



Preventing the extinction of the Dinaric-SE
Alpine lynx population through reinforcement
and long-term conservation



Monitoring of survival, movement, reproduction and predation of translocated lynx and other lynx equipped with GPS collars

Action D.2

Including data collected within the projects 3Lynx, InterMuc and ULyCA2.

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Introduction

The main goal of this action was to assess the overall effectiveness of the lynx reinforcement efforts within the Dinaric-SE Alpine lynx population. Data was drawn from both the pre-release phase (Action A3) and the release phase (Actions C3, C4, and C5). Various methods were used for data collection, including non-invasive genetic sampling, camera-trapping, snow-tracking, GPS-telemetry, and video surveillance of lynx kill sites. These data were collected systematically over consecutive years, spanning from 2017 to 2024, encompassing the pre-release and release phases (Fležar et al. 2019, 2022, 2023a, 2023b, 2024, Krofel et al. 2021).

Sampling occurred throughout the project area, detecting lynx presence and gradually expanding as the population spreads due to translocations, creation of stepping stones, and natural dispersal. Monitoring was conducted at two levels across Slovenia, Croatia, and Italy: 1.) at the individual level, assessing the fate of translocated lynx, and 2.) at the population level, examining genetic and demographic trends before, during, and after reinforcement activities. This multi-level approach enables a comprehensive evaluation of the reinforcement's effects on the lynx population's demographic and genetic health.

In this report, we focus on the individual-level of assessment of the reinforcement process, i.e. we present the results of the telemetry monitoring of the individual lynx. All translocated lynx, along with some of their offspring and some of the remnant animals were equipped with telemetry collars. GPS telemetry serves as a valuable tool for studying various aspects of lynx behavior, including habitat utilization, dispersal, movement patterns, predation, feeding habits, and reproduction (Krofel et al., 2013; Heurich et al., 2014; Hočevár et al., 2020; Mattisson et al., 2022; Ripari et al., 2022). Our primary focus in tracking translocated animals is to assess lynx survival rates, territory establishment, interactions with other lynx, movement behaviors, reproductive success and predation.

Monitoring of the translocated lynx

Dinaric Mountains

Goru

Lynx Goru, captured in Romania in February 2019 and released in Slovenia in May 2019, established a territory in Mala gora area, Kočevsko region, after 17 days. He was estimated to be 5 years old and weighed 22 kg at the time of the capture. His home range spanned 138 km² (average annual 95% minimum convex polygon of GPS locations, excluding dispersal period and excursions during the mating seasons) overlapped with that of a remnant female named Teja, with whom he already mated in June 2019. In August 2019, his first offspring, a female lynx Mala was born, who was also equipped with a telemetry collar later that year. Next mating season, Goru mated with Teja again, resulting in three kittens, including male named Niko that was also collared later on. In 2020, Goru temporarily left his territory during the mating season, heading to Croatia's Ravna gora area before returning. His paternity of potential kittens in that area remained unconfirmed. Recaptured in July 2020, he was in good condition and received a new telemetry collar. Goru mated with Teja again in 2021, which resulted in three born kittens, Neža, Valentina and Matic. Neža and Valentina were collared in 2022, while Matic was collared in 2024 as an adult lynx. After mating with Teja in 2021, he went again on a mating excursion to Snežnik and Gorski Kotar area, however we did not detect any potential offspring. In 2022, he probably mated with Teja again, as we recorded her with one kitten later that year. After that he went on two separate mating excursions, one towards the southern part of Kočevski Rog and other towards Velika and Racna gora. Altogether we genetically confirmed his paternity of 3 litters resulting in 7 kittens. The female from his territory (Teja) had additional 2 litters in 2022 and 2023, where Goru's paternity was not genetically confirmed due to lack of genetic samples, however, since they were recorded in his territory whilst he was still present, we assume Goru is the father also for these litters. This means he was the father of at least 5 litters. His collar dropped off in summer 2022, ending his telemetry monitoring. Despite this, he was regularly recorded with camera traps and non-invasive genetic monitoring, with the record in November 2023. Throughout telemetry monitoring, we investigated 54 of his kill sites on the field. All of them were roe deer except one red fox. Goru's successful establishment of territory and confirmed reproductions indicate his very successful integration into the Dinaric lynx population and so far, he is a translocated lynx with the largest number of confirmed and probable reproductions.

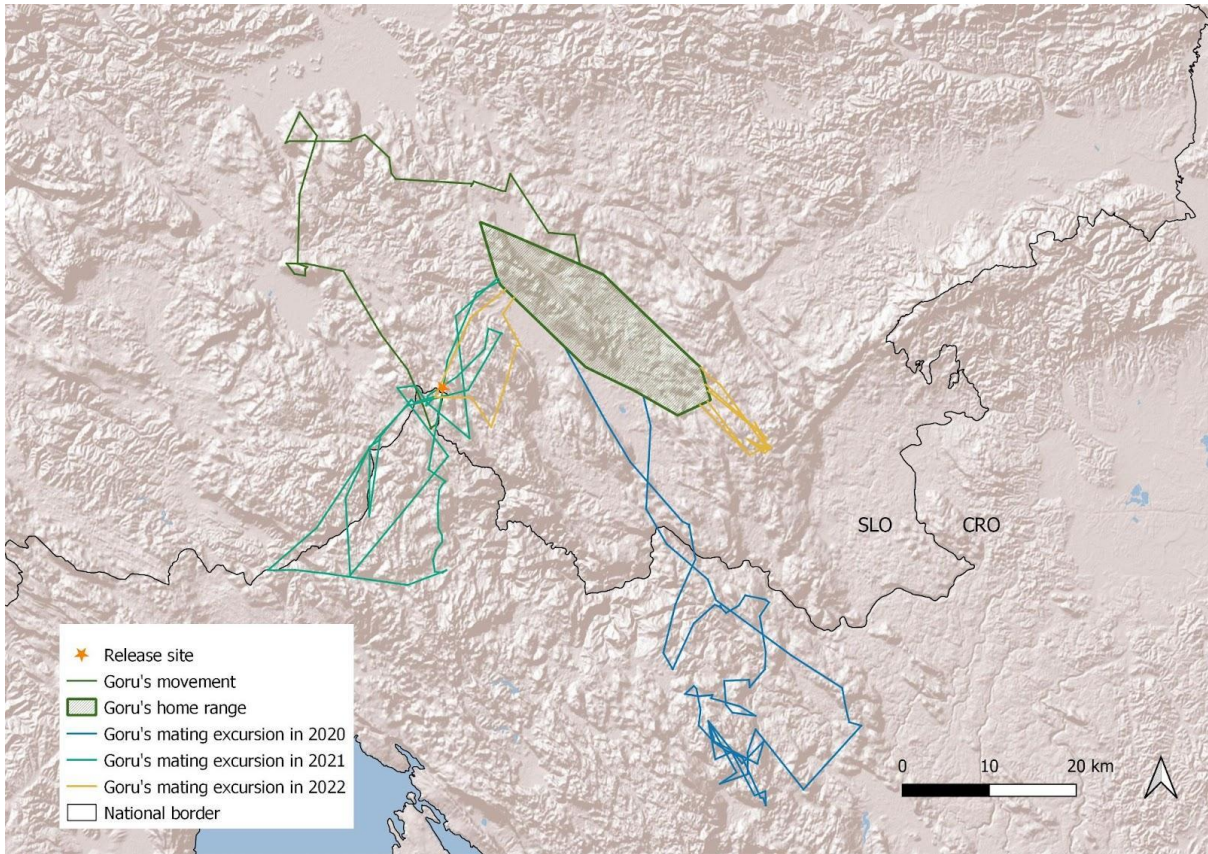


Figure 1: Map of Goru's home range (100% MCP), mating excursions and path from the release site

Doru

Doru, captured in Romania in February 2019, was released in Croatia's Risnjak National Park in May of the same year. At the time of the capture, he was estimated to be 2 years old, weighing 20 kg. After initial days in Risnjak, he moved north, eventually establishing territory in Slovenia's Javorniki area that measured 148 km². Unfortunately, telemetry data stopped in January 2020, and other monitoring methods, such as searching with VHF, camera-trapping and collecting genetic samples, found no signs of him or potential offspring which means he did not integrate into the existing lynx population. We replaced him with another Carpathian lynx. During monitoring, we investigated eight of his kill sites, all involving roe deer, in collaboration with local hunting clubs.

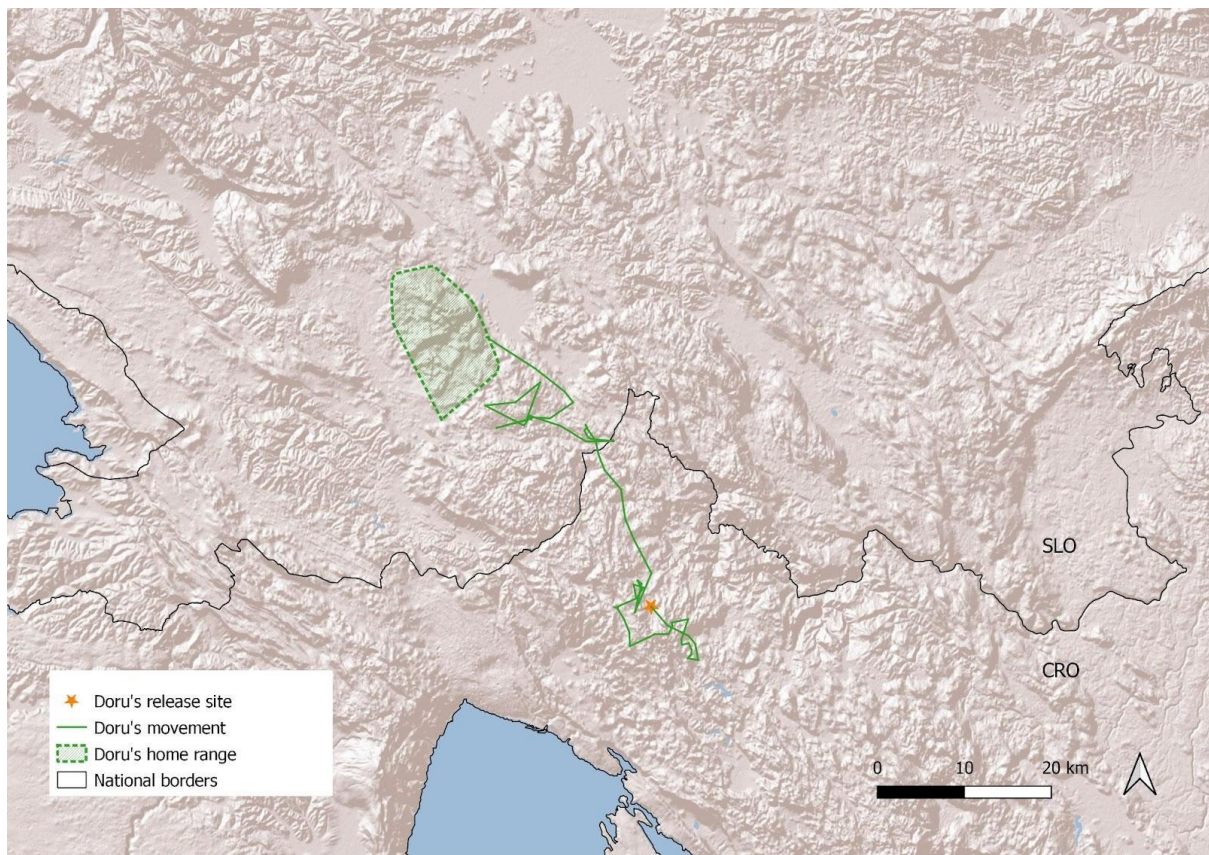


Figure 2: Map of Doru's home range (100% MCP) and path from the release site

Catalin

Catalin was captured in Romania in January 2020 and released into Slovenia in March of the same year. He was estimated to be 4-5 years old at the time of the capture, weighing 24kg. After his release in the Snežnik plateau, he initially headed south, crossing into Croatia's Istra region. He then turned west, crossing much of Gorski Kotar before returning back into Slovenia. He established his territory at Menišija, while also covering areas such as Logatec plateau, Rakitna, and eventually also Mokrc. His home range is bounded by the Ljubljana-Koper highway to the west, which he has not crossed yet. In the summer of 2020, he was frequently seen with a remnant female known as "Menišija1." During the 2021 mating season, he went to Kočevsko near the Croatian border, likely in search of a mate. The presence of kittens with the same coat pattern as Catalin's suggests he might be their father of Menišija1's kittens, although genetic confirmation is lacking. In 2022, he likely mated again with "Menišija1" before going on a six-day excursion in March, following a similar route as the previous year. Recaptured and recollared in February 2022, his monitoring was extended for two more years. Expanding his home range to the southeastern area after the neighboring male Igi's death, Catalin's multi-annual home range measures 315 km². During the 2023 mating season, he had three shorter excursions south of his territory, lasting a few days each. Sharing kills with a local female from Mokrc during the mating season suggests that he was mating with her. Regular camera trap monitoring indicates Catalin is in good physical condition.

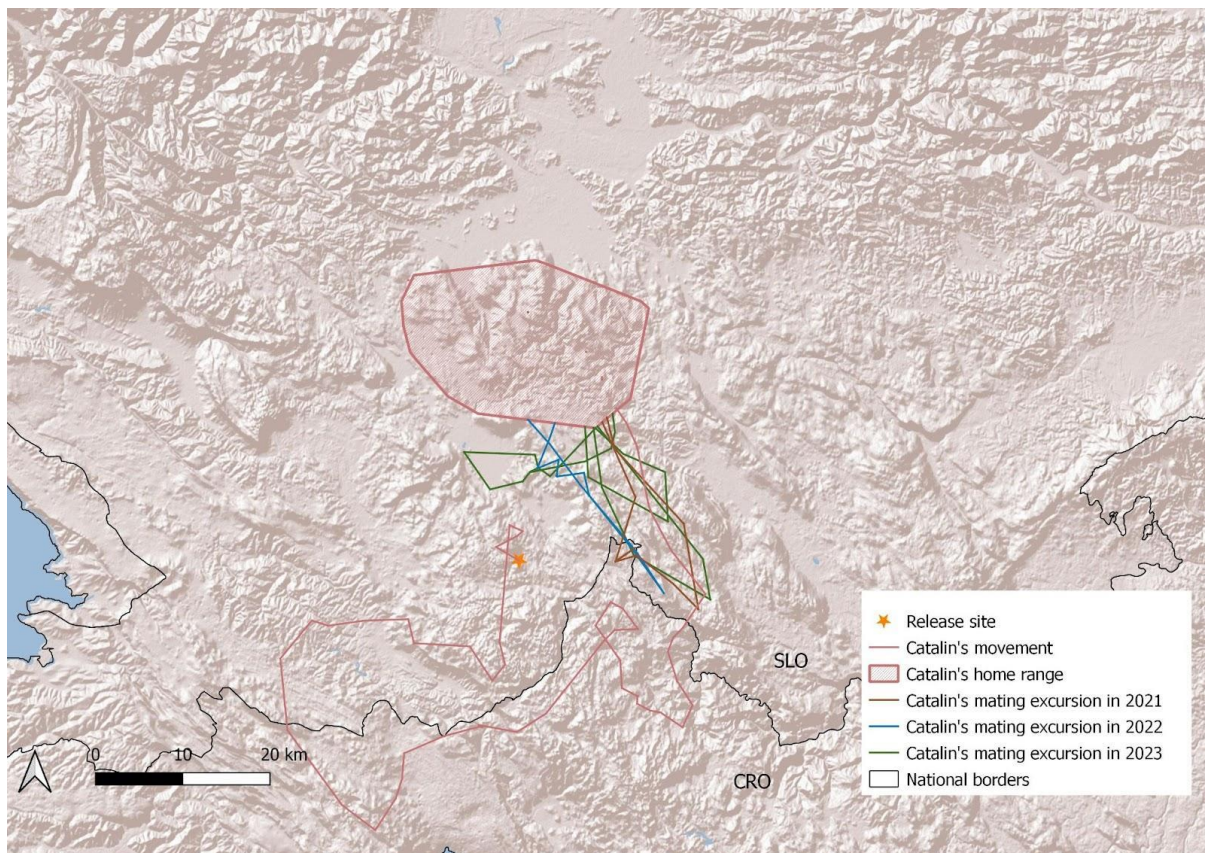


Figure 3: Map of Catalin's home range (100 % MCP), mating excursions and path from the release site

Boris

Boris, a 2-year-old male lynx captured in Romania in January 2020, weighing 15 kg, was translocated to the Loški Potok enclosure and released in late May of the same year. After release, he went to Croatia, where it looked like he established a home range around Gerovo for approximately two months. However, after an encounter with a collared territorial remnant lynx Bojan, Boris shifted southeast to Vrbovsko for a month before moving even further south to the Ogulin and Mala Kapela area by October 14, 2020. It appeared he settled there, establishing a territory. By the end of March 2021, his GPS collar stopped transmitting data, though VHF functionality remained. Attempts to recapture him were limited by the difficulty in locating fresh kills, compounded by parts of his territory overlapping with active mine areas, which negatively influenced fieldwork. Camera traps captured Boris four times during the 2022-2023 monitoring season. Within his territory, two remnant females were observed, one with a kitten, hinting at Boris's potential paternity. With signs of territory establishment and potential for reproduction, Boris is deemed integrated into the Dinaric population.

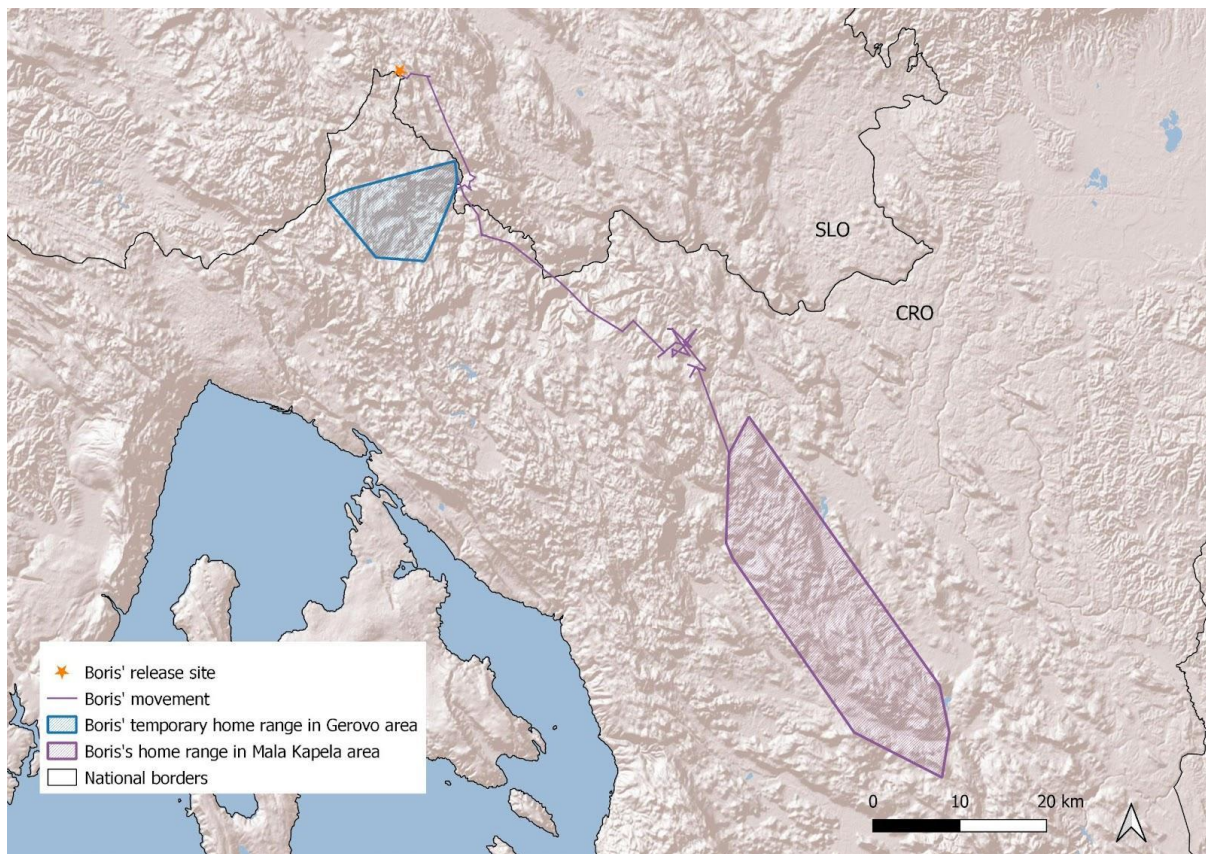


Figure 4: Map of Boris' home range (100% MCP) and path from the release site

Maks

Maks was a male lynx translocated from Slovakia to Slovenia in 2020. Due to a broken paw and poor health, he underwent successful rehabilitation at ZOO Bojnice before his release on the Snežnik plateau in late June 2020. At that time, he was estimated to be 2 years old, weighing 16kg. Initially, he moved north toward Javorniki but faced the obstacle of the Ljubljana-Koper highway, staying in the region for three months, potentially establishing territory in the area previously occupied by lynx Doru. However, on September 24, he left this area for unknown reasons. Moving to Menišija and the Logatec plateau, Maks spent two months, interacting with male Catalin and a resident remnant female lynx ("Menišija1"). Departing on November 22, possibly due to Catalin's presence, he was the only of the collared lynx that managed to cross the Ljubljana-Koper highway, starting an 81-day excursion to the Alps before returning to Menišija until May 2021. He then moved west towards Hrušica and Trnovski gozd, potentially establishing a territory in the region. Unfortunately, signal from his collar was lost in autumn 2021. Because this area is not included in the systematic monitoring, his status remains unknown. Since we also have no available data on his reproduction, Maks's integration into the remnant population remains unclear until potential further information is obtained.

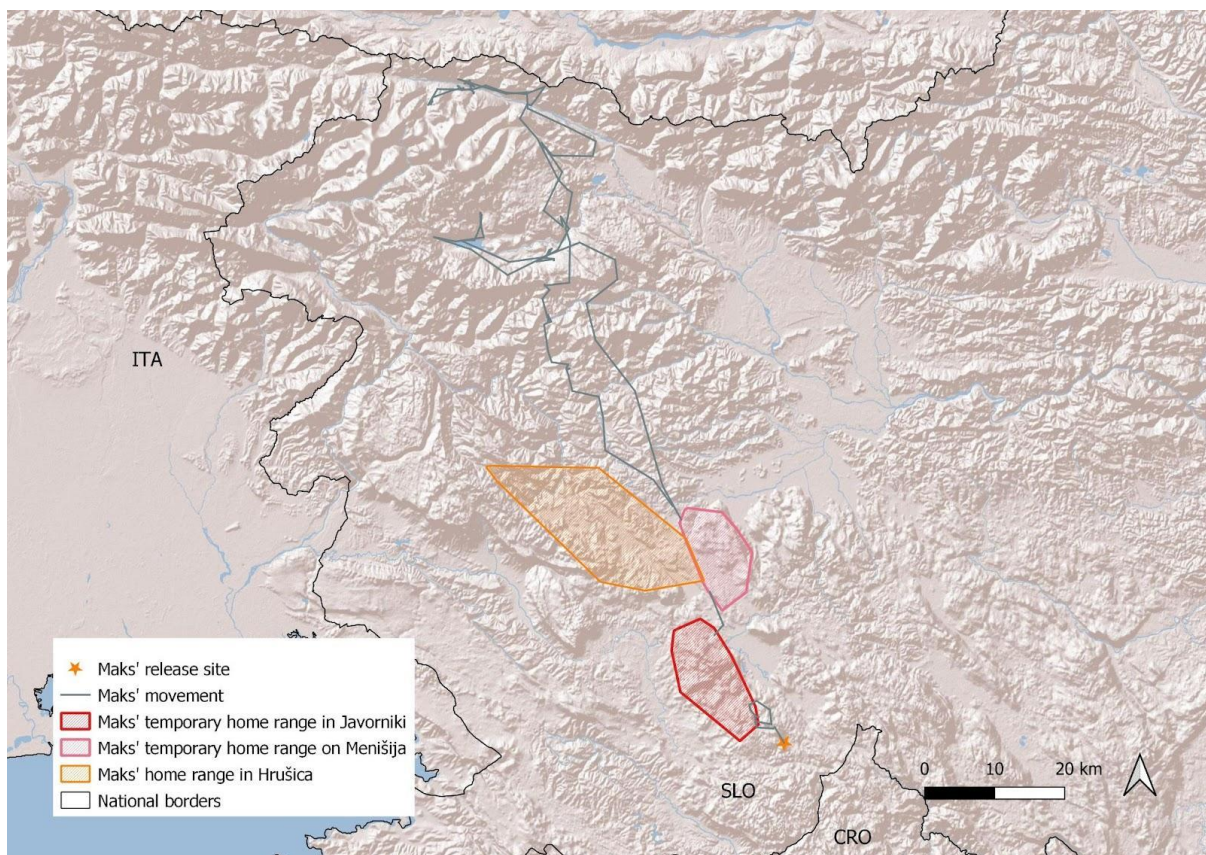


Figure 5: Map of Maks' home range (100% MCP) and movement since the release in Snežnik

Pino

Pino, a 5 years old male lynx captured in Slovakia in May 2020, weighing 20 kg, was released in Croatia's Štirovača forest reserve equipped with a functioning telemetry collar. However, immediately after release, the collar ceased transmitting, suggesting either technical failure or potential poaching. Extensive search efforts by the Croatian LIFE Lynx team, including aerial scans and camera monitoring, failed to locate Pino. In September 2023, a hunter found Pino's collar near the release site, showing signs of damage caused by humans. Data retrieved from the collar by the manufacturer confirmed the collar stopped working on the 6th day after the release so presumably this is the time when the animal was poached. Authorities investigated the incident but there is a almost no possibility to uncover the background of Pino's disappearance.

