TECHNICAL CONFERENCE THE IBERIAN LYNX LOOKING TO THE FUTURE

The conservation of the Iberian Lynx has been a species recovery success story, providing an example of what can be accomplished by a determined push towards a common goal by all stakeholders. Thanks to this work, the lynx is one of the few species in the world that has seen its threat category shrink. Iberian lynx populations grew from less than 100 specimens in 2002 to almost 700 in 2018.

After 20 years of working with the species, it is time to evaluate the work carried in order to draw conclusions about how to improve its conservation from now on. Above all, it is time to set long-term goals to meet European guidelines and establish a clear and defined roadmap, which will allow the species to be far off from danger.

To this end WWF has organized the conferences "The Iberian Lynx: Looking Towards the Future"; within the framework of Life Euro Large Carnivores, with the support of the Biodiversity Foundation and co-financed by the Ministry for Ecological Transition through the 2019 call for grants to NGOs that develop activities of general interest considered to be social interest in environmental scientific and technical research. These conferences were held in Madrid on the 24th, 25th, and 26th of September and involved a total of 154 people between the general public, technicians, and experts of all administrations and interest groups involved in the conservation of the species.

During the first day, the data and topics to be discussed were presented to lay the common foundation for the second day's discussion sessions. This involved technicians and experts from all administrations, as well as interest groups involved with the conservation of the species. Below are the most relevant conclusions from each of the discussion blocks.

a) Lessons Learned

The latest Life Liberlince project has generated a significant amount of information. A thorough analysis of the data can provide important conclusions that allow a better management for the next conservation actions of the species.

Firstly, a general analysis **of survival and mortality data** was conducted. It can be said that **all reintroductions made have been successful** with survival rates between 56% and 83%, far exceeding the rates of reintroduction of other experiences, especially regarding individuals from captive breeding.

Reintroduction area assessment protocols have been proven to be effective in detecting hotspots in bot accidents and poaching. However, there is a need to improve in reducing these causes of mortality. With regards to the prevention of accidents, the appropriate measures are known, although given their high cost, their implementation occurs very slowly and there is still a lot of work to be done.

Looking at the morality data of radio-marked individuals during the Iberlince project (2011-2018), the main causes of mortality identified are accidents (6% of the population) and poaching (5%). Considering the overall number of poaching cases detected, it is estimate that only 30% of uncollared lynx deaths are being located. It is clear that **it is necessary to improve poaching prevention work** by making a coordinated effort to reduce mortality rates. As a result of this,

the need for a new standardized protocol for tracking illegal arts has been identified to allow comparison between zones and analyze progress over time, as well as know whether the measures undertaken have the desired effect.

Below, how to improve the management of the species is analyzed and debated. The discussion was divided into two large blocks within which different aspects were addressed.

Recommendation for future reintroductions

a) **Evaluation process for reintroduction areas:**
   - **The process of evaluating reintroduction areas is essential as a pre-release action for individuals.** The existing reintroduction area selection protocol is sufficient in identifying strengths and weaknesses of the areas studied and has ensured the success of the reintroductions.
   - **Health monitoring efforts should be maintained over time** in order to control possible mortalities from sickness.

b) **Management of the releases:**
   - **Pre-release enclosures will preferably be used for the fixation of the first individuals.** Since the survival rate of individuals released in said enclosures is higher (72% vs. 65%) and the populations in which reintroductions have been made in this manner have progressed more rapidly and favorably.
   - **Releases must be carried out primarily concentrated in the same population nucleus during the first years of reintroduction.** In this way, mortality rates decrease as dispersive movements are avoided and populations progress more rapidly and favorably.

