

Doubts over Returning Lynx to Central Italy

Caution is necessary in considering reintroduction of lynx *Lynx lynx* to the area of the Abruzzo National Park in the Central Apennine mountains of Italy, recommends Dr Bernardino Ragni of the Institute of Zoology at Perugia University.

He was responding to an article in CAT NEWS 15 by Professor Franco Tassi, Director of the park.

Dr Ragni expresses particular concern about possible damage to the only remaining population of the Abruzzo chamois *Rupicapra pyrenaica ornata*, which is already subject to predation by wolves, brown bears, feral dogs, golden eagles and poachers.

"Furthermore, the spatial organization and habitat use of the chamois show that it has not colonized the whole environment available in the Abruzzo National Park. The lynx is an eclectic predator, capable of specializing temporarily or permanently on chamois. And the Abruzzo chamois has lost specific anti-lynx predation behaviour through hundreds, perhaps thousands of generations.

"I believe that it is necessary for us to ask whether it is necessary, right, ethical and civic to take the risk of reintroducing the lynx."

Ragni declares that there might be reason to feel reassured by the fact that proponents of lynx reintroduction were convinced of the necessity of creating at least two other viable populations of Abruzzo chamois in different areas. The operation would take at least five to 10 years, he says.

Other factors that need to be taken into consideration, Ragni says, are the lack of a system of protected areas linked to the Abruzzo National Park and the hostile attitude of

local people to large carnivores and to the establishment of more parks and reserves.

Drawing attention to the heavy hunting pressure throughout the Italian peninsula, which had created a "faunal desert", particularly for hares, game birds and deer, the preferred prey of lynx, he says that the Abruzzo National Park is exceptional and could be considered a "happy island". Both from a faunal and socio-political point of view it was in extreme contrast to the rest of the peninsula.

"It would be a strategic and fatal mistake to assume that it can be a model for regions outside its borders," he adds.

Ragni quotes studies by the Gruppo Lupo Italia and Centro di Studi Ecologica Appenninici concerning the death by poison, trapping and shooting of at least 30 wolves in the past 15 years - "150% of the 1990 population" - adding, "This does not generate any great hope for hospitality for a new large carnivore".

He says that, in the Lagorai mountains and the eastern Alps, four of an estimated 10 adult lynx had been killed, and similar happenings occurred in other countries where the lynx had returned - Austria, Bavaria, France, Slovenia and Switzerland.

In comments on the systematic position of the lynx in Italy, Ragni says that there were no concrete proofs of the existence of an Apennine lynx, although large and small lynx were present in the peninsula, as in all of south-western Europe, before the Pleistocene glaciations.

He suggests that evidence of the Apennine lynx's existence could be explained by the widespread custom in Italy, since the Middle Ages, of keeping exotic animals in captivity.

New Data on the Systematics of Lynxes

by Rosa Garcia-Perea*

I conducted a morphological study of the genus *Lynx* based on a large sample, 488 specimens, consisting of skins, skulls and postcranial skeletons, and representing the four extant species of the genus (*sensu* Werdelin, 1981). Criteria for age and sex estimation were identified, based on tooth replacement, annual growth layers of cementum, rates of sutures, synchondroses and epiphyseal cartilages ossification, as well as on biometrical variables. The development of these characters was then analyzed with respect to age. Once the samples were classified by age and sex, morphological and mensural differences between the species were described, and variation within and between populations was analyzed, as sample sizes permitted.

A principal focus of my research involved a reevaluation of the taxonomic status of the Iberian lynx. Despite the evidence presented by Werdelin (1981, 1990) and Garcia-Perea *et al.* (1985), the specific status of the Iberian lynx is not generally accepted. Although Honacki *et al.* (Mammal Species of the World, 1982), listed it as a separate species, they included the comment: "Probably a race of *Lynx*". More recently, three authoritative taxonomic references (Tumlison, 1987; Sokolov, 1988; and Corbet and Hill, 1991) treated the Iberian population as a member of the Eurasian species. Clearly, there has not been enough published data to convince mammalogists that the Iberian lynx is a good species.

