

The Iberian Lynx (*Lynx pardinus*) - what chance of its survival?

Current situation:

It says much for the current state of the existence of the Lynx that a 2009 survey in Spain on current numbers, (ex cubs) suggests that the total population could number some 200 wild lynx – “a remarkable increase on its 100–120 nadir of 2002” (1)

Of this 200, 150 reside in the Sierra Morena, with a further 50 lynx in Donana in South-West Spain. No lynx are thought to exist in Portugal (except in captive breeding programs – 16 just recently donated from captive animals in Spain). Various research into surveys has been done over the past decade, most of which suggest that numbers hovered around 1000–1500 in the 1980’s, but are now consistently stated to be somewhere below 200. (2)

It has been classified as critically endangered in the IUCN red list of threatened species.

Major threats:

Scarcity of prey -

Since W W II, probably the greatest cause of the decline in Lynx numbers stems from the rise in Myxomatosis in Europe (from Australia), introduced by a French paediatrician (in 1952) trying to control rabbits that attacked his vegetable garden. This has seriously decimated populations of wild rabbits in Spain (*Oryctolagus cuniculus*) which account for 93 % of the usual prey of the lynx (2). One 2005 report suggested that as few as 5 % of the rabbits exist that existed 50 years ago in Spain (3). This is rather ironic considering wild rabbits originated in the Iberian Peninsula! (3).

However declines in rabbit numbers present a mixed picture – another survey suggests that lynx are not good at adapting to changes in abundance of rabbits, and even as rabbit numbers fell from 55 to 4 per ha in tough years, the Lynx studied varied little their litter size, or saw a marked drop in litter mortality. (4) However they also noted that 4 rabbits/ha was probably the critical level for Lynx survival, and that the most heavily Lynx populated area of the Donana region coincided with the area of highest rabbit density/ha.(4)

Loss of habitat -

Falling international demand for cork has led to a change in land use for ancient cork forests, where cork is harvested (but importantly trees are not felled). Cork stoppers account for 70 % of all cork use, but are being replaced by synthetic stoppers in many wine producing countries. The drop in cork stopper demand is not only very recent phenomena, but also a spectacular one – From 2000 to 2005 the numbers of cork stoppers sold fell from 19.9bn annually to 16.3bn, an 18 % fall in 5 years. One survey suggested that under a plausible scenario this could fall to 9bn corks by 2020 (a 55 % drop), whilst under a catastrophic scenario this could fall to just 1bn corks by 2020 (a 95 % drop) – these two scenarios would render from 1m to 2m hectares of cork forest economically unviable. As wine growing countries develop non-cork stoppers (Australian wine producers use 35 % non-cork stoppers), it is hard to see a wine producer reversing his non-cork production investment once the decision to go “non-cork” has been made. Cork forests are one of the key habitats that lynx like to inhabit, and the change in the use of cork forest land has done much to annihilate wild lynx numbers in Portugal. (5)

In addition, legal and illegal strawberry farms surrounding lynx sensitive areas are making unprecedented demands on ground water levels, affecting flow into key marsh areas. This is not only an issue for the Lynx, but also for the rabbit, on which so much of Lynx survival depends. (3) (6)

Feline Leukaemia Virus & other pathogens -

A 5 year study concluding in 2007 studied 77 of the approximately 200 free-ranging Lynx in the Donana and Sierra Morena, and analysed them for seven viral, one protozoan and several bacterial infections. As an example of the threat imposed by such viral agents, of the 14 found to be pro-virus positive with Feline Leukaemia Virus (FeLV), 6 had died within a six month period in 2007. Overall, of the 77 Lynx studied, 16 died – of which 8 were considered to be from viral infections. As an example, one free-ranging male was FeLV pro-virus positive in Dec 2006, having been clear one year before – showing no clinical signs he was re-released in Dec 2006 and was dead (by the disease) six months later. In the Donana area, in Dec 2006 15 lynx were FeLV negative – by March 2007 five of these 15 were dead, all from FeLV pro-virus infection. In the same period 7 lynx were found to be FeLV positive, but survived. Worryingly, a 1993–2003 study on FeLV found 6 of 21 lynx being FeLV positive, but it was not considered a major risk to the lynx population, but either through mutation or weakening immunity, it appears to be an escalating now. (7)

