

# The Eurasian lynx as a key to the conservation and future viability of the endangered Iberian lynx

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The Eurasian lynx recovered in many parts of its European range. Credit:  
Painer/IZW

Understanding the mechanisms which control reproduction in lynx is

essential for their continued viability and effective conservation.

A team of international scientists from Europe discovered that the *Corpus luteum* of the Eurasian [lynx](#) (*Lynx lynx*) has the longest lifespan among mammals known to date. This hormone producing tissue is responsible for restricting this lynx species (and presumably the other lynx species as well) to only having one estrous cycle per year (mono-oestrous) and therefore only one opportunity per year to become pregnant. The findings were published in the scientific journal *PLOS ONE*.

The scientists from the Leibniz Institute for Zoo and Wildlife Research in Berlin (IZW) took the Eurasian lynx as a "model" species to investigate the reproductive cycle of lynxes in order to assist in the conservation of the highly endangered Iberian lynx (*Lynx pardinus*), the most threatened cat species worldwide, restricted to a few locations in southern Spain. A key component in the conservation strategy for the Iberian lynx are the captive breeding centers in Spain and Portugal where Iberian lynx are bred in order to be re-introduced back into the wild. Improving reproductive performance in captivity entails a thorough understanding of the mechanisms that facilitate reproduction in these felids.

The team's key discovery is that lynxes have *corpora lutea* (CLs, the gland producing the pregnancy hormone progesterone) which are maintained in their ovaries over many years – the longest lifespan known in mammals, and therefore indicative of a reproductive strategy unique for felids – and probably for mammals in general. In other species, the CLs disappear before, or shortly after, the female gives birth. Surprisingly, the female lynx can switch off its CL's progesterone production when entering a new cycle during spring or before giving birth without destroying the CL. Later on, progesterone is produced continuously, suppressing the follicular development in the ovary and

therefore preventing the onset of a second oestrus cycle within the same year. If a female cannot mate during its 5 - 7 estrous days per year, an entire reproductive period will therefore be lost, reducing fertility and effective lifetime reproductive output, a substantial problem for a small population such as the Iberian lynx.

"To obtain these results, our international team followed the reproductive cycles of captive Eurasian lynx in German zoological gardens and of free-ranging Eurasian lynx in Norway with the help of a Norwegian wildlife research project, Scandlynx, over a period of almost three years. We used advanced three-dimensional ultrasound techniques and in-house hormone analyses to uncover the mysterious development of the oestrus cycle", says veterinarian scientist Johanna Painer from the IZW.

Europe is home to two *Lynx* species, the Eurasian lynx and the Iberian lynx. Both species experienced drastic declines in population size during the last century. Whereas the Eurasian lynx recovered in many parts of its European range with the help of re-introduction projects, the population of the Iberian lynx crashed completely and was declared to be the most critically endangered felid species worldwide, today.

It is unknown to what extent lynxes will have the flexibility to adapt their reproduction to anthropogenic environmental changes. This study provides essential information for the assisted reproduction techniques in Iberian lynx which continue to be refined and improved, such as artificial insemination or embryo-transfer. Future research will focus on the manipulation of reproductive cycles to increase the reproductive output for breeding centers and to discover the molecular mechanism underlying this unique phenomenon.

**More information:** Painer J, Jewgenow K, Dehnhard M, Arnemo JM, Linnell JDC, Odden J, Hildebrandt TB, Goeritz F (2014):

"Physiologically persistent corpora lutea in Eurasian Lynx (*Lynx lynx*) – longitudinal ultrasound and endocrine examinations intra-vitam." *PLOS ONE*

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