Expedition report

Chamois, wolves and bears of the Nizke Tatry mountains, Slovakia

in partnership with

Expedition dates:	**14 August – 9 September 2005**
	13 August – 8 September 2006
Report published:	**December 2006**
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	Paul Franklin **Biosphere Expeditions**
	Matthias Hammer (editor) **Biosphere Expeditions**

Abstract

This report details the results of the study on Tatra chamois (*Rupicapra rupicapra tatrica* Blahout 1972) and large predators in the Nízke Tatry Mountains conducted by Biosphere Expeditions and the Carpathian Wildlife Society during the late summers of 2005 and 2006. The primary goal of the study was to illuminate interrelationships between chamois and their potential predators including wolf, lynx, bear and golden eagle. Indirect methods such as analysis of large carnivore scats and comparison of alpine habitat use by chamois and their potential predators were employed. The secondary goal was to assess human impact on chamois. The late summer chamois range calculated from the positions of animal sightings encompassed an area of 2,123 hectares in 2005 (N=51) and 2,181 hectares in 2006 (N=45). Bear diet was described based on the analysis of 135 scats (N_{2005}=71 and N_{2006}=64). Wild plants (52%) were the most important item of the late summer bear diet followed by insects (39%) and cultivated plants (7%). Based on the analysis of 54 wolf feaces (N_{2005}=31 and N_{2006}=23) it was shown that wild ungulates (89%) composed the most important part of the wolf diet. No chamois remains were found in either the wolf or bear feaces. No lynx scats were found during the study. Individual vigilance level of grazing chamois was used as a measure of protection behaviour. Vigilance level was ascertained as the number of alert postures with head up during a 10 minute period. Reactions of chamois to human presence and behaviour varied greatly up to the distance of 200 m. Beyond this distance chamois were less sensitive to human disturbance. Based on the GIS analysis of habitat use by chamois and predators it is suggested that non-lethal effects of predation on chamois clearly outweigh lethal effects in that they govern chamois habitat utilisation and selection. Predator-induced microhabitat shifts by chamois into safe but less energy-profiatable cliffs and the complete avoidance of woodland may limit further expansion and growth of the population.

Súhrn

Správa pojednáva o výsledkoch výskumu kamzíka (*Rupicapra rupicapra tatrica* Blahout 1972) a veľkých predátorov v Nízkych Tatrách, ktorý zrealizovali Biosphere Expeditions a Spoločnosť pre Karpatskú Zver v neskorom letnom období rokov 2005 a 2006. Prvotným cieľom výskumu bolo objasnenie vzťahov medzi kamzíkmi a ich potenciálnymi predátormy vlkom, medveďom, rysom a orlom skalným. Použili sa nepriame metódy analýzy trusu šeliem a porovnanie využívania alpínskeho prostredia kamzíkom a potenciálnymi predátormy. Druhotným cieľom bolo hodnotenie ľudských vplyvov na populáciu kamzíka. Súradnice pozorovaní kamzíkov a ich stôp boli východiskom pre vytvorenie areálu v neskorom letnom období. Areál kamzíka mal v roku 2005 výmeru 2 123 ha (N=51) a v roku 2006 dosiahol rozlohu 2 181 ha (N=45). Potravu medveďa sme opísali na základe analýzy 135 trusov (N_{2005}=71 a N_{2006}=64). Neskorú letnú potravu medveďa tvorili predovšetkým divo rastúce rastliny (52 %), hmyz (39 %) a kultúrne rastliny (7 %). Analýzou 54 trusov vlka (N_{2005}=31 a N_{2006}=23) sa potvrdilo, že najdôležitejšou potravou sú voľne žijúce kopytníky (89 %). V truse vlka a medveďa sa nenašli zvyšky kamzíkov. Počas obidvoch rokov sme nenašli trus rysa. Individuálnu úroveň ostražitosti pasúcich sa kamzíkov sme použili pre posúdenie obranného správania. Kritériom pre posúdenie ostražitosti kamzíkov bol počet zdvihov hlavy pri pasení počas 10 minút. Reakcie kamzíkov na prítomnosť a správanie ľudí veľmi varírovali do vzdialenosti 200 m. Pri väčšej vzdialenosti boli kamzíky menej citlivé na akýkoľvek rušivý faktor. Na základe GIS analýzy využívania prostredia kamzíkmi a šelmami predpokladáme, prevahu nesmrtných účinkov predácie nad koristením tým, že pôsobenie šeliem je jedným z rozhodujúcich faktorov určujúcich výber a využívanie prostredia kamzíkmi. Posun mikrohabitátu kamzíka vplyvom predátorov do energeticky menej vhodného prostredia brál a úplné vyhýbanie sa lesnému prostrediu môžu byť príčinou obmedzenia ďalšej expanzie a rastu populácie.

Contents

Please note: Each expedition report is written as a stand-alone document that can be read without having to refer back to previous reports. As such, much of this section, which remains valid and relevant, is a repetition from previous reports, copied here to provide the reader with an uninterrupted flow of argument and rationale.

1. Expedition Review

M. Hammer (editor)
Biosphere Expeditions

1.1. Background

Biosphere Expeditions runs wildlife conservation research expeditions to all corners of the Earth. Our projects are not tours, photographic safaris or excursions, but genuine research expeditions placing ordinary people with no research experience alongside scientists who are at the forefront of conservation work. Our expeditions are open to all and there are no special skills (biological or otherwise) required to join. Our expedition team members are people from all walks of life, of all ages, looking for an adventure with a conscience and a sense of purpose. More information about Biosphere Expeditions and its research expeditions can be found at www.biosphere-expeditions.org.

This expedition report deals with two expeditions to the Nízke Tatry (Low Tatras) National Park in Slovakia, which ran from 14 August to 9 September 2005 and from 13 August to 8 September 2006 respectively. The expeditions monitored critically endangered chamois (mountain goat) populations and their interrelationship with large predators, such as wolves and bears. The expedition teams surveyed chamois by direct observation on the alpine meadows and cliffs, recorded their signs, such as tracks, scats and markings. The expedition teams also recorded the signs of wolves and bears in the high mountain habitat and forests below. All this in a first-ever concerted effort to ascertain how many chamois, wolves and bears live in the area and whether wolves and possibly bears are predating on chamois.

1.2. Research area

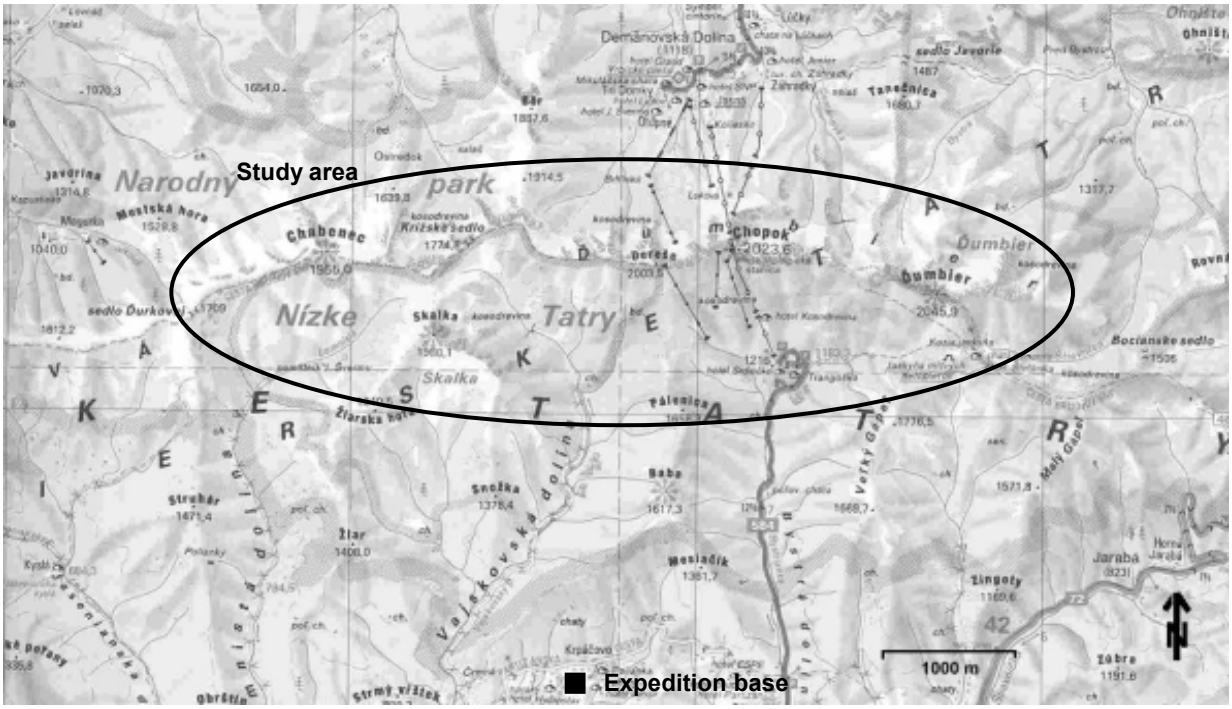
The Western Carpathian mountains cover much of Northern Slovakia, and spread into the Czech Republic with Moravia to the east and Southern Poland to the north. They are home to many rare and endemic species of flora and fauna, as well as being a notable staging post for a very large number of migrating birds.

Within these Western Carpathian mountains is the Nízke Tatry National Park, which was established in 1978. It extends over an area of 2200 km^2 of which 800 km^2 forms the core area and 1400 km^2 the buffer zone. Altitude above sea level ranges from 400 to 2043 m. The main ridge extends east to west over a distance of about 100 km. Forest cover in the area is 90%. The main trees are Norway spruce, beech and fir. The timberline is composed of Norway spruce and in some places beech, between 1400 and 1500 m. Above the timberline is a zone of dwarf pine, then a habitat of alpine meadows and cliffs. The buffer zone of the park is relatively densely populated. Meadows, pastures and arable land extend around the villages. The forests are managed and pastures are used for grazing livestock, mainly sheep and cattle.

However, in summer the grazing of livestock on alpine meadows is forbidden (a herd of cows was observed close to the main ridge on one occasion where grazing is allowed around the area of Zamoska hola for a few weeks every summer).

The territory of the Park is divided into a number of districts where both hunting and tourism are permitted throughout, including most of the core area (but tourism is forbidden on the rocky ridges of the study area). The most important ungulate is the red deer. Roe deer are also present in substantially lower numbers, along with a small population of wild boar. A small isolated native chamois population of fewer than 90 individuals inhabits this area above the tree line. The other large predators besides the wolf are the brown bear and lynx. The wolf was exterminated from the park in the 1960s but reintroduced into the area again at the end of the 1970s.

The research area spreads over the central part of the park dominated by the highest peak called Dumbier (2043 m). Up to now little data has been gathered on the ecology and behaviour of the large wild mammals and many of the birds in Slovakia.



Map of the study area.

1.3. Dates

The expeditions ran over a period of four weeks divided into two two-week slots, each composed of a team of international research assistants, scientists and an expedition leader. Slot dates were:

14 – 26 August | 28 August – 9 September 2005
13 – 25 August | 27 August– 8 September 2006

Dates were chosen to coincide with the summer peak of chamois births and with the early autumn Indian summer period of high feeding activity.

1.4. Local Conditions & Support

Carpathian Wildlife Society

On this project Biosphere Expeditions is collaborating with the Carpathian Wildlife Society (CWS), a Slovakian non-profit-making research and conservation organisation bringing together people with a shared interest in the research and conservation of large mammal and bird species in the Western Carpathian mountains. Established in 1994 by the expedition's local scientist Dr. Slavomir Find'o, the CWS is a young and dynamic organisation working to raise national, and international awareness and increase understanding of the rich and varied wildlife of the Western Carpathians, with particular emphasis on endangered or threatened species. The CWS aims to find real world answers to conflicts between wildlife and local people.

Expedition bases

The expedition teams were based in the recreational area of Krpacovo in a wooden cottage with showers and some modern amenities. Team members shared double or triple rooms; breakfast and a lunch pack was prepared at base by the expedition team on a rota basis and dinner was taken at a local restaurant on days that the expedition team returned to the valley. On ridge days, when the expedition teams spent several days on the mountain, meals were either prepared by the expedition team or by mountain hut staff. Vegetarians were catered for. There were also some guesthouses situated near the base, which included restaurants open to the public, and some shops.

Field communications

The only available telephones suitable for international calls were in the nearby guesthouses about 5 - 10 minutes walk from the base. In general mobile phone coverage was very good, but in some spots, such as deep valleys, signal reception was poor. When working in groups during the day, contact between groups and the base was by radio (where possible through line of sight) or by mobile phone. Each group also carried as part of its safety equipment a set of flares for emergency communication.

Transport & vehicles

Team members made their own way to the Bratislava assembly point. From there onwards and back to Bratislava all transport was provided for the expedition teams. Transport to and from base camp, and around the study site was by the Biosphere Expeditions Land Rover Defenders, Slavomir Find'o's own, or rented vehicles.

Medical support & insurance

The expedition leader was a trained first aider, and the expedition carried a comprehensive medical kit. Further medical support was provided via a network of mountain rescue stations. There are two hospitals in the nearby towns of Banska Bystrica (30 km from base) and Brezno (10 km from base). In case of immediate need of hospitalisation, and weather permitting, helicopters of the mountain rescue service or from the hospital in Banska Bystrica were available.

All team members were required to carry adequate travel insurance covering emergency medical evacuation and repatriation.

1.5. Local Scientist

The expedition's local scientist was Dr. Slavomir Find'o, an associate of the Forestry Research Institute in Zvolen. He was born in 1953 in Slovakia. His Master's degree in Forestry is from the Forestry University of Zvolen and his PhD from the Slovak Academy of Sciences. He has been researching large ungulate impact upon forest vegetation since 1976 and lately large carnivores, particularly wolves, in the Slovak Carpathian mountains. He has introduced modern research methods into the study of wildlife in Slovakia (e.g. radio-tracking) and has made a considerable contribution to wolf conservation. Over the last few years he has also been involved in resolving the problem of large predators' depredation on livestock. He is the director of the Carpathian Wildlife Society, which he established in 1994.

1.6. Expedition Leader

In both years, expeditions were led by Paul Franklin. Paul was born in Oxford and studied zoology at Swansea University. His Masters Degree was based on research of the migratory behaviour and ecology of amphibians. After graduation Paul spent a year working as a naturalist guide in the Peruvian Amazon. There, among other things, he was bitten by the travel bug. Since then he has led many expeditions and treks to far flung corners of the globe. Travels overseas have been interspersed with time spent in the UK working, among other things, as a Nature Reserve Warden and Environmental Consultant. Never far from a camera, many of his wildlife and travel images have been published in magazines and books. When not travelling on foot through the world's wild places his preferred modes of transport are a kayak, mountain bike or occasionally a horse.

