

## **Lynx in the Austrian Alps 2000 to 2004**

Ris v Avstrijskih Alpah v obdobju 2000–2004

J. LAASS<sup>1</sup>, Ch. FUXJÄGER<sup>2</sup>, T. HUBER<sup>3</sup>, N. GERSTL<sup>4</sup>

<sup>1</sup>Department of wildlife biology and game management, University of natural resources and applied life sciences, Peter-Jordan-Str. 76, 1190 Vienna, Austria; e-mail: jens.laass@boku.ac.at

<sup>2</sup>Nationalpark OÖ. Kalkalpen, Nationalpark Allee 1, 4591 Molln, Austria

<sup>3</sup>Tassach 13, 9542 Afritz, Austria

<sup>4</sup>WWF Austria, Ottakringer Str. 114–116, 1160 Vienna, Austria

**Abstract.** Based on reports submitted mostly by hunters and from monitoring activities in the national park Kalkalpen we tried to evaluate the status and the distribution of the lynx in the Austrian Alps for the period 2000 to 2004. Reports on lynx presence have been collected by the hunters associations of Styria, Carinthia, Upper Austria and Vorarlberg, by the national park Kalkalpen and by the department of wildlife biology and game management at the University of natural resources and applied life sciences. For the period 2000 to 2004 225 reports on lynx have been documented for the Austrian Alps. 116 of these were classified as category 3 data, 103 reports on prey-remains and tracks have been confirmed by trained people and classified as category 2 data and six reports concerned hard-facts (C1). All hard facts and all verified records originate from two distinct areas – national park Kalkalpen and the Niedere Tauern mountain range. Other areas with lynx reports are the Northeastern Limestone Alps, northwestern Carinthia and Vorarlberg. Based on the available data we can not determine the actual distribution of the lynx in Austrian Alps or the status of the species in the region. Monitoring efforts by hunters and foresters in the Niedere Tauern mountain range has yielded good data on the local situation of lynx. This has to serve as a model for the future development of the monitoring system in Austria.

**Keywords:** *Lynx lynx*, Alps, Austria, monitoring, distribution

## **Introduction**

Although Austria features an intensively used landscape, the country is densely forested. Currently about 47 percent of Austria is covered by forests (SCHADAUER 2004). Forest cover is even higher in the Alpine regions. Austria also features high densities of the most important prey species for the lynx: in 2003/2004 hunters in Austria shot 285.114 roe deer, 46.949 red deer and 26.185 chamois (STATISTIK AUSTRIA 2004, MOLINARI-JOBIN & al. 2000). Considering this, Austria should provide good habitat for the lynx. After being extirpated during the second half of the 19<sup>th</sup> century (EIBERLE 1972), lynx were re-introduced into the Austrian Alps in 1976–1979 (FESTETICS & al. 1980). The released animals scattered rapidly. Although reproduction has been documented, there was no indication that a viable core population developed in the following years (GOSSOW & HONSIG-ERLENBURG 1986). Since then, lynx presence has continuously been reported from large areas of central Austria, especially from

western parts of Styria and most of Carinthia. Following the intensive monitoring of the released lynx, monitoring in the Austrian Alps mostly depended and still depends on unsolicited reports by hunters. Since the early 1990s these reports have been scattered over a vast area, giving indication on the presence of a few solitary individuals roaming in central Austria (HUBER & KACZENSKY 1998, HUBER & al. 2001).

We describe the current situation of the lynx in the Austrian Alps based on reports on lynx presence documented between 2000 and 2004.

## Methods

Data collection on the status and the distribution of the lynx in the Austrian Alps depends for most areas on the collection of unsolicited reports on the presence of the lynx by the provincial hunters associations. Hunters have been asked to report all signs of lynx presence. To increase interest and knowledge on the species – a number of articles have been published in hunting magazines, and training courses on the identification of carnivore signs of presence have been held in some areas. Most of the collected reports have not been re-examined in the field by people with detailed knowledge on the species, due to organisational difficulties and especially lack of funding. A later confirmation often proved difficult as many reports were poorly documented.

