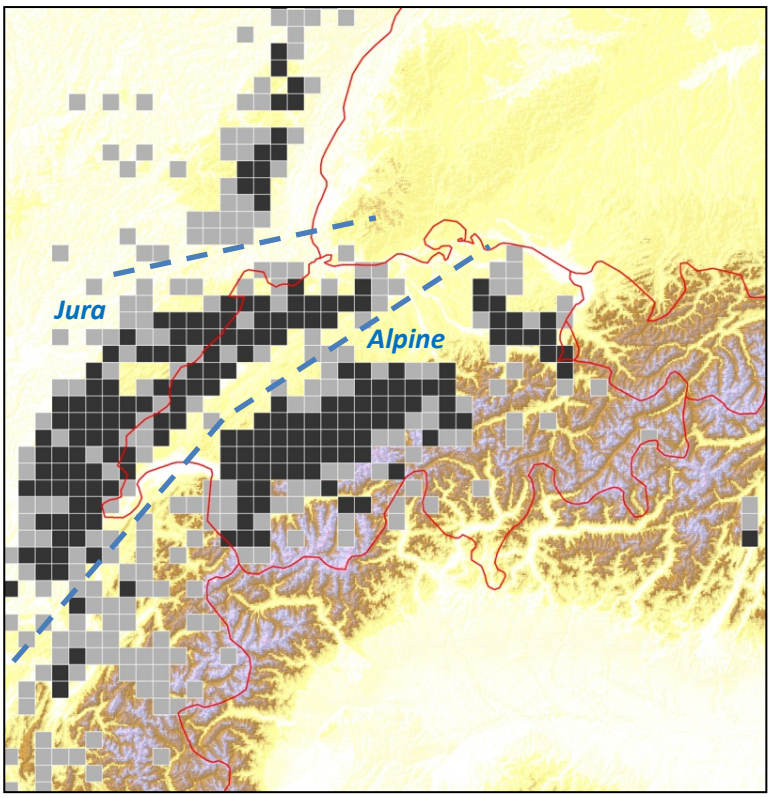
References:

Andrén, H., Svensson, L., Liberg, O., Hensel, H., Hobbs, N.T. och Chapron, G. 2010. The Swedish lynx population 2009-2010 and a forecast for 2011-2012. – Monitoring report Wildlife Damage Center 2010-4, Grimsö Wildlife Research Station, SLU. 29 pages. ISBN 978-91-86331-21-4 (In Swedish)

Andrén, H., Samelius, G., Segerström, P., Sköld, K., Rauset, G.-R. and Persson, J. 2011. Mortality and poaching of lynx in Sweden. – Report Grimsö Wildlife Research Station, Department of Ecology, Swedish University of Agricultural Sciences (12 pages).

Lynx – Switzerland

Manuela von Arx & Fridolin Zimmermann



Lynx distribution in Switzerland. Data are from 2006-2010.

Dark cells: permanent presence
(cell at least 3 out of 5 years occupied)
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

Lynx has been reintroduced in Switzerland in the 1970s and has established two populations: one in the Alps and the other one in the Jura Mountains. Nowadays, lynx occur along the entire Jura mountain chain from the southwest in France to the northeast in Switzerland. Lynx in the Swiss Alps form the western subpopulation of the Alpine lynx population. It occurs mainly in the northwestern and central Swiss Alps. Between 2001 and 2008, 12 lynx were translocated to the northeastern Swiss Alps in order to foster the expansion of the species. Switzerland has the biggest share of the Alpine lynx population.

2. Population estimates & monitoring

Switzerland uses a stratified approach to monitor the lynx population.There is a stratification in space (national level, compartments and smaller reference areas within compartments), in time (e.g. chance observations are gathered year round whereas systematic camera-trapping which is very labor intensive is conducted every 2 to 3 years in smaller reference areas) and in the datasets according to the type of observation and their validity (e.g. SCALP criteria). Following data sources are available: yearly inquiry of game wardens, sightings & signs, known losses of lynx, livestock number compensated as lynx kills, opportunistic and systematic camera-trapping. To address specific research questions, radio-telemetry is applied. Genetic samples of captured or dead lynx are collected and analysed. Each dead lynx is investigated at the Veterinary Faculty of the University of Bern.

The population estimates base on the ratio of population size estimated by means of photographic capture-recapture analyses and occupied cells based on chance observations. The current population sizes are 96-107 independent lynx in the Alps and 28-36 independent lynx in the Jura Mountains.

3. Legal status & relevant management agencies

Lynx is strictly protected by law since 1962. The Federal Office for the Environment (FOEN) is responsible for the management of protected species. For the management of lynx, a Concept was elaborated in 2000 and adapted in 2004. The cantons are in charge of the implementation of the Concept. To harmonize the implementation, the country was divided into 8 management compartments. For each compartment, an intercantonal commission coordinates the decision-making (in regard to monitoring, prevention and intervention measures). In June 2012, the revised Hunting Ordinance was enacted and currently, the Concept is reviewed as well. It will define criteria for lynx regulation if predation impact is too high. Removal of "problem" lynx killing too much livestock is already possible under the current Concept.

4. Population goal and population level cooperation

Population goals are only vaguely defined: lynx shall spread further and be present in local densities that do not cause conflict with the needs of sheep breeders and hunters.

On the scientific level, cooperation is ongoing since decades in the Alps within the frame of SCALP (Status and Conservation of the Alpine Lynx Population) and recently in the Jura Mts. where lynx abundances and densities are estimated by means of camera-trapping in two crossbordering reference areas.

On the political level, the Alpine countries have in 2009 signed a transboundary arrangement under the Alpine Convention called platform WISO (Wildlife and Society). The intention is to develop a common strategy for the management of the Alpine populations of lynx, bear and wolf.

5. Conflicts and conflict management

In both populations, lynx only occasionally kill domestic animals. Mostly concerned are sheep and goats. From 2006 to 2011 lynx in the Alps killed between 7 and 47 sheep/goats per year and in the Jura Mts. between 3 and 20 sheep/goats per year. The costs for the compensation of these losses were ~6'500-25'000 CHF per year. Killed livestock have to be examined by an official person and are compensated to 100% if predated by lynx. The state (Federal Office for the Environment) pays 80% of the amount, the rest is paid by the canton concerned. Electric fencing, livestock guarding dogs and shepherds are the main prevention methods applied in Switzerland. They are financially supported by the FOEN. If a lynx is killing more than 15 sheep within a given area within a year, the canton can ask for a permission for removing the individual. This was however last time the case in 2003, indicating that livestock depredation is not a major cause of conflict at the moment. The conflict with hunting is much more prominent. Hunters claim there are too many lynx in certain areas and they lobby for population regulations. Dialogue between different interest groups have been initiated and a common position paper on large carnivore management in Switzerland was signed by the national farmer's and hunter's associations and the two most prominent nature conservation NGOs and published in May 2012. However, conflicts seem to persist on local level.

There are three cantons (Solothurn, St. Gallen, Zürich) which pay compensation to hunting societies for lynx presence on their hunting ground.

6. Threats

Illegal killing is supposed to be the most important mortality factor for lynx in Switzerland, followed by traffic fatalities. A new emerging threat is the risk of inbreeding depression: Both populations were founded with a few individuals only. They now show reduced genetic variability compared to their source population in the Carpathians and are both inbred.

7. Summary table

Population size	Alpine: 96-107 independent lynx (2010) Jura: 28-36 independent lynx (2010)
Trend	Alpine: stable - increase Jura: increase
Distribution range (# cells in the 10 x 10 km EEA grid)	112 permanent & 88 sporadic
Range trend	Alpine: stable - increase Jura: increase
Depredation costs / year	(2006-2010): ~6'500-25'000 CHF per year
Number of cases / year	Alpine: (2006-2011): between 7 and 47 sheep/goats per year Jura: (2006-2011): between 3 and 20 sheep/goats per year
3 Most important threats	low acceptance by hunters & illegal killing, fragmentation & road accidents, inbreeding

References:

http://www.kora.ch

Breitenmoser, U., Ryser, A., Molinari-Jobin, A., Zimmermann, F., Halle, H., Molinari, P., Breitenmoser-Würsten, Ch. (2010). The changing impact of predation as a source of conflict between hunters and reintroduced lynx in Switzerland. In: Macdonald D W, Loveridge A J (ed.): Biology and conservation of wild felids. Oxford University Press, Oxford. P. 493–506.

Breitenmoser U., Breitenmoser-Würsten Ch., von Arx M., Zimmermann F., Ryser A., Angst Ch., Molinari-Jobin A., Molinari P., Linnell J., Siegenthaler A., Weber J.-M. (2006). Guidelines for the Monitoring of Lynx. KORA Report No. 33.

BUWAL (2004). Konzept Luchs Schweiz. 8 pp.

Molinari-Jobin, A., Marboutin, E., Wölfl, S., Wölfl, M., Molinari, P., Fasel, M., Kos, I., Blazic, M., Breitenmoser-Würsten, Ch., Fuxjäger, Ch., Huber, T., Izotok, K., Breitenmoser, U. (2010). Recovery of the Alpine lynx *Lynx lynx* metapopulation. Oryx 44: 267-275.

Pesenti, E., Zimmermann, F. (in press). Density estimations of the Eurasian lynx (*Lynx lynx*) in the Swiss Alps. *Journal of Mammalogy*

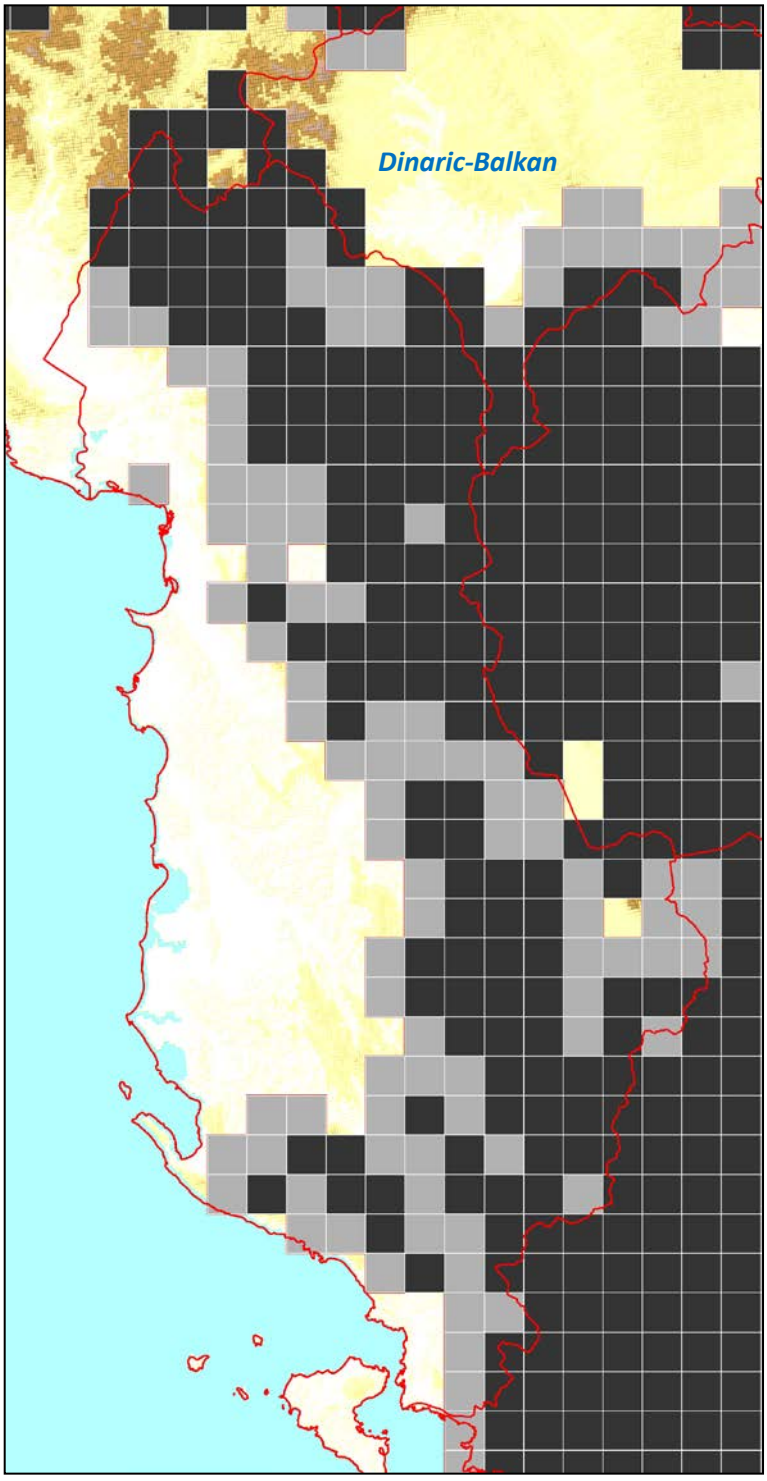
Zimmermann, F., Breitenmoser-Würsten, Ch., Molinari-Jobin, A., Breitenmoser, U. (in press) Optimizing the size of the area surveyed for monitoring a Eurasian lynx (*Lynx lynx* Linnaeus, 1758) population in the Swiss Alps by means of photographic capture-recapture. *Integrative Zoology*

Zimmermann, F., Molinari-Jobin, A., Ryser, A., Breitenmoser-Würsten, Ch. & Breitenmoser, U. (2011). Status and distribution of the lynx (*Lynx lynx*) in the Swiss Alps 2005–2009. Acta Biologica Slovenica 54: 74-84.

Zimmermann F., Weber J.-M., Dirac C., Ryser A., Breitenmoser-Würsten Ch., Capt S. & Breitenmoser U. (2010). Monitoring der Raubtiere in der Schweiz 2009. KORA Bericht Nr 53.

Wolf - Albania

Aleksandër Trajçe



Wolf distribution in Albania 2006-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves in Albania are known to be distributed across most of the country with the exception of coastal and western lowlands. They are found in the habitats covering hilly, mountainous and alpine zones in the northern, eastern, southeastern and southwestern parts of the country. The Albanian wolf population is part of the larger Dinaric-Balkan population that spreads across the Balkan Peninsula.

2. Population estimates & monitoring

Proper monitoring and research on wolves in Albania has been largely lacking in the past, thus information on their numbers is mostly based on expert estimations (Bego et. al. 2002).

In the past 6 years more solid data on wolf presence has been collected, mainly through the work of various projects undertaken by non-profit organizations. Recent camera-trapping surveys, tracking and sign identification as well as questionnaire surveys have generated a good amount of knowledge on the status of wolves in the country (Trajçe et. al. unpublished; Ivanov et. al. 2008; Keçi et. al. 2008; Trajçe & Hoxha 2011). Currently, experts estimate that some 200 – 250 wolves might be roaming the mountains of Albania.

There is however a huge discrepancy between the official information given by state authorities and experts' evaluations in regard to the wolf population size. The latest official estimation of the wolf population in Albania is presented at the Annual Report on the State of Environment for 2009 as consisting of 2370 individuals (MoEFWA, 2010). This is clearly a great overestimation, mostly coming from lack of adequate monitoring methodology among forestry districts and lack of knowledge on the basics of species ecology and land tenure system.

3. Legal status & relevant management agencies

The wolf is a protected species in Albania. It is classified as near threatened (LR/nt) in the Red Data List of the country (Red List of Flora and Fauna, 2007). Its hunting is prohibited and sanctioned in the new laws: law on Wildlife Protection (2008) and on Hunting (2010). However, killing/hunting of wolves might be allowed by special permission of official authorities in cases of problematic wolves (i.e. high damages on livestock, immediate threat to people, etc.). The species has had a non-game (and non-pest) status since 1994. In the National Biodiversity Strategy and Action Plan (Bego & Koni 1999) the wolf is selected as a priority species for conservation and the development of an action plan for is recommended as an immediate action to take. However, to date there is no official plan for the management of the species. The institution responsible for wolf management is the Ministry of Environment, Forestry and Water Administration.

4. Population goal and population level cooperation

There are no explicit population goals for wolves in Albania. There is a huge mismatch on the wolf population size estimates coming from different institutions – official data from the Ministry of the Environment is tenfold higher than what experts estimate the population of wolves to be. This represents a great challenge in setting appropriate management targets and population goals.

Population level cooperation for conservation is good among researchers and non-governmental institutions of the range countries. Unfortunately, up to date, on the GO level there has not been any major initiative of cooperation in regard to wolf conservation and management.

5. Conflicts and conflict management

The wildlife baseline survey conducted by PPNEA in 2006-07 gives primary insights on the conflicts existing between wolves and humans in Albania. Human-wolf conflicts seem to be widespread in the country and wolves were consistently reported to be the most damaging large carnivore on small and big livestock as well as causing significant damage on domestic/shepherd/hunting dogs (Trajçe et. al. unpublished, Keçi et. al. 2008). In addition, a human dimension study recently conducted by PPNEA to determine public attitudes of the rural population towards large carnivores reveals that the general public opinion towards wolf is predominantly negative, and they are generally the least tolerated large carnivore by the local population (Trajçe 2010).

Currently, there is no form of compensation system and there are no prevention or mitigation measures undertaken by management authorities for addressing the issue of livestock depredation. Traditional livestock herding with presence of shepherd and guarding dogs remain still at place in large parts of the country – particularly in the mountainous regions where also LC species occur. A few initiatives have been implemented in recent years by local NGOs to promote traditional breeds of livestock guarding dogs and donate pure bred animals to a number of shepherds in central and south Albania.

6. Threats

The most evident threats to wolves survival seem to be habitat destruction and fragmentation and human persecution, however the extent and magnitude of these threats remains little known. There is no systematic data on the number of individual wolves killed. However from recent observations and field surveys, experts estimate that approximately 20 – 30 mature individuals are killed illegally each year in Albania.

7. Summary table

Population size	estimated 200 – 250
Trend	stable to decreasing (historically it has been steadily decreasing)
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 125 Sporadic: 87
Range trend	stable
Depredation costs / year	unknown – not estimated
Number of cases / year	unknown
3 Most important threats	illegal killing, habitat destruction

References:

Bego, F. & Koni, M. (1999) eds. *Biodiversity Strategy and Action Plan – National Report*. National Environmental Agency, Tirana, Albania

Bego, F., Peja, N., Pllaha, S. (2002). Large Carnivores in Albania (Bear, Lynx and Wolf), in: *Psaroudas, S. (Ed.), Protected Areas of the Southern Balkans – Legislation, Large Carnivores, Transborder Areas*. Arctouros, DAC Project, Thessaloniki, pp. 73-81.

Ivanov G., Stojanov A., Melovski D., Avukatov V., Keçi E., Trajçe A., Shumka S., Schwaderer G., Spangenberg A., Linnell D. C. J., von Arx M. & Breitenmoser U. (2008): Conservation status of the critically endangered Balkan lynx in Albania and Macedonia. *Proceedings of the III Congress of Ecologists of the Republic of Macedonia with International Participation, 06-09.10.2007*. pp. 249-256. Struga, Macedonia: Special issues of Macedonian Ecological Society, Vol. 8, Skopje.

Keçi, E., Trajçe A., Mersini K., Bego F., Ivanov G., Melovski D., Stojanov A., Breitenmoser U., von Arx M., Schwaderer G., Spangenberg A. & Linnell J.D.C (2008): Conflicts between lynx, other large carnivores, and humans in Macedonia and Albania. *Proceedings of the III Congress of Ecologists of the Republic of Macedonia with International Participation, 06-09.10.2007*, pp. 257-264. Struga, Macedonia: Special issues of Macedonian Ecological Society, Vol. 8, Skopje.

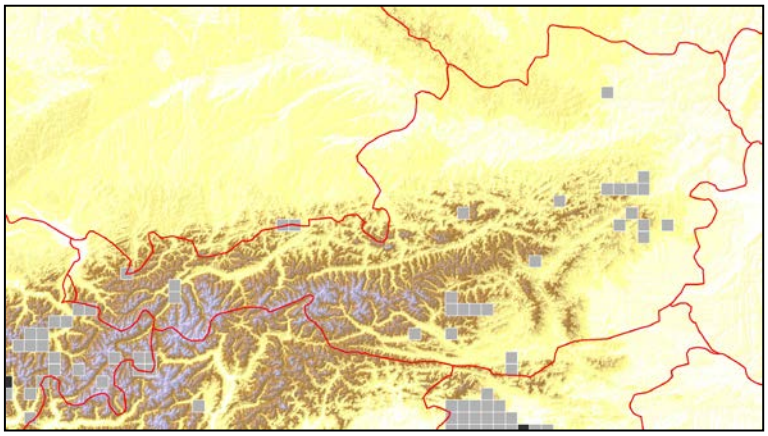
Ministry of Environment, Forests and Water Administration (2010). Report on the State of Environment 2009. Tirana, Albania. www.moe.gov.al/upload/publikimet/raporte%20te%20gjendjes%20mjedisit/Raporti%202009.pdf

Trajçe, A. & Hoxha, B. (2011). Report on camera-trapping activities in Albania during winter 2010-11. PPNEA, Tirana, Albania.

Trajçe, A., Keçi, E., Mersini, K. & Shumka, S. unpublished. *Final Report on the Baseline Survey for Lynx, Prey and other Large Carnivores in Albania, 2006-07*. PPNEA, Tirana, Albania.

Wolf – Austria

Petra Kaczensky and Georg Rauer



Wolf distribution in Austria 2007-2011.

Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

Dispersing individuals originating from the Italian-Alpine, Eastern European and Dinaro-Balkan population have been genetically confirmed in different parts of the Austrian Alps. Within 2007-2011 the number of wolves detected in Austria has clearly increased compared to the years before. There is one single stationary wolf, a male form the Italian-Alpine population, living in southern Lower Austria since Octobre 2010.

2. Population estimates & monitoring

All wolf signs, are entered into a central database and rated according to the re-fined German SCALP criteria (Kaczensky et al. 2009). Wolf monitoring is heavily based on genetic monitoring since 2009. In 2009 und 2010 6-8 wolves and in 2011 2-3 wolves were confirmed in Austria based on genetic analysis (sometimes only the species, but not the individual could be determined). In the winter 2011/2012 a radiocollared wolf from Slovenia crossed Austria during 38 days on its way to the Italian Alps.

3. Legal status & relevant management agencies

In Austria the wolf is mainly subject to the hunting law, but enjoys a year-round closed season. Responsibility for protecting species in accordance with the Habitats Directive lies with the hunting and natural conservation authorities of the provinces. A Coordination board for bear, wolf and lynx management in Austria (KOST) - composed of representatives of the hunting and natural conservation authorities of the provinces, the bear advocats and representatives of selected stakeholders - meets twice a year to review and discuss management issues regarding large carnivores in Austria. The KOST also drafted a Wolf Management Plan which was finalized in 2012 (Schäfer 2012).

4. Population goal and population level cooperation

There are no explicite population goals for wolves in Austria, busides acknowledging the legal requirements Austria has to protect immigrating wolves. Habitat modelling shows a high habitat suitability of the Eastern Alps (Marucco 2011).

Monitoring within Austria is coordinated by the bear advocats. Genetic monitoring is closely coordinated with Switzerland, the harmonization of different labs for a common identification of wolfs of different origin is still missing. Furthermore, there is close cooperation on the technical level

with collaegues from neighboring countries e.g. cross-border tracking of radiocollared animals. On the political level cooperation is happening within the framework of the Alpine Convention. However, there is no formal population level management or even a commonly expressed goal.

5. Conflicts and conflict management

The main conflicts with wolves are 1) damages caused by wolves to free-ranging livestock on Alpine pastures (~130,000 sheep / goats and ~300,000 cattle graze with minimal supervision on Alpine meadows over the summer months), 2) actual or perceived impacts on hunting particular in the context of the intensive winter feeding. The fear is that wolves may easily prey on deer at feeding sites and thus reduce numbers or spook deer thus resulting in them seeking for forage in forest plantations or on pastureland thus causing damages to forestry and agriculture.

Damage compensation is paid for confirmed livestock kills. However, compensation payments are "voluntarely" (no legal right for compensation) and in most provinces they are covered by the hunting associations through the hunting insurance. Compensation payments do not cover additional labor costs and the burden of proof is with the livestock owner. Because of the expansion of the wolf population in the Alps, a pilot project for livestock protection on alpine pastures has been launched in 2012. The program includes the testing of fencing, herding, livestock guarding dogs etc. in 5 pilot areas (in one area the program has been started so far).

6. Threats

Some wolves have stayed in Austria for several months or even longer, but most have dissapeared rather quickly. The reasons may be further dispersal (e.g. the radiocollared animal in 2012) or mortality. There are rumors of illegal killings but no proves.

7. Summary table

Population size	(2009-2011): ~2-8 different animals within the course of a year
Trend	Increased presence of dispersers
Distribution range (# cells in the 10 x 10 km EEA grid)	(2009-2011): 29 sporadic
Range trend	To early to talk about a trend
Depredation costs / year	No common database
Number of cases / year	2009:~70 sheep killed/wounded or missing 2010: 18 sheep/goat & 2 calves killed/wounded, ~90 sheep missing 2011: 14 sheep/ goat & 1 calf killed / wounded
3 Most important threats	Conflicts over livestock & hunting may result in illegal killings

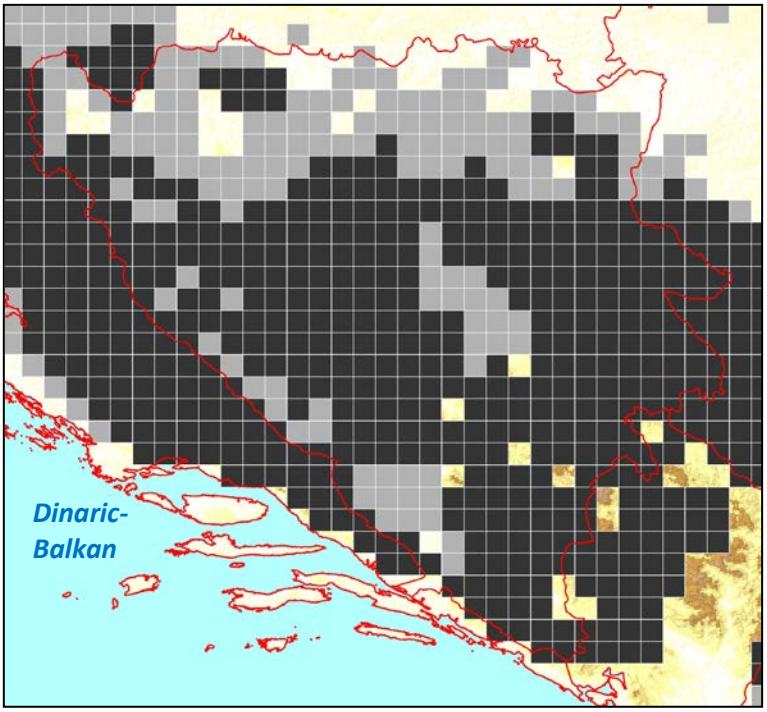
References:

Marucco, F. 2011. Distribution, habitat suitability, and connectivity of wolves (Canis lupus) in the Alps. Environment Agency Austria. <http://www.econnectproject.eu/cms/sites/default/files/Econnect_Wolf_2011.pdf>

Schäfer, M. 2012. The National Wolf Strategy in Austria. Master Thesis at the Swiss Federal Institute of Technology (ETH), Zürich. <http://e-collection.library.ethz.ch/eserv/eth:5987/eth-5987-01.pdf>

Wolf – Bosnia and Herzegovina

Compiled with data provided by Sasa Kunovac



Wolf distribution in Bosnia and Herzegovina 2000-2012.

