lynxconnect

IBERIAN LYNX

Training for trainers

Coordinator beneficiary:

Junta de Andalucía

Associated beneficiaries:

This document has been produced by the Project Team of the LIFE NATURE AND BIODIVERSITY 19NAT/ES001055 LINXCONNECT: “CREATING A GENETICALLY AND DEMOGRAPHICALLY FUNCTIONAL METAPOPULATION OF IBERIAN LINX (*Lynx pardinus*)”.

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GENERAL SECTION

01

INTRODUCTION

The LIFE 19NAT/ES001055 LYNXCONNECT project, ‘Creation of a genetically and demographically functional metapopulation of Iberian lynx (*Lynx pardinus*) (2020-2025)’, is the fourth LIFE project approved by the European Commission for the conservation of the Iberian lynx. Connecting all existing lynx population centres requires not only measures related to population management, but also the implementation of land stewardship and social participation tools.

The project promotes the design and implementation of a Training for Trainers Plan, whose main objective is to train those responsible for training the target audience (primary and secondary school teachers, driving instructors and law enforcement agencies).

This handbook has been produced as a resource to support this training and is divided into two sections. The first, common to all target groups of the Training Plan, covers the main aspects related to the biology, habitat and distribution of the Iberian lynx. The second has been developed specifically for each of the target groups, including tools and methodologies to improve and facilitate the transfer of knowledge to students in the case of teaching staff, and a compilation of the regulations and protocols for law enforcement agencies.

These materials are intended to facilitate the work carried out by the groups targeted by the Training Plan for Trainers within the framework of their competences, raising awareness in settings other than the traditional school context.

02

AN APPROACH TO THE SPECIES

1. EVOLUTION AND DISTRIBUTION

The Iberian lynx (*Lynx pardinus*, Temmick, 1827), endemic to the Iberian Peninsula, is one of the most endangered felines in the world and the most endangered in Europe. Our lynx is characterised by its short, spotted coat, pointed ears with black ear tufts (brushes) and a prominent facial ruff. It is relatively small in size compared to other big cats, and its body is agile and slender, allowing it to move quickly and discreetly. Beyond the importance of the species itself, it is a symbol of the biodiversity of the Iberian Peninsula, and its protection is key to the conservation of the ecosystems in which it lives.

There are currently four lynx species worldwide. In North America, there is the bobcat (*Lynx rufus*) and the Canadian lynx (*Lynx canadensis*). The Eurasian lynx (*Lynx lynx*) is native to much of Eurasia, but it is the Iberian lynx (*Lynx pardinus*) that has the most restricted distribution, as it is exclusive to the peninsula of the same name.

Fig. 1. Distribution of the species in 2023.

The species reached its maximum distribution in the Upper Pleistocene, occupying the entire Iberian Peninsula, southern France, and part of central Europe. There are three moments in which a decline in its genetic variability has been detected. The first coincides with the last glaciation and the arrival of *Homo sapiens* in Europe (approximately 47,000 years ago); the second occurred about 300 years ago; the last, the best known and most recent, took place during the 20th century. During the first half of this period, populations disappeared from the north of the Central System, the Iberian System, the Mediterranean arc and the Subbetic mountain ranges. Between 1950 and 1990, the area occupied by the lynx decreased by 80%, entering into a continuous decline. The lowest known population was in 2002, when the first census-diagnosis carried out on a peninsular scale reduced the number of lynx to approximately 100 specimens distributed in two isolated areas, Doñana and Sierra Morena Oriental (Andújar-Cardeña).

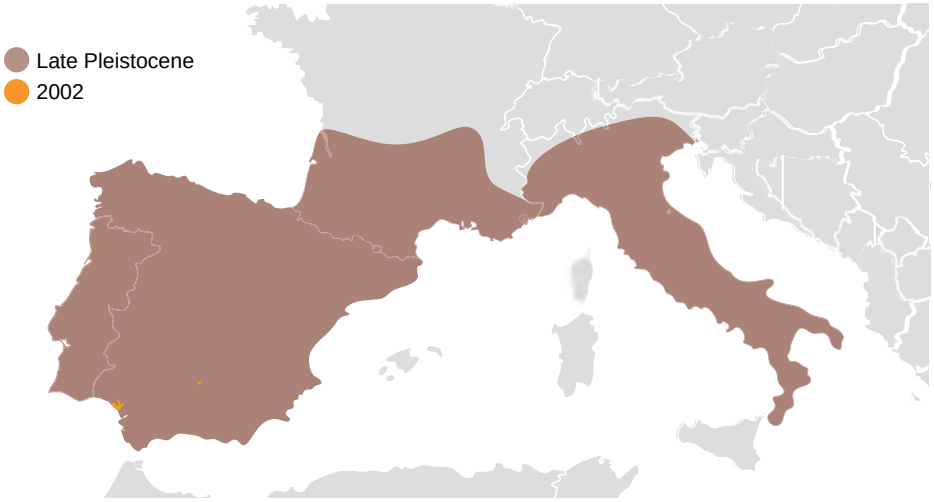


Fig. 2. Evolution of the geographical distribution of the Iberian lynx.
A) Distribution area approximately 40,000 years ago (Late Pleistocene).
B) Distribution area in 2002.

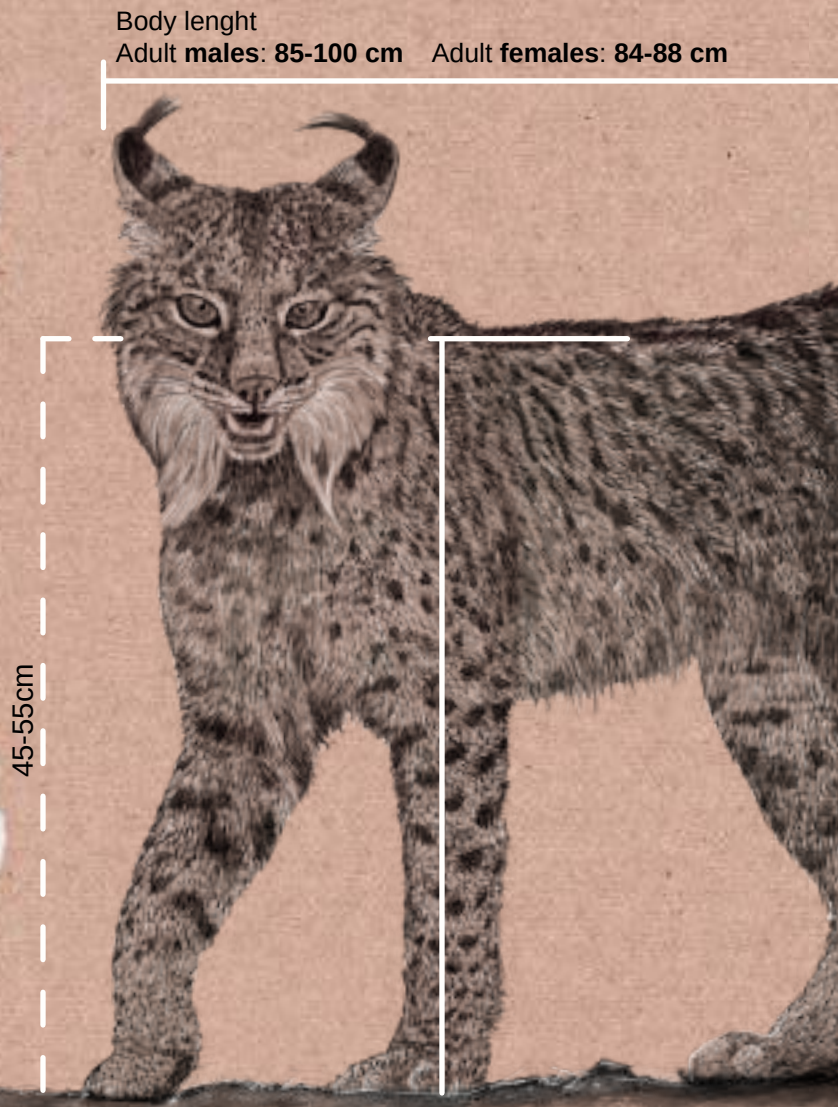
The main causes of the decline of the Iberian lynx are anthropogenic, with roadkill and illegal hunting having the greatest impact. Apart from these, the main threats hindering the recovery of the species are the decline in rabbit abundance and the alteration, fragmentation and loss of quality of its habitat resulting from agroforestry intensification, changes in hunting management, large infrastructure projects, etc. The loss of genetic variability and increased inbreeding have also led to a reduction in biological efficiency and high mortality from disease.