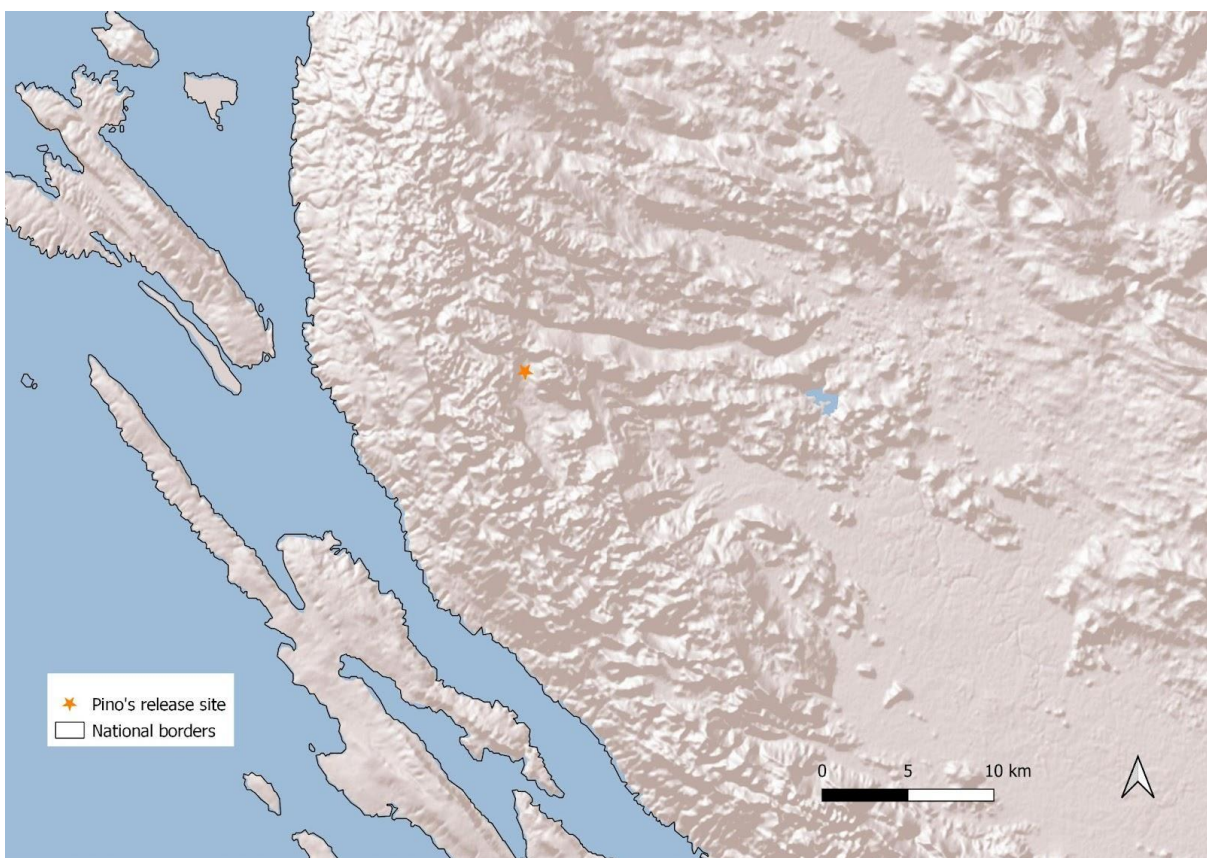


Figure 6: Map of Pino's release site

Alojzije

Male Alojzije, a 4 years old male, captured in Romania in January 2020, was released in Paklenica National Park in March. He established his territory around Sveti Rok in southern Velebit, where he has been since May 2020. His average annual home range (95 % MCP) spans 232 km². Two females are continuously monitored within his territory. In March 2021, a camera trap recorded three individuals, possibly a female with two kittens. In September 2021, another lynx kitten was photographed. In the following season, local female Mateja was observed with three kittens, likely fathered by Alojzije. No females with kittens were seen in the 2022-2023 season, and collection of samples for genetic analysis from kittens in his territory was challenging due to low snow cover. Alojzije is regularly captured on camera traps, with eight sightings in the 2021-2022 season and one in the 2022-2023 season. His latest sighting was in January 2024.

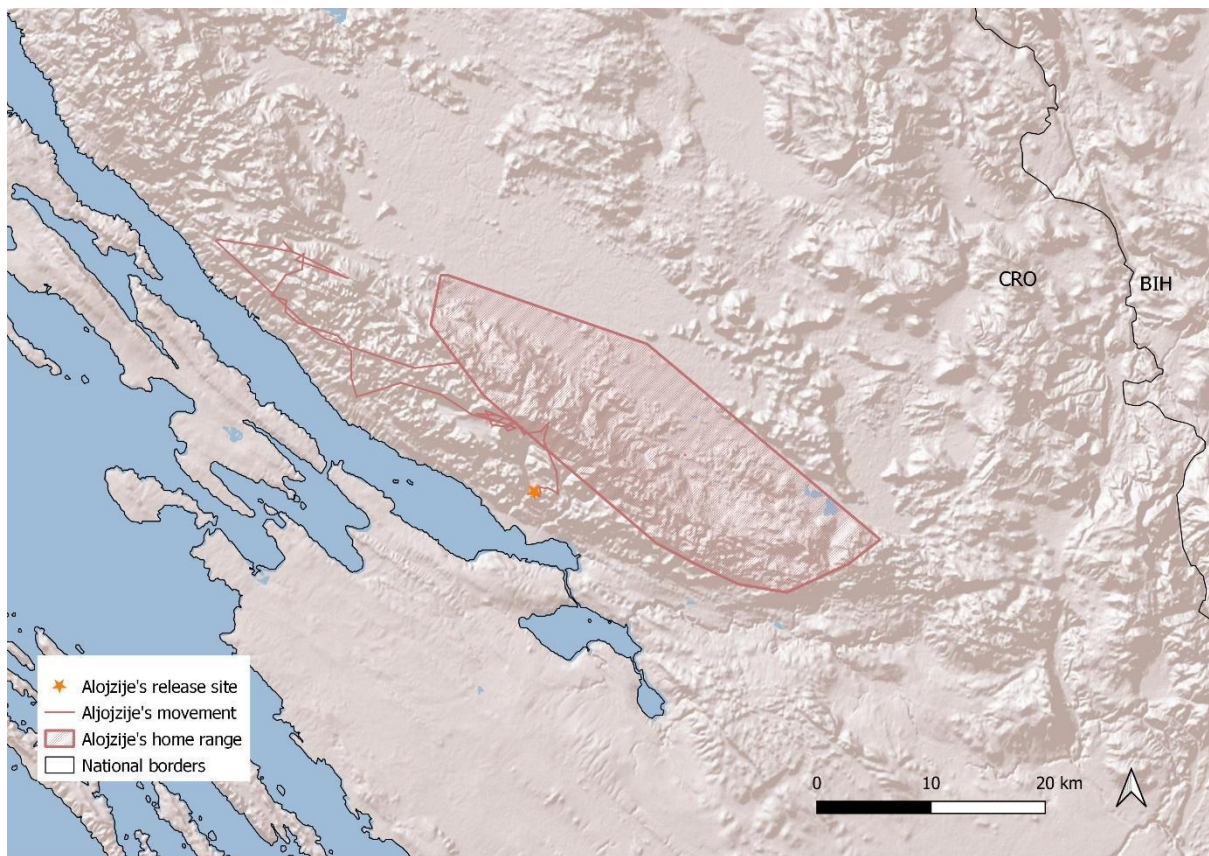


Figure 7: Map of Alojzije's home range (100% MCP) and path from the release site

Emil

Emil, a 20kg, 5-year-old male lynx captured in Slovakia in February 2021, was translocated to Croatia and released near the village of Krasno on May 14th 2021, in collaboration with Nature Park Velebit. After exploring northern and central Velebit, he established his territory in the Baške Oštarije area, bordering the central and southern Velebit. His average annual home range (95% MCP) spans 168 km², overlapping with the territory of a remnant collared male Pandora. During the 2022-2023 season, three females were recorded within Emil's territory: Tara was photographed with one kitten, while Trubaja and Buna were photographed without kittens. Buna has been monitored with camera traps since 2018 on the northwestern edge of Emil's territory. Unfortunately, Emil's collar malfunctioned in December 2022, which stopped his telemetry monitoring. Despite efforts to locate his signal with an airplane and VHF antenna in January 2024, his whereabouts remain unknown since his last confirmed presence by camera traps and non-invasive genetic samples collected in March 2023.

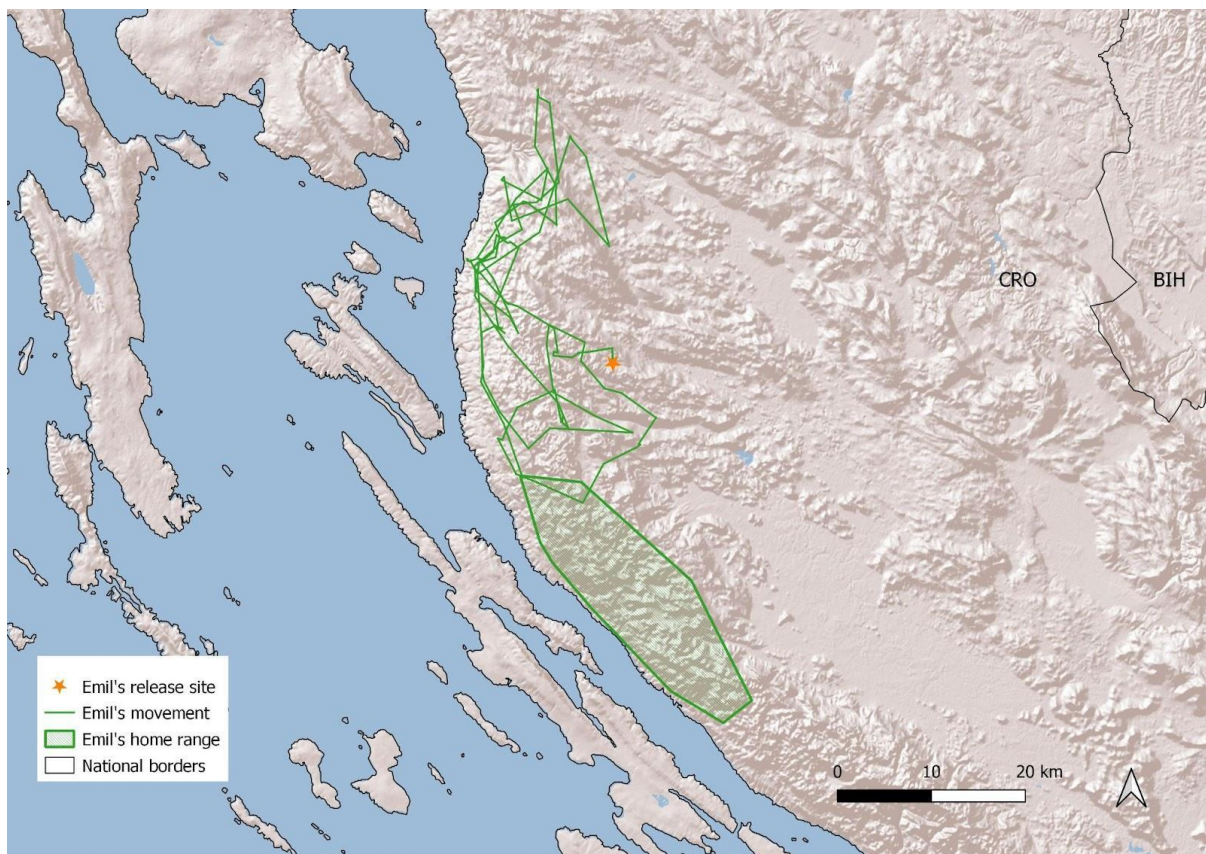


Figure 8: Map of Emil's home range (100% MCP) and path from the release site

Lubomir

Lubomir, also known as Ljubo, is an adult lynx captured in Slovakia, was released on June 14, 2022, in Ramino Korito hunting ground in Croatia. He was estimated to be 5 to 7 years old and weighed 22 kg at the time of the capture. First, he remained in the release site area for about ten days before starting to move north. Despite some difficulties with collar transmitting, we later noticed that he established a territory (95% MCP) that measured 122 km² next to the territories of translocated lynx Emil and Alojzije. No females with kittens were recorded in his territory during the 2022-2023 season, but Ljubo was photographed with camera traps four times.

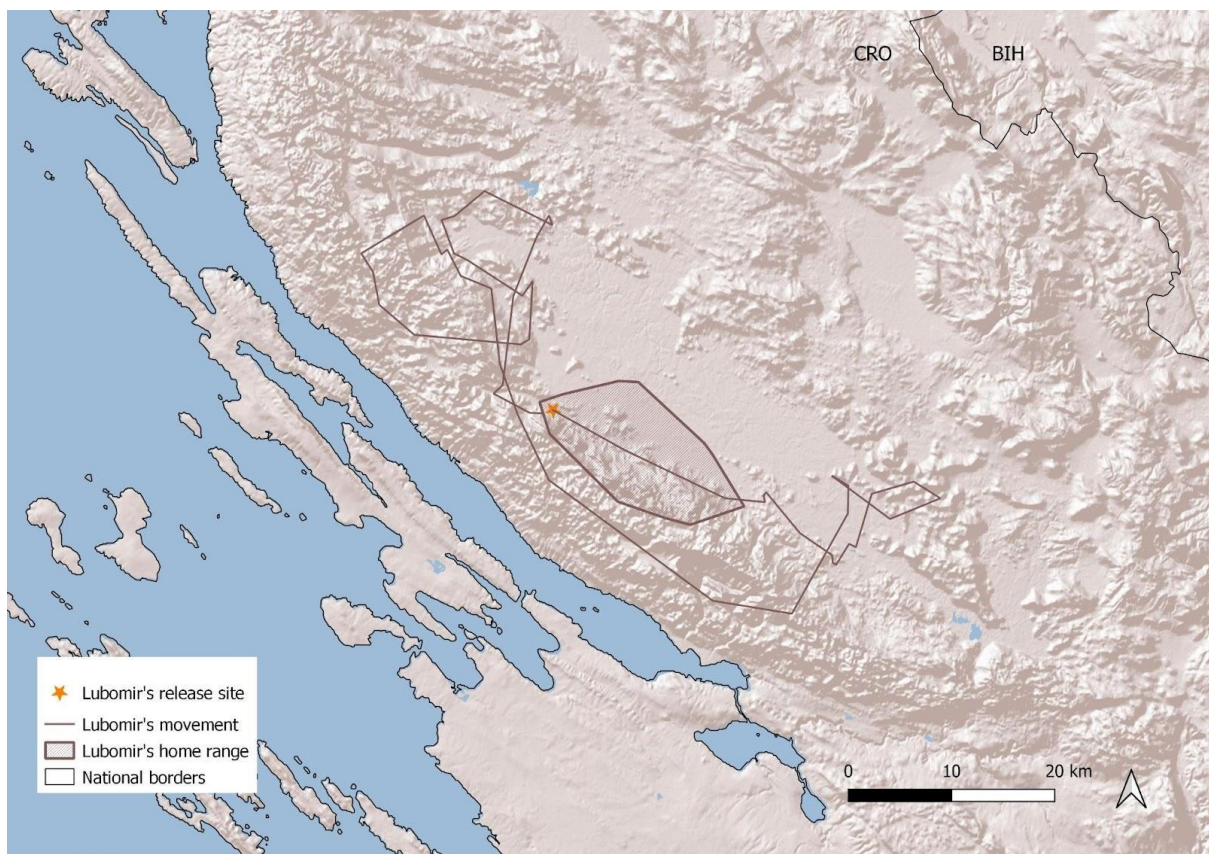


Figure 9: Map of Lubomir home range (100% MCP) and his path from the release site

Blisk

Blisk, captured in Romania in February 2022 weighing 27 kg and estimated to be 6 to 7 years old at the time of the capture, was translocated to Slovenia in April same year. After spending around 40 days in Snežnik soft release enclosure, he was released into the forests of Snežnik in mid-May. He then moved north towards Javorniki plateau, where he established a territory (95% MCP) spanning 153,5 km². Blisk shares his territory with at least one female, confirmed by camera traps. She was recorded with two kittens in 2023, which probably means that Blisk is their father. During mating season 2023, he ventured on a three-day mating excursion to Gorski Kotar, Croatia. Camera traps deployed at his kill sites showed him to be in good physical condition, and he was also recorded within national lynx monitoring.

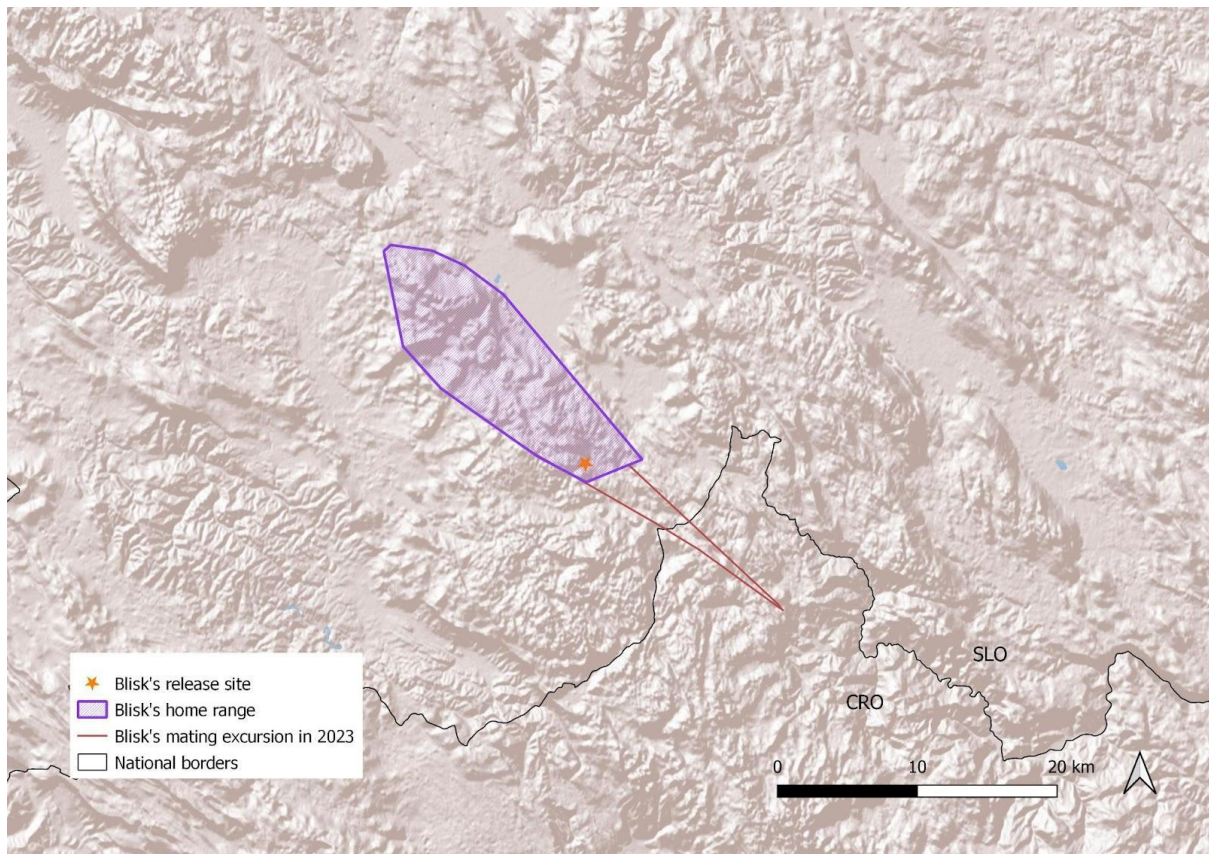


Figure 10: Map of Blisk's home range (100% MCP) and mating excursion.

Kras

An adult male lynx, captured in Romania, was released in Plitvice Lakes National Park on March 24, 2023, marking the sixth and final release in Croatia within the LIFE Lynx project. He was estimated to be 2 years old, weighing 22 kg at the time of the capture. Within the first two weeks, he briefly crossed into Bosnia and Herzegovina before returning to the Plitvice area. He then turned towards Gorski Kotar, where he stayed for three weeks before returning to Plitvice. In mid-July 2023, Kras established a territory (95% MCP) spanning 116 km² in Gorski Kotar. Regular monitoring of his kill sites indicates he is adapting well to the environment, and he was photographed by a camera trap in June 2023 and February 2024.

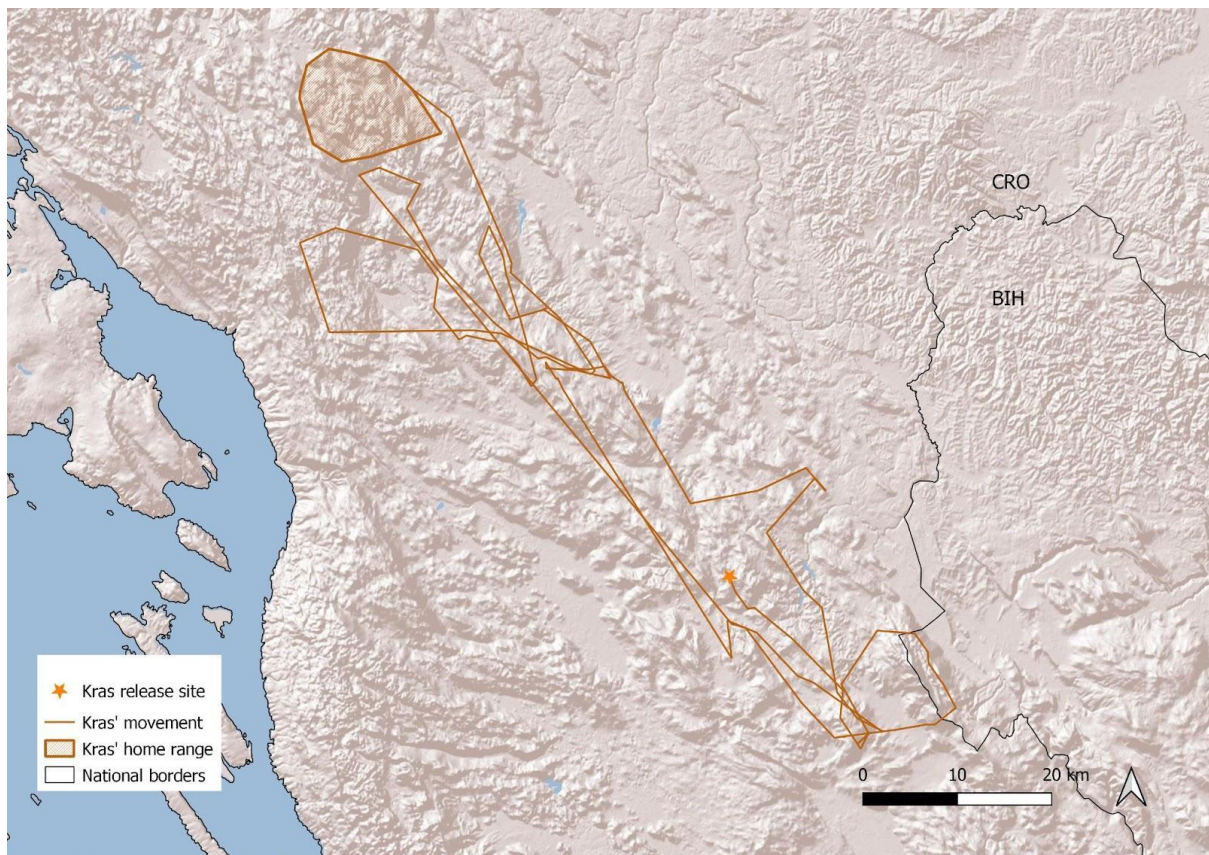


Figure 11: Map of Kras' home range (100 % MCP) and path from the release site

Sneška

Sneška, the final lynx released in Slovenia through the LIFE Lynx project and also the only female that was released in Dinarics, was captured in Slovakia on March 14, 2023, estimated to be five years old and weighing 17kg. Released in the Snežnik mountains, she initially headed east towards Velika gora near Ribnica before moving west to Loški Potok and eventually north to the Iška and Rakitna area by August 2023. There, she established a relatively small home range (95% MCP) of 61 km². She is regularly meeting with another translocated lynx, Catalin, with whom she shares her territory and who were also together during the mating 2024 season. Monitoring of her kill sites via camera traps revealed Sneška to be in good physical condition.