Dark cells: permanent presence
Grey cells: sporadic occurrence

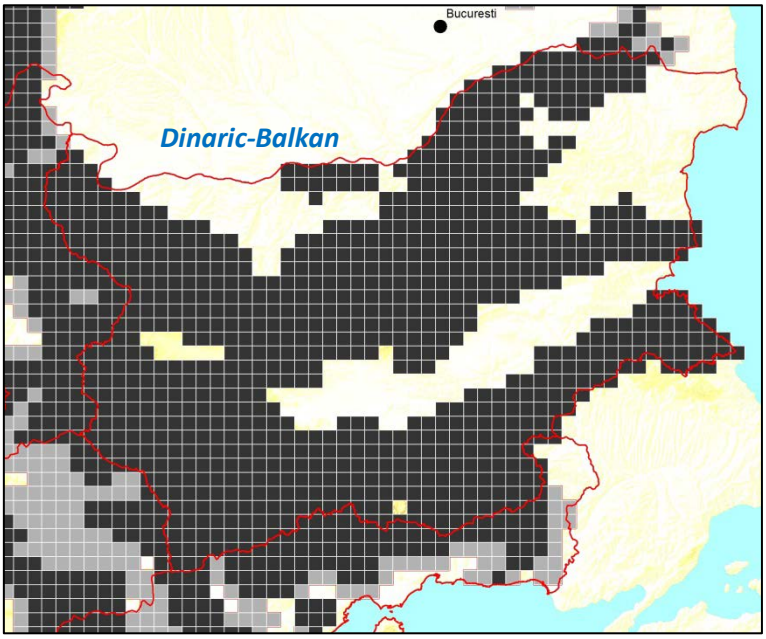
[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

Summary table

Population size	2010: 650
Trend	Increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 335 Sporadic: 150
Range trend	**?**
Depredation costs / year	No information
Number of cases / year	2011: ~400 livestock
3 Most important threats	Poor management structure

Wolf – Bulgaria

Elena Tzingarska-Sedefcheva



Wolf distribution in Bulgaria 2008-2011 (only data for permanent occurrence).

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

Wolves in Bulgaria are part of the large Dinaric-Balkan population. The area of stable presence in Bulgaria seems to cover ~76'244 km². Although the trend cannot be assessed due to non-standardized monitoring, there is evidence for a range expansion over the last 10 years.

2. Populations estimates & monitoring

The population size estimate done by expert is ~ 1000 individuals (Date: June 2011). Official estimation given by Executive Forest Agency (EFA)/Ministry of Agriculture and Foods are 2200-2500 (Period: 2006-2009), but this data do not account for double counts of packs as forestry units tend to be smaller than pack territories. The current density reported by experts through intensive snow tracking or radio-telemetry and extrapolation od data from various part of the country (Kraishte, Pirin Mts., Eastern Rhodopes Mts.) are 1.6-2.2 ind/ 100 km^2.

On average ~380 wolves were killed per year between 2006 and 2009. Bounty payments for killed wolves were stopped in 2010. Nowadays most hunters killing wolves are not reporting them officially anymore. Thus no official data for the number of wolves killed in Bulgaria are available after 2009 anymore.

The monitoring of the wolf in Bulgaria is done by forestry personnel within their forestry/hunting units and by park staff in the National/Nature parks, but is coordinated by the National Forestry Agency (Ministry of Agriculture and Foods).

Additional research on the species is done by a conservation NGO (Balkani Wildlife Society) through a long term research program with snow-tracking, radio-telemetry and genetic study (initial phase).

3. Legal status & relevant management agencies

The wolf in Bulgaria is listed as a game species by the Hunting and Game Conservation Act. As such it is hunted all year round, with no quota or other limits. According to the Action Plan in preparation

(after it is adopted) the species is going to be protected for three months (April, May, June) in the whole country.

Wolf management in Bulgaria is centralized and falls under the jurisdiction of the Ministry of Agriculture and Foods (MOAF) though the National Forestry Agency (NFA). Local management actions are applied through the Regional State Forest Enterprises, which are under the Jurisdiction of MOAF and NFA. In the National Parks the wolf is under the jurisdiction of the Ministry of Environment and Waters.

According to the Bulgarian Biodiversity Act, if in a region of the country or a time period the wolf is proven to be in unfavorable conservation status, a different management regime can be applied for that region / time period.

An Action plan for the Wolf in Bulgaria (on the level of management plan) is in the process of finalizing. It was prepared in a fully open process (2008-2012) with participation of all interest groups. The public and interest groups are involved in two stages: 1. In the processes of Action Plan preparations through representatives and 2. At the final stage before approval through organized public hearings.

4. Population goal and population level cooperation

There is no official goal for the size and distribution of the wolf population in Bulgaria. The main goal of the Action plan for the Wolf in Bulgaria is: “To increase the understanding and commitment to the wolf by creating prerequisites not to allow the wolf to become extinct and to help it to exist always in the country, while at the same time working to reduce the conflict between wolves and people”.

There is no specific zoning policies or different management systems in two population segments of the Bulgarian wolf population due to the centralized management.

5. Conflicts and conflict management

Conflicts exist over livestock depredation throughout the whole wolf range. There are two types of conflicts – with livestock breeders over damages on livestock and with hunters over competition for ungulates.

According to the Law of Hunting and Conservation of Game for each damage caused by a game species (i.e. also wolf) the institution managing the respective area should pay. Thus in lands managed by hunters, compensation for killed livestock should be paid by the hunting association to the farmer who owned the livestock. However, this compensation system doesn’t work in practice and consequently damages caused by wolves are de facto not compensated.

6. Threats

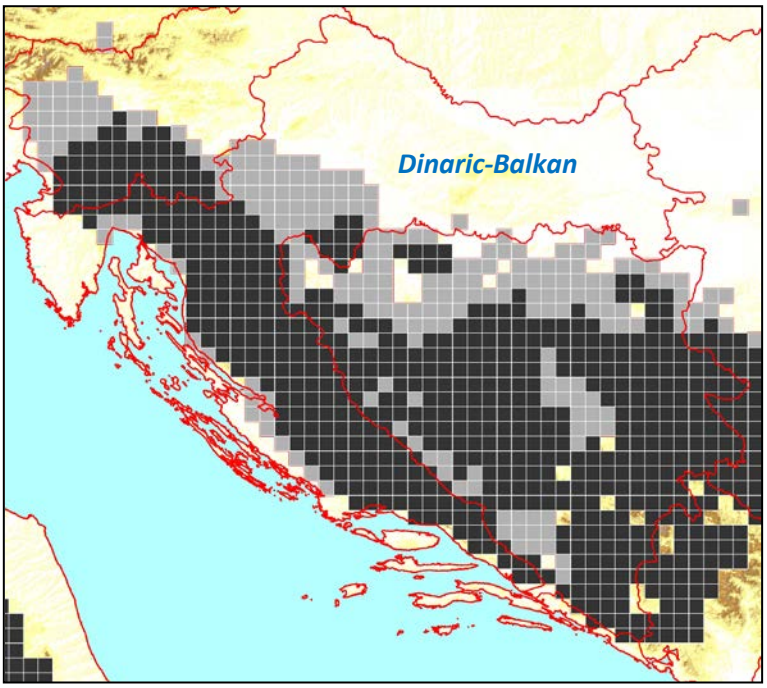
The most important threat is the low acceptance due to conflicts with hunters and shooting throughout the whole range according to the official population regulation. Important threats are also the hybridization, over-harvesting of wild prey populations leading to high depredation rate on livestock, pest control, land transport infrastructure (roads / railways) and vehicle collision, and disturbance due to recreation/tourism. A common management weakness is the poor enforcement of legislation, poor integration of science into decision making and lack of knowledge about species ecology.

7. Summary table

Population size	(2011): ~1000
Trend	unclear
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 871
Range trend	unclear, but likely expanding
Depredation costs / year	De facto no compensation payments
Number of cases / year	no information
3 Most important threats	low acceptance, direct killing, poor enforcement of legislation

Wolf – Croatia

Djuro Huber



Wolf distribution in Croatia 2005-2008.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves in Croatia belong to the large Dinaric-Balkan population. Total wolf distribution area in Croatia extends over 24,437 km^2 (45.4% of terrestrial surface of Croatia). The permanent wolf presence extends over 17.187 km^2, while the occasional wolf presence extends over 7.230 km^2.

Wolves are distributed over the entire Gorski Kotar and Lika regions, and the inland Dalmatia, thus ranging from the borders with Slovenia to and along the long border with Bosnia and Herzegovina, even reaching the small part of border with Montenegro in south-east.

2. Populations estimates & monitoring

Current estimate of the number of wolves in the Croatian segment of the Dinara-Balkan population is about 200 individuals (168-219, 50 packs in 2011; Štrbenac et al, 2010). Continuous monitoring enables yearly updates on numbers and the trend (Jeremić et al. 2012).

The number of wolves has been derived by combining data from various monitoring techniques: telemetry tracking, genetics, snow tracking, howling, photo traps, distribution of damages, and local experts' opinions. Body of each dead wolf is collected, measured and sampled (since 1995 N=222). Telemetry tracking of a total of 28 different wolves gave insight in the average sizes of pack territories: from 350 km^2 in Gorski kotar to 736 km^2 in Velebit area. Genetic survey and snow tracking are used to help reveal the ranges and means of number of valves in each pack. Photo traps, howling, damage distributions and expert opinions show the mere presence of wolves in certain area and occasionally the minimum number of wolves in a pack. The sizes of known pack territories are used to estimate the number of wolf packs by extrapolating to the entire recorded wolf range in Croatia. For the tracked wolf packs the actual numbers are used, as well as for each pack with relevant estimates. For other packs the mean number for pack sizes are used. The survey done in 2012 revealed 50 wolf packs, 24 of which were in the border area with Slovenia or Bosnia and

Herzegovina. For all those packs the estimated number of pack members was divided by 2, assuming that on average 50% of the pack territory was outside Croatia.

3. Legal status & relevant management agencies

Wolf in Croatia is strictly protected since 1995. A very conservative limited quota is allowed to be shot each year.

The main management agency is the Directorate for Nature Protection within the Ministry for Protection of Environment and Nature. The operational management follows the wolf management plan for the Republic of Croatia (Štrbenac et al 2010). The Large Carnivore Committee in partnership with the State Institute for Nature Protection prepares the yearly Action plan and oversees its implementation. The Wolf emergency team helps with the actions in the field including the reporting on each wolf mortality. The team of damage evaluators does examine each reported wolf damage what is the basis for paying compensations but also is used as part of the monitoring.

In the last four years quota for wolf hunting ranged from 4 to 22, out of which 0 to 21 have been actually shot (62 of a total of 95, or 65%). Quota is calculated as 15% of current population estimate minus the known human caused mortality in the past 12 months.

4. Population goal and population level cooperation

According to the management plan the total habitat capacity is around 500 wolves but the social capacity (acceptance) may be around 200. Currently the social capacity is reached and active management has to keep the population within the given limits.

Wolves in Croatia are part of the Dinara-Balkan population which Croatia directly shares with Slovenia and Bosnia and Herzegovina, and partly with Montenegro. With Slovenia there is full cooperation on the level of scientists while the political agreement on management is expected to develop when Slovenian side will accept the process. With Bosnia and Herzegovina the main difficulty is in the lack of capacity and in political situation in that country.

5. Conflicts and conflict management

Current conflict is high and has two sides. One is with livestock and the other with game.

Livestock losses are declared as damage and compensation is paid after verification by the damage inspector, which has to include the note on the preventive measures applied by the owner. The farmers are not content with the amount of compensation (equivalent to local market value) and with the timing (in average it takes over one year to receive money). Special problem are the areas where wolves expanded recently and where locals are not used to guarding lifestock. In some areas dogs are also targeted wolf prey which is additional challenge for compensations (although there is a pricelist for dog losses). Limited donations of guarding dogs and electric fences are additional way to mitigate the conflict with farmers. In 2011 1468 sheep/goats, 142 cattle, 58 horses/donkeys and 109 dogs were killed by wolves in Croatia.

Game as natural prey of wolf is not accepted as a “damage” and hunting organizations do not qualify for compensation. The exception may be a fenced game breeding facility. Hunters are the loudest group speaking about too many wolves. The only satisfaction they get is through the limited quota that may be even commercially utilized (each trophy has to be cleared through the relevant Ministry).

6. Threats

The current situation with wolf population segment that lives in Croatia is favorable considering the fact that it is not isolated, i.e. it is connected with the wolves in neighboring countries, thus comprising much bigger unit that 200 individuals.

Potential threat is worsening of public attitudes. In the last survey in 2003 even 73% of local inhabitants were against further increase of wolf numbers but clearly over 50% support wolf presence (Majic and Bath, 2009). Worsening will occur in the case of: (1) further increase of wolf numbers or spread of wolves to new areas, (2) inability of government to pay compensations, (3) and other drastic change in management (e.g. cancelation of removal quotas). In that scenario the illegal killings (which are always present) may explode including the use of poisons.

Among 150 genetically analyzed wolves 5 were found to be hybrids (father was dog in all cases).

There was a construction of mayor infrastructure (highways) in the wolf habitat in the previous decade but that seems to have been satisfactory mitigated by numerous crossing structures including big green bridges (Kusak et al 2009), The now threat is the planned construction of "wind power parks" in the core wolf habitat.

7. Summary table

Population size	2011: 168-219 (50 packs)
Trend	Stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 211 Sporadic: 67
Range trend	Some areas of occasional presence are becoming permanently occupied.
Depredation costs / year	2010: 194,000 € (in 2010) for all livestock
Number of cases / year	2009: 1414, 2010: 1777
3 Most important threats	- Increase of wolf numbers (acceptance will go down) - poisoning - Hybridizing with dogs - More construction in habitat like planned "Wind power parks"

References:

Majić, A. and Bath, A. (2009): Changes in attitudes towards wolves in Croatia. Biological Conservation, 143(1):255–260

Jeremić, J., Kusak, J., Huber, Đ., Štrbenac, A. (2012): Izvješće o stanju populacije vuka u 2012. godini, Državni zavod za zaštitu prirode, Zagreb, 37 pp.

Kusak, Kosip, Djuro Huber, Tomislav Gomerčić, Gabriel Schwaderer, Goran Gužvica. 2009. The permeability of highway in Gorski kotar (Croatia) for large mammals. European Journal of Wildlife Research, 55:7-21.

Kusak J., A. Majić Skrbinšek, D. Huber (2005): Home ranges, movements and activity of wolves (*Canis lupus*) in the Dalmatian part of Dinarids, Croatia. European Journal of Wildlife Research, 51: 254-262.

Beck R., A. Beck, J. Kusak, Ž. Mihaljević, S. Lučinger, T. Živičnjak, Đ. Huber, A. Gudan, A. Marinculić (2009): Trichinelosis in wolves from Croatia, Veterinary parasitology, 159:308-311.

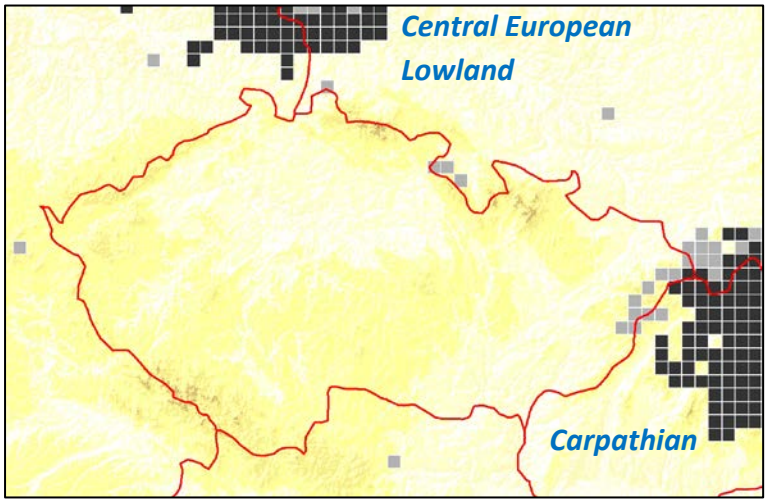
Gomercic, T., M. Sindicic, A. Galov, H. Arbanasic, J. Kusak, I. Kocijan, M.D. Gomercic, and D. Huber (2010): High Genetic Variability of the Grey Wolf (Canis lupus L.) Population from Croatia as Revealed by Mitochondrial DNA Control Region Sequences. Zoological Studies, 49(6):816-823.

Štrbenac, A., Huber, Đ., Kusak, J. , Oković, P., Sindičić, M., Jeremić, J., Frković, A., Gomerčić, T. (2008): Bilten "Očuvanje velikih zvijeri u Hrvatskoj", Državni zavod za zaštitu prirode, Zagreb

Štrbenac, A., Kusak, J., Huber, Đ., Jeremić, J., Oković, P., Majić-Skrbinšek, A., Vukšić, I., Katušić, L., Desnica, S., Gomerčić, T., Bišćan, A., Zec, D., Grubešić, M. (2010): Plan upravljanja vukom u Republici Hrvatskoj za razdoblje od 2010. do 2015. godine, Ministarstvo kulture i Državni zavod za zaštitu prirode, Zagreb

Wolf – Czech Republic

Miroslav Kutal



Wolf distribution in Czech Republic in 2006-2010.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolf presence in Czech Republic is only sporadic in the Beskidy Mountains in the east, bordering the large Carpathian population. The range may have decreased, but wolf presence has been minimal and monitoring methods have not been consistent over time.

2. Population estimates & monitoring

The most recent estimate for the Czech part of the Carpathian wolf population is only 1 wolf. Wolf presence has been monitored since 2003 by intensive snow tracking in the Beskidy Mountains. Additional information comes from wolf howling, hunting ground counts and guestimates. Monitoring is done by government agencies, NGOs and academic/research centeres. Offical estimates by the Agency of Nature Conservation and Landscape Protection are higher than those of NGOs or academic centeres.

3. Legal status & relevant management agencies

In Czech Republic the wolf falls under the jurisdiction of the Ministry of Environment (department of species protection and implementation of European regulations) and the Agency of Nature Conservation and Landscape protection. The wolf is strictly protected.

A proposal for a wolf management plan was drafted, but has been waiting for approval for the last 7 years. The management plan was developed by the Agency of Nature Conservation in cooperation with nature conservation NGOs and the major hunting associations.

4. Population goal and population level cooperation

No special management on wolves is applied by authorities and there are no explicite population goals for wolves in the Czech Republic.

There is a non-hunting agreement of wolves with Slovakia for a ~350 km² area in the district Čadca near the border with Czech Republic (regulation No. 344/2009). Furthermore, informal arrangements exist concerning cooperation on large carnivore monitoring by state administration (PLA Beskydy- CZ and PLA Kysuce – SK) and among local NGOs.

5. Conflicts and conflict management

Some damages on livestock, mainly sheep occur. All damages are compensated by government funds via the Ministry of Finance and paid by Regional Authorities. All kills have to be reported within 48 hours of dicovery and are inspected by a veterinarian and representative of the regionally relevant body of state nature protection. However, compensation is normally paid (100% market value) as it it rarely possibly to exclude wolf predation as a potential cause.

6. Threats

The most likely cause of low or non-occurrence of wolves in the Czech Republic is the intensive hunting in Slovakia, where some 120-159 animals are shot each year. Friends of the Earth Czech Republic send a complaint to European Commission in 2011 (Complain 08/2011).

Potentially wolves are also illegally killed in Czech Republic.

7. Summary table

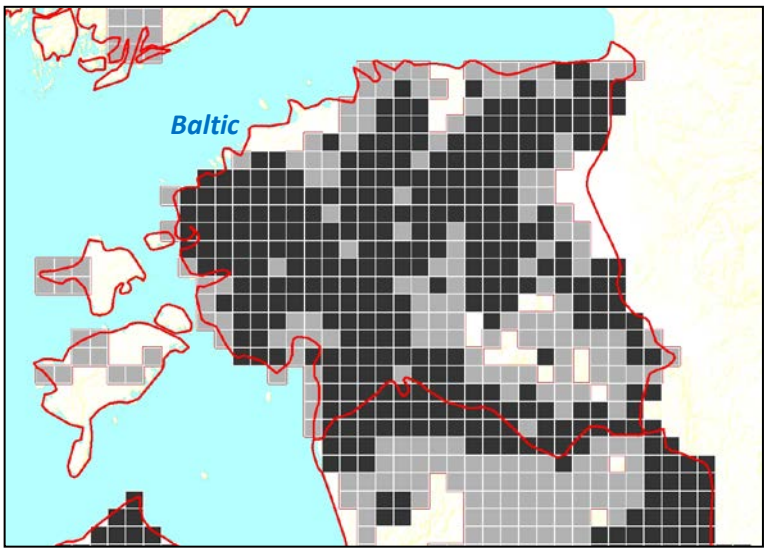
Population size	Carpathian (Czech part) (2012): 1
Trend	Carpathian (Czech part): decreasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Carpathian (Czech part) (2006-2010): 11 sporadic
Range trend	Carpathian (Czech part): decrease / unclear
Depredation costs / year	Carpathian (Czech part): ~1,800 €
Number of cases / year	Carpathian (Czech part) (2006-2010): ~10 sheep/goats, 0-1 cattle
3 Most important threats	high legal harvest in neighboring Slovakia, illegal killings, no breeding packs

References:

Complain 08/2011.Complaint to the Commission of the European Communities concerning failure to comply with Community law – hunting of grey wolves (*Canis lupus*) in Slovakia. http://www.carnivores.cz/data/files/EU_Complaint_2011_CZ.pdf

Wolf – Estonia

Peep Männil



Wolf distribution in Estonia 2008-2010.

Dark cells: reproduction
Grey cells: sporadic occurrence
(Distribution in Russia and Belarus not shown)

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

Wolves in Estonia are part of the large Baltic population and are found all over the country including the bigger islands. Reproductions occur in all counties.

2. Populations estimates & monitoring

The wolf population size was estimated at 230 in autumn 2010. Population size is based on the number of unique annual reproduction units. The number of reproductions is based on mapping observations and track all over Estonia.

Additionally, monitoring includes the data (site, sex, age, reproductive status) of harvested/dead individuals and data collected from permanent winter-track count transects distributed over the entire country.

Basic monitoring data are collected by hunters and personnel of protected areas and are analyzed in Estonian Environment Information Centre.

3. Legal status & relevant management agencies

The wolf is included in the list of game species in Estonia with an open season from 1.11. to 28.02. There is a valid national management plan for 2012-2021 signed by the Minister of the Environment.

Management of the wolf falls to the Environmental Board under the jurisdiction of Ministry of the Environment. There is a Working Group for Large Carnivore Management in the Ministry of the Environment. The working group consist of different stakeholders and advises the ministry to establish and implement the LC policy.

The Estonian Environment Information Centre under the Ministry of the Environment is responsible for wolf monitoring. The annual monitoring reports include the proposals for establishment of annual conservation measures and sustainable harvest quotas.

4. Population goal and population level cooperation

Following the current national management plan the goal is to: 1) keep the number of annual reproductions between 15 -25, 2) keep the distribution over the country equal in suitable habitats, and 3) reduce depredation on livestock. Wolf numbers in Estonia are regulated by hunting.

Cooperation with neighboring Latvia are: 1) Regular share of information on management (census, hunting bags) of wolf, and 2) common research with on genetics of the Baltic wolf population.

5. Conflicts and conflict management

The main conflicts over wolf are depredation on livestock (mainly sheep) and predation on wild ungulates.

Since 2007 the compensations for livestock damages are paid by the state with the responsible body being the Environmental Board and the funding source being the Environmental Investment Centre. All cases should be inspected by a trained experts of Environmental Board and if confirmed 100% of the market value is paid.

The wolf is regularly hunted in Estonia. Population control is more concentrated in agricultural areas thus giving more protection to packs living in the bigger forest habitats.

6. Threats

There are no foreseen any significant threat for favourable conservation status of wolf population in predictable future. Still, there are some aspects that should be under highlighted attention: low acceptance due to depredation events and predation on wild ungulates causing higher pressure to increase the hunting quotas and/or increase of illegal killing; spreading of sarcoptic mange among wolf population during the last few years may be considered a potential threat as well.

7. Summary table

Population size	230 (autumn 2010)
Trend	Stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Reproduction: 279 Sporadic: 146
Range trend	Stable
Depredation costs / year	2011: 95'000 €
Number of cases / year	2011: 209 cases
3 Most important threats	None

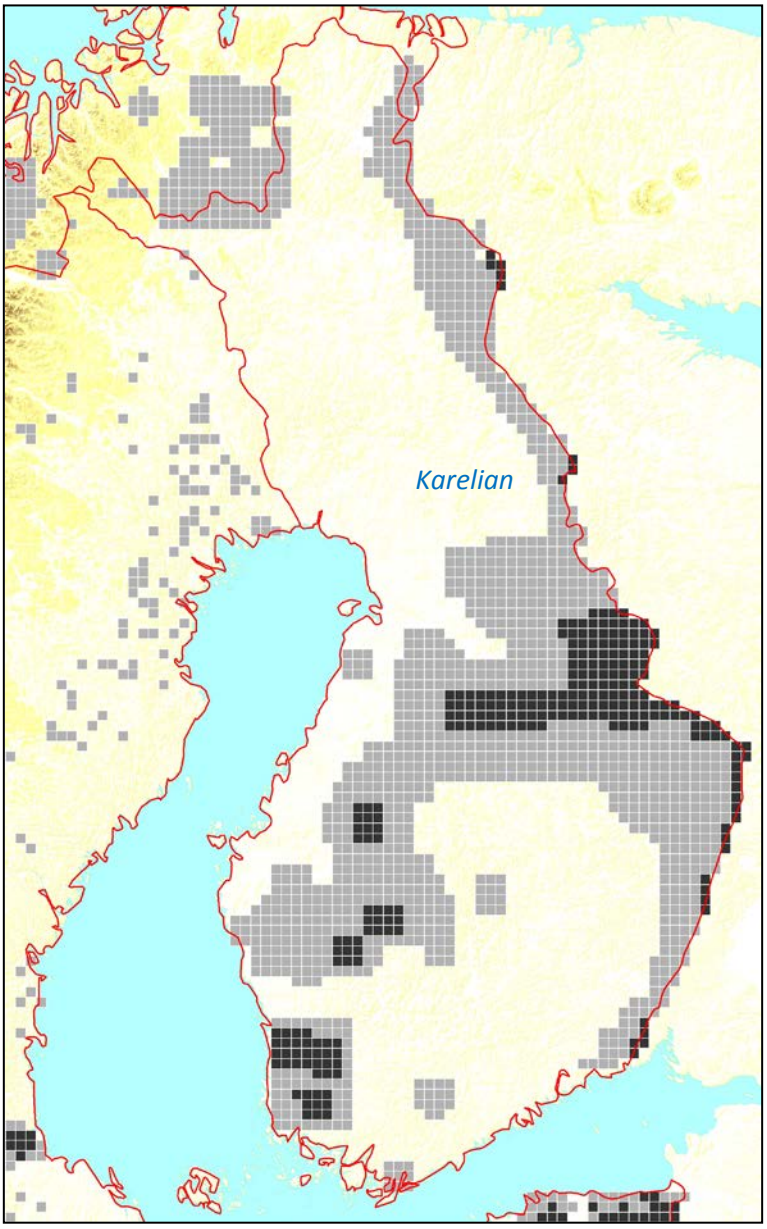
References:

Männil, P., Veeroja, R. & Tõnisson, J. 2011. Status of Game populations in Estonia and proposal for hunting in 2011 (in Estonian with English summary and figures). Estonian Environment Information Centre. http://www.keskkonnainfo.ee/failid/ULUKITE_SEIREARUANNE_2011.pdf

Männil, P. & Kont, R. (editors) 2012. Action plan for conservation and management of wolf, lynx and brown bear in Estonia in 2012-2021 (in Estonian). Ministry of the Environment. http://www.keskkonnainfo.ee/failid/SK_tegevuskava_2012-2021_lopp.pdf

Wolf - Finland

Ilpo Kojola



Wolf distribution in Finland 2009-2011. (Distribution in Russia not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves can be encountered everywhere in Finland, but reproductive packs occur in an arc from east-central Finland to southwestern Finland. In addition, there are transboundary packs along much of the Finnish-Russian border. The distribution range of breeding packs has quadrupled during the last 10 years, but the distance between neighboring pack territories varies largely. The wolf population expanded westwards and the first reproductions in southwestern Finland were confirmed in 2003 and 2004, after an absence of > 100 years. Within the reindeer management area in the north only a few reproductions have occurred (7 cases during 2003-2012 and 5 of these reproductions have taken place along the Finnish-Russian border).

2. Population estimates & monitoring

The last census (winter 2011-2012) yielded a total estimate of 150-165 wolves. The number of wolves in Finland has varied widely in history. Genetic analyses and the number of wolves annually killed indicate that the population size was about 1000 wolves in the mid-1800s (Aspi et al. 2006). A drastic decline occurred in the late 1800s. After that population crash, with the exception of some short periods, only a few individual wolves were living in Finland until the mid-1990s when wolves started to increase and expand their distribution range. For example, in the early 1970s wolves were declared as being practically extinct in Finland (Haglund 1975, Pulliainen 1980). From the mid-1990s onwards the number of wolves increased until winter 2006/2007 when it peaked at 250 – 300 animals. Between the winters 2006/2007 and 2009/2010 Finland's wolf population experienced a dramatic decline down to 150-170 wolves (Kojola et al. 2011; Jansson et al. 2012). The decline leveled off and the number of wolves has been relatively stable since the winter of 2009/2010.