Among the pathogensaffecting the Iberian lynx, the three main agents that have been shown to cause mortality in the species, due to their potential as population regulators, are feline leukaemia virus (FeLV), tuberculosis (TB) and canine distemper virus (CDV). FeLV affects and is transmitted from domestic and wild cat populations (*Felis catus* and F*elis sylvestris*), CDV to carnivores, and TB can be transmitted from wild ungulates.

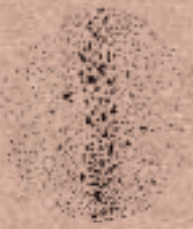
As far as the social perception of the species is concerned, it is very favourable to its presence, recovery and reintroduction. There are very sporadic situations of social rejection that slow down or limit the settlement of the species in some areas. This rejection is partly motivated by the interference that can be generated between lynx and domestic animals, whose commercial or non-commercial farms (sheep and goat herds, poultry farms or chicken coops) may suffer occasional attacks by the feline.

2. CHARACTERISTICS

- Medium-sized feline.
- Slender body, long legs and short tail. Adapted to hunting wild rabbits and the Mediterranean climate.
- Habits: mainly nocturnal and crepuscular.



Spotted coat that allows it to camouflage itself and go unnoticed among the grass and Mediterranean scrub. The spots and patterns are specific to each individual and allow for the identification and census of specimens.
There are three types of spots: small, medium and large spots.

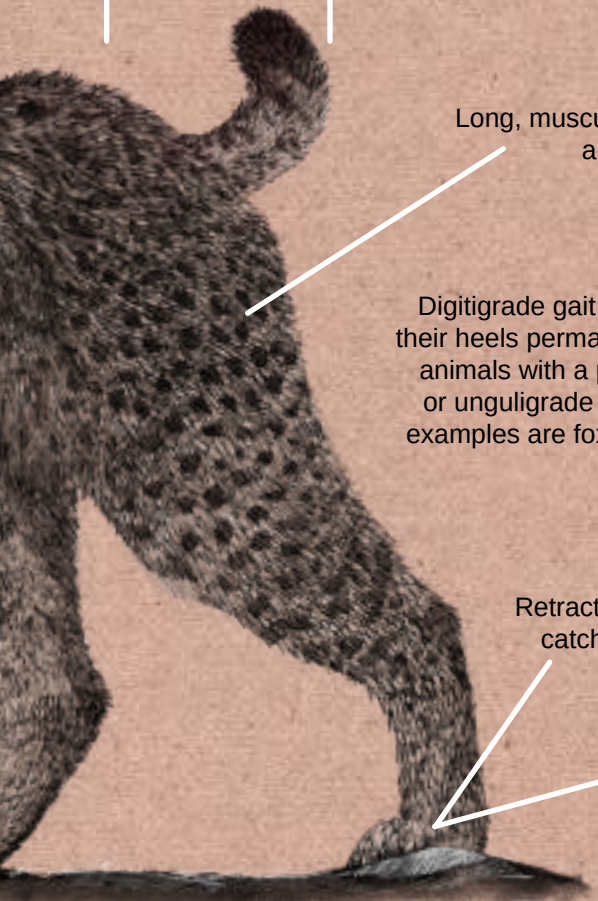


10-15 years

8-10 KG
Adult **females**

10-15 KG
Adult **males**

14 cm



Long, muscular hind legs, adapted for jumping and short, powerful runs.

Digitigrade gait: they walk on their toes, keeping their heels permanently raised. They are faster than animals with a plantigrade (e.g. bears, badgers) or unguligrade (e.g. deer, wild boar) gait. Some examples are foxes, wolves, lynx and wild rabbits.

Retractable claws to catch their prey.

Eyes positioned at the front, large round pupils. This allows for three-dimensional vision and the ability to see in dark conditions.

Ear tufts (brushes) and long whiskers that, in addition to blurring the contours of the face, send visual signals about the individual's mood.

The dentition is that of a strict carnivore, with large canines to deliver the fatal blow, carnassial teeth to tear large pieces of flesh, and small incisors.

3. FEEDING

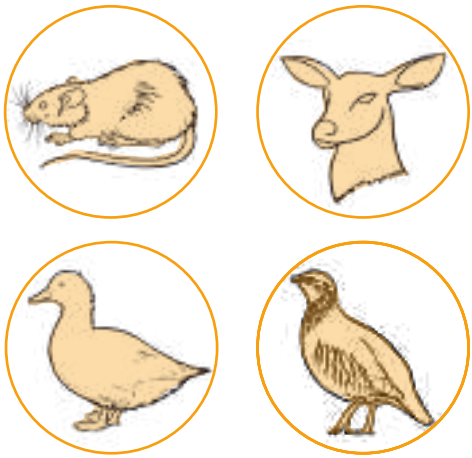
The lynx is a predator that specialises in hunting wild rabbits (*Oryctolagus cuniculus*), which make up between 85 and 100 per cent of its diet — a figure that can vary between different populations. The smaller size and lower energy requirements of Iberian lynx compared to European lynx are most likely due to parallel evolution between lynx and rabbits. The lynx's diet may also include small mammals (rodents), birds, reptiles and even ungulates.

85-100%

To meet its trophic needs, an adult male weighing 15 kg needs approximately 912 kcal/day, and an adult female weighing 10 kg needs approximately 673 kcal/day, which is equivalent to the consumption of one adult rabbit per day. These energy requirements undergo seasonal changes, being higher during winter, for example, and also depending on the breeding season, especially in the case of females. A breeding female with two young needs approximately three rabbits per day. The joint evolution of prey and predator can also be seen in the fact that the lynx's breeding season coincides with the peak rabbit population in early summer.

The specialisation is such that, despite the general decline in rabbit populations, the Iberian lynx does not change its diet, nor does it substitute other alternative prey.

The lynx hunts by stalking its prey, attacking with a leap or a short run and without pursuing it if it misses. It prefers to try again with new prey, which it will kill quickly with a bite to the back of the neck.



In the case of larger prey such as ungulates, it will suffocate them by biting the front of the throat, and if the prey is birds, it will bite the upper back, between the wings. The size of the prey also determines how and where it is consumed, so that smaller prey (rabbits and birds) are carried to a quiet, sheltered place to be devoured, starting with the head and leaving behind skin, paws or feathers. When the prey is larger, it is consumed on the spot, and the remains may be partially buried with earth or branches to be eaten again over several days. It does not often consume animals that it has not killed itself.

