

Report on the Field Survey

Mavrovo National Park, Macedonia

March 20-25, 2006

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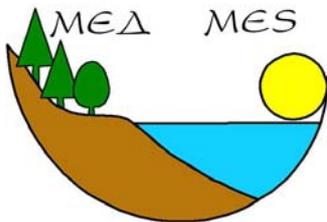


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Executive Summary

After a first training in monitoring methods in the Swiss lynx project, five young researchers from Macedonia and Albania, representing the Macedonian Ecological Society and the Society for Protection and Preservation of Natural Environment in Albania, organized a field survey in the Mavrovo National Park, Macedonia together with the IUCN/SSC Cat Specialist Group / KORA and Euronatur.

The aim of the survey, which took place from March 20-25, was to carry out some transects in supposed lynx habitats in order to identify correctly and record any tracks of mammal species encountered, to get an idea about the species composition in these areas, and with the hope to find indications of lynx presence. The Mavrovo National Park is thought to be the stronghold of the Critically Endangered Balkan lynx population.

We delineated five transects in different regions of the park (Fig. 2). Localities were selected basing on information of lynx observations in the past and depending on the snow conditions.

During these five days indications for the presence of several mammal species in the National Park were found. Besides the numerous hares and foxes, we encountered tracks of wild boar, chamois, badger, roe deer and marten. Among the large carnivores, tracks of one bear, possibly two wolves and, on the last day (Fig. 7), tracks of two lynx, probably a female with young, walking side by side, were found. In general, the species composition was more diverse in mixed forests than in beech forests. This was especially true for the large carnivores and the larger ungulates like roe deer and chamois (e.g. Fig. 5). The survey is well documented with photos; a collection for each day can be found at the end of the report (pages 15-19).

After this experience, we point out some future steps that in our opinion need to be undertaken:

- Continuation of the field work, in order to have more reliable data about lynx and its prey base;
- Creating a data base for collecting the various data and information;
- Continuation of the cooperation with the border police and other stakeholders;
- Rising awareness in order to create a bigger network in the area.

Introduction

The lynx population living in the southwestern Balkan mountains, mainly in Albania and Macedonia, has been identified as the most threatened population of Eurasian lynx in Europe (von Arx et al. 2004). This is even more alarming as it most probably concerns an own subspecies, as previously described by some authors (*Lynx lynx martinoi*, Mirić 1978) and as the preliminary genetic analyses show. Conservation agencies and environmental organizations have shown interest in conserving this population and different actions are taken up to now in help of its survival. These include a series of meetings, seminars, workshops and trainings aiming at the increase of knowledge, capacities and cooperation between the main range countries (see Balkan Lynx Conservation Compendium). A recovery programme for the Balkan lynx is expected to start within this year.

At present, the knowledge about the Balkan lynx distribution, habitat, prey base and threats is limited. This information is immediately needed as no conservation strategy can start without having enough knowledge about the species in the region. One of the conclusions of the Lynx Monitoring Workshop, held in Mavrovo, Macedonia, on 15-17 November 2005, was to gather more ecological data concerning the Balkan lynx (Report on Mavrovo Meeting, 15-17 Nov 2005; Breitenmoser et al. 2005).

With the support of the German Federal Agency for Nature Conservation (BfN), KORA, in collaboration with EURONATUR, organized a training about the lynx monitoring for five students from Albania and Macedonia in Switzerland in January 2006. During this training, the participants learned theoretical, practical and organizational aspects of monitoring wildlife. Field work was an important part of the training, and the participants had the opportunity to do some camera trapping and snow tracking (Balkan Lynx Training Report, Melovski et al. 2006).

The experience gained during the training in Switzerland was the precondition for starting basic surveys in Albania and Macedonia. KORA, together with EURONATUR and representatives from the Macedonian Ecological Society (MES) and the Society for Protection and Preservation of Natural Environment in Albania (PPNEA) organized such a survey in the Mavrovo National Park in Macedonia, the area which is thought to hold the stronghold of the Balkan lynx population. This field survey was conducted from 20-25 March 2006 by Aleksandar Stojanov, Aleksandër Trajçe, Dime Melovski, Gjorgji Ivanov, Olsi Qazimi & Manuela von Arx, members from the above mentioned organizations. The aim of the survey was to carry out some transects in supposed lynx habitats in order to identify correctly and record any tracks of mammal species encountered, to get an idea about the species composition in these areas, and with the hope to find indications of lynx presence. In addition, the conditions at place in regard to future activities, especially camera-trapping, were examined.

This basic survey required: well planned and organized transects, team work, equipment (cars, maps, GPS, snow equipment, field forms, cameras, etc.), analysis and interpretation of the field data. Apart from transects and field work, a very important part of the survey was to collect information from villagers who live in the study area, to set up new connections and meetings with the national park wardens and the border police with the aim to raise awareness in order to create a bigger network of contacts in the area.

