

THE CURRENT STATUS, DISTRIBUTION AND CONSERVATION OF IBERIAN LYNX IN PORTUGAL

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Abstract: The Iberian lynx (*Lynx pardinus*) is native to the Iberian Peninsula and ranked as endangered in IUCN's red data book. Its status in Portugal was studied in 1977 and superficially updated in 1989. Since then, new data have provided a better assessment of the situation. Lynx have an extremely fragmented, pocket-like, distribution in Portugal that may represent less than 10% of the Iberian range. Some of the main nuclei are western ends of the transnational populations. Isolated relics survive throughout the country reflecting the former distribution area. The decline that began at the turn of the century worsened in the 1930's and 1940's and again in the 1960's and 1970's. It continues now, leading to a further decrease of lynx densities and a stronger insulation of the populations. The main causes have been habitat loss, wild rabbit (*Oryctolagus cuniculus*) scarcity (the felid's obligate prey) and human-related mortality. In several regions, the shortage of rabbits forced lynx to abandon the relatively quiet mountain cores to settle around in the unstable and insecure peripheries. Lynx conservation plans shall emphasize the mitigation of these factors and sound educational actions. In the Malcata Nature Reserve a lynx recovery plan is currently being carried out through habitat management and experimental restocking with rabbits. A country-wide project for the study and conservation of the Iberian lynx is now being set up. The main goals are to determine past and present distributions as well as the status of the populations and to implement educational and conservation programmes.

Key words: conservation, decline, distribution, Iberian lynx, Portugal, status.

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INTRODUCTION

In the Pleistocene *Lynx pardinus*, Temminck, 1824 occurred as far as central Europe (Kurtén and Granqvist 1987) and until the mid 19th century, the lynx inhabited virtually the whole Iberian Peninsula (Delibes 1979). During the 20th century the species range was drastically reduced and fragmented, while densities diminished (Palma 1980, Rodríguez and Delibes 1992). In Portugal, the decline began at the turn of the century in the northern and central mountains. In the 1930's and 40's, most of the remaining populations were severely affected by an extensive conversion of brushland habitats to vast grain fields. Although protection was enacted in 1967 many lynxes have been killed (Palma 1980, unpubl. data). The combination of the decrease in the wild rabbit population (enhanced by *myxomatosis*) and loss of habitat (afforestations with pines and eucalyptus) since the late 1950's brought a serious threat to the last lynx populations in south and central Portugal and some became extinct. Industrial afforestation still is a current threat and may even cause almost irreversible damage to lynx habitats (Palma 1980, 1995; Rodríguez and Delibes 1992).

The Iberian or pardel lynx presents several characteristics that make it especially vulnerable to man — specifically, the transformation of natural habitats. The species is considered in danger of extinction by IUCN. This risk of extinction is mainly caused by its habitat specialization and trophic dependence on the wild rabbit (Delibes 1980, Palma 1980, Rodríguez and Delibes 1992). The decline evinced by most of the lynx populations in Iberia triggered conservation and recovery projects in

both Spain and Portugal.

In 1987, a recovery plan for the Serra da Malcata Nature Reserve lynx population was implemented by the Nature Reserve through habitat management and protection of large shelter areas. The effort is ongoing. Several small, scattered pastures were developed with the purpose of increasing rabbit density. Experimental restocking with radio-tagged rabbits is currently going on. All these actions are supported by environmental education.

The data here presented are the preliminary results of the "Programa Liberne", a 4 year research project focused on the conservation of Iberian lynx in Portugal. The major goal is to assess, as accurately as possible, the current lynx range and status in Portugal. Other objectives are the delineation of the species distribution in recent decades, the development of ecological studies (predator-prey and competition relationships, spatial organization, population genetics, etc.) of selected populations, habitat management in some priority lynx areas, the implementation of educational actions and the creation of a National Lynx Conservation Plan. During the next years we hope to collect the fundamental information necessary for the conservation of the most endangered Portuguese carnivore.

The present study aims at gathering data on the species range and status and preliminary information on its situation in Portugal.

