

IMPROVING THE CONDITIONS FOR LARGE CARNIVORE CONSERVATION: A TRANSFER OF BEST PRACTICES



FINAL REPORT

Annex XXIV

Report of action E5



INDEX

1. INTRODUCTION	2
2. METHODOLOGY	2
3. RESULTS	4
3.1 Italy	4
3.2 Romania	6
3.3 Bulgaria	7
3.4 Greece	7
4. CONCLUSIONS	8

1. INTRODUCTION

The monitoring of large carnivores distribution and abundance was carried out in all project countries, continuing what has been done in 2009 (Action A9).

In Italy and Romania bears and wolves were targeted, while in Greece and Bulgaria the monitoring program concerned only bears.

This action aimed at monitoring the status of wolves and bears, their potential expansion and/or threats for their conservation. It served as a general indicator to detect the effects of the activities implemented for preventing conflicts between large carnivores and humans. But it was also important to gather the necessary information for optimising the allocation of damage prevention measures, selecting those areas where the presence of large carnivores was detected most recently and thus to act in a preventive way rather than reacting after the damage was suffered.

In this report a synthesis of the main results obtained were presented even if a specific deliverable was not foreseen in the project proposal.

2. METHODOLOGY

The methodology used for monitoring the presence of large carnivores was the same as those used for estimating the starting point situation in project year 1 (activity A9).

The monitoring techniques were initially discussed among project partners in order to define a common monitoring protocol.

In Italy wolf monitoring included mainly:

- Wolf-howling;
- Snow-tracking;
- Additional information were also gathered through camera trapping.

Wolf-howling was used during summer period (July-September) in order to locate producing packs in the area. To achieve this objective we followed the protocol established by Harrington & Mech (1982) for "saturation census". A grid of lines at approximately 3 km intervals was overlapped to the study area and each intersection point of the grid represents an howling station. The exact station location was then modified taking account environmental factors that could influence sound transmission. The area to be censused was defined on the basis of its suitability to host a rendez-vous site. This was done considering 3 environmental variables: vegetation cover, distance to roads, and distance from human settlements. Each station was censused on 3 consecutive nights. A single stimuli was used in order to reduce difference in reply rate between small and large packs (Harrington and Mech 1982). The results obtained allow the estimates of the minimum number of reproducing packs. This implies night sessions with a recorded wolf howl and waiting for established time lapses. The technique requires the wolf howl to be repeated for three consecutive nights from a network of fixed stations identified after having surveyed the area for signs of presence and topography (Harrington and Mech 1982). The wolves present in the area are stimulated by the recording and tend to respond for letting potential competitors know that the area is included in their territory (Harrington and Mech 1979). The howling of pups are very well identifiable. The results obtained allow the estimates of the minimum number of reproducing packs.

During winter months snow-tracking activities were carried out. In each project area a system of transects was selected in order to find wolf tracks. The selection of transects was made in order to cover the potential directions of animal's movements, taking also in account the

accessibility of the area for the field operators. The majority of transects developed along forest roads and trails because these are mostly used by wolves during their movements on the territory. All the transects were simultaneously covered 24-36 hours after the last snowfall. Once wolf tracks were found, they were followed until it was possible, also in the following days, in order to estimate number of packs present in the project area.

In PNGSL and PNMS monitoring program concerned also the Marsican brown bear. Fur traps were installed in opportunistic way and checked regularly in order to detect animal's signs of presence.

All the hairs found in the traps were carefully analyzed. Camera traps were also installed near the fur traps.

In Romania the following wolf monitoring techniques used were:

- snow-tracking,
- camera trapping and direct observations at feeding sites and passing routes;

A system of transects to detect wolf and bear tracks were selected in each project site, using the same approach specified above for Italy. The information gathered from this activity was combined with that ones coming from camera trapping and direct observation to obtain a general overview of large carnivores distribution.

In Bulgaria the brown bear monitoring program included: mark-recapture (through DNA sampling), transects, questionnaires (mainly for damage assessment and registration of females with the cubs of the years), camera traps, radiotelemetry and GPS-GSM telemetry.

Mark-recapture method is conducted by collection of DNA samples both from hair and excrements. The samples are collected in the field from marking trees, feeding places, transects, etc. or by setting hair traps. For the sampling strategy with the hair traps (monitoring period, number of sampling days, etc.) a grid of 7x7 km ($\approx 50\text{km}^2$) was used. One hair trap per square grid was set. Hair traps were set as a priority on the north east border of Rila National park (NP) and on the south west border of Central Balkan NP. This was done in order to check whether there is adequate genetic material exchange between Rilo-Rodopean and Central Balkan subpopulations. The traps are built of a barbed wire with length 20-25 metres stretched between 4-6 trees at about 0,5 m. above the ground. In the middle of the enclosed area a pile of dead branches have been piled with not awarding bait poured over it. The bait was prepared by blood (containing anticoagulants) received from slaughterhouses with some additional scents such as fish, grease, eggs, etc.).