The abundance of wild rabbits plays a fundamental role in the population dynamics of the lynx, determining such important aspects as its reproductive capacity and survival rate.

An essential part of the conservation measures implemented since 2002 have been aimed at managing wild rabbit populations, primarily focused on improving habitat, creating refuges and strengthening populations, with the aim of improving the area with prey presence and increasing the density of specimens.

4. HABITAT

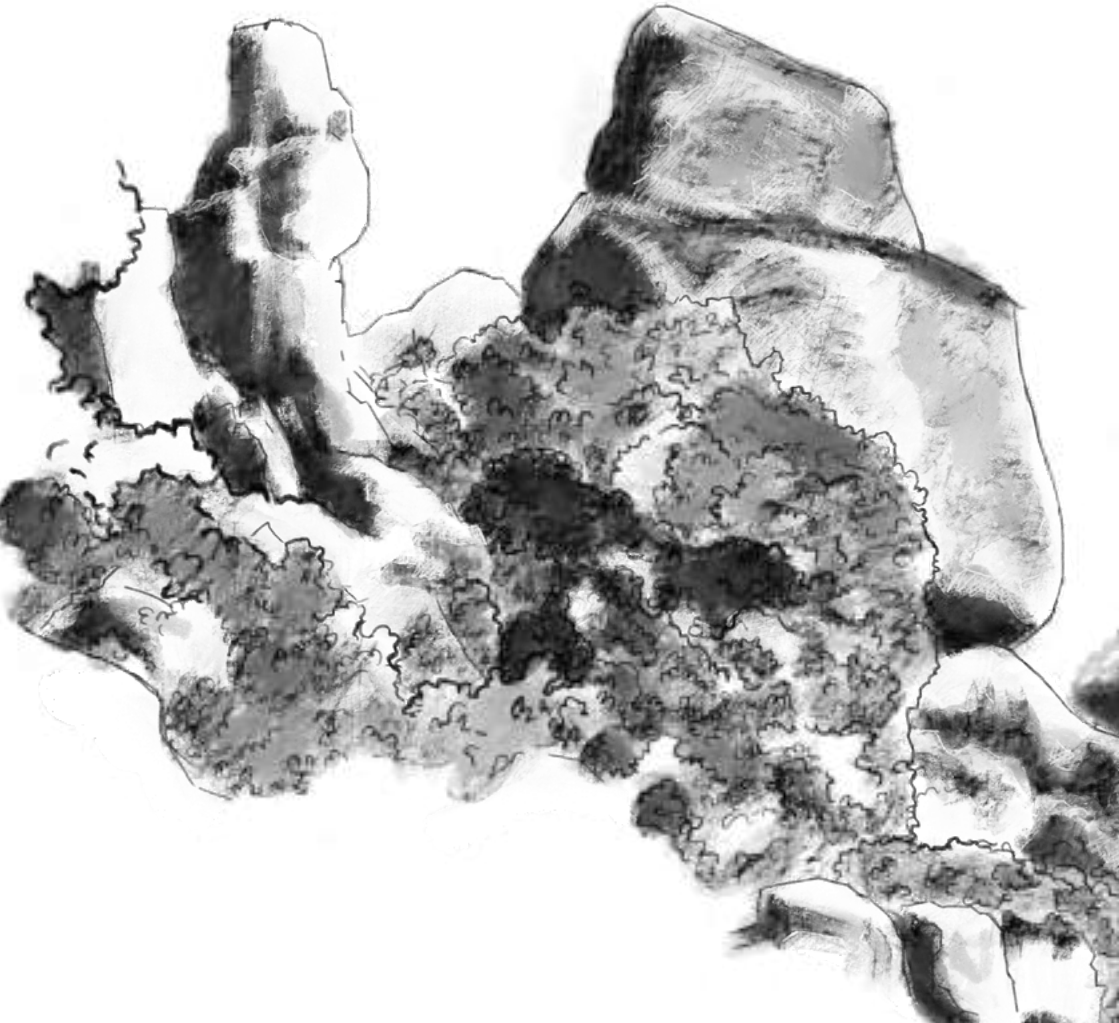
The optimal habitat for the Iberian lynx is Mediterranean scrubland and woodland, on which it is strictly dependent: the decline in the population in the second half of the 20th century is closely linked to the loss of this habitat.

The species' use of its habitat varies, preferring dense areas with rocks and dense vegetation cover for resting and edge areas for hunting rabbits. It can also inhabit scattered wooded formations (olive groves or pastures) with patches of scrub and riparian vegetation. Breeding dens are located in rocky areas or even in hollow trees.

Studies indicate that the average scrub cover in territorial lynx territories is 55%, with scrub cover of between 20 and 80% considered adequate. The ideal situation is the presence of abundant shrub cover interspersed with grassland areas, with large ecotone zones between the two, as this heterogeneous vegetation structure offers the best options for shelter and food availability for rabbits.

The home ranges of adult lynx remain defined throughout their lives, with males having larger ranges. The size of these ranges varies between 4 and 20 km^2, depending on sex and rabbit abundance. The average size of the territory of a potentially reproductive female is around 600 ha.

Habitat is one of the most limiting factors in terms of the species' distribution. Habitat loss and degradation is the main long-term threat, but losses due to urban development, connectivity and climate change are also significant. These can cause major changes in the survival of the lynx itself, as it is a specialist of the Mediterranean scrubland, and in the status of rabbit populations.



Some of the habitat improvement measures being implemented for the recovery of the Iberian lynx are:

» Improving shelter and food for wild rabbits
  - Heterogenisation of the plant structure, promoting the development of native Mediterranean vegetation
  - Protection of existing rabbit warrens
  - Improving food availability through clearing, sowing or providing seeds in feeders
  - Creating water points

» Reintroducing wild rabbits
  - Reinforcement population through rabbit enclosures, consisting of large areas (approx. 4 ha), which allow the population to develop while excluding potential predators
  - Free reinforcement of rabbits with mesh, in which reintroduction is carried out in groups of warrens that are protected with mesh for at least 24 hours
  - Free reinforcement of rabbits without mesh, as above, but without fencing the warren

» Management of rabbits used for reintroduction. A number of aspects will be taken into account for the selection and management of the specimens used, such as their origin, giving priority to populations close to the recipient and of the same subspecies, and the date of release, so that they occur sufficiently in advance of the breeding and rearing season

» Involvement of local owners and managers

5. INTERACTION WITH OTHER SPECIES

The presence of lynx can ‘shape’ the trophic structure of an area. As a superpredator, it can regulate the abundance of other opportunistic mesocarnivores such as foxes, mongooses, genets, etc., so that these are less abundant in the feline’s domain, having a positive impact on small prey populations such as rabbits and partridges.

6. TERRITORIAL BEHAVIOUR

The lynx is a territorial animal. This means that, while resources are optimal, it frequents a territory that it defends from other intruders of the same or competing species (e.g. foxes, mongooses and feral cats). The size of its territory and how well it defends it depends on the availability of food and sex. Males have larger territories. A male’s territory may overlap with those of several adult females, but generally does not overlap with those of other males. The lynx marks its territory with urine and excrement at key points on paths, trails and obligatory wildlife crossings, and sometimes next to the remains of consumed prey, in order to exclude other members of the same species.