1.7. Expedition Teams

The expedition team was recruited by Biosphere Expeditions and consisted of a mixture of all ages, nationalities and backgrounds. They were:

14 - 26 August 2005

Robert Archer (UK), Helen Bartlett (UK), Robin Bonass (UK), Stephen Bullivant (UK), Tracey Dobbs (UK), Silvia Fabiani (Switzerland), Alan Franklin (UK), Hanns Meder (Germany), Sabine Meyer (Germany), Pia Meyer (Germany), Rosch Schauls (Luxembourg), Jürgen Weginger (Austria).

28 August - 9 September 2005

Anne Brunnelle (Switzerland), Emmanuel Carcano (France), Jordan Chetcuti (UK), Roger Harmes (UK), Bernd Henning (Germany), Dagmar Hofmeister (Germany), Birgit Kadur (Germany), Jutta Lauf (Germany), Alexander Nesbitt (USA), Nicole Paul (Germany), Linda Pereira (USA), Konrad Schmidt (Germany), Katie Welch (UK).

13 - 25 August 2006
Leonie Alexander (UK), Thomas Barratt (UK), Imogen Cauthery (UK), Alan Franklin (UK), Alistair Fuller (UK), Emily Jeanes (UK), Michael Pullen (UK), Helmut Sendelbach (Germany), Johann Sendelbach (Germany), Jack Shepherd (UK), Jamie Sommerville (UK), Ariane Waelzer (Germany), Fiona Winchester (UK).

27 August - 8 September 2006

Igor Agafonov (Russia), Dermot Browne (UK), Liam Browne (UK), Reija Feldmann (Germany), Victoria Hughes (UK), Audrey Jefferis (USA), Michaela Lareine (UK), Georgia Leeming (UK), Marc Werner (Luxembourg).

1.8. Expedition Budget

Each team member paid towards expedition costs a contribution of £990 per person per two week slot. The contribution covered accommodation and meals, supervision and induction, special non-personal equipment, and all transport from and to the team assembly point. It did not cover excess luggage charges, travel insurance, personal expenses like telephone bills, souvenirs etc., as well as visa and other travel expenses to and from the assembly point (e.g. international flights). Details on how this contribution was spent are given below.

Income	£
Expedition contributions 2005 and 2006	47,094
Expenditure	
Lodging and food includes all board & lodging (valley & mountain)	8,988
Transport includes car fuel UK – Slovakia return, Biosphere & scientist vehicle fuel	2,430
Equipment and hardware includes research materials & gear etc purchased in UK & Slovakia	2,899
Staff & project support includes local and Biosphere staff salaries, travel and expenses to Slovakia and donation towards Carpathian Wildlife Society	8,603
Administration includes registration fees, sundries etc	980
Team recruitment Slovakia as estimated % of PR costs for Biosphere Expeditions	7,900
Income – Expenditure	**15,294**
Total percentage spent directly on project	**68%**

1.9. Acknowledgements

This study was conducted by Biosphere Expeditions which runs wildlife conservation expeditions all over the globe. Without our expedition team members (who are listed above) who provided an expedition contribution and gave up their spare time to work as research assistants, none of this research would have been possible. The support team and staff (also mentioned above) were central to making it all work on the ground. Thank you to all of you, and the ones we have not managed to mention by name (you know who you are) for making it all come true. Biosphere Expeditions would also like to thank members of the Friends of Biosphere Expeditions and donors, Land Rover, Cotswold Outdoor, Globetrotter Ausrüstung and Buff for their sponsorship.

1.10. Further Information & Enquiries

More background information on Biosphere Expeditions in general and on this expedition in particular including pictures, diary excerpts and a copy of this report can be found on the Biosphere Expeditions website www.biosphere-expeditions.org.

Enquires should be addressed to Biosphere Expeditions at the address given below.

2. Chamois, wolves and bears of the Nízke Tatry Mountains

Slavomir Find'o
Carpathian Wildlife Society

2.1. Introduction

Many animal species exhibit a decrease in the per capita birth rate at small population sizes or densities, a phenomenon known as the Allee effect (Allee 1931). Under Allee conditions, many of the factors at work in small populations (genetic drift, loss of genetic variability, demographic fluctuations, environmental stochasticity) begin to work additively, and the population is unable to avoid an extinction vortex (Courchamp et al. 1999, Stephens & Sutherland 1999). An often-cited example is the analysis by Berger (1990, 1993) showing that populations of fewer than 50 bighorn sheep have a very high probability of extinction within 50 years. One way that an Allee effect can be generated is by the reduction of beneficial social interactions in populations with fewer individuals, such as when antipredator strategies (vigilance, dilution effect) become inefficient in small groups of prey (Courchamp et al. 1999, Stephens and Sutherland 1999). Because species subjected to a strong Allee effect may be more susceptible to catastrophic population collapse with only a slight increase in mortality (Courchamp et al. 1999), wildlife managers need to understand the potential impact of predation on small populations. Knowledge of predation risk factors and antipredator behaviour can be used to predict which individuals are most vulnerable and help generate methods to conserve wild populations (Blumstein 2000).

Overwhelming evidence suggests that mammals modify their behaviour in the presence of predators, including increased vigilance, site abandonment, selection of safe habitat, and greater wariness (Kie 1999, Berger et al. 2001). In particular, a large body of evidence indicates that the proportion of an animal's activity budget devoted to vigilance reflects its overall risk of predation. Vigilance behaviour is positively correlated with increasing predation risk as determined by body size, presence of young, habitat structure, distance from cover, group size, and position within a group (Kie 1999, Steenbeek et al. 1999, Altendorf et al. 2001, White et al. 2001, Childress and Lung 2003, Wolff and Van Horn 2003). Importantly, vigilance has been found to increase in populations subjected to predation compared to populations with reduced or no natural predators (Boving and Post 1997, Berger et al. 2001, Laundre et al. 2001, Wolff and Van Horn 2003). Because actual predation events are rarely – if ever – observed, vigilance level can be a useful surrogate measure of predation risk.

The Tatra chamois is native species of the Western Carpathians, but today survives only in the Tatry (Slovak and Polish side) and the Nízke Tatry mountains. It is has effectively been separated by more than 15,000 years from the other European populations. In 1971 the Tatra chamois was described as a separate subspecies (Blahout 1972).

In spite of total protection over the last 40 years, the numbers of chamois in the Tatry mountains have gradually dropped. Currently in both isolated populations the numbers are estimated to be fewer than 300 individuals in total. The most extensive studies on chamois mortality and population decline have been conducted by Chudík (1969, 1974), Blahout (1972 a, b, c, 1976), Chovancová & Gömory (1999), Bališ & Chudík (1976), Chovancová & Gömory (1999).

Blahout (1972a) summarised human impacts on the chamois population in the Tatry Mountains during and after World War II. From 1943 up until the end of the war the numbers of chamois plummeted from 1,211 to 280 individuals. Bališ & Chudík (1976) analysed predation effects of lynx upon the populations of wild ungulates (red deer, roe deer, chamois and wild boar) in the Tatry National Park. During the period of 1954 to 1968 they analysed the reason of death of 504 chamois. 56 individuals (11 %) were killed by lynx. No chamois killed by wolves and bears were found over that period. Chudík (1974) assessed the impact of large predators on ungulates in the same national park during the period of 1968 to 1973. Of 136 dead chamois, 46 individuals (33,8 %) were killed by lynx. Chudík (1969) and Blahout (1976) observed two successful hunts of wolves on chamois in the Belanské Tatry. In total six chamois were killed by wolves during these two attacks. Later on more attempted or successful attacks of lynx and wolf on chamois were observed (unpublished data).

In the Nizke Tatry, chamois became extinct probably due to climate change at the end of the last Ice Age (Holocene). Between 1969 and 1976 the chamois was reintroduced from the Tatry to the Nízke Tatry when 30 animals were used to re-establish the population (Blahout 1976, Radúch & Karč 1983). The reestablished population increased rapidly, recolonised suitable habitats and the numbers peaked between 1989 and 1995. During this period the park staff reported the highest numbers of up to 120 to 140 individuals. Recently the numbers have plummeted to fewer than 90 individuals with the reasons for this mortality largely unknown. Besides severe winter conditions and human disturbance such as trail and off-trail hiking, paragliding etc., predation is suspected to limit population growth. Wolf, lynx and golden eagle also occasionally predate on chamois. Brown bear, fox and ravens are common scavengers of chamois carrions. As documented from other mountains in Europe and Asia (Filonov 1989), the latter three species can take mountain ungulates. However, such events are rarely observed in Slovakia (red deer taken by a bear, red deer fawn taken by a raven). For example, two radio-collared old red deer females killed in 2006 by bears in the Poľana Mountains (observation Slavomír Finďo) and a red deer fawn killed by a raven in June 2003 (Jan Ostrolucky, personal communication).

Today the long-term survival of both small isolated chamois populations in Slovakia is uncertain. This concern initiated the current study on chamois-predators interrelationships in the Nízke Tatry and this report refers to the findings collated during August and early September 2005 and 2006.

The goals of this study were to:

(1) Conduct chamois population surveys before the breeding season and after winter in early spring for identification of winter mortality.

(2) Ascertain size, sex-age composition and distribution of chamois groups with regard to type of habitat and human-caused disturbances.

(3) Analyze large carnivore diet through an examination of scats/faeces collected in the chamois habitat and surrounding mountain forests. Concentrate on an identification of percentage of mountain ungulates in the bear diet.

(4) Describe interactions between chamois and other wildlife species. Locate signs of large predator activity and their presence in the chamois habitat. In detail describe observed interrelationships between chamois and predators.

(5) Characterize chamois anti-predatory behavior.

(6) Co-operate with the park staff and relevant scientific institutions on a radio-tracking study of chamois and food analysis.

(7) Compare findings obtained in this study with other results achieved on the above subjects in the Nízke Tatry Mountains.

2.2. Materials and Methods

Field work

Field work was generally conducted in teams of two. Team members underwent a 3 – 4 days training period prior to data collection. Work was done primarily on foot, using public hiking trails and logging roads or hiking cross-country. Daily survey walks were conducted either in woodland or in alpine habitat. Across the whole study area, we surveyed for large predators signs of activity (tracks, footprints, bear trees etc.) and collected wolf and bear scats. Whenever chamois were sighted, group size was recorded, together with composition, and a map reference of the group. Additionally, behaviour of chamois was observed and interactions with other wildlife species and human beings were recorded. Observations were entered onto three different datasheets (chamois observations, animal encounters and tracks of predators). Scats of predators were put in plastic bags and labelled. All findings and observations were geographically coded using GPS devices (World Geographic System 84). For navigation, topographic hiking maps 1:50,000 or 1:25,000 were used. Any unclear footprints or doubtful signs of animal activity were photographed for proper identification later at base. Any important, questionable or dubious observations were immediately debated in the field via the radio or mobile phone communication. Daily field work terminated at base with a briefing. Each working pair handed over completed datasheets and reported their daily findings and observations to the rest of the team. Researcher and expedition leader outlined plans for the next day, delineated daily survey routes and set tasks for each pair of team members.

Scat analysis

For the analysis of scats the standardised method commonly used in wildlife research (e.g. Capitani et al 2003, Ciucci et al 1996) was used. Prior to analysis, all scats collected were appropriately re-identified in the lab. The main criteria used for scat identification were size, shape, smell, colour and macroscopic diet remains. Bear scats were often confused with red deer summer feaces, and wolf faeces with smaller and medium sized predators. Improperly identified and very old scats were excluded. Improperly identified and very old scats were excluded. The expedition teams collected 49 bear and 15 wolf scats in total. These scats were deep frozen and later used for analysis of diet composition.

Defrosted scat samples were leached using a sieve under cold running water and clean diet remains air-dried. The bear scats included seeds, leaves, grasses, berries, fruit, insect and mammal remains. Most of the wolf scats contained one food item. The indigested remains included hairs, bones, milk teeth and hooves of young ungulates. In some cases, hairs were identified by comparison with a collection of mammal hairs, after thoroughly examining their length, thickness, shape and colour. For precise identification of other mammalian species microscopy was needed. The pattern of the outermost layer of animal hairs (cuticular prints) was compared with reference samples and a specific atlas (Dziurdzik 1973). The percentage of each food item in the sample was estimated.

GIS analysis

Geographic Information System (GIS) analysis is a useful tool for the spatial analysis of biological findings. In this study ArcView software was used to compare spatial organisation of chamois herds in relation to the distribution of predator signs of activity. Geographically coded (readings of x and y coordinates from GPS) field data was overlapped with the aerial images of the study area. Most of the GIS coverages in Slovakia including aerial photographs are created in the JTSK coordinate systems commonly used in the former Czechoslovakia. This coordinate system is incompatible with western coordinate systems. Therefore all GPS readings obtained in the field (WGS 84 coordinate system) had to be transformed into the JTSK coordinate system. In practice this meant that all WGS 84 locations had to be manually plotted on a 1:25,000 military map and from this map the new S42 coordinates were derived. Finally it was possible to transfer S42 coordinates into JTSK with the use of a special software extension. The process of transforming the coordinates was the most time consuming part of the data assessment.

2.3. Results

2.3.1 Chamois

Spatial organisation and numbers

The chamois in the Nízke Tatry are distributed alongside the mountain ridge above the timberline, in the central part of the mountains. This area comprises rugged, rocky habitat, alpine meadows interspersed with patches of blueberry (*Vaccinium myrtylus*), cowberry (*Vaccinium uliginosum*), solitary willows (*Salix reticulata*), juniper shrubs (*Juniperus nana*) and dwarf pine stands (*Pinus mugo*), which contour the upper timberline. Tatra chamois avoid forest habitat and normally utilise open landscape near cliffs.