In Greece the main methodology for the bear presence and activity survey conducted in the project area, was based on the non intrusive "indirect method of systematic recording of bear signs of presence and activity". Because of field ruggedness and heterogeneity, "piecewise" (non linear) type "transects"(ANDERSON et al. 1979) were chosen for field sampling, covering in a mostly representative way the major ecological features and habitat types of the surveyed area. Their length and density were adjusted to the ecological diversity of the investigated sectors. The total sampling network used mostly forest roads (of various degrees of accessibility) as well as trails and paths and was of a total distance of 612 km. covering the majority of the bear distribution area with emphasis in the NATURA 2000 sites. (see map 2).

The selection of the above sampling network axes was based on the fact that brown bear uses systematically human made "routes" better adapted to topography and therefore less energy consuming. Systematic recording of all detectable signs of bear presence and activity was achieved either directly (through direct observations in the field) or indirectly through

interviews using standard questionnaires and in most cases confirmation in the field. Another method used to monitor bear presence in the study area was the use of fur traps. A small network of poles and tree hair trap stations (Mowat and Strobeck 2000; Woods et al. 1999) was also set up in the surveyed area as a complementary survey tool for the indigenous bear population. The choice of power and telephone poles was made based on the assumption and fact that in Greece brown bears have been observed to mark and/or re-mark the wooden power poles which transport electricity or telephone lines in rural areas. The installation of the hair trap, which consists of barbed wire, starts from approximately 2 meters above ground with a 2.5 – 3m single stranded barbed wire, which is hammered around the pole creating a helix of 4-5 metal rings that are distanced 40-50cm apart.) By rubbing on barbed wire poles bears leave hair packs and bunches that are carefully collected by the field crew and transported for further genetic analyses at the laboratory and individual DNA finger printing (see photo). The sampling sites in the project area were chosen in such way so that there are within the radius of sectors with the highest density of brown bear signs (based on previous surveys prior to project implementation). A sponge embedded with essential oils were hung (as attractants) from a branch of two corner trees in such a way that the bears can only reach it by entering HT station. Citronella and anise oil extracts are commonly used to attract bears successfully . Additional information on bear presence were also gathered through the use of camera traps.

3. RESULTS

The main results obtained in each project area are presented separately.

3.1 Italy

PNGSL

Wolf-howling

In 2010 the systematic sampling of the study has been carried out from 5/07/2010 to 21/07/2010. In this period we covered simultaneously each of the 5 sectors of the study area. 178 howling stations over the 183 selected have been censused for 3 consecutive nights and 38 additional howling sessions have been carried out from 14/07/2010 to 28/10/2010.

Totally 13-15 reproducing packs have been estimated.

In 2011 the systematic sampling of the study has been carried out from 11/07/2011 to 27/07/2010. 181 howling stations of the 183 selected have been censused for 3 consecutive nights and 21 additional howling session have been carried from 19/07/2010 to 06/10/2011. A total of 11-13 reproducing packs have been estimated.

In 2012 the systematic sampling of the study has been carried out from 2/07/2012 to 18/07/2012. 184 howling stations of the 188 selected have been censused for 3 consecutive nights and 28 additional howling sessions have been carried out from 31/07/2012 to 28/10/2012.

A total of 14 reproducing packs have been estimated.

The fluctuation in the number of reproducing packs estimated in different years doesn't reflect a real change in the number of packs present, but has to be interpreted as the difficulty to cover all the project area, and the possible displacement of a pack in an area not covered by the howling stations selected.

For that reason we can say that wolf abundance in the project area remained substantially stable in the four years.

Snow-tracking

In winter 2010-2011 43 snowtracking transects were made, and wolf tracks were followed for 50 Km.

In winter 2011-2012, only 19 snow tracking transects were made, due to adverse meteorological conditions (absence of snow fall in the first part of the winter, and an high risk of avalanches in the second part). Wolf movements were followed for a total of 22 Km.

Regarding bears a network of 30 fur traps has been placed on the ground opportunisticly in the areas where bear presence was most likely. The traps were regularly checked each month. In addition, 8 photo traps have been placed near the traps.

No evidence has been found of the presence of bears, but the photo traps have been useful for the assessment of other species such as wolves.

PNMS:

From 2010 through 2012 16 video/photo trapping sites have been active and have produced 83 videos.

Snow-tracking has been done as follows:

Winter 2010-2011: 192 km of wolf tracks

Winter 2011-2012: 75,8 km of wolf tracks

Winter 2012-2013: 75,8 km of wolf tracks

Wolf-howling has been done as follows:

Summer 2011: 69 stations in 108 sessions

Summer 2011: 80 stations in 126 sessions.