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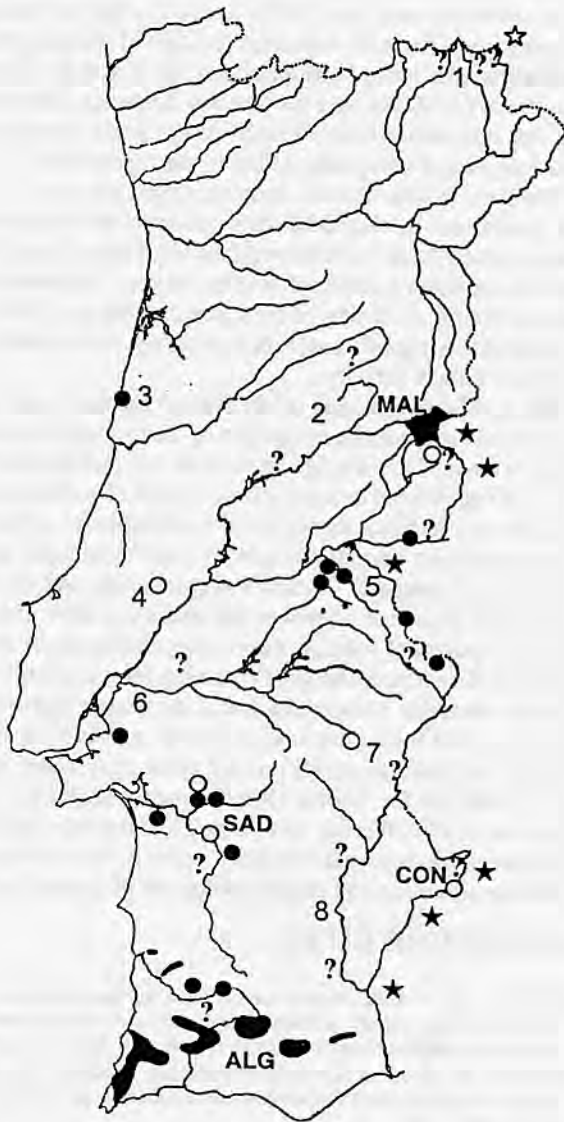


Fig. 1. Present (1994) distribution of the Iberian lynx in Portugal. Black areas represent lynx distribution in better known areas; black dots indicate occurrence since 1989; open dots indicate occurrences between 1984–88 and 1994; question marks are unconfirmed or dubious locations. Black stars point out contiguous Spanish breeding areas (approx.) and open star unconfirmed Spanish occurrence area (Rodríguez and Delibes 1992). Letters and numbers are area codes (see text).

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METHODS

Direct interviews with anyone whose activities might have

any relation with Iberian lynx were the main field method. Reports were accepted as positive if they were supported by lynx skins or accurate species descriptions obtained for any particular area within a short time. The search for tracks and signs gave further information in some areas. Additional data, occasionally gathered in recent years, led to the inventory of unconfirmed lynx presence. The present distribution of the species was based on the data relating to the last 10 years (Rodríguez and Delibes 1992).

RESULTS

Portuguese lynx populations occupy hilly or mountainous country and some lowland pockets of the south and central regions (Fig. 1) The Iberian lynx has an extremely fragmented, pocket-like distribution in Portugal. Certain occupied areas are in fact the western ends of transnational populations, the largest part being in Spain. The size of the former distribution can be estimated from several isolated relics that have survived throughout the country. The species distribution (as derived from data relating to the last 10 years), compared to 20 years ago (Palma 1980), reflects not only an accurate insight into the former range, but also represents areas of recent occurrence.

Serras do Algarve (ALG)

Lynx occur in mountainous areas covered with patches of cork-oak (*Quercus suber*) woodland amidst extensive Mediterranean shrubland. Habitat change hinges on man's move from rural to urban areas in the last 30 years. This move has had a heavy impact on lynx habitat, distribution and population evident in the general expansion of shrub cover and the development of eucalyptus (*Eucalyptus* sp.) plantations. Lynx in this area occupy about 450 km², the largest concentration in the country (Fig. 1). A strong population decline from the 1960's onward led to a highly fragmented distribution. This population has probably been isolated since the 1940's, when grain cultivation attained its peak. The adult population was recently estimated at 18 to 24 lynxes (2.5–6.4/100 km²) (Palma 1995). Density appears to decrease from west to east. Present major threats are scarcity of rabbit, forestry activities and wildfires.

Contenda-Barrancos (CON)

Few data from this area are available for the last 15 years, likely indicating a decrease. Habitat consists of sparsely wooded cistus (*Cistus ladanifer*) shrubland in moderately broken terrain. Palma (1980) reported the occupied area as 60 km². The scarcity of recent report could be explained by the shooting of lynxes, quite common during mid and late 1970's. The CON area is contiguous with the Spanish population of Western Sierra Morena (53 individuals in 1,037 km², 4.5/100 km² average; Rodríguez and Delibes 1992), but seems rather unconnected to other populations of southern Portugal (Fig. 1).