c) **Origin of the individuals:**
   - **The individuals from captive breeding centers are suitable for reintroductions.** Their availability thanks to the work of the centers is high, they allow planning of the genetics to be released and have high survival rates (average of 72%; minimum value of 55% and maximum of 83%). In addition, they reproduce normally, which has allowed the creation of healthy wild populations.
   - **Young individuals from other populations, while eligible for reintroductions, may be more suitable for genetic reinforcements.** Their survival rate is slightly higher than that of captivity breeding populations and they have a greater capacity to join the population. However, their availability is lower and, in turn, the possibilities for genetic planning are more limited.

d) **When to change from releases made with numerical criteria to genetic criteria**
   - **Appropriate thresholds based on demographic parameters should be set with numerical criteria to define the end of releases.** As new populations grow, there has been an increase in demographic pressure, leading to reduced settlement survival and success of reintroduced individuals, also affecting various demographic parameters of each population. However, the establishment of concrete thresholds are needed to delve into the available data, so it is proposed to hold a workshop to do so as soon as possible.
   - **As long as these criteria are not established and there are no new reintroduction areas prepares, lynx will continue to be released in existing areas.**

Recommendations for the management of established populations

a) **Genetic reinforcement**
   - **Establishment of a system or protocol for genetic monitoring of each population.** The execution of genetic reinforcement needs to know the genetics of the population in which it wants to be executed, as well as of the individuals available to be released there, in order to select the one that brings greater diversity to the population.
   - In **saturated populations**, with high intraspecific competition and low probability for settlement of released animals, **it is preferably recommended: i) individuals of wild origin ii) potentially breeding males (2-3 years) iii) soft release (in enclosure) and iv) in vacant territories (opportunistic/individual territorial extraction).** This last point may be delicate and may require courageous decisions that must be adequately explained to the public. **In expanding populations** the process of genetic reinforcement can be carried out **with the same methodology as the usual releases** (captive breeding contribution).
   - On the other hand, targeted **extractions might be needed to incorporate appropriate genetics into the captive breeding plan.**

Translocations

a) Based on the characteristics of successful translocations, these should be made according to the following criteria:
   - The **individuals must be specimens less than 4 years of age and not in dispersion.**
   - **The destination area should be as far away from the origin as possible.**
   - The release of the individual is recommended to be **soft** and after a period outside of the population **(quarantine plus adaptation period >50 days).**
   - **The receiving area must have the presence of the species, vacant territories, and a rabbit density equal to or greater than the catch area.**

Criteria for the management of wild animals caught for a variety of reasons:

a) **Any captured lynx that is not unrecoverable should always return to the field** (unless their genetics are viable for captivity).
   - If it is fit and non-conflictive it will be returned to the same capture point.
   - If it is fit but conflictive, it will be translocated following the recommendations of translocations.

b) **A senile animal in dispersal should not be captured for translocation purposes, its probability of settlement is extremely low.**
   - If it is captured because its physical integrity is in danger (proximity to infrastructure), it will be released at the nearest safe spot.
   - If its physical condition is compromised, it will be healed in captivity and released at the point of extraction or at the nearest safe point.

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b) Favorable Conservation Status (FCS)

Achieving the Favorable Conservation Status (FCS) is an obligation under the Habits Directive (92/43/EEC) at the level of each state member. However, this legal text is inaccurate on how to calculate the population sizes to achieve such a status. The European Commission itself developed the "Guidelines for Population Level Management Plans for Large Carnivores in Europe. Large Carnivore Initiative for Europe. Large Carnivore Initiative for Europe, July 2008". This guide has been used in conjunction with the approximation suggested by Epstein et al. 2016 to calculate the size of the Iberian lynx population needed to achieve the FCS.

The number for territorial females (HT) is a good indicator of the state and evolution of populations. Conservation and monitoring efforts are focused on these female, so very detailed information is available. To establish the FCS it is necessary to know the effective size of the population (Ne), which in this case can be said to approximate twice the number of territorial females, or what is the same HT=1/2 Ne.

The FCS was calculated using three approximations:

1) The size of the population is at least what it had been when the Habitat Directive came into force, 1992. Based on existing studies close to that date, it is established that FCS>367 HT.

