

The IUCN/SSC Red List Assessment, Reintroduction Guidelines and the Iberian Lynx

Applying the Red List criteria to define a recovery strategy for the Iberian lynx

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The Red List of the Species Survival Commission of the World Conservation Union (IUCN) is the world's leading authority to judge the conservation status of animal and plant species. Species are classified according to a sincere assessment of the status of the population(s) into categories of increasing threat of extinction. As the first cat species ever, the Iberian lynx (*Lynx pardinus*) was up-listed into "Critically Endangered" in 2002. The Red List assessment, analysing the status of a species, can also be considered when developing conservation strategies, as it classifies a species according to a complex list of biological criteria. These criteria allow illustrating different possible recovery scenarios and can therefore be used to develop a basic recovery strategy.

1. The „Red List“ history of the Iberian lynx

The IUCN/SSC Red List aims for a continuous survey of the status of the world's animal and plant species. The specialist groups with their members in the range countries assess the status of threatened species yearly, and classify them according to a hierarchical system of threat levels. The Iberian lynx has already in the first assessment in 1986 been classified Endangered (Table 1). However, already an earlier assessment by Scott (1965) – then still classified as subspecies *pardina* of the species *Felis lynx* – judged the Iberian lynx to be endangered. In the year 2002, after the newest monitoring efforts revealed a considerable lower number of lynx than previous surveys, the Cat Specialist Group up-listed the Iberian lynx to **Critically Endangered**, the first cat species ever. The justification for the up-listing was given as follows: "With the population declined to less than half of the 1,200 in the early 1990s, the Iberian Lynx is close to becoming the first wild cat species to go extinct for at least 2,000 years. Based on estimates of density and geographic range (Nowell and Jackson 1996), the total effective population size of the Iberian lynx is estimated at 250 mature breeding individuals, with a declining trend due to habitat and prey base loss and persecution, and no subpopulation containing more than 50 mature breeding individuals" (<http://www.redlist.org>). This up-listing made headlines across the world and was one of the reasons for the first international seminar on the conservation of the Iberian lynx, held in Andújar (Andalucía) in November 2002.

Table 1. Assessment and Red List classification of the Iberian lynx through the Species Survival Commission of the World Conservation Union IUCN.

Year	Assessment and taxonomy	Reference
1965	„Very rare and believed to be decreasing in number“ as <i>Felis lynx pardina</i>	Scott 1965
1986	Endangered as <i>Felis pardina</i>	IUCN Conservation Monitoring Centre 1986
1988	Endangered as <i>Felis pardina</i>	IUCN Conservation Monitoring Centre 1988
1990	Endangered as <i>Felis pardina</i>	IUCN 1990
1994	Endangered as <i>Lynx pardinus</i>	Groombridge 1994
1996	Endangered as <i>Lynx pardinus</i>	Baillie and Groombridge 1996
2002	Critically Endangered as <i>Lynx pardinus</i>	IUCN 2002

2. Red List categories, criteria and assessment

The Red List classifies any species into one of nine categories (Fig. 1), according to the information available and its conservation status. The guidelines for the assessment (IUCN 2001) consider not only the total number of individuals, but also the number of mature (reproducing) animals, the

fragmentation of the total distribution area, the size of (sub)populations and the rate of the decline. For the Iberian lynx, several of the criteria have led to the up-listing to Critically Endangered (CR). Only two more categories follow: Extinct in the Wild (EW) and Extinct (EX).

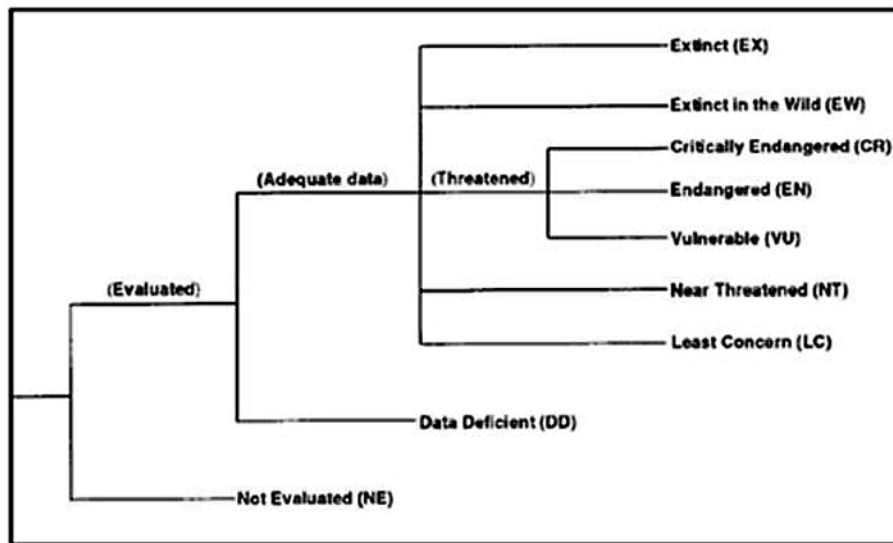


Fig. 1. IUCN/SSC Red List categories (IUCN 2001).