These scent marks are used to delimit the territory and mark important resources, such as water points, as their own. These deposits are often made in groups (latrines or dung piles). These marks also serve as an effective communication system, enabling females and males to be aware of each other’s presence and degree of receptivity as the breeding season approaches.

Fig. 3. Lynx droppings.

7. REPRODUCTIVE CYCLE

Between approximately eight months and one year of age (the latter being less common), young lynx begin to become independent and seek their own territory. Until this point, the sexual dimorphism easily seen in adult specimens does not exist. This is the most delicate and critical time for their survival, as it is a stage with high mortality rates, mainly due to factors related to human impact on the environment: roadkill, persecution, etc., as well as malnutrition and disease.

During this period, they can sometimes travel long distances, crossing areas such as roads or urban areas, demonstrating their ability to “avoid” unsuitable habitats, provided there are riverbanks, crops or tracks that serve as corridors. The dispersal period varies in length, from a few weeks to almost two years, after which the habitats used are usually of lower quality than those used by resident animals or those occupied prior to dispersal.

This dispersal of young individuals is usually related to times when rabbits are more abundant, with higher dispersal rates in years of scarcity. There are no differences between the sexes in terms of age, time of year or distance, although it does seem to be related to the return to high reproductive activity of the parents.

Sexual maturity is normally reached around one year of age and the mating season takes place between December and February, with females that do not become pregnant mating somewhat later. Urine markings that indicate reproductive status, as well as confrontations between territorial males and suitors, take place increasingly closer to the female, both during the day and at night.

As with other felines, mating is accompanied by a whole ritual of growling, head-butting... these are patterns of behaviour that will culminate in a period of just three days where both partners copulate, play and hunt together. It is very important that, as this mating period is so short, peace and quiet are ensured and disturbances are avoided so as not to interfere with the behaviour of the species.

Generally, the female will continue the gestation and rearing of the cubs alone. However, the male usually fulfils the role of protector, marking the territory and preventing other intruding males from entering and even killing the cubs, as occurs in other felines. There is also evidence of males providing food for the cubs. The birthing period usually ranges from March to April, although there may be fluctuations depending on the abundance of rabbits.

Gestation lasts about 65 days, after which the female will give birth to 2 to 4 cubs. The birthing dens are located in rocky burrows, brambles, thick scrub and even tree stumps or underground burrows abandoned by other species. It is common for the female to move the cubs to a new location to prevent disease, parasitism or to make it more difficult for potential predators or other males to find them. Early mortality is high in this species, with only two cubs surviving weaning in 90% of cases, and it is usually the smallest cubs that have the lowest survival rate.

The young remain with their mother for months, usually until she comes into heat again. Trophic independence is achieved gradually, with weaning beginning at three months. By seven months, the young spend only 60% of their time with their mother, decreasing to 2% at eleven months.

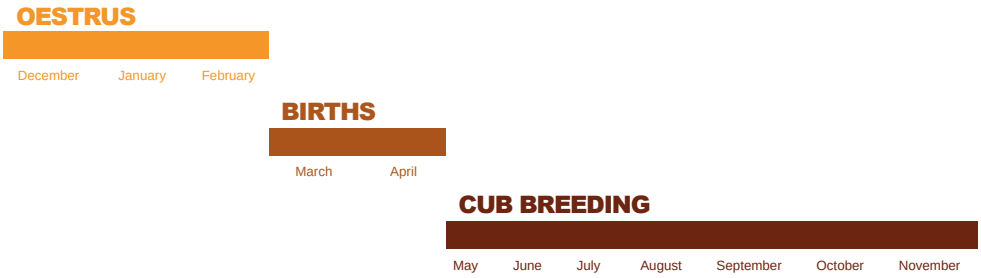


Fig. 4. Reproductive cycle diagram.

03

SPECIES REGRESSION AND RECOVERY

1. ON THE BRINK OF EXTINCTION

At the end of the 20th century, alarm bells were ringing: the emblem of Iberian wildlife was suffering a dramatic decline that was leading to its disappearance.

Half a century earlier, the lynx was considered vermin and its fur was highly prized. It was therefore hunted and persecuted in every possible way, which was the main cause of its disappearance from large areas of favourable habitat. Combined with the emergence of new diseases in its main prey, wild rabbits, and the fragmentation of its habitat, which resulted in inbreeding, this brought the species to the brink of extinction in 2002. Only two isolated populations of fewer than 50 adult individuals remained: Doñana and Andújar-Cardeña. The time had come to save the world's most endangered feline.

2. RECOVERY OF THE SPECIES

Given the delicate situation of the species, in February 1999 the first Strategy for the Conservation of the Iberian Lynx in Spain was approved. Since then, conservation measures have been implemented that have significantly reduced the risk of extinction for the species. To this end, the population has been increased by promoting the abundance of rabbits and reducing threats, optimising genetic variability and establishing new self-sustaining nuclei in Portugal, Andalusia, Castile-La Mancha and Extremadura. In relation to the latter, areas suitable in terms of size, quality, rabbit density, low risk of death and adequate social support have been selected, where genetically selected specimens have been released and subsequently monitored.

The Andalusian and national administrations' recovery efforts, as well as the concern of society, were joined by those of the European Union. Through various LIFE projects, the EU financed a significant part of the work to save the Iberian lynx.

The LIFE programmes co-financed by the European Commission have contributed to the implementation of the priorities established in the regulations for the protection of the lynx, as well as in its recovery and action plans. Several approved projects have benefited the Iberian lynx from 1994 to the present day and have been and continue to be of essential importance in providing the necessary financial support for the conservation actions proposed and undertaken by public and private entities. The recovery of the species has been supported by three consecutive LIFE projects, which between 2002 and 2010 achieved the consolidation of the isolated populations of Doñana and Andújar-Cardeña. The next step was to recover areas of distribution prior to the decline of its populations through the reintroduction of specimens, as well as connecting the existing populations in the province of Jaén, tasks that were carried out between 2011 and 2018. In 2010 and 2011, the creation of populations in the Guadalmellato Valley (Córdoba) and the Guarrizas Valley (Jaén) began through the reintroduction of individuals. From 2014 onwards, part of the work focused on creating population centres outside Andalusia, with reintroductions in Montes de Toledo (Toledo), southern Ciudad Real (Campo de Calatrava and Campo de Montiel), Valle del Matachel (Badajoz) and Vale do Guadiana (Bajo Alentejo, Portugal).

Increasing numbers through the reintroduction of specimens is the main action for the long-term recovery and maintenance of the species. The LIFE Lynxconnect project establishes a protocol for identifying potential areas that could support viable long-term lynx populations. Some of the characteristics of these areas are that they have a minimum continuous area of 10,000 ha of suitable habitat, i.e. they have an adequate structure and density of rabbits.

Regarding the released specimens, the lynx has demonstrated its ability to adapt well to the release areas. This applies to both wild specimens and those from captive breeding, with an average survival rate of 71%. Wild specimens from other areas have better survival rates (up to 81%) than those bred in captivity (60%). Both groups undergo health checks before release, and the latter undergo a programme of adaptation to freedom beforehand.