Serra da Malcata (MAL)

Malcata is a moderately rugged mountain region with a complex net of streams and gullies. Vegetation is dominated by gum cistus and heather (*Erica australis*) brushwood. Holm-oak

(*Quercus rotundifolia*) forest patches remain on some protected slopes. The traditional economy was based on goat-herding, which modified the vegetation structure through fire. This type of land use was gradually abandoned during the 1970's, leading to the closing of the vegetation. In 1981 Serra da Malcata Nature Reserve was created with an approximate area of 160 km². In 1990-92 the MAL population consisted of only 5 to 8 individuals, inhabiting approximately 127 km² (3.6 lynxes/100 km² average). Habitat Suitability Index (HSI) showed that Malcata is largely unsuitable for lynx (Castro 1994). A sharp decrease during the last 20 years was caused by habitat loss and rabbit scarcity. Also a rabbit Viral Haemorrhagic Disease (VHD) outbreak and habitat degradation worsened the lynx situation during the last 4 years. Numbers in the neighbouring Sierra de Gata in Spain were estimated as 58 lynxes occupying 1,229 km² (5.0/100 km² average, Rodríguez and Delibes 1992).

Sado valley (SAD)

This small scattered population is a remnant of what must have been a continuous lynx population throughout the lowlands of Tejo and Sado valleys until the middle of the 20th century. Habitat is dense cistus brushwood and cork-oak woodland along the banks of the ravines that cross the open-wooded and cultivated flat areas. Recent loss of habitat was caused by the afforestation with eucalyptus. This population suffered significant persecution in the 1970s. The species still occurs, however, in a scattered way, with low numbers through the remaining patches of suitable habitat.

Other areas

There are lynx report in 8 other different areas, and most of them have an indeterminate status. The geographic distribution of these occurrences denotes a vast former lynx range in Portugal, but in some cases could also be explained by dispersal movements. These areas (Fig. 1) are Montesinho Nature Park (1), Estrela mountain range (2), Mira coastal pinewoods (3), Serra de Aire (4), Serra de S. Mamede-upper Tejo (5), Tejo lowlands (6), Serra de Ossa (7) and Guadiana valley (8). Recent skins and corpses were registered in areas 3 and 4.

DISCUSSION

The Iberian lynx is in danger of extinction in Portugal. Compared to 20 years ago (Palma 1980) all major lynx populations have decreased in numbers to a few individuals each and retreated from part of the former range. The distribution pattern shows increasing insulation that could bring deleterious genetic consequences.

Data on lynx presence was obtained in areas with a former dubious status. These "new" sites either indicate dispersal movements or simply a better survey. Overall, the size of the Portuguese lynx population may not exceed 50 individuals. A shortage of rabbit forced lynx to abandon the mountain cores and settle in the still-cultivated, yet unstable and insecure pe-

ripheries. High mortality, in rabbits caused by VHD brought another "food stress" phase to lynx, similar to that caused by myxomatosis during the 1950's and 60's, further decreasing lynx density. The most important features of Iberian lynx optimal habitat are dense Mediterranean forest and shrubland, an abundance of rabbits, and low human influence. Predator persecution has been promoted in the recent years; several lynxes were caught and eventually killed in game preserves.

The Iberian lynx is a rare species, a predator, and a k-strategist specialized in closed habitats and involved in a co-evolutionary relationship with the wild rabbit. These characteristics make it particularly susceptible to extinction. The main factors responsible for declining of lynx populations are habitat fragmentation and degradation, rabbit decrease, man-induced mortality and human activity.

The essential measures needed to halt the declining trend of lynx populations are the mitigation of the causes of decline, the improvement of knowledge on the species, and the implementation of educational actions. Conservation of sufficiently large and suitable habitats through the establishment of protected areas and/or the encouragement of traditional land uses is a fundamental measure. Certain marginal areas that have occasional lynx presence or where the species is now absent, but with still potential habitat, may serve as important corridors linking different populations. Promoting food availability especially in areas that witnessed a drastic decrease of rabbit density during the last 4 decades is also a very important action. The creation of scattered small pasture areas may result in better food conditions for rabbits. Other measures such as restocking and control of VHD may have a positive impact on the rabbit population. Man-caused mortality could be reduced by sound educational actions and improved control of hunting activities.

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