Summer 2012: 62 stations is 112 sessions.

The number of reproducing packs detected was 7-8 in 2010 (2-3 packs were detected outside the park border), 6 in 2011 (1 pack outside the park border); 4 packs in 2012 all inside the protected area.

The wolf population in the project area seems to have remained stable. There seems to have been an attempt of the wolf population to expand into areas that were previously not inhabited. However, this expansion is obstructed by the presence of human pressures. Indeed, during the course of the project 20 dead wolves have been found, which have been killed by human causes (at least 7 were poached).

A single bear that was present in the Park territory from 2006 to 2010 but has lately not been found anymore in the monitoring activities. The last sign of its presence was registered in May 2010 by one of the installed photo traps.

PNATE:

From 2010 to 2012 wolf howling efforts can be summarized in this way:

2010: 474 emissions in 60 sessions

2011: 503 emissions in 77 sessions

2012: 89 emissions in 36 sessions

Furthermore, in the three winters 2009/2010, 2010/2011 and 2011/2012 also 84 snow-tracking transects have been made on 1.375 km. On these 201 km of wolf tracks have been followed.

The integration of the results obtained from the two monitoring techniques allowed us to estimate the presence of 8 wolf packs in 2010, 8 in 2011, and 9 in the last year of the project.

3.2 Romania

Snow tracking visits were performed annually during early spring (February and March), on pre-defined transects by mixed teams of field personnel and LIFE/EXTRA members and volunteers. The numbers obtained are considered the key number for the starting year as they represent the population after hunting and winter losses. For carnivores, being strictly protected species, the annual evaluations are done together with authorities (environmental protection agencies, regional game control agencies, environmental guard). Photo trapping cameras were used (to assess population level and status) mostly during the year at feeding points especially for bear which feeds on food for ungulates. Observations at observation points were used during the year and also during special periods (soon after hibernation, before going to den). The use of photo trapping cameras proved very useful as a tool (reducing by a lot the personnel costs and catching both species categories as, especially bears, are visiting ungulate feeding points). However, a major drawback was the fact that in some areas they were either destroyed or stolen. The memory cards also get easily damaged by frozen temperatures (most of the places they were used are in areas with harsh winters).

The numbers in all three project areas show a rather high but constant carnivore population:

Project area	species	2009	2010	2011	2012
Piatra Mare - Ciucas	bear	57	60	61	63
	wolf	20	16	18	18
	lynx	18	18	17	19
Dalnic	bear	25	24	24	27
	wolf	10	10	7	9
	lynx	7	6	6	9
Herculian + Cormos	bear	99	100	97	98
	wolf	23	26	29	34
	lynx	18	17	15	15

The relative stable tendency for carnivores shows the beneficial results of using complementary food combined with anti-poaching patrols (under action C7). Maintaining a balance between carnivores and their natural source of food is important not only for survival of carnivores but also for low damage levels, ensuring therefore a good acceptance of local communities and coexistence of carnivores and humans in the same area

3.3 Bulgaria

Since 2010 a country-wide bear monitoring program was activated by BWS and MOEW in cooperation with the Executive Environmental Agency. In this program monitoring sessions are done each spring and autumn. In these occasions 120 transects are done in 2 days covering the whole country. All signs of bears are collected such as prints, scats, DNA samples etc. This involves 200 persons (staff of the Environmental Agency, MOEW, Regional Inspectorates, NGOs, National Parks, Foresters). This has been a good example of the fruitful cooperation between NGOs and the authorities.

The following bears were captured and radiocollared:

1. April 2009 a young male bear was rescued from poacher snare in April 2009 in Vitosha
2. November 2009 a 3-years old male was captured in in Central Balkan
3. November 2009 a female bear was caught in Rodopi because it was attacking bee-hives
4. May 2011 male bear caught in Central Balkan National Park
5. May 2011 female caught in Rodopi Mountains
6. May 2012 male bear caught in Rodopi Mountains
7. May 2012 female bear caught in Rodopi Mountains
8. June 2012 young male bear released from poacher snare in Rodopi.

734 fur and scat samples have been collected and analysed in order to perform DNA analysis. Of these 365 were suitable to perform laboratory analysis.

It was initially foreseen to analyse 6 loci for each sample, but in order to improve the accuracy of the analysis 10 loci were analysed for each sample and in addition for each sample the mitochondrial DNA was analysed.

This provides information about the relation between different bear subpopulations.

The analysis of more loci provides a more accurate analysis of parental relationships in the population.

For the period 2010-2012 the national bear population was assessed as follows:

2010: 540-560 individuals

2011: 500-520 individuals

2012: 540-560 individuals

We can consider that from the population size point of view the bear population in the country is stable, showing only minor fluctuations, which could be the results of the fact that bears reproduce only once every 2-3 years, therefore peaks of new individuals can be expected only in certain years.