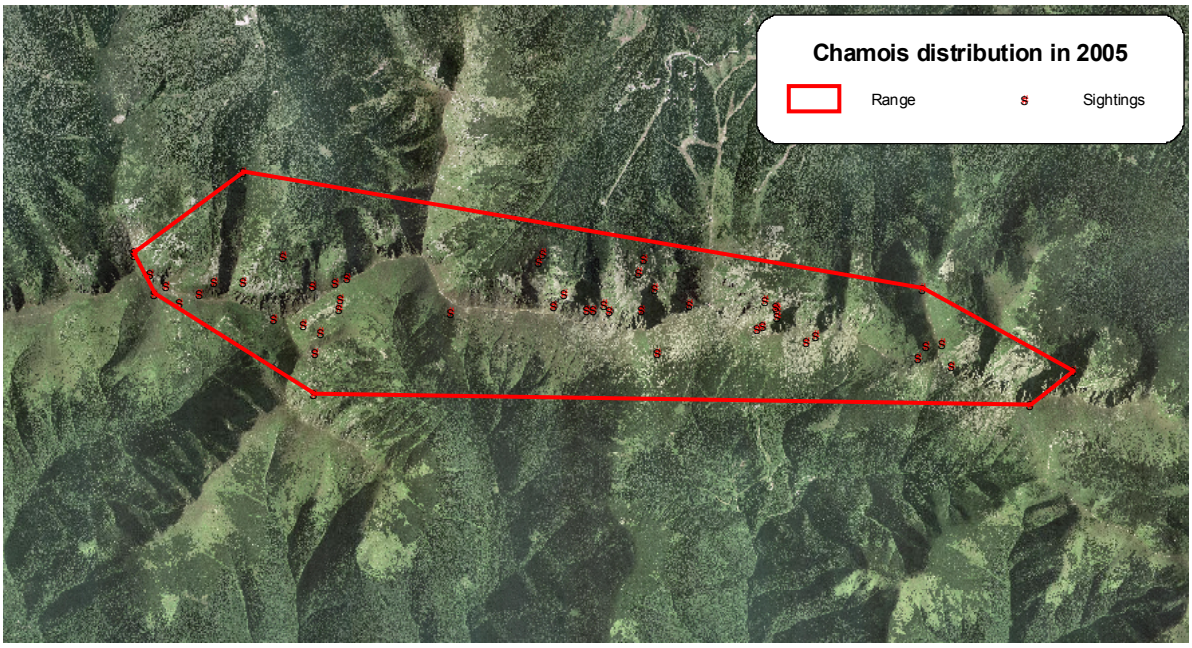


Figure 2.3.1a. Chamois distribution in 2005.

The chamois range in 2005 and 2006 was described based on 51 and 45 sightings respectively. Linking outermost locations of observed chamois delineated a polygon encompassing an area of 2,123 hectares in 2005 and 2,181 hectares in 2006 (Figs. 2.3.1a & 2.3.1b). These areas are slightly smaller than the total range of chamois in the Nízke Tatry as part of the National Nature Reserve Ďumbier was not possible to survey due to restrictions of the National Park authorities.

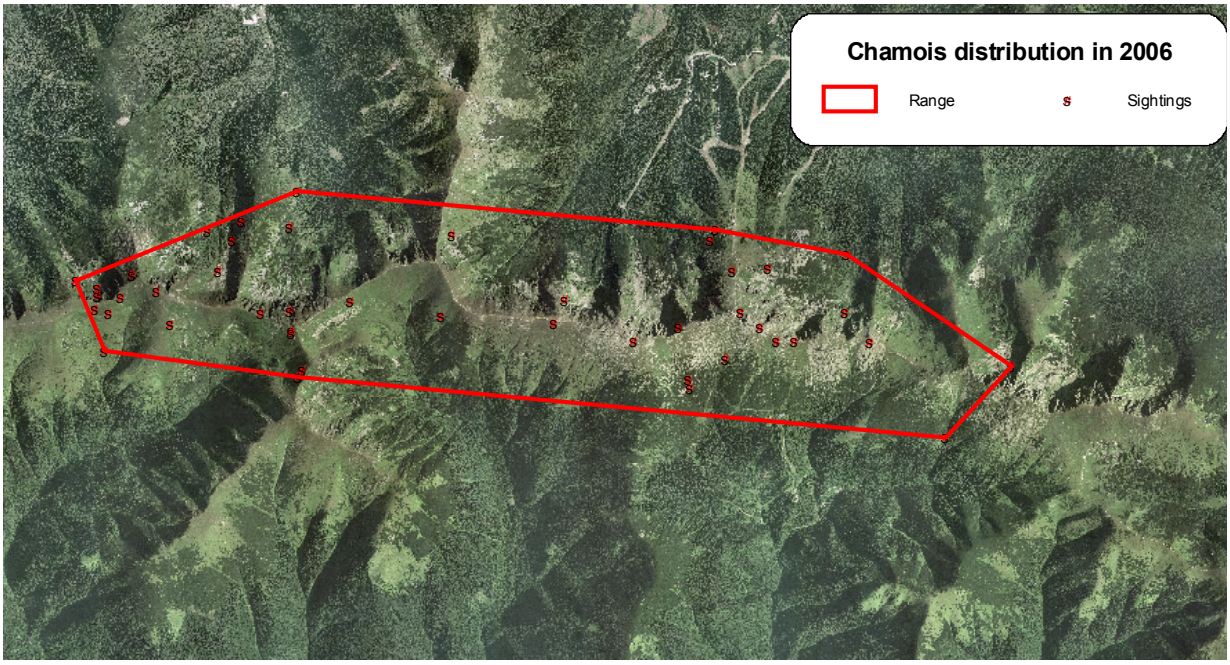


Figure 2.3.1b. Chamois distribution in 2006.

The areas of concentrated activity of chamois were calculated by the fixed kernel method (Worton 1989), which is commonly used for the assessment of telemetry data of terrestrial mammals. It was shown that chamois sightings and tracks were concentrated in two separate areas (Fig. 2.3.1c & 2.3.1d).

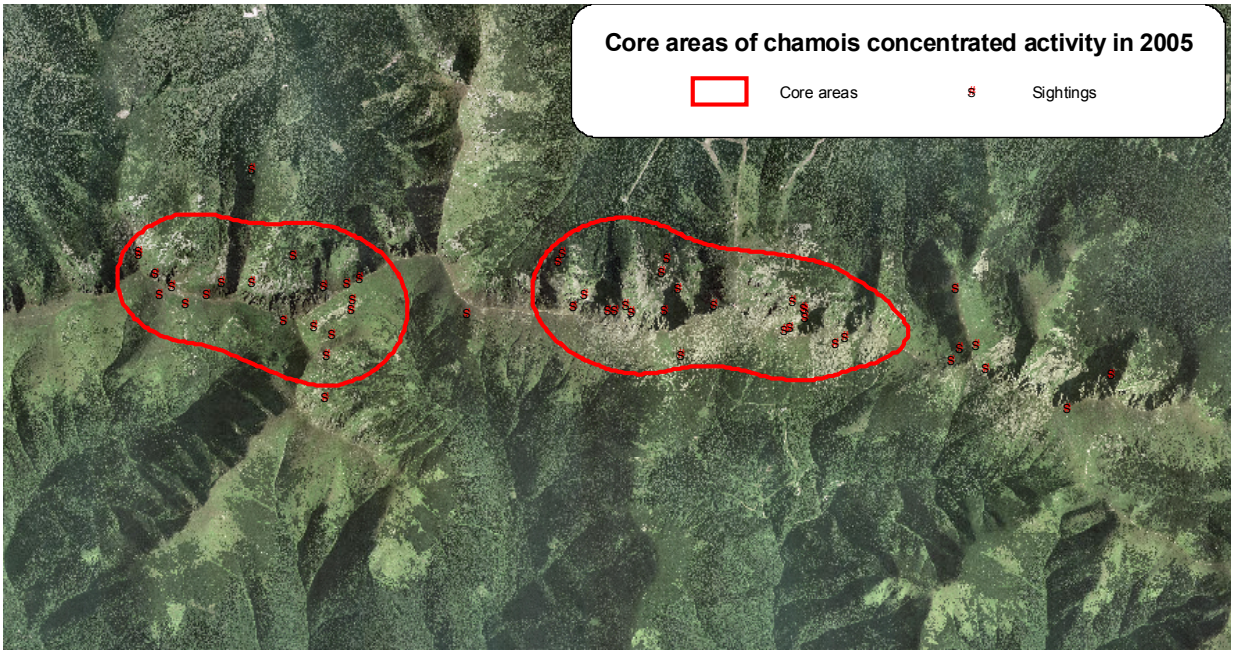


Figure 2.3.1c. Chamois activity in 2005.

The first, in the western part of the chamois range encompases about 1,182 hectares and is situated around the summits of Chabenec, Kotliská and Skalka. Further on to the east there is a second core area covering about 1,165 hectares, which comprises the summits of Dereše, Chopok and Koňsko. Both core areas of concentrated chamois activity cover approximately 55% of the total chamois range. The core areas are characterised by higher altitudes and more rocky terrain.

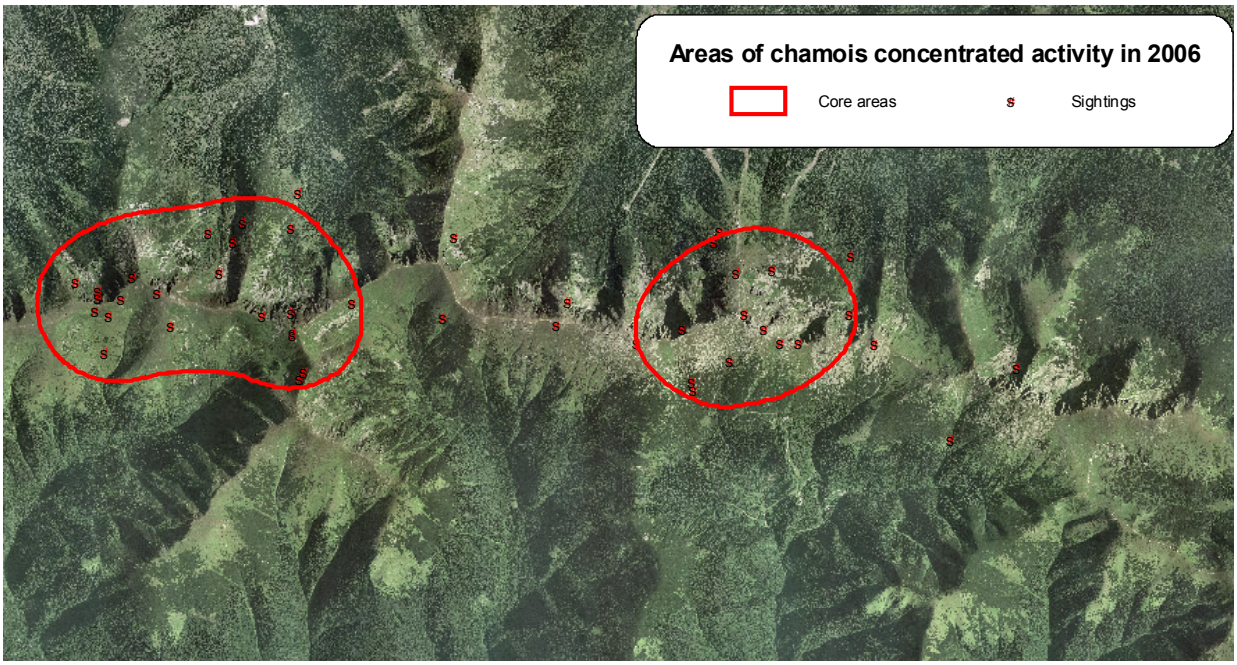


Figure 2.3.1d. Chamois activity in 2006.

It was not possible to ascertain the total number of chamois within the whole study area because research teams were small and denied access by the National Park authorities to the strictly protected parts of the National Nature Reserves of Skalka and Ďumbier. Moreover, it was not possible to judge sex and age composition of chamois herds under particular conditions (bad visibility, strong wind, big distance). Thus only the total number of observed chamois is assessed below (Fig. 2.3.1e and 2.3.1f).

In 2005 the number of chamois per sighting ranged from 1 to 29 individuals and the average size of chamois groups was 6.13 individuals (Fig. 2.3.1e). In 2006 the average size of a herd was 3.87 individuals.and the number of observed chamois ranged from 1 to 20 individuals (Fig. 2.3.1f). Large female herds comprising more than 10 individuals mostly occurred from the summits of Kotliská and Skalka eastward up to the summit of Koňsko. The average size of these groups in 2005 and 2006 were 16.12 and 15.30 individuals respectively.

It seems that these large groups of females with kids tend to avoid the western section of the chamois range often frequented by wolves. Wolves mostly use the western section of the chamois range for crossing the main ridge. Lone chamois males and smaller groups of females with young or yearlings were evenly distributed across the whole chamois range.

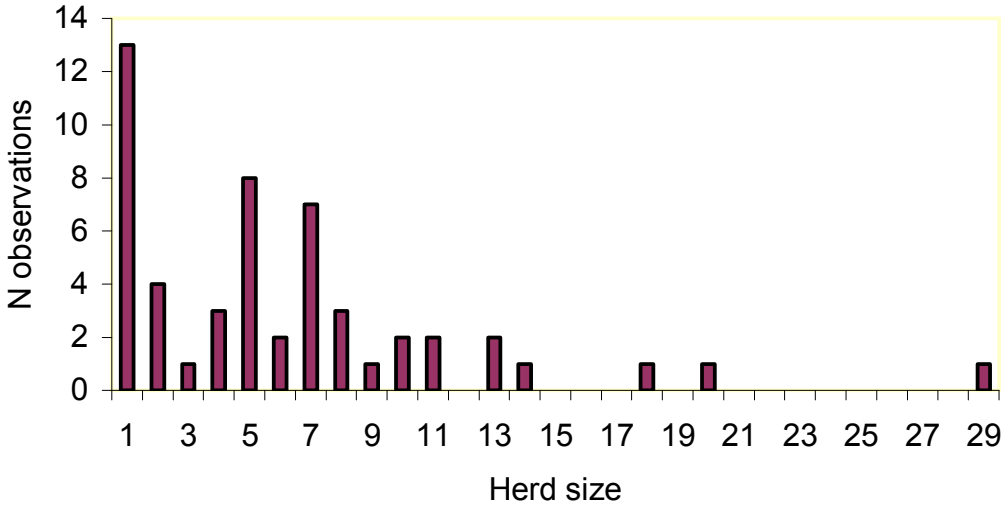


Figure 2.3.1e. Size of chamois groups in 2005.

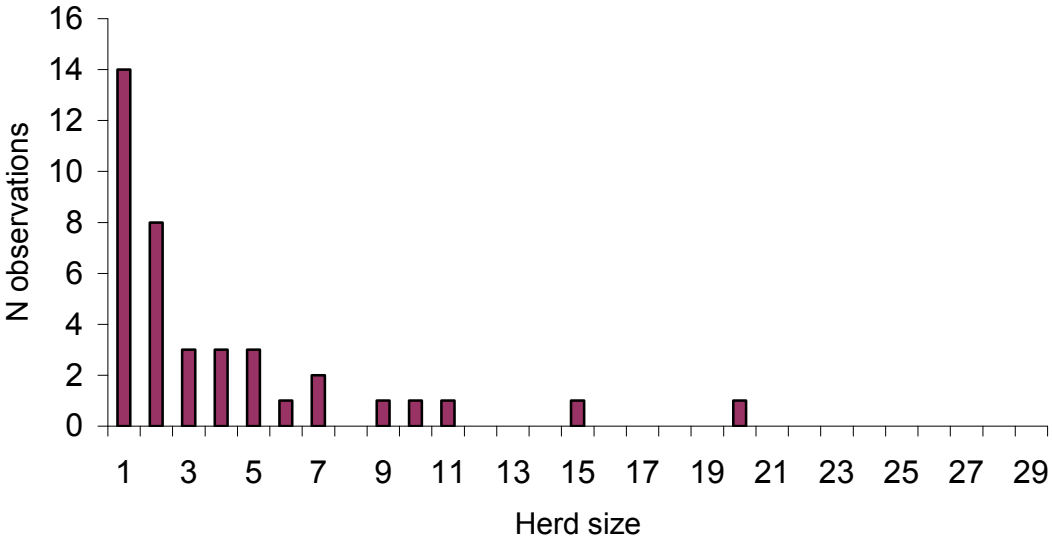


Figure 2.3.1f. Size of chamois groups in 2006.

