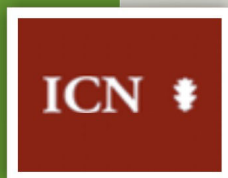




Requirements and planning for the Experimental Reintroduction Centre of the Serra da Malcata Nature Reserve– V 1.1



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1. Introduction

The present document intends to establish a blueprint for an experimental reintroduction centre to link the network of captive breeding centres and future reintroductions, linking ex-situ conservation and ex-situ conservation efforts. The centre will be scientifically oriented to safely test the release strategies and protocols proposed by the Reintroduction Working Group of the Iberian Lynx Captive Breeding Committee, and launch future Iberian lynx reintroductions in the Serra da Malcata Nature Reserve.

As mentioned in the Portuguese Action Plan for the Conservation of the Iberian Lynx, the status of the Portuguese Iberian lynx populations is presently profoundly negative. The last 2004 national census detected no lynxes or signs of its presence, confirming the pre-extinction status of these populations.

This situation led the Portuguese conservation authorities to commit to the Spanish ex-situ conservation efforts with the objective of participating in the captive breeding programme and other aspects of Iberian lynx conservation. The main objectives of the captive breeding programme are to raise and maintain a number of lynxes that will act as “insurance” against extinction and prepare offspring for future reintroductions / population reinforcements at suitable sites.

Reintroduction, therefore, is an indispensable conservation tool for the recovery of Iberian lynx populations and it will be the long term objective of the abovementioned Action Plan. It should be noticed, however, that reintroduction efforts are extremely complex, costly and slow, and that the current status of Iberian lynx populations in Portugal and Spain require immediate attention.

2. Current status of Iberian lynx populations

The Iberian lynx is on the verge of extinction, classified by the International Union for the Conservation of Nature (IUCN) as critically endangered. It has a highly restricted geographical distribution, its population confined to the Iberian Peninsula and distributed into two geographically separate nuclei in Andalusia.

These two populations, Doñana e Cardeña-Andújar, are estimated to contain about 150 to 200 lynxes in total (Guzmán *et al.*, 2002), although more recent data place these numbers between 100 and 120 animals. The numerous threat factors and high susceptibility to stochastic events (disease epidemics, natural disasters, etc) present grave danger to the species and seriously hamper the Iberian lynx conservation strategy.

The last national census did not detect any Iberian lynxes or signs of its presence, although great effort, years of research and considerable man/hours were directed towards it. Adding to this, wild rabbit populations studied throughout the historic range of the species could not, in the majority of sites studied, support viable lynx populations. Although we cannot confirm extinction at this point in time, the scenario is highly pessimistic (Sarmiento *et al.*, 2004).

3. Background

Considering that Iberian lynx populations have been under progressive and very significant decline for the past 20 years, the '*Dirección General de Conservación de la Naturaleza*' (DGCN, Ministry of the environment / MIMAM - Spain), the EU counsel, WWF and the IUCN have produced documents supporting the important role to be played by captive breeding, genetic management and subsequent reintroduction / population reinforcements for the conservation of the Iberian lynx.

With its participation in the creation of the '*Plan de Cria en Cautividad del Lince Ibérico*', (Captive Breeding Action Plan, approved in June 2001 by the '*Comisión Nacional de Protección de la Naturaleza*' MIMAM, Spain), the Portuguese conservation authorities acknowledged this role and

committed to support and finance several aspects of the Action Plan, contributing scientifically to the captive breeding programme and the genetic management by establishing an exclusive captive breeding centre and a genome resource bank.

This commitment was then reinforced by the Portuguese Government with its resolution 152/2001 of October 11, defining a national strategy for the conservation of nature and biodiversity (Estratégia Nacional de Conservação da Natureza e da Biodiversidade - ENCNB). Strategic option nº5 determines the development of specific action plans to manage species and habitats through the establishment of captive breeding centres, cooperation with national and international genome resource banks and animal collections.