2) The species is far from the Minimum Viable Population Size. In the absence of a specific population viability analysis, the only criterion of common acceptance is criterion D of the IUCN red list criteria, according to which we can say that FCS>> 500 HT. To ensure that we are far from this threshold, a margin of 50% is proposed, with the FCS=750 HT.

3) The FCS would be achieved when the species is closer to the carrying capacity (K) than to extinction (N<K/2). For the estimate of the carrying capacity, available information has been crossed from habitat suitability models, rabbit abundance data and the territory sizes of breeding females. Based on this information it is estimated that FCS (K/2) > 766 HT.

It was therefore agreed **to assume the figure of 750 HT as a target of population status** to secure the FCS, since this figure simultaneously meets the population and legal criteria for Spain and Portugal.

The time required to reach this figure was established through population growth projections taking into account the growth rates of current populations created by reintroduction and their carrying capacities. The number of additional populations that would need to be created (8) to reach this figure is also established.

With all of this the following **Final Proposal** has been established:

Objective: By **2040** the Iberian lynx has reached the FCS in Spain and Portugal, with, at least, **750 breeding females** living in **connected populations** and the species has reached the IUCN threat category of minor concern.

Milestones:

- By **2022** the requirements are met for the IUCN to downgrade the threat category of the lynx to **Vulnerable,** with at least **125 reproductive females.**
- By **2030** the lynx has reached the population status that it had in 1992 when the Habitat Directive came into force, with at least **367 reproductive females.**
- By **2035** the population has reached the IUCN category threshold of near-threatened with **500 reproductive females.**

The underlying model and intermediate milestones will allow continuous evaluation and readjustment of conservation efforts to achieve this objective, with the recommended **review of at least every 5 years.**

This result shows that the pending work is still immense. In the best of circumstances, as much work remains as has already been addressed.

Based on this proposal, a number of **needs** were identified.

a) **In order to achieve the FCS, the creation of at least 8 new populations is necessary, being essential to:**
   - **Keep breeding centers at full capacity at least until 2030.**
   - **Incorporate new regions to the reintroduction programs.**

b) **Carrying out an Iberian census of the rabbit,** essential for the correct planning of the management of populations and reintroductions.

Finally, it was proposed to continue working along the following lines

a) **Performing a Minimal Viable Population Analysis** (e.g. *vortex, metamodeling, etc.)* that serves to support the previous conclusion. As far as possible, the incorporation of demographic and genetic data from Iberian lynx populations, as well as mountain rabbit populations, is necessary.

b) Incorporation of present conclusion to the new LIFE Connect Lynx proposal, of both the genetics and lessons learned parts of the new, as well as that of the FCS.

c) **Establishment of a guide that standardizes and determines certain biological criteria** (reproductive female, territorial female, age, stable presence surface, surface of a territory, *etc.*).

C) Long-term objectives of the Ex-situ program

Since it was launched, the Ex-situ program has played a key role in the recovery of the species, working to maintain the maximum possible genetic diversity and providing individuals for reintroductions trained for life in freedom. It is necessary to review what role this program should play and what requirements and needs there will be to achieve the objectives set to achieve the FCS.

a) The **role of breeding centers in the coming years**, so that the proposed FCS for the species can be achieved, is to **continue with the current breeding scenario**, producing as many specimens as possible for the different reintroduction areas. The completion of intensive releases is not foreseen until at least 2030, since it has been estimated that at least 8 other reintroduced populations shall be created. Additionally, it will be necessary to continue with genetic reinforcements until at least 2040. In order to maintain current productivity, **a commitment from the different administrations** is necessary to carry out these reintroductions in a continuous way over time. If during any season the corresponding individuals were not released, the breeding program could not maintain the current efficiency of puppy production.