Data used for estimation of the size of Finland's wolf population is based on (1) extensive use of GPS-transmitters to map territory boundaries, (2) snow-tracking by 6 field technicians working for the Finnish Game and Fisheries Research Institute (FGFRI) and some volunteers to census the

number of wolves in packs and the number of territory-marking pairs and (3) observations recorded by a voluntary network of trained observers. GPS-tracking has been intensified after the population decline and during the last two years in about 60% of all Finnish wolf packs at least one resident alpha wolf has been carrying a GPS-collar. Of the packs and scent-marking pairs living on both Finnish and Russian territory, 50% have been included into the estimated number of Finnish wolves. Estimates express the midwinter season, and for this season the proportion of roaming, non-territorial single wolves has been assumed as 15% of the total population. The dispersal process has been monitored through GPS-tracking (Kojola et al. 2006, 2009).

3. Legal status & relevant management agencies

In Finland the decrees concerning the protection of the wolf population are written into the hunting law. Theoretically a hunting season can be opened on October 1 and last until the end of March. In the current situation of EU legislation hunting for population management is not allowed. All harvest is therefore targeted to remove wolves that cause exceptional damage or move too close to human residences. These removals can be performed year round ("hunting year" extends from August 1 until July 31). The Ministry of Agriculture and Forestry annually issues one or two quotas for damage-based licenses. When two quotas are issued one is for the area of reindeer management, another for the rest of Finland. In the last decision (hunting year 2012/2013), the quota (10 wolves) was set only for the segment outside of the area of reindeer management. However, removals in the reindeer area are not restricted by a quota. In both regions a license to kill a wolf or wolves has to be applied for from the Finnish Wildlife Agency and damages and/or problematic behavior has to be verified in the application.

Before setting quotas, the ministry requests an estimate of the number of wolves from the Finnish Game and Fisheries Research Institute. After the plan is drafted it will be distributed to NGOs, the Finnish Wildlife Agency, the Ministry of Environment and the Game and Fisheries Research Institute for comments. The mean annual legal harvest rate has been between 10-20% of the population estimate from 1996 through 2012.

The Management plan for Finland's wolves was published in 2005 at the Ministry of Agriculture and Forestry (English version at http://wwwb.mmm.fi/julkaisut/julkaisusarja/2005/MMMjulkaisu2005_11b.pdf). The management plan is preliminary scheduled for revision during 2013-2014.

4. Population goal and population level cooperation

In the 2005 management plan it was estimated that 20 annual reproductions would ensure viability of the Finnish wolf population. These criteria are based on the assumption that connectivity from Russia is functional. At least 20 reproductions took place in Finland during 2005 – 2008, but since then the number has been lower than 20. Genetic analyses have provided evidence that functional dispersal from Russia is not strong. The mean exchange rate between the breeding population in Finland and Russian Karelia has been assumed to be only few individuals per wolf generation (2.5 years) (Aspi et al. 2009).

Joint monitoring reports that gather data on the number, size and location of Scandinavian and Finnish packs have been published since the winter 1998-1999 (Aronson et al. 1999). The last report described the status in winter 2011-2012 (Wabakken et al. 2012). Connections between Finnish-Russian and Scandinavian populations are poor due to: 1) the long distances and 2) wolves' need to cross the reindeer herding areas where they tend to cause damage to easy and abundant prey in the form of free-ranging semi-domesticated reindeer (Seddon et al. 2006; Wabakken et al. 2007; Kojola et al. 2009).

At the Finnish-Russian border the wolf management changes dramatically: Finland is under surveillance monitoring by the EU for poaching of wolves whereas in Russian Karelia bounties are still paid. Trans-boundary cooperation between Finnish and Scandinavian managers includes exchange of information concerning (e.g. wolves that are moving in border areas) and joint research about population dynamics and genetics.

5. Conflicts and conflict management

In monetary terms the primary conflict is depredation on semi-domestic reindeer herds. A wolf living in the area of reindeer management is 50-60 times more expensive than a wolf living elsewhere. The principal goal of the Finish compensation system is the full compensation of the damage. Because only a small portion of calves killed by wolves can be found, the sum of money paid to reindeer herding associations as compensation for calf losses is determined by the herd size and the estimated level of predation by large carnivores. Compensation for losses of adult reindeer is based on reindeer carcasses being confirmed as wolf-kills. Wolves that move in villages and suburbs are usually removed with a short reaction time by using licenses that are issued by local police officers. The Ministry of Internal Affairs has recently distributed guidelines to the police administrations for criteria when bold (not shy) wolf (or bear) can be removed because of human safety concerns.

Public funding is reserved for electric fences to protect livestock. Attacks on sheep are a minor problem in Finland as compared to other countries hosting wolves in Europe. The risk is biggest in remote farms (Kaartinen et al. 2009).

The recent expansion of wolves to southwestern Finland where human densities are high and where wolves were recorded to have killed 22 children in 1880-1881 has created an active public debate including critics toward the management policy. This debate may further damage the wolf's public image. Several citizen initiatives and campaigns have been organized opposing any wolf policy that encourages any natural expansion from east to west. Misleading legends about translocations and hybridizations are common material in internet discussion forums.

Wolves kill domestic dogs in hunting situations and some wolves may also repeatedly take dogs in house-yards (Kojola and Kuittinen 2002). In Finland where moose is the only ungulate within most territories of wolves and moose densities are three times lower than in Scandinavian wolf territories the risk of a dog to encounter a wolf may be pronouncedly high. Although there are substantial differences between packs in their tendency to attack dogs (Kojola et al. 2004), attacks on dogs are very damaging to the public's view of wolves. The relationship between the estimated size of the wolf population and the annual number of dogs lost to wolves is strongly linear (Kojola, unpublished data). To save some dogs from wolf attacks, the Finnish Game and Fisheries Research Institute has maintained a wolf service phone from where a caller gets informed about the spatial risk based on the last positions of GPS-collared wolves. This service virtually covers all important hunting grounds and is open from 7:00 to 14:00 in every day during the hunting season.

Wild forest reindeer (*Rangifer tarandus fennicus*) that returned to east-central Finland from Russian Karelia in early 1960s after an absence of 40 years increased steadily and peaked in 2001 at 1700 reindeer. After the return of wolves the percentage of calves in winter herds has dropped and according to a recent helicopter surveys the wild reindeer population is nowadays 50% smaller than 10 years ago (Kojola et al. 2009). Because the wolf is listed as an endangered species in Finland (Rassi et al. 2010), only the harvest of the more numerous large carnivores (bear, lynx) has been increased within the range of wild forest reindeer.

6. Threats

The major threat on Finland's wolves is illegal killing. This problem cannot be readily resolved. The legislation has set heavier punishments but their impact is questionable because the risk of being caught is very low. Legal harvest instead is strictly regulated. The genetic diversity of Finland's wolves has slightly decreased with decreasing population size (Jansson et al. 2012).

7. **Summary table**

Population size	February 2012: 150-166
Trend	(Increased 1996-2006, decreased 2007-2009) now stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 253 Sporadic: 1163
Range trend	Stable
Depredation costs / year	2007-2011 range: 500'000 - 1'350'000 € (reindeer) 32'688 – 154'302 € (other depredation)
Number of cases / year	2007-2011 range: 650 -1001 reindeer, 30- 120 sheep, 2-6 other livestock (cattle, horses), 25-35 dogs
3 Most important threats	Illegal killing, low acceptance by hunters with hunting dogs, deteriorating public image of wolf, lowering genetic diversity

References

Aronson, Å., Wabakken, P., Sand, H., Steinset, O. K. and Kojola, I. 1999: The wolf in Scandinavia: status report of the 1998/1999 winter. – Høgskolen i Hedmark, Oppdragsrapport 18. 40 p. (in Swedish with English summary).

Aspi, J., Roininen, E., Ruokonen, M., Kojola, I. & Vila, C. 2006: Genetic diversity, population structure, effective population size, and demographic history of the Finnish wolf population. – Molecular Ecology 15: 1561 – 1576.

Aspi, J., Roininen, E, Kiiskilä, J., Ruokonen, M., Kojola, I., Bljudnik, L., Danilov, P. I., Heikkinen, S. & Pulliainen, E. 2009: Genetic structure of the Northwestern Russian wolf populations and gene flow between Russia and Finland. - Conservation Genetics 10: 815-826.

Haglund, B. 1975: The wolf in Fennoscandia. – In: Wolves. Proceedings of the first working meeting of wolf specialists and of the first international conference of the wolf (ed. D. H. Pimlott). IUCN Publications New Series. Suppl. 43. pp. 36 – 43.

Jansson, E., Ruokonen, M., Kojola, I. and Aspi, J. 2012: Rise and fall of a wolf population: Genetic diversity and structure during 6 recovery, rapid expansion, and drastic decline. – Molecular Ecology 21: 5178 – 5193.

Kaartinen, S., Luoto, M. and Kojola, I. 2009: Carnivore-livestock conflicts: determinants of wolf (Canis lupus) depredation on sheep farms in Finland. - Biodiversity and Conservation 18: 3503 – 3517.

Kojola, I., Aspi, J., Hakala, A., Heikkinen, Ilmoni, C. and Ronkainen, S. 2006: Dispersal in expanding wolf population in Finland. – Journal of Mammalogy 87: 81 - 86.

Kojola, I., Helle, P. and Heikkinen, S. 2011: Recent changes in wolf population in Finland based on various data sets. – Suomen Riista 57: 55-62 (in Finnish with English summary).

Kojola, I., Kaartinen, S., Hakala, A. and Voipio, H.-M. 2009: Dispersal behavior and the connectivity between wolf populations in Northern Europe. - Journal of Wildlife Management 73: 309-313.

Kojola, I. & Kuittinen, J. 2002: Wolf attacks on dogs in Finland. – Wildlife Society Bulletin 30: 498 - 501.

Kojola, I., Ronkainen, S., Hakala, A., Heikkinen, S. and Kokko, S. 2004: Interactions between wolves Canis lupus and dogs C. familiaris in Finland. – Wildlife Biology 10: 101-105.

Kojola, I., Tuomivaara, J., Heikkinen, S., Heikura, K., Kilpeläinen, K., Keränen, J., Paasivaara, A. and Ruusila, V. 2009: Endangered prey and predators: European wild forest reindeer and wolves. - Annales Zoologici Fennici 46: 416-422.

Pulliainen, E. 1980: The status, structure and behavior of populations of the wolf (Canis l. lupus L.) along the Fenno-Soviet border. – Annales Zoologici Fennici 17: 107 – 112.

Rassi, P., Hyvärinen, E., Juslen, A. & Mannerkoski 2010: The 2010 Red List of Finnish species. – Ministry of Environment. Finnish Environment Institute. 685 p.

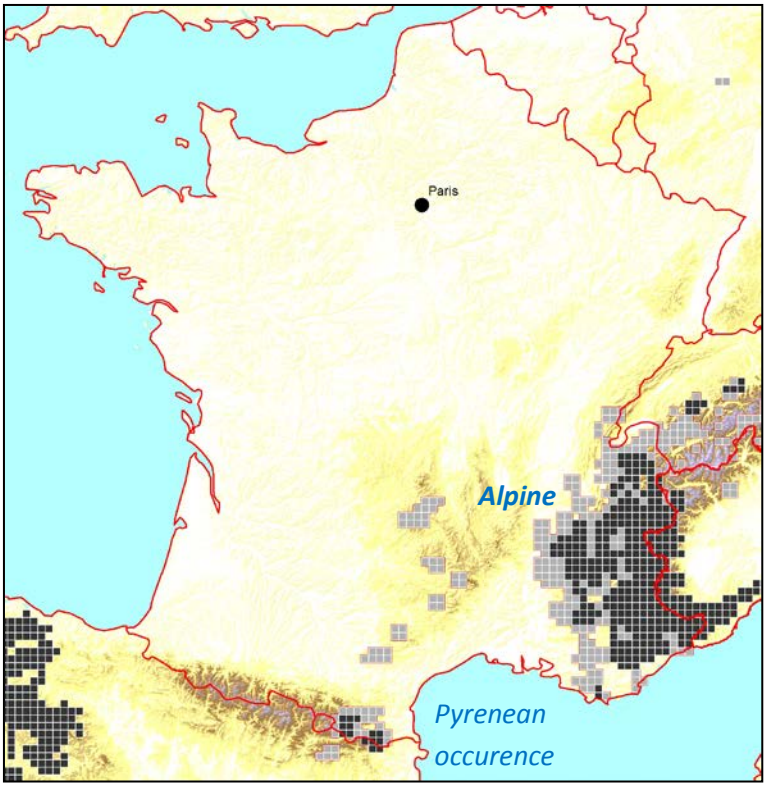
Seddon, J.-M., Sundqvist, A.-K., Björnerfeldt, S. and Ellegren, H. 2006: Genetic identification of immigrants to the Scandinavian wolf population. – Conservation Genetics 7: 225 – 230.

Wabakken, P., Sand, H., Kojola, I., Zimmermann, B., Arnemo, J. M., Pedersen, H. C. and Liberg, O. 2007: Multi-stage, long-stage natal dispersal by a GPS-collared Scandinavian wolf. – Journal of Wildlife Management 71: 1631 - 1634.

Wabakken, P., Svensson, L., Kojola, I., Maartman, E., Strømseth, T. H., Flagstadt, Ø., Åkesson, M. and Zetterberg, A. 2012: The wolf in Scandinavia and Finland: final report from wolf monitoring in the 2011-2012 winter. - Høgskolen i Hedmark, Oppdragsrapport 5. 46 p. (in Norwegian with English summary).

Wolf - France

Eric Marboutin



Wolf distribution in France 2006-2010.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves in France are found mostly in the Alps. This core area originated in the early 1990s based on individuals dispersing from the recolonizing Italian population. Some individuals have spread also outside the Alps: to the Pyrenees massif since 2002 and to the Vosges massif since 2012.

2. Populations estimates & monitoring

The French segment of the Alpine wolf population is made up of 19 packs, including 4-6 transboundary packs which are shared with Italy. Population size estimated from MR modeling (with detection héterogeneity) and snowtracking data suggests ~250 wolves by late winter 2011/2012.

A network of ca. 1200 trained field experts is in charge of presence signs survey all along the year; any detected sign is described and sent to a central state agency (ONCFS) in charge of the validation process. CMR-based estimates of abundance are derived from non invasive sampling, and intensive snow tracking is implemented over every packs' territory (see Duchamp et al., 2012).

3. Legal status & relevant management agencies

Wolves are a fully protected species (Bern Convention, HFF Directive, National Law). Management can be authorized based on HFF Directive art.16 to removed stock raising individuals. Maximum numbers that can be removed yearly are estimated based on MVP and adpative management modeling**.** Poached individuals are substracted from this "quota". The 2012 quota is 11.

4. Population goal and population level cooperation

There is no explicit population limit so far in the 2008-2012 Wolf National Action Plan. Monitoring of the Alpine wolf population is coordinated with Italy and France.

5. Conflicts and conflict management

Conflicts mainly exist over sheep husbandry. In 2011, 1332 attacks to flocks were documented, corresponding to 4618 dead/wounded animal that were compensated (~1 million €).

To counteract depredation and improve acceptance, preventing measures are strongly encouraged and supported. These include: large garding dogs (about 1200 dogs in the Alps), subsidiazed extra-herding costs, and electric fencing. In 2011, total mitigating costs were about 7 millions €. On average 10 to 15% of flocks in the wolf range are attacked any given year. Of those attacked, 70% are attacked only once, whereas <10% are attacked >5 times (but up to 20 -30 times). Such predation "hot-spots" have been identified even when accounting for sheep numbers and duration of exposure to the predation risk.

Competition with hunters for large game species is another upcoming issue.

6. Threats

Traffic accidents and poaching (on average: 1-2 cases of each per year).

7. Summary table

Population size	250 (late winter 2011/2012; 19 packs including 4-6 transboundary packs)
Trend	Increasing (+ 27% per year on average)
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 286 Sporadic: 220
Range trend	Expanding (10-25% per year)
Depredation costs / year	~8 million € (1 million € compensation & 7 million € prevention)
Number of cases / year	2011: 1332 attacks; Increasing as a function of wolf range expansion
3 Most important threats	Traffic accidents, poaching

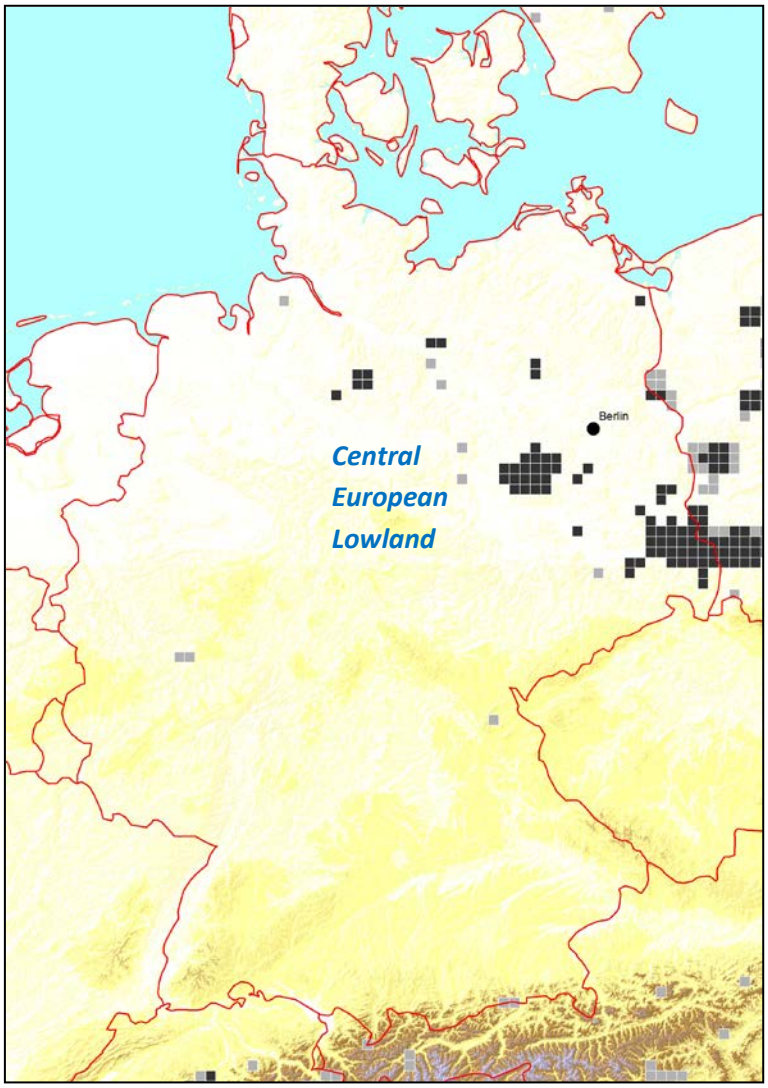
References:

Duchamp, C., Boyer, J., Briaudet, P.E., Leonard, Y., Perrine Moris, P., Bataille, A., Dahier, T., Delacour, G., Millisher, G., Miquel, C., Poillot, C. and Marboutin, E. (2012) – A dual frame survey to assess time and space related changes of the colonizing wolf population in France. Hystrix, 23 (1): 14–28

.

Wolf – Germany

Ilka Reinhardt



Wolf distribution in Germany in 2011/12.

Dark cell : permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presence]

1. Distribution

Wolves in Germany are found mainly in the north-east of the country. The first reproduction of wild wolves, after more than 100 years of absence, was confirmed in 2000 in Saxony, close to the Polish border. From there the population has been spreading to the north-west of the country. So far no expansion of the distribution range to the south / south-west has occured.

The distribution of wolves in Germany is split in two population segments: one in Lusatia with direct connection to the wolves in Western Poland, consisting of 12 wolf packs / pairs on the German side, and a second population segment consisting of 4 packs located about 120 km to the north-east (south-west of Berlin). In 2012 the first reproduction of wolves in Lower Saxony (south of Hamburg), was confirmed. In addition, several other occurrences of mostly single resident wolves have been confirmed.

The source population for wolves in Germany is the Baltic population via north-east Poland. However, genetic effective immigration from neighbouring populations seems to be rare since genetic analysis have shown that 12 years after recolanization, wolves in Germany are still closely related to each other. Consequently wolves in Germany and western Poland have been assigned to the Central European Lowlands population (formerly called the German / W-Poland population).

2. Population estimates & monitoring

In 2011 the minimum population size for Germany were 43 adult wolves living in 14 packs, three scent marking pairs and as single resident individuals (4). This estimate was based on C1 (hard facts) obtained due to camera trapping and / or genetic analysis. The population has been rapidly increasing from one pack in 2000 to 17 packs / pairs in 2011.

Germany is a federal country and nature conservation conservation and consequently monitoring falls under the jurisdiction of the states (Länder). Since 2009 the Länder adopted common national monitoring standards for large carnivore (Kaczensky et al. 2009).They specify how population size & trend, area of occurrence & trend and range of large carnivores (LCs) are to be documented. The standards aim to harmonise interpretation of monitoring data across the Länder. They clarify what signs of large carnivores and under what conditions qualify as hard evidence (C1), confirmed observation (C2), or unconfirmed observation (C3).

To estimate population size and determine the area of occurrence only hard evidence (C1) and confirmed observations (C2) are used. The area of occurrence is mapped on the 10 x 10 km EEA grid. A grid cell is considered occupied if one C1 or at least three independent C2 observations of wolves have been documented. Grid cells with only C3 observations (e.g. sightings) or too few C2 are not considered occupied by wolves; rather monitoring has to be intensified.

Monitoring effort varies greatly between the Länder according to their different monitoring structures and not all Länder have people experienced enough to evaluate wolf signs. To overcome this deficit, the people in charge of LC monitoring from the Länder with large carnivore presence meet once a year for a common Germany wide large carnivore population and distribution range assessment. The meetings have been organized since 2009 by the Federal Agency for Nature Conservation (BfN) and will be the basis for the FFH reporting.

3. Legal status & relevant management agencies

Germany adopted the Bern Convention in 1984 without reservations regarding the wolf. According to the Habitats Directive, the wolf is listed in Appendix II and IV. Nationally the wolf falls under the jurisdiction of the Federal Nature Conservation Act, where it is listed as strictly protected (§44 BNatschG 29.07.2009); enforcement is delegated to the Länder. In Saxony the wolf has recently (in September 2012) also become subject to the hunting law (with a yearround closed season), resulting in a double responsibility of nature conservation and hunting authorities in this Land.

According to the federalist system of Germany the management system is decentralised and the nature conservation authorities of the Länder are responsible for wolf management (in Saxony also the hunting authorities). In some Länder the regional ministries of the environment are in charge, in other Länder responsibility is further delegated to the district administrations.

Today, several Länder have developed regional wolf management plans, action plans or guidelines. These regional plans or guidelines, although called management plans, mainly deal with regional conflict mitigation and management competences. The plans do not define any population goals or management measures acting on the population level. Although a national management plan is not under consideration, a general framework on how wolf management should be organized exists (in BfN 2010 unpublished final report).

4. Population goal and population level cooperation

There are no explicite population goals for wolves in Germany so far, rather wolves should be allowed to "re-establish themselves in all suitable habitats". A modelling exercise showed that Germany has suitable habitat to house about 440 wolf packs (Knauer et al. 2010, in BfN 2010 unpublished final report).

On the population level there is a Polish-German wolf working group with the main aim to exchange information. Members are national and regional governments / agencies and wolf experts from both countries. The working group was initiated by the German Federal Agency for Nature Conservation and is chaired by Poland and Germany alternately. The working group commissioned a feasibility study for joint management of the common Polish-German population ("Review of wolf management in Poland and Germany with recommendation or future transboundary cooperation." Reinhardt et al. 2012). The next step will be to develop joint monitoring standards.

5. Conflicts and conflict management

Overall wolf-livestock conflicts in Germany seem moderate compared to many other European countries (Reinhardt et al. 2010, 2012). In the German lowlands, were most wolves occur prevention measures are much easier to implement than in high mountain areas where sheep are grazed unattended on alpine pastures.

In 2011 225 livestock, mostly sheep, were killed by wolves in Germany. Compensation is payed in all Länder that implemented Management Plans. Some Länder linked compensation to prevention. Several Länder provide funding for prevention measures for small livestock (sheep & goats). However, the procedure, the amount of funding and who can apply for funds differs widely among the Länder.

In Germany the main area of conflict is the lack of acceptance of wolves by hunters. Contrary to the general public, hunters' attitudes toward wolves are much more negative (Gärtner & Hauptmann 2005, Kaczensky 2006).

6. Threats

Threats to wolves in Germany are clearly associated with humans. Traffic is the main known cause of mortality followed by illegal killings (Reinhardt et al. 2012). Law inforcement is week when it comes to illegal killings.

Fragmentation of suitable habitat is dividing the wolf population into several population segments; this trend will rather increase in future with the spreading of the population. Maintaining connectivity between these segments will be important. The directional appearing wolf expansion is a hint that there might be (unknown) threats hindering the south-west expansion of wolves (Reinhardt & Kluth 2011, Reinhardt et al. 2012).

Connectivity with neighbouring populations is still weak and interbreeding between closely related animals common.

Management and monitoring fragmentation and the lack of cooperation between regional authorities are hindering a progressive and effective conflict management and a robust area-wide monitoring across intranational administrativ borders.

7. Summary table

Population size	2011/2012: 14 packs, 3 scent marking pairs, 4 single resident wolves (Σ 43 adult individuals)
Trend	increasing
Distribution range (# cells in the 10 x 10 km EEA grid)	2011/2012: 69 permanent cells & 9 sporadic cells
Range trend	increasing
Depredation costs / year	2011: 26'584 € (in some Länder not sufficiently protected small livestock is not compensated)
Number of cases / year	2011: 225 (mostly small livestock)
3 Most important threats	low acceptance by hunters & illegal killing, fragmentation & road accidents

References:

Gärtner, S. & Hauptmann, M. (2005): Das sächsische Wolfsvorkommen im Spiegelbild der Jägerschaft vor Ort - Ergebnisse einer anonymen Umfrage. Beiträge zur Jagd- und Wildforschung, 30:223-230.

Kaczensky, P. (2006): Akzeptanzstudie „Wölfe in Deutschland". Endbericht im Rahmen des F+E Vorhabens „Fachkonzept für ein Wolfsmanagement in Deutschland" (FKZ 805 86 007).

Kaczensky, P., Kluth, G. Knauer, F. Rauer, G. Reinhardt, I. & Wotschikowsky, U. (2009): Monitoring Large Carnivores in Germany. BfN – Skripten 251, Bundesamt für Naturschutz, Bonn, Germany.

Knauer, F. (2010): Habitatbewertung für Wolf, Braunbär und Luchs. Kapitel 4 aus: Projektteam Rahmenplan Wolf. 2010. Grundlagen für Managementkonzepte für die Rückkehr von Großraubtieren – Rahmenplan Wolf. Unpubl. Final Report.

Reinhardt, I., Rauer, J., Kluth, G., Kaczensky, P., Knauer, F. & Wotschikowsky, U. (2010): Synopse und Bewertung existierender Präventions- und Kompensationsmodelle. 55 pp. Kapitel 3 aus: Projektteam Rahmenplan Wolf. 2010. Grundlagen für Managementkonzepte für die Rückkehr von Großraubtieren – Rahmenplan Wolf. Unpubl. Final Report.

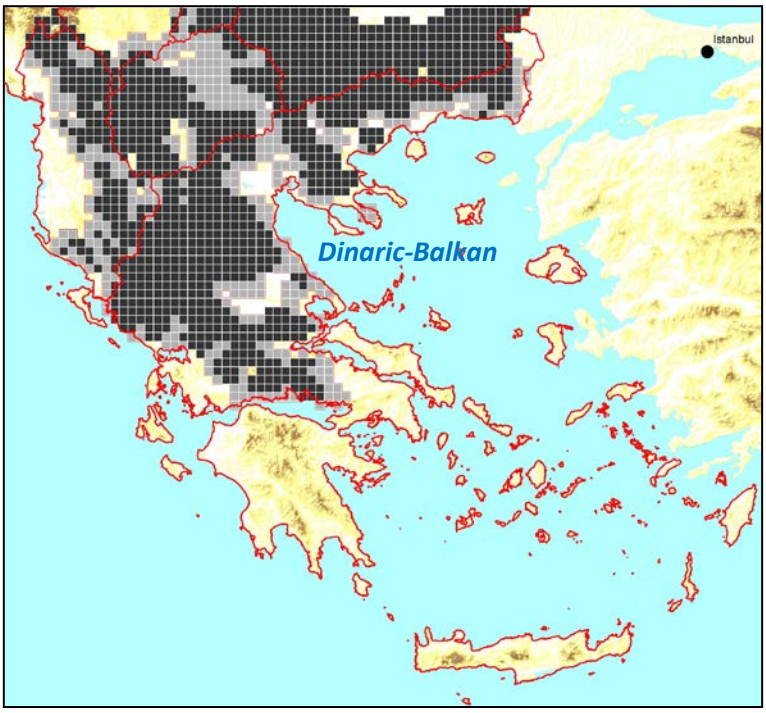
Reinhardt, I. & Kluth, G. (2011): Pilotstudie zur Abwanderung und zur Ausbreitung von Wölfen in Deutschland. Final Report, F+E Vorhaben (FKZ 806 86 080).