Characteristics of the National Park Mavrovo

The Mavrovo National Park (Fig. 1) was established in 1949. At the beginning, the area of the park was 11.750 ha. Since then it has expanded continuously. Today, the territory of NP Mavrovo is 73.088 ha. The area is part of the Scardo-Pindic mountain range. This region covers the southern parts of the Šara Mountain, a whole massif of the mountains Korab and Dešat and parts of Bistra and Vlainica. In the eastern part of the Bistra Mountain, the Mavrovo Lake was constructed as an artificial lake in the field of the Mavrovo Pole. The National Park comprises 36 villages in four local regions.

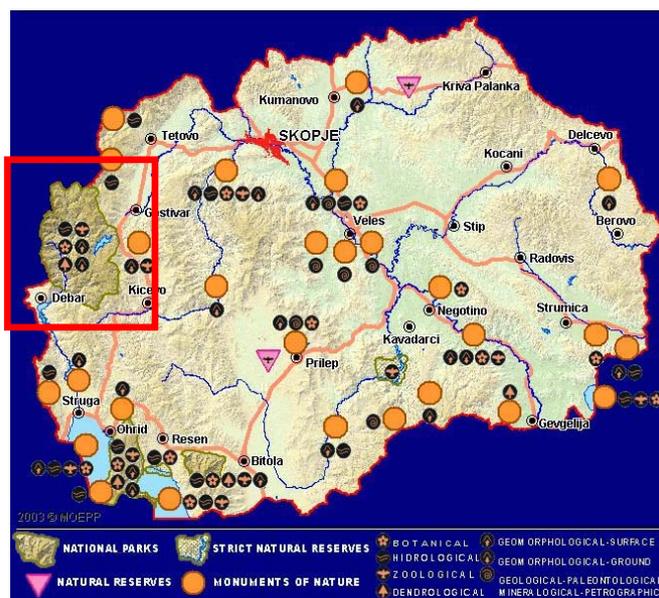
The climate is mountain-continental with a Mediterranean influence. The average annual temperature in the region of Mavrovo is 7.1 °C, and the mean annual precipitation 1103 mm (Mavrovo meteorological station, 1250 m a.s.l.). Similar climatic conditions were observed in the southern parts of Bistra Mt. (meteorological station Lazaropole). However, the lower parts (Radika region) have a warmer climate, and the mountain regions above 2000 m a.s.l. are characterized by an alpine climate.

The main relief types are mountainous and river-valley forms. The lowest part is 600 m a.s.l. at the inflow of Mala Reka into Radika River. The highest peak is Korab on Korab Mt. (2764 m a.s.l.). Paleozoic

phyllite schists represent the largest surface in the NP Mavrovo, but a considerable part consists of Triassic limestones.

Fig. 1:
Situation of the Mavrovo National Park (red square) in the western part of Macedonia, bordering with Albania.

Source of the map: Ministry of Environment and Physical Planning website (<http://www.moe.gov.mk>)



Alpine mountain vegetation is represented only on Korab Mt., while on the mountains Bistra, Dešat and parts of Šara Mountain there is sub-alpine vegetation. Seven vegetation belts can be distinguished:

- Continental-submediterranean region with oriental hornbeam forest (*Quercus-Carpinetum orientalis macedonicum* Rud. Apud. Ht.), (to 600 m a.s.l.);
- Warm continental region with Italian and Turkey oak forest (*Quercetum-frainetto cerris macedonicum* Ober.emend. Ht) (600-900 m a.s.l.);
- Cold continental region with sessile oak (*Orno-Quercetum petraceae* Em), (900-1100 m a.s.l.);
- Piedmont-continental-mountain region with submontane beech forest (*Festuco heterophyleae-Fagetum*), (1100-1300 m a.s.l.);
- Mountain-continental region with montane beech forest (*Calamintho grandiflorae-Fagetum* Em), (1300-1650 m a.s.l.);
- Subalpine mountain region with subalpine beech forest (*Fagetum subalpinum scardo pindicum* Em), spruce forest, *Piceon excelsae*, (1650-2250 m a.s.l.); and
- Alpine mountain region with high mountain pastures (*Edriantheto-Seslerion* Ht. and *Seslerion cosmosae* Ht.), (over 2250 m a.s.l.).

The estimated numbers of the large mammal species present in the park are (T. Gjogjevski, pers. comm.): 18-20 lynx (*Lynx lynx*), 60-80 brown bear (*Ursus arctos*), 14-16 wolf (*Canis lupus*; number of packs unknown), 1500-2000 chamois (*Rupicapra rupicapra*), 350-400 wild boar (*Sus scrofa*; number of adult animals), and 1000-1200 roe deer (*Capreolus capreolus*). In summer, around 15'000 sheep are grazing on pastures within the park. Besides forestry, which forms the most important income to the park, water power (generated by the lake) and tourism are the main industries. Tourism is more or less concentrated around the lake and in winter because of the ski infrastructure in Mavrovo village.