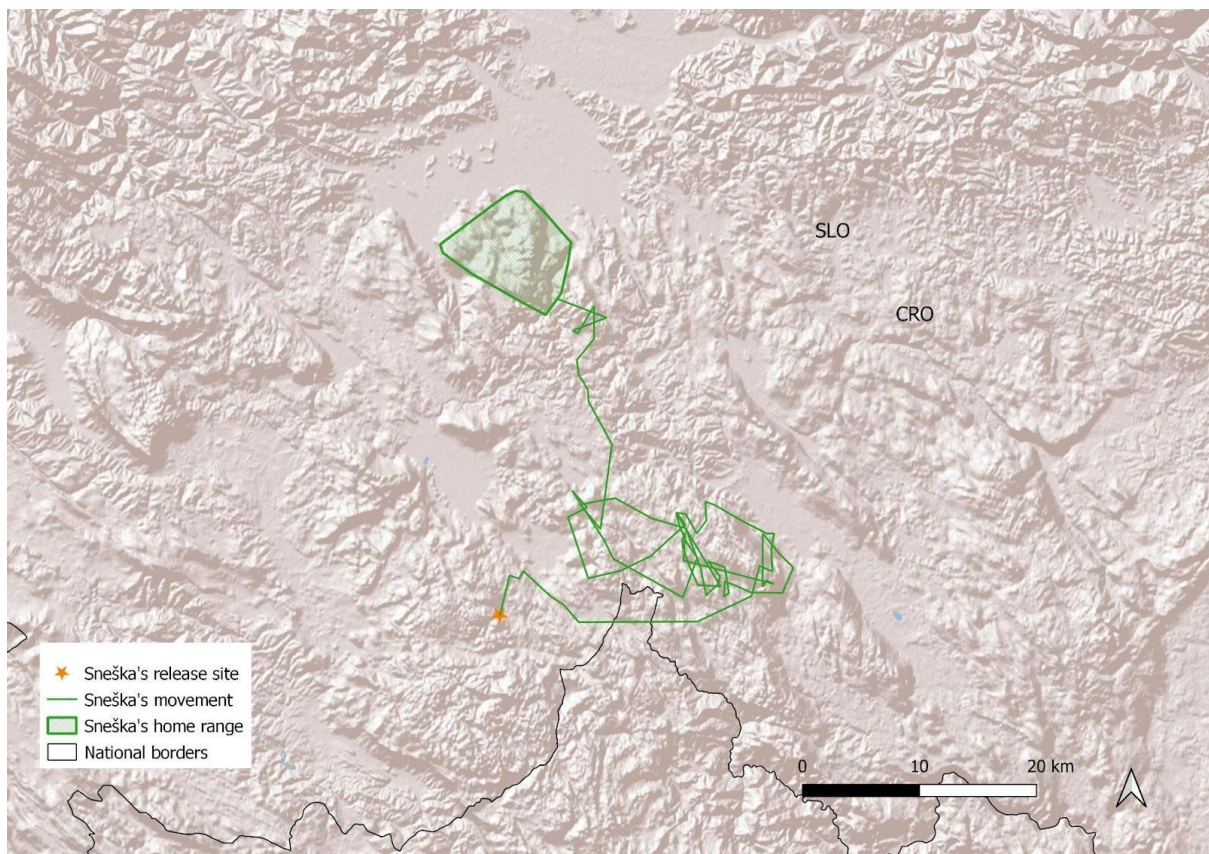


Figure 12: Map of Sneška's home range (100 %MCP) and path from the release site

Translocated lynx in the Alps

Julija

On March 11th, 2021, adult female lynx Julija was captured in Slovakia and transported to Slovenia on April 24th. Estimated to be 2 years old, weighing 17kg, she was released from the Pokljuka enclosure alongside Lenka and Tris on April 28, 2021. Despite being pregnant during translocation, no kittens were detected later in the summer through camera traps set on her kills or within national lynx monitoring, despite initial denning behavior indicated by GPS-telemetry data. Julija established her territory in Pokljuka and Mežakla area, primarily shared with Lenka and Tris, covering 109 km² (95% MCP). In the 2022 mating season, she mated with lynx Tris, who shares her home range, although lynx Zois was also present during that period. In May 2022, Julija gave birth to three kittens, all of them later equipped with telemetry collars. Regular monitoring of Julija's activities, including camera traps on kill sites, were conducted until her collar stopped working in late winter 2023. Efforts to recapture her were unsuccessful. In October 2023, Julija was spotted with one kitten in the Pokljuka area, with frequent sightings also recorded in the Radovna area during winter. With the establishment of her territory and two successful reproductions, Julija has firmly integrated herself into the Alpine lynx population.

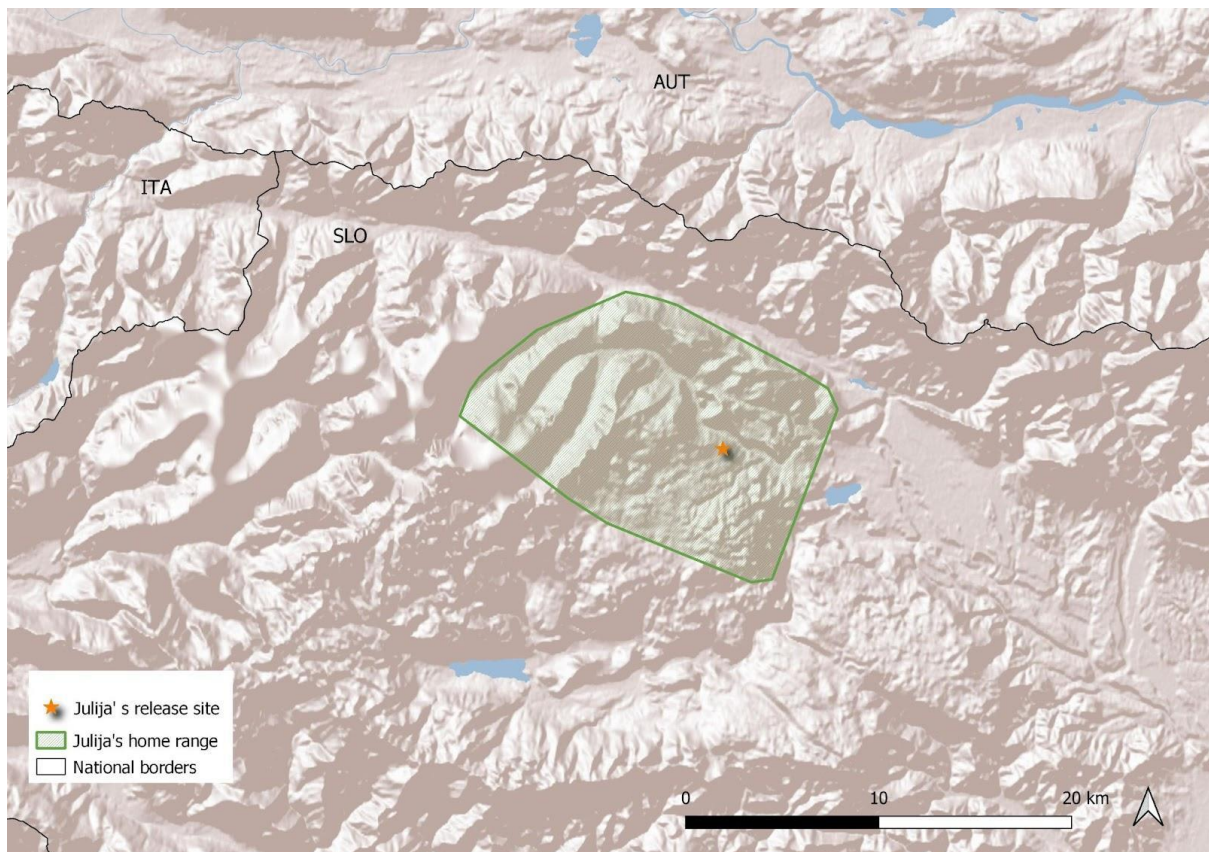


Figure 13: Map of Julija's home range (100% MCP)

Zois

Zois, an adult male lynx, was captured in Romania on March 9th, 2021, weighing 19 kg and estimated to be 2 years old. Transported to Slovenia's Jelovica soft-release enclosure, he was released on April 26th. He established his home range that measured 173 km² (95% MCP) in the Jelovica area, where he mated with translocated female Aida, resulting in the birth of three kittens already in 2021. In the 2022 mating season, he mated with Aida again and briefly went on a mating excursion to Pokljuka before returning to Jelovica. Despite being spotted with female lynx Julija during his excursion, he was not the father of Julija's litter, which was fathered by male Tris (confirmed by the genetic analysis). Zois' collar stopped sending data on April 28th, 2022, a year earlier than expected. Monitoring with camera traps was also not successful as we did not detect him in the area afterwards. While Zois contributed to the stepping stone population with two successful reproductions, his current status remains unknown, although we suspect him to be dead.

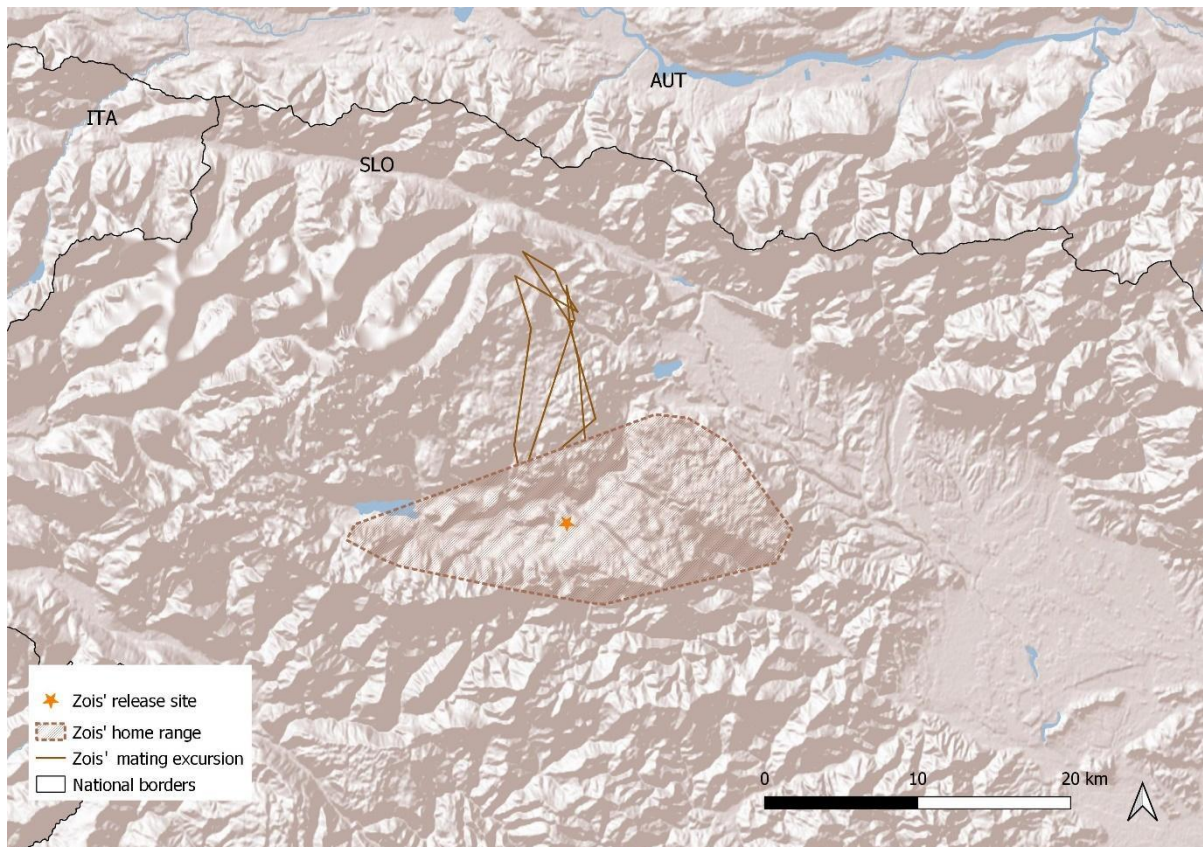


Figure 14: Map of Zois' home range (100% MCP) and mating excursion to Pokljuka

Aida

A female lynx named Aida was captured in Romania on February 13th 2021. Estimated to be two years old and weighing 16 kg at the time of the capture, she was transported to a lynx enclosure on Jelovica, Slovenia. She was released on April 26, 2021, alongside male lynx Zois. She quickly established her home range in the Jelovica area, covering approximately 155,5 km² (95% MCP), she met with Zois on several occasions after the release, sharing at least one kill with him. In August 2021, she gave birth to three kittens, genetically sampled in winter and confirmed as offspring of Zois, with at least one surviving until spring 2022. A successful mating season in 2022 led to the birth of three more kittens (2 females, 1 male) in late May, with Zois confirmed as the father. Aida was captured in late November 2022 and her collar was replaced, however it stopped working soon after, therefore our telemetry monitoring came to an end. We still monitor her on camera traps. One of her second litter kittens, Rozi, was captured in January 2023. In October 2023, Aida was spotted with three kittens by a local hunter in Stara Fužina, although the father remains unconfirmed. In February 2024, a genetic sample was collected in the Tarvisiano which resulted to be from one of the kittens of the 2022 litter. Additionally, an adult lynx detected in Planina Zajamniki is also believed to be offspring from her 2022 litter, but genetic confirmation is still not available. With her established territory and three successful reproductions, Aida has significantly contributed to strengthening the Alpine lynx population.

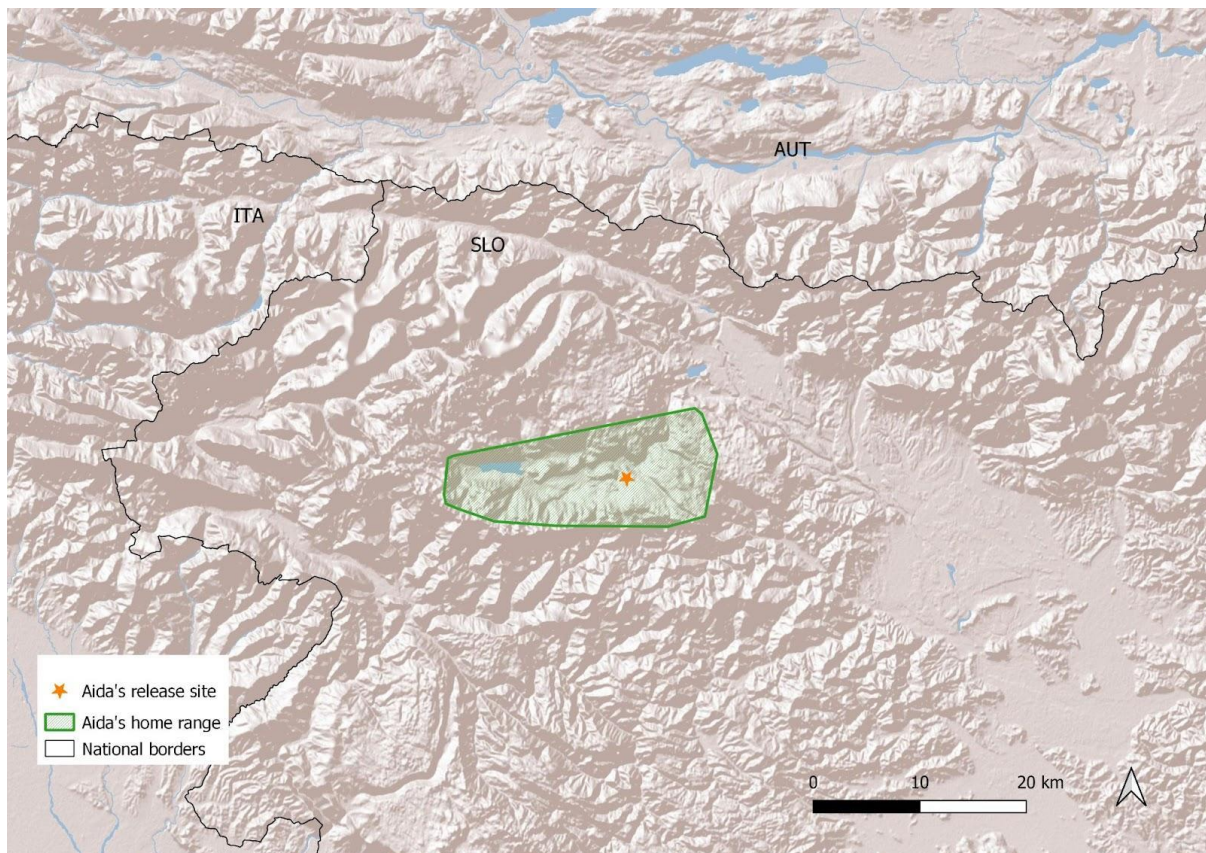


Figure 15: Map of Aida's home range (100% MCP)

Lenka

Lenka, an adult female lynx, was captured in Slovakia on March 18, 2021, weighing 15 kg and estimated to be approximately 3 years old at the time of the capture. She was transported to Slovenia's Pokljuka enclosure and released on April 28, 2021. During quarantine, Lenka displayed no signs of stress, consumed food regularly, and spent much of her time resting on a platform. Post-release, she established her territory in the Pokljuka area that measures 147 km² (95% MCP), which she shares with translocated male Tris and, initially, with female Julija, which is an uncommon behavior among lynx. At one instance, Lenka was observed scavenging at a kill site of Julija. Unfortunately, her collar failed on December 12, 2021, which stopped her telemetry monitoring. Despite this setback, Lenka was regularly recorded on camera traps within the lynx national monitoring area in the southern side of the Triglav National Park. In 2022, she was recorded with one kitten whose father was probably male Tris. In late 2023, Lenka was recaptured, but her telemetry collar fell off due to technical issues after a few days.

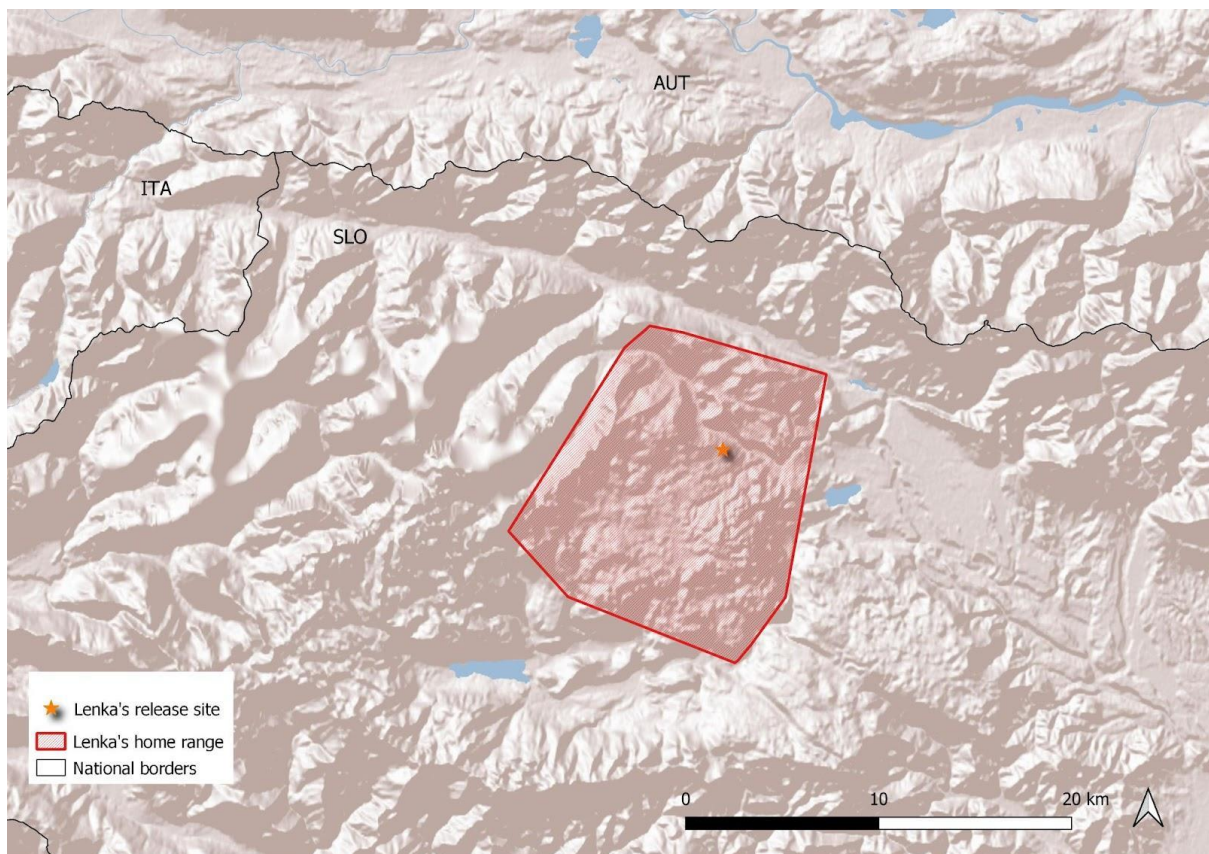


Figure 16: Map of Lenka's home range (100% MCP)

Tris

On April 28, 2021, an adult male lynx named Tris was released into the Triglav National Park area. Estimated to be 6 years old and weighing 27 kg upon translocation from Romania, Tris spent six weeks in the Pokljuka enclosure before release. During quarantine, he displayed normal behavior, regularly consuming provided roe deer and resting on a platform. After release, Tris established his territory in the Pokljuka area, spanning 128 km² (95% MCP), and was observed moving at elevations up to 2400 meters above sea level. Tris's collar stopped transmitting data on December 16, 2021, which stopped telemetry monitoring. Nevertheless, he was consistently captured by camera traps in subsequent monitoring seasons. During the 2022 mating season, Tris mated with local female Julija, who later gave birth to three kittens. He also mated with a female Lenka, who had one kitten in 2022. Efforts to recapture Tris for collar replacement began in spring 2022 using a box trap, but were unsuccessful. Tris was last recorded in April 2023, leaving his current status unknown.