Reinhardt, I., Kluth, G., Nowak, S. & Myslajek, R. (2012): A review of wolf management in Poland and Germany with recommendations for future transboundary management. Final report for the German Federal Ministry of Environment, Nature Conservation and Nuclear safety (BMU) (N I 3 – 45031 POL/0).

Reinhardt, I., Rauer, J., Kluth, G., Kaczensky, P., Knauer, F. & Wotschikowsky, U. (2012): Livestock protection methods applicable for Germany – a Country newly recolonized by wolves. Hystrix, 23(1):62-72.

Wolf – Greece

Yorgos Iliopoulos



Wolf distribution in Greece 2006-2010.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves are found throughout continental Greece and form a large continuous population within the Dinaric-Balkan wolf population. There are no geographically separated sub-populations or population segments in Greece (Iliopoulos et al, 1999, 1999(1), 2000 Life project "Wolf" 1998-2001).

The area with stable presence of wolves covers ~50'000 km^2. The wolf distribution has been expanding during the last 20 years, mainly at the southern and western edge (central Greece and Epirus areas). Although the wolf distribution has been expanding it is not clear if the population increase is uniform. Livestock damage statistics and interviews of local people indicate a rather stable population in northern Greece (or decreased in some areas) and an increasing population in the southernmost areas of the wolf distribution.

Wolves have recently (2005-2012) occupied areas where they have been absent for at least 60 years (Boeotia prefecture). Wolf presence has been recently recorded and reported even close to Athens (Iliopoulos, pers. Observations). Damages caused by wolves in these new areas can be expected to be considerable as husbandry methods have been weakened. However, the most serious consequence is the social tension following wolf recolonization.

Wolf habitat in Greece includes mainly semi mountainous and mountainous areas below 1200m; here most reproduction events have been recorded (Iliopoulos, 2010). However, the species can also be found seasonally in agricultural and alpine areas.

2. Populations estimates & monitoring

Wolf numbers were last estimated at 700 individuals (minimum numbers) in 1999 (Iliopoulos et al, 1999, 1999[(1)] , 2000, Life project "Wolf" 1998-2001). The current population is expected to be larger, but an updated national estimation is still pending.

Since 1999, wolf population estimations and monitoring were undertaken in smaller areas with the use of simulated howling surveys, satellite telemetry, camera traps and recently with genetic analysis in the framework of different conservation or research projects.

Wolf territories estimated with satellite telemetry are large (400-600 km^2) conforming well to estimates undertaken with simulated howling surveys. Average wolf densities were estimated to be about 2 individuals per 100 km^2 (Iliopoulos et al, 2005, 2008, 2008b, 2009b).

Monitoring of the wolf population is planned in the near future only in the national parks to be undertaken once every 6 years.

3. Legal status & relevant management agencies

According to National Law 86/69 (articles 258§3z, 257§5, 259§2a) wolves were initially classified as pest species subjected to lethal control even within a bounty system. Yearly hunting regulations included wolves as pest species till 1993. Afterwards and according to a decision from the Greek ministry of agriculture (641/93) any reference of wolves as "pest" species was discontinued.

Recently, the legal framework concerning the conservation and management of the wolf in Greece is mainly dictated from the most recent European legislation ratified by the Greek authorities. The EC Habitats Directive (92/43 of 21.5.1992) (European Union members only) lists the wolf in Appendix II (needs habitat conservation) and Appendix IV (fully protected), but with the exception of the populations in Greece north of 39° longitude. Wolves can be hunted north of of 39° longitude in Greece only if exceptional reasons like public safety occur (11/ 12/98 article 13 §2 of Greek 92/43 ratification). Any such 92/43 declensions should be thoroughly justified by member states. The wolf is considered a vulnerable species according to Greek red data book (Iliopoulos 2009).

Wolf management falls under the jurisdiction of the Ministry of the Environment, regional administration and local forestry services. No active management is actually undertaken nor does a wolf management plan exist. Illegal human-caused mortality remains high (Iliopoulos et al, 1999a, 1999b, 2000, 2008b) and it has been roughly estimated locally to reach 25% of the estimated wolf numbers, (Iliopoulos et al, 2005, 2008a, 2008b). Persecutions are very rare and illegal wolf control efforts follow trends in seasonal livestock damage levels.

4. Population goal and population level cooperation

No population goals have been established officially. A wolf management plan is under consideration from the Ministry of Environment to be implemented in 2013-2014.

5. Conflicts and conflict management

Conflicts are widespread in the whole wolf distribution area. Wolf diet in Greece still heavily based on livestock and consequently several thousand sheep, goat, and cattle are killed each year. The national compensation system covers damages larger than 200 euros per attack (ELGA 2011) and is uniform in all wolf areas throughout Greece. Killed livestock are covered up to 90% of their value following inspection by qualified veterinarians. Milk production or other interest lost following depredation is not covered. The system covers all livestock species except dogs.

However, damages remaining largely unreported as the bureaucratic procedures and a high rejection rate of compensation claims discourage farmers from applying. It has been estimated that only ~25% of the actual damages are covered by the national compensation system (Iliopoulos et al, 2001). Recent wolf telemetry studies showed that a large part of the wolf related livestock kills remain unrecorded as dead livestock retrieval is difficult in densely forested areas (Iliopoulos et al, 2009, Iliopoulos et al, 2012 in preparation).

Use of shepherd dogs and herd supervision are widespread amongst farmers. Efforts to restore traditional guarding dog breed (Greek sheepdog) are ongoing from national NGO's and also local dog breeders as farmers show great interest on maintaining and enforce the measure.

In the near future the Ministry of Environment plans to incorporate special agro-environmental measures to further support this preventive measure.

6. Threats

Rapid habitat fragmentation is ongoing due to the construction of major highways and other infrastructure throughout wolf range (Iliopoulos et al, 2009b, 2010c). Human caused mortality remains high. Illegal use of poison baits is uncontrolled and extremely widespread. Rabies has been locally reported in wild fox populations very recently and this may also affect wolf population if the outbreak is not effectively controlled. Hybridization with dogs has also been recorded and needs further investigation.

Although illegal wolf removals remain high, the wolf population is expanding - probably as a consequence of being part of the large Dinaric – Balkan population.

In the medium to long term, a shortage of food resources may become a threat (free ranging livestock is decreasing, garbage dumps and carrion sites (which represent an important food resource) are being closed, densities of wild ungulates (roe deer and wild boar) are still low compared to other European populations, due to poaching, uncontrolled hunting and complete lack of appropriate game habitat and hunting management.

7. Summary table

Population size	1999 minimum estimate: 700
Trend	Increasing in southern part of distribution - stable or unclear trends in rest of the wolf distribution
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 507 Sporadic: 208
Range trend	Increasing
Depredation costs / year	~800'000 – 1'500'000 €
Number of cases / year	Probably only ~25% of damages get reported. 2006-2009 average: ~20'000 sheep, ~12'000 goat, ~2000 cattle, ~2000 horses/mules/donkeys
3 Most important threats	Illegal killing, shortage of natural food sources, poisoning

References:

Iliopoulos, Y. (1999). Wolf distribution, population estimates and trends in Greece. Interim report. Project LIFE "Lycos" NAT 97/GR/04249, Arcturos, E.C DGXI, Ministry of Agriculture (in Greek).

Iliopoulos, Y. 1999. Monitoring of wolf population in Central Greece. Estimates of wolf population and human caused mortality. 1st annual interim report. Project LIFE "Lycos", NAT 97/GR/04249Arcturos, E.C DGXI, Ministry of Agriculture (in Greek).

Iliopoulos, Y. (2000). Monitoring of wolf population in Central Greece. Estimates of wolf population and human caused mortality. 2d annual interim report 2000. Project LIFE "Lycos" NAT 97/GR/04249, Arcturos, E.C DGXI, Ministry of Agriculture (in Greek).

Iliopoulos,Y. P. Menounos, P. Pavlides, S. Tzortzakis, 2001. "Damage inspection and compensation in Fthiotida and Trikala prefectures. Data presentation and evaluation: factors influencing depredation levels per attack and per farmer". Project LIFE "Lycos" NAT97-GR04249: Conservation of the wolf (*Canis lupus* L.) and its habitats in Greece (Arcturos, EC DGEnv, Greek Ministry of Agriculture).

Iliopoulos, Y. (2005). "Linkage areas of wolf distribution in the alignment of EGNATIA highway – section 4.1- Grevena", Pp.198-287 in: "Monitoring and evaluation of Egnatia highway construction (section 4.1.) on large mammals and their habitats, pre – construction phase". Project final report (Arcturos NGO- EGNATIA S.A.), 120pp. + GIS maps.(in greek).

Iliopoulos, Y. (2008). “Effects of Egnatia construction on local wolf population in the alignment of EGNATIA highway – section 4.1- Grevena”, in: “Monitoring and evaluation of Egnatia highway construction (section 4.1.) on large mammals and their habitats – during construction phase”. 2d Interim report, Callisto NGO, EGNATIA S.A.

Iliopoulos Y., 2008b. “Distribution, population estimates, conservation problems and management of wolf, in Northern Pindus National Park”, pp 100. Callisto NGO, Management authority of Northern Pindus National Park. In: Special Environmental study (monitoring) of the Northern Pindus National Park.

Iliopoulos, Y., Sgardelis, S., Koutis, V., Savvaris, D., 2009. Wolf depredation on livestock in Central Greece. Acta Theriologica 54 (1): 11-22. http://acta.zbs.bialowieza.pl/contents/?art=2009-054-001-0011

Iliopoulos, Y. (2009b). “Effects of Egnatia construction on local wolf population in the alignment of EGNATIA highway – section 4.1- Grevena”, in: “Monitoring and evaluation of Egnatia highway construction (section 4.1.) on large mammals and their habitats – during construction phase”. Project final report (Callisto NGO- EGNATIA S.A.), 100pp. + GIS maps (in Greek).

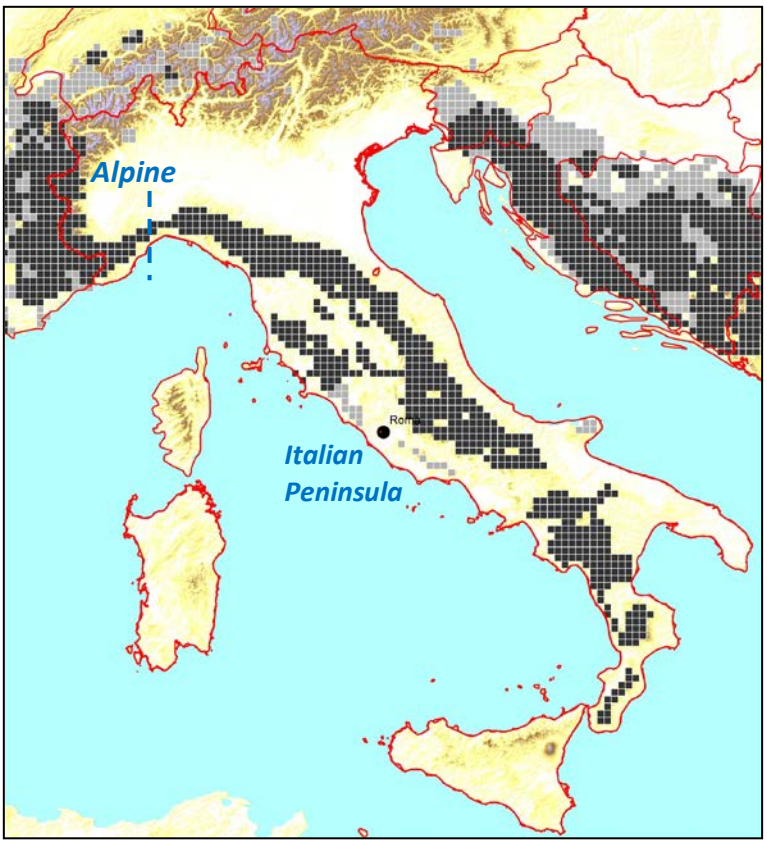
Iliopoulos, Y., 2009. Wolf status, Pp: 389-90, *in* Red Data Book. Greek Zoological society, (Legakis and Maragou, eds.), (In Greek), 525pp.

Iliopoulos, Y. (2010). Wolf pack (*Canis lupus*) territory selection in Central Greece: habitat selection, daily movements and effect on livestock, 2010. PhD Thesis. Aristotle University of Thessaloniki.

Iliopoulos, Y. Giannakopoulos, A. Petridou, M. Lazarou, Y. and Galinos, S. (2010). Monitoring wolf population in the construction zone of the high speed railway (Leinokladi- Domokos) in Central Greece. Interim report. Callisto NGO (in Greek).

Wolf – Italy

Luigi Boitani and Francesca Marucco



Wolf distribution in Italy, Italian Peninsula 2006-2011, Alpine 2010-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves in Italy are distributed all along the Apennines mountain range from Calabria to Liguria and extending into the western Alps, also sending dispersers toward the central-eastern Alps and into Switzerland and as far as Germany and Austria. For management purposes, the Italian wolves are divided in two populations: the largest and oldest population (Italian peninsula) occupies the entire Apennines range and extends also to the hilly areas of central Tuscany and northern Lazio. A small but important extension of this population is found also in the mountain area of central-western Puglia. The extent of this large population lacks continuity (but not functional connectivity) between central and southern Italy in the provinces of Avellino and Benevento that are densely populated and intensively used for agriculture. Historically, this population had been reduced in the '60s to a range south of Florence but dispersing animals have been always found all along the Apennines. The total area covered by this population is grossly estimated at about 60.000 km^2.

Stemming from the expansion of the peninsular population, in 1992 the wolf reappeared in the western Alps and a new (Alpine) population has been steadily building up occupying both the Italian and French side of the Alps and further westward into France. Hence, the Alpine wolf population originated by natural expansion of the Apennine population. A moderate bottleneck occurred during the recolonization process, and gene flow between the Apennines and the Alps was moderate (1.25-2.50 wolves per generation) (Fabbri et al. 2007). Bottleneck simulations showed that a total of 8-16 effective founders explained the genetic diversity observed in the Alps (Fabbri et al. 2007). Therefore, the levels of genetic diversity in the current expanding alpine wolf population totally depends on future successful migrants from the Apennines. The current extent of this population on the Italian side is 5500 km^2 but dispersing animals have been found as far as western Pyrenees, southern Germany and Austria, eastern Switzerland and central-eastern Italian Alps.

The separation between the two Italian populations has been arbitrarily set at the Colle di Cadibona which also marks the geographical separation of the Alps and Apennines: although there is evidence of continuous, albeit tenuous genetic flow between the two populations (Fabbri et al. 2007, Ciucci et al. 2009) and, by all biological standards, they form only one population but significant differences in the ecological, social and economic contexts justify the separation in two populations for management purposes(WAG, 2012).

In 2012, the first contact between the Italian Alpine and the Dinaric wolf populations, which have been separated for centuries, has been documented in the Italian eastern Alps (regione Veneto), where a male wolf from Slovenia formed the first pair in the area with a female wolf from the Italian Alpine population.

2. Population estimates & monitoring

Italian peninsula

The size of the Italian peninsula population has never been researched using range-wide sampling and estimation methods that could provide numbers and their level of confidence. Only expert opinions based on the extrapolation of well known local estimates the entire range have been available (Boitani 1992, Ciucci and Boitani 1998a). Local estimates have been produced with excellent accuracy and sufficient precisions but these have been restricted to few protected areas (e.g. National Park of Abruzzo, Lazio and Molise: Ciucci & Boitani 2010; National Park of Pollino: Ciucci & Boitani 2004; National Park of Foreste Casentinesi and Province of Arezzo: Apollonio et al. 2004; Northern Apennines: Caniglia et al. 2012). Extrapolation of these densities to the (estimated) entire range has been applied with several caveats and the results are valid only as broad guesstimates and suffer from subjectivity and inconsistencies among different authors. The minimum current working figure for this population is 600-800 animals: number of individuals are still given instead of number of packs as there is no concerted effort to assess pack densities and distribution over the entire range. Moreover, the unpredictability of snow cover in large parts of the range and lack of interest in the regional governments have prevented a coordinated effort to survey range and densities of the wolf through snow-tracking or other methods (e.g., wolf-howling) across the entire peninsular range: fragmentation of the responsibility among 14 different regions and the complete lack of interest/support by the central authority of the Ministry of Environment have left all estimates to the level of personal opinions.

Indirect index of presence/abundance such as reported livestock killed, wolf carcasses found, sightings, partial and local surveys all suggest that the current population is approximately stable in its distribution and size. With few local exceptions (i.e., few National Parks and a large portion of the Northern Apennines, see citations above), there is no monitoring scheme in place, although this has been a timely recognized priority at the national scale (Genovesi 2002) and technical guidelines have accordingly been made available to the Ministry of the Environment (Ciucci & Boitani 2011).

Alpine population

The commitment of the Regione Piemonte on managing wolves since their reappearance in the Alps has been excellent and the results are the outstanding series of population assessments and monitoring scheme implemented in the last 12 years. The current size of the population is estimated to be at least 70 wolves distributed in at least 15 packs: 14 packs in Piemonte and one in Val d'Aosta (Marucco et al. 2010, 2012). Wolves are now found all along the western Alps in Piemonte with limited presence in Val d'Aosta (Gran Paradiso National Park). Using a combination of snow-tracking, non-invasive genetic sampling and wolf-howling techniques, staff from the Forestry Service and rangers of the regional and national protected areas contributed to assess and monitor population size and distribution over the years in Regione Piemonte. Unfortunately, the current regional administration in 2012 halted the continuity of this effort which will be minimized.

3. Legal status & relevant management agencies

In Italy, wolves are fully protected by the Habitat Directive (Annex II and IV), the Bern Convention and national law 157/92 and wolf management falls under the jurisdiction of the Ministry of the Environment. However, the Ministry has been notably absent on all wolf management issues, even though an Action Plan at the national level (Genovesi 2002) prescribed a different course of action. Enforcement and implementation of the laws is left to the Regions: in particular, regional laws provide compensation for damages to livestock with a great diversity of provisions (amount reimbursed, procedures for reimbursement, etc.; for a critical review see Boitani et al. 2010). No derogation has ever been requested/granted for culling under article 16 of the Habitat Directive. No active management is actually undertaken. A national wolf management plan exists (Genovesi 2002) but no single action was ever implemented since its formal approval. Illegal human-caused mortality remains high (e.g., Lovari et al. 2007, Ciucci et al. 2007) and it has been roughly estimated locally to reach 20% of the estimated wolf numbers (Boitani & Ciucci 1993). No illegal wolf killing has ever been seriously investigated and no effort exists to control illegal killing.

4. Population goal and population level cooperation

There is a "National Action Plan for Wolf Conservation and Management" (Genovesi 2002) approved by the Ministry of the Environment , which provides management guidelines for the whole country (the guidelines are not legally binding), but no no specific population goals or limits to population growth. However, actions and general goals prescribed in the Action Plan were never implemented due to lack of funds and political support.

A research/monitoring informal partnership, called Wolf Alpine Group (WAG), among Italian, French, and Swiss biologists, and further extended to Slovenian, Austrian, and German ones, has been established in 2001 to monitor the Alpine population, and has been active since. A formal agreement have been signed in 2006 by the Ministries of Environment of France, Swiss, and Italy to formally collaborate in the management of the wolf alpine transboundary population. This group has been active only in 2006-2009. More recently (2011), in the framework of the Alpine Convention, the Large Carnivores, Wild Ungulates and Society (WISO) Platform is developing a Project (called ROWALPS) aimed at setting an effective stage for a common management of the transboundary wolf and lynx populations in the Alps.

5. Conflicts and conflict management

Wolves kill livestock throughout their range and especially in areas that were recolonized after decades/centuries of absence. In particular, damages are more serious in central-western Tuscany where farmers are from Sardinia, a region where wolves never existed and livestock husbandry methods evolved in absence of wolves (Ciucci & Boitani 1998b). Conflict is (non-)managed in a variety of approaches by the regional governments, ranging from no intervention at all to provision of funds for prevention methods (guarding dogs, electric fences, salary for shepherd, etc.) to financial incentives to subscribe insurance policies against predation by wolves. There is no national database for conflict data and also many regional administration do not keep formal records on the compensation schemes, making it impossible to have a comprehensive figure on damages at national level (Boitani et al. 2010). However, a gross estimate may be ranging in the order of 1.5-2 million euros.

In the Alps, damages are limited thanks to intensive programs implemented by the Regione Piemonte to prevent damages through providing electric fences, guarding dogs and veterinary support to shepherd and farmers. The total of all direct losses in Regione Piemonte in 2010 was 68,000 Euros and in 2011 was about 73,000 Euros (Dalmasso et al. 2012). In spite of this limited damage and the obvious success of the regional program of conflict management, there are recurrent attempts to claim that wolf damages are unsustainable.

6. Threats

Illegal killing remain the most important cause of mortality, particularly through the illegal use of poison baits which is increasingly widespread and largely uncontrolled, and has been documented in also Piemonte (Marucco et al. 2009, 2010). Hybridization with dogs is also increasingly reported and in several areas of central Apennines it has become a serious concern (Ciucci 2012, Randi 2008). Based on recent non-invasive genetic surveys and morphological analyses (Ciucci 2012, Randi pers. comm.), introgressed wolves are particularly frequent and established in wolf packs along the Northern Apennines, from where this problem might likely extend to the Alpine range in the near future. The LIFE project IBRIWOLF is being implemented (2011-2014) to define the problem and start implementing actions to remove hybrids in two areas of Tuscany: this threat may well be key to the medium-term conservation of wolves in Italy.

Negative attitudes remain high in few local situations (e.g. southern Tuscany), especially when exploited for political reasons (e.g. Piemonte), but are not a widespread concern.

In general, administrative fragmentation and the obvious absence of any national authority on the scene of wolf management is to be considered an important threat that needs to be urgently addressed through a renewed effort by the Ministry of Environment as the key agency to coordinate the regional governments in implementing national and EU laws. The lack of an effective functional link between scientific data, stakeholders and the authorities in charge of adopting and implementing management policies is also a major concern that needs to be urgently addressed.

7. Summary table

Population size	Italian Peninsula: 600-800 Alps (winter 2010/11): 15 packs (≥70 wolves)
Trend	Italian Peninsula: stable Alps: increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Italian Peninsula: Permanent: 572, sporadic: 24 Alps: Permanent: 53, sporadic: 5
Range trend	Italian Peninsula: stable Alps: increase
Depredation costs / year	Italian Peninsula: No data available for livestock compensation at national level, data are available only for some protected areas. Alps (Piemonte Region 2011): 72'953 € & 19'703 € indirect losses
Number of cases / year	Italian Peninsula: No data available for livestock compensation at national level, data are available only for some protected areas. Alps (Piemonte Region 2011): 383 mostly sheep/goats
3 Most important threats	Italian Peninsula: hybridization with dogs, illegal killing Alps: accidental killing, traffic accidents, illegal killing, small population

References:

Apollonio M, L Mattioli, M Scandura, L Mauri, A Gazzola, E Avanzinelli. 2004. Wolves in the Casentinesi Forests: insights for wolf conservation in Italy from a protected area with a rich wild prey community. *Biological Conservation* 120:249-260

Boitani, L. 1992. Wolf research and conservation in Italy. *Biological Conservation* 61: 125–132.

Boitani L., P. Ciucci. 1993. Wolves in Italy: critical issues for their conservation. Pp. 75-90, in (C. Promberger, W. Scröeder, ed.): "Wolves in Europe - Status and perspectives". Wildbiologische Gesel. Munchen.

Boitani, L., P. Ciucci, E. Raganella-Pelliccioni. 2010. Ex-post compensation payments for wolf predation on livestock in Italy: a tool for conservation? *Wildlife Research* 37:722-730.

Caniglia R., E. Fabbri, S. CVubaunes, O. Gimenez, J-D Lebreton. 2012. An improved procedure to estimate wolf abundance using non-invasive genetic sampling and capture-recapture mixture models. *Conservation Genetics* 13:53-64.

Ciucci, P. 2012. Ibridazione con il cane come minaccia per la conservazione del lupo: Stato delle conoscenze e criteri per l'identificazione degli ibridi. Progetto Life Ibriwolf LIFE10NAT/IT/265. Provincia di Grosseto, Grosseto.

Ciucci P., L. Boitani. 1998*a*. Il lupo. Elementi di biologia, gestione, ricerca. Istituto Nazionale per la Fauna Selvatica, Documenti Tecnici 23: 1–114.

Ciucci P., L. Boitani. 1998*b*. Wolf and dog depredation on livestock in central Italy. *Wildlife Society Bulletin* 26:504–514.

Ciucci, P., L. Boitani. 2004. Progetto per la ricerca e conservazione del Lupo (*Canis lupus*) nel Parco Nazionale del Pollino: relazione finale delle attività di ricerca (1999-2003). Ente Parco Nazionale del Pollino, Rotonda. 196 pagg.

Ciucci, P., L. Boitani. 2010. Conservation of large carnivores in Abruzzo: a research project integrating species, habitat and human dimension. Annual Report 2009. Widlife Conservation Society, New York, N.Y.

Ciucci, P., L. Boitani. 2011. Monitoraggio del Lupo in Italia: inquadramento, finalità e prospettive. Istituto Sperimentale per la Ricerca Ambientale e Ministero dell'Ambiente e della Tutela del Territorio e del Mare, Roma. 18 pagg.

Ciucci, P., G. Chapron, V. Guberti, L. Boitani. 2007. Estimation of mortality parameters from (biased) samples at death: are we getting the basics right in wildlife field studies? *Journal of Zoology*, *London* 273:125-127

Ciucci, P., W. Reggioni, L. Maiorano, L. Boitani. 2009. Long distance dispersal of a rescued wolf from the northern Apennines to the western Alps. *Journal of Wildlife Management* 73:1300-1306.

Dalmasso, S., U. Vesco, L. Orlando, A. Tropini, C. Passalacqua. 2012. An integrated program to prevent, mitigate and compensate wolf (*Canis lupus*) damage in the Piedmont region (northern Italy). *Hystrix, the Italian Journal of Mammalogy* 23 (1). doi:10.4404/hystrix-23.1-4560.

Fabbri, E., C. Miquel, V. Lucchini, A. Santini, et al. 2007. From the Apennines to the Alps: colonization genetics of the naturally expanding Italian wolf (*Canis lupus*) population. *Molecular Ecology* 16:1661–1671.

Genovesi P. (ed). 2002. Piano d'azione nazionale per la conservazione del lupo (*Canis lupus*). Min. Ambiente – Ist. Naz. Fauna Selvatica, Quad. Cons. Nat. 13,

Lovari S., Sforzi A., Scala C., Fico R. 2007. Mortality parameters of the wolf in Italy: does the wolf keep himself from the door? *Journal of Zoology, London* 272: 117–124.

Marucco, F., D. H. Pletscher, L. Boitani, M. K. Schwartz, K. L. Pilgrim, and J. D. Lebreton. 2009. Wolf survival and population trend using non-invasive capture-recapture techniques in the Western Alps. *Journal of Applied Ecology* 46: 1003-1010.

Marucco, F., E. Avanzinelli, S. Dalmasso, L. Orlando, and L. Boitani. 2010. Rapporto 1999-2010 - Progetto Lupo Piemonte. Regione Piemonte, Torino.