My own findings (1991), as summarized below, support recognition of four recent species: two living in the Palaearctic, *Lynx lynx* (Eurasian lynx) and *Lynx pardinus* (Iberian lynx); and two living in the Nearctic, *Lynx canadensis* (Canadian lynx) and *Lynx rufus* (bobcat).

1. Study of the cranium and postcranial skeleton revealed that the processes associated with postnatal development are very similar for all populations studied, but the chronology is not always the same. For example, *Lynx pardinus* matures faster in postcranial development, reaching the adult condition in proportions and degree of ossification at least six months earlier than *Lynx lynx*. This observation suggests the existence of a heterochronic change associated with the speciation process that resulted in the separate species. In contrast to the other species, samples of *L. pardinus* also exhibit a unique ossification pattern of the presphenoidal synchondrosis.

2. In qualitative morphological features, *L. pardinus* possesses the highest number of unique traits (10 of 30 coded) among the four species. Some characters traditionally used for distinguishing the two Palaearctic species (for example, presence of m1 metaconid, relative position of hypoglossal and posterior lacerate foramina) are inadequate for complete separation. I discovered one cranial character, the structure of the maxillary bone in relation to inferior oblique muscle fossa, that discriminates 100% of the individuals of

the two Palearctic species. This character is also useful to discriminate between the two Nearctic species.

Four well-defined pelage patterns were identified based on variation in size and arrangement of spotting (types A to D). Type A (large spots arranged in longitudinally oblique rows) is almost identical for *L. pardinus* and *L. lynx*, being very common in the Carpathian, Balkan and Caucasian populations of lynxes. Based on cranial traits and size, these populations clearly belong to *L. lynx*, but because of the frequency of occurrence of type A markings, authors have either assigned them to *pardinus* (e.g. Chappuis and Bologna, 1929; Djulic and Tortic, 1960; Dinnik, 1914) or included the Iberian population in *lynx* (e.g. Corbet and Hill, 1980; Tumilson, 1987).

Another factor that confuses the taxonomic issue of Iberian and Eurasian lynxes is their present-day allopatric distributions. However, both forms were sympatric in southwestern Europe without evidence of intermediate forms during the Pleistocene (see, for example, Boule and Villeneuve, 1927; Dubois and Stehlin, 1933; Zeuner, 1959). By the 18th century, the two species had become allopatric due to the contraction of their ranges and population sizes (Kratochvil *et al.*, 1967)

3. Based on external appearance and osteological features, many authors have considered *Lynx canadensis* as a close relative of *L. lynx*, and some have even viewed them as conspecific (Kurten and Rausch, 1959; Corbet and Hill, 1980; Tumilson, 1987; among others). The greatest difficulty of this issue concerns the allopatric occurrence of Canadian and Eurasian lynxes, but in this case, there is no fossil evidence of sympatry, nor has evidence of transitional forms in the area of Beringea been found (Kurten and Anderson, 1980).

Nevertheless, the number of qualitative character differences between the two species is similar to that observed in the other species of lynx. For these reasons, I regard *Lynx lynx* and *Lynx canadensis* as distinct species.

4. The bobcat and the Canadian lynx were found to share certain character similarities that do not appear in the Palearctic species (for example, the shape of the posterior edge of the palate, absence of porosity in presphenoid bone). This character information contradicts the general belief that the Canadian lynx is more closely related to the Eurasian lynx than to the others (Kurten and Rausch, 1959; Werdelin, 1987). A re-examination of the phylogenetic relationships among the members of this genus is therefore warranted.

The results of my study support the specific recognition of the Iberian lynx, whose correct name should be *Lynx pardinus* (Articles 30 and 31. of International Code of Zoological Nomenclature, 1985), since I accept the generic usage of *Lynx*. The Iberian lynx warrants attention as one of the most endangered species of cats. I urge the development of captive-rearing programmes and its reintroduction into strictly protected areas.

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