b) Establishment of minimum requirements of breeding centers to maintain the current contribution to on-site work, both from a quantitative (number of specimens) and qualitative (genetic variability) point of view makes it possible to achieve the objective of the FCS. It is **essential to comply with the different established protocols**, defined in an agreed-upon manner and approved by all administrations involved in the conservation of the Iberian lynx. Additionally, a continued financial effort is essential over the marked time frame.

c) **Update of the Action Plan of the Captive Breeding Program,** taking into account the new scenario in which we find ourselves and in accordance with the objectives set to achieve the FCS of the species.

d) **The basis of the Iberian lynx conservation program,** both ex-situ and in-situ, should be the **genetic management** of the entire Iberian lynx population. Therefore, different financing mechanisms must be adopted to ensure the integral genetic management of the species over the period established to achieve the FCS of the species.

e) **Update the litter training protocol** for reintroduction programs based on the analysis carried out with data from in-situ and ex-situ conservation programs, facilitating the exchange and use of information between different projects and administrations. **The promotion and encouragement of research studies that help in the decision-making** is proposed, as well as updating the different protocols.

f) **Adoption of a protocol for the management of surplus Iberian lynxes**, both captive and wild, which streamlines decision-making in the different scenarios that we may encounter, not compromising the viability of the in-situ and ex-situ conservation programs of the species.

- **The recovery centers** of each proper administration **must have the necessary means to be able to take specimens from wild populations, preventing them from being transferred to the breeding centers**, unless it is recommended by genetic criterions established by the relevant advisory group**.**
- **Establishment of an animal welfare guide in captivity** and the use of *culling* as a captive population management tool.
- **Review of the criteria set out in the protocol for the transfer of surplus individuals from the breeding program for exhibition centers** and expedite the administrative process to carry out the corresponding transfer authorizations. To this end, it is important to decide who is the owner of the Iberian lynx individuals

and, therefore, which is the administration responsible in the transfer of these species.

g) **Creation of an *Endangered Species Program* (ESP) of the Iberian lynx** due to the complicated implementation of an ESP, it is necessary to start working on a design so that it can start operating in the middle term. It must count on the collaboration of the zoos, so that when the intensive releases are completed, the role of the breeding centers and the fate of the ex-situ conservation program specimens can be managed in a staggered manner.

d) Establishment of an adequate governance model that ensures coordination on an Iberian scale

The number of administrations and entities involved in the conservation of the species is growing, and on the other hand there are many decision-making structures. This situation makes decision-making extremely difficult, so solutions need to be found for the management of the species to coordinate efficiently.

a) A **clear model of governance** must be defined to organize the work of conservation of the Iberian lynx, which is permanent and that goes beyond the governance of a project (LIFE) or of a certain time.

This new model of governance has to:

- **Ensure an equitable representation of Portugal** both politically and above all at the technical level.
- Simplify the governance model as much as possible, eliminating those elements that are unnecessary or redundant (e.g. the multilateral commission).
- Collect, **value and rely on all existing technical and scientific background,** reviewing and validating existing protocols and proposing those that are necessary.
- Ensure the proper participation of all social actors.
- **Clearly define the levels of decision** and how possible disagreements are resolved (vote, who has a vote, *etc*.).

b) **Memorandums and protocols of understanding** between Portugal and Spain and the functions of the joint commission between the two countries should be updated to guide it in the monitoring to an Iberian strategy.

c) An **Iberian Lynx Conservation Strategy** should be approved to set common medium and long-term objectives and priorities and encompasses the governance system.

d) The governance system should be supported by the existing governing and coordinating bodies in each country and provided for in the relevant sectoral legislation.

e) It is proposed to enhance the **Working Group** under the Animals and Fauna Committee and the State Commission, which has to assume a clear executive profile as a technical management body at a supraterritorial level. To do this in the working group in addition to the Autonomous Communities, Portugal must be incorporated with full representation (with voice and vote) as well as with the different social agents (conservation organizations, researchers, experts, *etc*.), actively involved in the management of the species.

f) When defining how this group works, it is recommended that this group should have a **coordinator** in charge of revitalizing this group and including operating rules that allow the management of disagreements. They should be able to ensure **cohesion between the Ex-Situ and In-Situ programs.** This working group (or in their absence the National Strategy) should have a **scientific committee** responsible for monitoring and assessing clear compliance indicators for accountability.