More recently, the II International Seminar for the Iberian Lynx was held in Corboda (15th-17th December 2004) where, among others, the following conclusions were drawn:

- a) The captive breeding programme must be understood as an important tool for the future recovery of the species, contributing decisively to preserve current genetic diversity. The free living and captive Iberian lynx populations must be managed as a single unit to increase the likelihood of recovery for the species.
- b) New captive breeding centres are considered necessary with a certain degree of urgency. These should be in sufficient number and must follow the recommendations of the Captive Breeding Committee for the Iberian Lynx (CCCLI). Participation is offered to Portugal and other Spanish Autonomous Communities through agreements to be signed in the near future between them and Andalusia.
- c) Following IUCN recommendations, Portugal and the Spanish Autonomous Communities must identify, improve and prepare suitable habitat for future reintroduction / population reinforcements to create new population nuclei as soon as 2010. All detailed and updated information on habitat restoration and management must be gathered, and actions taken to prepare suitable habitat for reintroduction, population reinforcement and/or translocation of animals.

4. Objectives

Considering that new population nuclei should be created as soon as 2010, the main objective of this document is to define the profile of the infrastructures to be built in the Serra da Malcata Nature Reserve - linking the network of captive breeding centres with an area considered to be a priority reintroduction area in Portugal. The aim is to test and develop release protocols and techniques and prepare and monitor captive bred or wild caught lynxes safely for future reintroductions in the Serra da Malcata Nature Reserve and possibly elsewhere. To pursue the objective, it must:

- a) Possess suitable animal enclosures for receiving lynxes from the captive breeding network and animal rehabilitation centres. Three separate quarantine buildings, a minor enclosure of 1ha and a major enclosure of about 300ha are projected, creating the conditions to maintain a maximum of 6 animals and to test both soft and hard release techniques.
- b) Be equipped with adequate technical, logistical, financial and administrative means, as well as trained personnel, to pursue the long term objective following the recommendations of the IUCN reintroduction specialist group and the CCCLI reintroduction working group for Iberian lynx reintroductions.
- c) Be placed within the historic range of the species, in an priority area with full legal protection, logistical structure and adequate lynx habitat.

Aiming to:

- a) Test and develop adequate release strategies and protocols, studying aspects of the species' biology (adaptation to the wild, dispersal, causes of mortality), ethology, reproductive physiology and potential threats (including health threats) to evaluate the efficiency, costs and benefits of each strategy safely and at variable degrees of monitoring and supplementation.
- b) Evaluate the efficiency of the techniques developed by the CCCLI to prepare captive bred Iberian lynxes for future reintroductions, creating an information loop between the two.

5. Location

The Serra da Malcata Nature Reserve is the most studied and renowned Iberian lynx territory in Portugal, and the reserve was created as a Protected Area in 1981 to protect and conserve this species. The nature reserve was then benefited between 1994 and 1998 with habitat management practices contemplated in the LIFE project “Conservação do Lince-Ibérico em Portugal” (Iberian Lynx Conservation in Portugal), and, from 1999 to 2003, habitat restoration and wild rabbit reintroduction / population reinforcement activities were performed under a subsequent LIFE project. Iberian lynx conservation practices and actions are currently funded under the POA (Operational Environment Programme) “Gestão de espécies e habitats na Reserva Natural da Serra da Malcata” (Management of species and habitat in the Serra da Malcata).



Fig.1 The Serra da Malcata Nature Reserve

The SMNR is located on the border with the Spanish Autonomous Communities Castilla-Léon and Extremadura, directly involved in Iberian Lynx conservation efforts. It occupies 16.000ha of legally protected land and it has a comprehensive logistical and scientific structure. Its proximity to protected areas in Spain is important and can lead to an area of approximately 100.000ha available for new Iberian lynx population nucleus, ten times the minimum area considered as adequate for habitat viability analysis by the CCCLI reintroduction working group. The possibility of a trans-frontier park mustn't be overlooked and may play an important role for the future of Iberian lynx conservation efforts.

5.1 The Serra da Malcata Nature Reserve

The Serra da Malcata Nature Reserve (RNSM) was created in 1981 by governmental decree no. 294/81 of October 16th 1981. Its creation was justified with the much needed protection of its Iberian lynx population as well as of other important flora and fauna values present in the area. This Protected Area was later reclassified as a Nature Reserve by another governmental decree (no. 28/99, November 30th 1999).

