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Eurasian lynx (*Lynx lynx*) in the Austrian Alps in period 2005–2009

Evrazijski ris (*Lynx lynx*) v avstrijskih Alpah v obdobju 2005 do 2009

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Abstract: To assess the status of Eurasian lynx (*Lynx lynx*) in the Austrian Alps we evaluated signs of lynx presence collected from 2005 to 2009. The spatial distribution and the number of records collected (228 versus 225) remained stable compared to the 5-year period 2000–2004. The distribution of the signs of presence showed three clusters: (1) the clearest in Upper Austria (Kalkalpen National Park), (2) in Styria (Niedere Tauern), and (3) in southern Carinthia (Carnic Alps). From other regions, only isolated or unverified records are reported. In fact, based on an analysis of the spatial and temporal distribution of the information we conclude that there is no population established, presumably even reproductive units are lacking. Instead, the scattered observations rather indicate the presence of single individuals only.

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

Izvleček: Za oceno stanja populacije evrazijskega risa (*Lynx lynx*) v avstrijskih Alpah smo ocenili podatke o znakih prisotnosti risa, zbrane od leta 2005 do 2009. Prostorska razporeditev in število zbranih podatkov je ostalo nespremenjeno v primerjavi s predhodnim petletnim obdobjem 2000–2004 (228 v primerjavi s 225). Razporeditev znakov prisotnosti risa kaže na zgostitve v treh območjih: (1) najbolj očitne zgostitve v Zgornji Avstriji (Narodni park Kalkalpen), (2) na Štajerskem (Nizke Ture) in (3) na južnem Koroškem (Karnijske Alpe). Iz drugih regij, so poročali le posameznih ali nepreverjenih znakih. Na osnovi prostorske in časovne analize porazdelitve podatkov o znakih prisotnosti risa sklepamo, da na teh območjih ni vzpostavljene populacije, verjetno so odsotna tudi razmnoževalna jedra. Sporadična opažanja verjetno kažejo le na pojavljanje posameznih živali.

Ključne besede: Alpe, Avstrija, distribucija, *Lynx lynx*, status, ris

Introduction

In the Austrian Alps all larger, contiguous forest areas can in principle be regarded as suitable lynx habitat. In the eastern part of the Austrian Alps mountain peaks are rather low and rarely reach an altitude of 3000 m and forest cover is high. Even compared to all the Alps this area represents one of the most suitable and most extensive habitats for the lynx.

The origin of the lynx can be attributed to several sources. In the years 1977–1979, a total of nine lynx were reintroduced in the Turrach region (Styria). Furthermore, some lynx are assumed to

have immigrated from the then rapidly growing Slovenian population since the end of the 1980s. Rumors about clandestine releases and escaped zoo animals could not be verified. Whether lynx from the Bohemian population have already crossed the Danube and immigrated into the Alps has not been proven yet.

In the frame of SCALP (Status and Conservation of the Alpine Lynx Population, Molinari-Jobin et al. 2010), each Alpine country updates the status and distribution of lynx in the respective territory in a five-year interval. The first status reports for Austria summarized the data from the reintroductions until 1995 (Huber and Kaczensky 1998). The data from 1995 to 1999 were analysed by Huber et al. (2001), and those from 2000 to 2004 by Laass et al. (2006). Here, we give an overview on the development of the status and distribution of lynx in Austria summarizing data from 2005 to 2009.

Methods

The monitoring of lynx in the Austrian Alps consisted of a passive collection of reports on lynx observations and indirect signs of presence. The information is collected by the regional hunting associations and local institutions (e.g. IWJ University of Natural Resources and Applied Life Sciences Vienna, Kalkalpen National Park, Nature Centre Bruck/Mur). Until 2007, the data was collected and evaluated at the IWJ, thereafter the examination of the data was privately organized.

