LAYMAN'S REPORT

LIFE Lynx PROJECT

Preventing the Extinction of the Dinaric-SE Alpine Lynx Population Through Reinforcement and Long-term Conservation



Project Title: Preventing the Extinction of the Dinaric-SE Alpine Lynx Population Through Reinforcement and Long-term Conservation Acronym: LIFE Lynx Reference: LIFE16 NAT/SI/000634 **Project Time Frame:** 01.07.2017 – 31.03.2024 **Total Project Budget:** 6,829,377.00 € Lead Partner: Slovenia Forest Service (SFS)

Project Partners:

- Association for the Biological Diversity Conservation (ACDB)
- Association BIOM (BIOM)
- Arma dei carabinieri Comando Unità Tutela Forestale. Ambientale e Agroalimentare (CUFAA)
- Faculty of Veterinary Medicine University of Zagreb (FVM)
- Hunters Association of Slovenia (HAS)
- Progetto Lince Italia (PLI)
- Technical university in Zvolen (TUZ)
- University of Ljubljana (UL)
- Karlovac University of Applied Sciences (VUKA)
- Institute of the Republic of Slovenia for Nature Conservation (ZRSVN)

Cofinancers:

- The Ministry of Natural Resources and Spatial Planning of the Republic of Slovenia (MNVP)
- Environmental Protection and Energy Efficiency Fund (EPEEF)
- Euronatur
- Office for cooperation with NGOs Government of the Republic of Croatia
- The Ministry of the Environment of the Slovak Republic
- WWF Deutschland

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MINISTRY



WWF

Background

BEGINNING OF THE 20th CENTURY:

The Dinaric-SE Alpine lynx population becomes extinct due to hunting, persecution, habitat loss and lack of prey species

YEAR 1973:

Successful reintroduction of six animals from the Carpathian Mountains to Slovenia

FOLLOWING DECADES:

Lynx population spreads south to Croatia, Bosnia and Herzegovina, although lynx were noted also in Italy and Austria

AFTER THE YEAR 2000:

Population decline, mostly due to genetic deterioration - inbreeding and genetic drift

2017 - 2024:

Urgent measures taken to prevent the extinction – the LIFE Lynx project

PROJE LYNX] LIFE

Objectives

To save the Dinaric-SE Alpine lynx population from extinction!

HOW?

- ✔ By reinforcing the Dinaric population through translocation - again from the Carpathian Mountains
- ✓ By developing conservation management at the transboundary level
- ✓ By fostering broad public acceptance of lynx conservation
- ✓ By developing science-based management tools for strategic planning and decision-support tools
- ✓ By improving population connectivity with the creation of a stepping stone population in the Julian Alps





The Carpathian Mountains of Romania

Capturing lynx was probably the biggest challenge we had to face during the project but every lynx captured meant one step closer to safeguarding the Dinaric-SE Alpine lynx population. The transfer of project partners' know-how helped capture 14 lynx (10 of which were relocated for the LIFE Lynx project to Slovenia and Croatia, two were collared and released in the Romanian forests, and an additional two animals were relocated to Italy within the ULyCA2 project).

The status of the Romanian lynx population was monitored throughout the project using camera-trapping, snow-tracking, and genetic analysis. This newly collected data indicates that the population in the capture areas remains strong, and confirms the limited impact of translocations.

"When the LIFE Lynx project began, I was sceptical about the likelihood of capturing the number of lynx individuals planned, mostly because the project team had little experience with lynx captures. The exchange of knowledge with the Slovenia Forest Service, Progetto Lince Italia and the University of Ljubljana contributed to the project's success, and we feel great joy in knowing that we have actively contributed to the recovery of the Dinaric-SE Alpine lynx population." - ION MILITARU, Director of Putna-Vrancea Natural Park, RNP ROMSILVA (collaborator in the LIFE Lynx Project)

WHERE THE LYNX CAME FROM

The Carpathian Mountains of Slovakia

Based on the systematic surveys it is possible to claim that the captures and translocations of 8 lynx for the LIFE Lynx project (nor the previous project LIFE Luchs) had no negative effect on the viability of the Slovak population at the local, regional or national level. And so, the LIFE Lynx project helped not only to save the Dinaric - SE Alpine population but also to better understand the lynx conservation challenges and needs in the Carpathians.

Moreover, the cooperation between the project team and key stakeholders (especially foresters, hunters and nature conservation) within the LIFE Lynx activities, particularly in the systematic monitoring and lynx translocations is an excellent example of collaboration and mutual trust. It is an important precedent for further lynx (and large carnivores) conservation and management at national and international level.



"When I first heard about lynx captures in 2020, I didn't believe it was possible. Today, I am proud that I was part of this project and helped to save this endangered species in the Dinaric Mountains, SE Alps and Europe. At the same time, I met a team of great people. Thank you." – Ing.