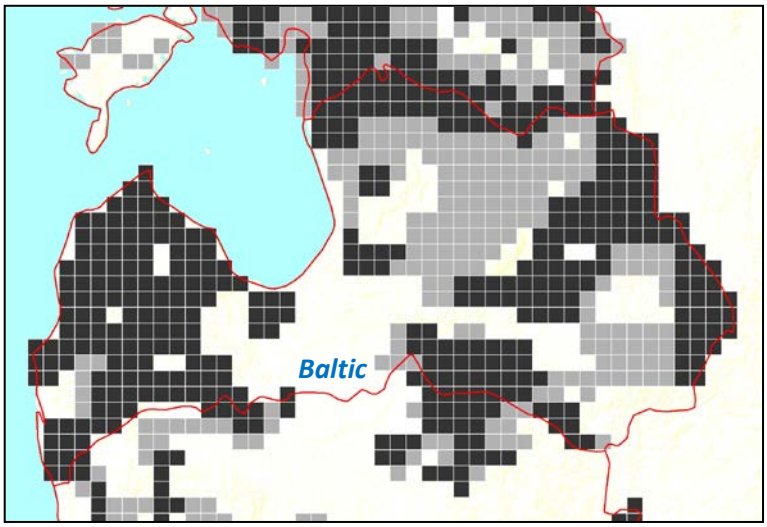
Marucco, F., E. Avanzinelli, L. Boitani. 2012. Non-invasive Integrated Sampling Design to Monitor the Wolf Population in Piemonte, Italian Alps. *Hystrix, the Italian Journal of Mammalogy* 23 (1):5-14.

Randi E. 2008. Detecting hybridization between wild species and their domesticated relatives. *Molecular Ecology* 17: 285–293.

WAG. 2012. Wolf population status in the Alps: pack distribution and trend from 1993 to 2009. Published LCIE Web site http://www.lcie.org.

Wolf – Latvia

Janis Ozolins



Wolf distribution in Latvia 2006-2012. (Distribution in Russia and Belarus not shown)

Dark cells: reproduction presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves in Latvia belong to the large Baltic population and are found in whole territory. However, the breeding population is unevenly distributed and wolf occurrences are rare in the central part of the country near the capital Riga and further southwards to the Lithuanian border. West Latvia is evenly inhabited by wolves while in the east wolves are many breed in remote woods along the Estonian, Russian, Belarussian and Lithuanian borders. Distribution pattern has been stable for a long period since the 1980s, however the population seems to be split into two or even three segments with distribution centres in the west, north-east and south-east of the country. Some morphometric and demographic differences are detected among these segments (Andersone and Ozoliņš 2000, Ozoliņš et al. 2011).

2. Population estimates & monitoring

The population in Latvia is estimated at a minimum of 300 individuals based on cohort analysis of hunting bags from 1998 till 2010. The population is stable or slightly growing after a period of decline caused by strong control and bounty payments in the 1990s.

All legally shot or found dead wolves are reported to the State Forest Service hence the national distribution maps (10 x 10 km EEA grid) can be produced based on hunting data. Cells with kills of reproductive females and/or pups were defined as “permanent” while the kills of other age and sex groups as “sporadic”. In addition, nearly 40% of annual hunting bag is examined for exact animal age and female fecundity in laboratory (Ozoliņš et al. 2001). Thus, cohort analysis can be carried out by mutual comparison of age structure, birth and survival rates in annual samples.

3. Legal status & relevant management agencies

In Latvia, the wolf has the status of a protected species that can be exploited to a limited extent by sport hunting and for damage control to livestock. The hunting season is open from the 15th July until the 31st of March. Quotas are set and controlled by the State Forest Service under the Ministry of Agriculture. The first quota in 2004 was calculated as average cull within period when bounties were abolished but no hunting restrictions introduced yet (1999 – 2003: average 150). Further quotas

were adjusted to the changes in demographic structure and reproductive success gained by investigations of wolf carcasses from hunting bags. Changes in distribution pattern of wolf population and predation on livestock have been considered too. The quota can be generally used for the entire territory excluding the central part of the country with least occurrence of carnivores. As soon as the quota is fulfilled, wolf hunting is stopped until the next season. So far, hunting has been limited to a maximum of 200 individuals a year. Fines for poaching are appointed in cases the killing occurred during the closed season or in a protected area and the hunted animal is not reported to the State Forest Service in the line with the Hunting Regulations. The National Action Plan for the Conservation of the Wolf (2003) has been updated in 2008. Further updates are liability of the Nature Protection Board under the Ministry of Environment and Regional Development.

4. Population goal and population level cooperation

There are no explicit population goals for the wolf in Latvia. Species conservation objective is to maintain the Latvian wolf population of least 300-500 individuals for the future ensuring (1) continuous species distribution, (2) an adequate environmental carrying capacity, and (3) natural ecological functions (namely predator-prey relationships) of the species in the ecosystem.

Despite shooting more than 150 wolves annually, gaps in distribution pattern and comparatively long open season for hunting, wolf management in Latvia does not seem to cause any threat to the continuity of the population within the Baltic region (Ozoliņš et al. 2011). However, the sub-population in east Latvia depends on a good geographical connectivity to Estonia, Russia and Belarus, obviously enabling replacement of lost individuals by immigrants across the border.

5. Conflicts and conflict management

The main reason for wolf hunting in Latvia is a deeply rooted belief among hunters that wolf is their competitor for wild ungulates. Attitudes of the hunters are based on observations that wolves diminished ungulate populations (Valdmann et al. 2005, Žunna et al. 2009) especially during deep snow conditions (actually winters in 2009 and 2010). Damage to livestock is very limited and localised. A compensation system of damages to livestock has been not implemented.

Wolf hunting is not only a measure of population control but also a hunting tradition in itself. The wolf has always been a relatively rare trophy and killing one increases the social rank among fellow hunters. In the last few years there has been an increased demand for stuffed wolves as an interior design feature. Thus, interest or value conflicts may appear between people that like or dislike hunting leaving damage and conservation problems behind. Attitude problem needs permanent mitigation using broad methods of raising public awareness and involvement of hunters in research activities – e.g. reporting and providing wolf carcasses for monitoring.

6. Threats

A low acceptance resulting in attempts to eradicate wolves from hunting grounds has been and still are the main factors limiting wolf population in Latvia for the last two centuries (Andersone and Ozoliņš 2004). Harvest has appeared rather sustainable, nevertheless the future of the population will depend on the success of adaptive management based on comprehensive monitoring and spatial continuity of the Baltic wolf population. A gap in the wolf distribution in central Latvia is a reason for concern. A low forest cover and a high degree of urbanization in the surroundings of Riga hinders animal dispersal between the east and the west. In the long term this may increase isolation between sub-populations resulting in decreased genetic diversity unless ecological corridors are ensured.

Hybridization with stray dogs has been detected and its scale and consequenses should be further monitored (Andersone et al. 2002).

7. Summary table

Population size	≥ 300
Trend	Stable or slight increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 131 Sporadic: 161
Range trend	Stagnant
Depredation costs / year	None
Number of cases / year	2008-2011 range: 50-239 domestic animals
3 Most important threats	low acceptance by hunters, spatial gap in distribution in middle part of the country, limited institutional capacity for population monitoring

References:

Andersone Ž., Lucchini V., Randi E., Ozoliņš J. 2002. Hybridisation between wolves and dogs in Latvia as documented using mitochondrial and microsatellite DNA markers. – *Mammalian Biology*, 67: 79-90.

Andersone Ž., Ozoliņš J. 2000. Craniometrical characteristics and dental anomalies in wolves *Canis lupus* from Latvia. – *Acta Theriologica,* 45 (4): 549-558.

Andersone Ž., Ozoliņš J. 2004. Public perception of large carnivores in Latvia. – *Ursus,* 15(2): 181-187.

Ozoliņš J. 2006. „Appearance from the other side" – strengths and weaknesses of large carnivore management system in Latvia. – Environmental encounters, No. 60, Proceedings, Transboundary management of large carnivore populations, Osilnica (Slovenia), 15-17 April 2005: 72-74.

Ozoliņš J., Andersone Ž., Pupila A. 2001. Status and management prospects of the wolf *Canis lupus* L. in Latvia. – *Baltic Forestry*, 7 (2): 63-69.

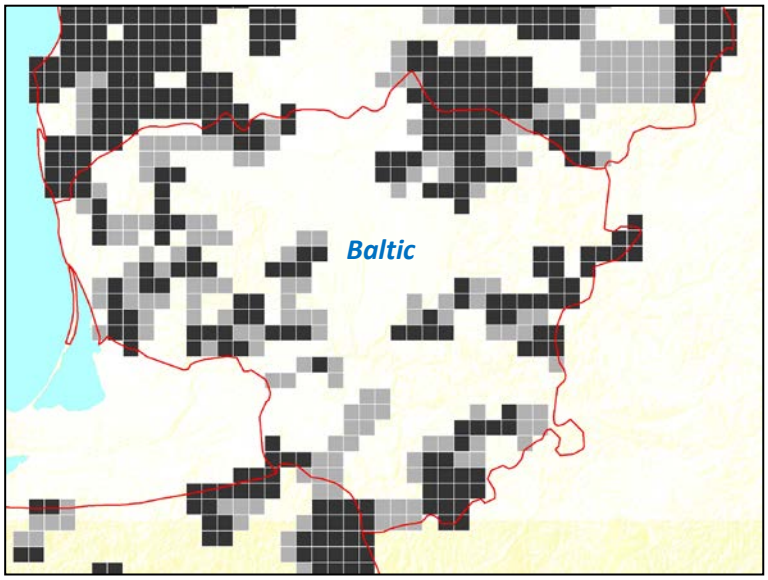
Ozoliņš, J., Stepanova, A., Žunna, A., Bagrade, G., Ornicāns, A. 2011. Wolf hunting in Latvia in the light of population continuity in the Baltics. In: M. Stubbe (ed.), Beiträge zur Jagd- und Wildforschung, Band 36, Halle/Saale: Gesellschaft für Wildtier- und Jagdforschung e.V., S. 93-104.

Valdmann H., Andersone-Lilley Z., Koppa O., Ozolins J., Bagrade G. 2005. Winter diets of wolf *Canis lupus* and lynx *Lynx lynx* in Estonia and Latvia. – *Acta Theriologica,* 50 (4): 521-527.

Žunna A., Ozoliņš J., Pupila A. 2009. Food habits of the wolf *Canis lupus* in Latvia based on stomach analyses. - *Estonian Journal of Ecology*, 58, 2: 141-152.

Wolf – Lithuania

Compiled by Guillaume Chapron from data provided by Vaidas Balys, Raimonda Bunikyte & Linas Balciauskas



Wolf distribution in Lithuania 2006-2011. (Distribution in Russia and Belarus not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

According to data presented by country officials in the process of negotiations of joining EU (in 2000-2004), wolves were common throughout the country, permanently inhabiting 20% of forests (which cover 30% of the country). Nowadays, the range is estimated from snow tracking by calculating a number of forest districts with fresh wolf tracks. The average area of forest district is 190 km^2, which roughly corresponds to the territory of a wolf pack. In 2010-2012, fresh wolf tracks were registered during snow-tracking days in 30% of forest districts.

2. Population estimates & monitoring

The wolf population is estimated at about 300 wolves (or 60-70 packs, see Špinkytė-Bačkaitienė 2012). Monitoring is done by snow tracking by foresters and snow tracking in reference areas. Snow tracking by foresters is carried out in the end of February or the beginning of March by recording wolf tracks on two occasions within 3-5 days of interval on selected routes (10 km long, where likelihood of finding tracks is believed to be the highest). Results are presented as a minimum count (double counting can however not be ruled out). Every 3 years, a more intense snow tracking is carried out by the Institute of Ecology in 30 selected territories over the country with more elaborated track forms and a more thorough data analysis.

3. Legal status & relevant management agencies

The wolf is a protected species in the national legislation since 2006. Lithuanian wolves are on Annex V of the Habitats Directive and Appendix III of the Bern Convention. There is potentially a limited hunting season (October 15 – April 1). No Natura 2000 territories are designated for the species in Lithuania. The Ministry of Environment is responsible for the management of the population. In practice, the Directorate General of State Forests (at the Ministry of Environment) is responsible for population monitoring by annual snow tracking by foresters. The Environmental

Protection Agency (also under the Ministry of Environment) and its regional departments are responsible for supervising game hunt (season, quota, regional limitations, etc.). The state Service for Protected Areas (also under the Ministry of Environment) is responsible for supervising protected areas.

4. Population goal and population level cooperation

Since winter 2012, a Wolf Population Control Plan [http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_bin?p_id=418731] defines the population goals (favourable population: 250 individuals, maximum population: 400 individuals), hunting regulation with an annual hunting quota that may not exceed 20% of population and monitoring of population (annual snow tracking). Currently, wolves are not hunted in nature reserves (the most strictly protected areas, where no human is allowed to carry out any activity or to walk there without a special permission). However, in other types of protected areas (e.g. landscape protected areas, national or regional parks) wolves can be hunted, even though there is a "no hunting in protected areas" comment in the Wolf Population Control Plan. However, as no methodology is being proposed on how this measure should be implemented, this record remains vague in practice. A broader Wolf Population Management Plan is meanwhile being developed by a group consisting of representatives of official institutions (Ministry of Environment, General Directorate of Forestry, State Service for Protected Areas, Ministry of Agriculture) and main stakeholders: farmers, hunters, scientists, and NGOs. There are no formal or informal transboundary arrangements concerning cooperation in wolf management, but it is hoped this will be arranged in the future and put in the management plan.

5. Conflicts and conflict management

There is neither a livestock depredation compensation scheme nor funding available for adopting mitigation measures. Wolves, together with feral dogs and stray domestic dogs are believed to be the main predators on sheep, goats, and cattle (usually calves). Owners of farm animals are obliged to keep an up-to-date data on their animals in the State Register of Farm Animals and upon the case of loss due to depredation they must fill in an appropriate form within a month so that the data in the Register is updated. However, as no compensations are paid, incentives to fill in forms are low and furthermore, animals can be registered as killed by wild predators while the cause of death remains unclear. Interviews conducted in the early 2000's indicated that depredation was widespread.

6. Threats

Threats to the wolf population in Lithuania are infrastructure development, habitat fragmentation, illegal killing (and also of their prey), low acceptance due to conflicts with hunters and poor management structures. Also, neighboring countries (Latvia, Belarus, and Poland) apply very different wolf management regimes ranging from full protection (Poland) to exploitation (Latvia) to large scale culling (Belarus). This creates difficulties for forecasting population trends and choosing the appropriate management and conservation measures. The lack of scientific data could also be named as a threat, since it becomes difficult to establish a good management strategy without a solid platform of research based knowledge. The level of poaching is also unknown here, so, even if this threat cannot be ruled out, it is not known how serious a threat it is.

7. Summary table

Population size	2011: 200-300
Trend	Stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 142 Sporadic: 125
Range trend	Stable or increasing
Depredation costs / year	No compensation system
Number of cases / year	No information
3 Most important threats	Low acceptance, lack of knowledge, poor management structure

References

Bačkaitienė, R.S. 2012. The influence of environmental factors on the population of wolves (Canis lupus lupus L.) in Lithuanian forests. PhD dissertation, Aleksandras Stulginskis University.

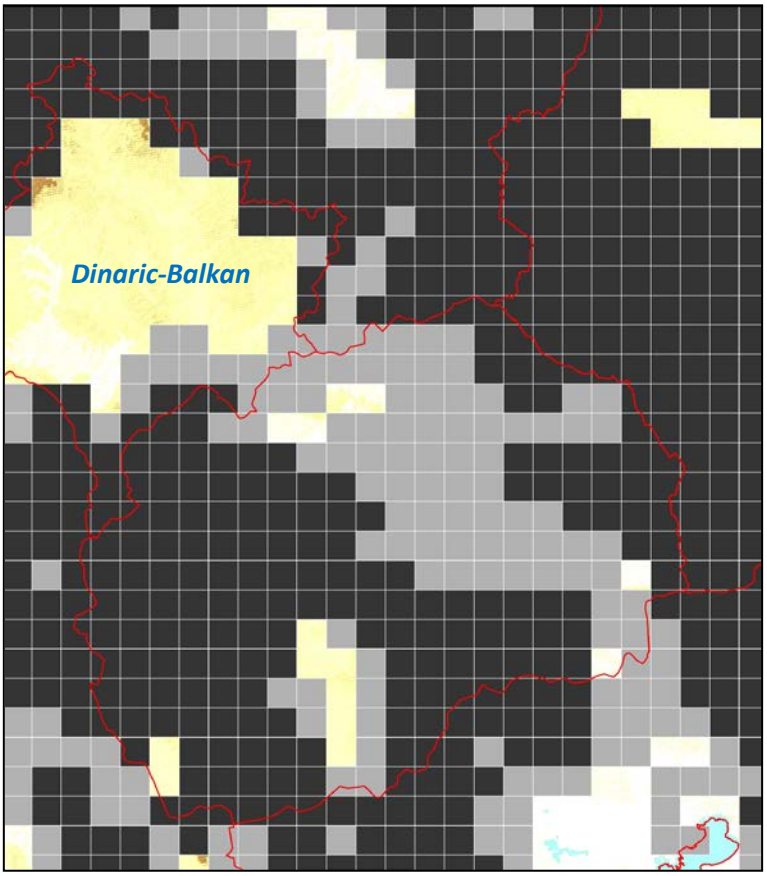
Balciauskas, L., Balciauskiene, L. & Volodka, H. (2002) Preliminary assessment of damage caused by the wolf in Lithuania. *Acta Zoologica Lithuanica,* **12,** 419-427.

Bluzma, P. (1999) Estimation of the state of lynx and wolf populations in Lithuania. *Acta Zoologica Lituanica,* **9,** 35-41.

Bluzma, P., Baranauskas, K. & Mickevicius, E. (1995) Status, abundance and distribution of the wolf in Lithuania. *Canid News,* **3,** 18-19.

Wolf – "The Former Yugoslav Republic of Macedonia"

Compiled with data provided by Aleksandar Stojanov



Wolf distribution in "The Former Yugoslav Republic of Macedonia" 2006-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

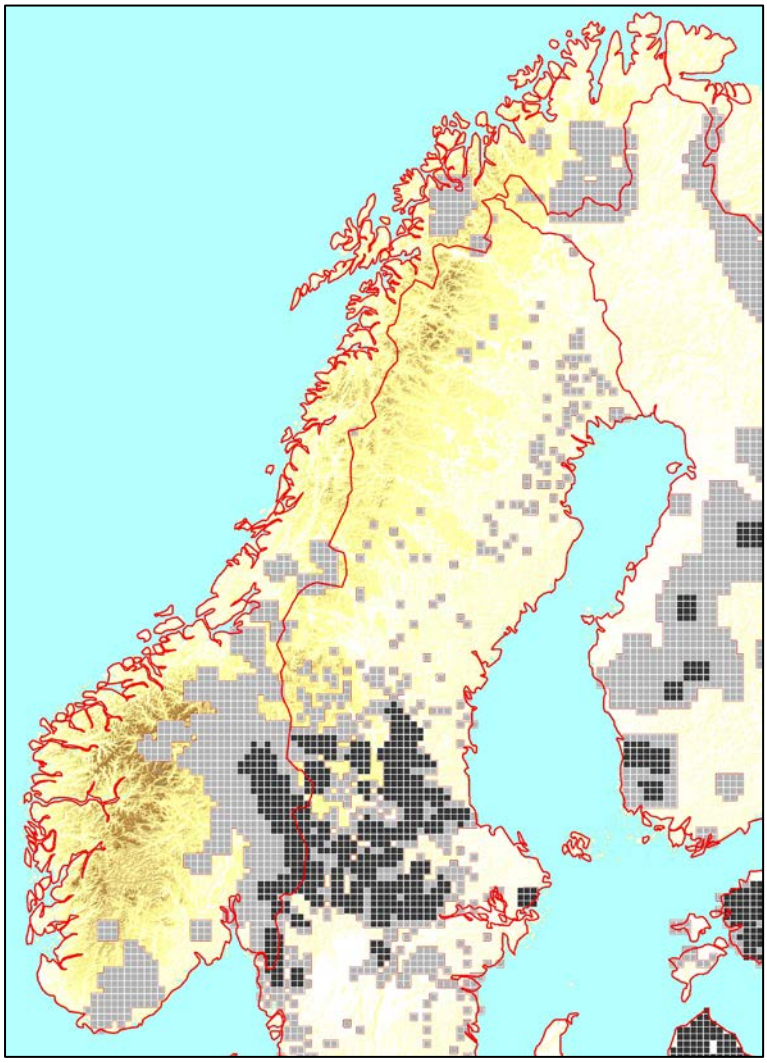
[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

Summary table

Population size	2010: 267
Trend	Decrease
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 177 Sporadic: 99
Range trend	Stable
Depredation costs / year	No information – no compensation system
Number of cases / year	No information – no compensation system
3 Most important threats	Lack of public acceptance

Wolf – Norway

John D. C. Linnell & Henrik Brøseth



Wolf distribution in Norway 2007-2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

Resident wolves are only found in a limited area of southeastern Norway close to the border with Sweden. These are part of the Scandinavian wolf population. Individual dispersing wolves can be potentially found in many parts of the country on a very irregular basis.

2. Populations estimates & monitoring

Wolves are monitored through intensive snow-tracking during winter which aims to map the number of packs and the numbers of animals in each pack. Packs are separated based on intensive snow-tracking. The reproductive and social status of wolves is also determined based on observed urination behavior. DNA extracted from faeces and urine is increasingly being used to identify individuals. DNA analysis is also used to try and identify genetically important individuals (i.e. immigrants from the Karelian population). The monitoring aims to map the locations of territories used by packs and pairs and determine whether they have reproduced the previous summer. Documented evidence of pups, such as photographs or evidence from dens or rendezvous sites is also used in this process. Distribution is based on snow-tracking and DNA data as well as confirmed cases of livestock depredation and any wolves shot or found dead. Monitoring is conducted by Hedmark University College and the Norwegian Institute for Nature Research. In the winter of 2011-12 a total of 3 packs (all of which had reproduced in summer 2011) and 2 scent-marking pairs had territories that were entirely inside Norway. In addition, were 4 packs and 3-4 scent-marking pairs

that had territories straddling the Norwegian – Swedish border. This corresponds to 32-34 wolves and 22-25 wolves in Norwegian and border territories respectively.

3. Legal status & relevant management agencies

All species are protected by default under Norwegian law unless there is a specific opening for hunting within certain seasons. Within this framework, wolves are subject to a restricted form of license hunting which is designed to enforce a strict zoning policy and regulate numbers at the goal. Hunters who register and have passed the necessary tests may take part in the annual hunt which is limited by area specific quotas between 1st January and 15th February (inside the wolf zone) or from 1st October to 31st March (outside the wolf zone). Management authority rests with the Ministry of the Environment's Directorate for Nature Management, however, as soon as regional goals are met the power will be delegated to a committee (appointed by the Ministry of the Environment) drawn from elected politicians in the county parliaments. These committees are assisted by employees of the relevant county administration. In addition, a number of wolves are killed each year in response to acute livestock damage situations. In recent years between 2 and 4 wolves have been shot by hunters in the license hunt, with an additional 2 – 5 shot by game wardens in response to acute damage.

4. Population goal and population level cooperation

The Norwegian parliament has set management goals for wolves in Norway. The goal was set in 2004 at 3 annually breeding packs wholly inside Norway, in addition to an unspecified number of border packs. A special wolf management zone was created in southeastern Norway along the border with Sweden. Resident wolves are meant to be only found in this zone. Wolves outside the zone will be subject to much lower damage thresholds before being removed. The national level Directorate for Nature Management coordinates management between the regional committees for the two regions that share the wolf zone. These two regions are obliged to coordinate wolf management. There is no formal transboundary management plan with Sweden with whom Norway share the population. However, there is frequent dialogue between the respective national wildlife management agencies for Norway and Sweden. A common research project, the Scandinavian Wolf Project (Skandulv), coordinates Norwegian and Swedish wolf research activity. Monitoring methods are very coordinated and an annual report for the Scandinavian population is produced each year. In August 2011 the respective state secretaries from the Norwegian and Swedish Ministries of the Environment signed a letter of intent to coordinate their activities with respect to offering special protection for genetically valuable wolves that are valuable for the overall survival of the population. In addition, this letter of intent calls for further coordination in research and monitoring activities.

5. Conflicts and conflict management

The major conflicts with wolves include depredation on domestic sheep, predation on hunting dogs, perceived competition with hunters for game (mainly moose) and widespread fear and a lack of acceptance of wolves among the rural population. Some efforts have been made to adapt sheep husbandry practices within the wolf zone, with some success, as well as converting from sheep farming to other agricultural activities. A number of projects have tried to address issues of fear through outreach programs, aimed especially at children. The potential for conflict with semi-domestic reindeer in central and northern implies that there will be a very low threshold for wolves

moving through this area that covers 40% of Norway's area. Present policy will not allow for wolves to establish in this area.

6. Threats

The most proximate threat to wolves in Norway is the very small population size which will not be allowed to grow as it is now at the management goal. There is also a very high degree of social conflict around the presence of wolves which reflect a very low acceptance for wolves among some segments of the rural community. There is very active lobbying by various stakeholder groups to reverse all Norwegian wolf conservation goals. Poaching is also believed to be widespread. In addition, the entire Scandinavian population is threatened by inbreeding as the population is only descended from 5 founders.

7. Summary table

Population size	2011-2012: 3 Norwegian packs and 2 Norwegian pairs (23-24 individuals), plus 4 border packs and 3-4 border pairs (22-25 individuals)
Trend	Stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 153 Sporadic: 795
Range trend	Stable
Depredation costs / year	120'000-430'000 € for sheep, 0 – 70'000 € for reindeer
Number of cases / year	400 - 2300 sheep, 0 - 239 reindeer, 5 -10 dogs, 1-2 cattle
3 Most important threats	Lack of acceptance due to depredation on livestock and dogs, perceived competition with hunters for game, and a diversity of social conflicts. Inbreeding. Illegal killing.

References:

Annual monitoring reports are available at www.rovdata.no

Scandinavian Wolf Project http://skandulv.nina.no/

Liberg, O., Andrén, H., Pedersen, H.C., Sand, H., Sejberg, D., Wabakken, P., Åkesson, M. & Bensch, S. (2005) Severe inbreeding depression in a wild wolf (Canis lupus) population. *Biology Letters,* **1,** 17-20.

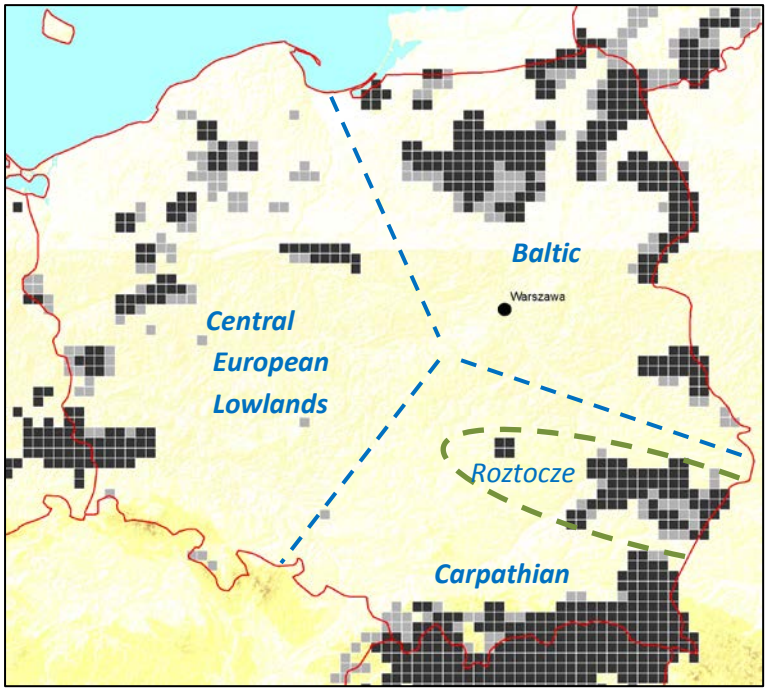
Liberg, O., Chapron, G., Wabakken, P., Pedersen, H.C., Hobbs, N.T. & Sand, H. (2012) Shoot, shovel and shut up: cryptic poaching slows restoration of a large carnivore in Europe. *Proceedings of the Royal Society of London B,* **279,** 910-915.

Skogen, K., Mauz, I. & Krange, O. (2006) Wolves and Eco-power. A French-Norwegian Analysis of the Narratives of the Return of Large Carnivores. *Journal of Alpine Research,* **94,** 78-87.

Wabakken, P., Sand, H., Liberg, O. & Bjärvall, A. (2001) The recovery, distribution, and population dynamics of wolves on the Scandinavian peninsula, 1978-1998. *Canadian Journal of Zoology,* **79,** 710-725.