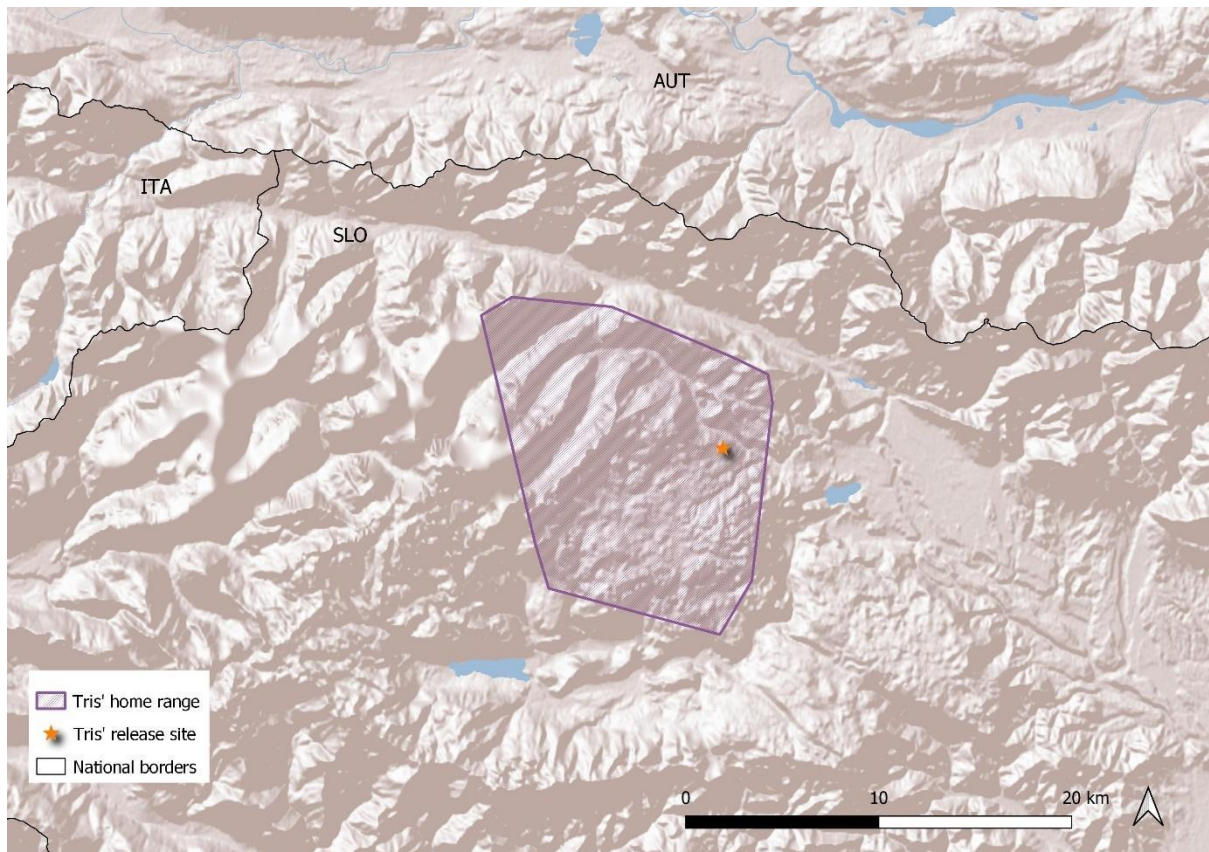


Figure 17: Map of Tris' home range (100% MCP)

Lukaš

Lynx Lukaš, the last lynx translocated to the Slovenian Alps under the LIFE Lynx project, was captured in Slovakia on January 27th, 2023. He was estimated to be 3 – 5 years old, weighing 24 kg at the time of the capture. Translocated to Jelovica release enclosure on March 12, 2023, he was released on April 19. Heading east, he crossed the river Sava and Gorenjska highway towards the Karavanke mountains. It appeared he established his territory in the area between Karavanke and Kamnik-Savinja Alps, where he remained for four months. In mid-August, his telemetry collar stopped transmitting GPS data, leaving his status unknown, as he was in an area without camera traps set for national lynx monitoring. Attempts to locate Lukaš using a VHF antenna were unsuccessful.

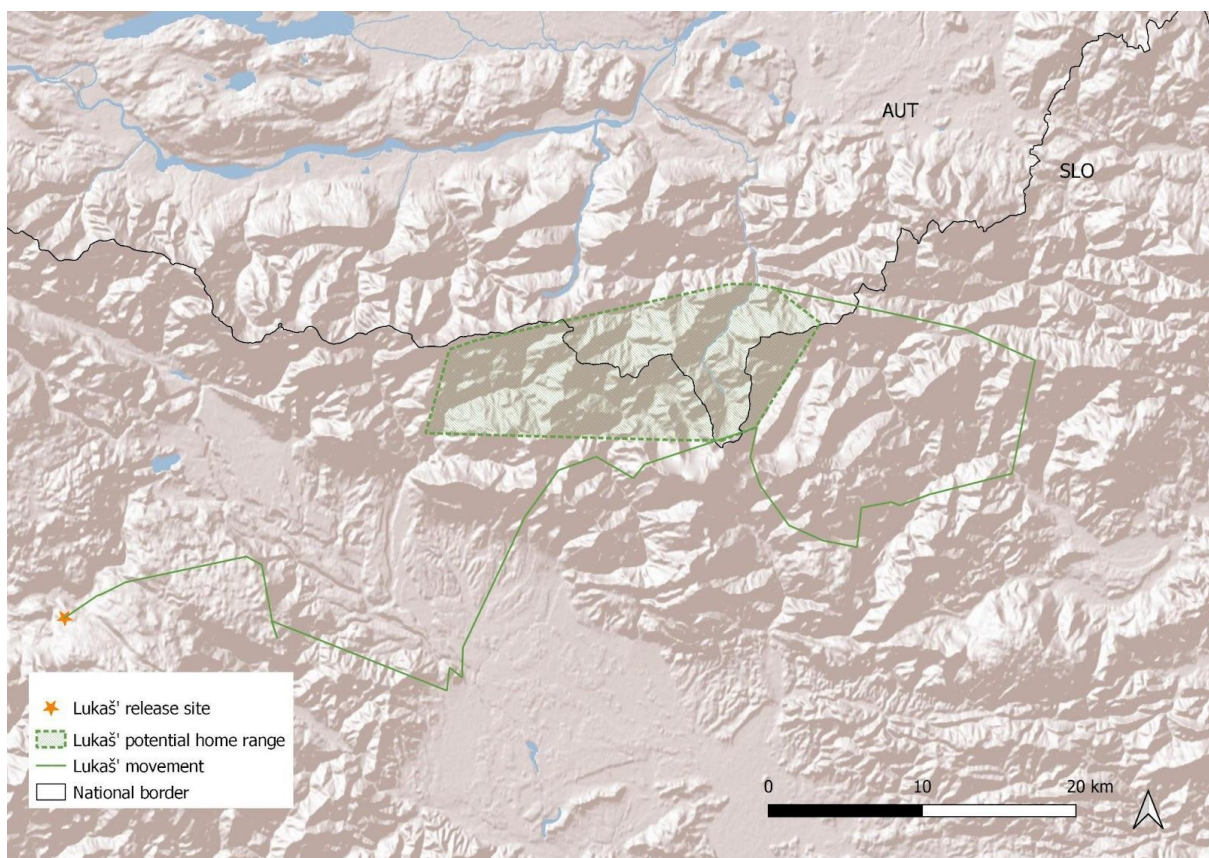


Figure 18: Map of Lukaš' home range (100% MCP) and path from the release site

Margy

On March 9, 2023, Margy, an adult female lynx captured in the Swiss Jura Mountains, was released in Tarvisio, Julian Alps of Italy as part of the ULYCA2 project. She spent 7 days in the enclosure before the release and shortly after release, she began moving north, and by the end of April 2023, she had reached Nockberge National Park in Austria, approximately 50 km north of the release site. Her current status is currently unknown as her collar stopped transmitting the data on 23th of October 2023.

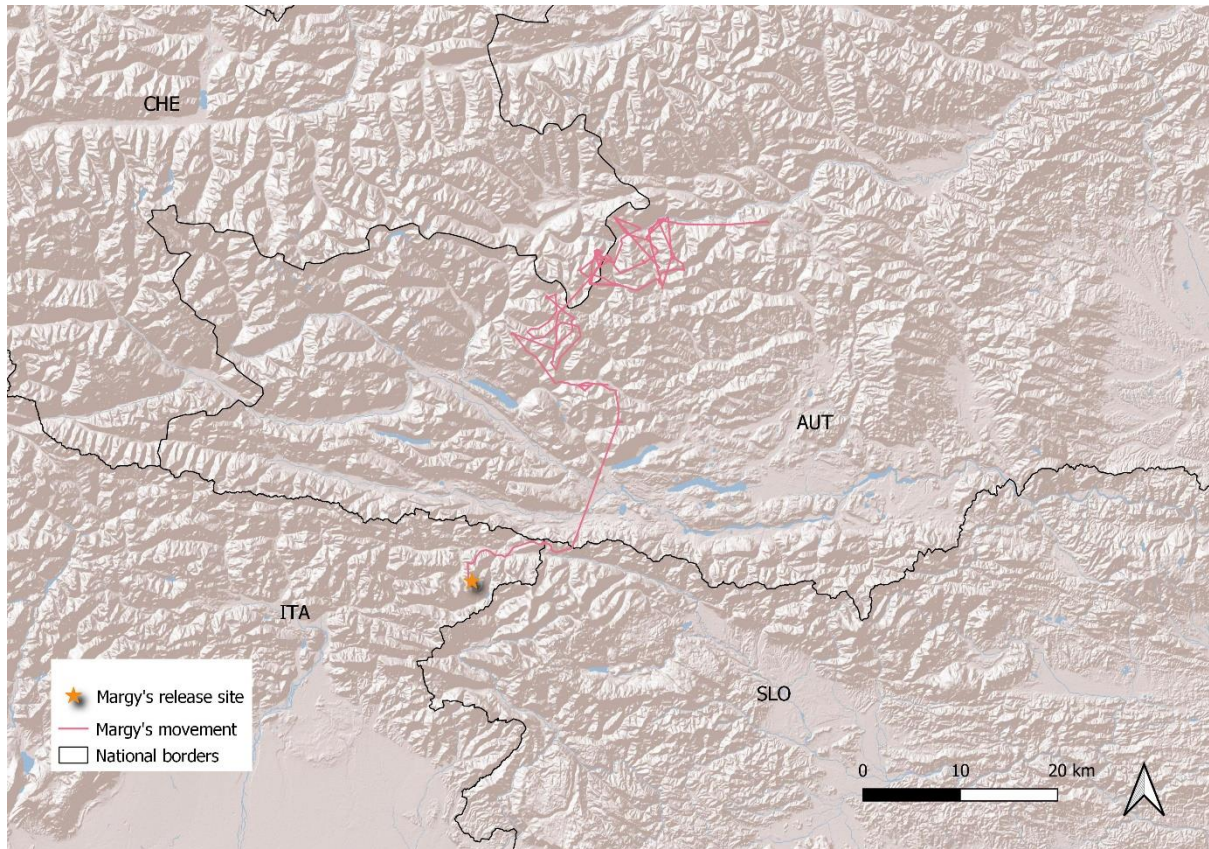


Figure 19: Map of Margy path from the release site

Sofia

On March 16, 2023, adult female Sofia was released in the Italian Julian Alps as part of the ULYCA2 project. She was released from the enclosure in which she stayed for 15 days. Born in 2017 in the Swiss Jura Mountains, she underwent health checks and genetic screening before being translocated to Tarvisio. Within the first two weeks, she explored the Foresta di Tarvisio, crossing the Venice-Vienna freeway three times. Afterwards, she moved north and established a territory between Villach and Bad-Kleinkirchheim in Carinthia, Austria, where she was illegally killed in August 2023.

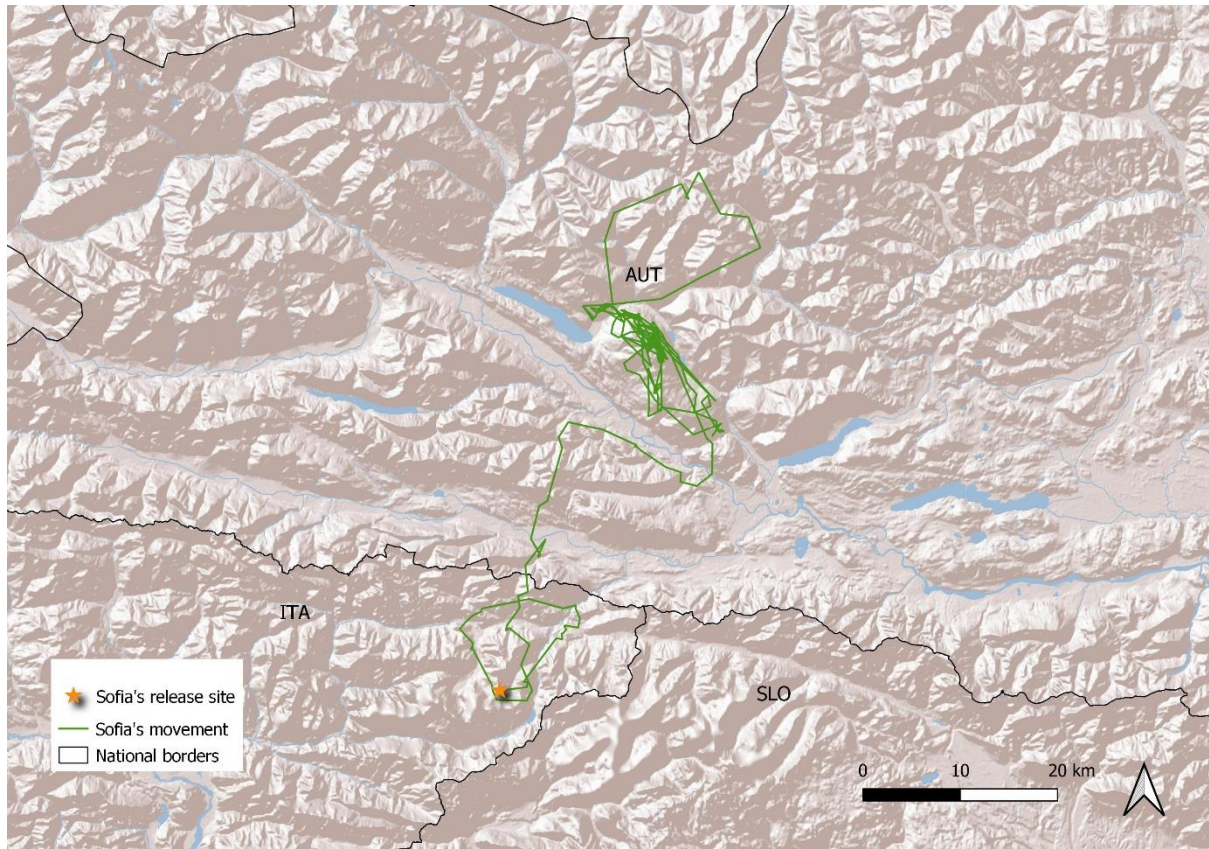


Figure 20: Map of Sofia's path from the release site

Jago

Jago was captured in Romania within ULYCA2 project and then “hard” released in Tarvisio on May 16th 2023. He was estimated to be 2 years old, weighing 22,6kg at the time of the capture. After the release, he went east close to the three-way border of Slovenia, Italy and Austria. He then moved towards Karavanke, where he stayed for a while, but did not look like he established a territory. After that, he moved to Austria and kept moving across long distances. Last locations were close to Kranjska Gora in Slovenia in late winter 2024. His current status is alive and still being GPS-tracked, however, we believe he still did not establish his territory.

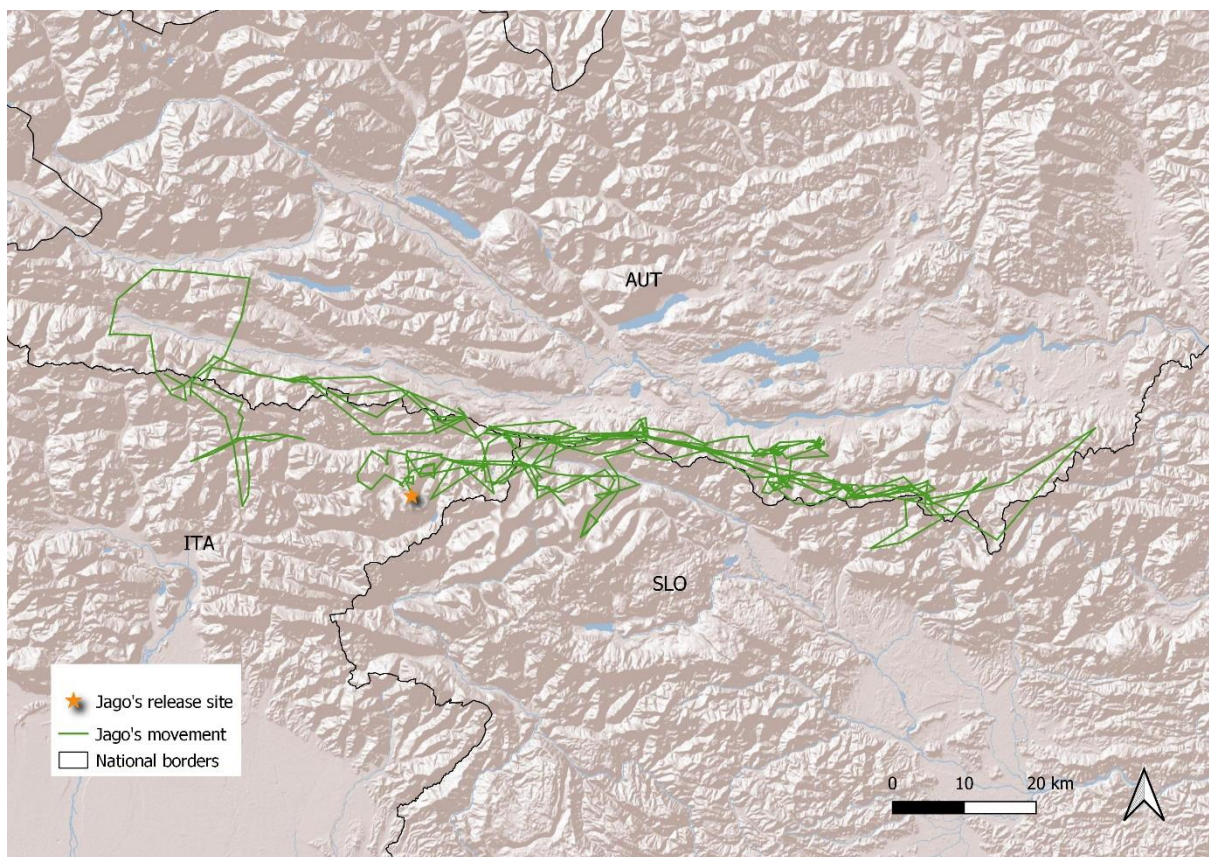


Figure 21: Map of Jago's path from the release site

Talia

Talia was captured in Romania and “hard” released in Italy on 16th of May 2023 within ULYCa2 project. She weighed 17,9 kg at the time of the capture. Soon after the release, she headed east and crossed the border with Slovenia. Then she turned south and established her territory on Jelovica plateau. VHF transmitter on her telemetry collar stopped working, however it still sends GPS data, but due to potential water leakage, the collar could malfunction soon. The plan is to recapture her and change her collar. So far, our attempts were unsuccessful. In the mating season 2024, she was recorded with male Miha, the offspring of female Aida. Hopefully she will have kittens in spring, therefore the plan is to monitor her closely.

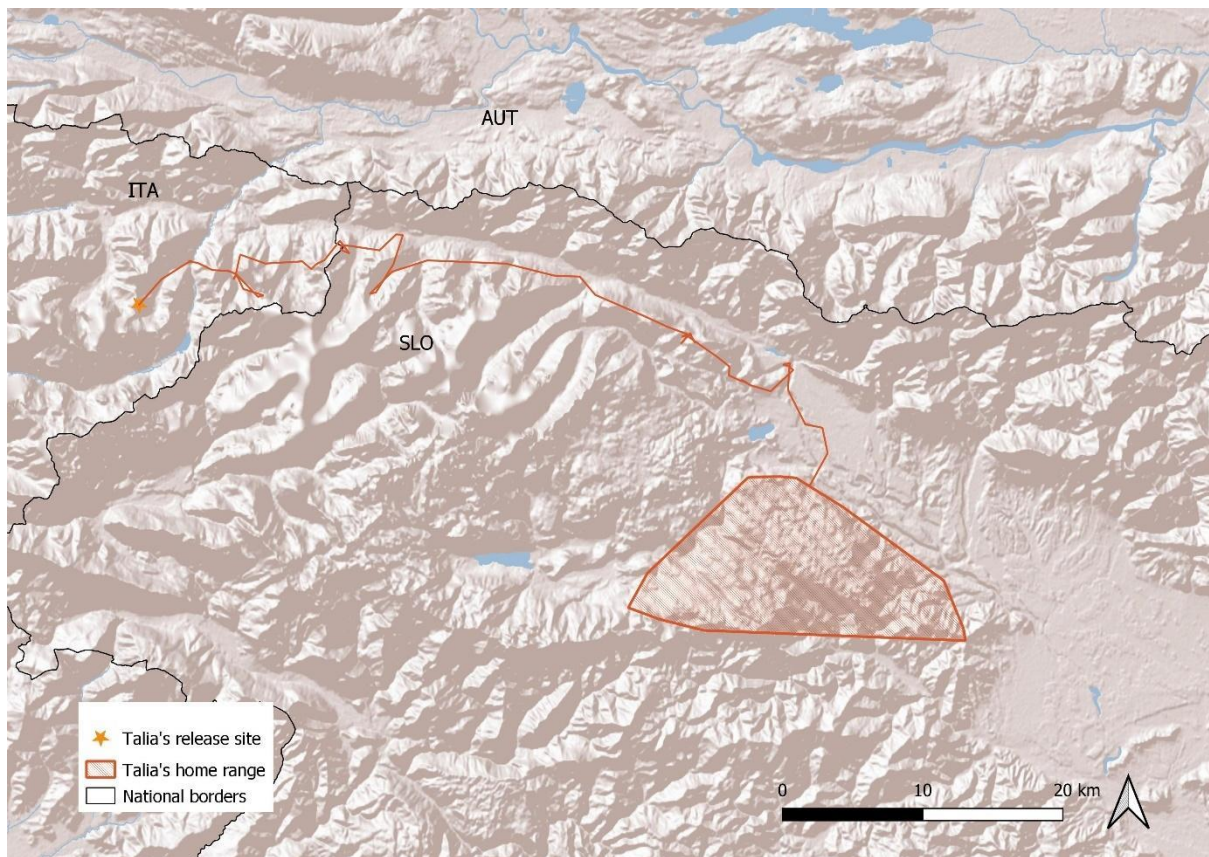


Figure 22: Map of Talia's potential home range (100% MCP) and path from the release site

Monitoring of remnant lynx and offspring of translocated lynx

Dinaric Mountains

Teja

Female lynx Teja was initially recorded on camera-trap on September 7, 2018, in the vicinity of Mala Gora near Ribnica. Teja was subsequently captured and collared on April 19, 2019, also on Mala gora. Shortly after, on June 1, translocated lynx Goru entered Teja's territory, and the two encountered each other on the same day. Over the following weeks, they frequently interacted, often moving and feeding on the same prey. Despite a delayed birth date compared to typical Eurasian lynx births, Teja gave birth on August 15, 2019, to a female kitten named Mala. DNA analysis confirmed Goru as the father. Mala survived to independence despite the late birth date. Teja's collar detached in early February, but her movements were monitored through Mala's collar until early May 2020. Telemetry data suggests that Teja and Goru mated again between February 21 and 24, 2020. Teja and Mala remained together until May 1, 2020, when Mala ventured out of her mother's territory to become independent. Teja subsequently gave birth to another litter, this time with two kittens, first recorded by camera-trap in September, confirming their good physical condition. The male kitten, Niko, was captured and collared, and genetic analysis confirmed Goru as the father of this litter as well. She mated with Goru in 2021, when she gave birth to Valentina, Matic and Neža, who were all captured and equipped with telemetry collar later on. In 2022, she had 2 kittens and one kitten in 2023 according to data collected with camera traps. Paternity was not confirmed; however, kittens were most likely from territorial male Goru. Teja is still regularly being recorded with camera traps.

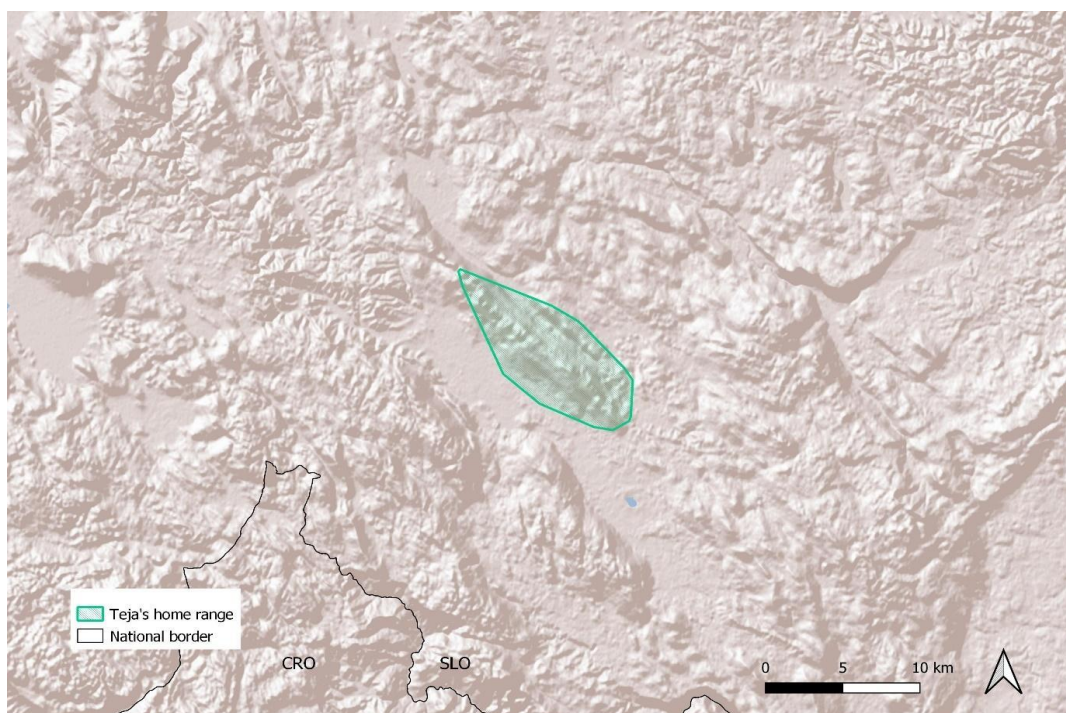


Figure 23: Map of Teja's home range (100% MCP)

Mihec

Remnant male lynx Mihec was initially captured on December 23, 2010, weighing 12 kg as a kitten in the Snežnik region. He was born to the GPS-tracked female Snežka. By April 2011, he had ventured northwest, establishing his own territory on Javorniki, where he was monitored until October 2011, when his collar stopped working (Krofel, 2012). Although sporadically sighted in the area until 2013, when his collar was found, no further data were obtained, likely due to the difficulty of identifying him without a collar during opportunistic sightings. However, his survival was confirmed during the 2019-20 lynx monitoring season through photographic evidence and subsequent genetic analysis following his capture on March 21, 2020. Telemetry data revealed that within the previous eight years, Mihec had shifted his territory from Javorniki to a new area spanning from the northeastern part of the Snežnik plateau to Racna Gora and the western region of Goteniška Gora, covering 340 km². He shares this territory with at least two remnant female lynx, one of whom was photographed with offspring in 2020, suggesting Mihec may be the father, though genetic confirmation is lacking. His collar dropped-off on July 23, 2021, but regular camera trapping has since provided over 20 photos, mostly from hunting grounds Iga vas and Babno Polje. Furthermore, his presence has been confirmed via genetic samples collected in Racna Gora. Despite being one of the oldest known lynx in the Dinaric Mountains, Mihec still appears to be in good health.