The Alps

Crucial for lynx conservation in the Dinarics and the Alps was to **establish** a connecting lynx population in the Southeastern Alps. Therefore, the Julian Alps in Slovenia act as a vital corridor - connecting the lynx population between the Dinaric and other Alpine regions. With this goal in mind, we translocated six adult animals to the Slovenian Julian Alps (3 males and 3 females).

The essential role in this lynx reintroduction story was a tight collaboration with hunters who cared for the lynx in enclosures and participated in lynx monitoring. In the year 2024, we are recording the presence of four translocated animals in the Alps and several of their offspring. Overall, we confirmed six lynx litters belonging to all three translocated females.

To strengthen the established connecting population in the Julian Alps, an additional five lynx were released in Italy in 2023 - as part of the ULyCA2 project. Hopefully, this will contribute to the long-term survival of lynx in the Alps as well as in the Dinarics.

> »The return of the lynx to the Triglav National Park is a historic moment, because we are returning to nature something that we, humans, have taken from it.« – MIHA MAROLT, Triglav National Park

WHERE THE LYNX WENT TO



Lubomir Full line represents lynx that are still monitored. The dashed line represents lynx that are no National borders longer detected.

Goru

Doru

Catalin

Boris

Maks

Alojzije

Emil

Zois

Tris

Julija

Aida

Blisk

Kras

Sneška

Lenka

Lukaš

CRO

The Dinarics

The main goal of the LIFE Lynx project was to reduce the level of **inbreeding** that was threatening the survival of the Dinaric lynx population. This challenging task was successfully implemented by the joint efforts of partners from donor (Romania & Slovakia) and receiving countries (Slovenia & Croatia).

In the 2019 – 2023 period, **11 adult male** lynx and one female were translocated from the Carpathian to the Dinaric mountains. At the beginning of 2024, we can confirm 9 of them are still alive, 5 lynx established territories in Croatia and 4 in Slovenia.

The biggest success is that translocated animals reproduced and so far over 30 kittens with Carpathian genes are increasing the genetic diversity of the Dinaric lynx population. These results instill hope that international cooperation, drawn upon expertise from various backgrounds and engaging key interest groups, stands as a successful formula for securing the future of the Eurasian lynx in Europe.

»It was a great honour to participate in the LIFE Lynx project and to release translocated lynx Lubomir in our hunting ground Ramino korito. The presence of such a rare, mysterious and endangered species provides an opportunity to enrich tourist programmes in our county.« – MARIJA KRNJAJIĆ, Director of the Rewilding Velebit Foundation



Inbreeding – troubles of our lynx

Each animal carries a "genetic load", harmful mutations that become a problem only if an individual receives the same mutation from both parents. As each such mutation is very rare and unrelated animals typically have different mutations, the probability of this happening in a large population is extremely low. However, close relatives share the same mutations they inherited from a common ancestor. If close relatives mate, we call this "inbreeding", and the offspring are highly likely to have lower survival and problems with reproduction. There is a good reason that incest is a tabu in all human cultures.

The past

GENETI

[T]

After the reintroduction of the six lynx in 1973, the population was rapidly growing and expanding at first, but it remained isolated from other lynx and started inbreeding. As inbreeding accumulated, survival and reproductive success dropped, **the population started collapsing toward extinction.** Lynx really needed our help!

The present

Researchers are tracking the genetics of lynx in the wild through the collection of trace DNA they leave behind in the environment. These non-invasive genetic samples are used to genetically identify individuals, confirm parentage and track the genetic status of the population. That allows us to detect if the translocated lynx are successfully reproducing in their new home. We are already observing its first positive effects - a drop in the level of inbreeding, and the first signs of higher reproduction and survival.

It seems that **the project succeeded in bringing the Dinaric lynx from the brink of a second extinction.**

The future

Nonetheless, on its own, the Dinaric – SE Alpine lynx population remains too small to be viable in the long term, and **will**



need gene flow from other populations, either naturally through the establishment of a Dinaric – Alpine metapopulation or assisted with translocations. We explored this using individual-based genetic-demographic computer models. As follows, we suggested several management scenarios that may help us understand how to **ensure the long-term survival of the reinforced population.** Larger parts of the **Dinaric area** (stretching from the southwestern part of Croatia to the central part of Slovenia) form a more or less homogeneous area of **suitable habitat for lynx**.

The Ljubljana - Koper motorway in Slovenia represents a major linear barrier that severely constrains the connectivity of lynx habitats. On the other hand, the Croatian motorways are much more permeable because they include various crossing structures (e.g. green bridges, tunnels, viaducts).

The situation northwest of the Ljubljana - Koper motorway, is quite different. There are still some moderately large forest complexes, although part of this area is fragmented.



Comparison of the impact of the Ljubljana-Koper and Zagreb-Rijeka motorways on habitat connectivity for lynx.