Material and Methods

We did the survey in the Mavrovo National Park area from 21 to 26 March 2006. Tracking normally started at 09:00 AM everyday. We used two 4-wheels Lada Niva cars to go to the points, from where we started tracking. Transects were prepared one day before, using topographic maps (1:25'000). For facilitating the walking in the snow we used snowshoes and gaiters. The whole transect route was followed with two GPS (Garmin GPSmap 76 and Garmin GPSmap 60CS) in which we signed the most significant tracks and signs as waypoints. When tracks or other field signs were found, we used the "Balkan Lynx Field Handbook" to identify them. Tracks and scats were analysed, measured and pho-

tographed. Three digital cameras and three pairs of binoculars were used during the survey for photographing and scanning the areas, respectively. When we encountered lynx tracks, we made plaster casts of them and filled the track form (see page 14). Following the lynx tracks we were able to find lynx hairs, which were collected in appropriate paper envelopes for later analyses. The collected data were assessed and discussed.

Activities and Results

The first thing that had to be done in order to establish good transects was to select possible lynx localities in the region. Localities were selected based on the recent data taken from the questionnaires made by the border police in the Macedonian-Albanian border (Janevski 2006) and not so recent data based on the questionnaires, from scientific papers (e.g. Micevski 1997).

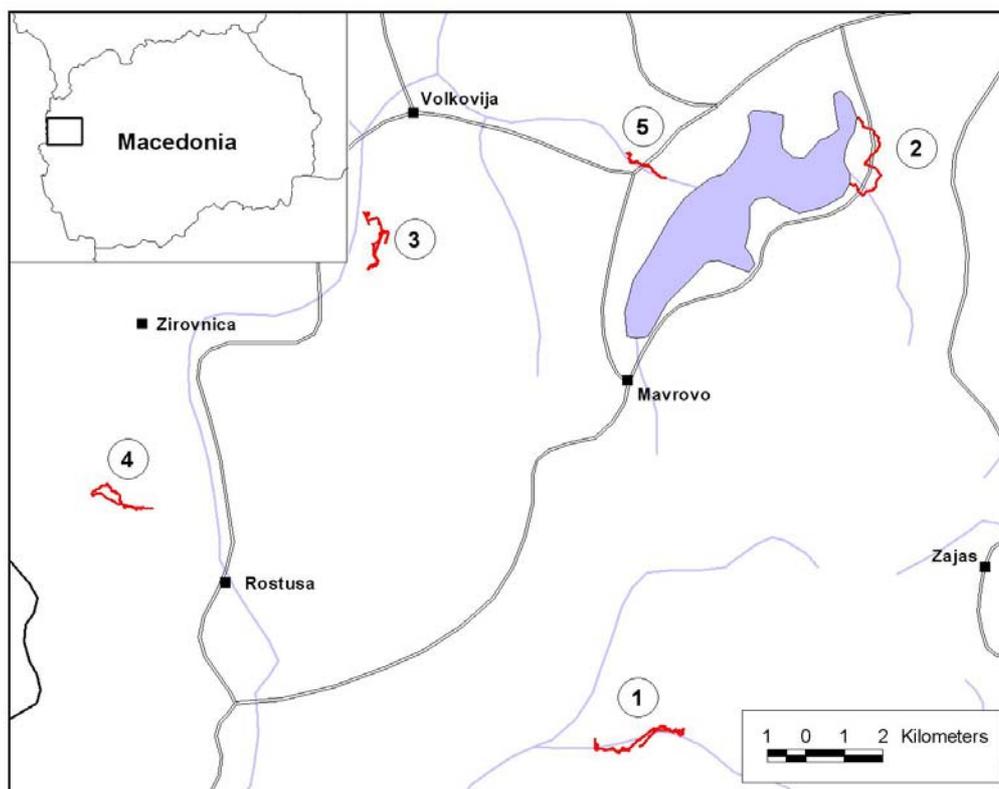


Fig. 2: Location of the transects made during the five days of field work: 1 Tresonče, Alilica cave, 2. Šuntevsi Rid, Vlainica, Leunovo, 3. Sence, 4. village Bituše, and 5. Kičinicka Češma.