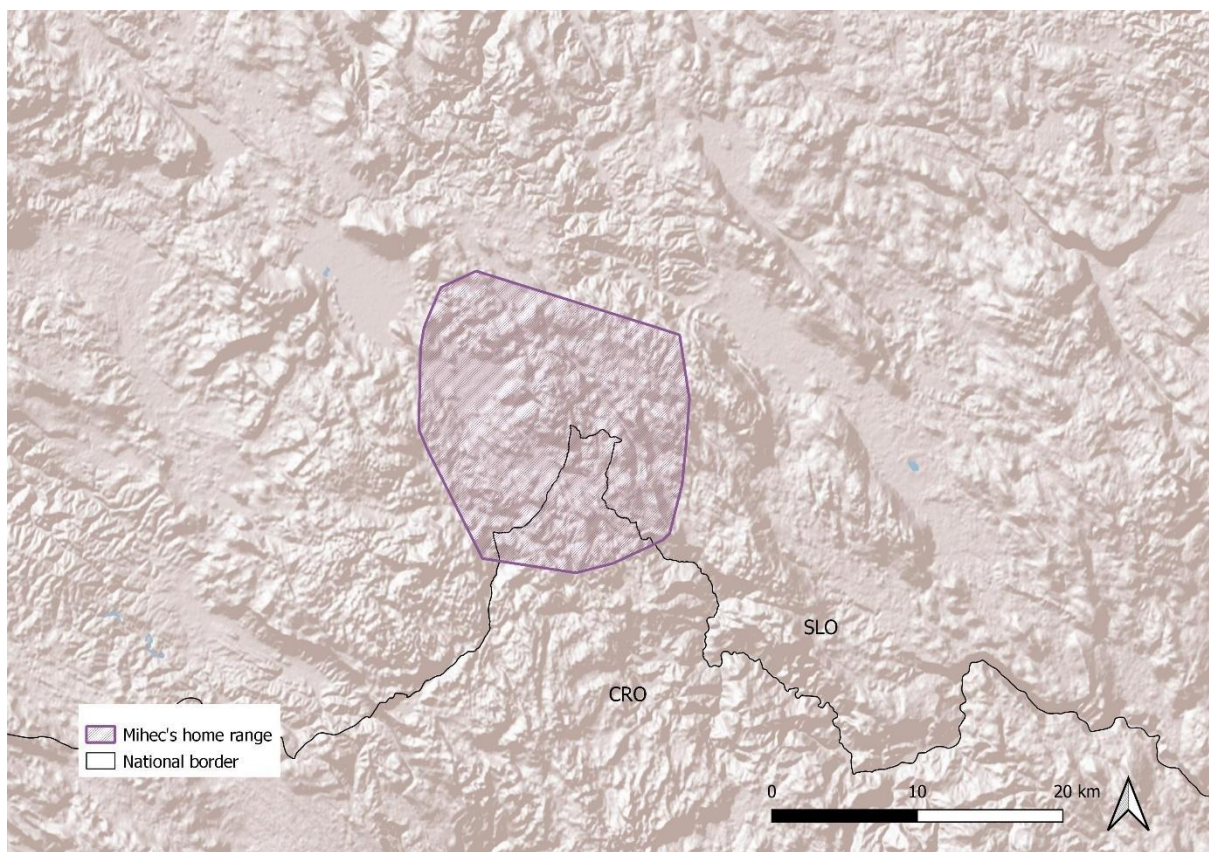


Figure 24: Map of Mihec's home range (100% MCP)

Mala

Female lynx Mala, born in mid-August 2019, is a descendant of the remnant lynx Teja and the translocated male Goru. This birth timing is notably late for Eurasian lynx in Europe (Mattisson et al. 2022), likely due to the absence of male lynx in her mother's territory before the arrival of Goru in early June. Mala was initially spotted at her mother's kill site on November 21, estimated to weigh approximately 3-4 kg. On January 18, 2020, we captured Mala while attempting to recapture her mother, and fitted her with a light GPS collar. Remaining with her mother until early May, Mala then dispersed north to the Suha Krajina area, although she stayed close to her mother's territory which she occasionally visited. Mala successfully captured her first roe deer shortly after gaining independence. However, by the end of June 2020, the collar batteries began to fail, prompting us to trigger a drop-off mechanism, which unfortunately did not activate due to collar malfunction. Despite the loss of signal, Mala has been regularly detected on camera traps until December 2020. After that, she was not recorded anymore, which means her current status is unknown, however, we suspect she is not alive anymore.

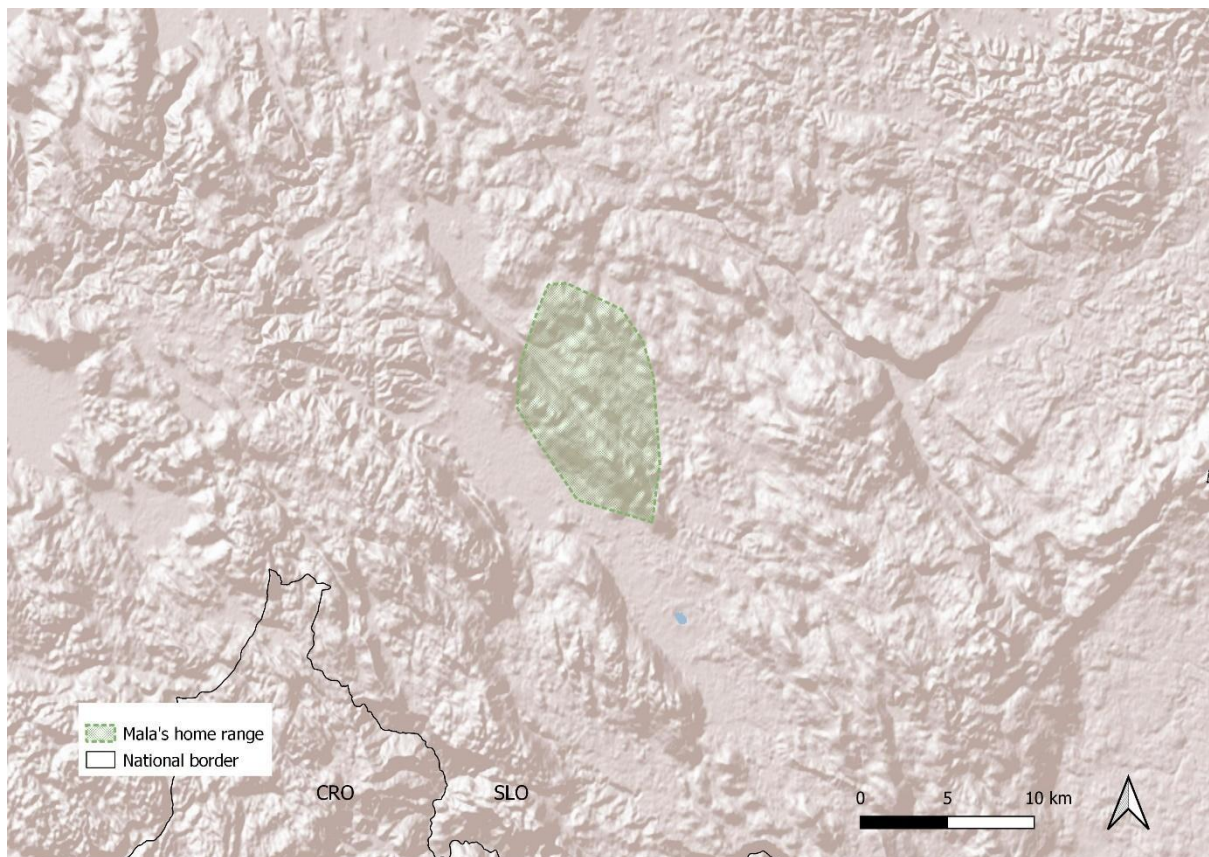


Figure 25: Map of Mala's home range (100% MCP)

Bojan

Male lynx Bojan, a remnant individual collared as part of the Interreg 3Lynx project on December 1, 2019, weighed 24 kg and was estimated to be four years old. Captured near the Slovenian-Croatian border in the Osilnica hunting ground, he initially stayed in Slovenia for a few days post-capture before crossing into Croatia. Since then, he predominantly occupied the Gorski Kotar area. Bojan's home range measured 212 km² (95% MCP). Telemetry data indicated a probable encounter with the young translocated lynx Boris, who later departed the area following this interaction. Signal from Bojan's collar was lost on March 3, 2021, and his current whereabouts remain unknown, however we believe he is not alive anymore.

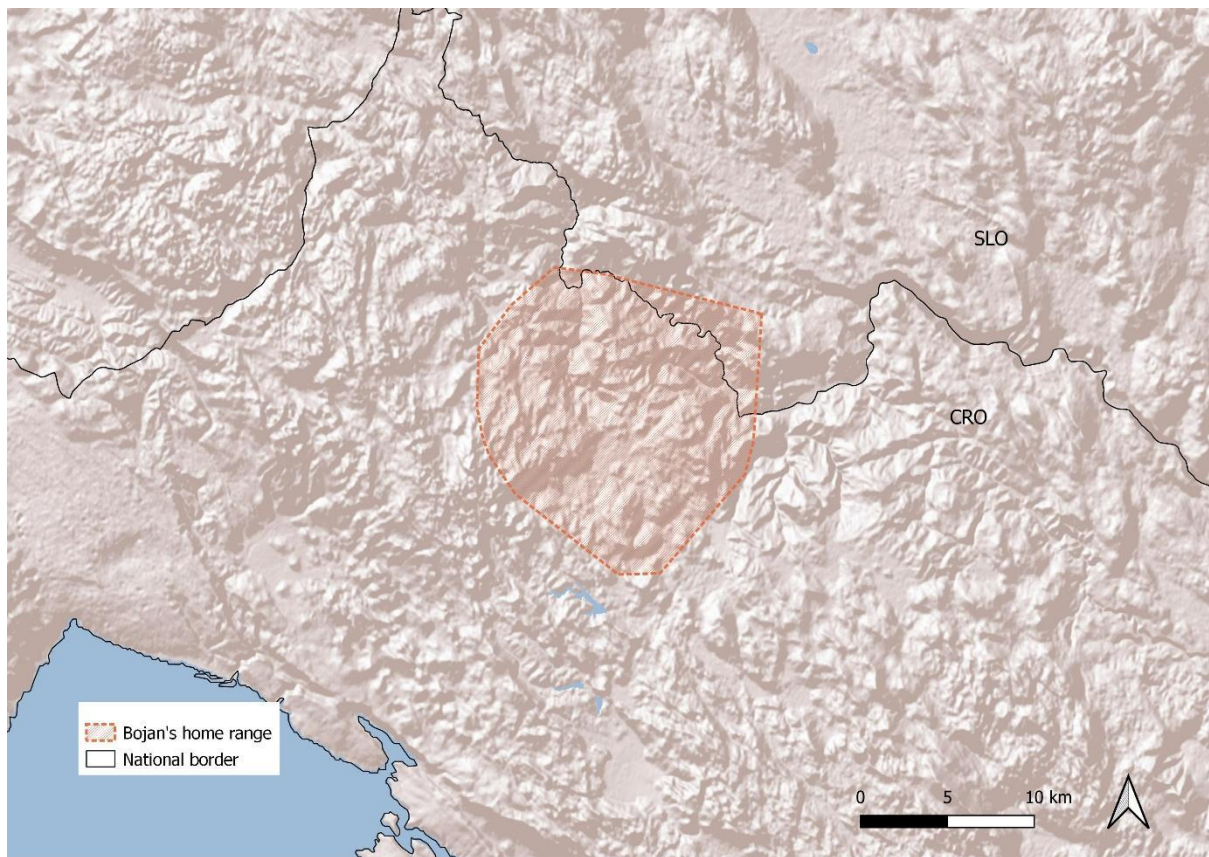


Figure 26: Bojan's home range (100% MCP)

Martina

Martina, an orphaned lynx, was captured on November 11, 2019, near Ogulin by a Croatian wolf and lynx intervention team as she was seen close to villages. At the time of her capture, Martina was approximately 6 months old and weighed only 6 kg. She was relocated to the enclosure in Risnjak National Park designed for orphaned lynx, where she was cared for and fed until the end of February 2020, when she was released back into the wild. Prior to her release, Martina had broken her upper canines in the enclosure, but the Croatian team from the Faculty of Veterinary Medicine in Zagreb successfully reconstructed them. Equipped with a telemetry collar, Martina initially moved north for two weeks before settling near Lividraga in Risnjak National Park. However, she soon crossed the border and headed towards Ilirska Bistrica. Martina frequently visited the vicinity of villages, scavenging slaughter remains and occasionally chasing domestic cats. She was also observed visiting fox dens, where she preyed upon and consumed fox pups. To aid her rehabilitation, a roe deer carcass was placed near her location, resulting in a successful feeding session. Despite this intervention, Martina continued to roam near villages. On June 2, 2021, her collar stopped working, and two months later, only her skeletal remains along with her collar were discovered in the agricultural landscape near Pivka.

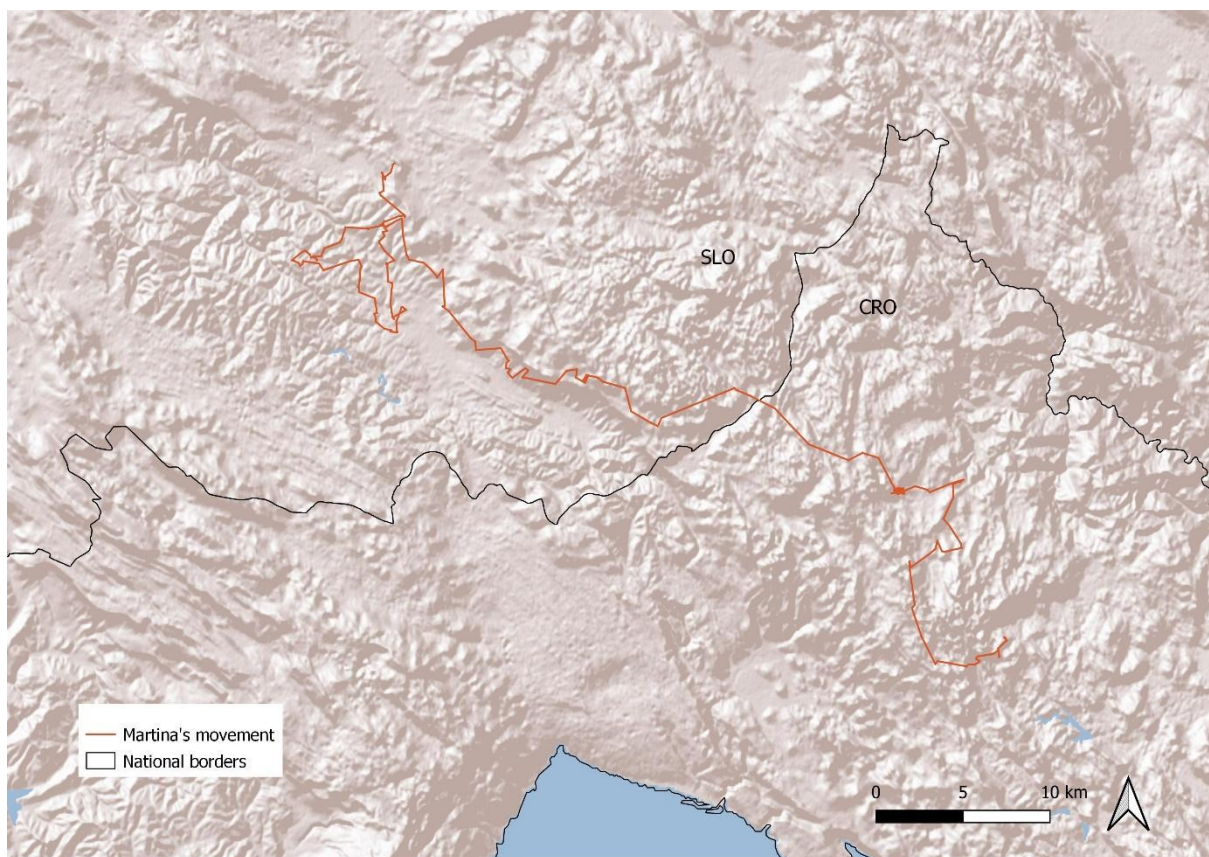


Figure 27: Martina's path from the release site

Niko

On December 6th, 2020, we captured and collared a young male lynx, one of the 2020 offspring of lynx Teja and Goru. At the time of capture, he weighed 11 kg. By mid-December 2020, he headed 15 km eastward to the Kočevski Rog region. In February 2021, his collar malfunctioned, but fortunately, we located him at the last known location transmitted by the collar, recaptured him, and replaced the collar. Initially, his movement suggested he might establish territory in this area, but by early April 2021, he moved around 30 km south to the Vrbovsko region in Croatia, where he stayed until June 11, 2021. Later, he headed southeast of Ogulin and remained there until mid-August 2021. In early September 2021, he returned to Slovenia, initially heading towards Stojna but then redirecting back to the Kočevski Rog area. After about a month, he headed south again, residing in Croatia between Kolpa and Vrbovsko, where we believe he established his territory. During his dispersal, he has traversed at least 1,355 km, crossing the Kolpa River thrice times and the Rijeka-Zagreb highway six times. While he likely swam across the river, he navigated the highway via green bridges or tunnels, underscoring the importance of such ecological connections for the lynx population. In March 2022, we attempted to recapture Niko as his collar was programmed to detach at the end of April 2022. Despite efforts at three kill sites, we were unsuccessful. As scheduled, his collar dropped off on April 21st, 2022.

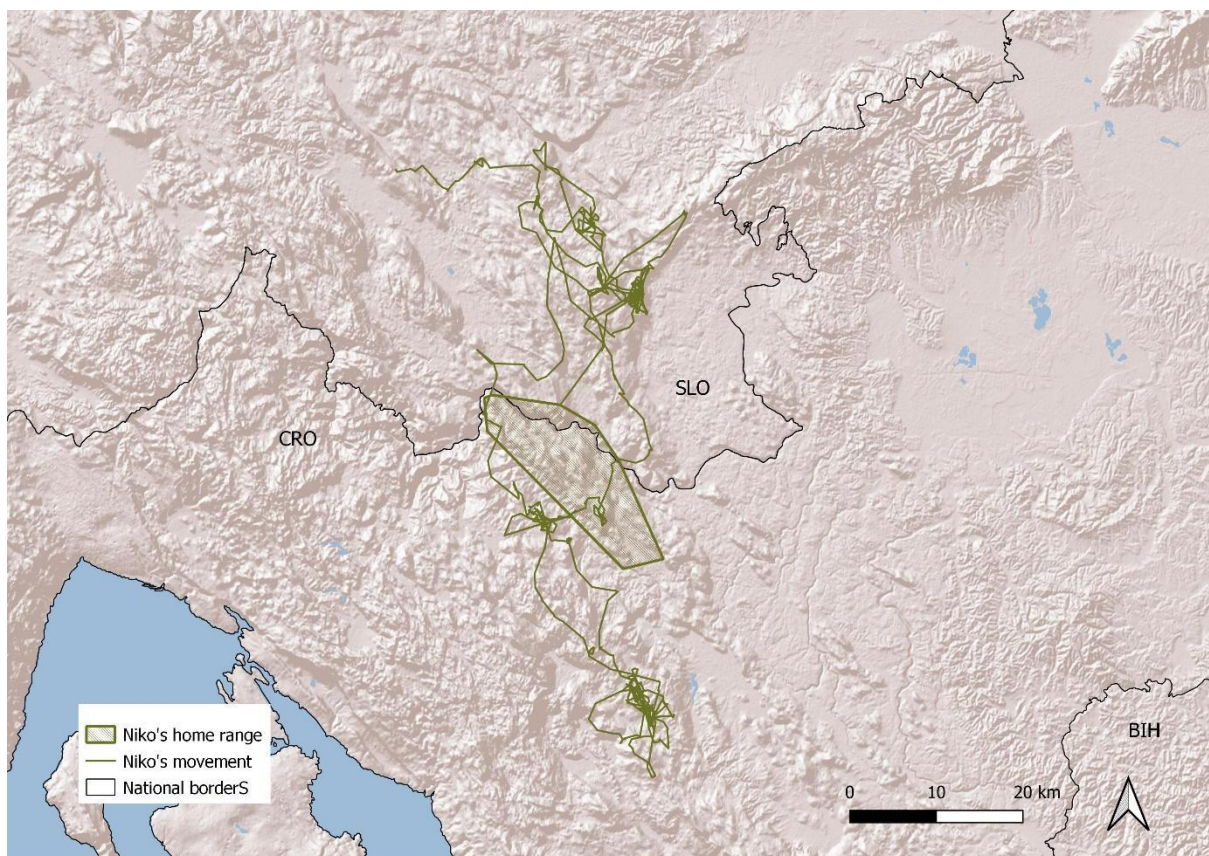


Figure 28: Map of Niko's home range (100 % MCP) and his dispersal path

Petra

On March 1st, 2021, an adult remnant female lynx named Petra, a remnant lynx from the Kočevsko area, was captured in the upper Kolpa valley in Slovenia. Estimated to be between 6 to 7 years old, she weighed 16 kg and exhibited excellent physical condition upon capture. Petra's home range is estimated at 164 km² (95% MCP). During the 2020/21 season, Petra raised one kitten who had already dispersed beyond her home range and had not been detected on camera traps within national monitoring efforts. In the 2021 mating season, she was observed and recorded with a local territorial male named Klif, with whom she mated. By mid-May 2021, Petra gave birth to four male kittens, all of whom were confirmed to have survived to independence and one of them was later collared. In contrast, in 2022, Petra did not have any kittens. Her collar malfunctioned in mid-December 2022. Despite this, we managed to recapture Petra in April 2023 and fitted her with a new collar, enabling continued monitoring for another year and a half. During immobilization, it was discovered that she was pregnant and carrying two kittens. Her overall health was assessed, revealing one damaged canine but otherwise good physical condition. By mid-May, Petra gave birth to the two kittens, also fathered by the remnant male Klif, both of whom survived at least until early autumn in 2023.