Habitat use

The main habitat types within the chamois range include alpine meadows, cliffs, ridges, ravines, boulder fields and dwarf pine. Alpine meadow is an open landscape covered mostly by grasses and sedges. A more detailed classification of non-woody vegetation communities was outside the scope of this study. The use of main habitat types by chamois varies greatly. In 2005-6 chamois appeared to prefer alpine meadows (48 % and 45 % of observations) and cliffs (28 % and 42 %) or a combination of both (24 % and 11 %). Occasionally chamois descended to dwarf pine habitat (2 % of observations in 2006, Fig. 2.3.1g and 2.3.1h).

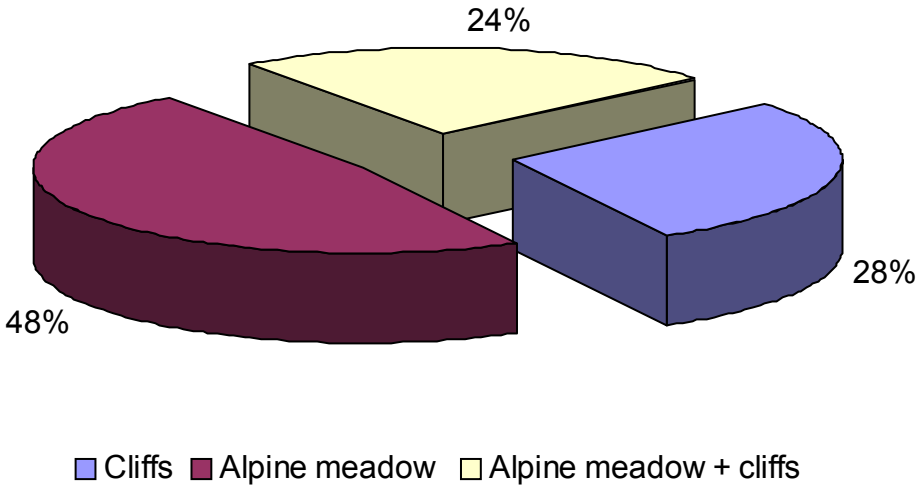


Figure 2.3.1g. Habitat use by chamois in 2005.

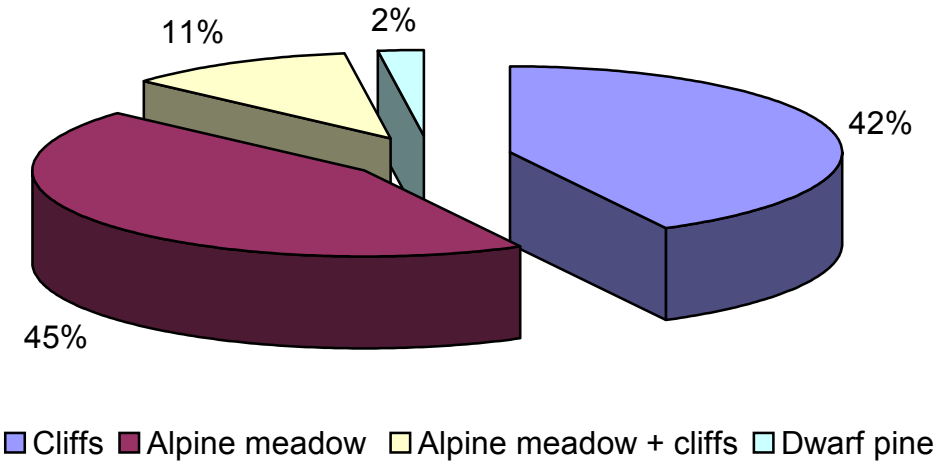


Figure 2.3.1h. Habitat use by chamois in 2006.

Chamois-human interrelationships

Chamois in the Nízke Tatry are constantly subjected to human impacts. Three mountain lodges (Štefánikova chata, Kamenná chata and Ďurková) are opened to the public all year round. The area is used for summer and winter outdoor sports, peaking during the summer and winter holiday periods. In general chamois tolerate human presence. Nevertheless the response of chamois to people is difficult to predict.

Grazing chamois are vulnarable to predation. Therefore feeding animals usually survey the surrounding area 1 - 3 times per minute (Bauman 2004, Mayer 2004).

To test individual vigilance levels of grazing, indviduals were chosen randomly from the herd to count the number of alert postures with head up per 10 minute span. Individual vigilance was defined by the following criteria: the focal animal (1) had its head raised above shoulder level, (2) was standing and not moving, (3) had stopped other activities such as feeding, (4) surveyed its surroundings with its attention fixed on the environment, and (5) had its ears cocked forward. Aditional data recorded for each sample included focal animal age-sex category, time and date, group size and type, and any relevant comments. A total of 14 observations of individual vigilance were conducted in 2005 and 2006 (Tables 2.3.1a and 2.3.1b).

Table 2.3.1a. Individual vigilance of chamois in 2005 (10-min sample of focal animal).

ID	Sex-age category	Herd size	Individual vigilance (number of times animal looked up within 10 minutes)	Aware of observer	Obser-vation distance (m)	Human disturbance
1	Adult male	1	3	No	150	No
2	Adult male	1	26	Yes	62	No
3	Adult male	1	5	Yes	70	Escaped to neighbouring ridge
4	Adult female	7	3	No	360	No
5	Adult female	8	15	No	35	Reacted to hikers 300 m away
6	Adult female	5	10	No	146	Got up when hikers moved by 200 m away
7	Adult female	11	2	Yes	118	Stopped grazing when hikers passed far from the herd
8	Adult female	4	13	Yes	100	Stopped grazing and moved on
9	Adult female	18	27	Yes	84	Escaped due to hikers 80 m away from herd
10	Adult female	8	13	No	200	No

Table 2.3.1b. Individual vigilance of chamois in 2006 (10 minute sample of focal animal).

ID	Sex-age category	Herd size	Individual vigilance (number of times animal looked up within 10 minutes)	Aware of observer	Obser-vation distance (m)	Human disturbance
1	Adult male	1	9	No	1000	No
2	Adult female	9	13	Yes	210	Disturbed by observers at 170 m
3	Adult female	2	11	Yes	247	Unconcerned of 3 observers, no kids
4	Adult female	5	9	Yes	386	Aware & watchful of observers when moved off path

Reactions of chamois to human presence and behaviour varied greatly up to a distance of 200 m. Under some circumstances chamois were extremely concerned by the presence of humans and raised their head during grazing up to 27 times. Sometimes chamois raised their head only 5 - 10 times and looked unconcerned even if the distance was fewer than 100 metres. If watchers or hikers walked off the approved hiking trail, chamois became alert and normally retreated or escaped. Chamois tolerated human presence at a distance of more than 200 metres and raised their heads usually fewer than 10 times (Fig. 2.3.1i). It is therefore clear that the level of human disturbance to chamois depends largely on the distance and unusual human behaviour, e.g. attempts to approach chamois by leaving the hiking trails.

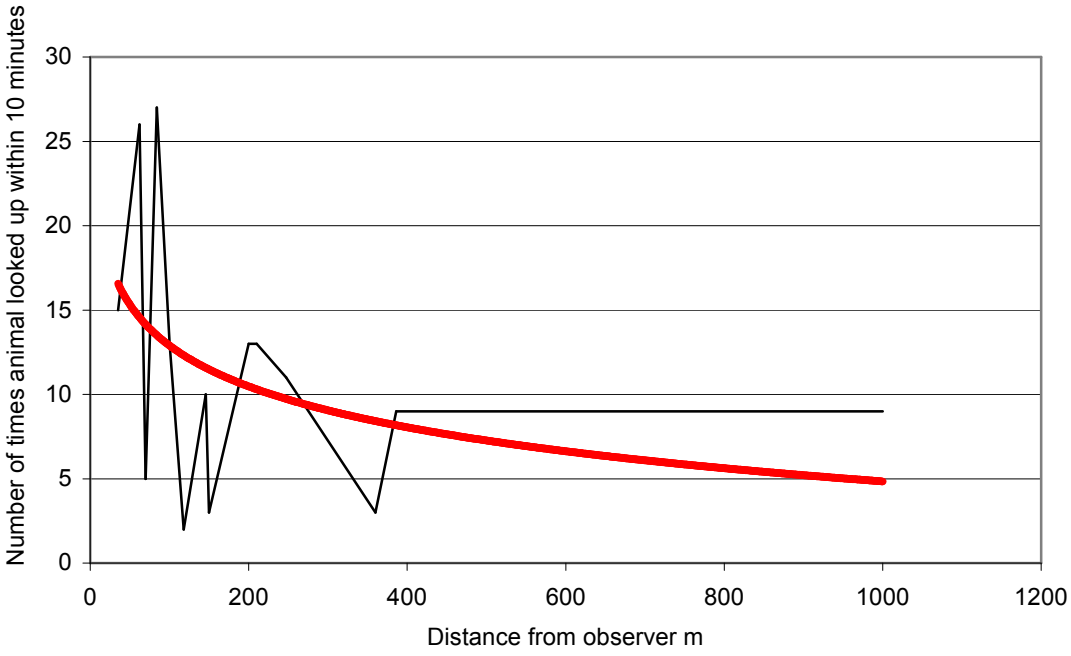


Figure 2.3.1i. Individual vigilance of chamois. Data in black and trendline in red.

Interrelations in habitat use of chamois and predators

In the Nízke Tatry mountains the chamois and large predators are sympatric and usually inhabit the same areas. The intensity of habitat use is, however, different and depends mostly on the species requirements (forest or open landscape species), distribution of food resources, suitable hides and human disturbance. The spatial distribution of locations of target species sightings (chamois, bear, wolf and lynx) and positions of their signs of activity (tracks and faeces) allow an indication of habitat overlaps (Table 2.3.1c). Thus it is possible to assess how large predators indirectly influence chamois distribution and habitat use.

Table 2.3.1c. Positional data (N) used for comparison of habitat use by target species.

Year	Chamois		Bear		Wolf		Lynx	
	Sightings	Tracks	Scats	Tracks	Scats	Tracks	Scats	Tracks
2005	51	8	71	32	28	10	0	2
2006	45	0	64	24	21	10	0	1

The Fixed Kernel Method was used for delineating the core areas of chamois and large predators concentrated activity (Worton 1989). All positional data including sightings, tracks and faeces for each species were used to estimate the areas of concentrated activity. The analysis of chamois concentrated activity in 2005 included 59 locations (51 sightings and 8 tracks, Table 2.3.1c).

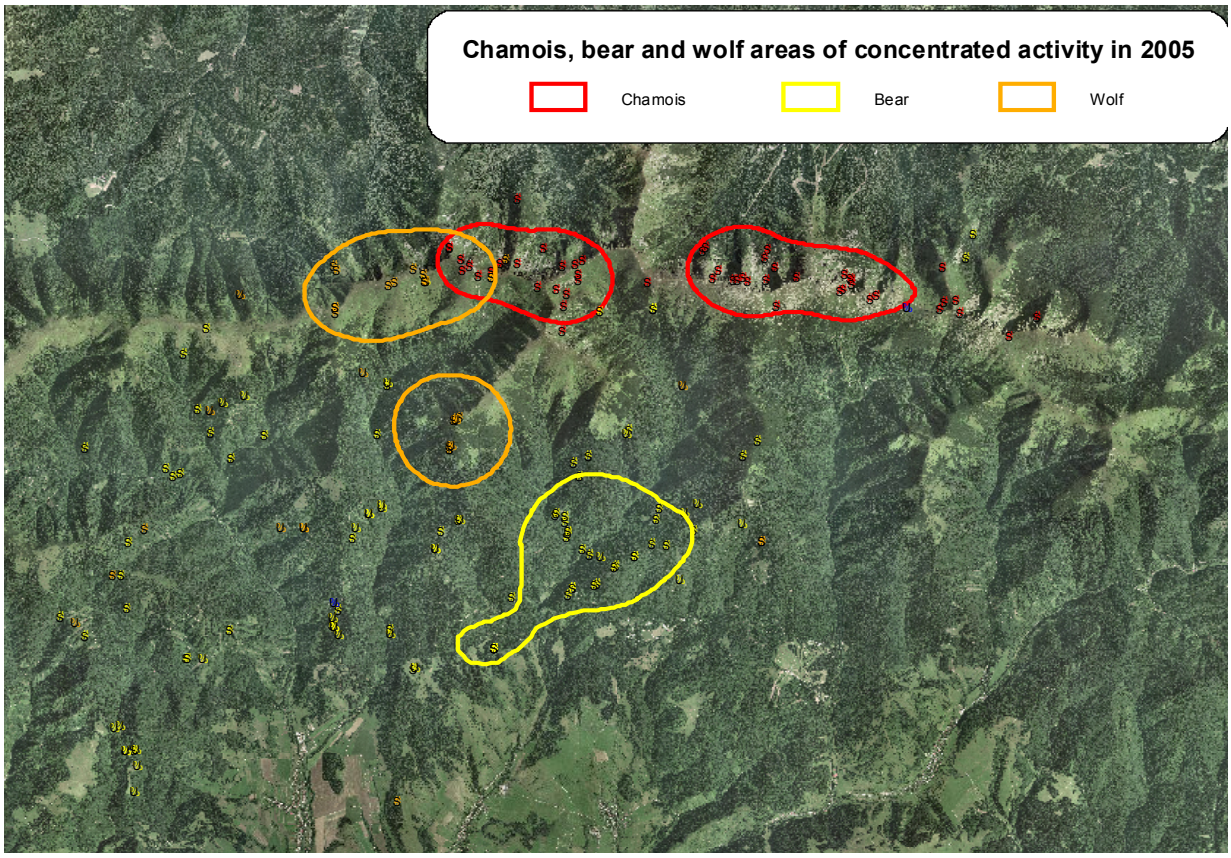


Figure 2.3.1j. Areas of concentrated activity 2005.

Fig. 2.3.1j shows the areas of concentrated activity for chamois, bear and wolf in 2005. The activity of bears was concentrated around one area, which spread over the lower parts of the Vajskovská and Kulichova valleys. The highest positions of bear scats were situated at the upper timberline. Only one bear scat was found within the core area of chamois habitat in the western part of its range.

Wolf occurrence was concentrated in two areas. The first area spread over the main ridge between the summits of Ďurková and Chabenec. In this area the zones of concentrated activity of wolf and chamois overlapped. The second zone encompassed the main crest and slopes of the summits of Žiar and Žiarska hoľa. Chamois normally avoid this area during summer.