The activities during our stay in Mavrovo, with the description of each day are given in the following text:

Tuesday, March 21, 2006 – Tresonče, Alilica cave

On the first day, we went on a field trip to the village Tresonče, following the forest road that leads to the Alilica cave (Fig. 3). Snow conditions were bad. There was no snowfall for about 6-7 days, and because of the warmer weather the snow was wet. Therefore, most of the tracks were melted and difficult to recognize/identify. Along the trip we met different habitat types. In lower parts there were meadows and agricultural land. Most of the tracks found in these habitats were from hares and fox. In the upper parts, beech forest and riparian habitats were predominant. There we met less but different tracks (hare, wild boar, badger, etc.). No roe deer or chamois tracks were encountered, but sighting of a chamois in the high altitude rocks of Brzovec (2000 m). Along the trail to the cave, we noticed some potential sites for camera trapping.

On our way back, we visited the border police station in the village Žirovnica. The chief policemen told us about their activities for the lynx monitoring, and showed interest for further cooperation. Route and GPS track from the first day are given in the map below.

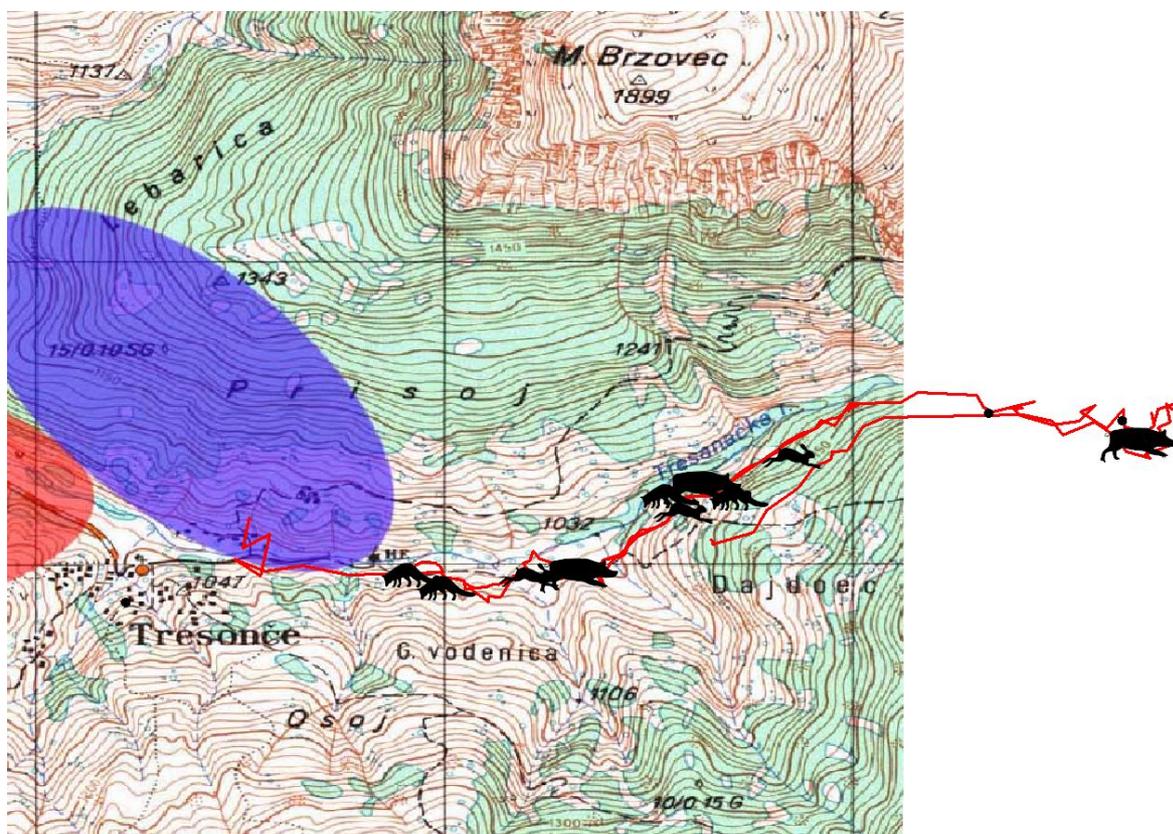


Fig. 3: Transect (red line) and tracks (symbol of the species) encountered on March, 21. The red and blue patches indicate locations of recent and less recent (>10 years old) lynx observations. Not all of the hare tracks have been recorded.

Wednesday, March 22, 2006 – Šuntevsi Rid, Vlainica, Leunovo

On the second day, we made a field trip into the beech forest and open forest habitats that stretches along the localities Šuntevsi Rid and Vlainica on the southern shores of Mavrovo Lake, and we finished in village Leunovo (Fig. 4). There was still about 1m of (old and wet) snow laying in those forests, and we hardly encountered any tracks apart from a few hare and fox tracks, and a badger track following a forest trail. The weather was cloudy and rainy that day.



Fig. 4: Transect (red line) and tracks (symbol of the species) encountered on March, 22. Not of all of the hare and fox tracks have been recorded.