The Nature Reserve has the following objectives:

- 1 – To protect the natural patrimony through correct territory management, dictated by the potential and characteristics of each area, in order to manage and preserve essential habitat for the conservation of its fauna and flora;
- 2 – To promote science and environmental education and to support traditional human practices and activities.

In acknowledgement of its important natural values, the SMNR gained international recognition through the attribution of several protection statuses under EU directives and international conventions, as follows:

- CORINE biotope (C12800014), August 1986;
- Classified as Biogenetic Reserve by the European Council, 1986;
- Classified as Special Protection Zone by Governmental Decree no. 384-B/99, September 1999;
- Classified as Nature 2000 Site PTCON0004 – Malcata, by Ministry Counsel Resolution no. 142/97, of August 1997.

This Protected Area has been established for over twenty years, and we now have a deep understanding of its natural patrimony. The Nature Reserve has a functional logistical, scientific and technical structure, and continuous investments in habitat and prey recovery for the Iberian lynx are being made. This area is therefore considered a priority area for future Iberian lynx reintroductions in Portugal.

5.2 Quinta do Major

The Experimental Reintroduction Centre will be located at a place known as 'Quinta do Major', a valley situated at approximately 600 meters above sea level and placed between the Bazágueda River and the Casinha stream, an integral protection area located in the heart of the SMNR. At the Quinta do Major we can find a complex of ruins and functional buildings that will be used for the Experimental Reintroduction Centre.



Fig.2 Quinta do Major

6. Infrastructures

The infrastructures are planned in harmony with the surrounding scenery and existing buildings, through the usage of materials like local wood and stone. The usage of renewable sources of energy and water and the maintenance of an adequate and rustic environment will also be encouraged. Focus will be put on the implementation of structures and on construction by modules, expandable and easily transportable.

The infrastructures destined to receive Iberian lynxes and other associated structures are designed following the directives of the CCCLI and are planned in accordance with the “Zoo Standards for Keeping Large Felids in Captivity” (Shoemaker, EAZA), the “Husbandry Standards for Keeping Small Cats in Captivity (Mellen, AZA), the Husbandry Guide for Captive Iberian Lynxes (Guia de Manejo em Cautividad para el Lince-Ibérico, CCCLI, MIMAM), and with the “Proyecto de ejecución de jaulones e instalaciones para la conservación de la fauna silvestre en el monte de “La Aliseda”, Santa Elena, Jaén” (CCCLI, MIMAM).

Also taken into account were the existing conditions at the El Acebuche pilot captive breeding centre in Doñana and subsequent alterations planned to benefit it (CCCLI, MIMAM). Visits to the CREA (Endangered Species Rehabilitation Centre) at Jerez Zoo (Jerez, Andalusia), to the El Acebuche pilot captive breeding centre and to the CREA of Los Hornos (Cáceres, Extremadura) were made, and visits to the CREA of Los Villares (Córdoba, Andalusia) and to the La Aliseda Exclusive Captive Breeding Centre (Jaén, Andalusia) are planned.

6.1 Existing structures

At the Quinta do Major there are a group of buildings, one of which has been recently rehabilitated as a housing complex with capacity to maintain four individuals indefinitely. There is also a storage room and a group of ruins that should be recovered in the future.

6.1.1 Housing Complex

It's equipped with kitchen, WC, two separate rooms and storage space. It will be used to house the centre's permanent team and may be expanded in the future. It occupies a total area of 101m² (Fig.2).

6.2 Structures to be built

As mentioned above, these structures are either designed to house Iberian lynxes or to provide the logistical and technical support to the centres' activities. Structures to be built can be divided into a building complex and animal enclosures.

6.2.1 Building Complex

a) Clinic – Laboratory – Coordination Centre

This building is destined to receive the equipments needed to proceed with the clinical and laboratory work and to provide a coordination centre equipped with a meeting room from where all the centres' activities will be monitored. The distribution of areas will obey to the necessities of each space, and if necessary divided into separate construction modules.