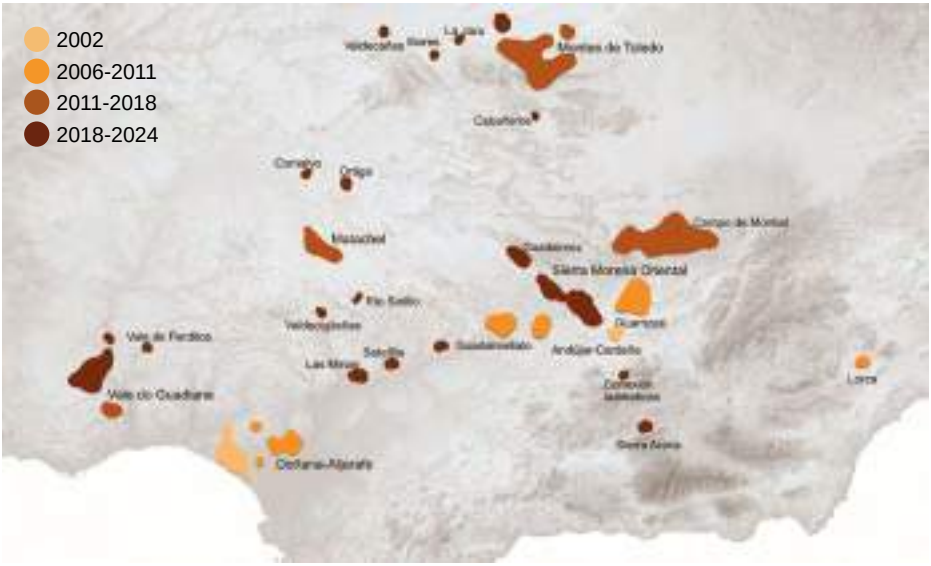


Fig. 5. Evolution of the recovery of Iberian lynx populations on the peninsula.

3. AN UNCERTAIN BUT PROMISING FUTURE

Despite all the work carried out, the viability and future of Iberian lynx populations remains uncertain. Connecting existing population centres is essential to achieve metapopulation integration, which will produce a genetic flow that ensures the long-term sustainability of the species.

This is why a fourth LIFE project, called LYNXCONNECT (LIFE 19NAT/ES001055 LYNXCONNECT 'Creation of a genetically and demographically functional metapopulation of Iberian lynx (Lynx pardinus) (2020-2025)', has been created and developed. The project aims to continue the conservation plans from previous stages and implement 33 new strategic conservation actions. These actions are intended to consolidate and connect emerging populations and ensure demographic and genetic viability, as these are considered the most pressing threats to the species. A key aspect is the project's transnational nature, necessitating effective collaboration between Spain and Portugal. Work plans must transcend political and administrative boundaries so that the species recovery process is a joint effort involving the countries and autonomous communities concerned.

The achievement of a large Iberian metapopulation of the species and, therefore, its long-term conservation, requires the promotion of demographic and genetic exchange between the different lynx populations, thus ensuring that these populations and the species as a whole remain self-sufficient. Connectivity between already stable populations and reintroduction areas plays a very important role in this regard. This requires ensuring an adequate distribution of reintroduction areas (in relation to each other and also in relation to already stable population areas) and adequate management of the territorial matrix, ensuring functional connectivity between populations, either through the conservation or restoration of corridors or through actions that reduce the barrier effect of linear infrastructure and other landscape elements.

As a result of the efforts made by the various administrations to conserve the species, in June 2024 it was finally removed from the 'Endangered' category of the Red List of Threatened Species, thanks to a 'spectacular recovery process'. Since then, it has been considered 'vulnerable', according to the latest update of the list.

SPECIFIC SECTION

01

LEGISLATIVE FRAMEWORK

1. INTERNATIONAL AND COMMUNITY SCOPE

At the Community level, the Iberian lynx is included in Annex II (species of Community interest whose conservation requires the designation of special areas of conservation) and Annex IV (species of Community interest requiring strict protection) of the Habitats Directive (92/43/EEC), and in Appendix II (strictly protected fauna species) of the Bern Convention on the Conservation of European Wildlife and Natural Habitats.

It is also included in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and Annex A of Council Regulation (EC) No 338/1997 of 9 December 1996 (amended by Commission Regulation (EU) 2019/2117 of 29 November 2019 and by Commission Regulation (EU) 2023/966 of 15 May 2023), on the protection of species of wild fauna and flora by regulating trade therein, which regulates captive breeding and the movement of individuals.

Scope	Regulation/Document	Link
International	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Appendix I.	https://cites.org/esp/disc/text.php
Community	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and wild fauna and flora. Annex II-Animal and plant species of community interest whose conservation requieres the designation of special areas of conservation.	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1992L0043:20070101:es:PDF
	Bern Convention. Council Decision, of 3 December 1981, concerning the conclusion of the Convention on the conservation of European wildlife and natural habitats. Appendix II-Strictly protected fauna species.	https://www.miteco.gob.es/es/biodiversidad/legislacion/leg-internacional-berna.html
	Council Regulation (EC) No 338/1997 of 9 December 1996, on the protection of species of wild fauna and flora by regulating trade therein. Annex A.	https://eur-lex.europa.eu/legal-content/ES/TXT/HTML/?uri=CELEX:01997R0338-20230520

2. NATIONAL AND REGIONAL SCOPE

The Spanish Catalogue of Threatened Species classifies the Iberian lynx as an ‘endangered’ species and, therefore, it is included in the List of Wild Species under Special Protection (RD 139/2011, “of 4 February, ‘for the development of the List of Wild Species under Special Protection and the Spanish Catalogue of Threatened Species”). According to Law 42/2007, on Natural Heritage and Biodiversity, as it is included in the ‘endangered’ category, the species must be subject to specific recovery plans, which are drawn up and approved by the Autonomous Communities. In Andalusia, Law 8/2003, of 28 October, on Wild Flora and Fauna, adopts this same catalogue and modifies it, with no changes in relation to the lynx with respect to national legislation.

Also, in application of Law 42/2007, RD 1057/2022, of 27 December, which approves the State Strategic Plan for Natural Heritage and Biodiversity to 2030, includes conservation actions that favour the Iberian lynx.

The species has had two strategic frameworks at the Spanish national level, the first approved in 1999 and the second in 2007. The third Iberian Lynx Conservation Strategy was approved jointly for Spain and Portugal in July 2024, a significant change in view of the supranational distribution of its populations.

The Spanish regions where the Iberian lynx is currently present include it as an ‘endangered’ species in the following catalogues:

- Andalusia. Decree 23/2012, of 14 February, attached to Law 8/2003, of 28 October, on the wild flora and fauna of Andalusia.
- Extremadura. Decree 37/2001, of 6 March, attached to Law 8/1998, of 26 June, on the Conservation of Nature and Natural Areas in Extremadura.
- Castilla-La Mancha. Decree 33/1998, of 5 May, and its amendment in Decree 200/2001, attached to Law 9/1999, of 26 May, on Nature Conservation in Castilla-La Mancha.
- Murcia. Law 7/1995, of 21 April, on wildlife in the Region of Murcia (Annex I).

With regard to recovery plans, these autonomous communities have the following official documents in force:

- Andalusia: Agreement of 18 January 2011, of the Governing Council, approving the recovery and conservation plans for certain wild species and protected habitats, and the Order of 20 May 2015, approving the action programmes of the Recovery and Conservation Plans for listed species in Andalusia. Annex I. Action programme of the Iberian Lynx Conservation Plan 2015-2019.
- Castilla-La Mancha: Decree 276/2003, of 9 September 2003, approving the Recovery Plan for the Iberian Lynx (Lynx pardinus) and declaring areas critical for the survival of the species in Castilla-La Mancha to be sensitive areas. Amended by Decree 67/2008, of 13 May, and currently under review.
- Extremadura: Order of 5 May 2016, approving the Recovery Plan for the Iberian Lynx (Lynx pardinus) in Extremadura.
- Murcia: the decree implementing the Iberian Lynx Recovery Plan is currently in the draft stage, with the prior public consultation phase having been completed at the time of writing.