There are two major exceptions from the above described situation. One exception is the province of Upper Austria where the provincial hunters association is paying their members € 72 for reports on ungulates killed by lynx. Reports have to be documented by pictures of the kill and confirmed by a person trained in the identification of lynx kills. Since the start of the program a number of training sessions have been held to train hunters in the identification of signs of carnivore presence. The other exception is the national park Kalkalpen in Upper Austria, where a monitoring scheme has been installed. The monitoring consists of systematic snow-tracking surveys, installation of camera traps and a systematic collection of reports from hunters, foresters and locals.

Compensation for large carnivore damage on livestock is regulated separately for each species and each province. In the provinces of Carinthia, Styria and Lower Austria damage caused by lynx is compensated by an insurance maintained by the respective hunters association. For the other provinces no compensation system has been established, but there are a variety of funds available to provide compensation payment for livestock losses. All claims for compensation have to be examined by people trained in the identification of carnivore signs.

All documented reports on lynx presence in the Austrian Alps have been collected on a yearly base by the authors to ensure equal data interpretation and to provide status reports for the Austrian Alps across the provinces.

For the present report we analysed reports on the presence of lynx for the years 2000 to 2004 from all organisations, which to our knowledge, collect such data. We classified all records on lynx presence according to SCALP-criteria as published by MOLINARI-JOBIN & al. (2003). We distinguished three levels of reliability according to the possibility to verify the report. Category 1 (C1) data represent “hard facts” such as lynx found dead, lynx captured, or pictures of lynx taken by camera-traps set by known people. We added scats, identified using DNA techniques, or hair analysis to this category as we believe that they provide very reliable data. Category 2 (C2) represent wildlife or livestock kills as well as tracks and scats confirmed by a person with profound knowledge on the lynx. Category 3 (C3) represent prey remains and other indirect signs of lynx presence not verified by someone trained in the identification of such signs. Additionally this category includes observations and vocalisations, as they can not be verified retrospectively. Reports that did not seem plausible were rejected from the dataset when we re-examined all records for the analysis.

## Results

For the period January 2000 to December 2004, we were able to document 225 records of lynx presence for the Austrian Alps. 51.5% (116) of these records were classified as category 3 data (Tab. 1), signs of lynx presence that could not be confirmed but seemed plausible. In contrast to previous years we could also document a number of verified records. 103 reports on prey-remains and tracks have been confirmed by trained people and classified as category 2 data. Six records from this five-year period concerned hard-facts (C1). In 2002 fragments of a lynx skeleton were found near the border of Eastern Tyrol and Carinthia. No indication on the cause of death could be determined as only bones of the frontal extremity were found. In 2000 and 2001 a camera-trap, installed in the national park Kalkalpen, took pictures of a lynx with large spots. Although the two pictures were once from the left and once from the right side of the lynx, additional photos recently taken confirm that all pictures show the same individual. Video footage taken in the same region early 2005 did not yield enough details for individual identification of the taped lynx. Finally three scats were analysed using hair identification techniques and identified as lynx scats. One scat was found in 2002 in the Northern Limestone Alps west of national park Kalkalpen. The other two were found in Central Austria in the Niedere Tauern mountain range.

Tab.1: Number of records collected on the presence of lynx in the Austrian Alps, categorised into the three SCALP classes of data classification.

Data category	1995–1999	2000–2004
<b>CATEGORY 1</b>		
lynx found dead	1	1
capture	–	–
camera-trap pictures	–	2
analysed scats	–	3
<b>TOTAL</b>	<b>1</b>	<b>6</b>
<b>CATEGORY 2</b>		
prey remains	7	56
tracks	5	48
<b>TOTAL</b>	<b>12</b>	<b>104</b>
<b>CATEGORY 3</b>		
prey remains	55	56
tracks	35	23
sightings	34	31
vocalisations	–	4
markings	–	1
<b>TOTAL</b>	<b>124</b>	<b>115</b>
<b>TOTAL</b>	<b>137</b>	<b>225</b>