The results of the DNA analysis showed that two of the project areas (Central Balkans and Rodopi Mountains) which were thought to be isolated are actually interconnected because two male bears from Rodopi Mountains were found in Central Balkan.

3.4 Greece

Each year 20 bear tracking transects have been surveyed on 612 km in spring and autumn.

On these 115 biosigns have been collected in 2010, 121 in 2011, 164 in 2012. Three infrared photos cameras were also set up in 2009 and 2010 and were regularly checked for bear individual identification. From the collected data we may conclude that bear presence and distribution in the surveyed areas appears to be continuous in time and homogeneous in space especially in the two SCI's located in the mountainous zones of the project area

(GR1440001 and GR1440002). Moreover, the presence of bears in the re-colonization area (GR1440003) (a natural dispersal triggered in the late '90's) shows stabilization tendencies. In detail, the field work allowed to identify 7 different bear individuals in an area of circa 200 km² in one survey period. Furthermore, the identification of 3 different FWCOY (females with cubs of the year) in the two aforementioned SCIs give a minimum estimate of population size at circa thirty 30 individuals (Bunnell & Tait 1981 extrapolation model:1 FWCOY=10-12%).

4. CONCLUSIONS

From the results achieved by the monitoring of large carnivores populations implemented during the project, we acquired relevant information about the outlook of wolf and bear in the project areas.

The populations of the two species seem to be substantially stable in the four project countries, as witnessed by the estimates of population size.

In Italy wolf population remains relatively stable during the last four years. The number of reproductive packs present in 2012 in the 3 National Parks is around 30, indicating that the environmental conditions are favourable in terms of prey abundance and vegetation cover. As stated below the major threats to the species are still represented by humans in particular in the territory outside these protected area. For this reason it should be a priority to transfer the best practices of wolf management acquired in the EX-TRA project to neighbouring areas, because here we can expect an higher level of conflict. Generally outside the protected areas regional and provincial administrations are not well prepared to face possible conflict resulting from wolf presence.

Another major threat to wolf conservation is represented by hybridization with free ranging dogs. The presence of hybrids was documented in the territory of PNATE, and the possible presence of hybrids was supposed in PNGSL, indicating that this phenomenon needs to be carefully monitored in the future.

In the territory of PNGSL and PNMS also bears were targeted, but no evidence has been found of the presence of bears in the PNGSL. In PNMS only one animal was present in the Park territory from 2006 to 2010 but the last sign of its presence was registered in May 2010 by one of the installed photo traps . The problems is that in the central Apennine bear presence is substantially restricted to the area of Abruzzo Lazio e Molise National Park, thus the future conservation efforts must focus to favour the expansion of the species. Anyway the activities implemented in the LIFE EX-TRA project were useful to prepare the ground for a potential reappearance of the bear.

In Romania the large carnivore species populations seem to be constant at national level (according to the official numbers provided by the national authority for environment). However, not only official numbers but also high level of conflict is suggesting populations are way above carrying capacity of habitat or at least above the level which would ensure low conflict and high human population tolerance (social acceptance capacity). Moreover, chances are that the population of these species will increase in the near future as hunting (the former management method, used before accession) is forbidden now and culling quotas (meant to eliminate animals producing high levels of damage or posing a threat to human safety and health) are half as the natural growth rate and not fully covered (e.g. in the past year only 60% of the bear quota was attained). However, the lack of prompt compensation and prompt intervention to prevent damages could lower the tolerance of local communities towards carnivores, most probably one of the key factors which ensured coexistence of such large carnivore populations with human communities in the Romanian Carpathians.

In Bulgaria the bear population seems stable, and it's also important to underline that genetic analysis showed that two of the project areas (Central Balkans and Rodopi Mountains) which were thought to be isolated are actually interconnected because two male bears from Rodopi Mountains were found in Central Balkan. The preliminary analyses also showed that there are two distinct genetic lineages in Rodopi mountain which might cause a problem in the future if any isolation occurs.

Future conservation efforts must focus to preserve habitat quality, and to continue to link the management of the species to the results of the national wide monitoring implemented in the framework of Life EX-TRA project. The estimate produced is more reliable than the past ones, and thus allows to develop a better management program.

In Greece on the basis of the monitoring program implemented we may conclude that bear presence and distribution in the surveyed areas, appears to be continuous in time and homogeneous in space especially in the two SCI's located in the mountainous zones of the project area (GR1440001 and GR1440002). Moreover presence in the re-colonization area (GR1440003) (a natural dispersal triggered in the late '90's) shows stabilization tendencies which consists a very positive related attribute regarding population positive trends.