The fragmentation of suitable habitat is evident in the Italian part of the south-eastern Alps, where urbanized valleys interrupt otherwise suitable habitats. Areas above the tree line are also perceived as less suitable. The model prediction outlines a few areas with **particularly suitable habitat in the Alpine region** (mostly plateaus at 1000-1500 m altitude such as Jelovica and Pokljuka) where the lynx already occurs, while the areas in the western part of the Alpine project area tend to be smaller and further apart.

Finally, we incorporated this gathered knowledge within Slovene national forest and hunting management plans to help with the **protection of the connectivity corridors.**



Lynx suitable habitat and lynx optimal habitat patches in the Dinaric and the Alpine Area.







PINO

Sex: d Translocation: 2020, 5 years old Reproduction: ?

~(#)

2021, 2 years old Reproduction: ✓

LENKA

Sex: ♀ 20121, 3 years old 🤿 Reproduction: ✓

-(#)

ALL 18 TRANSLOCATED LYNX

SNEŠKA 📲 🚞

Sex: Q Translocation: 2023, 5 years old 🔶 Reproduction: ? 之

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Understanding public perceptions helps wildlife management authorities and conservationists determine the level of acceptance or opposition to the presence of lynx in specific regions and develop effective conservation strategies. A comprehensive survey of public attitudes was implemented three times in Slovenia, Croatia, and Italy - before, during, and after translocations, including 5832 survey participants who declared hunting of lynx or illegal killing unacceptable.



Overall, it revealed a positive public attitude towards lynx and widespread support for its conservation in all three countries.

Livestock breeders were the only group that expressed concerns regarding potential financial losses due to lynx presence, despite that lynx depredations on livestock are very rare. Therefore, the breeders need to have access to information on how to protect their domestic animals - like with high electric fences that we also distributed - and what to do when damage occurs.

This collective stance highlights a shared commitment to the protection and preservation of this species.

Looking ahead, public outreach activities in the following years should







Hunters & Police

Due to a **significant lack of awareness** regarding illegal killing among police

officers, the Hunters Association of Slovenia produced a comprehensive handbook for field personnel (hunters, foresters, etc.) and police officers that defines how to properly organize an investigation procedure in case of an illegally killed lynx or other wildlife species. Moreover, several practical seminars and multi-day workshops were organized for key players and institutions to enhance their understanding of the importance of





Lynx Neža: A case of suspected illegal killing

- Born in 2021, offspring of the translo cated lynx Goru;
- February 2022;
- In May 2022, the LIFE Lynx team received a mortality signal from the collar;
- The collar was found in a forest with signs of tampering (cut cotton belt), indicating illegal killing; The police were informed;
- A lynx detection dog indicated a blood stain at the scene, later confirmed to belong to the lynx Neža; The lead investigator was a participant in the workshop for police officers;
- The investigation is ongoing (in 2024).

• Captured and fitted with GPS collar ir

'Hunters Association of Slovenia has zero tolerance towards illegal killing of lynx and other wildlife"

GETHER AGAINST POACHING

The Handbook for

Investigation of Poaching

LOCAL CONSULTATIVE GROUPS

Active cooperation with local inhabitants and local schools in areas with lynx' presence



Anybody interested Together producing was welcome to join at any time

YOUNG LYNX GUARDIANS

A tighter cooperation with nine schools - Young lynx guardians

workshop, open door day

Seminars for teachers

DOCUMENTARIES, BOOKS & A CARTOON

Two short documentary

another extinction).

Path of the Lynx (2018; historic efforts to bring

lynx back to the Dinaric Mountains in 1973)

• Together for Lynx (2023; activities of the LIFE Lynx project team to save the lynx fro.



interactive online



▷ The Mighty Cartoon

• Children's books:

P Max, the Bravest Lyn

KEY STAKEHOLDERS -**HUNTERS AND** GAMEKEEPERS

various materials

Educating and increasing their acceptance of lynx

- Educational seminars
- Conferences
- Articles in hunting magazines
- Meetings with hunters on the field • Involvment of hunters and rangers in camera trapping

COMMUNICATING **ABOUT THE** LYNX

COMMUNICATION WITH GENERAL PUBLIC

- Webpage, Facebook, Instagram & YouTube

- Final project conference

LYNX AMBASSADORS

Cooperation with:

 Anže Kopitar (world-known hockey player), Peter Prevc (world champion ski jumper), Desa Muck (writer and actress) and others.

TOURISM AND ART

Promoting benefits of lynx

 Raising awareness. How? Educational seminars Informing media and partners. How? Study tour. Creating tourism products. How? Art tourism programs, art workshops, lynx thematic trails - hiking & gravel cyclists.