Although the number of lynx records did almost double from the previous reporting period (1995–1999: 137; 2000–2004: 225), the area of distribution of the records did shrink. Confirmed records (C1 and C2) were found concentrated in two areas (Fig. 1). One of these areas is around the national park Kalkalpen in the northern limestone Alps of Upper Austria. The second area is the Niedere Tauern mountain range in Styria. Unconfirmed records are distributed over greater area, with reports also coming from the eastern edge of the northern Limestone Alps and the Fischbacher Alpen, both in Styria, as well as from the north-western part of Carinthia. Reports on lynx presence have also been given from Vorarlberg – the western most province of Austria bordering Switzerland and Liechtenstein. Following the first reports from Vorarlberg a training session on the identification of lynx signs has been held. The trained hunters have not been able to confirm any of the numerous

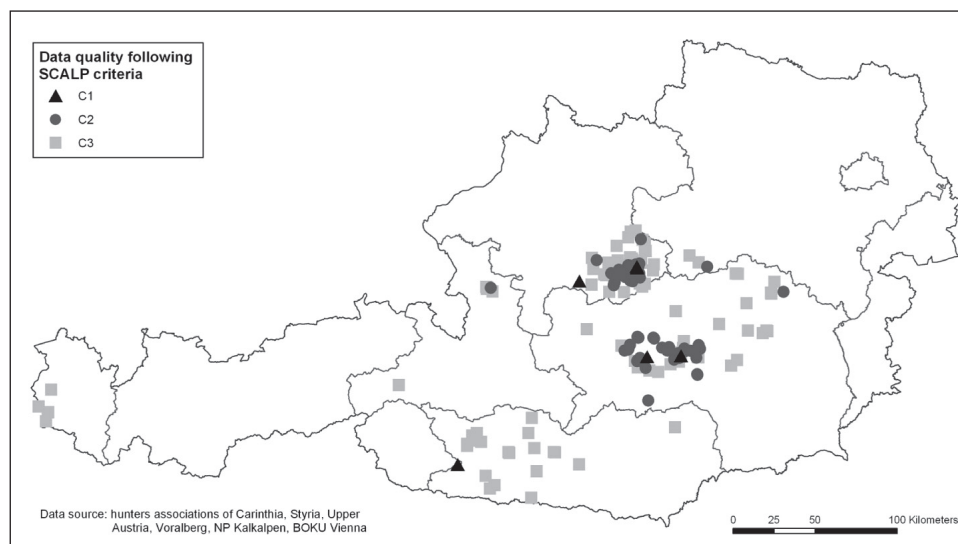


Fig.1: Distribution of records on signs of lynx presence in the Austrian Alps for the period 2000–2004.

reports on the presence of the large cat. Single plausible reports on the presence of lynx continue to come from the Osterhorn range near the city of Salzburg.

For the whole period 2000–2004, we know of 15 reports concerning depredation on livestock. Unfortunately no one experienced in the identification and handling of livestock depredation investigated the incidents in the fields, nor was good photographic documentation available. Therefore eight of these incidents had to be classified as attacks by canids or could not be evaluated in any way due to missing documentation.

For the whole period 2000–2004 we did not receive any plausible reports on reproduction in the Austrian Alps.

Between 2001 and 2004 24 reports on found roe deer remains have been filed by hunters from alpine region of Upper Austria in order to receive 72€ for reporting lynx kills from the local hunters association. When analysing the well documented reports for this paper, we found, that ten of the documented roe deer kills were most probably caused by dogs. Based on the given information the other 14 reports documented lynx kills.

