

Acoustic communication in the Iberian lynx (*Lynx pardinus*)

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Geographic distribution of Iberian lynx populations adapted from Sarmento et al. (2009).

1. Algarve–Odemira–Sado valley
2. Gata–Malcata–San Pedro–S. Mamede
3. Western Sierra Morena–Guadiana
4. Albarche 5. Gredos
6. Subbéticas 7. Doñana
8. Central Sierra Morena

Introduction

The Iberian lynx *Lynx pardinus* is endemic to the Iberian Peninsula. Its population and distribution range have been declining in recent decades, reaching a critical situation in 2005 with a population of less than 200 individuals, thus being the most threatened carnivore in Europe and the world's most endangered cat species.

Methods

Recordings were made during 9 recording campaigns from 2007 - 2011 at Sierra Morena-Andújar (Jaén), Breeding Centers of El Acebuche (Huelva) and La Olivilla (Jaén), at distances from the vocalizing animals of less than 5 meters to 100 m. Recorders: SoundDevices 722, Tascam DA-P1, Fostex FR-2LE; microphones: Telinga pro6 Science and Stereo, Sennheiser MKH70, Rode NT-1A. Recordings in .wav-format (48 or 44.1 kHz sampling rate, 24 or 16 bit). Analysis of copies of original files with PRAAT 5.1.41 with different settings.

Results

The acoustic signal repertoire of the Iberian lynx is the basic 'standard' felid vocal repertoire (see table below), matching those of the other species in the genus *Lynx* studied so far (too little is known in the Canadian lynx to include it here but it is highly likely to agree). The vocalization types' complete set of structural characteristics and their possible relationships with other types in the species' repertoires are not fully established yet.

Vocalization type	species		
	<i>Lynx pardinus</i>	<i>Lynx lynx</i>	<i>Lynx rufus</i>
mew	+	+	+
gurgle	+	+	+
purring	+	+	+
spit	+	+	+
hiss	+	+	+
growl	+	+	+

Depending on the sender's motivation intensity, tonality/noisiness, pitch and frequency modulation of mews are highly variable but they still show a general similarity with the well-known equivalent calls of the domestic cat. Corresponding to the species' smaller body size fundamental and dominant frequency is higher in *Lynx pardinus* than in mews of *Lynx lynx*. Gurgles are of the bubble type. Purring has the prototypical structural characteristics. Spit, hiss, and growl as vocalizations of the agonistic repertoire sound similar to those of the domestic cat and have the largely stereotypic structural characteristics of each of these vocalization types also known in other felid species.

The similarity of the vocal repertoires in the species of the genus *Lynx* and that of the structural characters of their vocalizations is not in line with the paraphyly of the genus *Lynx* as presented in the most recently (2010) published molecular phylogenetic tree of the cat family (Felidae).

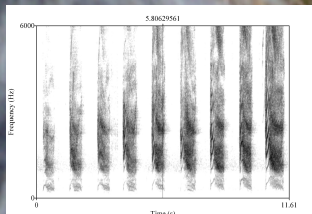
Conservation

The fact that the Iberian lynx is critically endangered and the remaining small populations are scattered calls for urgent effective *in situ* conservation actions in addition to concomitant *ex situ* measures. The use of typical loud mew calls for long-distance communication by females and males during the mating season is a promising tool to monitor the species' presence/absence and population trends in a given (known or supposed) distribution area by automatic acoustic monitoring. The recordings of the present study can serve as a reference sound archive for such activities.

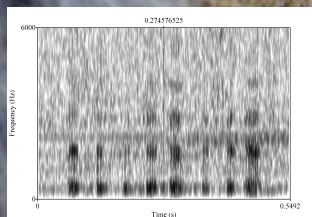


Geographic distribution of Iberian lynx adapted from Sarmento et al. (2009)

1. Doñana
2. Cardenera–Andújar



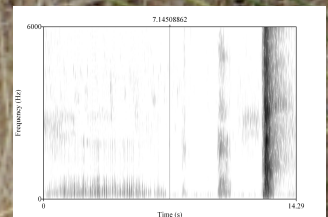
series of loud mews



gurgle (bubble type)



purring



growl

spit > hiss