Thursday, March 23, 2006 – Sence

At breakfast, we met some foresters who showed interest in helping us out during our field trips, pointing out some good localities. They were provided with the field handbook and monitoring guidelines.

The weather conditions were bad again; it was pouring all day long. First, we visited the border police station in the village Žirovnica, in order to organize our trip above the village Bituše, but since it was still raining we decided to make this trip the following day. On our way back, we decided to pass by the village Sence. There we talked with local people, asking them about possible lynx presence in the area. One of the villagers, an old hunter, claimed that he saw a lynx about one year ago crossing the bridge that turns from the road in the Radika valley to the village.

From the conversation with the hunter, we gained information about the game present in the area of Sence, and according to this information, we decided to make a survey into the nearest fir forest (Korija, Fig. 5). This field trip turned indeed out to be very productive for us. Before we entered into the forest, we had already found some tracks and scats from ungulates (roe deer and chamois) and fox. Between the village and the small stream, the area is rocky with a lot of small caves. When we were climbing around there, we encountered old bear tracks. The trail that leads over the stream into the forest would be perfect for camera trapping as animals are almost forced to go along it, especially next to the stream - the bear at least did exactly this. Fir and mixed forest seems to be a good habitat for the game (probably due to the less deep snow and better food availability than e.g. in the beech forest). Here we saw chamois (one individual of chamois rushed just 10 meters in front of us), and found a lot of chamois scat and tracks, but also fresh bear and wolf tracks.

Soaking wet but happy we went back and spent the evening downloading the pictures from the cameras, and the GIS data from the GPS into the Arc View program.

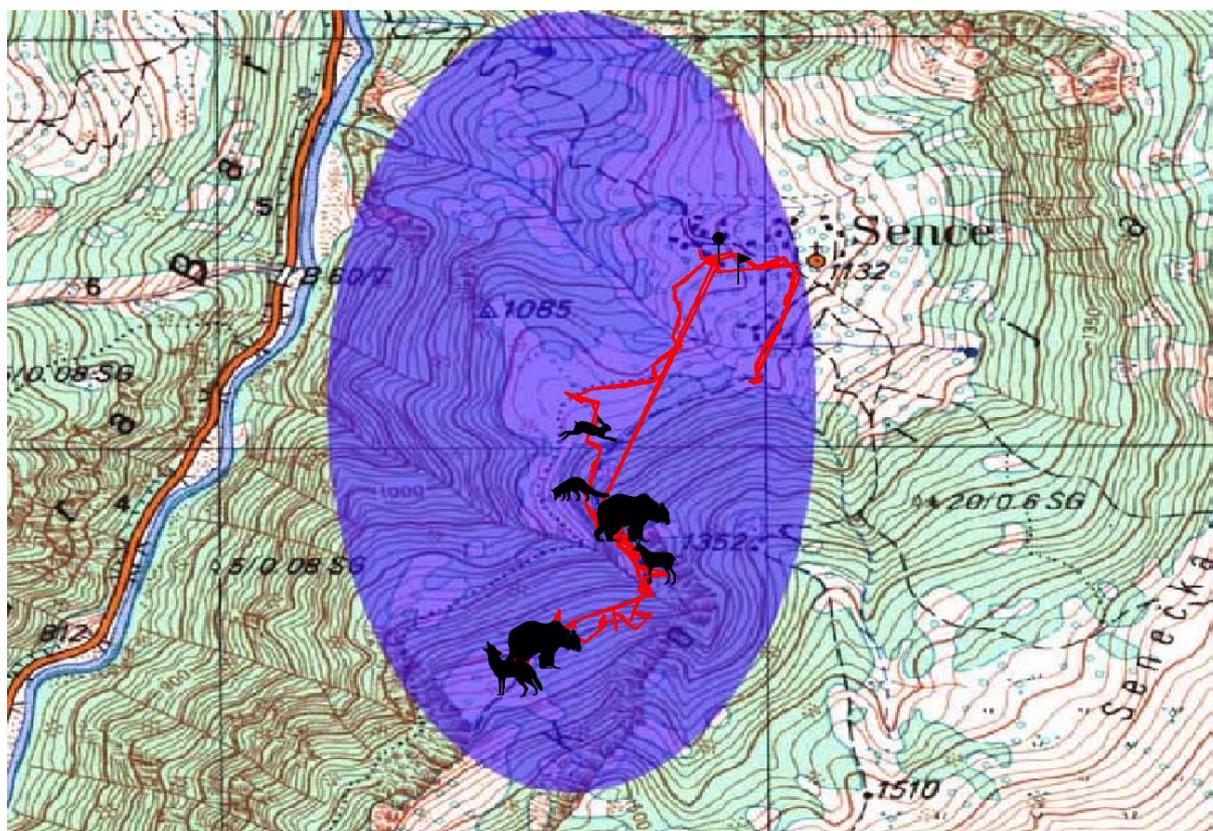


Fig. 5: Transect (red line) and tracks (symbol of the species) encountered on March, 23. The blue patch indicates the location of a less recent (>10 years old) lynx observation. The different bear tracks found most probably belong to the same individual.