## Discussion

For the period 1994–1999 reports on lynx presence have been scattered over a large area of the Austrian Alps, but there have been only very few confirmed records (HUBER & al. 2001). The authors concluded that there was no evidence for an established lynx population in Austria. The scattered signs of lynx presence were thought to give evidence for a few solitary individuals only. For this reporting period (2000–2004), the number of documented signs of lynx presence has increased, but a great proportion of the reports were clustered in two areas. From the temporal and spatial distribution of the signs we conclude that more than one lynx can be found in both of these areas – the Niedere Tauern and the area including the national park Kalkalpen. Outside of these two regions there are lots of rumours on lynx presence but there are very few documented records on prey items or tracks. There are some reports from the north-eastern Limestone Alps, and western parts of Carinthia, due to delayed reporting and a

lack of funding we have not been able to either confirm the reports personally or initiate a network of local contacts well trained in the identification of signs of lynx presence. Because of the low number of reports and the fact that there are no confirmed records we can not confirm the presence of lynx in these areas. A similar situation can be found in Vorarlberg, along the border towards Switzerland. A year after the first releases of lynx in the re-introduction program for north-eastern Switzerland (RYSER & al. 2004), reports on lynx sightings and kills emerged in Vorarlberg. A training session on the identification of lynx kills and tracks was held in cooperation of the local hunting association. Reports on sightings, vocalisations, tracks and even found prey-remains continued to arise, but even though a small proportion of the few documented observations sound plausible, none has been confirmed yet. Rumours on the presence of the large cat can be heard from many areas of the Austrian Alps, but there are few documented, plausible reports. Even from some areas of known lynx presence, for example the northern Limestone Alps – there are very few signs reported by the local hunters. Austrian hunters do not seem too interested in the lynx or in reporting signs of lynx presence. Even the program initiated by the hunters association of Upper Austria had only moderate success in getting 14 reports on lynx kills in three year. At least two lynx have been confirmed in the area for this period. Still we are convinced that lynx monitoring can only be established in close cooperation with the local hunters. The Austrian hunting system is based on hunting territories of rather small size without any system of professional game wardens. But the lynx is under the jurisdiction of the hunting law in most of the provinces – giving the hunters the legal responsibility for the species. There are many hunters that do know a lot about the lynx. The data on the lynx in the Niedere Tauern mountain range would not have been available without the knowledge and the activities of the local hunters. Based on the commitment of these hunters and the activities in the national park Kalkalpen the quality as well as the quantity of the reports has improved when compared to the previous reporting period (Tab. 1 and Fig. 2). Most of the improvement is due to the activity of single persons or local organisations and has been concentrated on two rather limited areas. For the rest of the Austrian Alps monitoring still

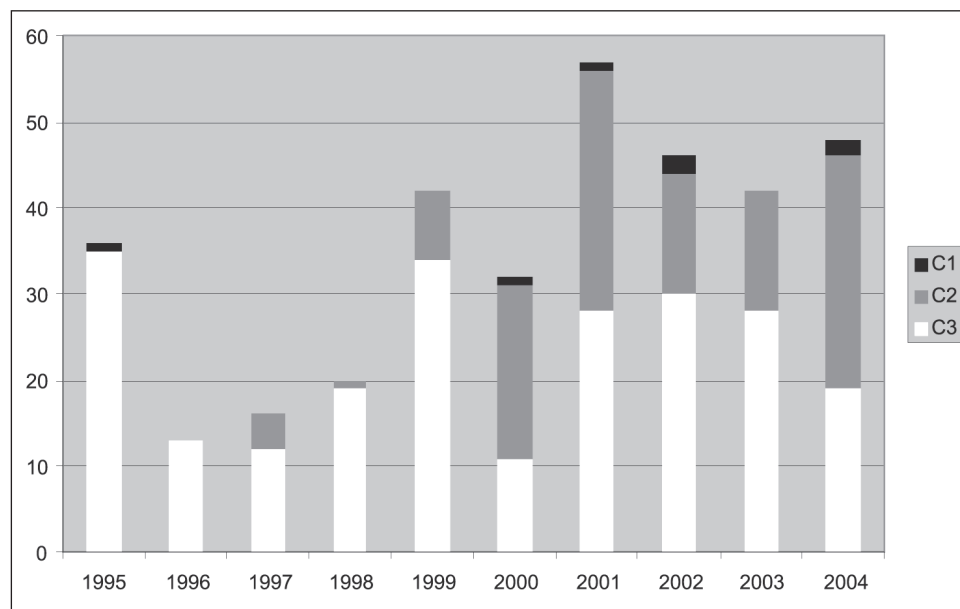


Fig. 2: Trend in numbers of reported signs of lynx presence from the Austrian Alps 1995-2004. Reports are categorised according to the SCALP classes of data classification.

depends on voluntary reports by the public and especially by hunters, data quality and quantity has not improved. As we are missing valuable local contacts and consequently good data on large areas of potential range in the Austrian Alps – we feel unable to evaluate the actual distribution of the lynx in the Austrian Alps, much less to evaluate population size and trend. For the period of 2000 to 2004 the documented reports give no indication for a viable population of lynx in the Austrian Alps, but we cannot judge whether there are more of the secretive cats around, than we know.