Scope	Regulation/Document	Link
Supranational (Spain and Portugal)	Strategy for the conservation of the Iberian lynx.	https://www.miteco.gob.es/es/biodiversidad/publicaciones/pbl-fauna-flora-estrategias-lince.html
National	RD 139/2011, “of 4 February, ‘for the development of the List of Wild Species under Special Protection and the Spanish Catalogue of Threatened Species” and its amendments.	https://www.boe.es/buscar/act.php?id=BOE-A-2011-3582
	Law 42/2007, on Natural Heritage and Biodiversity.	https://www.boe.es/buscar/act.php?id=BOE-A-2007-21490
	RD 1057/2022, of 27 December, which approves the State Strategic Plan for Natural Heritage and Biodiversity to 2030.	https://www.boe.es/buscar/act.php?id=BOE-A-2022-23751
Regional Andalusia	Law 8/2003, of 28 October, on Wild Flora and Fauna.	https://www.boe.es/buscar/act.php?id=BOE-A-2003-21941&p=20081211&tn=2
	Decree 23/2012, of 14 February, regulating the conservation and sustainable use of wild flora and fauna and their habitats.	https://www.juntadeandalucia.es/boja/2012/60/6
	Agreement of 18 January 2011, of the Governing Council, approving the recovery and conservation plans for certain wild species and protected habitats.	https://www.juntadeandalucia.es/boja/2011/25/1
	Order of 20 May 2015, approving the action programmes of the Recovery and Conservation Plans for listed species in Andalusia.	https://www.juntadeandalucia.es/boja/2015/100/BOJA15-100-00002-9363-01_00070470.pdf
Regional Extremadura	Law 8/1998, of 26 June, on the Conservation of Nature and Natural Areas in Extremadura.	https://www.boe.es/buscar/act.php?id=BOE-A-1998-20256
	Decree 37/2001, of 6 March, regulating the Regional Catalogue of Threatened Species of Extremadura.	https://doe.juntaex.es/pdfs/doe/2001/300o/01040040.pdf
	Order of 5 May 2016, approving the Recovery Plan for the Iberian Lynx (*Lynx pardinus*) in Extremadura.	https://doe.juntaex.es/pdfs/doe/2016/900o/16050104.pdf

Regional Castilla-La Mancha	Law 9/1999, of 26 May, on Nature Conservation in Castile-La Mancha.	https://www.boe.es/eli/es-cm/l/1999/05/26/9/con
	Decree 33/1998, of 5 May 1998, Governing Council, creating the Regional Catalogue of Threatened Species of Castile-La Mancha.	https://docm.jccm.es/portaldocm/detalleDocumento.do?idDisposicion=123061563212731534
	Decree 276/2003, of 9 September 2003, approving the Recovery Plan for the Iberian Lynx (*Lynx pardinus*) and declaring areas critical to the survival of the species in Castile-La Mancha to be sensitive areas.	https://www.castilla-lamancha.es/sites/default/files/documentos/20120511/linceiberico.pdf
	Decree 67/2008, of 13 May 2008, establishing the assessment of endangered wildlife species.	https://docm.jccm.es/docm/descargarDisposicionAntiguado?ruta=2008/05/16&idDisposicion=123062527407550187
Regional Murcia	Law 7/1995, of 21 April, on wildlife, hunting and river fishing.	https://www.boe.es/buscar/act.php?id=-BOE-A-1995-13301
	Draft decree implementing the Iberian Lynx Recovery Plan.	https://transparencia.carm.es/-/plan-de-recuperacion-del-lince-iberico

02

REGULATIONS AND CONSIDERATIONS IN CONSERVATION OF IBERIAN LYNX

In order to understand the importance of applying certain legal measures related to the conservation of the Iberian lynx, we must take into account the many factors and threats that limit its evolution as a species, its ability to disperse and the maintenance of its populations.

There are three major factors that could limit the survival of this very specific feline: the degree of habitat conservation, the availability of food and unnatural mortality.

The first two, which we could call ‘indirect’, are related to both its diet and its habitat. If the ecosystems where the lynx or its prey live are altered, we will face the first major obstacle to its conservation.

In particular, the change in the use of our woodlands is a threat that endangers the delicate balance of the Mediterranean scrubland ecosystem. Article 40 of Law 43/2003 of 21 November (BOE No. 280 of 22 November 2003), regulates that such a change is only possible if there are reasons of general interest. Of course, it is prohibited to change the use of land after a forest fire; moreover, it is mandatory to restore the affected area.

In relation to the availability of food, the lynx’s dependence on wild rabbits is a limiting factor, with the evolution of its populations being contingent on the availability of this prey. In general, the Iberian Peninsula has suffered a significant decline in rabbit populations since the middle of the last century, with a marked negative trend despite local overabundances.

The main causes of this population decline are viral diseases (myxomatosis and viral haemorrhagic disease) and the loss of the mosaic structure of the landscape and the reduction of trophic resources and shelter, the latter mainly as a result of soil changes and intensive agriculture. The management of wild rabbit populations is complicated by the fact that they are the main small game species and, at the same time, the species that causes the most damage to agriculture. Measures to improve their health and population status include actions to improve their habitat, create shelters and reinforce the population.

In the case of repopulation carried out by hunting grounds, this type of activity is generally subject to obtaining the corresponding authorisation from the competent authority, provided that the health protection and genetic diversity of the species in the affected area are guaranteed.

With regard to hunting, the presence of lynx in a hunting reserve does not prevent hunting from taking place there, provided that all the relevant legal requirements are met. The hunting of wild species must, in principle, be compatible with the conservation and protection of endangered species. This means that the measures planned for each area must be taken into account in order to know exactly the limitations of hunting activity due to the conservation requirements of a species such as the one in question.

Finally, in relation to 'direct' factors, we find four causes of unnatural mortality resulting from human actions:

- Direct death (roadkill and other linear infrastructure, poisoning, illegal persecution, etc.)Muerte directa (atropellos en carreteras y otras infraestructuras lineales, envenenamiento, persecución ilegal,…)
- Drowning in water storage infrastructure.
- Invasive or feral species (predation or disease).
- Disturbances during critical periods.

During the LIFE Iberlince project (2011-2018), roadkill accounted for an annual mortality rate of 6% (32% of deaths) and illegal persecution for 5% (24% of deaths).

Illegal persecution occurs in three main scenarios: retaliation for attacks on domestic animals, management of hunting grounds that includes non-selective methods of predator control (traps, snares, cage traps and poison) and shooting.

Concerning the offence of killing a protected species, Article 334.1 of the Criminal Code establishes that: "*Anyone who, in contravention of laws or general provisions, hunts, fishes, acquires, possesses, or destroys protected species of wildlife; trades in them, their parts or derivatives; or engages in activities that impede or hinder their reproduction and migration, shall be punished with imprisonment of six months to two years or a fine of eight to twenty-four months, and in all cases with disqualification from a profession or trade, as well as from hunting or fishing, for a period of two to four years. The same penalty shall apply to anyone who, in contravention of laws or general provisions, destroys or seriously alters their habitat.*"

Although increasingly less common, snares, traps and poisons remain one of the direct causes of lynx mortality attributable to human activity. Law 42/2007, in Article 80, provides that killing a lynx, regardless of the method employed, constitutes an administrative infringement. However, when assessing the seriousness of the sanction, the competent authority will take into account the intentionality or “degree of malice” behind the act.