3. Setting recovery aims according to the Red List criteria

The situation of the Iberian lynx is especially critical because so far, no lynx have been bred in captivity, so there is no backup for the gene pool of this unique species, nor is, at the moment, any stock available for restocking or for reintroduction programmes. From the viewpoint of the Red List, the first priority is to at least maintain the present status of CR and, as fast as possible, to create a captive population, hence to at least provide the possibility of “Extinct in the Wild”. Taking a more optimistic position, we should try to recover the Iberian lynx in a way allowing to down-list it again to Endangered (EN) within a few years and then to Vulnerable (VU) as soon as possible. Given the limited total area, the dependence to one staple prey species and the competition with humans for the living space, the Iberian lynx will probably always remain a vulnerable or at least Near Threatened (NT) species.

4. Possible recovery scenarios for the Iberian lynx

The most obvious approach is to let the species recover in the areas most recently lost (e.g. Rodriguez and Delibes 2003), although alternative strategies, such as the creation of a benign population (IUCN/SSC 1998) outside the recent historic range, but with adequate habitat and prey base, could be considered.

Several approaches to the recovery of the Iberian lynx are possible, each with its advantages and disadvantages (Fig. 2). The conservation efforts could concentrate on the maintenance, stabilisation and expansion of the two remnant populations. This is however a risky strategy as any further decline or a catastrophic event can wipe out either of the two nuclei. Furthermore, recent analyses have shown that the Andújar and the Doñana populations are already genetically distinct (Johnson *et al.* 2004), indicating that the maximum available gene pool can only be maintained when mixing the two populations. This can either be done through direct translocation of animals or through a conservation breeding programme. The latter option is clearly the better choice, allowing to build-up a back-up population in captivity. Animals reintroduced from captivity to the wild can be released within, close to or totally isolated from the remnant populations. The first option would help to immediately maintain the gene pool of the two extant nuclei, but the restocking of an existing population always bears the risk of disturbing the land tenure system of the resident lynx and to over-exploit limited resources. The creation of new population nuclei in the neighbourhood – within the expected dispersal

distance – can help to avoid such problems. However, close-by nuclei may be exposed to the same extrinsic risks of extinction than the remnant populations. The option to (re)create populations in a certain distance and isolated from the two remaining occurrences would reduce this risk, has however the considerable shortcoming that dispersing subadult lynx may never find access to conspecifics.

- 1. Without reintroduction/conservation breeding**
 - A Maintain and expand remnant populations only**
 - Forces and resources concentrated on extant populations
 - No conservation breeding programme needed / no backup population
 - Populations remain demographically/genetically isolated
 - High risk of extinction through intrinsic and extrinsic factors
 - B Maintain remnant populations with exchange of individuals**
 - Translocate lynx between Andújar and Doñana / possible disturbance
 - Maintain maximum gene-pool (genetic exchange)
 - High risk of extinction through extrinsic factors
- 2. With reintroduction from captive stock**
 - A Restock and expand remnant populations from captive bred stock**
 - Maintain available gene-pool / backup population in captivity
 - Possible disturbance of land tenure system through released lynx
 - High risk of extinction through extrinsic factors
 - B Create new populations in vicinity of remnant populations**
 - No disturbance of resident lynx through released animals
 - Dispersing animals have chance to meet conspecifics
 - Optimised gene-pool management, meta-population approach
 - Moderate risk of extinction through extrinsic factors
 - C Create new population isolated from remnant populations**
 - Isolated populations instead of meta-population
 - Low risk of extinction through extrinsic factors
 - Dispersing animals no access to neighbouring sub-populations

Fig. 2. Possible approaches to the recovery of the Iberian lynx (*Lynx pardinus*) in regard to the translocation or release of animals.