The clinic will be equipped with the materials and equipments needed for emergency, routine and/or triage procedures, a surgery room, radiology equipment and clinical pathology equipment. Post-surgery recovery, if needed, will be conducted at one of the quarantine areas.

The laboratory will be divided into two separate areas: one area destined to the storage and preparation of food for the animals; and another area for the processing and storage of samples obtained at clinical or field work. These two areas should remain separate. The samples will be forwarded to specialized laboratories recommended by the CCCLI for analysis and permanent storage.

The coordination centre is destined to receive the video surveillance system to be installed in all animal enclosures and buildings. It will be equipped with office space and a meeting room from where all the centre's activities will be prepared and monitored.

These three areas will have separate access and the building configuration will follow that rule. The total area occupied by the clinic – laboratory – coordination centre will be approximately 100m².

b) Quarantine buildings

The centre is to have three separate quarantine buildings, at a safe distance from each other and from other buildings and animal enclosures. Within each, four distinct areas are planned: an **access chamber** for disinfection and change of clothing, acting as a sanitary barrier between the animals and the exterior; from this chamber we access the **observation corridor** and the **feeding chamber**, from where we enter the indoor and outdoor chambers of the **quarantine enclosure** (Fig.3).

The **access chamber** must be equipped with appropriate safety mechanisms for controlled access to and from the exterior. It must have enough space to allow the transport box to enter and be placed in feeding chamber, from where the animals will enter the quarantine enclosure. It must be equipped with cabinets to store clothing and equipment and be fitted with easily cleanable surfaces for disinfection. Operators must have access to fresh water, electricity and artificial light.

From the access chamber we enter the **observation corridor**, parallel to the indoor chamber of the quarantine enclosure. It will be fitted with one-way observation windows or other means to minimize human exposure during observation of animals, and easily cleanable surfaces for disinfection. It can also be fitted with small access windows for remote infection if feasible.

The access chamber communicates with the **feeding chamber**, from where animals will be fed and watered using a drawer system similar to the ones found in El Acebuche. The door to the quarantine enclosure will be fitted with a smaller, central guillotine door for safe passage of the lynx

from the transport box to the enclosure. It will be fitted with observation windows similar to ones found at the observation corridor, electricity, artificial light and fresh water.

From the feeding chamber one enters the **quarantine enclosure**, composed of an indoor chamber and an outdoor chamber

The indoor chamber will have access from the feeding chamber and the observation corridor as described above. Lynxes will enter this chamber via the feeding chamber as described above or via the outdoor chamber. Separating the indoor and outdoor chamber there will be a sliding door, operated from the exterior and the observation corridor. It will be fitted with easily cleanable surfaces for disinfection, video surveillance, drawer system for food and water, heating, behavioural enrichment elements (elevated shelves and nest boxes). It will have natural and artificial light sources. It occupies an area of approximately 15m².

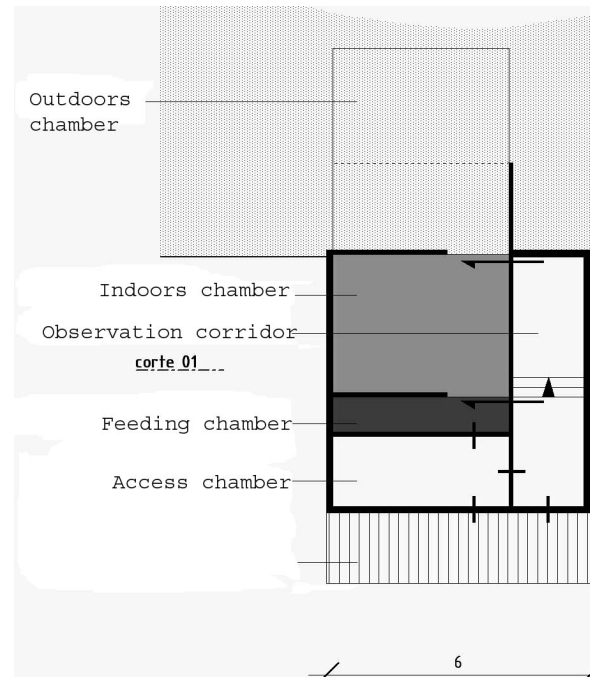


Fig.3 Quarantine building

The outdoor chamber will be a completely closed enclosure in wire mesh with a gauge of 2,5cm or less. The wire mesh gauge can be decreased in up to a meter above ground in one of the quarantine buildings to prevent accidents with cubs. It will be equipped with behavioural enrichment elements and it occupies an area of 25m².