Additionally, the Kalkalpen National Park (Upper Austria) organized a systematic monitoring within the Park boundaries using camera traps and effectuating transects in winter. A minimum of six camera trap stations were active year-round, covering an area of 200 km^2, and seven transects (60 km) were covered simultaneously searching for lynx tracks. All signs of presence are evaluated based on their reliability. The classification was jointly developed by lynx experts from the Alpine countries (Molinari-Jobin et al. 2012):

C1: Confirmed "hard facts", verified and undisputable records of lynx presence such as (1) dead lynx, (2) captured lynx, (3) good-quality and geo-referenced lynx photos (e.g., from camera traps), and (4) samples (e.g. excrements, hair) attributed to lynx by means of scientifically reliable analyses.

C2: Records confirmed by a lynx expert (e.g. trained member of the network) such as (1) killed livestock or (2) wild prey, and (3) lynx tracks or other assessable field signs.

C3: Unconfirmed observations (kills, tracks, other field signs too old or badly documented, where however the description conforms to a lynx sign) and all observations such as sightings and calls which by their nature cannot be verified. 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 2005 to December 2009, we were able to collect 228 records of lynx presence in the Austrian Alps. Sixty-one percent (140) of these records were classified as C3 data, signs of lynx presence (Table 1). Fifty-six reports (25%) of trained members of the network on prey-remains and tracks were classified as C2 data, 4 of the kills concerned livestock depredation events (1 killed sheep, 1 goat and 2 fallow deer). Additionally, 32 (14%) camera track photos represented hard-facts (C1). During this five-year period no lynx carcass was recovered and no signs of reproduction were reported, as well. Rumours about lynx that escaped from enclosures were reported from Upper Austria and Salzburg, but could not be verified.

The spatial distribution (Fig. 1) and the number of records collected remained stable compared to the 5-year period 2000–2004 (228 versus 225, Table 2). However, the number of C1 data collected increased five-fold while only half as many C2 data were collected. Half of all the records and 85% of C1 and C2 records were collected in and around the Kalkalpen National Park. With the exception of two photos all lynx photos were taken within the National Park Kalkalpen and show the same individual that was photographed the first time in 2000 in the Kalkalpen National Park (Laass et al. 2006). In 2009, two other lynx were photographed in the Pinzgau and in the Tennengau (Salzburg), respectively by two different hunters (Fig. 1). From the Salzburg region no other signs

DATA CATEGORY		2005	2006	2007	2008	2009	SUM
C1	cam.-trap photo	1	6	14	2	9	32
	TOTAL	1	6	14	2	9	32
C2	prey remains	5	4	5		3	17
	tracks	9	7	15	3	5	39
	TOTAL	14	11	20	3	8	56
C3	prey remains	15	13	9	11	5	53
	tracks	6	3	3	2	9	23
	sightings	4	10	18	12	14	58
	vocalisations		2	1	1		4
	markings	1					1
	hair				1		1
	TOTAL	26	28	31	27	28	140
TOTAL		41	45	65	32	45	228

Table 1: Number of data of lynx presence recorded in the Austrian Alps in period 2005–2009 by different SCALP categories.
Tabela 1: Število znakov prisotnosti risa zbranih v avstrijskih Alpah v obdobju 2005 do 2009 po različnih SCALP kategorijah.

DATA CATEGORY		1995-1999	2000-2004	2005-2009
C1	dead lynx	1	1	
	cam.-trap photo		2	32
	analysed scats		3	
	TOTAL	1	6	32
C2	prey remains	7	56	17
	tracks	5	48	39
	TOTAL	12	104	56
C3	prey remains	55	56	53
	tracks	35	23	23
	sightings	34	31	58
	vocalisations		4	4
	markings		1	1
	hair			1
	TOTAL	124	115	140
TOTAL		137	225	228

Table 2: Number of data of lynx presence recorded in the Austrian Alps by different SCALP categories compared by pentads since 1995.
Tabela 2: Število znakov prisotnosti risa zbranih v avstrijskih Alpah po različnih SCALP kategorijah po petletjih od leta 1995.