A second study in 2004 considered the Bovine Tuberculosis (*Mycobacterium bovis*) and its effect on wild animals in Spain including the lynx. In an admittedly small sample, 4 lynx were studied, 3 of which were infected with *M. bovis*, with lesions on the respiratory tract, probably from scavenging on tuberculosis carcasses of fallow deer. *M. bovis* has been found in other wild felids (Lions, Cheetah, Bobcats) so it is not a surprise that lynx are also susceptible. (8)

What is concerning for the lynx particularly with regard to pathogens, is its limited genetic diversity. In a 2005 report looking at the gene flow between the two main lynx population areas (Donana and Sierra Montana) it concluded that “relative to most other field species, genetic variation in mtDNA genes and nuclear microsatellites were reduced in Iberian lynx, suggesting they experienced a fairly severe demographic bottleneck” (9) – as lynx numbers decrease moreover, “recent reductions in gene flow and population size are being manifested in local patterns of molecular genetic variation.”(9) Given that cheetahs suffer from similar limited genetic diversity (10), it may be that lynx also are susceptible to pathogens and other infectious agents.

Human interaction -

“Although the Iberian lynx appears not to fear man, it will not live in an area where permanent settlements are established” (Simon and Geroudal 1970 – (2))

It is interesting to note that in both pathogen studies in the previous section, both FeLV and *M. bovis* infection are attributed to cattle and domestic cats invading lynx habitats. The FeLV study calls for “the reduction in local cat population if the lynx population is to be maintained” (7) whilst the *M. bovis* study concludes that “this infection is a threat to livestock, wildlife and endangered species, such as the Iberian lynx.”(8) Both reports suggest that man is encroaching on lynx habitats, even indirectly within established National Parks.

Outside national parks, and in Spain’s many private hunting areas, the picture appears particularly gloomy. In the FeLV report, the fact that of the 77 lynx sampled, 7 went on to die by being struck by vehicles, whilst one was due to illegal hunting, suggests high mortality due to direct human interaction. Interestingly, the presence of the FeLV virus in those 8 carcasses was significantly lower than in carcasses caused by FeLV – suggesting that these animals were in no way sick or vulnerable before they were hit by cars etc. (7) However on the positive side, most conservationists now do not see hunting or snaring as a major threat to the lynx, as the threat to its survival has become more widely telegraphed, and laws inhibiting killing lynx were introduced.

Lynx behaviour - self help or self harm?

It has already been noted that Lynx do not adapt well to changes in their food source, but in other areas of their natural behaviour, one can be more optimistic that they can help themselves to survive.

Whilst females only generally breed from three years onwards (though sexually active at one year) studies showed that over 9 years in Donana, 83% of adult females bred annually – in 29 cases of female-year data, females bred on 24 occasions. This produced in the same period 64 cubs (c.8/year), with an average litter size of 3 cubs. Cubs had a 75% survival chance to 3 months, and thereafter at 10 months, 69% had survived and at dispersion (2 years) 57%. In the two cases that were discovered were a cub died between 10 months and dispersion, one was killed by dogs and one was hit by a car. (4)

Being territorial, Lynx generally tend towards polygyny except in high density of both sex areas where there is a tendency to monogamy. Adults with territory have a higher survival rate than those without, a concerning factor given the narrow pockets in which both populations live. The fact that these populations are unlikely to interact given geographic distance, is also a concerning fact for ongoing lynx genetics and survival. (2)

Conclusion –

It's not easy to be particularly optimistic on the chances of the Iberian lynx thriving in the wild, although captive programmes should hopefully ensure its survival. However the evidence on the effects of pathogens is particularly gloomy, and given the difficulty of vaccinating successfully a nocturnal, elusive cat, it is hard to see, without a strong genetic defence, such pathogens being successfully eradicated. However, the encroachment of man on to these last few wild areas where the lynx resides should be strongly resisted.

Help however comes from many sides, aside from a small band of determined lynx conservationists. The Spanish Govt, the EU and local government have now activated resources and money to help save the lynx and the captive program has been substantially beefed up. The growing amount of uneconomic agricultural land in Spain could provide a method to increase the current restricted range of the lynx, and Spanish scientists have modelled agricultural areas to find which adjacent areas to parks have the greatest potential. (11)

In writing this short report however, you do get the impression that every lynx counts when you see how small some of the sample sizes (by necessity!) have to be – and we can only hope that sample sizes, and by proportion the population of the Iberian lynx, continue to grow in years to come. So pop a (proper) cork... and raise a glass to that!

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