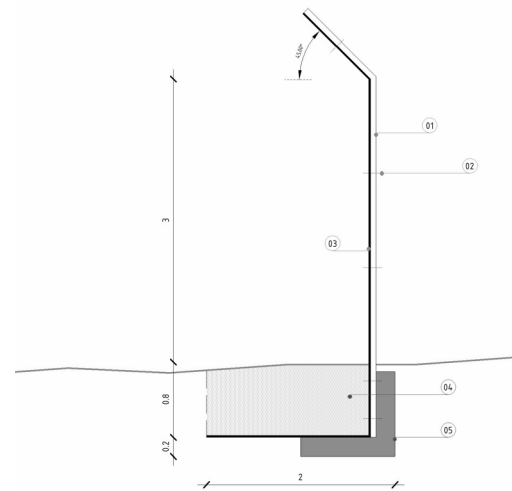
6.2.2 Animal enclosures

The complex of animal enclosures starts at a short but safe distance from the coordination centre and quarantine buildings. It is planned to hold a maximum of 3 adult lynxes at a given time: a couple in a 300ha enclosure, and one animal in a smaller enclosure..

a) The “big” enclosure

The 300ha enclosure surrounds a valley in the heart of Serra da Malcata, and will simulate a small Iberian lynx territory. It will have its' population of wild rabbits, natural sources of water, natural and artificial shelter and some degree of habitat management. Animal monitoring intensity is to be variable and simulate natural settings to the extent possible.

The enclosure is to be fenced by a 3-meter high wall in wire mesh, with an additional 1 meter at a 45° degree angle on the top to the inside of the enclosure. An electric wire fence system will be installed at the top of it as an additional safety measure. The fence must be buried at least one meter below ground, supported by an horizontal 2 meter gravel band towards the inside of the enclosure (fig.4).



The fence should be equipped with a video surveillance system. A 15-meter wide fire cut line will be created all around the enclosure. Vegetation 5 meters to the inside of the enclosure will also be periodically cut to prevent animals escaping using tree branches.

The enclosure can be accessed through a fenced corridor separating the two enclosures. This “common” corridor will be approximately 2 meters wide and will be equipped with mechanical doors, operated from the exterior. Access can also be made from two **access chambers** at both sides of the top of the valley.

The **access chambers** are planned to control access to and from the enclosure at contact points with the road network present at both sides of the valley. These completely fenced areas will allow agricultural machinery and all-terrain vehicles to access the enclosure in a two-step way, minimizing the risk of animals escaping.

b) The small enclosure and watch tower

The small enclosure is to be located at the bottom of the valley, occupying an area of approximately 1ha. This enclosure is planned to test soft release protocols. Animal monitoring, husbandry and habitat management are to be more intensive, similar to the management of captive lynxes if necessary. It will have natural and artificial shelter and sources of water, wild rabbit, natural behavioural enrichment elements, and access to supplementary feeding. Fencing, fire cut lines and video surveillance will be similar for both animal enclosures. A watch tower will be built next to the enclosure to monitor lynxes in both enclosures.

We can access the enclosure through the 'big' enclosure as described above and through an access chamber, similar to the ones found at the big enclosure, to be placed next to the watch tower. The access chamber doors will also be fitted with smaller doors for access to operators only.

The watch tower (fig. 5) will be placed near the access chamber overseeing the small enclosure and part of the big enclosure. The ground floor is destined to the supplementary feeding using a drawer system, avoiding visual contact between animals and operators in the process. During feeding animals will be monitored through the video surveillance system and possibly through one-way windows. The first floor is currently planned for storage, the second for water collection tanks, and the third for observation of animals in both enclosures.