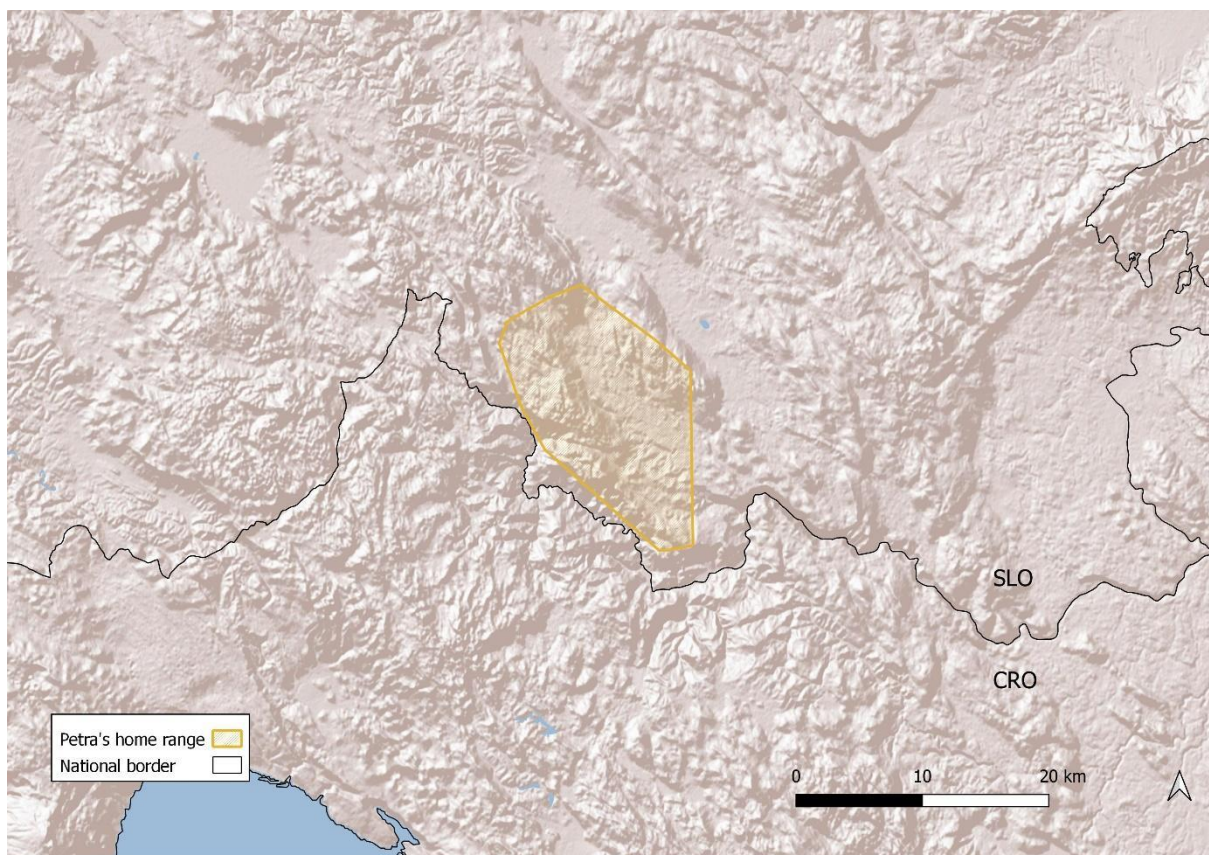


Figure 29: Map of Petra's home range (100% MCP)

Bor

On January 18, 2022, juvenile remnant lynx Bor was captured near Borovec village in Kočevsko, one of the four male kittens of female Petra born in May 2021. Weighing 10.5 kg at capture, he quickly gained weight, confirmed by camera traps set at his kill sites. His dispersal began shortly after capture, heading northeast toward Mala gora, likely interacting with territorial male Goru, then south to Kočevski Rog. Eventually, he settled near the Croatian border, establishing a home range of 115 km² (95% MCP). In 2023, he expanded into Croatia, regularly crossing the Kolpa river. Sharing territory with at least one female, he was monitored via telemetry and camera traps, showing good physical condition. His collar dropped off on December 20, 2023, ending his two-year GPS-tracking.

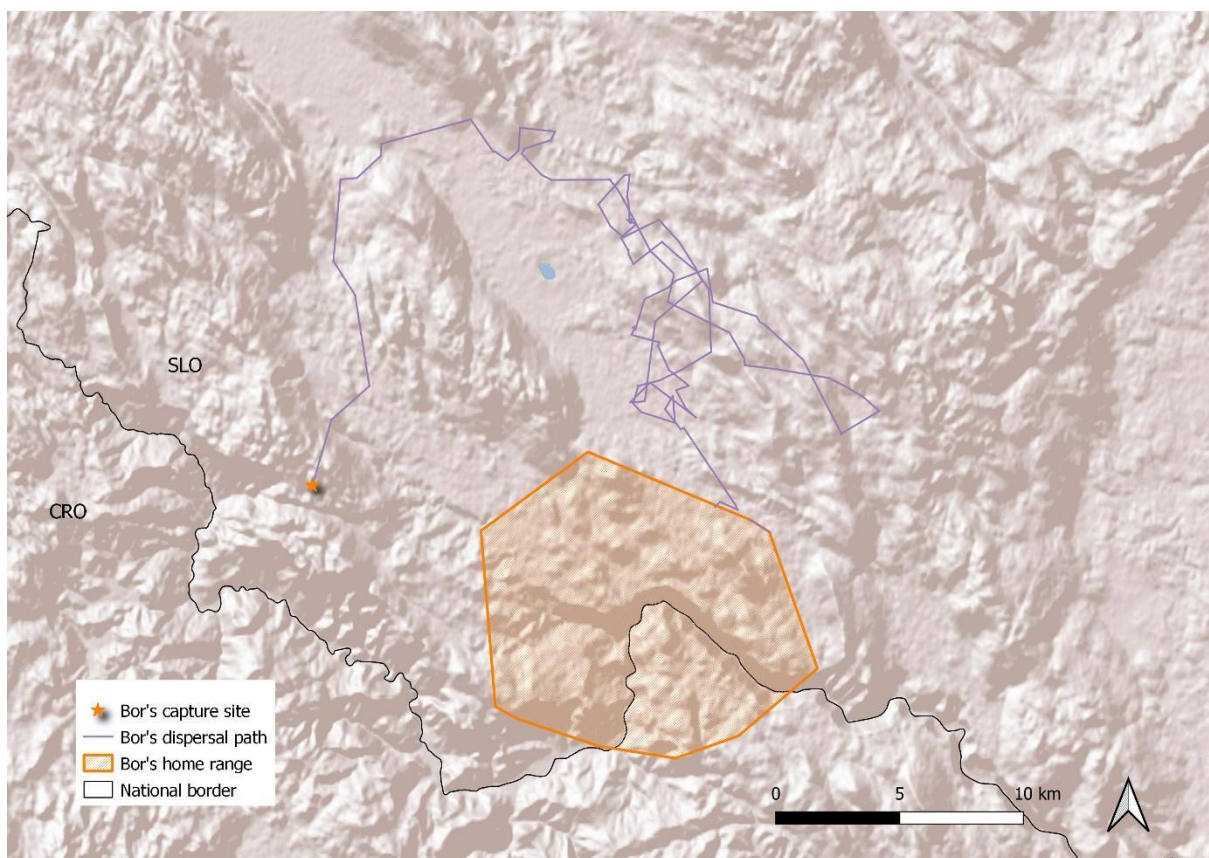


Figure 30; Map of Bor's home range (100% MCP) and his dispersal path

Klif

On February 4, 2022, adult remnant male lynx Klif was captured in Kočevsko, estimated to be 5-6 years old and weighing 24 kg in great physical condition. Known from camera-trapping monitoring since 2020, he is the father of Petra's four kittens in 2021, including collared male Bor. His home range spans Goteniška gora, Borovška gora, Velika gora, and Stojna, covering 209,5 km² (95% MCP). In the mating season 2022, he spent 29 days in Gorski Kotar, Croatia, before returning to Kočevsko. He primarily preyed on roe deer, red deer, and chamois. Recaptured in August 2022, to remove his previous collar with audio-logger and replaced with a new one. In mating season 2023, he spent 13 days in Gorski Kotar before returning home, where he suffered a leg injury observed from opportunistic video recording, likely from a fight or collision. After recovering, he resumed hunting, and he continues to be tracked with telemetry. In the mating season 2024, he again headed in the same direction as the previous years. He is still being GPS-tracked at the moment.

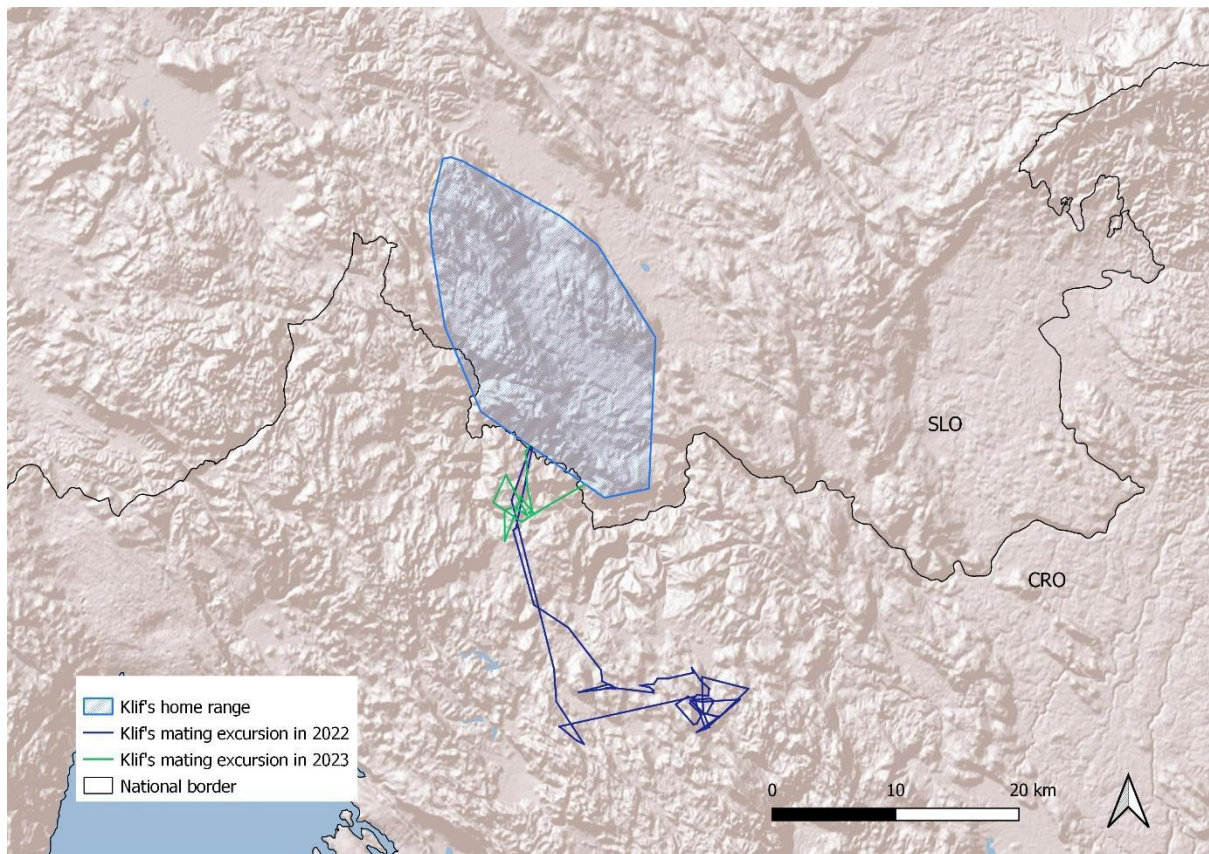


Figure 31: Map of Klif's home range (100% MCP) and his mating excursions in 2022 and 2023

Pandora

The adult remnant male lynx Pandora, known since 2019 from camera traps in Nature Park Velebit, was captured and collared with an Iridium collar on March 30, 2022. Weighing 24 kg and estimated to be around 5 years old, his territory partly overlaps with territorial male Josip's, with a home range size of 165 km² (95% MCP). During monitoring, three kill sites were found, including two roe deer and one unidentified prey. His collar dropped off after one year of tracking. Pandora holds the record as the most photographed lynx on Velebit, with over 70 recorded events at 18 different camera trap locations since 2019. Notably, he and translocated lynx Emil were photographed at the same camera trap on multiple occasions, sometimes within hours apart.

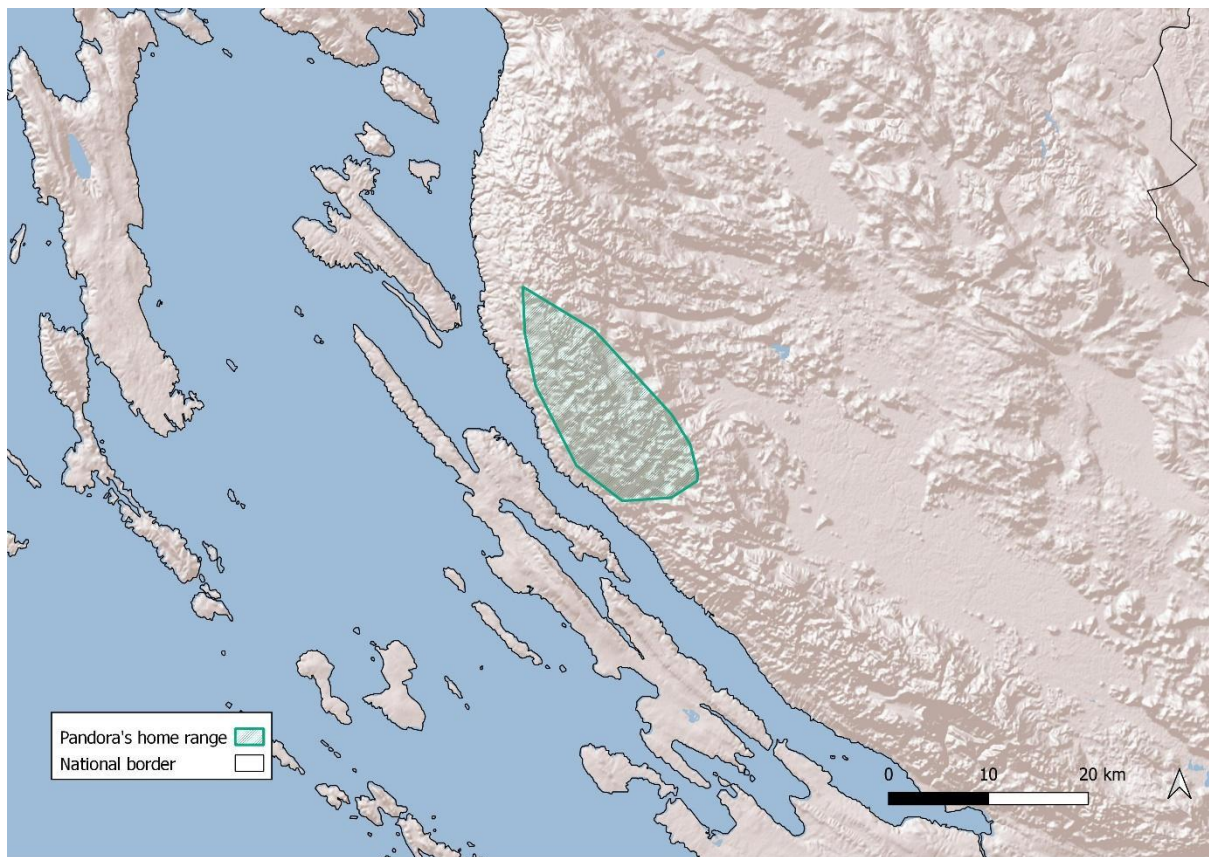


Figure 32: Map of Pandora's home range (100% MCP)

Josip

An adult remnant male lynx Josip was captured and collared with an Iridium collar on February 4, 2022. Weighing 27 kg and estimated to be around 5 years old, Josip had been known since 2019 from camera traps in Nature Park Velebit. His home range spans 190 km² (95% MCP), overlapping with the territory of collared male Pandora in the southern part. We discovered five kill sites, primarily of roe deer, though some findings were delayed due to poor Iridium satellite communication. After one year, the collar dropped off as scheduled. Josip was recorded six times with camera traps during the monitoring period.

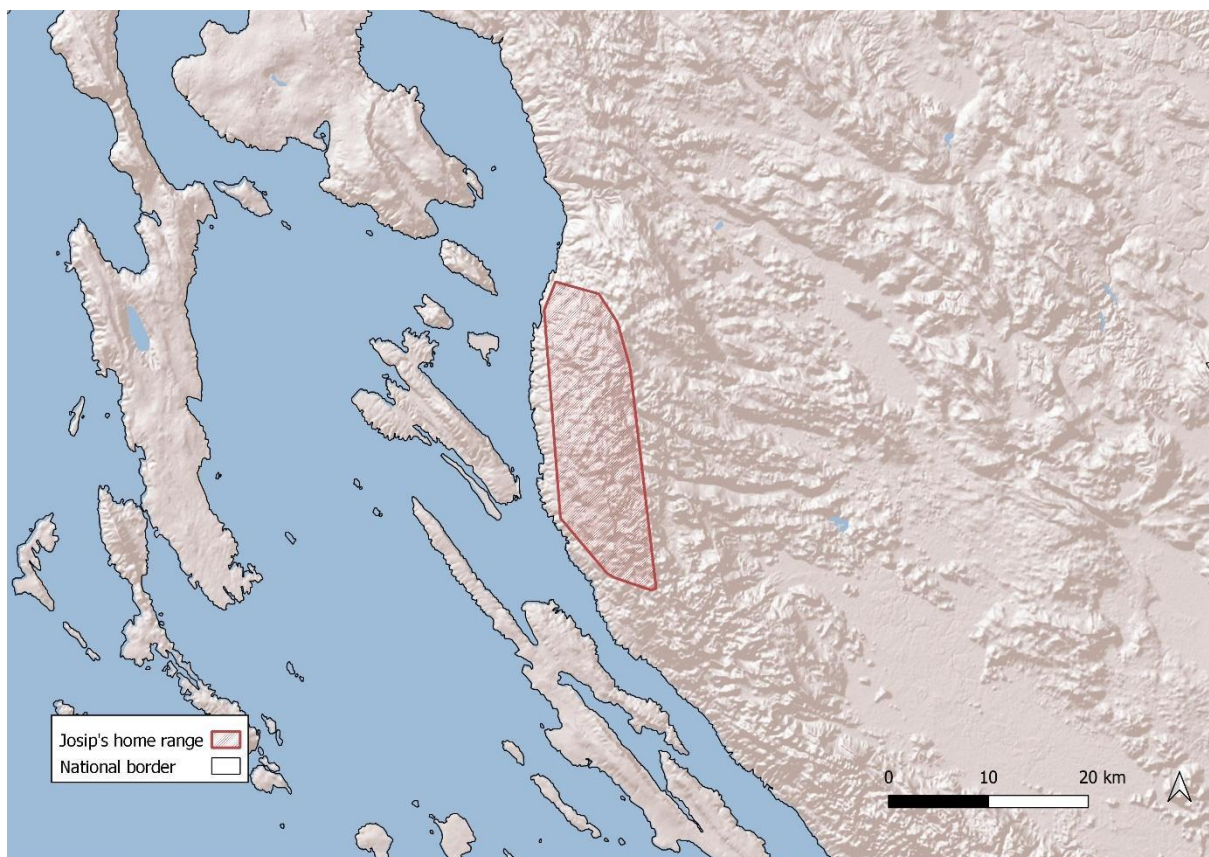


Figure 33: Map of Josip's home range (100% MCP)

Igi

On February 17th, 2022, we captured a remnant male lynx named Igi in the Mokrc area. Estimated to be approximately 5 years old and weighing 20 kg, during his immobilization, we discovered that he had a heart murmur, possibly linked to the inbred nature of the Dinaric lynx population. Notably, Igi possessed a distinctive characteristic setting him apart from other lynx: two tufts on one ear, likely another consequence of inbreeding. Prior to his capture, Igi was already familiar to us through the national lynx camera trap monitoring, regularly spotted in the Mokrc area. His home range was relatively small compared to the other males, spanning only 52 km² (95% MCP). During telemetry tracking, we investigated some of his kill sites, revealing a preference for roe deer as prey. However, we also discovered evidence of him consuming a feral cat near the village, likely killed by him. In early May 2022, we received a mortality signal from Igi's collar. Upon confirmation, we retrieved his carcass. Telemetry data indicated that Igi had been confined to a small area of about 1 km² for two weeks preceding his death. Furthermore, activity data from the telemetry collar revealed a significant reduction in activity following his last roe deer kill. Considering his various deformities, notably the severe heart murmur, we presume that his death resulted from heart or other internal organ malfunction, likely triggered during a hunting attempt.

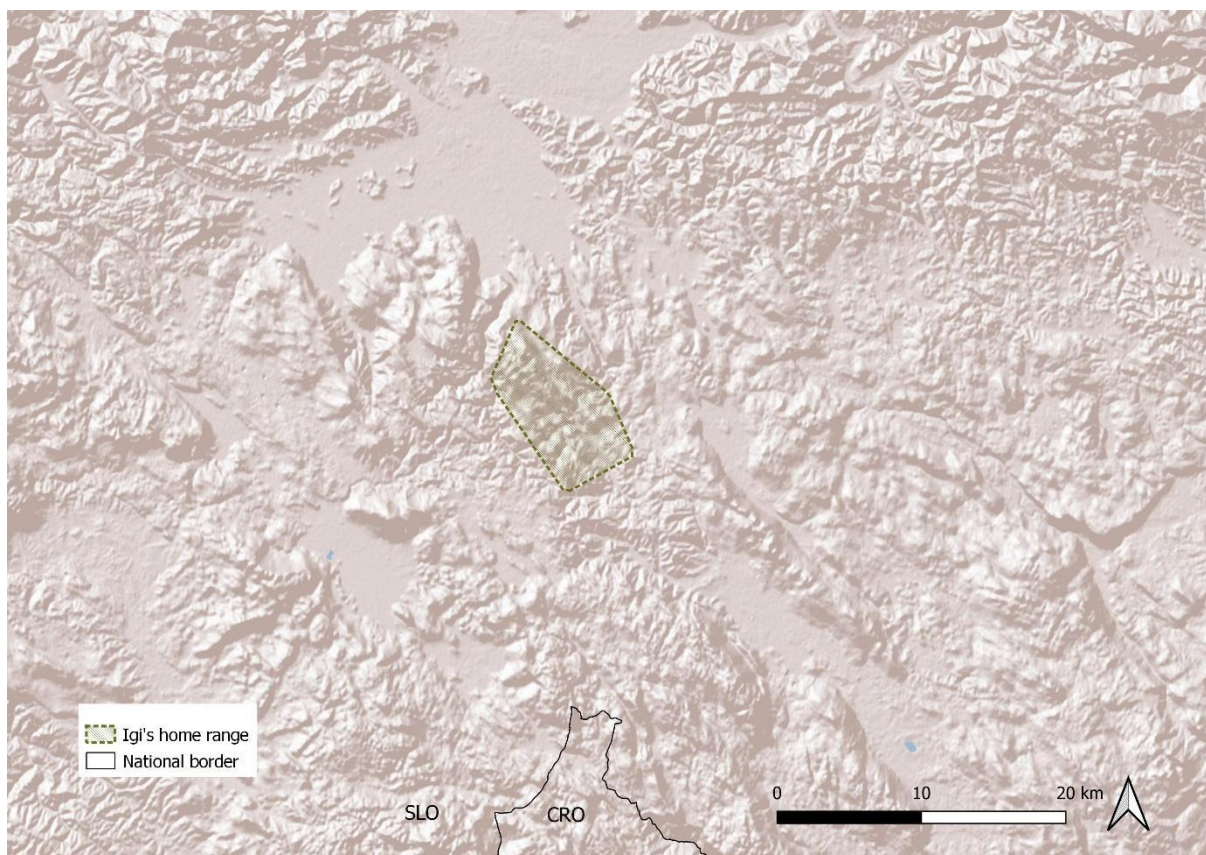


Figure 34: Map of Igi's home range (100% MCP)

Valentina

Lynx Valentina, one of three kittens from Teja and Goru 2021 litter, was captured on February 13, 2022, on Mala gora, weighing 12 kg. Initially moving with her mother after release, she later ventured towards the southeast in May 2022. Until September 2022, she continued to visit her mother's kills before beginning to hunt independently. By early 2023, she seemed to be establishing her own territory southeast of her mother's range. However, in April 2023, we lost the signal from her collar, leaving her current status unknown.