Based on the restraints faced in Austria, HUBER & LAASS (2005) tried to develop a scheme to determine the situation of the lynx considering the favourable conservation status as determined by the Habitats-Directive of the European Union (92/43/EWG). Member states of the European Union are committed to report the status to the European Commission by 2007. Based on the currently available data, we do not feel able to provide a well founded evaluation of the status of the lynx at the time being.

Besides the lynx occurrence in the Alps, lynx can be found in northern parts of Austria, as lynx from the Bohemian-Forest population have spread into Austria. After a peak in the late 1990s, the Austrian part of the population is now considered stable on a low level (LAASS & ENGLEDER 2005, ENGLEDER pers. comm.). The monitoring in this area mostly depends on reports by hunters, but a local environmental group has created a network of personal contacts. Closely attending this network of personal contacts needs a lot of effort, but yields much more meaningful data than unsolicited reports. We think that without a system of personal contacts among the local hunters for most parts of the Austrian Alps, we will not be able to evaluate the conservation status of the lynx. Setting up such a network and continually attending to it needs funding and can not be done on a voluntary base only as the monitoring has been done up to now in the Austrian Alps.

### Acknowledgements

This report is based on reports of lynx presence collected and submitted by the hunter's associations of Upper Austria, Styria, Carinthia, Vorarlberg and Salzburg, and the national park Kalkalpen. We are thankful for every effort taken to examine reports and confirm signs of lynx presence. Financial and logistical support was granted by WWF Austria, the national park Kalkalpen and the University of Natural Resources and Applied Life Sciences. We thank A. Molinari-Jobin and P. Molinari for beneficial reviews.

### Zusammenfassung

Seit der Wiederansiedlung 1976–1979 in der westlichen Steiermark wurden Luchse in weiten Bereichen der österreichischen Alpen nachgewiesen. Aufgrund der Verteilung der Nachweise mußte davon ausgegangen werden, dass es sich eher um verstreute Einzeltiere handelte als um eine lebensfähige Population. Um den aktuellen Zustand des Luchsbestands in den österreichischen Alpen zu beurteilen, haben wir die Qualität und die Verteilung der Hinweise auf die Anwesenheit von Luchsen analysiert. Die Luchsnachweise wurden von den Jägerschaften der Bundesländer Steiermark, Kärnten, Oberösterreich und Vorarlberg, vom Nationalpark Kalkalpen bzw. vom Institut für Wildbiologie und Jagdwirtschaft der BOKU Wien gesammelt und zur Verfügung gestellt. Für die Periode 2000–2004 wurden im österreichischen Alpenraum 225 (C1: 6; C2: 104; C3 115) Hinweise dokumentiert. Die Qualität und Quantität der Nachweise hat sich somit seit der letzten fünf Jahre wesentlich verbessert (127 Nachweise, C1: 1; C2: 12; C3: 124). Allerdings stammen alle gesicherten Nachweise (C1 und C2) aus der Region des Nationalparks Kalkalpen beziehungsweise aus den Niederen Tauern. In beiden Regionen konnte durch die Aktivität von lokalen Kontaktpersonen das Luchs-Monitoring wesentlich verbessert werden. Weitere Meldungen über die Anwesenheit von Luchsen kommen aus der nördlichen

Steiermark, aus den westlichen Bereichen Kärntens, sowie aus dem Grenzgebiet zwischen Vorarlberg und der Schweiz. Leider konnten die meisten dieser Meldungen nicht überprüft werden. Aufgrund der Verteilung und der Qualität der vorliegenden Nachweise ist es nicht möglich die tatsächliche Verbreitung des Luchses zu beurteilen. Aussagen zur Populationsgrösse oder –trends wären Spekulation. Aus vielen Regionen der österreichischen Alpen werden Gerüchte über die Anwesenheit des Luchses bekannt, leider fehlen bislang bestätigte Meldungen. Daher sehen wir den Aufbau eines Netzwerks an lokalen Kontakten sowie die Etablierung eines zentralen Koordinators als essentiell an, um den Status des Luchses in Österreich ausreichend beurteilen zu können.