The distribution of zones of concentrated activities of chamois, bear and wolf was similar in 2006 and 2005. Bear activity in 2006 was concentrated in one forest area in the lower sections of the Lomnistá, Kulichova and Vajskovská valleys. Some bear scats were found at the upper timberline outside the chamois core areas. The second small zone of bear concentrated activity was situated northward of Ráztocké lúky within the area of the side ridge between the summits of Matúšová and Ráztocká hoľa (Fig. 2.3.1k).

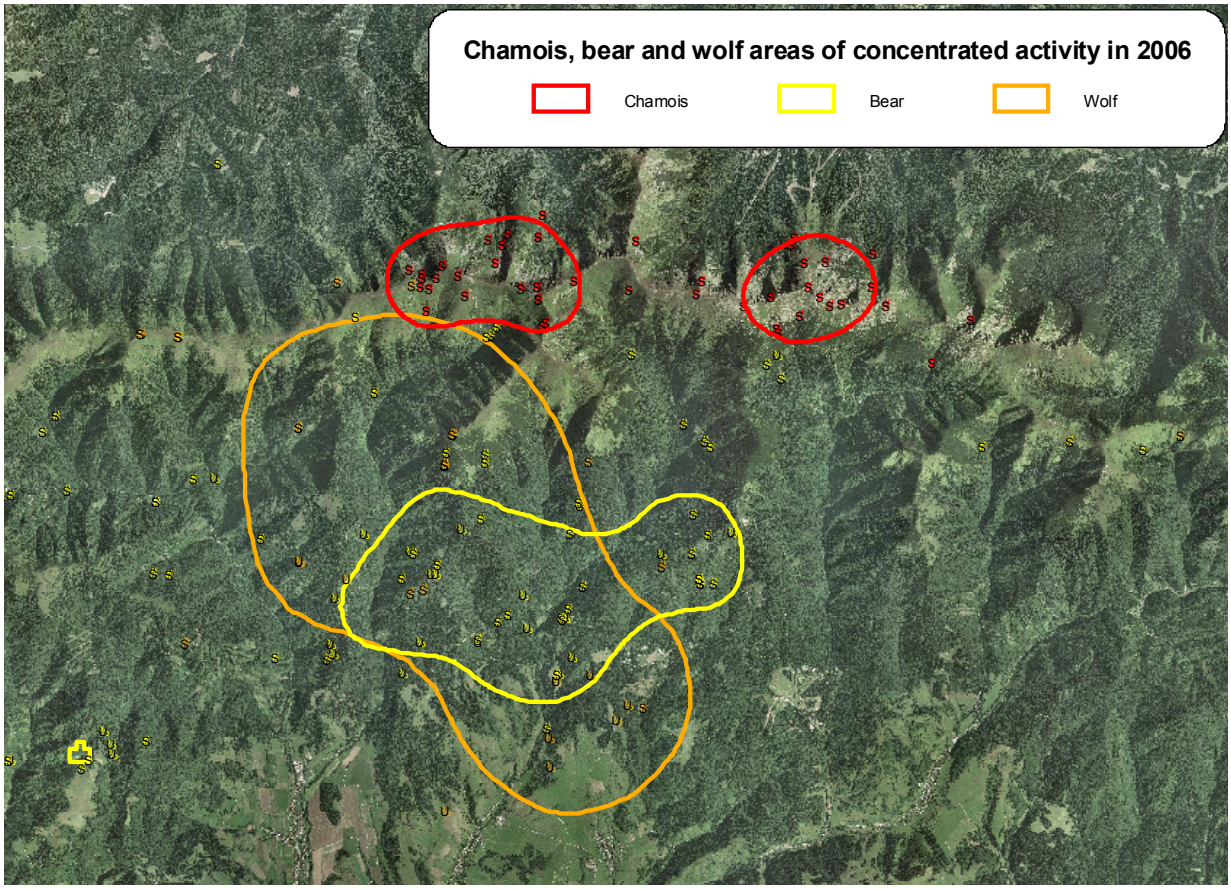


Figure 2.3.1k. Areas of concentrated activity 2006.

The area of wolf concentrated activity spread over the main crest up to the lower timberline and further on to the villages of Jasenie, Dolná and Horná Lehota. In 2006 wolves preyed on small stock at several sheep camps situated across the meadows, thus their area of concentrated activity encompassed the farmland near the human settlements. Similarly as in 2005 the northern section of wolf concentrated activity overlapped with that of the chamois. The wolf occurrence within the chamois range is most important alongside the main ridge from the saddle of Ďurková further on up to the summits of Chabenec, Kotliská, Skalka and Žiarska hoľa. Wolves connecting the northern and southern sections of their territory traditionally use this trail. Consequently, the area alongside the trail poses a higher risk of wolf predation on chamois. Occasional findings of lynx tracks did not allowed proper assessment of habitat use by this predator.

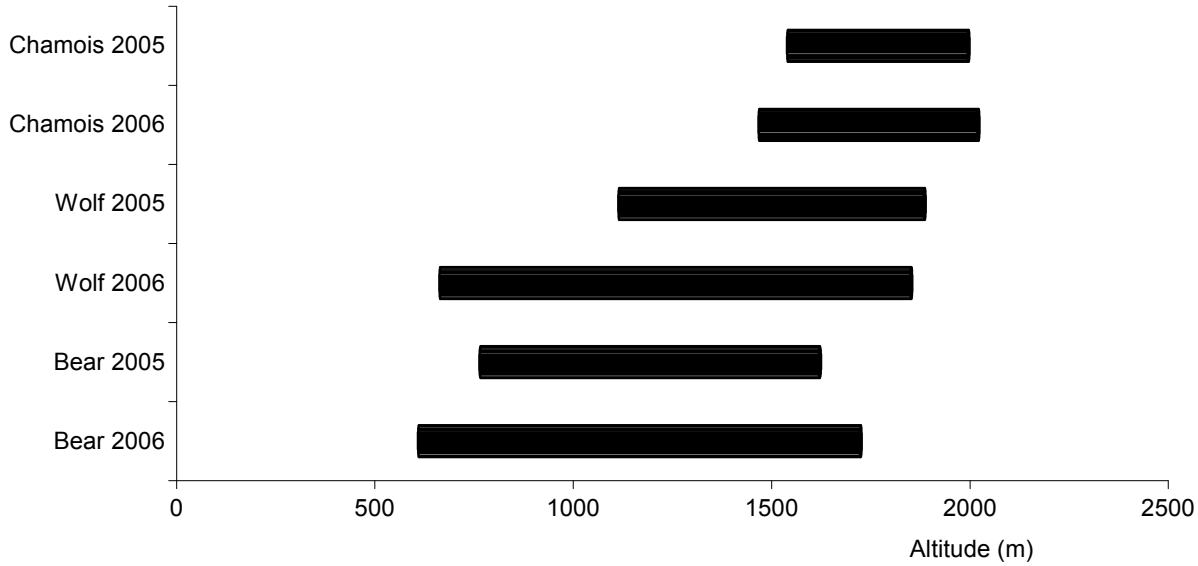


Figure 2.3.1l. Range of altitudes of chamois sightings and signs of bear / wolf activity (scats & tracks).

Altitudinal overlap of chamois, bear and wolf occurrence is shown in Fig. 2.3.1l. In 2005 and 2006 the range of altitudes of chamois occurrence was 1535 to 1990 m and from 1463 to 1985 m respectively. Regarding the vertical gradient, bear occurrence overlapped less with chamois habitat than wolf. The bear occurred within the range from 760 to 1615 m in 2005 and from 605 to 1718 m in 2006. Wolf presence was documented between 1110 to 1879 m in 2005 and from 659 to 1845 m in 2006.

2.3.2 Predators

Bear diet

Bear diet was described based on the analysis of 71 (in 2005) and 64 (in 2006) scats respectively. In 2005 the scats were collected in the following habitats: forest 83%, alpine meadow 10%, timberline 3%, dwarf pine 3 % and mountain meadow 1% (Fig. 2.3.2a).

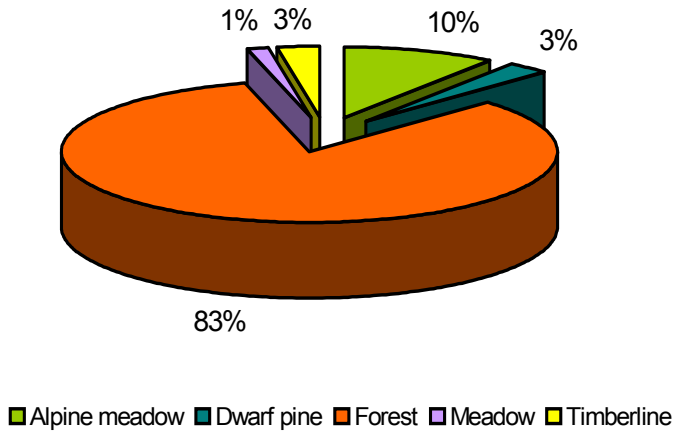


Figure 2.3.2a. Location of bear scats by habitat types 2005.

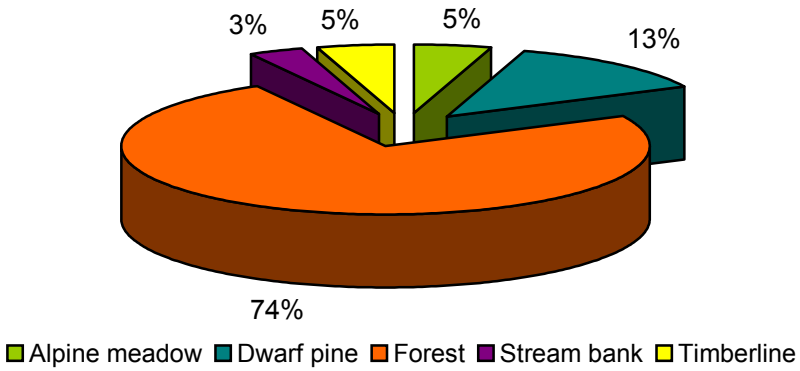


Figure 2.3.2b. Location of bear scats by habitat types 2006.

In 2006 bear scats were situated in forest 74%, dwarf pine 13%, timberline 5% , alpine meadow 5% and stream banks 3% (Fig. 2.3.2b). Merged data for 2005-6 showed woodland areas including forests, stream banks, and forest meadows as the most important bear habitats comprising 78% of all bear scat locations. Only 16% of bear scats were situated within the ecotone between upper tree line and alpine meadows.

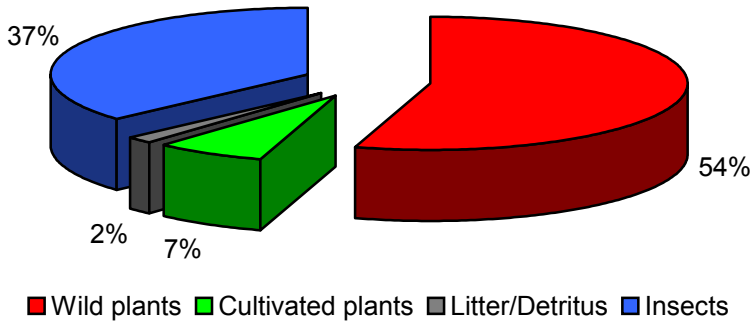


Figure 2.3.2c. Composition of bear diet 2005 (N = 74).

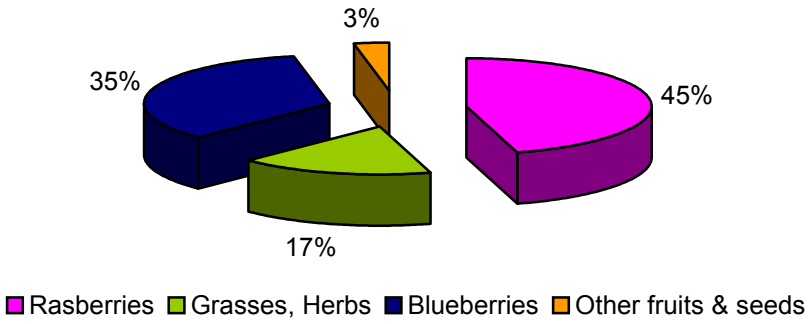


Figure 2.3.3d. Detailed wild plant items 2005.

In 2005 wild plants were the most frequent food item (54%) consisting mainly of raspberries (*Rubus idaeus*) and blueberries (*Vaccinium myrtillus*) (Fig. 2.3.2c and 2.3.2d). Grasses and herbs constituted 17% of wild plants while fruits (*Crataegus oxyacantha*) and seeds (*Corylus avellana*) of trees only 3% (Fig. 2.3.2d). Cultivated plants (wheat and oat) eaten by bears at the feeding sites of deer and wild boar constituted 7%. Animal matter constituted 37% of the summer food diet composed mainly of social hymenopteran insects (71%) such as ants and wasps. The rest of the animal matter was composed of other insects and invertebrates. In 2005 late summer bear diet did not comprise mammalian food items.

In 2006 late summer bear diet composition was similar to that of 2004-5 (Fig. 2.3.2e and 2.3.2f). Wild plants were the most important food (48%) consisting mainly of various berries including raspberries (40%), blueberries (38%) and cowberries 5% (*Vaccinium uliginosum*). Herbs and grasses constituted 12% and other fruits 5% of wild plants. The most important food from wild trees was fruits of rowan (*Sorbus aucuparia*) and seeds of hazel (*Corylus avellana*).

Cultivated plants constituted 8% of bear diet. Bears commonly utilise food either provided by hunters to ungulates at deer feeding sites or from fruit trees interspersed throughout the study area. Thus cultivated plants comprised apples (58%), wheat (25%) and oat (17%).

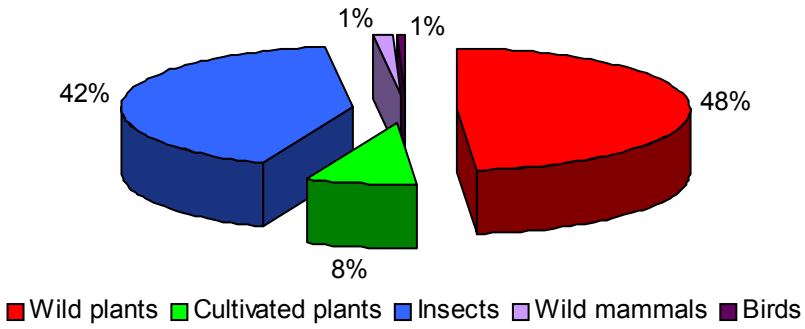


Figure 2.3.2e. Composition of bear diet 2006.