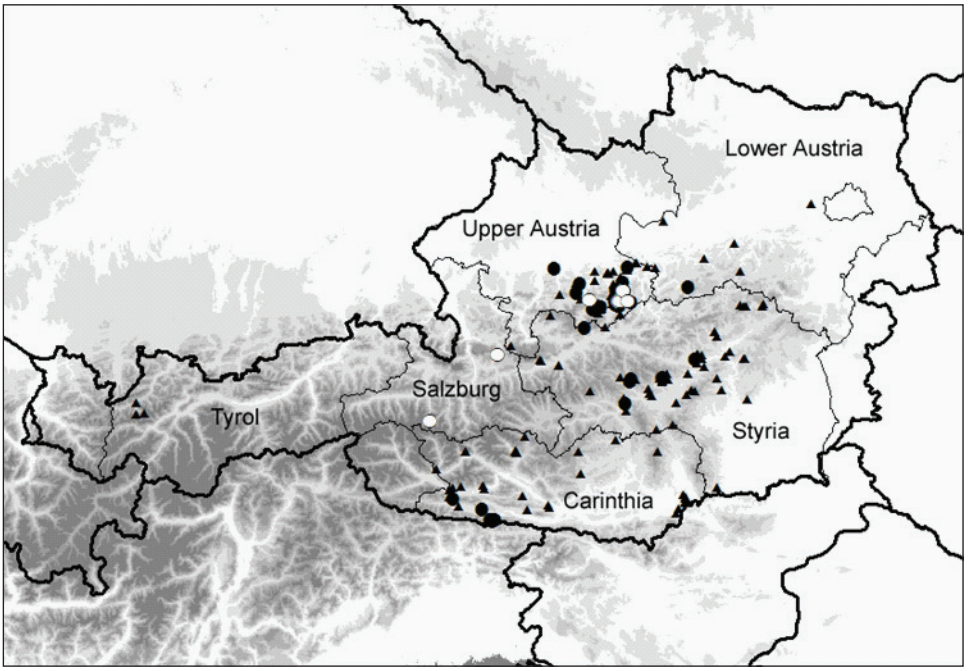

Figure 1: Distribution of lynx signs of presence in the Austrian Alps for the five-year period 2005–2009 (white points = confirmed hard fact data C1; black points = confirmed data C2; black triangles = unconfirmed data C3).

Slika 1: Razporeditev znakov prisotnosti risa v avstrijskih Alpah v petletnem obdobju 2005 do 2009 (beli krožci = potrjeni dokazi C1; črni krožci = potrjeni podatki C2; črni trikotniki = nepotrjeni podatki C3).

of presence were reported in this 5-year period. Isolated C3 observations were reported from Tyrol, Carinthia, Styria and Lower Austria (Fig. 1).

Discussion

In the Austrian Alps, the presence of lynx was ascertained by hard fact data (C1) in Upper Austria and Salzburg, and by confirmed data (C2) in Upper Austria, Lower Austria, Styria and Carinthia; only unverified records (C3) were available for Tyrol (Fig. 1). However, only three clusters are apparent: the clearest in Upper Austria (Kalkalpen National Park), the second in Styria (Niedere Tauern), and the third in southern Carinthia (Carnic Alps). In fact, based on an analysis of the spatial and temporal distribution of the information we conclude that there is no population established, presumably even reproductive units are lacking. Instead, the scattered observations rather indicate the presence of single individuals only.

The uneven density of point observations may not only reflect differences in the presence (or absence) of lynx but also in monitoring effort. With the exception of the National Park Kalkalpen the collection and confirmation of lynx signs of presence in the Austrian Alps depended on private initiatives of a small number of interested individuals. This mostly opportunistic collection of data allowed the estimation of distribution and abundance of lynx in the Austrian Alps only with great difficulty and limitation. Based on the distribution of all observations, we estimate the number of lynx in the Austrian Alps for the reporting period 2005–2009 at 5–10 individuals. The two lynx pictures from camera traps in the Salzburg region give indication of a growing use of camera traps by hunters. We hope that this source will provide valuable information in the future, if

it can be collected from the hunters on a regular basis. Still this will not be able to substitute a systematic and active monitoring of the lynx in the Austrian Alps, which would be especially necessary for areas of continuous presence or new occurrences like in the Salzburg area.

Acknowledgements

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