This group should be responsible for:

- Developing the Iberian Strategy and medium and short-term action plans.
- Ensuring proper technical coordination (sharing data, approving drop zones and annual distribution of puppies for releases, *etc*.).
- Validate and define new operating protocols.
- Address emergencies.
- Establish investment priorities and financing lines.
- Ensure comprehensive genetic management (Ex-situ and In-Situ).
- Define work subgroups.

g) **An interim decision-making system is requested as an urgent manner,** in order to address urgent issues such as the distribution of puppies for the 2020 releases, which must be decided by November 15, 2019. It is suggested that the working group be used for them, following the operating scheme suggested here.

e) Round Table

As the conferences close, to discuss the results of the working groups and their future of the conservation of the Iberian lynx, administrations with competence in the field management of current lynx populations were invited to a round table. It was attended by D. Ángel Andrés Sánchez Garcia, D.G. de Medio Natural, Biodiversidad y Espacios Protegidos de la Junta de Andalucía; D. Rafael Cubero Rivera; D.G. de Medio Natural y Biodiversidad de la Junta de Castilla-La Mancha; D. Jesús Moreno Pérez; D.G. de Sostenibilidad de la Junta de Extremadura y D. Nuno Banza; Presidente do Conselho Directivo de ICNF de Portugal. These are the principle conclusions of the committee.

a) It is celebrated that there is **an ambitious and concrete objective,** like that presented in these days that marks work in the medium and long term. All participants in the round table consider it essential to have this long-term vision defined, which makes it possible to reinforce the existing commitment to continue working together, with broad participation of civil society.

b) All of the involved administrations **reaffirm their commitment to continue working for the conservation of the Iberian lynx,** and clearly see the need to establish a **new and more effective governance model**, which ensures continuity in the work. They also agree on the importance of working on an Iberian scale through the corresponding **Iberian lynx conservation strategy.**

c) It highlights the importance of emphasizing, between different local communities and citizens in general, the value of the species and the conservation efforts that have been undertaken, **intensifying awareness-raising, communication, and participation.**

d) It is suggested to unify criteria and work on an **Iberian Funding Strategy**, which allows the optimization of the use of these funds. This topic goes deeper into the following points:

- **It is necessary to activate funding lines beyond LIFE funds.** These funds have been very important in these two decades and will need to continue to be supported, but other options need to be explored as the various autonomous communities are already doing. For example, in Andalusia or Castilla-La Mancha with the ERDF and/or FEADER or Extremadura, Andalusia and Portugal with INTERREG projects, among others.
- To this end, it will be fundamental **to work actively on the new Priority Framework for Action and in the development of the PDRs,** to ensure that the lines and priorities that allow investment in the lynx and its habitat are established.
- **The NGOs and private sector are valuable assets** to be counted on to strengthen and complement these financial investments, as has happened in LIFE projects, where different partners have been an important economic multiplier.
- Portugal recalls the important opportunity that **private funds** can bring and to take advantage of the patronage law that it hopes to revise shortly.

e) All administrations recognize the need to work on **connectivity and defragmentation of the territory,** both for the Iberian lynx itself and for other species, especially in the face of the new scenario of climate change. They hope that the new LIFE project, if granted, will lead the way forward, but at the same time agree on the need to work more thoroughly on this issue from the different areas of competence.

f) Finally, they recognize the importance and need to deepen the **management and conservation work of rabbit populations,** adopting new approaches and new solutions such as management contracts linked to ecosystem services. This commitment is clear since all the administrations participating in the round table are part of the IBERCONEJO project presented by WWF Spain to the LIFE 2019 meeting.