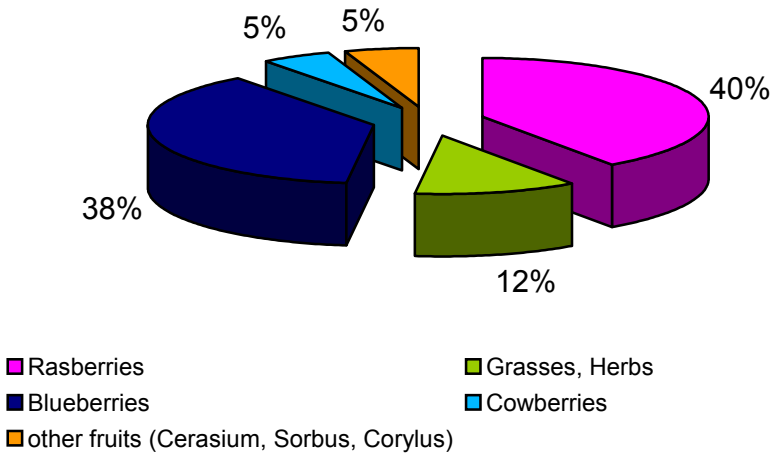


Figure 2.3.2f. Detailed wild plant items 2006.

Animal food constituted 44% of the late summer food diet and was composed mainly of hymenopteran insects (42%). The most frequent groups of insects included ants (43%), wasps (35%) and remains or developmental stages of other insects (22%). One scat sample from 15 August 2006 contained remains of red deer fawn and one sample of the feathers of a bird. Mammal remains composed only 1% of the bear diet. No chamois remains were found in any of the samples in any of the years.

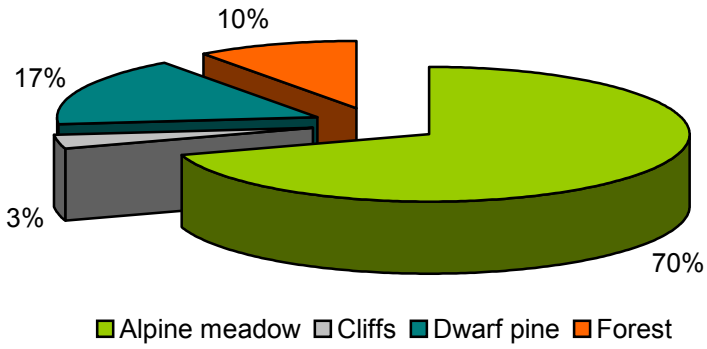


Figure 2.3.2g. Location of wolf scats by habitat types 2005.

Figure 2.3.2h. Location of wolf scats by habitat types 2006.

Of the total number of wolf scats (n=31) collected during the expedition in 2005 up to 90% were located in alpine habitat composed of alpine meadows (70%), dwarf pine (17%) and cliffs (3%). Only 10% of scats were found in the woodland areas (Fig. 2.3.2g). A completely different pattern of habitat use by wolves was documented in 2006. Of the total number of collected wolf scats (n=23), only 65% were found in alpine habitat and 35% in the forests (Fig. 2.3.2h, see also Fig. 2.3.1j and 2.3.1k). The shift of the wolf core area of activity to the forest zone and lower timberline was likely related to depredation on livestock as reported by herders in June and July 2006. However, this suggestion is not confirmed by the analysis of wolf diet.

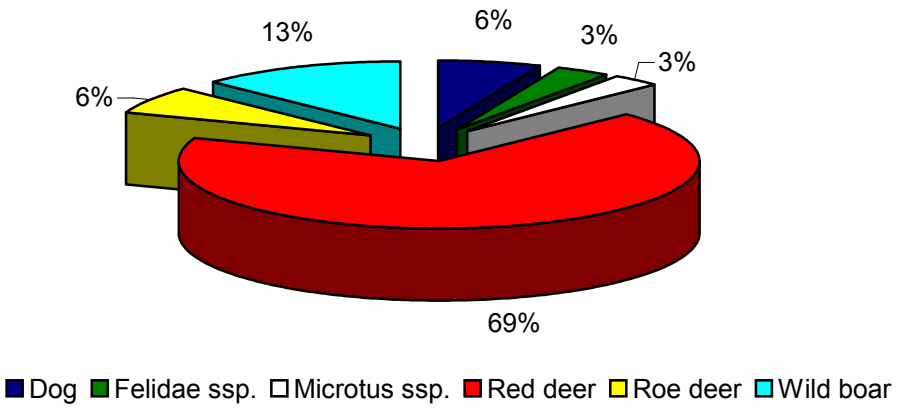


Figure 2.3.2i. Composition of wolf diet in 2005 (N = 31).

As in 2004, wolves in 2005-6 predominantly preyed upon wild ungulates. In 2005 the main prey species was red deer (69%) followed by wild boar (13%) and roe deer (6%). Of domestic animals the wolf diet comprised only dog and cat remains. Small mammals composed 3% of the wolf summer diet (Fig. 2.3.2i and 2.3.2j).

In 2006 wild ungulates composed 91% of the wolf diet. Similar to 2005, the main prey species was red deer (61%), followed by wild boar (26%) and roe deer (4%). No remains of chamois were found in wolf scats collected in 2005-6. Interestingly, the analysis of wolf scats from 2006 did not confirm depredation on livestock as reported by local people. However some remains of dogs were found in the wolf diet (9%).

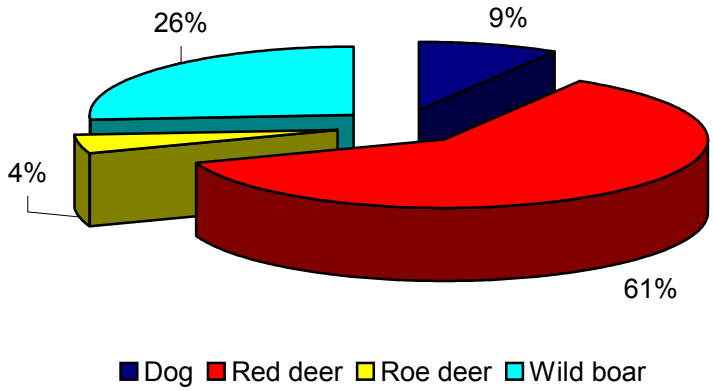


Figure 2.3.2j. Composition of wolf diet in 2006 (N = 23).

2.3.3 Other observations

In 2005-6 golden eagles were observed six times during each expedition but no attempts to attack chamois were documented. Other observations of raptors included peregrine (*Falco peregrinus*), hobby (Falco subbuteo), kestrel (Falco tinunculus) and lesser-spotted eagle (*Aquila pomarina*).

During both expeditions marmots (*Marmota marmota latirostris*) were recorded across the study area. The number of marmot observations includes seven in 2005 and ten in 2006.

2.4 Conclusions

This report details the results of the study on chamois and large predators in the Nízke Tatry Mountains conducted by Biosphere Expeditions and the Carpathian Wildlife Society in 2005 and 2006.

- 51 and 45 sigthings were used to describe the shape and size of the chamois range in 2005-6. The chamois range extended over an area of 2,123 hectares in 2005 and 2,181 hectares in 2006. Chamois activity was concentrated in two seperate core areas, which covered approximately 55% of the total chamois range.

- The size of chamois groups varied greatly from 1 to 29 individuals. The average size of a chamois group was 6.13 (2005) and 3.87 (2006) individuals respectively. Large female groups with young numbering more than 10 individuals tended to avoid the western section of the chamois range frequented by wolves. The average size of large female herds with kids was 16.12 (2005) and 15.30 (2006) individuals. The total number of chamois in the Nízke Tatry was not ascertained.

- Chamois preferred alpine meadows and cliffs or combinations of both, as these habitats provide more safety from predation.

- Individual vigilance level of grazing chamois was used as a measure of protection behaviour. Vigilance level was ascertained as the number of alert postures with head up during a 10 minute period. Reactions of chamois to human presence and behaviour varied greatly up to the distance of 200 m. If concerned by humans, chamois raised their head during grazing up to 27 times. Chamois began to tolerate human presence at a distance of more than 200 m.

- To assess the possible impact of large carnivores on chamois populations, 135 bear and 54 wolf scats collected in 2005-6 were analyzed. None of them contained chamois remains. No lynx faeces were found.

- Wild plants were the most frequent food item in bear diet (54% in 2005 & 48% in 2006). Animal food constituted 37% (2005) and 44% (2006) of the late summer bear diet. Social hymenopteran insects were the most important animal food. No remains of chamois were found in the bear diet. 19% of bear scats were situated in the chamois habitat (alpine meadows, dwarf pine and upper timberline).

- 79% of wolf scats (2005 plus 2006) were found within the chamois habitat. The most important component of wolf diet during both years were wild ungulates (89%) including red deer (64%), wild boar (19%) and roe deer (6%). No remains of chamois were found in the wolf diet.

- Although there is no evidence of predation of bear and wolf on chamois, predators imposed non-lethal effects on chamois. It is suggested that non-lethal effects of predation on chamois outweigh lethal effects in that they govern chamois habitat utilisation and selection. The physical structure of a habitat (e.g. the presence or absence of cliffs) appears to be a key determinant of risk and, hence, of the use of space by chamois. Predator-induced microhabitat shifts by chamois into safe but less energy-profiatable cliffs and the complete avoidance of woodland (a phenomenon unknown in areas free of large carnivores) may limit further expansion and growth of the population.

Further research

The research initiated here should be carried out not only in the summer/autumn, but also in early spring to ascertain chamois survival over the winter and to gather data on lynx habitat use within the chamois habitat. Spring snow and mud tracking can yield more accurate results on habitat utilisation by all large carnivores. It is impossible to collate sufficient data on lynx distribution and habitat use during the snow free period.

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3. Expedition leader's diary Slovakia

3.1. Year 2005

5 August

It's preparation time at UK HQ for the Slovakia 2005 expedition. The last two days have been spent sorting out all the equipment, paperwork and logistics that will be required for the research to come. Everything that will be needed, including binoculars, spotting scopes, cameras, tripods, GPS units, maps, compasses, books, has been packed into boxes and loaded into the Land Rover ready for our overland journey to Slovakia. Matthias and I (Paul, the expedition leader) have also been spending time printing off all the data sheets and research information that will be used for the fieldwork.

Tomorrow morning I will be leaving for the drive down to Dover and then on through Germany and Austria, arriving in Bratislava on Tuesday. Once in Slovakia I will be meeting up with Slavo (the expedition scientist) and Claudia (from Biosphere Germany) for some final preparations at base camp before the arrival of the first expedition team on Sunday. I look forward to meeting the first slot expedition team members on Sunday morning (or on Saturday evening 20:00 at the Chez David reception if you are already in Bratislava by then). Have a safe journey and hope your preparations are going well.

Until Slovakia!

Paul Franklin
Expedition leader

7 August

Today the advanced party arrived, to be greeted by Claudia, at the Biosphere Germany office. Our trusty Land Rover Defender is performing well and the satellite navigation system has guided us accurately without having to resort to the use of maps. A shame we cannot use it to find the chamois, but then what would be the fun in that? At one point we thought we had upset the sat nav as she did not speak to us for a while, probably just having a little nap (sleep). After leaving the Biosphere UK HQ on Saturday we headed down to Dover and crossed to Calais through the Channel Tunnel.It was a new experience for me driving, rather than walking, down the platform and onto a train. We spent last night in Belgium. Our only noteworthy wildlife sightings so far have been the roe deer grazing in fields alongside the road. At least we did not mistake them for chamois, so there is hope ;->

It is one week today until we meet the rest of the expedition team in Bratislava. I expect the anticipation and excitement levels will be building while remaining items of kit are being purchased. The next diary entry will probably be on Wednesday when we arrive at base camp to unpack the equipment and do some final preparations with Slavo before the research begins.

11 August

On Wednesday the advance team arrived at basecamp, a total drive of 2126 kilometres from UK HQ. Since then we have been busy unloading and setting up our equipment, meeting with Slavo and acquainting ourselves with the surroundings. We have already experienced some mixed weather conditions.

Last night we had thunder, lightning and a torrential downpour. Today was much better with blue skies and sunshine. My advice to expedition team members is be prepared for any eventuality. There are still some patches of snow up on the main ridge study site and the temperature drops during the evening, but the weather is generally fresh and pleasant. We had our first chamois sightings of the season today, five individuals on the north side of the main ridge. We also saw a contented looking marmot with its mouth stuffed full of grass.

Tomorrow we will be stocking the food larder before I drive back to Bratislava. I will be meeting up with any expedition team members available to join me for dinner on Saturday evening (20:00 in the Chez David reception) or otherwise 08:00 on Sunday. See you then!

16 August

On Saturday morning we completed our expedition preparation at basecamp and made a shopping trip to buy food supplies. In the afternoon I drove back to Bratislava to meet the expedition team members. On Saturday evening we started the getting-to-know-one-another process over dinner with expedition members already in Bratislava. Sunday morning 08:00 was our official expedition assembly and after all the introductions we loaded luggage on the Land Rover and set off in a three vehicle convoy from Bratislava. Pia, our youngest expedition member (7), was observed stocking up on cakes at breakfast time. Perhaps she was a little concerned that there would not be any food on the expedition ;-> There was no need not worry as Claudia and Alan had a nice lunch prepared for our arrival at base camp.

It was a nice sunny day, so we were able to do our introductory briefings and safety talk outside. After this Slavo gave an introductory talk about the research accompanied by some pictures of the species we will be studying and their tracks and signs. To avoid an information overload on the first day, we finished with just a brief introduction to the expedition equipment.

Monday and Tuesday were spent learning to: use the navigation and observation equipment; identify measure and record tracks and scats; fill out the data sheets correctly. Most of this was done out in the field where the team have also been able to experience the varied weather conditions that the area has to offer!

Now our training days are over, although there is plenty left to learn, and tomorrow we will begin collecting data on bear and wolf tracks and scats in the forest areas of the study site.

After our work is done in the evenings some of us have sampled one or two of the local beverages in a nearby bar. They have table football, so with our mix of nationalities we can stage our own mini world cup.

21 August

Today is a rest day following our first week of data collection. Following our training days on Monday and Tuesday, we were greeted by torrential rain on Wednesday morning. Fortunately conditions improved a little in the afternoon and we were able to get out on the forest trails checking for tracks and collecting wolf and bear scats. Thursday was also spent mainly in the forest zone although one group ventured up onto the ridge to find that visibility was limited by low cloud. On Friday we decided to get everyone up onto the main ridge for chamois observation despite the changeable weather conditions. We stayed on the ridge in the mountain huts on Friday night allowing us to continue field work on Saturday morning. Fortunately the cloud stayed off the ridge and visibility was good. We split into two groups so we could cover both western and eastern sections of the ridge; the team was then further subdivided into survey groups of three or four team members.