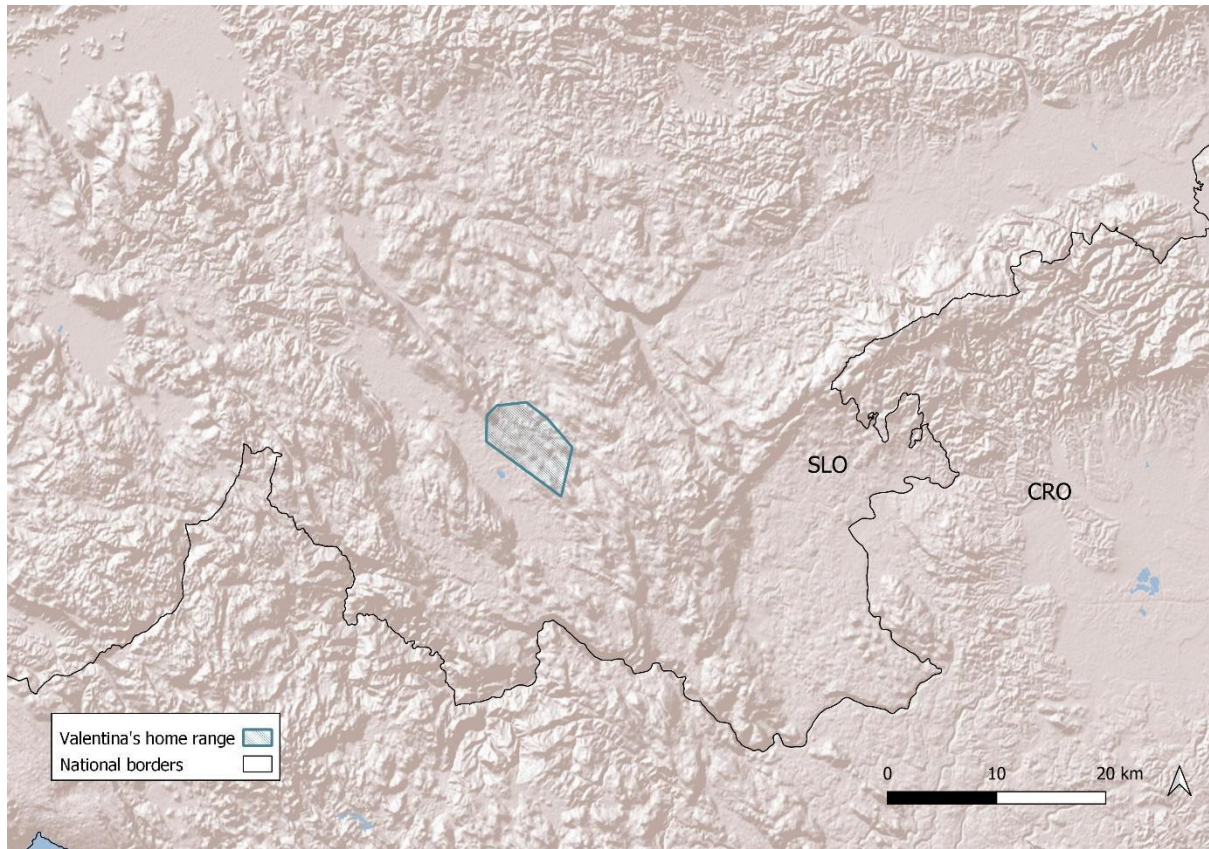


Figure 35: Map of Valentina's home range (100% MCP)

Neža

On February 13th, 2022, we captured lynx Neža in the same trap as her sister lynx, Valentina. Neža was one of the three kittens born to Goru and Teja in 2021. At the time of capture, Neža weighed 12 kg and was eight months old. Initially, during the first month of monitoring, she remained close to her mother, feeding on her kills. However, by the end of March 2022, she began exhibiting signs of dispersal. Her initial dispersal led her towards Stojna, southwest of her mother's territory. After a week, she returned to her natal territory and subsequently attempted different routes, primarily towards the east, each time ultimately returning. On May 11th, 2022, we received a mortality signal from Neža's collar and recovered it. The collar had been torn off the lynx, and with the assistance of a trained detection dog, we discovered blood nearby, confirmed to be Neža's through genetic analysis. Based on this evidence, an investigation into suspected illegal killing was initiated by the police unit specialized in such matters. The case has been reported to the court and the legal process remains ongoing.

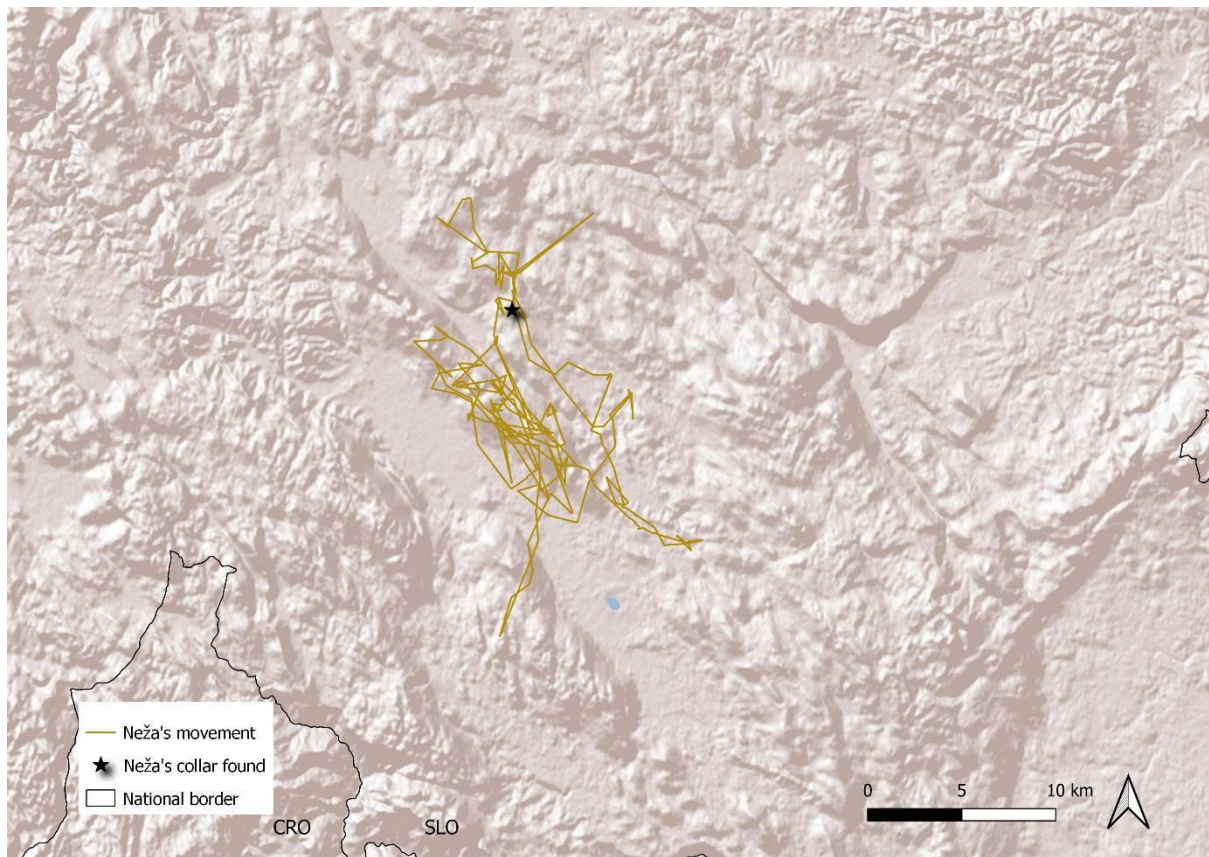


Figure 36: Map of Neža's dispersal path and location of her ripped collar

Slavko

On July 21, 2023, in the area of the Ričičko Bilo hunting ground (Primorsko-goranska county, Croatia) a remnant male lynx was successfully captured and fitted with an Iridium satellite collar. The lynx was named Slavko and we have regularly recorded him with camera traps on multiple marking sites since 2019. The data from his collar showed that Slavko was moving in an area the size of 139 km² (95% MCP). The collar has been programmed to drop off after one year of monitoring. Thus far, we found one kill site where Slavko preyed on a roe deer.

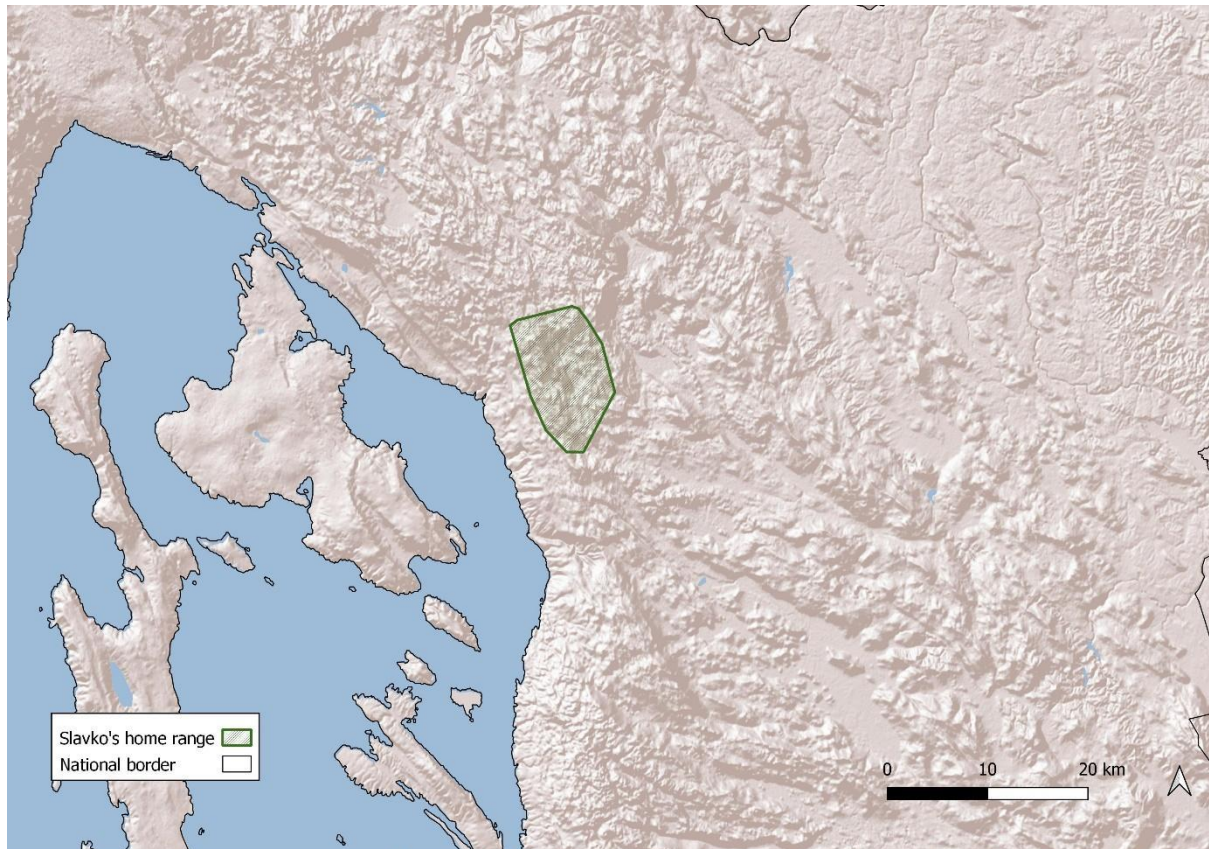


Figure 37: Map of Slavko's home range (100% MCP)

Matic

In January 2024, lynx Matic was captured and fitted with a telemetry collar in Velika gora near Ribnica. He is a 3-year old male, an offspring of Goru and Teja from 2021. At the time of the capture, he weighed 23.5 kg and was in a good physical condition. Matic was monitored as a kitten alongside his sisters Neža and Valentina in Mala gora. He has been previously sighted multiple times as an adult lynx in the broader area of Velika Gora and Stojna. Initial data suggest that Matic established his territory in the area, which borders the territory of the remnant adult lynx males Mihec in the northwest and male Klif in the south.

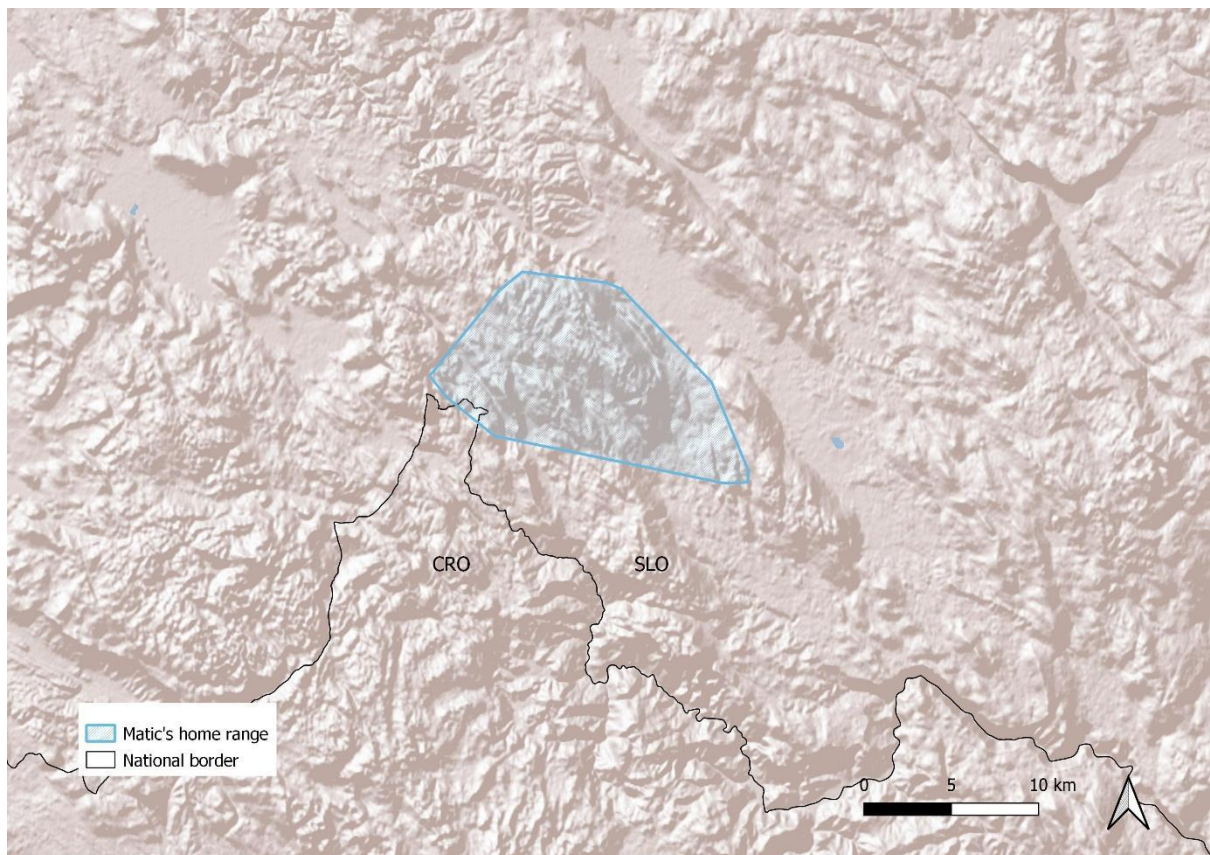


Figure 38: Map of Matic's home range (100% MCP)

Alps

Meri

On 25.12.2022, we captured a male lynx Meri in a box trap in the Pokljuka area. He is the offspring of the first litter of translocated lynx Julija and Tris. His estimated age was 7 months at the time of the capture. He weighed 11 kg and was in good physical condition. After the capture, he went to the southern part of the Triglav Mountains, where he apparently established territory. We checked several of his kills with cooperation with local hunting families.

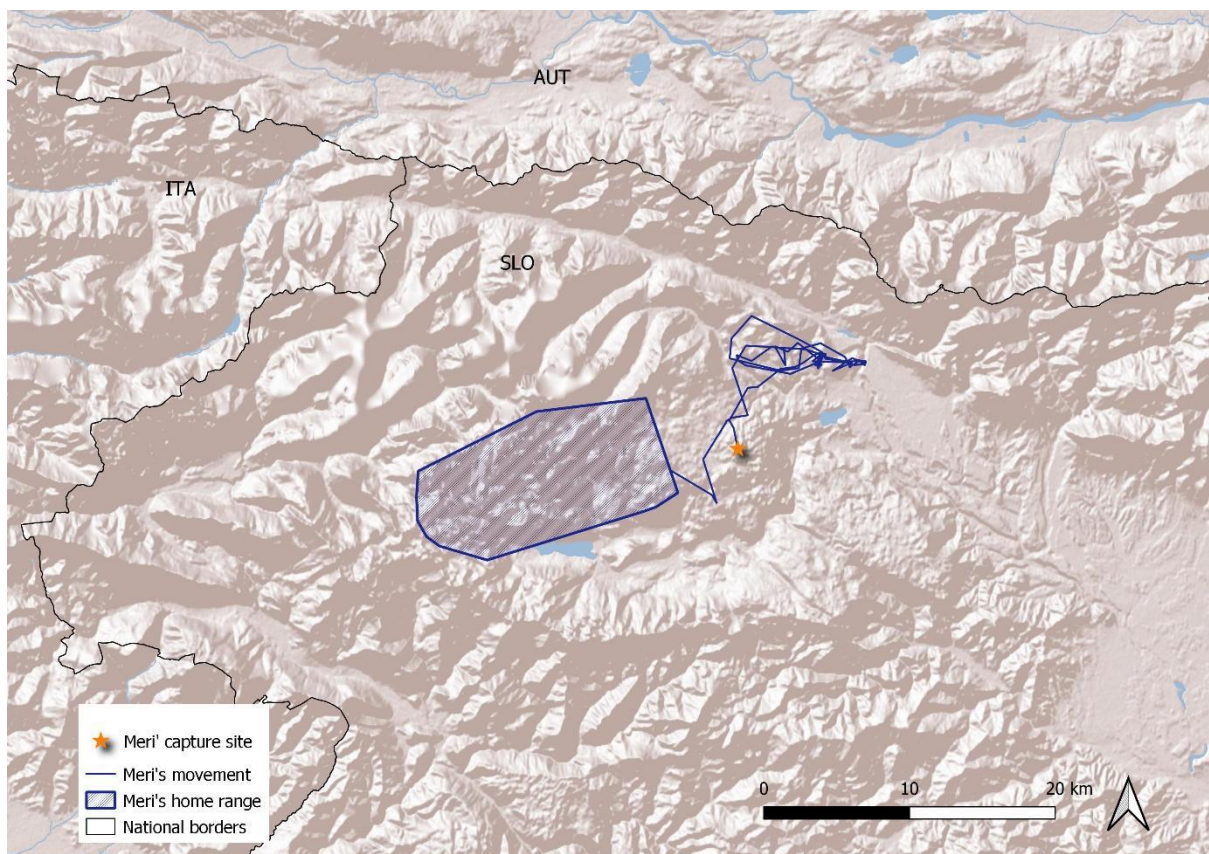


Figure 39: Map of Meri's home range (100% MCP) and his dispersal path

Rozi

On 13.1.2023, we captured a female lynx Rozi in a box trap in the Jelovica area. She is the offspring of the second litter of translocated lynx Aida and Zois from 2022. Her estimated age was 7-8 months at the time of the capture. She weighed 10,5 kg and was in good physical condition. After the capture, she went on to the southern part of the Triglav Mountains, where she and Meri had several encounters. She then extended her range of movement towards the west to Posočje region, where she later came in contact with other young males (Meri's brothers Florijan and Andrej). Rozi spends most of her time in the Triglav Mountains.

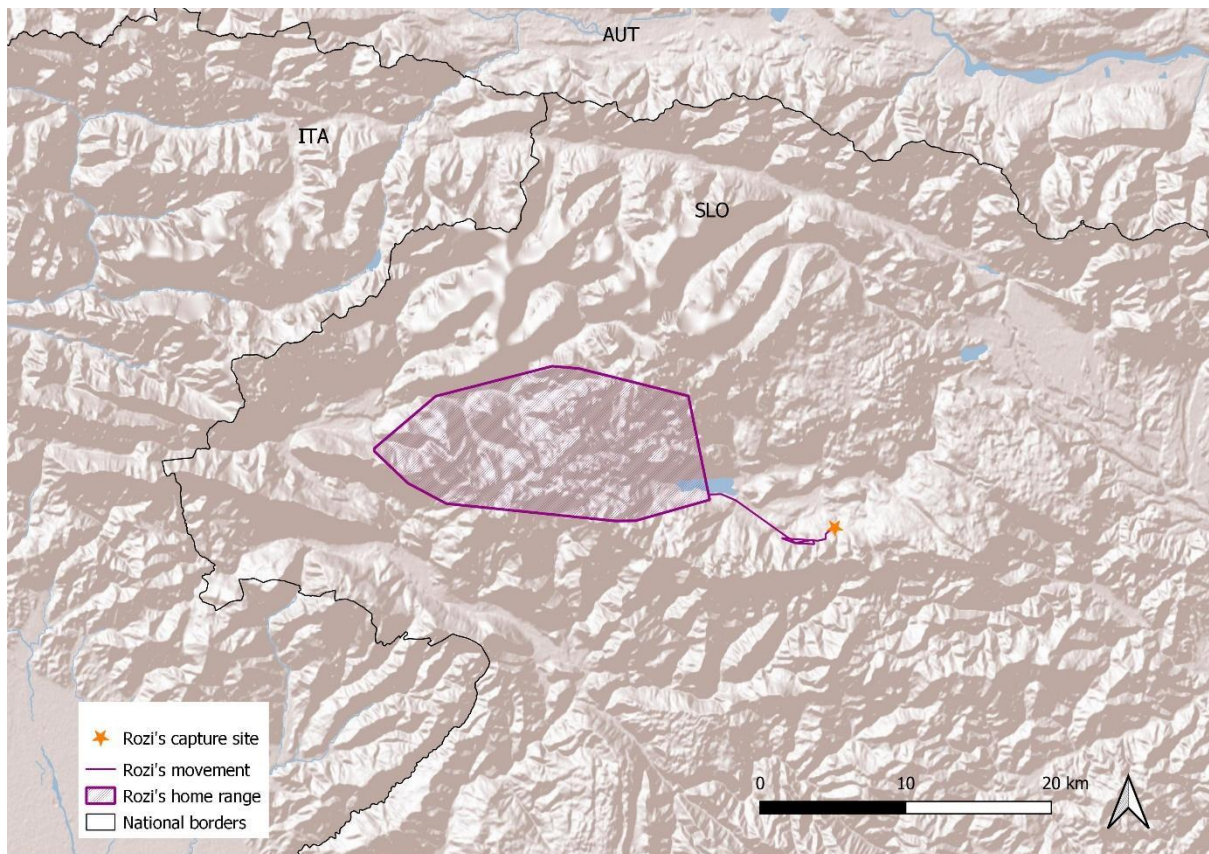


Figure 40: Map of Rozi's home range (100% MCP) and her dispersal path

Flori

On 3.3.2023, we captured a male lynx Flori in the Pokljuka-Radovna area. He is the offspring of the first litter of translocated lynx Julija and Tris from 2022. His estimated age was about 9 months. He weighed 15 kg and was in good physical condition at the time of the capture. After the capture, he stayed for some time together with Julija in the area of Mežakla and Radovna. In April, he continued part of his journey also together with his brother Andrej towards the Tamar valley and had later continued towards Italy. Most of the time, he moves on the north-western border between Slovenia and Italy, lately spending most time in Posočje. His territory establishment is still not clear.