If the perpetrator cannot be identified, it is not possible to initiate either administrative sanction proceedings or criminal prosecution (as the elements necessary to apply Article 334 of the Criminal Code would not be present). In cases where the death of a lynx occurs within a hunting reserve, liability falls upon the landowners or rights-holders of the estate where hunting is carried out. This is supported by Article 54 of Law 8/2003 of 28 October on the Flora and Fauna of Andalusia. In such cases, the competent Administration may suspend hunting rights, wholly or partially, when negative management practices undermine the sustainability of resources (Article 65.3.h of Law 42/2007).

Regarding drownings in water storage infrastructures, wells and irrigation ponds must comply with specific safety standards, being properly covered or sealed with mesh, and adequately signposted to prevent accidents involving both wildlife and people. Ideally, escape structures should be installed, such as exit ramps in irrigation channels and ponds. These do not necessarily need to be complex, and in many cases can be constructed from stones, pallets or mesh.

Feral domestic animals and invasive alien species may also pose a serious threat to the survival of the Iberian lynx. In such situations, Public Administrations are authorised to adopt control measures where these animals may harm endangered wildlife. However, such intervention is not generally recorded in specific wildlife protection regulations, but rather under legislation concerning public health or animal health.

An indirect means of protecting the Iberian lynx is through Article 631 of the Criminal Code, which establishes penalties for abandoning domestic animals in circumstances that endanger their lives or integrity. This provision aims to prevent the threat posed by feral domestic animals. This is reinforced by Law 42/2007 of 13 December on Natural Heritage and Biodiversity, which in Article 54.5.bis prohibits the unauthorised release of alien or native species of fauna or domestic animals into the wild, classifying it as an administrative infringement under Article 80.

Similarly, Law 7/2023 of 28 March on the Protection of Animal Rights and Welfare expressly prohibits, in Article 27.g, the release or introduction of any species of companion animal into the natural environment. Article 26.d also prohibits allowing animals to roam free or in conditions that may cause harm in public or private spaces with public access, particularly in national parks, grazing pastures or other protected natural areas where they may pose risks to people, livestock, or the environment.

In addition to the disturbance or predation caused by feral dogs and cats, there are also diseases they may transmit to the Iberian lynx. Several cases of tuberculosis caused by Mycobacterium bovis have been recorded, along with numerous pathogens shared with domestic cats, wildcats, other wild carnivores, and domestic dogs. These include viruses such as feline coronavirus (FCoV), feline leukaemia virus (FeLV), feline parvovirus (FPV), feline herpesvirus (FHV), feline calicivirus (FCV), canine distemper virus (CDV), as well as haemoparasites such as a lynx-specific Cytauxzoon, Bartonella henselae, and haemotropic mycoplasmas.

Finally, it must not be forgotten that avoiding disturbance during the most critical phases of the lynx's reproductive cycle, from late February to late May, is essential for conservation. Hunting, sporting, leisure or active tourism activities are therefore subject to consideration under the regional legislation of each autonomous community in matters of wildlife protection. Furthermore, activities such as observation, photography, filming, recording or monitoring of wildlife require authorisation from the relevant regional authority when they involve threatened species during the breeding season, or when carried out from fixed locations for more than one day. Where such activities take place within protected natural areas, the specific regulations governing those areas must also be observed.

Scope	Regulation/Document	Link
National	Law 43/2003, of 21 November, on Forests	https://www.boe.es/eli/es/l/2003/11/21/43/con
	Law 42/2007, on Natural Heritage and Biodiversity.	https://www.boe.es/buscar/act.php?id=-BOE-A-2007-21490
	Law 7/2023, of 28 March, on the Protection of the Rights and Welfare of Animals.	https://www.boe.es/eli/es/l/2023/03/28/7
Regional Andalusia	Law 8/2003, of 28 October, on Wild Flora and Fauna.	https://www.boe.es/buscar/act.php?id=-BOE-A-2003-21941
	Decree 23/2012, of 14 February, regulating the conservation and sustainable use of wild flora and fauna and their habitats.	https://www.juntadeandalucia.es/boja/2012/60/6

03

TOOLS FOR CONSERVATION AND RESEARCH

The European Union's LIFE Programme is not indifferent to the problem of wildlife crime. In this respect, the LIFE SWiPE project had among its objectives to enhance the knowledge and capacity of professionals responsible for prosecuting such crimes. Among the investigative tools, four are of particular use in the case of the Iberian lynx:

- Radio-collars are radiotelemetry-based tracking systems fitted to animals so that they transmit real-time data. This radio-tracking helps to better understand their habits and movements within or outside their territory, and such information can be used in the investigation of environmental crimes. These devices are equipped with low-intensity satellite radio transmission technology that enables the monitoring of animal movements via GPS, thereby tracking their distribution and survival in the territory. This monitoring can even be carried out through drones that capture the signal. Thanks to increasingly durable batteries, tracking can be extended over several years. Likewise, the reduction in weight and size, together with the possibility of satellite connection and the transmission of information such as the animal's vital state, provide highly valuable data without interfering excessively with its behaviour.
- One of the useful tools to curb poaching of wildlife is the use of metal detectors to locate traps made of wires or metallic parts, also proving useful in hunting grounds that apply non-selective predator control methods. Metal detectors are also employed in investigations following criminal acts, allowing for the detection of bullets or other ammunition.
- Mobile applications also promise many advantages in the fight against environmental crimes: ease of use, interconnection, high capacity for image capture, and the computing power of smartphones for investigation, record automation, and territorial control. The use of smartphones and applications enables, for example, connection to central databases and the reception of information from networked sensors practically anywhere. They also have an important feature: the possibility of involving citizens in reporting environmental offences.

- The proper use of drones, as a complement to other monitoring or crime-detection tools, is becoming increasingly common. They allow large areas to be monitored in relatively little time and, in many cases, ensure the safety of enforcement officers, who can investigate from remote locations. Nevertheless, the drawbacks of this tool must be taken into account (pilot licences, restrictions imposed by national legislation, permits for flying in sensitive areas, disturbance to wildlife, and so on).

04

POISONS AND SPECIALIZED CANINE UNIT

One of the main risks threatening the survival of many wildlife species, including the Iberian lynx, is the presence of toxic substances in the natural environment. This presence can be accidental, arising from the use of pesticides in agriculture or rural areas, but it is often the result of deliberate and irresponsible actions by individuals who place poisoned baits to eliminate certain wildlife species. Recently, the 2004 strategy was reviewed and updated, resulting in the approval of the National Strategy against the Illegal Use of Poisoned Baits in the Natural Environment in July 2024.

The growing concern over the use of poison in nature has led to programmes and strategies aimed at eradicating this harmful practice. Thus was established, as a support mechanism for law enforcement officers in the search for and monitoring of poisons, both in Andalusia and in other autonomous communities (Castilla-La Mancha, Aragon, Madrid), the Specialized Canine Unit (SCU) for the detection of poisoned baits and carcasses; a tool initially designed to complement the visual inspection conducted by authorised officers.