Friday, March 24, 2006 – village Bituše

On the fourth day, we went on a survey into the beech forest that stretches above the village Bituše, near the border watchtower (Fig. 6). Tracking conditions were bad because of the dense fog and wet and deep snow. Only fox and hare tracks and some badger and marten tracks were present in this area.

On our way back, we visited the red deer reserve (Bačilište), located in the beech forest near the resort Bunec. Here we came upon to a lot of red deer tracks and scat.

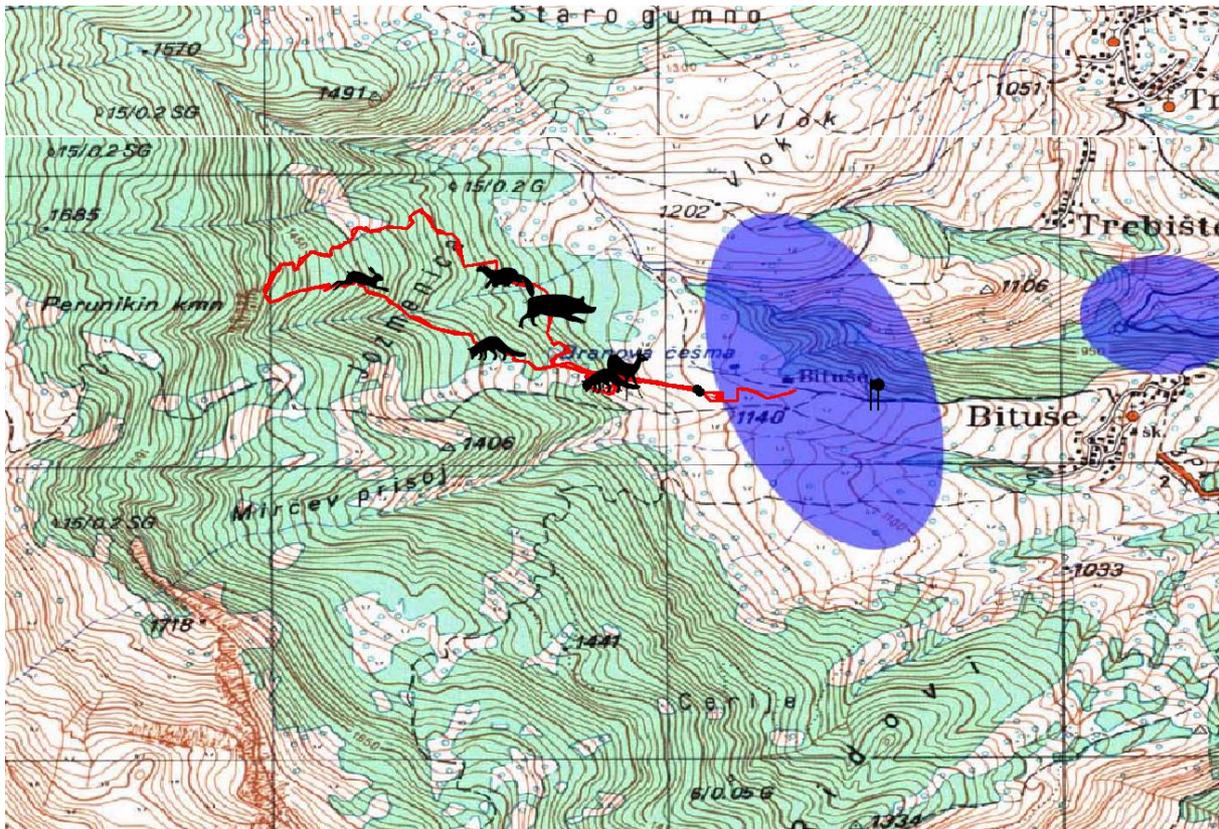


Fig. 6: Transect (red line) and tracks (symbol of the species) encountered on March, 24. The blue patches indicate locations of less recent (>10 years old) lynx observations. Not all hare tracks have been recorded.