Wolf – Poland

Sabina Nowak and Robert W. Mysłajek



Wolf distribution in Poland 2008-2011. (Distribution in Ukraine, Russia and Belarus not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

In Poland stable and relatively numerous wolf populations inhabit the eastern part of the country (Baltic population) and the Carpathian Mts. (Carpathian population) (Jędrzejewski et al. 2008). Several of the larger forest patches of western Poland have recently been recolonised by wolves coming from NE Poland and eastern Germany (Central European Lowland population) (Nowak et al. 2011, Nowak and Mysłajek 2011). Recent genetic evidence suggests that wolves in the Roztocze area - a lowland region inhabited by 16 packs (ca. 75 wolves) may actually belong to the Baltic, rather than the Carpathian population; thus the present population division in Poland (which places the Roztocze wolves in the Carpathian population) should be eventually revised. The only region from which resident wolves were not reported are the Sudety Mts. (south-western Poland). Since 2001, data on wolf distribution in Poland has been available on the web site of the National Wolf Census conducted by the Mammal Research Institute of the Polish Academy of Sciences (http://www.zbs.bialowieza.pl/artykul/557.html). According to information from 2011 all favourable wolf habitats east of the river Vistula, which together cover about 22,600 km^2 are inhabited by wolves (Jędrzejewski et al. 2008). In western Poland, where there are about 38,900 km^2 of suitable habitats for wolves, parts still remain unoccupied. Current resident area in the whole of Poland, based on 10 × 10 km^2 grid, is estimated at ~47,900 km^2, with an additional ~17,900 km^2 visited occasionally by vagrants.

2. Population estimates & monitoring

According to results obtained in 2009 by the National Wolf Census, which was based on data provided by the State Forest Service, staff of national parks, and volunteers, the number of wolf packs living in the whole of Poland was estimated at 129 - 144 (mean 135), and the number of wolves at 543 - 687 (mean 615) individuals (http://www.zbs.bialowieza.pl/artykul/528.html). The north-eastern part of Poland hosted 51 - 56 packs (201 - 264 wolves), eastern Poland (Polesie and Roztocze

regions) 16 - 21 packs (66 - 95 wolves), and the Polish part of the Carpathan Mts. 47 - 51 packs (209 - 254 wolves). However, since data on observations of wolf activity were not provided by all forest divisions, these numbers should be considered as minimal counts. Monitoring conducted in western Poland by the Association for Nature "Wolf" in early 2012, estimated the size of the recovering wolf population there at 22 packs and 2 scent marking pairs, comprising 100 - 110 animals (Nowak and Mysłajek 2011, unpubl.). The distribution range and number of wolves in this population is growing.

The yearly estimates of the wolf population number collected by regional directorates for environmental protection are mostly based on guessestimates provided by forest divisons. There is no nation-wide monitoring conducted by a governmental agency on a regular basis. More precise estimates and trends in wolf populations are only available from projects and surveys conducted by scientific institutions and NGOs, where genetic monitoring is now involved.

3. Legal status & relevant management agencies

The wolf in Poland is on Annexes II and V of the Habitats Directive. Altogether, wolves are included in 85 standard data forms from Natura 2000 sites. In 73 sites with a total area of 15,284 km^2, important wolf habitats are protected. Most of these sites are located in eastern Poland (37 sites, total area 9,137 km^2) and in the Carpathians (15 sites, total area 4,268 km^2), with fewer habitats protected in western Poland (21 sites, total area 1,880 km^2). This network covers about 25 % of suitable wolf habitats in Poland (Jędrzejewski et al. 2008) and is connected with ecological corridors defined within a project "Ecological corridors linking Natura 2000 sites" (Jędrzejewski et al. 2005).

In Poland the wolf has been a strictly protected species in the whole country since 1998. Furthermore, the wolf is listed among species requiring active protection. Consequently, a seasonal protection zone encompassing a radius of 500 m may be established around wolf pup-rearing areas from 1st April to 31st August. However enforcement of the law is very weak.

Responsibility for protection of the species and management issues lies with the Ministry of Environment and the General Diriectorate for Environmental Protection, which are national governmental bodies together with regional environmental protection directorates.

4. Population goal and population level cooperation

The favourable reference population for wolves in Poland was determined in the *Report on the main results of the surveillance under article 11 for annex II, IV and V species* sent to the European Commission by the Polish Government (http://cdr.eionet.europa.eu/Converters/convertDocument?file=pl/eu/art17/envrlf_pg/species-canis-lupus.xml&conv=rem_24). The Report was developed in 2007 for the period 2000 – 2006. FRP and FRR in the report were estimated on the basis of a wolf habitat suitability model for Poland (Jędrzejewski et al. 2008). FRP for the whole country was defined at 1,400 individuals (1,200 wolves for Continental bioregion and 200 wolves for Alpine bioregion). FRR was estimated on 104,100 km^2 (95,000 km^2 in Continental bioregion and 8,600 km^2 in Alpine boregion). On the international level a special wolf working group has been established within the Polish-German Council for Environmental Protection since 2009. The group holds meetings once or twice a year. Moreover, a Polish-Slovakian large carnivore working group has also been proposed by Polish NGOs. In June 2012 on the first meeting of the Polish-Slovakian LC Working Group the preliminary agreement for creating buffer zones along the Polish-Slovakian border to protect transborder populations of wolves and bears was achieved. The proposed buffer zones are: 23 km zone without hunting on wolves and 10 km zone without regulating culls of bears in Slovakia, and 46 km zone of close cooperation and data exchange

concerning large carnivores on both sides of the borderline. A final decision of the Slovakian government on creating these zones is still pending.

There is no established national working group for information exchange and coordination of wolf conservation and management in Poland. However, before taking most decisions regarding wolves, the General Directorate for Environmental Protection seeks the opinion of the National Council for Nature Conservation (NCNC), which, under the Nature Conservation Act, functions as an advisory body for both institutions. Each province also has a regional council for nature conservation, which acts as advisory body to regional directorates for environmental protection. If necessary, they may also discuss issues connected with wolf conservation at a regional scale.

5. Conflicts and conflict management

Wolves in Poland mostly feed on wild ungulates, which constitute up to 97% of the biomass eaten (Jędrzejewski et al. 1992, 2000, 2012, Okarma 1995, Śmietana and Klimek 1993, Nowak et al. 2005, 2011). Domestic animals contribute approximately 1-3% of the biomass of a wolf's diet, but less than half of Polish wolf packs prey on livestock. On average, the number of domestic animals killed by wolves is 1000 animals per year. The biggest share amongst livestock killed by wolves are sheep (75.5%), followed by cattle (19%), goats (3.5%), horses (0.5%) and others (1.5%, dogs, pigs, ostrich) (Jędrzejewski et al. unpubl.). Regional directorates for environmental protection are responsible for estimation and compensation of damage caused by wolves and for reporting of accidental mortality in every province, but directors of national parks are responsible for damage compensation within their respective national parks.

As the damage compensation system is quite well-established in Poland and the corresponding law functional, conflicts with livestock breeders are generally not frequent. However, some cases of depredation, mostly those that happen regularly at certain farms or in areas newly re-colonised by wolves cause difficulties for breeders. Thus, several regional directorates for environmental protection and NGOs equip farmers with damage prevention measures such as electric fences, livestock guarding dogs and fladry sets. Every year 1-3 applications are submitted to the General Director for Environmental Protection for permission to cull wolves responsible for regular damage. In 2000-2011, a total of 20 such derogations were issued for 43 wolves, of which 9 were shot.

Although all wild-living ungulates belong to the State, predation on wild ungulates is regarded by hunters as a reason to change the legal status of the wolf. However, because the majority of the the Polish society does not consider hunting as a valuable tool for wildlife conservation, such a view has a very weak support.

6. Threats

Currently, there are several main threats to wolves in Poland, of which the most important are: 1) habitat fragmentation and isolation as well as disruption of ecological corridors by development of transportation infrastructure and urbanisation, 2) disturbance of wolves in their refuges by diverse human activities like forest works, recreation, collecting mushrooms and berries, 3) natural (diseases) and human-caused mortality (traffic accidents, illegal killing, hunting of wolves from transborder areas), and 4) conflicts with animal husbandry (Jędrzejewski et al. 2004, 2005, Popiołek et al. 2007, Huck et al. 2010, 2011).

Road mortality and illegal killing are the most important threats in the recovering wolf population in western Poland, where the loss of any individual may influence the survival of the pack or

interrupt colonisation of adjacent areas (Jędrzejewski et al. 2008, 2009, Nowak and Mysłajek 2011). Poland shares parts of its wolf populations with several countries: with Lithuania and Slovakia, where wolves are game animals, with Belarus, Russia and the Ukraine, where wolves are subject to persecution, and with Germany and the Czech Republic where they are strictly protected. The biggest impacts on the Polish wolf population likely result from culls of wolves in Belarus, Slovakia and Ukraine that have the potential to cause severe source-sink effects (Nowak et al. 2008).

7. Summary table

Population size	Baltic (Eastern Poland) (2009): minimum estimate 67 - 77 packs (267 - 359 wolves) Carpathian (2009): minimum estimate 47 - 51 packs (209 - 254 wolves) Western Poland (2012): 22 packs and 2 pairs (100-110 wolves)
Trend	Baltic (Eastern Poland): slightly increasing Carpathian: slightly increasing Western Poland: increasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Baltic (Eastern Poland): Permanent: 267, sporadic: 78 Carpathian: Permanent: 119, sporadic: 26 Western Poland: Permanent: 93, sporadic: 75
Range trend	Baltic (Eastern Poland): stable Carpathian: stable Western Poland: increasing
Depredation costs / year	2008-2010 mean: 94'900 €
Number of cases / year	~1000 animals per year in whole country (range 800-1200 animals), 2011: 1046 sheep, 17 goats, 80 cattle, 11 horses, 32 deer on farms
3 Most important threats	Habitats and corridors fragmentation & road mortality, disturbance in refuges, hunting of wolves from transborder areas

References:

Huck M., Jędrzejewski W., Borowik T., Miłosz-Cielma M., Schmidt K., Jędrzejewska B., Nowak S., Mysłajek R. W. 2010. Habitat suitability, corridors and dispersal barriers for large carnivores in Poland. Acta Theriologica 55: 177-192.

Huck M., Jędrzejewski W., Borowik T., Jędrzejewska B., Nowak S., Mysłajek R. W. 2011. Analyses of least cost paths for determining effects of habitat types on landscape permeability: wolves in Poland. Acta Theriologica 56: 91-101.

Jędrzejewski W., Jędrzejewska B., Okarma H., Ruprecht A. L. 1992. Wolf predation and snow cover as mortality factors in the ungulate community of the Białowieża National Park, Poland. Oecologia 90: 27–36.

Jędrzejewski W., Jędrzejewska B., Okarma H., Schmidt K., Zub K., Musiani M. 2000. Prey selection and predation by wolves in Białowieża Primeval Forest, Poland. Journal of Mammalogy 81: 197–212.

Jędrzejewski W., Niedziałkowska M., Nowak S., Jędrzejewska B. 2004. Habitat variables associated with wolf (*Canis lupus*) distribution and abundance in northern Poland. Diversity and Distributions 10: 225-233.

Jędrzejewski W., Niedziałkowska M., Mysłajek R. W., Nowak S., Jędrzejewska B. 2005. Habitat selection by wolves *Canis lupus* in the uplands and mountains of southern Poland. Acta Theriologica 50: 417-428.

Jędrzejewski W., Jędrzejewska B., Zawadzka B., Borowik T., Nowak S., Mysłajek R. W. 2008. Habitat suitability model for Polish wolves based on long-term national census. Animal Conservation 11: 377–390.

Jędrzejewski W., Nowak S. , Kurek R., Mysłajek R. W., Stachura K., Zawadzka B., Pchałek M. 2009. Animals and roads. Methods of mitigating the negative impact of roads on wildlife. Mammal Research Institute Polish Academy of Sciences, Białowieża.

Jędrzejewski W., Jędrzejewska B., Andersone-Lilley A., Balčiauskas L., Männil P., Ozolinš J., Sidorovich V. E., Bagrade G., Kübarsepp M., Ornicāns A., Nowak S., Pupila A., Žunna A. 2010. Synthesizing wolf ecology and management in Eastern Europe: similarities and contrasts with North America. W: Musiani M., Boitani L., Paquet P. C. (Eds.). The world of wolves. New perspectives on ecology, behaviour and management. University of Calgary Press, Calgary: 207-233.

Jędrzejewski W., Niedziałkowska M., Hayward M. W., Goszczyński J., Jędrzejewska B., Borowik T., Bartoń K. A., Nowak S., Harmuszkiewicz J., Juszczyk A., Kałamarz T., Kloch A., Koniuch J., Kotiuk K., Mysłajek R. W., Nędzyńska M., Olczyk A., Telon M., Wojtulewicz M. 2012. Prey choice and diet of wolves related to ungulate communities and wolf subpopulations in Poland. Journal of Mammalogy 93: doi: http://dx.doi.org/10.1644/10-MAMM-A-132.1

Nowak, S., Mysłajek R. W. 2011. Wilki na zachód od Wisły. Stowarzyszenie dla Natury „Wilk", Twardorzeczka.

Nowak S., Mysłajek R. W., Jędrzejewska B. 2005. Patterns of wolf *Canis lupus* predation on wild and domestic ungulates in the Western Carpathian Mountains (S Poland). Acta Theriologica 50: 263–276.

Nowak S., Mysłajek R. W., Jędrzejewska B. 2008. Density and demography of wolf *Canis lupus* population in the western-most part of the Polish Carpathian Mountains, 1996-2003. Folia zoological 57: 392-402.

Nowak, S., Mysłajek R. W., Kłosińska A., Gabryś G. 2011. Diet and prey selection of wolves (*Canis lupus*) recolonising Western and Central Poland. Mammal Biology 76: 709–715.

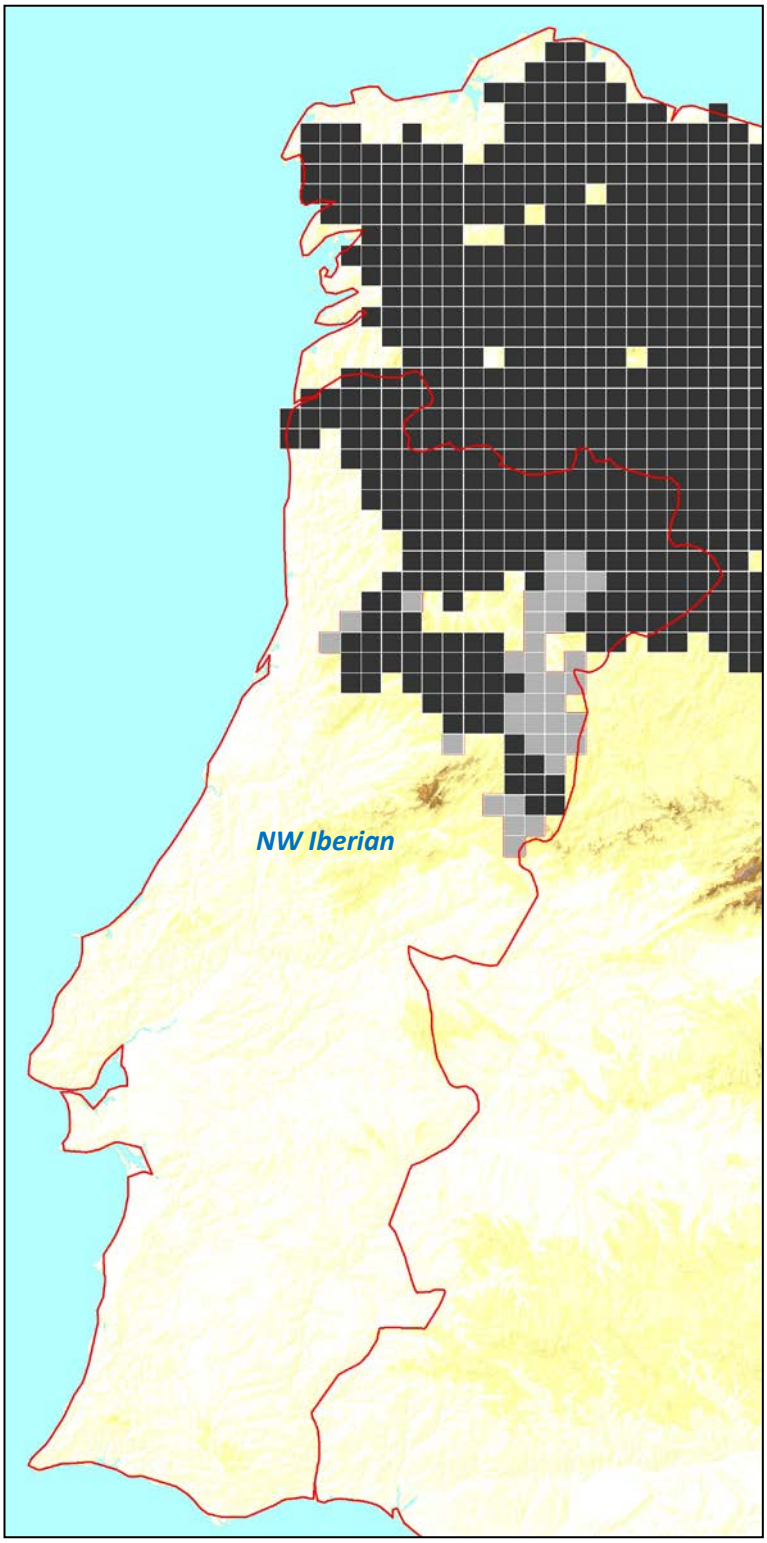
Okarma H. 1995. The trophic ecology of wolves and their predatory role in ungulate communities of forest ecosystems in Europe. Acta Theriologica 40: 335–386.

Popiołek M., Szczęsna J., Nowak S., Mysłajek R. W. 2007. Helminth infections in faecal samples of wolves *Canis lupus* L. from the western Beskidy Mountains in southern Poland. Journal of Helminthology 81: 339-344.

Śmietana W., Klimek A. 1993. Diet of wolves in the Bieszczady Mountains, Poland. Acta Theriologica 38: 245–251.

Wolf - Portugal

Francisco Álvares



Wolf distribution in Portugal (WOIS 2005 with data from 2002/3 and some regional updates).

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution.

Wolves live in the north of Portugal, making part of the Iberian wolf population. In the 2002/2003 national census, wolves had confirmed presence in 10,100 km2 and probable presence in 10,300 km^2 (the total area was 20,400 km^2). Around 80% of the area with confirmed presence was north of the river Duero. There is no updated map of wolf range in Portugal. However it seems that, in general, present wolf range is similar to the one obtained in 2002/2003 census (Pimenta et al. 2005).

2. Population estimates & monitoring

In the national census carried out in 2002/2003, 63 wolf packs were found (51 confirmed and 12 probable), i.e., approximtely 220-430 individual wolves. No National survey has been conducted

since 2003. However, recent studies (2009/2010) conducted in specific areas (Trás-os-Montes area, South Douro river area) reveal a decrease in the number and reproductive stability of breeding packs.

The method used to survey the population is to count the approximate number of packs, which are recognized by the presence of pups in summer. For this, elicited wolf howling and other secondary techniques are used.

3. Legal status & relevant management agencies

Wolves are fully protected by the Habitat Directive and by specific legislation. The management is centralized in the Instituto da Conservação da Natureza e Biodiversidade (ICNB), Ministry of Environment.

4. Population goal and population level cooperation

There is no a national management plan and there is no zoning in wolf management. There is no formal cooperation with Spain to coordinate the management of the Iberian population, but there are informal contacts between scientists of both countries.

5. Conflicts and conflict management

The main conflicts are related to the damages to the livestock. From 2006 to 2010, the annual average number of compensated attacks has been 2497.

The Instituto da Conservação da Natureza e Biodiversidade/ICNB pays compensation for the documented losses. The damage verification is ensured by teams from ICNB belonging to different Protected Areas included or located near wolf distribution area. The total market price is paid. By law, the livestock owner must be compensated within 60 days, but unfortunately payment delays of more than one year are frequent. From 2006 to 2010, the annual average compensations paid in Portugal have been 674,925 euros.

In addition, prevention measures (electric fences and livestock guading dogs) are subsidized by the ICNB (Nature Conservation Institute from Ministry of Environment) and GRUPO LOBO (NGO).

6. Threats

The negative attitude of rural people caused by the damages to the livestock, the lack of wild prey and the habitat disturbance are major threats for wolves in Portugal. In addition, the population segment south of the river Duero has inbreeding problems caused by their isolation. The hybrization with dogs has been detected as well (Godinho et al. 2011).

From 2006 to 2011, 26 dead wolves were recorded. The known causes were ilegal killing (11), traffic (7), disease (3) and attack by canids (1). These data come from a “Dead Wolf Monitoring System”, implemented by ICNB to assure accurate determination of death causes.

7. Summary table

Population size	63 wolf packs were (51 confirmed and 12 probable) in 2002/2003.
Trend	Unknown, by probably decreasing in some areas
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 186 Sporadic: 37
Range trend	Apparently stable
Depredation costs / year	2010: 763,858 €
Number of cases / year	2010: 2497
3 Most important threats	low acceptance because of the damages to livestock, lack of wild prey. Isolation of the population segment south of the river Duero

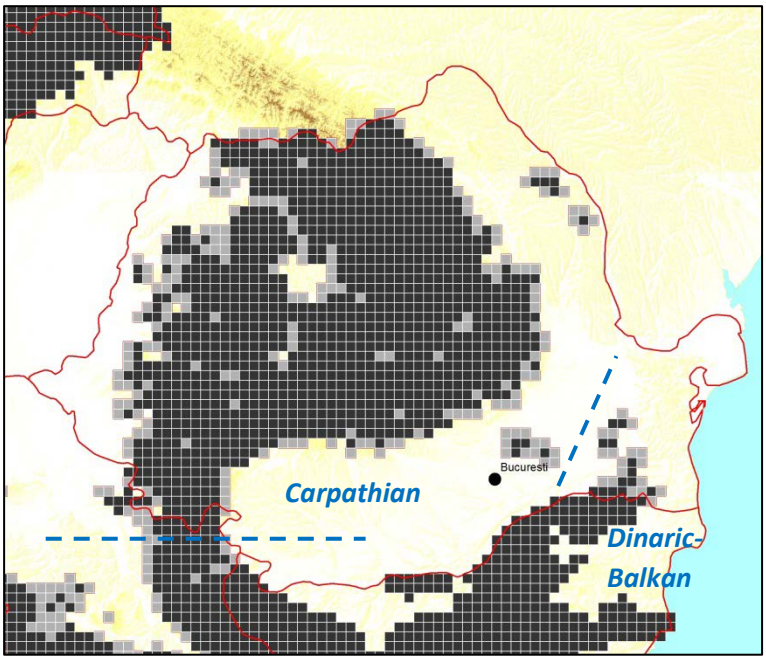
References:

Godinho R., Llaneza L., Blanco J.C., Lopes S., Álvares F., García E.J., Palacios V., Cortés Y., Talegón J., Ferrand N. (2011) Genetic evidence for multiple events of hybridization between wolves and domestic dogs in the Iberian Peninsula. Molecular Ecology 20(24): 5154-5166.

Pimenta V., Barroso I., Alvarez F., Correia J., Ferrao da Costa G., Moreira L., Nascimento J., Petrucci Fonseca F., Roque S. and Santos E. (2005). Situaçao populacional do lobo em Portugal. Resultados do censo nacional 2002/2003. Relatorio Técnico. Instituto da Conservaçao da Natureza/ Grupo Lobo. Lisboa.

Wolf – Romania

Ovidio Ionescu



Wolf distribution in Romania 2006-2011/12. (Distribution in Ukraine is not shown).

Dark cells: permanent
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The Romanian wolf population is part of the large Carpathian population. Within Romania the population occupies ~90'000 km². This surface is mainly located in the Carpathian Mountains but there are also areas located on the Transylvanian Plateau and on hills outside the Carpathian range. In 1990 the estimated population was around 2500 individuals, the highest level since the 1960s. The increase was triggered by socio-economic changes which caused a lower hunting pressing. In 1991 the wolf was very intensely hunted and the population decreased to 2400 individuals. From this time on the number of wolves has been increasing.

2. Population estimates & monitoring

Presently the wolf population in Romania is estimated at 2300-2700 individuals. The number of wolves is estimated based on snowtracking during winter. At the end of the spring time, the hunting unit leaseholders are obliged to provide annual estimates of wolf numbers on their game management units. These estimations are compiled on large areas and the data are centralized and analyzed on regional and national level. Considering the characteristics of the wolf habitat (mountain forested areas), their densities in Romania, and biological characteristics of the species (need for large living space, migration), most of the other and more intensive methods currently used for small populations are not applicable.

3. Legal status & relevant management agencies

The wolf is considered a high priority species for conservation. Because of their dependence on large natural areas, they are an "umbrella species" for a number of other wildlife species. Romania is a signatory to the Bern Convention and as an EU member are also bound by the Habitats directive and thus the wolf is a strictly protected species. Nationally, the wolf population's conservation is regulated by the provisions of the Nature Conservation Law no. 462/2001, regarding the conservation of natural habitats and protection of wild species of flora and fauna, the Law for Game

Protection and Hunting, and by the provisions of the Hunting Units' Management Plans. In Romania the management of wolves is approved by the specific central public authority now in the Ministry of Environment and Forestry. Removal of a limited number of wolves is done under derogations.

4. Population goal and population level cooperation

The wolf in Romania is a wild protected species, which deserves the utmost care and attention and which undeniably has the right to exist. In this respect, the wolf is one of the most valuable elements of biodiversity, and plays an important role in biodiversity maintenance. When compared to other animal species, the wolf is at the top of the food web and is directly threatened only by humans and their activities. Since wolves and humans inhabit the same areas, it is apparent that there is a need to ensure their coexistence, which is the final goal that the various measures defined in the management plan aim to accomplish.

Implementation of the measures for conservation and protection of biological and ecological balance in the natural habitats of wolves or, in other words, for enabling the coexistence of wolf and humans, has to be developed on the basis of modern ecological knowledge, suitably regulated, and there has to be a general agreement on the key issues among the different interest groups.

With an understanding that the actions of wolf population management in Romania can influence the wolf populations in neighboring countries, Romania has committed, under the umbrella of the "Carpathian Convention", to such management that will keep the population in balance – so that approximately equal numbers of wolves migrating across the borders in both directions can be expected. Romania expects a similar approach to wolf management from the neighboring countries and will support Ukraine in efforts related to wolf management.

5. Conflicts and conflict management

Conflicts between wolves and livestock farmers are the main limitation to the spread of the species over the entire European territory. Most countries, if not all, where the wolf coexists with livestock industry, are concerned about damages on livestock. Solving, or at least reducing, these conflicts is an essential condition for achieving acceptance for the presence of the wolf. In the areas in which the wolf is (or will be) present, a certain degree of damage to livestock is inevitable, whatever the preventive measures taken. The problem, therefore, is to manage this aspect of conservation in the best possible manner. Compensation is paid in Romania for wolf killed livestock, although efforts to strengthen livestock protection measures are underway.

6. Threats

The poaching of wolves is low with less than 10 cases recorded per year. Generally there are cases of poaching using guns and poison. Related to the number of wolves in Romania, the level of poaching does not endanger the population.

In the Romanian Carpathians, numerous roads with different level of traffic pass through wolf habitats, although most of these roads having low traffic levels. The main roads that cross wolf range are the Bucharest – Brasov road that passes through high density wolf ecosystems in the Prahova Valley and the Pitesti – Sibiu road that passes through dense wolf ecosystems in the Olt Valley. These two roads have the most intensive traffic in the mountainous areas. Other roads that affect the wolf range are Brasov – Bacau, also located in the high density wolf area of Covasna, and the Deva – Arad road, which passes through the wildlife corridors between southern part of the Apuseni Mountains and the rest of Carpathians. These roads are not fenced and the main traffic occurs by day time.

7. Summary table

Population size	2300-2700
Trend	Stable
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 1031 Sporadic: 228
Range trend	Stable
Depredation costs / year	No recent information
Number of cases / year	No recent information
3 Most important threats	None

References:

Ionescu, O. 1996. Managementul cinegetic în pădurile României. VPR, 1:15 -18.