The west ridge team had an exciting if bumpy ride in the Land Rover up to their hut at Durkova. The east ridge team had a smoother ride on the chairlift up to Chopok. It took until lunchtime to get everyone up to the Durkova hut. After bagging our sleeping spots in the bunkroom and eating our sandwiches we headed out to survey the ridge. Our first chamois encounter was a lone male that Alan spotted resting on a flat rock. We were quite close, 60 metres, so Steve and Claudia were able to get some good photographs. We observed the male for 40 minutes sharing its time between resting and grazing, not too concerned by our presence. Further on we observed a group of seven chamois from about 1 km grazing on the northern slope. The same area of the ridge also proved productive the following morning with a total of 13 individuals being observed at distances between 40 metres and 1 km. Eleven wolf scats were collected on the ridge although all quite old, the only recent evidence of wolf we have found so far are one set of tracks in the forest zone. The scats will be useful for analysis of wolf diet and in particular to see if any evidence can be found for wolf predation on chamois.

Other observations included a sighting of golden eagle, numerous marmot, a pair of basking vipers and a red deer with a fawn. Helen thought she heard a frog on the main ridge but realised it was actually a raven when it flew over her head. So we are all still on a steep learning curve improving our identification and observation skills, but collecting valuable research data along the way. As a team we are getting to know each other better as the days go by. Particularly noteworthy behaviour observed within the group are Tracey's ability to sleep anywhere at anytime.

We are hoping for some clear weather next week so we can get back up onto the ridge for more observations of the chamois population. This is important for estimation of the population size and reproductive success.

23 August

The last couple of days have been rather cloudy and wet so field work has been restricted to walking the forest trails in our continuing quest for wolf and bear signs. Jurgen & Silvia found fresh wolf tracks yesterday in the Struhar valley so today we concentrated further searches in that area.

Roger and Hanns returned with a large quantity of scats including two from wolf. While driving along one of the forestry tracks yesterday, we encountered two big piles of bear scat which were collected for diet and DNA analysis. Fresh tracks of an adult and cub were recorded close by and today another pile of scat had appeared in the same location. We have been photographing some of the finer examples of tracks and scat to make a slide show which will be useful for training the new field team arriving for the second slot next week. Slavo has been impressed with the team's navigational abilities and so far (touch wood) no-one has got lost.

Yesterday evening we resisted the call of the bar and headed back to base with a couple of bottles of Slovakian wine in tow. Slavo gave us a very interesting presentation on the radio telemetry studies he has been conducting over the last couple of years on red deer and wolves.

Tomorrow we have planned another trip up to the main ridge. Hopefully the weather will improve as low cloud on the ridge will make chamois observation difficult, if not impossible. Fingers crossed.

26 August

Wednesday morning we woke to another cloudy day, less than ideal for chamois spotting on the ridge. Still undeterred and hopeful for a change in conditions we prepared for departure. Once again we split into two groups, four with Slavo to Chopok hut at the east end of the ridge and the remainder with me for the white knuckle ride in the Land Rover up to Durkova hut on the western side of the ridge. We reached Durkova at about 11:00 after stopping to collect a fresh bear scat from the forestry track on the way up.

Conditions were terrible for chamois spotting with low cloud and poor visibility. We would probably walk into a chamois before we actually saw it. Rather than sitting around the hut we decided to brave the elements and venture out onto the ridge. As expected we did not see any chamois, but we were rewarded with two fresh wolf scats, bear and red deer tracks. Back at the hut we heated up some pasta and sauce, which turned out to be a vast improvement on the starchy mess we produced last week. This was followed by tinned peaches for desert and washed down with red wine, which had somehow found its way into the food crate.

Conditions had not improved the next morning, but we set out again so at least we would be in a good spotting location on the ridge if visibility did improve. It did! For a couple of hours at least. During the clear spell we were able to locate a male chamois in exactly the same location as it was seen last week. We watched it for about 15 minutes from 30 metres away before it moved off around the slope. Jurgen managed to get some good shots with his telephoto lens and Tracey, who was unlucky not to see a chamois last week, got her first sighting. We continued along the ridge but the clouds returned and we were unable to locate any more chamois. A radio message from Alan & Hanns informed us that he had found a group of 29 animals at their location on the eastern end of the ridge. Their tally for the day actually went up to 46 individuals and in total the survey teams on the eastern end of the ridge had 80 chamois sightings. The results are interesting because they fit in with Slavo's theory that the chamois prefer the eastern side where there are more tourists and consequently fewer predators. On the western side we have recorded fewer chamois but found many wolf scats. This spatial distribution of chamois, predators & tourists is something we hope to investigate further in the next two weeks. This is a good example of how a negative result i.e. not seeing chamois on the western side, can be just as useful to the outcome of the research as positive sightings. The chamois observations also emphasises the benefits of using a relatively large number of field workers simultaneously surveying a large area.

Today is the last day for the slot one team and in a little while we will be driving back to Bratislava. It has definitely been a successful two weeks both for chamois observation and predator scat collection. We have collected over 50 bear scats and 20 wolf scats which will be used for analysis of diet and also identification of individuals from DNA. Thanks to the slot 1 team for all your hard work and good humour.

I will be meeting the second slot team members on Sunday morning at 08:00 (or for dinner at 20:00 on Saturday evening in the reception of Chez David, anyone already in Bratislava). Hopefully the weather conditions will improve a little in the coming two weeks. We still have many areas that need to be checked for predator signs and more observation time needs to be spent on the main ridge.

1 September

The second slot started with a torrential downpour on Sunday morning. Wiper blades were working full speed as we left Bratislava to make the four hour drive to base camp. We had a slight delay when water found its way into the distributor on Slavo's car, but it was quickly fixed and we were on our way. At base camp the new team were initiated with the normal introduction & risk assessment briefings followed by Slavo's talk about the research objectives.

On Monday we started bright and early with a look at the field techniques and equipment that will be used during the expedition. After looking at the various datasheets and maps we went out into one of the forest areas of the study site for further training in the use of GPS, compass, rangefinders & spotting scopes. Bears had been very active in the area so there was plenty of opportunity to practice scat collection, track measurement and data recording. Emmanuel also found time for some mushroom collection to supplement the next days breakfast.

As weather conditions were predicted to be good for the next few days it was decided to go straight up onto the ridge on Tuesday morning for a two night stay. Half the team to Chopok hut on the chairlift and half to Durkova in the Land Rover. By late morning we were out on the ridge surveying for chamois. We quickly found our first wolf scat for slot 2 which was deftly bagged by Bernd. A little while later we found my old chamois friend, the Chabenec male. We had been watching the male for some time before we noticed another, female chamois, even closer to our observation position. As we turned our attention to the female it became apparent that she was part of a group of seven.

On Wednesday Jordan, Anne, Bernd and I headed west along the ridge from Durkova. The main purpose of this excursion was to check for evidence of large predators. We found two wolf scats on the saddle above Durkova hut but no evidence further west. This suggests the wolves are not utilising the ridge west of Durkova so provides us with useful information, if not an action packed day for the field team. Well, we did get to see a golden eagle and a viper on the route back. So far our scat collection suggests that wolves are active on the main ridge between Durkova and Kotliska but do not venture further west or east towards Chopok. The wolves are also using the Skalka side ridge that heads down to the south and some of the side ridges heading north from the main ridge.

We will spend the next two days in the forest zone surveying some new areas for large predator signs. Sunday is a well deserved rest day and then back up onto the main ridge next week for our final chamois observations for this field season.

5 September

Since returning from our last excursion up to the main ridge we have been working in the forest zone collecting more scats and track data for wolves and bears. Anne has compiled a complete list of all the scat samples so far collected this year. The totals collected during the first slot were: 37 bear & 16 wolf scats for analysis of diet; 8 chamois & 26 bear scat samples for DNA analysis. Combined with the growing pile of scat sample envelopes currently being collected during the second slot, the overall totals will be impressive. The lab analysis of this pile of samples will keep Slavo busy for some time after we leave!

On Friday we said goodbye to Konrad & Emmanuel who had just joined us for the first week of the second slot. Konrad has been filming the expedition for German TV. Emmanuel is a photo journalist writing an article for the French magazine “Forets”. What with Sandy, an American photographer, on the team as well, the second slot members have been spending plenty of time staring down camera lenses.

On Saturday we varied the program a little with a late afternoon/evening outing into the forest. The idea behind this was to increase the possibility of wildlife sightings and listen for calling wolves and red deer stags which are just starting to rut. Some of the team spent the night camping and did an early vigil on Sunday morning. Late evening and early morning is a beautiful time to be out and about in the forest, although we were not lucky enough to make any observations of large mammals on this occasion.

The remainder of Sunday was a day off for most, except for Roger and Jutta who decided to visit a section of trail that they had missed on Friday, resulting in a good haul of bear scat. The day finished pleasantly with a barbeque in the evening.

Tomorrow we will head back up to the main ridge for our final chamois counts and observation of this field season.

8 September

Today we returned from a two night stay on the main ridge, our main purpose being our final chamois counts and observations for this field season. On Tuesday the team on the west side of the ridge located the Chabenec male again and also managed to observe and photograph three females and three kids from a distance of fewer than 10 metres. Two remaining ridges running north that had not yet been looked at were checked for wolf scats and a couple more added to the collection. This morning Birgit and Dagmar valiantly braved the cold wind on the ridge and made observations on a group of 10 chamois. Nicole and Anne had some fantastic luck when they set off ahead of the Land Rover to walk down the forestry track into Lomnista valley. When we caught up to them in the vehicle Anne was jumping up and down with excitement. They had met a wolf on the track which on being discovered ran off down the slope through the forest! So finally we have a large predator observation to add to the data.

This afternoon Slavo and I packed up the expedition equipment as another Slovakia field season draws to a close. Definitely a success with a large number of scats collected and many good observations of chamois.

Tomorrow we will drive the team to Bratislava for final farewells. Slavo will then become a scatologist for a while analysing the samples and I will be driving a Land Rover full of expedition equipment back to the UK.

A big thank you to everyone who has helped with the field work this year. The research would not be possible without you. I look forward to seeing the findings of our labour when Slavo has had time to sift through a lot of scat and analyse the data!

3.2. Year 2006

8 August

Time to kick off this year's Slovakia expedition. Yesterday at 05:30 we set off in the Land Rover from the UK in the pouring rain. We made good time and arrived at the Germany office in the evening. Today is being spent sorting out the expedition kit and loading up the Land Rover for the next leg of the journey. Tomorrow will be another early start for the drive to Bratislava where we will spend the night before heading out to the base camp the following day. At base camp we have a couple of days to set everything up, stock the larder and discuss final expedition logistics with Slavo, the research scientist. Then it's back to Bratislava, a four hour drive, on the 12th. Hopefully I will be meeting some of those expedition members that are already in town on Saturday evening (meet at the Chez David at 20:00 hrs). If not I am looking forward to meeting all first slotters at 08:00 in the conservatory of the Chez David on Sunday 13th. Having led the Slovakia expedition last year, I am excited about getting out there and doing it again. The area is beautiful and who knows maybe I will recognise some of the chamois from last year….

Paul Franklin
Expedition leader

14 August

The first slot of the Slovakia 2006 expedition is now well under way. Some members of the expedition started getting to know one another over dinner on Saturday evening in Bratislava and the whole team met for the first time on Sunday morning. We are a diverse mix of ages, interests and backgrounds that should make for an interesting two weeks. Among us are students (school and university), an ecologist and son, estate worker, computer programmer, artist, community worker and a radio journalist.

After a four hour drive from Bratislava we arrived in good time for lunch at base. There we met up with Slavo, the expedition research scientist and Michaela, a research student from Germany assisting Slavo with the study. In the afternoon it was down to work with introductions and safety briefing. Later Slavo gave an introductory talk about the research illustrated with slides of the study species and area. To avoid information overload we adjourned for showers and some relaxation time before dinner. Following dinner there was an opportunity to sample some of the local beer and slivovitz, a Slovakian plum brandy.

Today started with an instructional session on the research equipment, everyone having an opportunity to use binoculars, rangefinders, spotting scope, radios and digital cameras. The emergency field procedures, use of emergency flares and whistle were explained. A break was needed before tackling the important theme of field navigation. It is essential for this expedition that all team members are competent in at least basic use of map, compass and GPS. Not only does this minimise the risk of a field team becoming lost, it is also necessary for accurate recording of the scientific data. Fortunately the sun was now shining so we were able to practice outdoors the skills of orientating maps, taking bearings, recording coordinates and using them to find map position. Having practiced using all the equipment it was now time for Slavo to explain about data collection and recording. This is also a very important subject as data collected will only be useful to the research if it is recorded accurately on the data sheets. After a theoretical explanation of data collection we took a break for lunch before heading out into the forest to get our first hands-on experience of practical data collection in the field. Team members were able to collect and record bear scat and were able to start learning how to recognise tracks such as red deer.

A lot of information and techniques have been covered today and I must thank the team for being so patient and punctual to all the sessions. Tomorrow will be an opportunity to consolidate all that has been learned, gain some more experience identifying tracks and scats, practice using the equipment and collecting data in the field. We will start the day with a tracks and scats slide show put together by last year's expedition that is a big help to identification of signs in the field.

17 August

After two days training in the use of field equipment and data recording the expedition members were ready to get out on their own to start collecting scat samples and record locations of large predator tracks. Yesterday we split up into four groups to start surveying some of the trails starting in the lower forests and extending above the tree line into dwarf pine and alpine meadow habitats. Team one: Jamie, Fiona, Johann and Ariane, took a route that lead them up to a point on the main ridge and were able to make this year's first chamois observations, a group of seven individuals. We also collected the first two wolf scats of the year. Each evening, before dinner, we meet to review the results of the day. Each field team reports back on their days findings and Slavo has an opportunity to check that data sheets have been filled out correctly, with all the necessary information. Slavo also looks at digital photographs taken by the field teams of any animal signs they were unsure about. The difference between wolf and dog tracks sometimes causes confusion.

Today followed a similar pattern to yesterday with four field teams walking different routes. Jamie, Helmut, Leonie and Emily walked a route from Palenizka meadow along a side ridge up to Skalka peak. They managed to collect an impressive six wolf scats. We also found a large number of scats on this ridge last year so it seems to be a popular route for wolves. Bear tracks were also recorded in the forest zone and scats collected in the dwarf pine habitat above the timberline. The blueberry bushes are covered in berries at the moment, which provides an important food source for bears (judging by the colour of their scats) and also a tasty distraction from survey work.

18 August

Today we split into four field teams covering forest tracks in the Lomnista and Vajskovska valleys. This completes the initial survey of this zone before we move further west. I took two of the teams in the Land Rover to their start points in the Lomnista valley. Unfortunately the forest office had given us the wrong gate key and we were unable to open the gate. While I was trying various tools from the Land Rover tool kit that might have provided some solution to the locked gate, Helmut spotted a possible driving route that circumnavigated the gate. Driving across the rocky stream would be no problem but the black muddy hole and steep slope back onto the forestry road on the other side might present more of a challenge. We all carefully walked the route removing rocks and tree branches that were potential Land Rover obstacles. Poking a stick into the boggy bit confirmed that despite looking like it could swallow a vehicle, it did indeed have a solid bottom. All went well until the black hole where the Land Rover came to a halt, wheels spinning. Fortunately straightening the steering to reduce the resistance to forward progress was all that was needed to release us from the mire and get back onto the road. My quest to get the Land Rover stuck continues.