## References

- BREITENMOSER, U. 1998: Recovery of the Alpine lynx population: Conclusions from the first SCALP report. Council of Europe, Environmental encounters **38**: 135–144.
- EIBERLE, K. 1972: Lebensweise und Bedeutung des Luchses in der Kulturlandschaft. Mammalia depicta **8**: 1–65. (in German)
- FESTETICS, A., F.C. VON BERG, & M. SOMMERLATTE 1980: Die Wiedereinbürgerung des Luchses in Österreich. – Ein Forschungs- und Artenschutzprojekt. In: FESTETICS, A. (ed.): Der Luchs in Europa. Kilda Verlag, Greven: 268–284. (in German)
- GOSSOW, H. & P. HONSIG-ERLENBURG 1986: Management problems with the re-introduced lynx in Austria. Proc. Intern. Symp. “Cats of the World”. Nat. Wildl. Fed. Washington D.C., 77–83.
- HUBER, T. & P. KACZENSKY 1998: The situation of the lynx (*Lynx lynx*) in Austria. Hystrix, **10**(1): 43–54.
- HUBER, T., J. LAASS & T. ENGLEDER 2001: Present knowledge on the distribution of the lynx (*Lynx lynx*) in Austria. Hystrix **12** (2): 31–37.
- HUBER, T. & J. LAASS 2005: Luchs (*Lynx lynx*). In: ELLMAUER, T.: Entwicklung von Kriterien, Indikatoren und Schwellenwerten zur Beurteilung des Erhaltungszustandes der Natura 2000-Schutzgüter. Arten des Anhang II der Fauna-Flora-Habitat-Richtlinie., 2, 166–179; Umweltbundesamt GmbH, Wien (in German).
- LAASS, J. & T. ENGLEDER 2005: Der Luchs in Österreich. Zur aktuellen Situation. Natur & Land **91**: 28–30. (in German)
- MOLINARI-JOBIN A., P. MOLINARI & U. BREITENMOSER 2000: Prey spectrum, prey preference and consumption rates of Eurasian lynx in the Swiss Jura Mountains. Acta Theriologica **45**(2): 243–252.
- MOLINARI-JOBIN A., P. MOLINARI, C. BREITENMOSER-WÜRSTEN, M. WOELFL, C. STANISA, M. FASEL, P. STAHL, J.M. VANDEL, L. ROTELLI, P. KACZENSKY, T. HUBER, M. ADAMIC, I. KOREN & U. BREITENMOSER 2003: Pan-Alpine Conservation Strategy for the Lynx. Nature and environment **130**, Council of Europe Publishing: 20 pp.
- RYSER, A., K. VON WATTENWYL, M.P. RYSER-DEGIORGIS, Ch. WILLISCH, F. ZIMMERMANN & U. BREITENMOSER 2004: Luchsumsiedlung Nordostschweiz 2001 – 2003, Schlussbericht Modul Luchs des Projektes LUNO. KORA Bericht **22d**, Bern, Schweiz, 60pp. (in German).
- SCHADAUER K. 2004: Die österreichische Waldinventur 2000/02 – Vielfältige Information aus erster Hand. BFW-Praxisinformation, Wien, (3): 3 (in German).
- STATISTIK AUSTRIA 2004: Statistisches Jahrbuch Österreichs 2004 – Statistical Yearbook 2005 Austria. Statistik Austria, Wien, 620pp. Fig.1: Distribution of records on signs of lynx presence in the Austrian Alps for the period 2000–2004.