An intensive monitoring program of the Dinaric-SE Alpine lynx population was launched in 2018. The core activity was **camera trapping** which allows the identification of photographed lynx based on their unique fur pattern. Roughly 200 local hunters, protected area rangers and other volunteers got involved in the program as camera operators. With their engagement, we have been able to survey over 10.000 km2 and collected over 3000 photos of lynx within the Dinaric-SE Alpine area for five consecutive years.

We documented an incredible **50** % increase in the density and abundance of lynx in the Dinaric Mountains between 2019 and 2022, as well as an increase in their reproduction. We believe this outcome demonstrates the success of effective collaboration with key stakeholders. Their active participation in data collection fosters a positive attitude towards lynx and other wildlife, and it is vital to ensure that this collaboration continues in the future.

To **exchange data** among five project countries, we adapted the international online geo-database "MBase" (https://portal.mbase.org) as a repository for data collected during monitoring activities. On the portal, project staff, wildlife managers, researchers, and the general public can search for and visualise geo-referenced data on lynx camera-trap images, genetic samples, mortality, movement of radio-collared lynx, and more.

200 The abundance of lynx in the Dinaric Moun-tains between 2019 and 2022, estimated with spatial capture-recapture models.





The forest is complete with

Goru

Goru, the first lynx translocated from the Carpathians to Slovenia's Dinaric Mountains, successfully integrated into the local lynx population. He established his territory in Mala gora alongside remnant female lynx Teja, mating with her at least five times from 2019 to 2023 which resulted in five litters detected within his home range.

We monitored him with the help of a telemetry collar, telemetry being an important tool used for studying lynx ecology. It allows us to track vital lynx behaviors by studying predation, documenting interactions with conspecifics, locating resting sites and monitoring mating excursions.

Every year after mating with Teja, Goru went on a mating excursion outside his home range and probably **contrib**uted to richer lynx genetic diversity also beyond his territory. It seems that Goru's effort payed off as it resulted in already having grandchildren.

Goru's mating excursion in 2022 National borders

Release site





THE LYNX STORY

Map of Goru's home range and mating excursions.

»Although I will probably never see lynx in the wild, I would do anything to protect him from extinction. That is why I support education and workshops about lynx we had at school.« - LEJA MIKULIČ, student at Gymnasium and secondary school Kočevje, Slovenia The implementation of the LIFE Lynx project required the **involve**ment and cooperation of many institutions and volunteers. Many selflessly provided their time and effort in saving the Dinaric-SE Alpine population of Eurasian lynx from extinction.

In the name of the LIFE Lynx pro-

ject partners, I would like to express our sincere gratitude for the cooperation and efforts of the following institutions: in the Slovak Republic, the Ministry of the Environment of the Slovak Republic, the State Nature Conservancy of Slovak Republic, the National Zoo Bojnice, Forests of Slovak Republic; in Italy, Corpo Forestale regionale – Regione Friuli Venezia Giulia, Corpo di Polizia provinciale di Belluno, the hunting associations Federcaccia, Enalcaccia, Arcicaccia and Liberacaccia of Friuli Venezia Giulia; **in Slovenia**, The Ministry of Natural Resources and Spatial Planning of the Republic of Slovenia, The Ministry of the Interior of the Republic of Slovenia, ZOO Ljubljana, local hunting clubs, Association Dinaricum, Triglav National Park, Municipality Bohinj, Municipality Loški Potok, Municipality Gorje, DINA Pivka, Public institute Kočevsko; in Romania, Ministry of Environment, Waters and Forests, **RNP** Romsilva, Sanitary Veterinary Directorate of Vrancea County, Environmental Protection Agencies from Bacău, Neamt and Vrancea Counties, Putna Vrancea Natural Park

Administration, Slovenian Embassy in Romania; in Croatia, Ministry of economy and sustainable development of the Republic of Croatia. Ministry of Agriculture of the Republic of Croatia, local hunting clubs, Public Institutions: "National Park Risnjak", "National Park Paklenica", "National Park Sjeverni Velebit", "National Park Plitvička Jezera", "Nature Park Velebit", "Nature Park Učka", "Priroda", Zagreb ZOO, Rewilding Velebit.

Moreover, we would like to thank all who were willing to get to know lynx a bit better and participated in various actions with great enthusiasm: Lynx ambassadors, LCG members, Young Lynx Guardians, and various schools. Rangers, hunters, and other volunteers were an important part of the lynx monitoring, as well as caretakers of lynx in enclosures in Slovenia. Finally, we appreciate the support of the general public for our efforts to save lynx, Europe's largest wild cat.

In the beginning, the project joined many people with the same vision; in the end, this was not just our job but became an important part of our lives. Dear project partners, it is my honour to have shared this journey with you.

Rok Černe

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A VISION FOR THE FUTURE:

We wish the lynx populations to connect naturally & the natural balance to be restored, and therefore projects such as LIFE Lynx will not be needed anymore.