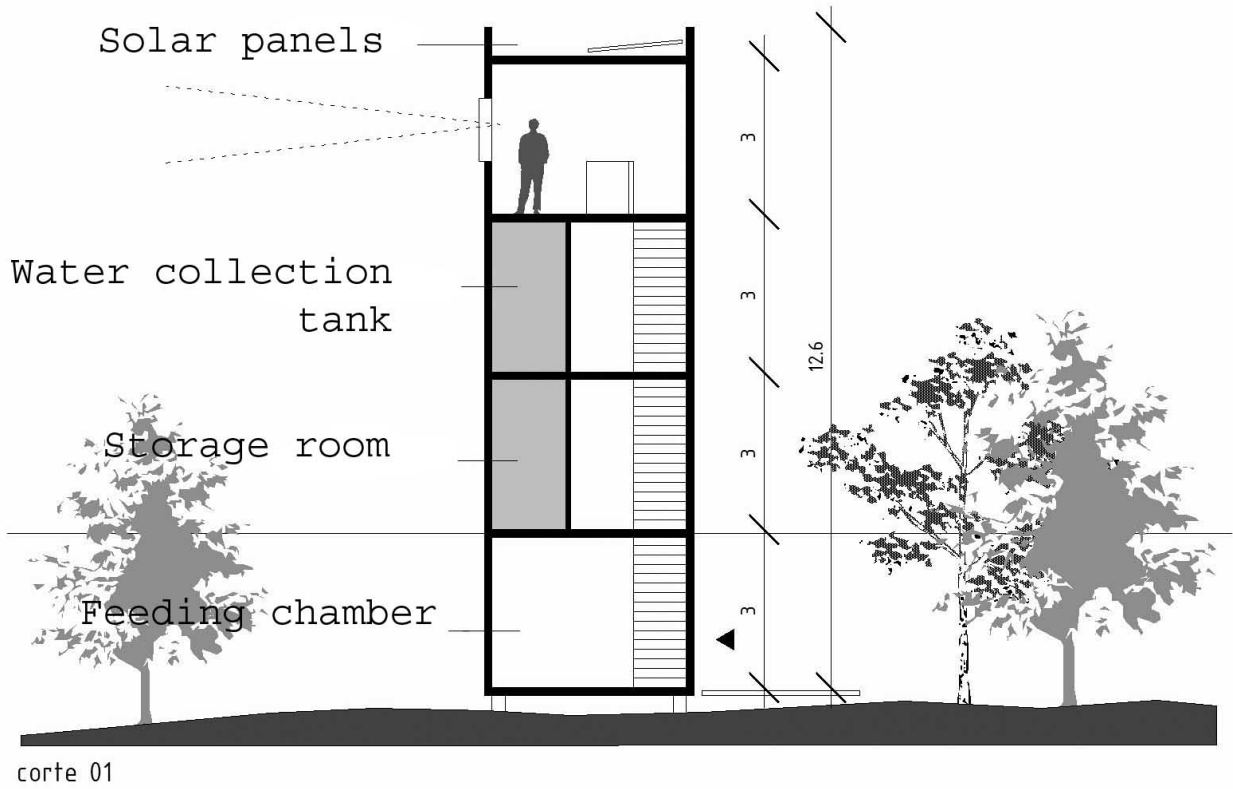


Fig.5 The watch tower

7. Calendar and Budgeting

The projected buildings and animal enclosures will be completed 12 to 18 months after the reception of the architects' project next May. Budgeting will begin after its completion and it's expected to reach the values estimated for exclusive captive breeding centres.

The acquisition of equipments must be decided later by the team chosen to conduct the centre's work. This list of equipments will be decided according to the centre's needs and the recommendations of the CCCLI.

The RNSM will provide the technical and scientific management of the centre, which will be unified under CCCLI management. The personnel to be hired – a part-time veterinarian, one keeper and one part-time keeper – must be trained in El Acebuche and in Jerez zoo for a minimum of 1 month. Operational costs are thought to be equivalent to those of associated breeding centres.

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