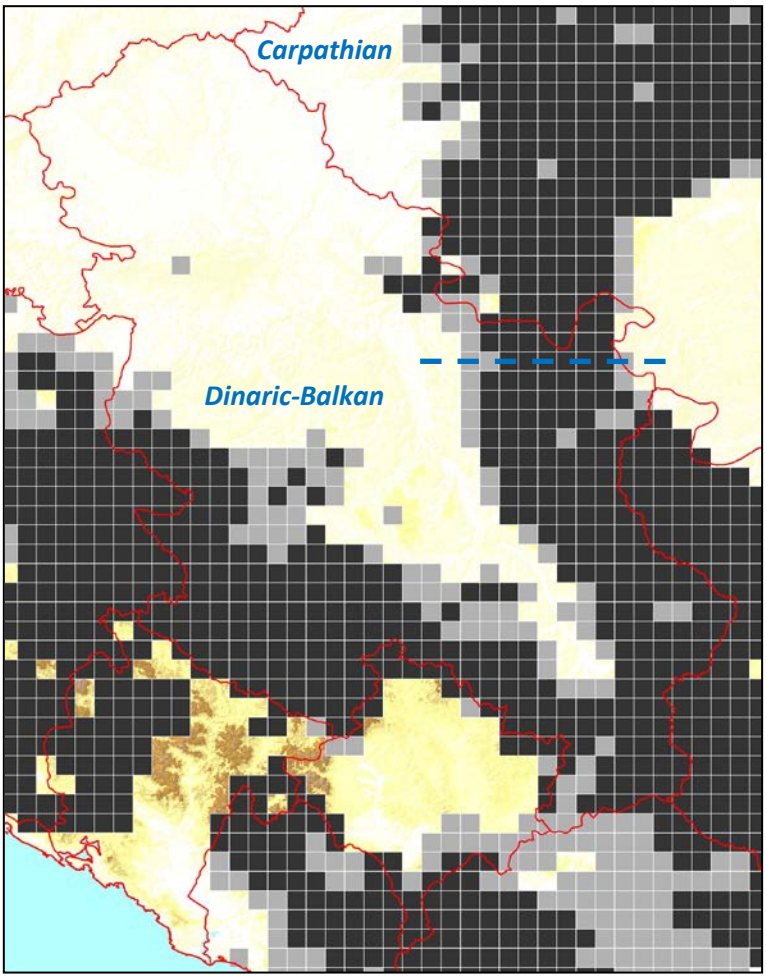
Ionescu, O., Schröder, W., Promberger, C. 1996. The wolf in Romania, past, present and future. Wolves of Europe, pg. 23-29.

Ionescu, O., Promberger, C. 1996. Carpathian Wolf - Romania at its Wildest. International Wolf Magazin, 6:16-17.

Ionescu, O., Ionescu, G. 1997. Ecologia Lupului (*Canis lupus L*) in Carpatii Romanesti-Acta Cinegetica Romaniae- Ocrotirea habitatelor naturale si a faunei de interes cinegetice Ed. Aldus, pg 100, Bucuresti.

Wolf – Serbia

Milan Paunovic



Wolf distribution in Serbia 2011.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves in Serbia are mostly part of the large Dinaric-Balkan population, but also belong to the edge of the Carpathian population. The area of presence in Serbia seems to cover ~43'400 km². Although the trend cannot be assessed due to non-standardized monitoring, there is some evidence for a stable range and even a slight expansion over the last 10 years. The situation is particularly in southern Banat, the southeastern part of Vojvodina province, where wolves belong to the far southern edge of Carpathian population.

2. Populations estimates & monitoring

The best available data is a guestimate made by independent experts of ~ 800 individuals ±50 (Date: 2005 - 2011). Official estimation given by relevant governmental institution doesn't exist. This estimate is similar to that reported by the hunters' organisations. The density of the population was not calculated due to the high degree of uncertainty in numbers and range.

The total number of officially recorded wolves killed by hunters in the frame of hunting societies in Serbia was 92 during 2006-2011. Annual guesstimated harvest in the mentioned period is between 150 and 200 specimens. Bounty payments for killed wolves were stopped in 2008. Nowadays most

hunters killing wolves are only sporadically reporting the killing. Thus no complete official data for the number of wolves killed in Serbia are available from after 2006.

The monitoring of the wolf in Serbia is done in parallel by hunting organizations, forestry personnel within their forestry/hunting units and by park staff in the National/Nature parks, but it is not coordinated by any national governmental institution.

Additional research on the species is done by a team of independent researchers gathered around three institutions: the Institute for Biological Research, the Natural History Museum and the Faculty of Biology, all from Belgrade, as well as the wildlife conservation NGO Mustela.

3. Legal status & relevant management agencies

The wolf in Serbia has quite a controversial legal status. It is listed as a game species by the Game and Hunting Law, protected by the close season that is open whole year for male specimens, but for females and cubes it is open from July 1st to February 28th for the most of the territory of Serbia. It is strictly protected only in the province of Vojvodina where it usually does not exist. Exceptions in Vojvodina are in the two protected areas of Deliblatska Pescara sands and Vrsacke Planine mountains where it is protected by closed season that is open as mentioned above. As such it is in practice hunted all year round, with no quota or other limits. The strategic part of an Action Plan was prepared in 2007, but up to today it has no official status.

Wolf management in Serbia falls under the jurisdiction of the both the Ministry of Agriculture, Forestry and Water Management (MAFWM) and the Ministry of Energy, Development and Environmental Protection (MEDEP). Local management actions are applied mostly by the local hunting organizations (they are NGOs actually), but also through the public enterprises Srbijašume and Vojvodinašume, which are all under the jurisdiction of MAFWM. In the National Parks and other protected areas the wolf is under the jurisdiction of the MEDEP.

4. Population goal and population level cooperation

There is no official goal for the size and distribution of the wolf population in Serbia. The main goal of the action plan for the wolf in Serbia was to increase monitoring and knowledge of regular population parameters and to apply active and appropriate management of it, minimizing damage on livestock, and establish a good compensation system.

5. Conflicts and conflict management

Conflicts exist over livestock depredation throughout the whole wolf range. There are two types of conflicts – with livestock breeders over damages on livestock and with hunters over competition for ungulates.

According to the Law on Game and Hunting for each damage caused by a game species (i.e. also wolf) the institution managing the respective area should pay compensation. Thus in lands managed by hunters, compensation for wolf-killed livestock should be paid by the hunting association to the breeder who owned the livestock. However, this compensation system doesn't work in practice and consequently damages caused by wolves are *de facto* not compensated. With an open season throughout the whole year MAFWM tries to allow shooting and the strict control of the wolf population to avoid responsibility for damages.

6. Threats

In general the most important threats are the lack of knowledge – about ecology, numbers and trends and conflict mitigation, in addition to poor management structures.

Important threats include persecution in areas where it is strictly protected. Accidental mortality is still present, but not so important. The other threats which are moderately important include intensive forestry practice and infrastructure development in some important areas, wildfires that are frequently present in recent years, and disturbance due to recreation/tourism.

7. Summary table

Population size	2011: 800 (±50)
Trend	Stable or slight increase
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 346 Sporadic: 96
Range trend	Slight increase to the north in central part
Depredation costs / year	No central database – no information.
Number of cases / year	No central database – no information.
3 Most important threats	Lack of knowledge, poor management structure, persecution of weak population parts in protected areas

References

Milenković, M., Ćirović, D., Paunović, M., (2007). Action plan on conservation of wolf *Canis lupus* (L., 1758) in Serbia, Phase 1 – Strategic plan. Institute for Biological Research, Belgrade and Ministry of environmental protection of Republic of Serbia, 1-35, Belgrade. (in Serbian).

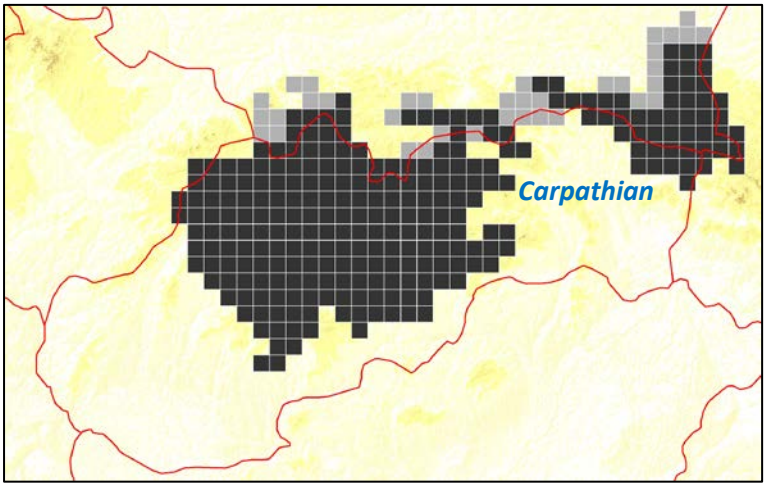
Paunović, M. (2004). Damages caused by Large Carnivores in Serbia – Compensation and insurance schemes – Implementation of preventing measures (Eco Net 3). Report to the Council of Europe, Wildlife Conservation Society «Mustela», 1-35, Belgrade.

Milenković, M., Ćirović, D., Paunović, M. (2008). Current status of Wolf and possibility of sustainable use. International meeting on large carnivores and bloodhounds, Huntung Association of Serbia, proceedings, 103-111, Zagubica (in Serbian with summary in English).

Paunović, M., Ćirović, D., Milenković, M. (2008). Status and Conservation of Carnivores in Serbia. CIC Proceedings of the Symposium «Coexistance of man and carnivores: Threat or Benefit?», 111-117, May 1st, 2007, Belgrade.

Wolf – Slovakia

Compiled by Guillaume Chapron with data provided by Robin Rigg, Jakub Kubala, & Michal Adamec



Bear distribution in Slovakia 1992-2012. (Distribution in Ukraine not shown)

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

The wolf occurs in approximately 40% of Slovakia, being widespread in upland areas of northern, central and eastern Slovakia (Finďo et al. 2008), where the population is contiguous with the one in the Polish Carpathians (Finďo & Chovancová 2004, Nowak et al. 2008). Wolves are almost absent from most lowland areas bordering Hungary to the southand are also missing, or occur only sporadically, in several mountain ranges of western Slovakia (Finďo et al. 2008). Recent records of wolves in the Aggteleki National Park in the northern Hungary (Hausknecht et al. 2010, Lanszki et al. 2012) showed that some individuals may occur also in mountain ranges situated in southern part of Slovakia along the state border with Hungary.

2. Population estimates & monitoring

There is some local or regional level monitoring by government agencies through a combination of snow tracking and CMR camera trapping in reference areas (e.g. in Tatry NP, Nízkye Tatry NP, Veľká Fatra NP, Malá Fatra NP, CHKO Poľana). The official national estimate of wolf numbers from the Ministry of Agriculture is generated by summing together local estimates provided by hunting ground users. Besides a lack of a clear and consistent methodology for how hunting ground users should estimate wolf numbers within their hunting ground, this methodology is doubtful because summing such local estimates does not take into account the established fact that a wolf home ranges typically overlaps several hunting grounds. Thus, whereas national estimates of wolf numbers from the Hunting Geographic Information seem to show an increase from 1219 wolves in 2006 to 1823 wolves in 2010, these are likely to represent substantial overestimates. Even the apparent population trend may not be a reflection of the actual situation and could rather be the consequence of an increase in the number of hunting grounds and concomitant decrease in their average size, which can be expected to increase the potential for multiple counting of the same wolves across two or more hunting grounds. According to the report produced by the Ministry of Environment (Report on the main results of the surveillance under article 11 for annex II, IV and V species http://cdr.eionet.europa.eu/Converters/convertDocument?file=sk/eu/art17/envrlqbva/species-canis-lupus.xml&conv=rem_24), there is however a population of 252–410 wolves in Slovakia. A NGO (the Slovak Wildlife Society) ran the Slovakia Wolf Census Project which in 2005–2007 produced

estimates of population size using four different quantitative methods 1) mapping the distribution and size of wolf packs; 2) extrapolating from estimated winter mortality; 3) recalibrating game statistics from tracking in model areas; and 4) extrapolating from densities observed in model areas. Based on these methods, population estimates have ranged from 200 to 400 wolves depending on season (Rigg 2007).

3. Legal status & relevant management agencies

The wolf in Slovakia is under Annex II and V of the Habitats Directive. The national list of proposed Natura 2000 sites of Community importance prepared as part of the implementation of the Habitats Directive in Slovakia includes 72 sites identified for wolf protection covering a total area of ~4,300 km^2. Several core areas of wolf occurrence are included, such as the Tatras, Low Tatras, Veľká Fatra, Malá Fatra, Muránska planina and Beskýd (Finďo et al. 2008). There was inconsistency between nature conservation and hunting legislation before, but recently both Acts (Nature Conservation Law Zákon č. 543/2002 and Hunting Law – Zákon č. 274/2009) are the same (decree no. 125/2012), thus the wolf is a partly protected species with a 2,5 month-long hunting season. Both the Ministry of the Environment and the Ministry of Agriculture are responsible for wolf management and regional forestry offices propose quotas for their area of jurisdiction. In 2012, the Slovak Ministry of Agriculture allowed to kill 130 wolves (distributed among counties) within a hunting season lasting from 1 November to 15 January. Last years (2007-2011) 120-160 wolves were hunted each year in Slovakia according to official statistics, with two protected areas (the Kysuce Landscape Park and the Slovensky Kras National Park) in the vicinity of state borders with Czech Republic and Hungary where wolf hunting is not allowed. In other protected areas wolves are hunted. Until 2010 there was no limit on the number of wolves that could be legally killed during the open hunting season. Since the 2010/11 hunting season, the Ministry of Agriculture has been setting quotas but the process of establishing them is not transparent and it is not clear which, if any, scientific data are used. The public and stakeholders are only partly involved in management planning and management decisions– those who are members of Consultancy board of each hunting area on the level of County forest authority.

4. Population goal and population level cooperation

There is neither a management plan nor a population goal. The establishment of a Slovakia-Poland transboundary commission has recently been discussed.

5. Conflicts and conflict management

There has been a compensation system since 2003, which is managed by the State Nature Conservancy under the Ministry of the Environment. A commission consisting of a representative from the district environmental office, district hunting office and hunting ground user and, usually, the protected area with jurisdiction decides which cases should be compensated. Within the two areas where wolves are year-round protected (Kysuce LP and Slovensky Kras NP), compensations are paid to hunters for wild ungulates killed by wolves. Measures of livestock protection are provided to farmers by local NGOs (Rigg et al. 2011).

6. Threats

Legal hunting is by far the largest cause of known mortality and may act as a sink for neighbouring countries, particularly Poland. Poaching, while difficult to estimate, is also likely to be significant. In

addition, the rapid development of the road network (Ecorys 2006) and other infrastructure is the most important indirect threat to the wolf population due to the fragmentation, degradation and loss of suitable habitat, which in some cases has not been adequately mitigated by, for example, wildlife crossing structures.

7. Summary table

Population size	March 2010: official estimate 1,823 (believed to be largely overestimated by experts who instead propose estimates of 200-400 wolves)
Trend	?
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 255
Range trend	?
Depredation costs / year	2010: ~16'000 €
Number of cases / year	2010: ~500 livestock
3 Most important threats	Legal and illegal hunting, habitat fragmentation

References

Ecorys. 2006. Study on Strategic Evaluation on Transport Investment Priorities under Structural and Cohesion funds for the Programming Period 2007-2013. No 2005.CE.16.0.AT.014. Country Report Slovak Republic. Final Report. ECORYS Nederland BV, Rotterdam, September 2006.

Finďo S., Chovancová B. 2004. Home ranges of two wolf packs in the Slovak Carpathians. Folia Zoologica 53: 17–26.

Finďo S., Rigg R., Skuban, M. 2008 The wolf in Slovakia. In Kutal M. & Rigg R. (eds.): Perspectives of wolves in Central Europe: Proceedings from the conference held on 9th April 2008 in Malenovice, Beskydy Mts., Czech Republic: 15–24.

Hausknecht R., Szabó Á., Firmánszky G., Gula R., Kuehn R. 2010. Confirmation of wolf residence in Northern Hungary by field and genetic monitoring. Mammalian Biology 75: 348–352.

Lanszki J., Márkus M., Újváry D., Szabó Á.,Szemethy L. 2012. Diet of wolves *Canis lupus* returning to Hungary. Acta Theriologica 57: 189–193.

Nowak S., Mysłajek R. W., Jędrzejewska B. 2008. Density and demography of wolf *Canis lupus* population in the western–most part of the Polish Carpathian Mountains, 1996–2003. Folia Zoologica 57: 392–402.

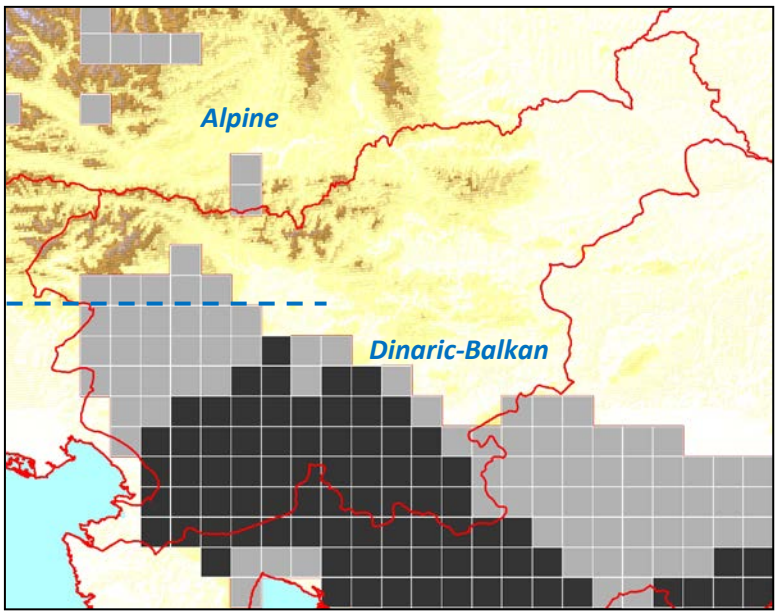
Rigg R, 2007: Slovakia wolf census project. Progress report, February 2007. Slovak Wildlife Society, Liptovský Hrádok. 14 pp.

Rigg R. 2008. Abundance, hunting and protection of the wolf (*Canis lupus*) in the Slovak Carpathians - too much or not enough? In: Adamec M., Urban P. & Adamcová M. (eds.). Proceedings of the conference "Výzkum a ochrana cicavcov na Slovensku VIII", Zvolen 12-13.10.2007. Štátna ochrana prírody Slovenskej republiky, Banská Bystrica: 200-213. (in Slovak with English abstract)

Rigg R., Finďo S., Wechselberger M., Gorman M. L., Sillero-Zubiri C., Macdonald D. W. 2011. Mitigating carnivore–livestock conflict in Europe: lessons from Slovakia. Oryx 45: 272–280.

Wolf - Slovenia

Aleksandra Majić Skrbinšek



Wolf distribution in Slovenia 2009-2011/12.

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolf distribution in Slovenian represents the northwestern part of the Dinaric-Balkan wolf population. They are distributed in the south-western Slovenia (Dinaric mountain chain), along the border with Croatia, towards the coast and in Trnovo forest in the North. The wolf range extends over four large, connected SCI sites that list the wolf as a classification species with total surface of 2229 km². In the wolf distribution area are also six large SPA sites that partially overlap with the listed SCI's, and 17 smaller SCI sites. The area is recognized as Ecological Important Area and as the Designated Core-area of Large Carnivores in Slovenia (ID.Nr. 80000). Part of the area (Cerknica Lake, Menišija plateau, Krim Hills, Javorniki Mts.) has a status of a regional park – Notranjska Regional Park. Part of Snežnik plateau, including the peak Veliki Snežnik, is designated as a botanical reserve. There are also a number of forest reserves, as well as several well-preserved virgin forests stands. There are plans for another part of the region to become a regional park, Regional park Kočevska. Dispersing individuals are occasionally noted in the Alpine area and there is one well documented case of a dispersing individual with GPS/GSM collar – wolf *Slavc* which dispersed in 2011 from Slovenia, across Austria to Italy.

2. Population estimates & monitoring

In the past population estimates were based on "Integral monitoring" of the population by the employees of the Slovenia Forest Service. The monitoring included opportunistic recordings of observations, tracks, faeces, damages, litter findings and reconstruction of past mortality. In 2010 a genetic CMR method was used to obtain reliable population size estimate. The estimate was calculated using a genetic mark-recapture study for the entire wolf range in Slovenia and transboundary packs in Croatia. After corrections for the transboundary wolf packs (were divided in half), the maximum estimate (September 2010), after reproduction and before cull was 43 (39-50 95% CI) wolves. The minimum estimate (May 2011, after cull before reproduction) was 32 (28-39 95% CI).

In 2010 systematic wolf howling was also introduced with the purpose to record presence of territorial wolves and reproduction. In 2011, 14 responses were recorded, out of which 7 with pups and 2 were recorded from the Croatian side of border. In 2010, there were 13 responses, out of which 7 with pups.

3. Legal status & relevant management agencies

In Slovenia, wolf enjoys complete legal protection with exceptional culls permitted to decrease conflicts with agriculture. Provisions for wolf protection are included in national legislation in Nature Conservation Act (adopted 17.06.2004), Environment Protection Act (adopted 31.03.2004), Hunting Act (adopted 20. 2. 2004) and Forest Act (adopted 25.6. 1993). Slovenia has a strategic management plan. First five-year action plan is currently in the process of being accepted.

Responsible for management is the Ministry of Agriculture and Environment (since 2012), before it was Ministry of Environment and Spatial Planning. Responsible for population monitoring and damage estimations is Slovenia Forest Service. Advisory "Expert opinion" is produced also by the Institute of the Republic of Slovenia for Nature Conservation on a yearly basis.

4. Population goal and population level cooperation

There are no explicit population goals for wolf in Slovenia, however proposed action plan foresees continuation of the wolf culling with the following goals: prevention of hybridization with dogs, less illegal killings, better local public acceptance of wolves, maintenance of hunters' support to wolf conservation and keeping wolves wary of humans.

Both Wolf Conservation Strategy and the proposed Action plan foresee intensive cooperation with the neighboring countries. While informal cooperation and exchange of information and cooperation within the frames of joint conservation projects is already well established among experts from Slovenia with those in neighboring countries, formal cooperation is currently being established only with Croatia.

5. Conflicts and conflict management

There are regular conflicts with livestock breeders, and a large number of damages considering the number of wolves. Damages to livestock are being systematically compensated by the government, but the compensation system has been criticized as it does not stimulate breeders to invest in protection against predator attacks (compensations usually exceed the commercial value of the killed livestock). The majority of damage cases happen to a very small number of livestock breeders with very poor protection against attacks by large carnivores. To be eligible for compensation, the livestock breeder must meet certain legal requirements for livestock protection, however these requirements are so low that meeting them provides no protection against large carnivore attacks. There are serious initiatives to change the compensation system and correct these weaknesses.

6. Threats

There are several threats faced by wolves in Slovenia. The most important is probably low acceptance due to conflicts with livestock breeders and hunters, exacerbated by poor livestock protection and poor motivation for its improvement caused by very generous damage compensations by the government. This increases calls for high cull quotas and leads to high levels of legal persecution. Besides that, there are strong indications of considerable poaching

pressure, both “soft” information heard by field personnel as well as disappearances of wolves wearing telemetric collars. Vehicle collisions typically cause wolf mortalities on yearly basis. Last but not least, an important possible threat that is currently being assessed is hybridization with domestic dogs.

7. Summary table

Population size	2010: 32-43 individuals
Trend	Unclear
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 54 Sporadic: 36
Range trend	Increasing
Depredation costs / year	2007-2011 average: 269’000 €
Number of cases / year	2007-2011 average: 453
3 Most important threats	Low acceptance due to conflicts with livestock, Persecution (illegal killing), Lack of capacity in management structures

References:

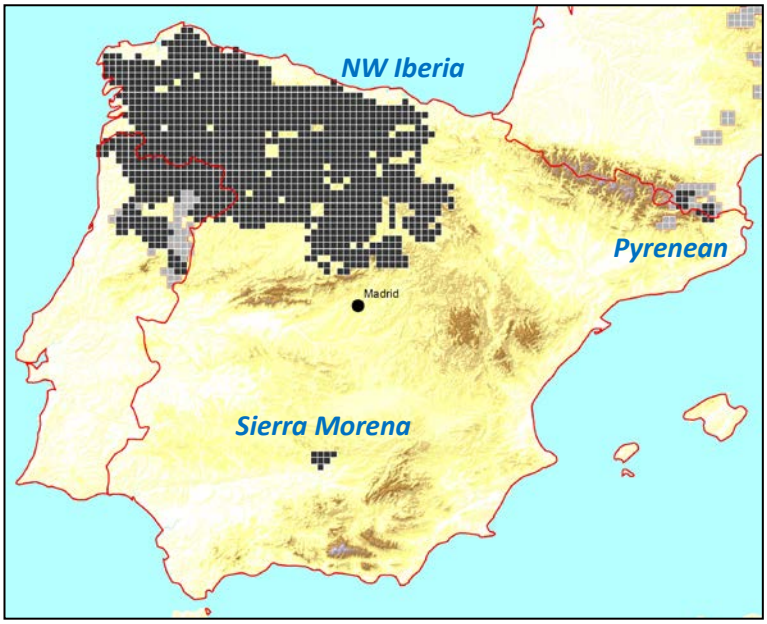
SloWolf project (LIFE08 NAT/SLO/000244 SloWolf) reports: http://www.volkovi.si/sl/multimedia/publikacije

Analiza odškodninskih zahtevkov za škodo, ki so jo povzročile živali zavarovanih vrst (Analysis of damage compensation claims – yearly reports by the Agency of the Republic of Slovenia for Environment). http://www.arso.gov.si/narava/poro%C4%8Dila%20in%20publikacije/

Yearly reports on the status of the population (Ministry of Agriculture and Environment): http://www.mko.gov.si/si/delovna_podrocja/narava/velike_zveri/

Wolf - Spain

Juan Carlos Blanco



Wolf distribution in Spain (after WOIS 2005).

Dark cells: permanent presence
Grey cells: sporadic occurrence

[Please note: neighbouring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

Wolves in Spain are found in two populations: the Iberian population, which is a large one in the northwestern part of Spain (which also occupies the north of Portugal), and the remnant, critically endangered population of Sierra Morena, in southern Spain. In addition, there is an occurrence in the eastern Pyrenees, where a few wolves coming from the Alpine population have been wandering between France and Spain since 1999, but have never reproduced so far.

In Spain, the Iberian wolf population covers some 120,000 km^2. More than 90% of wolves are concentrated in three autonomous regions: Castilla y León, Galicia and Asturias. In addition, the wolves also breed in 4 or 5 more autonomous regions: Cantabria, Basque Country, Castilla-La Mancha (Guadalajara province), Madrid and, perhaps, La Rioja. This population has been expanding since circa 1970, but has been rather stable since 2002.

The population of Sierra Morena used to live in this mountain range in part of the provinces of Jaén, Córdoba (Andalucía autonomous region) and Ciudad Real (Castilla-La Mancha). Field surveys carried out in Ciudad Real since 1999 have failed to detect reproduction there, although there is some sporadic wolf presence. Since 2007, the evidence of wolf reproduction is restricted to a small area of Jaén province (and Córdoba in 2012). The wolf core area covers some 800 km^2. Although the trend cannot be assessed due to non-standardized monitoring, its range seems to have reduced in recent years.

In the Spanish Pyrenees, the wolves have been detected in 900 km^2 in the north of Catalonia, mainly in the Nature Park Cadí- Moixeró and surrounding areas.

2. Population estimates & monitoring

Iberian population

The size of the Iberian population has not been recently estimated. It occupies 8 autonomous regions (in addition, all the wolves of Portugal are included in the Iberian population) and every region carries out their own wolf estimates but not in a coordinated way. For example, packs in the Basque Country are surveyed every year, in Asturias every second year, in Castilla y León (CyL) every ten years, and in some small regions, the packs have never been surveyed by wolf specialists (there are just unreliable official estimates). The main wolf regions in Spain are CyL (which harbours more than 50% of the packs of the Iberian population in Spain) and Galicia (25% of the packs). The last survey in CyL was carried out in 2001, and in Galicia, in 2003. Hence, the information is not updated.

The most recent reliable regional surveys are as follows (the year is included in brackets): Galicia 68 packs (2003), Asturias 35 packs (2004), Cantabria 5 packs (1997), Basque Country 2 packs (2010), Castilla y León 149 packs (2001), Castilla-La Mancha (Guadalajara province) 2 packs (2011), Madrid 1 pack (2011). Although recent information is lacking, the partial surveys carried out in specific areas and the stability of the wolf range suggest that the population seems to be more or less stable.