Saturday, March 25, 2006 – between the dam and Kičinica (Kičinicka Češma)

According to our previous experience, on the last day of our survey we decided to go on a short trip into the mixed fir and beech forest, located near the Mavrovo Lake dam. We followed the forest trail, and in the first part of the trail we didn't encounter any significant tracks (Fig. 7). Following the trail occurred to be very important that day. After 1 km of walk in the forest on steep terrain, we finally found tracks, which made our hearts swell. After looking at them carefully, taking measurements and following them for a while, we were certain that those tracks belonged to a lynx. We noticed that there were even tracks from two different individuals which often walked one after the other, leaving just one trail, but which also separated from time to time leaving two separate trails before joining again. One individual left slightly smaller footprints than the other. We started to protocol for documenting the tracks: filling in the track survey form (see Appendix), measuring different parameters of the tracks, photographing the site etc. We used plaster to make casts of the lynx footprint. After all this activities, we separated in two groups for back- and forward tracking, respectively. The back-trackers finally lost the tracks in the Radika River bed, while the forward trackers could follow them for a long time, first going uphill, before turning down, crossing the forest trail again and going further downwards. While tracking we succeeded to find some hairs that could potentially belong to lynx and urine places. Whether the two individuals were an adult female with a young or an adult male and female, we could not say because in this season both cases are actually possible. Besides the lynx tracks, we found hare and some roe deer tracks.

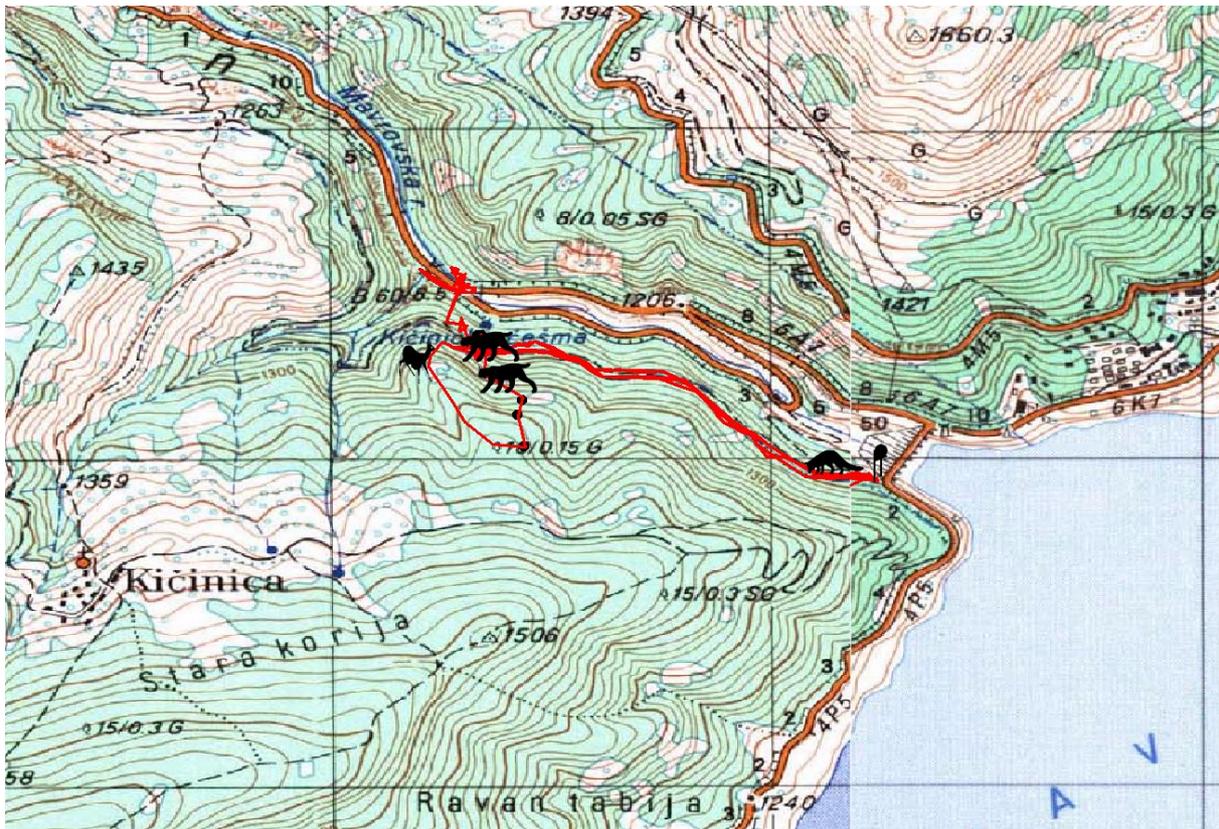


Fig. 7: Transect (red line) and tracks (symbol of the species) encountered on March, 25. From the point where the lynx tracks have been found our trail is branching off in two for back-tracking (down to the valley bottom) and forward tracking (up-hill), respectively.

During our field survey, several results can be point out:

1. We made 5 field trips in various localities in the frame of the National Park Mavrovo;
2. We took photos from all the different tracks and scats we found;
3. We took photos from all habitats we visited;
4. We took some hair for morphological analysis;
5. We used plaster to make casts of lynx footprints; and
6. We took waypoints on the GPS and created transects on a map.