The “best” recovery strategy can only be defined through a careful analysis of all factors involved. The most important (but by far not only) aspect is the availability of suitable habitat patches (with a sufficient prey supply) connected through corridors. A rough and very preliminary analysis of the landscape in southern Spain and Portugal have revealed some 32 patches of >100 km² suitable habitat (Fig. 3), offering space for a total of approximately 1500 mature lynx, considering a mean density of 10 lynx/100 km² (see Rodrigues & Delibes 1992 for an overview of Iberian lynx densities). The creation of a chain of population nuclei either along the Sierra Morena or from the Andújar population to the north, forming a meta-population, seems possible. However, some of the patches are separated by a distance in the upper range of observed dispersal distances of lynx (Fig. 3; see also Ferreras *et al.* 2004). This implies that “steeping stones” (e.g. suitable habitat patches <100 km²) are important and that habitat corridors may have to be maintained or re-created.

These reflections do not consider the prey supply. The rabbit population, the Iberian lynx’ main prey, is today mainly driven by the epidemiology of diseases (myxomatosis, RHD). Hence a high quality habitat does not automatically include sufficient prey availability. Both, the present status of the habitats and the local rabbit populations and the chances to improve inadequate situations within a certain time span, need carefully to be considered when deciding about the recovery strategy.

5. Evaluation of the time scale

In an optimistic scenario, assuming that the remnant populations can be maintained and that the conservation breeding programme can provide the first animals in five years, the down-listing of the Iberian lynx from Critically Endangered to Endangered should be possible within ten years. The next step, down-listing to Vulnerable, will then, however, at least last another ten years, as it requires the

recreation of a viable meta-population or several populations of a total of some 2500 Iberian lynx living in the wild.

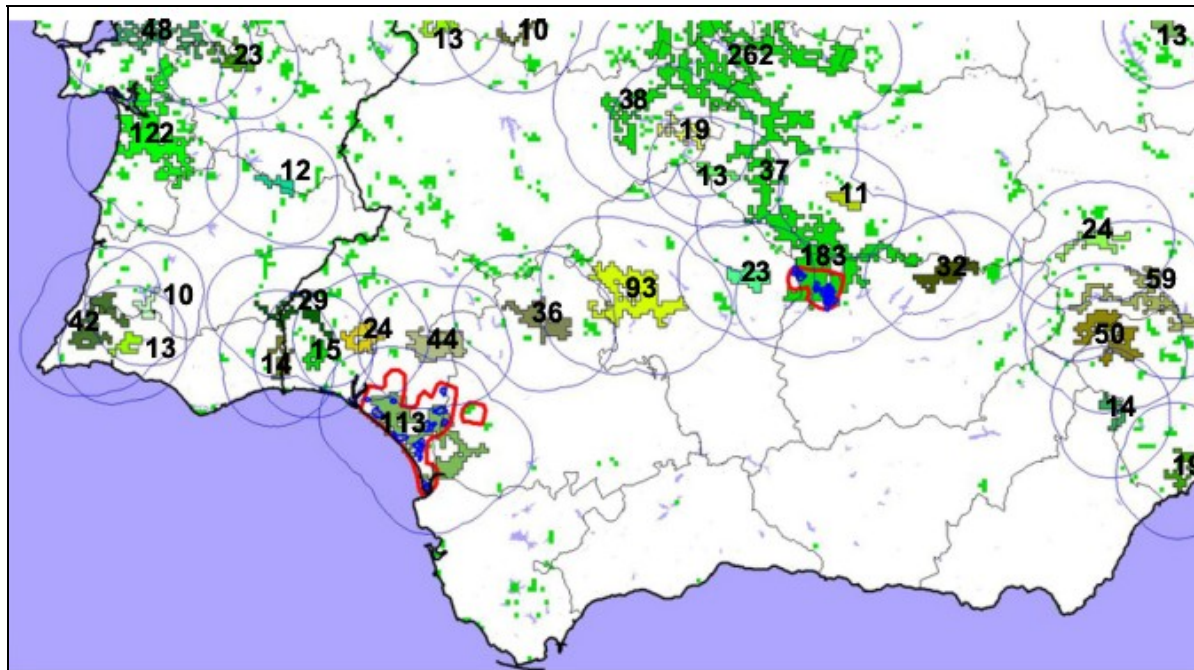


Fig. 3. Habitat patches in a 2.5 x 2.5 km raster grid identified in southern Spain and Portugal according to the Ecological Niche Factor analysis (Hirzel *et al.* 2002). The reference were all cells within the present distribution of lynx in the Andújar and Doñana populations (red outlines). Light green all patches <100 km² (“stepping stones”). The figures give the potential number of mature lynx assuming an intermediate density of 10 animals/100 km² (Rodríguez and Delibes 1992). The buffer around the patches (grey circles) represents the mean dispersal distance found for females in the Coto del Rey (Ferrerás *et al.* 2004).

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