A world-leading initiative, the SCU has marked a turning point in the fight against poisoning, contributing not only to its primary function—poison detection—but also creating a significant deterrent effect on potential offenders, fostering genuine concern over the increased likelihood of being caught compared to before.

05

PROCEDURES

Upon the discovery or report by a member of the public of an injured, sick, or deceased Iberian lynx, the Nature Protection Service of the Civil Guard (SEPRONA), Environmental Agents, or technical personnel from the competent Directorate General for species conservation must follow established guidelines and data collection procedures to support subsequent investigation.

If a member of the public is the first to report the incident, all relevant information regarding the location should be recorded. Once the authorities arrive, they will collect details regarding the location (municipality, coordinates, place names, kilometre marker, etc.) and the condition or characteristics of the affected individual (observable injuries, approximate age, sex, etc.). It is also important to gather information about the incident itself, such as reporting persons, circumstances of the accident, vehicle damage, and, of course, the time of discovery.

Discovery of a lynx:

a. injured

b. deceased

a. In the case of an injured animal or one showing symptoms of illness, the assigned technical personnel responsible for species management should assess the situation. This assessment will be carried out through direct observation or, if not possible, using camera-trapping methods. Following this, it will be determined whether the capture of the individual is necessary or if monitoring alone will suffice.

   Capture will be carried out by specialised technical personnel, following the “Iberian Lynx (Lynx pardinus) Capture Protocol”, with prior notification to law enforcement officers and landowners.
   After capture, if the diagnosis requires it, the animal will be transferred to the quarantine facilities of the designated Breeding or Recovery Centres, and the case will be resolved as follows:

   - Rehabilitation and release in the capture area or another suitable location, as appropriate.
   - Incorporation into the Breeding Programme.
   - Euthanasia and necropsy.

b. If the animal is deceased, the report must be forwarded to the competent authorities (Civil Guard, SEPRONA, Environmental or Natural Resource Agents) so they can attend the site where the carcass was found. It is especially important that no one, except authorised officers, touches or handles the lynx or any object that may be related to its death. In the case of roadkill, if the carcass is on the roadway, it is recommended to move it to the verge, particularly on busy roads, to prevent further accidents and destruction of the specimen.

   Upon receiving the report, the officers will inform the technical personnel of the conservation plans and projects designated for the area. During the retrieval of an Iberian lynx carcass, Environmental Agents and/or SEPRONA officers must be present, with the technical staff assigned to species management optionally attending; however, the procedure will be carried out jointly by the Environmental Agents and SEPRONA officers. If it is not possible for both to be present, the retrieval will be conducted by whichever authorised officers are available.

   If the carcass carries a radio-collar, the lynx monitoring team will be contacted to attend the site if removal of the collar is necessary.

Fig. 6 y 7. Lynx carcass wearing a transmitter collar.

Reports may be received via 112, 062, directly by Environmental Agents, SEPRONA officers, or project technical personnel. Any officer or technician receiving the report must ensure that all other relevant parties have been notified.

Considerations during carcass retrieval.

Before handling the carcass, it is especially important to carry out a thorough photographic record. Comparing photographs of the remains with the live animal database generated by camera-trapping allows for identification of the individual. To ensure accurate comparison, the following considerations should be observed:

- Photographs must include the full right flank and full left flank, as well as the genital area for accurate sex determination.
- The animal should be positioned on its side, with photographs taken perpendicular to the body.
- Before taking photographs, the fur should be brushed with the palm of the hand to reveal the natural spotting pattern, brushing in an anterior-posterior direction (with the fur).
- Key areas for identification in the photographs include the full flank and the inner face of the opposite forelimb.
- Proper lighting is essential, using a light source to illuminate the flank perpendicularly to avoid shadows, especially when photographing at night.

It is recommended to include a card in the photograph with the animal's identification and the date. It is also highly useful to take pictures of the surroundings where the lynx carcass was found, as well as any evidence that may clarify the circumstances of its death.

Correct: Perpendicular positioning, coat combed and inner side of the front limb visible. Both sides must be photographed.

Incorrect: Oblique positioning, dishevelled coat and inner side of the foreleg not visible.

Fig. 8 y 9. Examples of positioning of the lynx carcass.

Photographs that are not suitable for identification purposes:

Poor lighting.

Dishevelled coat, the inner side of the EA is not visible.

Fig. 10 y 11. Examples of images that are not suitable for identification purposes.

The collection of an Iberian lynx carcass is carried out following established procedures and using standard materials. Every Iberian lynx found dead must undergo a regulated necropsy, making it especially important that the collection, handling, and transport of the carcass to the laboratory where the necropsy will take place follows an official protocol. This protocol is executed by the competent authorities (Civil Guard, SEPRONA and/or Environmental Officers), who seal the carcass and complete a collection report that accompanies it to the laboratory, maintaining the chain of custody.

It is also necessary to collect samples of any elements deemed useful for the investigation (e.g., soil beneath the animal for analysis of toxins or lead, bullets, snares, etc.). Collected samples must be properly organised, referencing the report number and seal numbers. Each sealed bag must be individually numbered and sealed before being placed together in a single, larger bag.

All Iberian lynx samples collected at both the site where the carcass is found and during necropsy are valuable. Given that some samples deteriorate over time, it is a priority to complete all steps from discovery to the commencement of necropsy as quickly as possible.

The collection and sample submission report must include: informant details, date and time of discovery, location description (including exact coordinates in UTM), hunting reserve number if applicable, circumstances of death (if known), carcass position, names of personnel conducting the collection and any witnesses, description of the lynx (sex, age, general condition), description of events, numbers and contents of collected samples with corresponding seal numbers, and any other relevant information surrounding the discovery and collection of the carcass.

For sex identification during collection, the genital area under the tail should be examined, paying attention to the distance between the anus and the genital opening:

- Males: distance between anus and penis opening exceeds 2 cm. Testicles are usually visible from six months of age.
- Females: distance between anus and vulva opening is less than 2 cm. Testicles are absent.

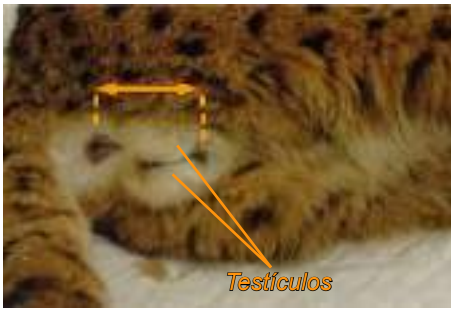


Fig. 12. Genitals of a male lynx.

Fig. 13. Genitals of a female lynx.

Once sealed, the carcass may be sent via courier or transported directly to the necropsy location by the competent authorities or by the technical personnel responsible for the species' conservation. The accompanying documentation must always certify the correct maintenance of the chain of custody until its arrival at the necropsy site. If the carcass must be held for any reason before being sent, it should be kept refrigerated at 4°C–7°C. Although less desirable, if circumstances require, it may be frozen (a temperature below −12°C is recommended). Transport should be carried out in an insulated container with refrigeration, surrounded by ice packs or cold accumulators. The veterinary team and the corresponding on-call contact should be notified immediately to prepare the necessary personnel and equipment for performing the necropsy upon the carcass's arrival.

At all times, the utmost discretion regarding the circumstances must be maintained so as not to interfere with the investigation. The project's technical staff will inform the management of the relevant regional conservation programme.

06

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