The method used to survey the population is to count the approximate number of packs, which are recognized by the presence of pups in summer. For this, elicited wolf howling and other secondary techniques are used (Blanco and Cortés 2012). This method gives an idea of the number of packs, but in order to estimate total wolf numbers, the average pack size and the percentage of solitary wolves must be known, and these data do not exist. For this reason, all the estimates of the Iberian wolf population are approximate and rarely adequate for comparisons. The increase or decrease of the population are deduced from obvious changes in the wolf range (an obvious expansion of the wolf range is usually considered as a consequence of the increase of wolf numbers).

Sierra Morena population

There is some controversy regarding Sierra Morena wolf population. According to the official information, there are around 5 to 7 wolf packs, but the low number of damages to the livestock, the decrease of wolf presence in some of the best areas of Andújar (Jaén province) and the small number of breeding packs confirmed suggest that the population might be much lower. In 2010 and 2012, just one breeding pack was confirmed by the presence of pups, and in 2011 no packs were confirmed.

In Andalusia, the population is monitored checking wolf damages and wolf presence reports. The breeding packs are confirmed by wolf howling. In Ciudad Real province (Castilla-La Mancha), there is a network of wardens and technicians trained to recognize the wolf presence.

Pyrenees

In the Spanish Pyrenees, 14 different wolves have been detected from 2001 to 2012 through genetic analysis, all of them males but one female found in 2001. In 2011 one wolf and in 2012 two wolves have been detected. Monitoring is mainly based on genetic analysis of scats (Lampreave et al. 2011).

3. Legal status & relevant management agencies

In Spain, wolves are in the Annex V of the Habitat Directive (no protected) north of the river Duero, and in the Annex II and IV (protected) south of the river Duero. Within this frame, each autonomous region north of the river Duero decides if wolves are a game species (Castilla y León north of the river Duero, Cantabria, La Rioja), if they are selectively culled to prevent damages (Galicia, Asturias, Basque Country) or if they are fully protected (Catalonia). South of the river Duero, wolves are selectively culled under the article 16 of the Habitat Directive to prevent damages to the livestock in Castilla y León, but are fully protected in Madrid, Castilla-La Mancha and Andalusia.

Wolf management is fully decentralized. The autonomous regions take all the decisions on wolf management, monitoring and research, and on compensation of damages to livestock.

4. Population goal and population level cooperation

There is a "National Action Plan for Wolf Conservation and Management" (Estrategia nacional para la conservación y gestión del lobo) approved by the Ministry of the Environment and the autonomous regions in 2005, which provides some general management guidelines for the whole country (the guidelines are not legally binding). Its goal is to conserve and recover the Iberian population where it is ecological and socialy feasible. The autonomous regions of Galicia, Asturias, Castilla y León and the province of Alava (Basque Country) have specific management plans. In the management plan of Castilla y León the goal is to maintain at least 149 packs. In the management plan of Asturias, wolves are excluded from some areas. In the other plans there are general goals but avoiding figures on population size and range. There are specific zoning policies, based on the damages to livestock, in Galicia, Asturias and Castilla y León management plans. In areas with more damages (in general, with free-ranging livestock), the hunting quotas are higher or the authorities cull a larger number of wolves. Most of the plans give information to the stakeholders in meetings carried out once a year, but their involvement in the management decisions is very small or absent.

The management is carried out by the environmental agencies of the autonomous regions. The coordination by the national Ministry of the Environment is almost absent. The Spanish wolf coordinating group of the Ministry of Environment was established in 1999 following the agreements of a meeting held by members of the Wolf Specialists Group (IUCN). This group integrated representatives of the autonomous regions, the Ministry of the Environment and several independent experts, and its goal was to coordinate monitoring, research and conservation actions, and to review the information collected on wolves in the autonomous regions. In 2011, the Ministry of the Environment removed the experts from the group. More and more, the scientific approach is vanishing.

There is no formal transboundary cooperation, but there is some technical cooperation among scientists and experts from Portugal and Spain. There are some agreements between Catalonia and France to monitore the Pyrenean wolves in a coordinate way.

5. Conflicts and conflict management

Wolves kill livestock throughout their range. Livestock damages are more serious in areas where the livestock is poorly protected, i.e., in mountain areas (mainly the Cantabrian Mountains), in the dehesa areas of western and southern Spain and in the areas of recent wolf expansion (Blanco and Cortés 2009).

Depending on the region, damages to the livestock are compensated mainly in three ways:

1) Compensation payment for all damages throughout the territory (amount compensated by damages around 2010): Galicia (167,000 €), Asturias (1 million €), Basque Country (60,000 €), Catalonia (1,500 €) and Andalusia (no damages in Sierra Morena population)
2) Compensation payment of wolf damage only in hunting reserves: Cantabria (120,000 €) (most of the wolf population is in Saja Hunting Reserve) .
3) Reimbursement only to farmers who have taken out private insurance on their stock (the difference between amount covered by the insurance and the real cost of damage): Castilla y León, Castilla-La Mancha. In Castilla y León, 120,000 € were paid in 2008, but the total damages could be guesstimated at ~800,000 €. In Castilla-La Mancha, damages cost ~30,000 € per year.

The annual total damages in Spain could be estimated in 2 million €, 75% of which is compensated by the regional governments.

In some regions (Basque Country, Catalonia, sometimes in some areas of Galicia, Castilla y León and Castilla-La Mancha) preventive measures are subsidized: mainly, mastif dogs, electric fences and enclosures to lock the livestock.

Wolf hunting and culling are one of the ways of reducing conflicts. In recent years, about 10 wolves were legally killed in Galicia every year (culling to reduce damages to livestock), 35 in Asturias (idem), 15 in Cantabria (hunting), 1-2 in the Basq Country (culling), 140 in Castilla y León (hunting and culling) and 1-2 in La Rioja. These are very rough figures. In conclusion, some 200 wolves are legally killed every year in Spain. In addition, many other wolves are killed by vehicles or removed illegaly.

6. Threats

Because of the damages to the livestock, the attitude of rural people toward wolves is negative, which is reflected in a high rate of illegal killings. Conflict mitigation (mainly through damage prevention and compensation) will likely improve the attitudes and reduce illegal killing. Other threats include habitat disturbance (mainly because of lineal infrastructure construction) and hybridization with dogs (in a genetic survey of the Iberian population, 4% of the sampled individuals were hybrids, but sampling perhaps was not random, Godinho et al. 2011). In recent years, the influence of science in wolf monitoring and management in Spain has been decreasing and the influence of politics has increased. A major challenge in Spain to re-integrate science in the monitoring and management of wolves.

The large Iberian population is not actually threatened. In Spain, it has been increasing since 1970 to 2000. In the last 10 years, the population seems to have be rather stable. The removal of carcasse pits following the mad cows desease (in 2000) may have reduced the food availability to one part of the population in Castilla y León area, and could be the cause of the lack of expansion in the last decade.

The population of Sierra Morena seems to be in the very border of the extinction. Maybe there are just one or very few wolf packs left, threatened by inbreeding and illegal killing to avoid damages to the livestock and to the big game bussines in the private estates.

7. Summary table

Population size	Iberian (2001/2): some 260 packs (no updated infomation) Sierra Morena (2012): one confirmed pack Pyrenees (2012): 2 wolves (no repreduction)
Trend	Iberian: unclear, but apparently stable Sierra Morena: decreasing
Distribution range (# cells in the 10 x 10 km EEA grid)	Iberian: Permanent: 998 Sierra Morena: Permanent: 8 Pyreenes: Sporadic: 7
Range trend	Iberian: stable Sierra Morena: decreasing
Depredation costs / year	Iberian: ~2 million € (guesstimate) Sierra Morena: almost no damages
Number of cases / year	Iberian: unknown Sierra Morena: almost none
3 Most important threats	Iberian: negative attitude of rural people, illegal killing, divorce between science and management Sierra Morena: very small population size, inbreeding, negative attitude of hunters and livestock breeders

References:

Blanco, J. C., Cortés, Y. (2009). Ecological and social constraints of wolf recovery in Spain. Pp.41-66. In: Musiani, M., Boitani, L., Paquet, P. C. (Eds.). *A new era for wolves and people: wolf recovery, human attitudes, and policy*. University of Calgary Press, Calgary.

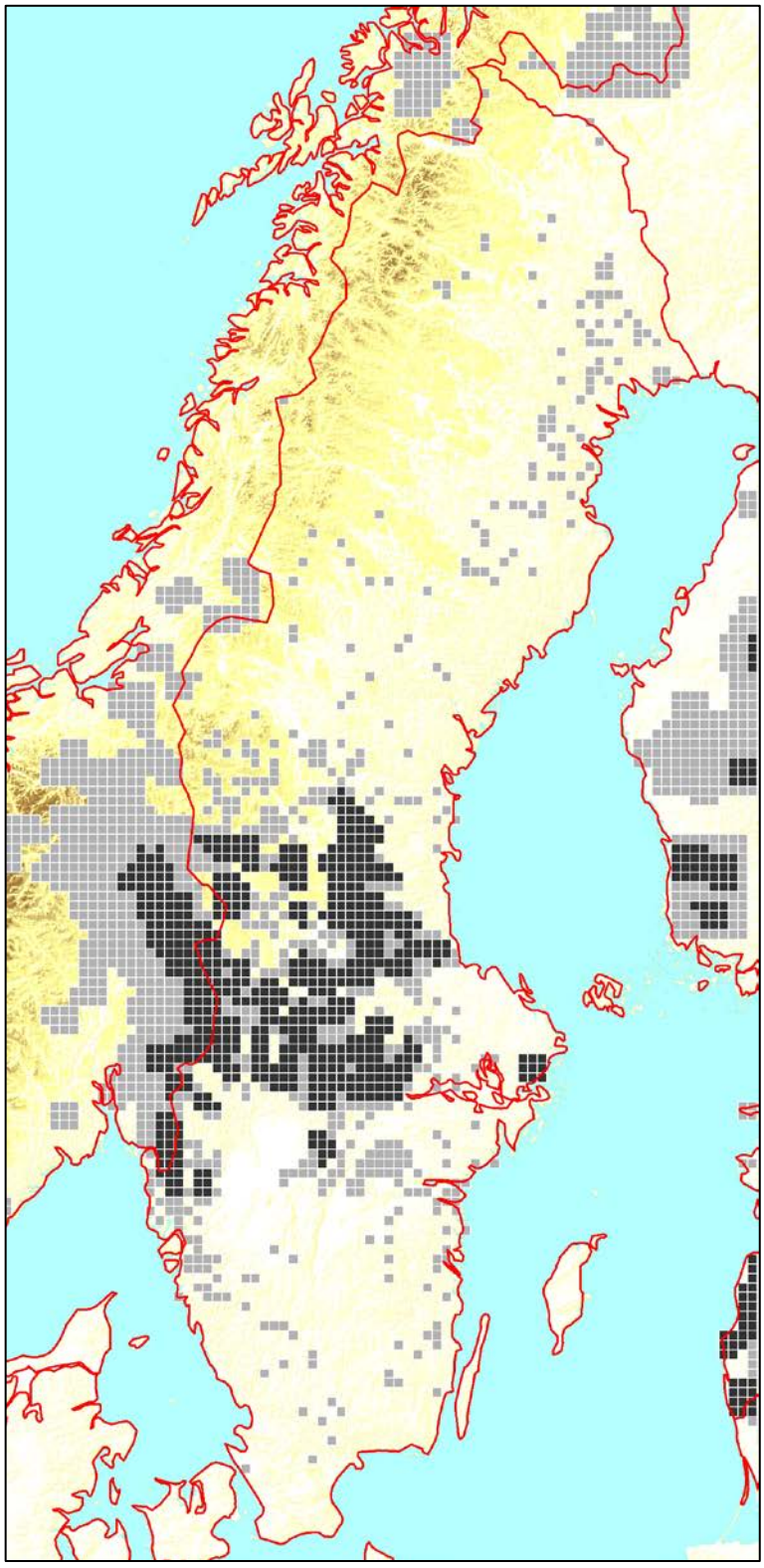
Blanco, J. C., Cortés, Y. (2009). Surveying wolves without snow: a critical review of the methods used in Spain. Hystrix, the Italian Journal of Mammalogy. http://www.italian-journal-of-mammalogy.it/article/view/4670/pdf

Godinho R., Llaneza L., Blanco J.C., Lopes S., Álvares F., García E.J., Palacios V., Cortés Y., Talegón J., Ferrand N. (2011) Genetic evidence for multiple events of hybridization between wolves and domestic dogs in the Iberian Peninsula. Molecular Ecology 20(24): 5154-5166.

Lampreave G., Ruiz-Olmo J., García-Petit J., López J.M., Bataille A., Francino O., Sastre N. and Ramírez, O. (2011). El lobo vuelve a Cataluña. Historia del regreso y medidas de conservación. Quercus, 302: 16-25.

Wolf – Sweden

Guillaume Chapron



Wolf distribution in Sweden 2011.

Dark cells: reproduction
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with reproduction / permanent and sporadic presences]

1. Distribution

The Scandinavian wolves are shared between Sweden and Norway, though the majority of the population is found in central Sweden. There are no permanent territorial wolves in the northern and southern part of Sweden.

2. Population estimates & monitoring

The historical Scandinavian wolf population started declining during the 19th century, and when protected, 1966 in Sweden and 1972 in Norway, the wolf was functionally extinct in Scandinavia (Wabakken et al. 2001). The nearest source population occurred in Russian Karelia along the eastern border of Finland. During the 1970's wolves expanded into eastern Finland, and by 1977 several wolves were recorded in northern Sweden.

In 1982 a pair was formed in south-central Scandinavia and successful breeding was recorded in 1983 (Wabakken et al. 2001). This breeding pair and a third male immigrant arriving in 1990, also with origin in Finland/Russia, were the sole founders of this recovered Scandinavian wolf population until 2008 (Liberg et al. 2005). In 2008 another two immigrants from the Finnish/Russian population

entered the breeding Scandinavian population, making total number of founders by March 2011 to five. In spite of an increasing degree of inbreeding with negative effects on reproduction (Liberg et al. 2005, Bensch et al. 2006), the wolf population has expanded and in early winter 2011/12 the total population size in Scandinavia was preliminary estimated to 260-330 wolves, of which approximately 90 % occurred in Sweden or in border territories (Svensson et al. 2012). Estimates of the number of wolves in Scandinavia is mainly based on snow tracking and DNA-analysis of collected scats. When available, radio-telemetry data, other research data and data on dead wolves were also used. Active monitoring is restricted to October – February. Wolf presence is monitored on territory level and classified as 1) family groups (packs), 2) scent-marking pairs, 3) other resident wolves, or 4) other wolves (category 4 used only in the reindeer husbandry area in Sweden). Family groups are always checked for the presence of pups.

3. Legal status & relevant management agencies

In Sweden, the wolf is a protected species under national law and the EU Habitats Directive (Annex II and IV). In 2009 the Swedish government decided on a new management policy for large carnivores in Sweden (2009/10:MJU8). For the Swedish wolf population this decision resulted in that 1) the population should for a 3-year period be restricted to a maximum level of 210 wolves, implemented through a regulating harvest, and 2) that active management actions should be jointly carried out to improve the genetic situation of the population. The latter included a strategy to introduce up to 20 wolves from other populations. The Swedish government has at two occasions in 2010 (M2010/3062/R) and 2011 (M2011/647/R) been requested by the EU Commission to answer and provide further information about the new management policy for wolves in Sweden. The Commission states that the new wolf management policy adopted by Sweden in 2009 may directly interfere with the goal of attaining a Favourable Conservation Status (FCS) according to the Habitat Directive (92/43/EEC). In particular, the Commission questioned the decision to let the population be exposed to a regulating quota harvest aimed to control population size at a level of 210 wolves. As a result the Swedish government decided in August 2011 to remove the temporary cap of 210 for the Swedish wolf population. In June 2010 the Swedish government decided to appoint a commission of enquiry aiming at evaluating the long-term goal for the population size of large carnivores, to consider further needs for improving the genetic status of the wolf population, and to suggest additional actions that will improve the coexistence between wolves and humans. The commission presented in April 2011 an interim document on the conservation status of large carnivores (SOU 2011:37) and in April 2012 the final document concerning the goals for the size of all four large carnivore populations (SOU 2012:22). The final report suggests that a long-term goal for the Scandinavian wolf population should be 500 wolves of which 450 should be seen as a preliminary reference value for Sweden and that a new evaluation should be done in 2019.

4. Population goal and population level cooperation

In 2012, the Swedish EPA commissioned a PVA of wolf population in Sweden (Chapron et al. 2012) and based on the results the agency concluded that the wolf population needed to contain at least 380 individuals, given that at least seven wolves sucessfully immigrated and reproduced during a 10-year period, to maintain its genetic and demographic viability. Following this conclusion, the Environment minister announced that Sweden should decrease the wolf population to 180 individuals, given that at least eight new immigrant wolves successfully reproduced during a 10-year period. At the time of writing (November 2012), it is not yet known if 180 individuals will be the new population goal. There is no formal common population level management plan for Sweden and

Norway. But the national agencies (Swedish EPA and Norwegian Directorate for Nature Management) have regular meetings. There is a tight research co-operation between Sweden and Norway, called Skandulv. There is also a common annual status report for Sweden and Norway, which also includes data on the number of wolf packs and pairs Finland (Svensson et al. 2012).

5. Conflicts and conflict management

The two most important conflicts with wolves are with hunters and reindeer herders. Wolves require hunters to reduce the moose hunting quota to keep the moose population stable and wolves can also kill loose hunting dogs (22 cases in 2011, 20 in 2010). To mitigate the conflict with reindeer herders, there is a zoning policy in the reindeer herding area (approx. northern half of Sweden) that precludes establishment of wolf pack due to a very low tolerance level (disturbance of reindeer – not depredations – is enough for removals). There is also a de facto zoning in the southern part of Sweden: it is not a political decision as the criteria for culling are the same as in central Sweden where most of the wolves are, but the higher density of livestock in southern Sweden results in reality that an almost wolf-free zone is created. In 2011 (resp. 2010), Swedish wolves killed in total 455 (191) sheep, 1 (0) goat and 4 (10) cattle.

6. Threats

Because the population has so far been founded only by five individuals, inbreeding depression and low genetic variability (Vila et al 2003, Liberg et al. 2005, Bensch et al. 2006) are important factors to consider in the conservation of the Scandinavian wolves, especially since gene flow from other populations may be very limited. The average inbreeding level has surpassed the one of full-sib progeny and inbreeding has been found to cause strong reductions in two fitness components; winter litter size (Liberg et al. 2005) and recruitment of individuals to the breeding population (Bensch et al. 2006). Poaching is a another major threat and has been shown to be widespread in Sweden and to account for approximately half of total mortality with more than two-thirds of total poaching remaining undetected by conventional methods (i.e cryptic poaching, see Liberg et al. 2012). Simulations have suggested that without poaching during the past decade, the population would have been almost four times as large in 2009. The practical implementation of wolf management in Sweden could also somewhat be seen as a threat. While the 2010 and 2011 hunts were intended to increase acceptance of wolves among hunters and were part of a package including the introduction of genetically different wolves, there is still no evidence the former has worked and the latter has not yet taken place. Two analysis by legal scholars found that the 2010 and 2011 hunts were in breach of the Habitats Directive (Darpö 2011, Michanek 2012) and that Sweden further breaches the Aarhus convention since environmental NGOs do not have the possibility to challenge wolf management decisions in national courts (Michanek 2012).

7. Summary table

Population size	Survey 2011: 26 packs, 22 scent marking pairs (Sweden only), 3 packs, 3-4 scent marking pairs (along the Swedish-Norwegian border) 260-330 individuals (whole Scandinavian population)
Trend	Increasing (stable 2010-2011)
Distribution range (# cells in the 10 x 10 km EEA grid)	Permanent: 432 Sporadic: 522
Range trend	Stable (increasing during the past 5 or 10 years)
Depredation costs / year	~100'000 €
Number of cases / year	200-500 small livestock, 20 hunting dogs
3 Most important threats	Inbreeding, Poaching, Practical implementation of management

References

Bensch, S. et al. 2006. Selection for heterozygosity gives hope to a wild population of inbred wolves. PLoS ONE 1, e72.

Darpö, J. 2011. Brussels Advocates Swedish Grey Wolves. European Policy Analysis:1-20.

Liberg, O et al. 2012. Shoot, shovel and shut up: cryptic poaching slows restoration of a large carnivore in Europe. Proceedings of the Royal Society Biological Sciences Series B 279: 910-915.

Liberg, O. et al. 2005. Severe inbreeding depression in a wild wolf (Canis lupus) population. Biology Letters 1, 17-20.

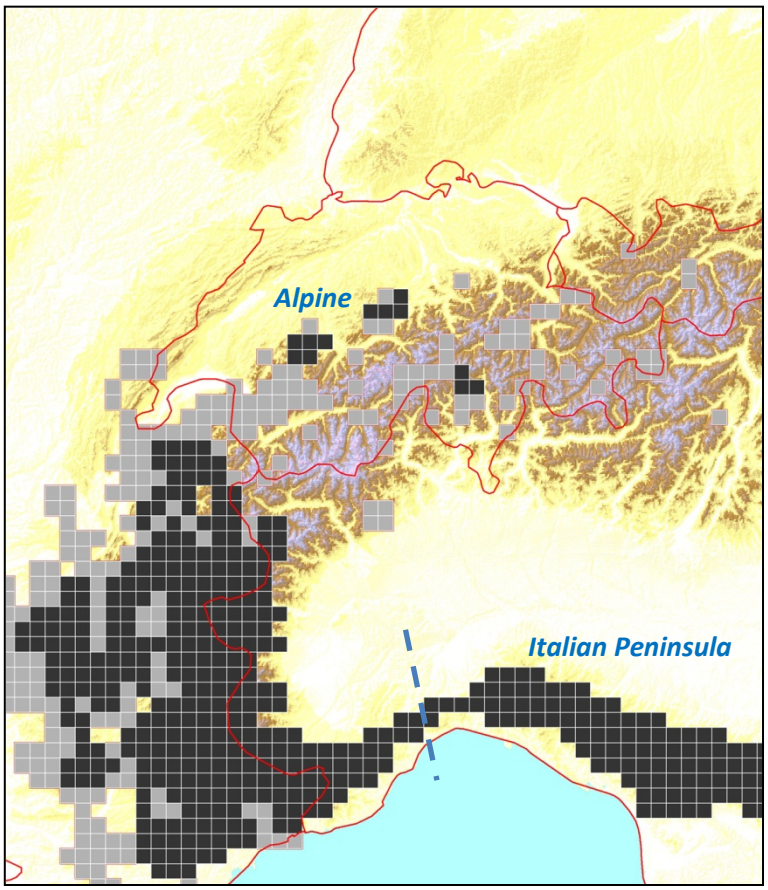
Michanek, G. 2012. Strictly Protected European Wolf Meets Swedish Hunter with Licence to Kill. Pro Natura - Festskrift till Hans Christian Bugge: 323-345.

Svensson, L. et al. 2012. Varg i Skandinavien och Finland Slutrapport från inventering av varg vintern 2011-2012. Högskolan i Hedmark Uppdragsrapport nr. 6 – 2012.

Vila, C. et al. 2003. Rescue of a severely bottlenecked wolf (Canis lupus) population by a single immigrant. Proceedings of the Royal Society Biological Sciences Series B 270, 91-97.

Wolf – Switzerland

Manuela von Arx & Ralph Manz



Wolf distribution in Switzerland 2005-2011.

Dark cells: permanent presence
(cell at least 3out of 5 years occupied)
Grey cells: sporadic occurrence

[Please note: neighboring countries can have different criteria and time periods for the definition of cells with permanent and sporadic presences]

1. Distribution

From 1995 on, the first wolves were immigrating to Switzerland from Italy. Since then there is continuous immigration of single individuals from France and Italy. Often they are dispersing animals which wander over huge areas. The majority are males. Of the 38 individual wolves genetically identified until 2011, only 7 were females. So far, most of the individuals were only detected for one or two years and then disappeared. In 2011, three individuals were considered resident as they had been present for 3 years (areas of permanent presence in map): F05 in the northwestern Alps (cantons Bern & Fribourg), male M20 in the central Swiss Alps (cantons Luzern & Obwalden) and male M26 in the Ticino. In August 2012, the first reproduction of wolves in Switzerland was confirmed in the region of Calanda (Grisons) where a male and female seem to have settled in autumn 2011.

2. Population estimates & monitoring

The number of animals fluctuates a lot. Genetically identified were 7 in 2006 (however, 3 of them were then removed), 2 in 2007, 3 in 2008, 11 in 2009 (of which one removed), 7 in 2010 (of which one was removed, one dispersed to Bavaria and another one to the Trentino). In 2011, 8 individuals were genetically identified of which two were females. The most current numbers are always published on the KORA website (www.kora.ch).

The monitoring of wolf in Switzerland is carried out opportunistically. Samples for genetic analysis, livestock and wild prey killed, sightings and pictures are continuously collected. The genetic analysis

of scats, saliva, tissue or hair allows for identification of the species and – given the sample is of good DNA quality – allows for individual fingerprinting.

3. Legal status & relevant management agencies

In Switzerland, wolf is fully protected by law. For its management a Concept was developed in 2004 and adapted in 2008 and 2010. The Concept defines rules for livestock prevention and the removal of wolves in case of too much damage. The Federal Office for the Environment (FOEN) is responsible for the overall management of the species. However, for the implementation of the Concept, the cantons are in charge. To harmonize the implementation, the country was divided into 8 management compartments. For each compartment, an intercantonal commission coordinates the decision-making (in regard to monitoring, prevention and intervention measures). In June 2012, the revised Hunting Ordinance was enacted and currently, the Wolf Concept is reviewed as well.

4. Population goal and population level cooperation

In 2001 the Wolf Alpine Group was established and later on appointed as technical advisory board for the management of wolves in the Alps. In 2009 the Alpine countries signed a transboundary arrangement under the Alpine Convention called platform WISO (Wildlife and Society). The intention is to develop a common strategy for the management of the Alpine populations of lynx, bear and wolf. So far, there are no common goals. Furthermore, the monitoring still needs some harmonisation amongst the range countries.

5. Conflicts and conflict management

Wolves have killed between 88 and 358 domestic animals per year between 2006-2011, mainly sheep. The sum paid for compensation was between 40’000 -120’000 €. Killed livestock have to be examined by an official person (game warden) and are compensated to 100% if predated by wolf. The state (Federal Office for the Environment) pays 80% of the amount, the rest is paid by the canton concerned. Electric fencing, livestock guarding dogs and shepherds are the main prevention methods applied in Switzerland. They are financially supported by the FOEN. The canton can ask for a permission for removing an individual wolves given the criteria defined in the Concept are met. From 2006-2011, 4 wolves were legally shot.

In the past few years, the Swiss parliament discussed several motions dealing with large carnivore management (mainly wolf), livestock compensation and prevention measures. Switzerland has once again asked for amendments of the Bern Convention concerning wolf.

6. Threats

The main threat is low acceptance due to livestock depredation, symbolic and wider socio-economic issues. As a consequence, stricter regulation measures are asked for by local interest groups and illegal killings might occur as well.

7. Summary table

Population size	2011: 8 individuals genetically identified (6 males, 2 females), 2012: first reproduction
Trend	Fluctuating
Distribution range (# cells in the 10 x 10 km EEA grid)	12 permanent & 66 sporadic
Range trend	Slightly expanding
Depredation costs / year	2006-2011 (range): 40'000-120'000 €.
Number of cases / year	2006-2011 (range): 88-358 (the majority being sheep)
3 Most important threats	- Low acceptance due to conflicts with livestock. - Symbolic and wider social-economic issues as well as overprotection (political opposition to European legislation). - Potentially illegal killings are also threat, but hard fact data are missing.

References:

BAFU (2010). Konzept Wolf. Managementplan für den Wolf in der Schweiz. 16 pp.

Imoberdorf, I. (2012). Deutungskampf im Oberwallis. Interessenverbände in der Debatte um den Wolf. Masterarbeit, Geographisches Institut, Universität Zürich. 80 pp.

Zimmermann F., Weber J.-M., Dirac C., Ryser A., Breitenmoser-Würsten Ch., Capt S. & Breitenmoser U. (2010). Monitoring der Raubtiere in der Schweiz 2009. KORA Bericht Nr 53.

http://www.kora.ch