Conclusions

In order to continue to practise and improve the experience gained from the training in Switzerland for the Balkan lynx monitoring programme, KORA together with EURONATUR and representatives from the *Macedonian Ecological Society* (MES) and the *Society for Protection and Preservation of Natural Environment in Albania* (PPNEA), organised a field survey in the Mavrovo National Park in Macedonia. The field trip lasted from 20 to 25 March 2006. It was organised in 5 days of tracking surveys to various localities in the area of the National Park. During our stay there, we learned more about:

- Transect routes that can be used in the future;
- The composition of mammal species in the area;
- The conditions of the habitats in the National Park;
- Good sites for camera trapping;
- Possible lynx presence in the area from the contact with the local people;
- Activities taken on by the border police from the Macedonian western border;
- Making plaster casts of track footprints.

We also refreshed and extended our previously gained knowledge on the identification of various mammal tracks, including lynx tracks seen the last day, working with GPS device etc.

Considering the experience gained up to now, we can point to some of the next steps needed:

- Continuation of the field work, in order to have more reliable data about lynx and its prey base;
- Creating a data base for collecting the various data and information;
- Continuation of the cooperation with the border police and other stakeholders;
- Raising awareness in order to create a bigger network in the area.

All the knowledge acquired from the training courses in Switzerland and Macedonia, along with the two workshops organised in Macedonia and Albania, can be applied to build a reliable network for future cooperation. A monitoring programme is not easy to establish. A lot of information, organised in a database, has to be collected in order to establish and manage a recovery programme in the long-term.

Perhaps, finding tracks of a lynx is a small accomplishment, but it is of great importance for young enthusiasts, dedicated for the protection of this wild species.

References

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<http://www.catsg.org> > Conservation Compendia. ([direct link](#))

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Appendices

- Track survey form
- Pictures from the Field Survey



Track survey form

Please fill out a complete form for each lynx track set you encounter and a form for each unsuccessful survey.

Date, Location & Conditions

Date: 25.03.2006 Coordinates: X 20.7347(8/2) /Y 41.6993(7/1)

Name of locality: Kičinicka Češma Altitude: 1266 m

Community/District: Mavrovi Anovi

Survey person or team: A. Stojanov, A. Trajçe, D. Melovski, G. Ivanov, O. Qazimi, M. von Arx

Estimated trail distance covered: 0,980 kilometres (dam to tracks)

Weather: cloudy

Time/day of last snow fall: 17.03.2006

Snow condition: dry/fluffy compacted/dry

wet surface crust

Snow depth: 110 cm

Track location habitat: forest shrub open other

Describe location habitat: mixed fir/beech forest

Track description

Number of lynx: 1 2 3 other uncertain

Behaviour: walking trotting bounding other:

Estimated track age: <1day <1week >1week uncertain

Track condition: distinct outline indistinct outline melted

Toe-nail imprints: absent present uncertain

Track size

Pad Length: 8 cm Width: 7 cm

Stride distance between tracks: greatest 85 cm / least 80 cm

Straddle With 9 cm

Track Photo: no yes, digital yes, conventional

Remarks

(scat, other sign?) nail imprints visible in steep terrain, marking place at tree. Often the two individuals walk in the same track, sometimes they separate and two trails are visible before joining again.

Pictures from the Field Survey, Mavrovo NP, March 20-25 2006

Tuesday, March 21, 2006 – Tresonče, Alilica cave



Beech and oak were the predominating tree species during the transect from Tresonče to the Alilica cave.



Footprint of a wild boar *Sus scrofa*.



A hare *Lepus europaeus* hide.

Wednesday, March 22, 2006 – Šuntevsi Rid, Vlainica, Leunovo



The group snow-tracking through the beech forest at the southern shore of Mavrovo lake.



Only hare (Fig.), fox and badger tracks were found.



Hare scats art.

Thursday, March 23, 2006 – Sence



Mixed forests and partly rocky areas with caves stretch above the village Sence.



The group identifies scats (of a roe deer) with the help of the Field Handbook.



Bear *Ursus arctos* tracks.



Chamois *Rupicapra r.* tracks.



Big canid, probably *Canis lupus*.

Friday, March 24, 2006 – village Bituše



Beech forest with still a lot of snow.



Break after quite an unsuccessful tracking day.

Saturday, March 25, 2006 – between the dam and Kičinica (Kičinicka Češma)



Mixed fir and beech forests form the habitat in this area.



Finally, tracks of lynx *Lynx lynx* were encountered.



The trails of a lynx and a hare are crossing each other.



They were actually even two lynx individuals, separating for some meters from time to time.



The footprint of a roe deer *Capreolus capreolus*.



Backtracking of the lynx tracks ended in the valley bottom.