Our collection of wolf and bear scats continues to grow (as does the smell in the basement garage where they are being stored). The scats are first collected in a plastic bag, this bag is then placed in an envelope to which a label is stuck containing all the relevant data such as: type of scat, whole or partial, estimated age, GPS location and altitude. It is wolf scats that have by far the strongest smell and, along with size, this is one of their distinguishing features. The scats will be soaked in water and the contents separated and identified to provide information on the animal's diet. In the case of wolves, the scats contain many bones and hairs which can be identified under the microscope to ascertain the prey species. If wolves are predating the chamois population on the ridge it would be expected to find chamois hair in the scats. At the end of each year's expedition Slavo still has a huge task ahead of him to analyse the scats that we have collected. This year he is lucky to have a research assistant, Michaela from Germany, to help him with this laborious task. Michaela has already made a start processing the scats that we have collected in the last few days. This is also providing an opportunity for the expedition members to see how it's done and help out with this part of the study.

We are hoping that the weather will be good enough this weekend to make our first trip onto the main ridge for chamois observation. Good weather is important as low cloud on the ridge reduces the visibility and makes it impossible to spot the chamois.

22 August

On Saturday morning we loaded up the Land Rover with provisions and equipment for a two night stay on the main study ridge. The drive up to Durkova hut follows a winding forestry track up the side of Lomnista valley before eventually emerging above the tree line. Another opportunity to get some mud on the Land Rover. Once at Durkova those of us not staying in the mountain hut set up tents and then we had an early lunch before setting off in groups of three to search for chamois. Alan, Jamie and Leonie made the first sighting of an adult male near Chabenec. This coincides with the most westerly point where chamois were observed on last year's expedition. Lone animals are, generally speaking, male and can be difficult to spot when they are at some distance from the observer. The technique required is to find a good observation point from which a large area of slope can be seen and to carefully scan the terrain using binoculars. Alan, who was also on the Slovakia expedition last year, is by now an expert spotter able to show other expedition members how it's done. When chamois have been spotted it's time to get comfortable and make observations for a minimum of 30 minutes. Location of the animals is made by recording the location of the observer (GPS), distance away (Rangefinder) and bearing (compass).

The number, sex and age of the chamois is recorded along with climate and habitat details. Behavioural observations are also recorded on the data sheet such as activity patterns, protection behaviour and escape reactions.

Further along the ridge another lone chamois was spotted by Imogen, Fiona and Emily. This animal was about one kilometre away so we used the spotting scope to get a clearer view. Although the equipment we use for observation and data recording is not complicated to use, it often does take some time and experience to become proficient in its use. A good example is using the binoculars: team members with previous experience as birdwatchers can switch between using the naked eye and binoculars, locating the subject immediately. Those unfamiliar with binoculars often have to spend time searching around with the binoculars to find the object they can see by eye. Practice using the equipment definitely makes for more efficient observers. The spotting scope is useful to get a more detailed view of important characteristics such as horn size and shape, which aids identification of age and gender.

Tuesday was our day off. Some of the team went on a train ride to visit an open air museum about agriculture and forestry in Slovakia. Others preferred to relax around base camp. Leonie and Michaela even headed off into the woods armed with scat bags and data sheets (that's keen!). In the evening we had a barbeque and sat around the fire at base camp. After many enquiries we have eventually managed to borrow a guitar. While Helmut played, we sang along to some old favourites. Helmut plays regularly in a band and had brought a songbook with him. We started with Puff the Magic Dragon and finished with Bon Jovi. Great fun! Thanks Helmut! Maybe a guitar should be put on the expedition kit list? Helmut and his brother Johann have also turned out to be talented table football players. We have been holding a table football world cup at the local pub which we occasionally frequent in the evening. Germany beat England and Scotland, but were narrowly defeated by the local Slovakian team.

25 August

Despite a late night everyone was up and ready to get back in the field on Wednesday morning. Half the group went to Struhar valley with Slavo. This is an area used by both wolves and bears that has not been previously surveyed. Myself and the rest of the group drove to the chair lift and took it up to mid-station from where we walked up to Chopok hut on the main study ridge. The purpose of this was to get more data on chamois numbers from the eastern side of the ridge. We arrived at Chopok around lunchtime having seen four marmots on the way. Conditions were not ideal for chamois spotting in the afternoon with low cloud and a strong wind making observation difficult. We did manage to find one group of seven on the northern slope about 30 minutes walk from the hut. This was my first opportunity to spend a night in the hut at Chopok (usually I drive the Land Rover to Durkova hut, while Slavo covers the eastern section). I finally got to try the gulasch and hot wine that I had heard so much about from last year's team members. Definitely worth the walk.

On Thursday morning weather conditions were much better and we split into two teams to search for chamois to the west and north of Chopok. Both teams were successful with a total of 16 animals being observed. We also saw two doe red deer with fawns and Jamie spotted four adders (that probably gives him the expedition 'best snake spotter' award). Late morning we re-grouped back at the hut and tested to see if the coffee still tasted as good as it had at breakfast time. Then we all headed west to check for chamois on the ridge towards Stefanicka. We found another group of four and later a group of ten. The group of ten had three yearling animals but we saw no young (kids) born this year. This is unusual as it would normally be expected that 50% of adult female chamois would have young at this time. Chamois seen in groups are usually females and young, the males are usually solitary.

The implication of seeing no kids is that breeding success or survival of the kids has been very low this year. We had a good day all in all with a total count of 30 chamois. From Stefanicka we headed down the valley and back to the Land Rover. Back at base camp we met up with the others and joined Slavo for a de-brief of the last few day's findings and a preliminary review of the data collected by this first slot of the 2006 expedition. Slavo and Michaela also showed us some of the wolf scats that have already been cleaned and contain hooves of young deer as well as hair from wild boar and red deer.

Friday was the last day for slot one. The drive back to Bratislava took a little longer than normal due to traffic and heavy rain. This is the most rain we have seen this slot - at least it waited until we had finished the field work!

Thanks to all the slot 1 team members for your hard work over the last couple of weeks. We collected 27 bear scats and 16 wolf scats. We made over 80 chamois observations. None of this would have been possible without you. It will take Slavo and Michaela some time to examine all the scats and input all the observation data. After the analysis is complete Slavo will be writing a report of the findings which will be sent out to everyone. Thanks again!

31 August

On Sunday morning we gathered at the Chez David and made the drive to base. There was little traffic and good weather so we made good time. On arrival Michaela and Slavo had set out a nice lunch, after which we started on the introductory and safety briefing. This was followed by Slavo's talk on the scientific aspects of the expedition. With a little spare time Slavo was also able to talk briefly about some of his previous research on wolves and red deer in the area.

Once again we have a diverse group of interests and professions within the group: Reija is from Germany and works in advertising; Georgia is from the UK and starts studying for a zoology degree in October; Dermot is a consultant and his son Liam has another year at school, by complete coincidence they are from the same small town in the UK as Georgia; Victoria is a student of animal management in the UK and this expedition will comprise part of her work experience; Michaela is a medical technician from the UK; Marc is an economics student from Luxembourg; Audrey is an attorney from Florida; Igor is a journalist from Russia for National Geographic Traveller magazine.

Monday was a nice day so we carried out equipment instruction outdoors. Then came the all important navigation session with instruction in the use of map, compass and GPS. After a short break Slavo went through the data sheets and scat collection. After lunch we went out to walk some of the nearby forest trails in the hope of finding some scats and tracks to practice on. Unfortunately we found only pine marten, red deer and fox scats. We are only interested in collecting the scats of the large predators: wolf, bear & lynx. These scats are then analysed to determine the diet of the predator and specifically to determine if the endangered chamois constitutes part of that diet.

Tuesday morning we woke to heavy rain and cloud. Slavo had three routes through forest, dwarf pine and alpine meadow habitats that needed surveying for large predator signs. The conditions were far from ideal for collecting field data, but everyone was eager to get out into the field so with waterproofs on we headed out. Despite the soaking everyone enjoyed being out and some useful field data was collected in the form of four bear scats. Other sightings included fire salamanders, black woodpecker and golden eagle. Igor collected some edible fungi which he cooked up with potatoes back at base. Demonstrating faith in his identification skills some of us sampled the fare and quickly cleaned the plate.

On Wednesday the weather was much improved. We split into four teams. Two teams surveyed forest habitat in the far west of the study area and the other two teams, forest and alpine habitats, in the east. Dermot and Liam found the first wolf scats collected by slot 2. These were above tree line on a side ridge leading up towards the main ridge. The wolf scats were quite old, probably left during the winter, and comprised mainly hair and sizeable pieces of bone. These scats were collected quite close to chamois habitat, so analysis will be important to determine if they contain chamois remains. The other survey teams found bear tracks and scats both in forest and higher up in alpine habitat.

On Thursday we had planned our first visit to the ridge to make chamois observations. Unfortunately we were defeated by the weather which was wet and cloudy. We need good conditions, at least clear visibility, to observe the chamois. Hopefully conditions will improve tomorrow, it is important that we collect more chamois data to verify population size and reproductive success. Igor left today - he had to return to Moscow for work. His cheerful demeanour will be much missed by the rest of us, not to mention his fried mushrooms.

7 September

Friday was again poor weather with more rain forecast for Saturday. We decided to spend today surveying more trails in the forest zone. We moved our day off forward to Saturday so that we could head up to the ridge on Sunday. On our day off we drove to Banksa Bystrica to spend a few hours in the old part of the town which has a nice square and old buildings. Afterwards we went to the supermarket to stock up on food and beverages for a barbeque in the evening. The fine art of delegation ensured the smooth running of the evening's activities. Michaela was bar manager with Marc her underling bar tender. Dermot, Vicki, Georgia & Reija prepared salads. Audrey made a punch. Liam was the Crazy Fire Starter and easily won the race against his Dad to start the fire using only a flint and steel. They did cheat a bit by using cotton wool as tinder rather than the more traditional birch bark. No guitar players this time, so we entertained ourselves with lateral thinking puzzles: "man wakes up in front of the TV, goes up the stairs, turns the light on, shoots himself" What happened? Yes or No answers only. For anyone who still hasn't figured out how to play the bone game, here is a final clue: "OK, I can play the bone game, the bone game, the ……"

Back to business on Sunday and up to the main ridge for chamois observation. We split into two groups. Reija, Michaela, Dermot, Liama, Michaela & Slavo went up to Chopok hut towards the eastern end of the ridge. I drove up to Durkova with Vicki, Georgia, Audrey and Marc. In the morning it was misty on the ridge so we waited until after lunch before heading out from the hut. In the afternoon we (Durkova crew) observed a group of two female chamois and also a lone male on the western side of Chabenec peak. This is probably the most westerly record we have for chamois on the ridge. On our way back towards the hut, Marc startled the male chamois which had moved up onto the ridge. It ran off to about 15 metres away and we had good views of it during the moments when the mist cleared. The next morning conditions were not good, low cloud covered the ridge. We stayed in the hut until mid-day playing cards (only discovering this morning that Marc's deck of cards, which we were also using last night, was 11 cards short of a full deck). In the afternoon we headed out, despite very strong winds, and relocated the three animals we had seen the day before. Further along the ridge on the trail to Skalka peak we were able to observe another six chamois; females and one yearling. The Chopok crew also had good luck today and a total of 43 chamois were observed. Tuesday was also very windy and cold on the main ridge. The Durkova crew made more observations of the chamois group on the Skalka saddle and the Chopok crew were able to relocate the large group they had recorded yesterday near Derese. Some useful data have been collected over the last few days regarding numbers and distribution of chamois. Still worrying is the very low numbers of young kids that have been observed. Perhaps next year will be more productive for the chamois?

9 September

Wednesday and Thursday were spent back in the forest zone surveying some tracks and areas not previously visited. The forest survey has covered a large area. Made possible of course only by dedicated team members. During this second slot of the expedition a total of 32 bear scats and eight wolf scats were collected. Once again it has not been possible to collect any lynx scats (the lynx usually buries its scat like a domestic cat does). All three of these large predator species have been recorded in other areas preying on chamois. In our own study area there is some evidence, although not recent, of wolf predation on chamois: an observation on the ridge of two wolves hunting chamois, remains of one chamois killed by wolves, chamois remains in two wolf scats collected by Slavo. In total 59 bear scats and 22 wolf scats were collected this year. These scats have already been cleaned (the contents are broken apart in water) and dried. On Friday, our last day, Slavo showed us some of the dried samples. Initial examination shows that bear diet is largely blueberries at this time of year, wolf scats contain mainly remains from red deer and wild boar. The samples now need to examined under a microscope to carefully check if any contain direct evidence of chamois predation. Although this year's expedition has come to an end, there is still plenty of work ahead for Slavo and Michaela examining the samples, analysing the data and publishing the report.

A total of 44 data sheets were completed for chamois observations during this year's expedition (one data sheet corresponds to an observation of a group or single chamois). A cursory examination of this data suggests, as was true for the previous year, that the majority of chamois and largest groups are found in the eastern section of the survey area. This corresponds to the area with most cliffs and rugged rocky habitat. It is also the zone most used by tourists and hikers. It is likely that proximity to cliffs is important to chamois in the Tatry mountains where wolf predation is a threat. It is difficult for wolves to hunt chamois in this rugged terrain, in the less severe alpine meadows of the western ridge section chamois could be easy prey. In the Alps, where wolves are not present in significant numbers, chamois regularly use open meadows and even forest habitats around the tree line as feeding areas. The chamois in our study area may also be taking advantage of the presence of humans to avoid large predators. Nearly all the wolf scats we have collected have been from areas least used by humans. The wolves probably avoid the more heavily utilised areas in the eastern section. Our chamois observations would seem to suggest that the population is at best stable, but probably not increasing. Small isolated animal populations are known to be vulnerable to extinction and we can only hope that our Low Tatry chamois population will be sustainable in the future. As is often the case with ecological studies, the research is starting to provide answers to some of our questions but bringing up a lot of new ones.

Thursday night was our last at base camp and our final visit to the garage pub. After another table football marathon we headed back to Baileys, beer, backgammon and banter. Friday morning we packed up the kit, said our farewells to Slavo & Michaela, then made the drive back to Bratislava. For me the Slovakia expedition has once again been a great experience and I think we have successfully achieved our goals of safety, science and satisfaction. I would like to thank all the expedition members for the hard work you have put in over the last four weeks. It was a privilege to meet and share this time with you. Also thanks for all the feedback we have received both on the forms and through our varied discussions over the last few days. We do give serious consideration to all your comments and it will help us make improvements to the expedition for coming years. Slavo will be busy over the next few months analysing the data and preparing the research report. Everyone will be sent a copy. None of it would have been possible without you. Thanks again!

Paul Franklin
Expedition leader