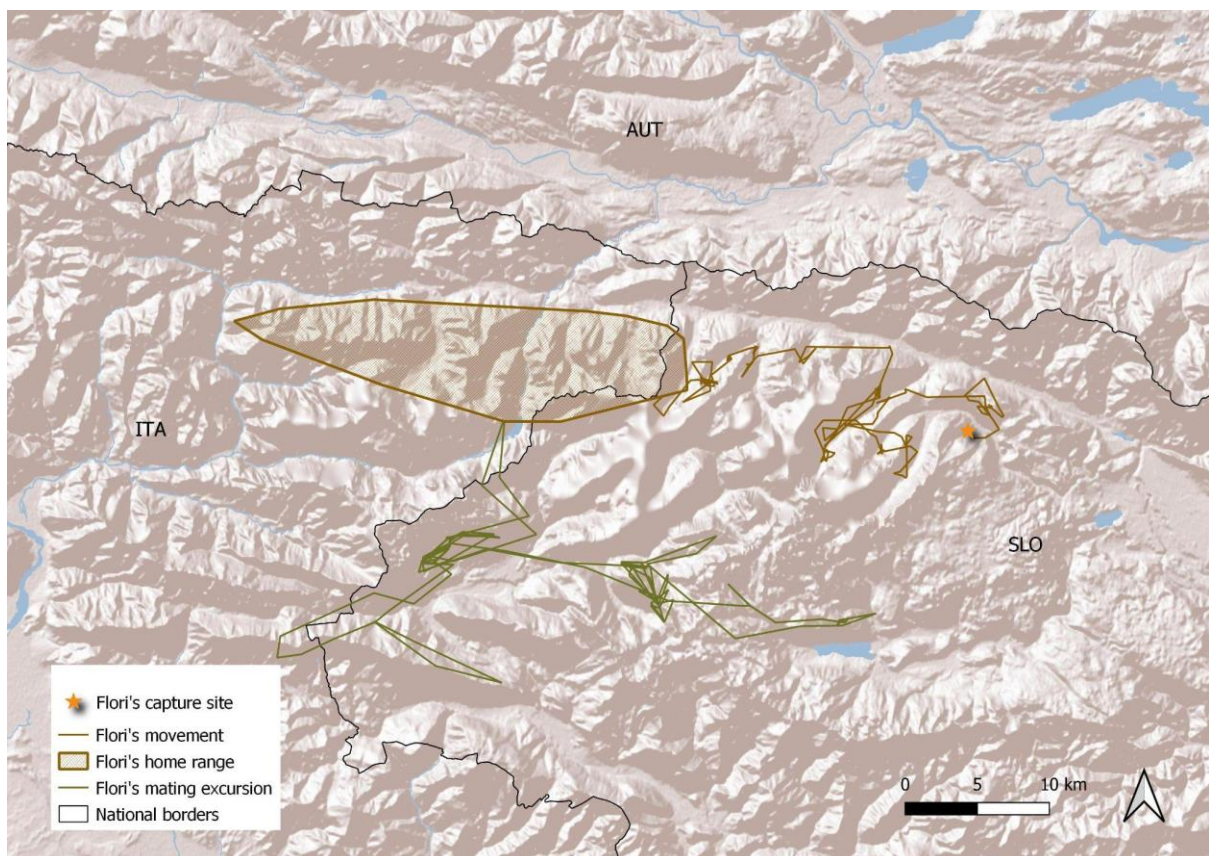


Figure 41: Map of Flori's potential home range (100% MCP), his dispersal path and mating excursion

Andrej

On 14.3.2023, we captured a male lynx Andrej in the Mežakla area. He is another offspring of the first litter of translocated lynx Julija and Tris from 2022. His estimated age was about 9 months and he weighed 16,5 kg and was in good physical condition at the time of the capture. After the capture, he stayed for some time together with Julija in the area of Mežakla and Radovna. He separated from Julija in April. Most of the time he is in the area of the Martuljek group of mountains, around Vršič and Trenta. Same as Flori, it is not clear if he already established his territory.

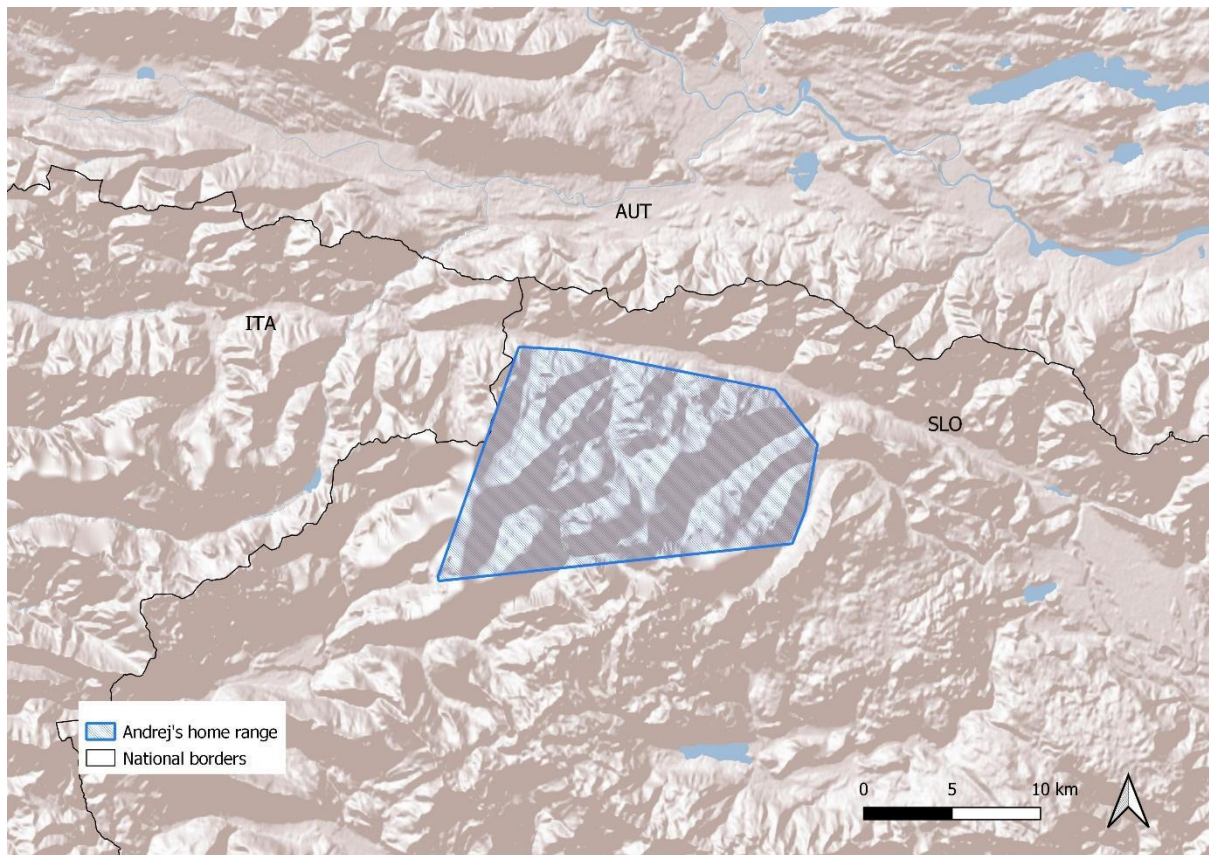


Figure 42: Map of Andrej's potential home range (100% MCP)

Miha

In mid-March 2024, male lynx Miha was captured and equipped with a telemetry collar in Jelovica plateau. At the time of the capture, he weighed 20 kg and was estimated to be between 1 to 2 years old. Most likely he is the offspring of the translocated lynx Aida and Zois from 2022, however, genetics are still yet to be confirmed. First data showed that he moved towards the translocated female Talia, who established her territory in the Jelovica plateau. They met shortly after his collaring and were together for three days during the mating season, which will hopefully result in kittens later this year. After meeting with Talia, he moved towards Posočje. Currently his home range area remains unknown, as we still need to gather more data to see whether he already established a territory and where.

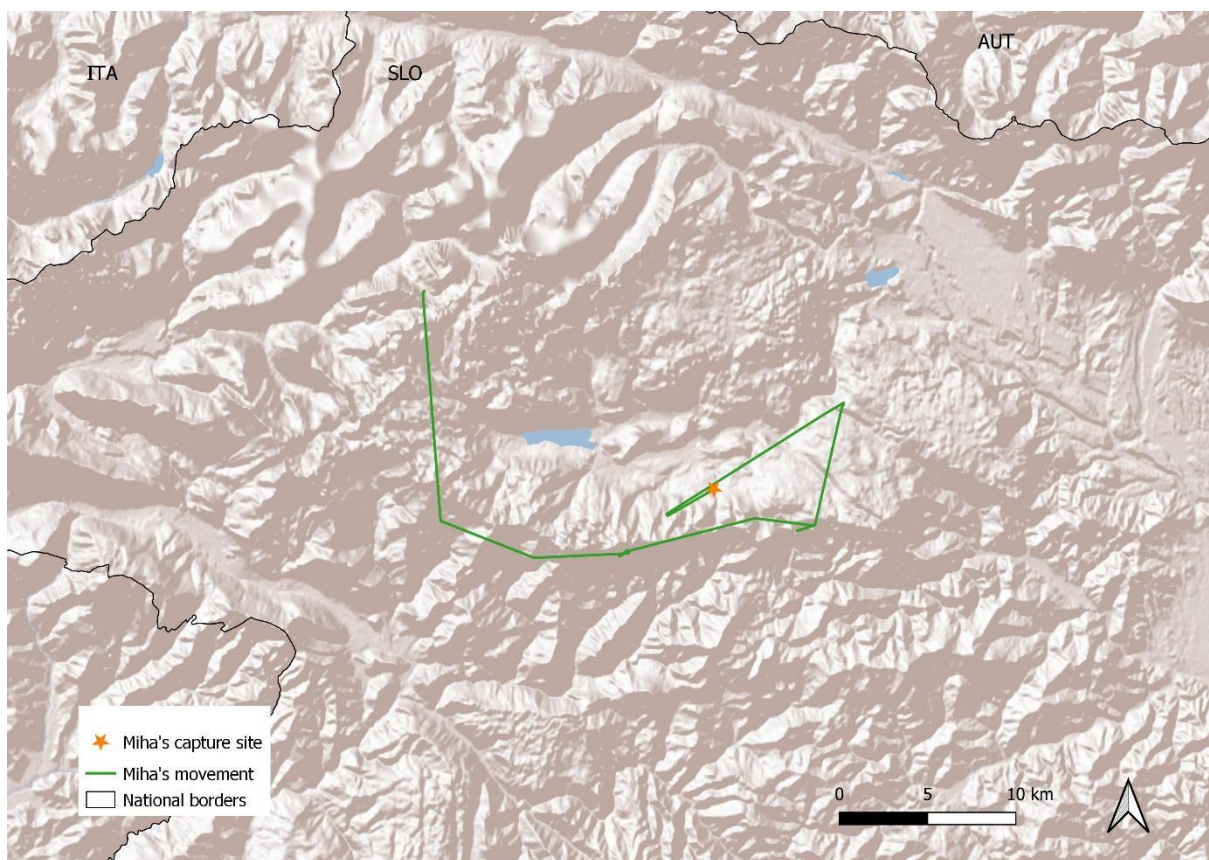


Figure 43: Map of movements of Miha in the first days after his capture

Monitoring of the lynx kill sites

Telemetry enabled us to locate and inspect lynx kills in the field. As lynx feed on their prey remains over several days, we can use telemetry data to identify these kills based on GPS location cluster analysis (Krofel et al., 2013; Oliveira et al., 2022). Deploying camera traps at the kill sites allowed us to observe lynx behavior and their physical condition, as well as evaluate the extent of kleptoparasitism by other species (Krofel et al., 2019). With the kill site surveys, we gather data on the prey species, as well as the sex and age distribution of the prey, to gain insights into the lynx impact on ungulates that can be implemented into ungulate management strategies.

In total, we surveyed 467 lynx prey remains in the field. Most prey remains belonged to roe deer (*Capreolus capreolus*) that made up 82% of all identified kills (Figure 44). Red deer (*Cervus elaphus*) followed as the second most common prey species representing 8% of the total kills inspected. Notably, the killed red deer were exclusively juveniles and females. Chamois (*Rupicapra rupicapra*) comprised 5% of all recorded kills, with red foxes (*Vulpes vulpes*) representing 2% of the found prey. Additionally, our survey unveiled a diverse array of other species within the lynx diet, including mouflon (*Ovis ammon musimon*), beech marten (*Martes foina*), Eurasian badger (*Meles meles*), domestic cat (*Felis catus*), brown hare (*Lepus europaeus*), and European wildcat (*Felis silvestris*). Each of these species individually accounted for less than 1% of the lynx diet, collectively making up 3% of the surveyed prey species (Figure 44). When comparing the diet of Dinaric and the Alpine lynx population, some differences emerged. Chamois comprised 17% of all kills found in the Alps, whereas in the Dinarics, they only accounted for 4%. Consequently, there was a higher percentage of roe deer kills in the Dinarics (84%) compared to the Alps, where roe deer comprised 71% of all field-checked kills. However, there were no differences in the presence of red deer in the lynx diet, with the same proportion (7%) observed in both areas.

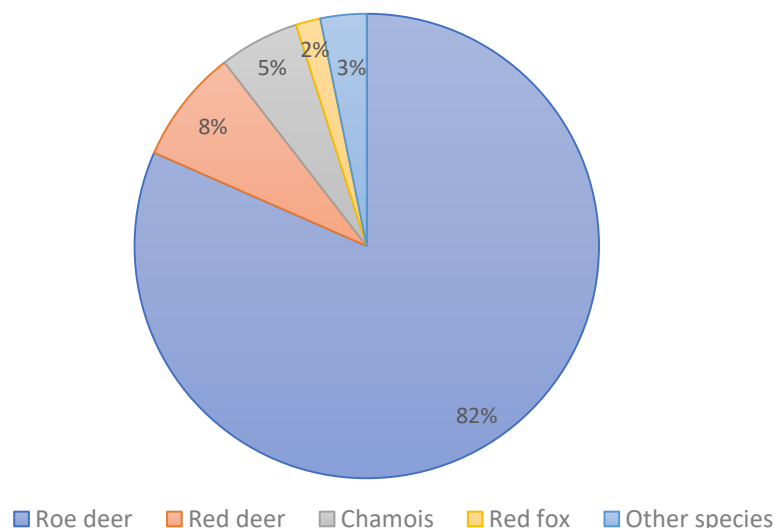


Figure 44: Field checked lynx kills – prey species (n=467)

We analyzed sex and age distribution of the lynx main prey, roe deer, including data from the collared translocated lynx and those from the remnant population (Table 1). In total, we surveyed 381 roe deer kills. Our findings reveal that lynx predominantly target adult prey, with higher proportion of females than males. These results showed similar predation patterns observed in prior studies of remnant lynx from the Dinaric population (Krofel et al., 2014).

Table 1: Age and sex structure of roe deer killed by collared lynx within the project duration (n = 381)

roe deer	sex			Total (%)
	male (%)	female (%)	unknown (%)	
adult	24.1	29.7	7.1	60.9
age juvenile	3.1	8.4	7.9	19.4
unknown	0.3	0.8	18.6	19.7
Total (%)	27.6	38.8	33.6	100.0

Beside prey species, we also collected information about scavenger species that were visiting lynx kill sites. The species the we recorded most often, were red fox (*Vulpes Vulpes*), brown bear (*Ursus arctos*), beech marten (*Martes foina*), Eurasian jay (*Garrulus glandarius*), common raven (*Corvus corax*) and common buzzard (*Buteo buteo*). We also recorded the presence of gray wolf (*Canis lupus*), Eurasian jackal (*Canis aureus*), golden eagle (*Aquila chrysaetos*), white tailed eagle (*Haliaeetus albicilla*), Eurasian badger (*Meles meles*), pine marten (*Martes martes*), European wildcat (*Felis silvestris*), coal tit (*Parus ater*), ural owl (*Strix uralensis*), Eurasian goshawk (*Accipiter gentilis*), bank vole (*Myodes glareolus*), domestic dog (*Canis lupus familiaris*) and other lynx (i.e. other than the individual that made a kill). This underscores the significant role that lynx plays in forest ecosystems, not only by influencing prey populations but also by providing a food source for other species.

Overview of lynx survival, movement, reproduction and predation

The translocations conducted within the LIFE Lynx (n=18) and ULyCA2 (n=4) projects involved a total of 22 lynx (7 females, 15 males) sourced from Romania (2 females, 10 males), Slovakia (3 females, 5 males), and Switzerland (2 females). These animals were released in the 2019 - 2023 period as part of population reinforcement efforts in the Dinaric mountains of Slovenia (1 female, 5 males) and Croatia (6 males), or reintroduction to establish a stepping-stone population in the Julian Alps of Slovenia (3 females, 3 males) and Italy (3 females, 1 male).

Soft release methods were utilized for lynx translocated to Slovenia, while hard release methods were employed for those destined for Croatia, and a mixture of soft and hard release in Italy. The entire translocation process, including releases, was conducted with the support and involvement of local hunting organizations and public institutions managing protected areas.

Regarding dispersal from the release areas, higher proportion of soft-released lynx (43%; n=14) established permanent home ranges in the release area (or less than 5 km from) compared to hard-released lynx (13%; n=8). Dispersal rates were notably lower during reintroduction efforts in the Slovenian Alps, where only one among the six soft-released lynx left the release area. One male lynx (Maks) from the Dinaric Mountains made a round trip dispersal to the Alps and back, suggesting potential functional connectivity between release areas.

Of the 22 translocated lynx, 15 (68%) were deemed successfully integrated into the population, while the status of one (Jago) remains unclear, and 6 (27%) died or disappeared before reproducing. Integration success was somewhat higher for soft-released lynx (71%; n=14) compared to the hard-released lynx (63%; n=8). We observed highest integration success (83%) for soft-released lynx in the Slovenian Dinaric Mountains (n=6) and the Slovenian Alps (n=6).

For survival analysis, we defined lynx status at the end of GPS-tracking as following: alive (lynx still tracked at the end of the study or moving when the collar drop-off was triggered), disappeared (collar signal lost before the expected battery lifetime, but no camera-trapping was conducted in the area of disappearance to provide further information; mostly likely either the collar failed or the lynx was poached), suspected poaching (collar signal lost before the expected battery lifetime and lynx disappeared from camera-trapping records at about the same time), confirmed poaching (evidence of poaching found, e.g. shot lynx or destroyed collar), road-kill (lynx killed in vehicle collision), and natural mortality (dead lynx found without signs of human-caused mortality). Survival analysis revealed that among the 49 GPS-tracked lynx (including both translocated and remnant animals), 33 (67%) survived until the end of tracking, 5 (10%) disappeared, and 11 (22%) were confirmed or suspected to have died. Survival during the tracking period was the highest for the offspring of translocated lynx, intermediate for the translocated lynx and the lowest for the remnant lynx, although the differences in the survival probability were not significant (Kaplan-Meier, $p=0.52$; Figure 45). Mortality was the highest among the remnant lynxes (33%; n=18), followed by translocated lynxes (18%; n=22) and F1 (lynxes (11%; n=9). Among the translocated lynx and their offspring, all observed or suspected mortalities were human-caused mortalities, primarily due to poaching, while natural mortalities were prevalent among the remnant lynx, often attributed to health issues potentially linked to inbreeding (Table 2). Notable is high proportion of lynx that quickly disappeared or were poached after they dispersed to Austria or to areas along the Austrian border.

Reproductive success among the translocated lynx was evident, with 13 lynx assumed to have reproduced by 2024 (i.e. detected mating or presence of kittens in the territory), and for two more there is potential to reproduce in the future. Parenthood was confirmed genetically for translocated lynx in 10 out of 24 litters. By combining genetic data and camera trapping, a total of 52 kittens were confirmed to have at least one of the translocated lynx as parent. Camera-trapping data indicated 37% larger litter sizes when at least one parent was presumed to be a translocated lynx compared to litters with both parents from the remnant population with 2.2 kittens (n=24) vs. 1.6 kittens per litter (n=73), respectively. Considering only camera-trapping data from genetically-confirmed litters, average litter size was 2.3 kittens (n=10).

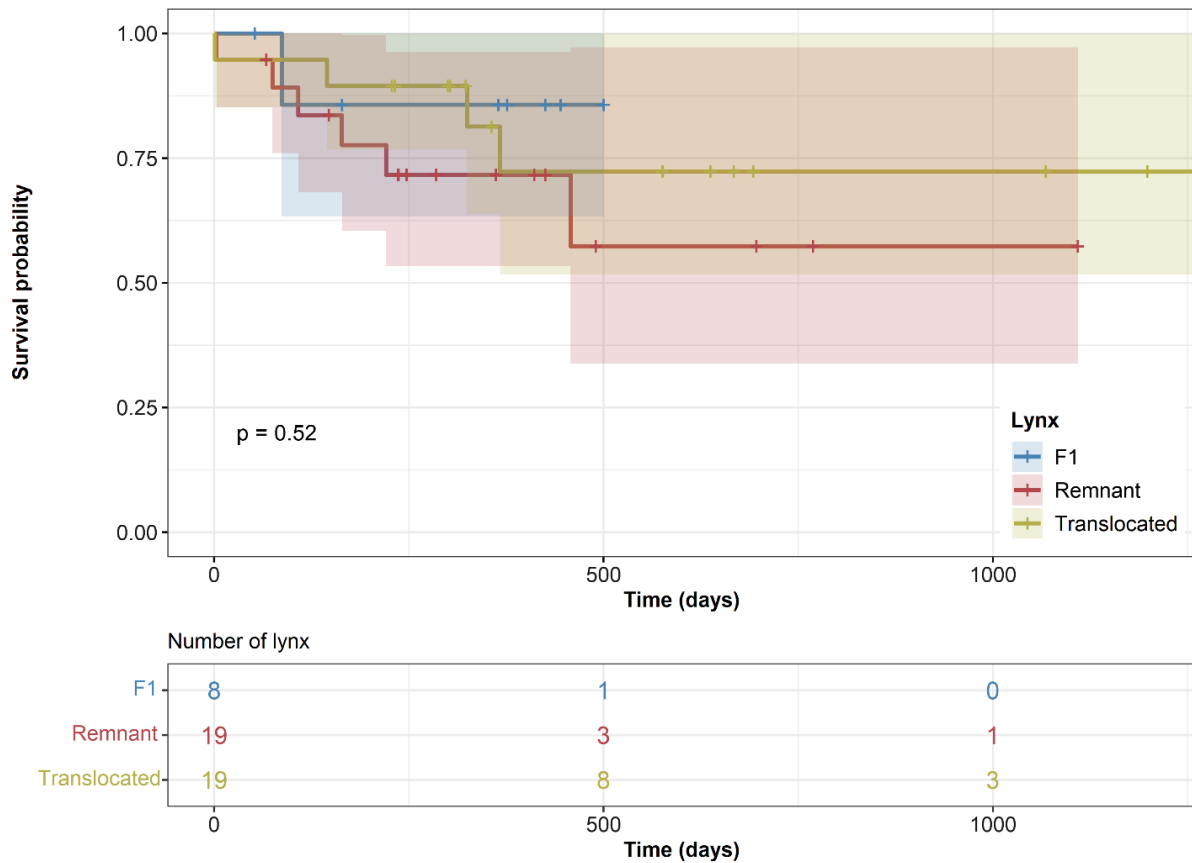


Figure 45. Non-parametric survival estimates for Eurasian lynx within the GPS-tracking period. Product-limit (Kaplan-Meier) survival estimates for remnant, translocated, and F1 lynx (offspring with at least one of the parents being translocated lynx). Lynx with unknown status at the end of the tracking period were excluded from the analysis.

Table 2: Overview of all GPS-collared lynx tracked within the LIFE Lynx project duration with basic information. "F1" - offspring of at least 1 translocated lynx; "remnant" – lynx from existing Dinaric population

Lynx	Origin	Population	Telemetry monitoring period	Integration	Reproductions (n)	Number of genetically confirmed reproductions	min. num. of kittens	Current status	95% MCP
Goru	translocated	Dinaric	14.5.2019 - 24.8.2022	yes	6	4	13	alive	138.7
Doru	translocated	Dinaric	11.3.2019-30.1.2020	no	0	0	0	suspected dead	148
Catalin	translocated	Dinaric	31.3.2020-present	yes	4	0	9	alive	315
Alojzije	translocated	Dinaric	13.3.2020 - 14.2.2023	yes	2	0	5	alive	232
Boris	translocated	Dinaric	29.5.2020-25.3.2021	yes	1	0	2	alive	285
Maks	translocated	Dinaric	23.6.2020-27.9.2021	no	0	0	0	unknown	243
Emil	translocated	Dinaric	14.5.2021-11.12.2022	yes	1	0	2	alive	168
Pino	translocated	Dinaric	30.5.2020-31.5.2020	no	0	0	0	suspected dead	/
Aida	translocated	Alpine	26.4.2021-22.11.2022	yes	3	3	9	alive	155.5
Zois	translocated	Alpine	26.4.2021-28.4.2022	yes	2	2	0	suspected dead	173
Tris	translocated	Alpine	28.4.2021-16.12.2021	yes	3	1	6	unknown	129
Julija	translocated	Alpine	28.4.2021-21.3.2023	yes	2	2	5	alive	109
Lenka	translocated	Alpine	28.4.2021-12.12.2021	yes	1	1	1	alive	147
Lubomir	translocated	Dinaric	16.6.2022-present	yes	0	0	0	alive	122
Blisk	translocated	Dinaric	17.5.2022-present	yes	1	0	2	alive	153.5
Lukaš	translocated	Dinaric	19.4.2023-14.8.2023	no	0	0	0	unknown	245
Kras	translocated	Dinaric	24.3.2023-present	yes	0	0	0	alive	116
Sneška	translocated	Dinaric	26.4.2023-present	yes	0	0	0	alive	61
Sofia*	translocated	Alpine	16.3.2023-8.8.2023	no	0	0	0	dead	/
Jago*	translocated	Alpine	16.5.2023-14.3.2024	NA	0	0	0	alive	/
Margy*	translocated	Alpine	10.3.2023-23.10.2023	no	0	0	0	unknown	/
Talia*	translocated	Alpine	16.5.2023-present	yes	0	0	0	alive	176
Teja	remnant	Dinaric	19.04.2019-9.2.2020	NA	5	5	10	alive	43
Mihec	remnant	Dinaric	21.03.2020-24.7.2021	NA	0	0	0	alive	272
Mala	F1	Dinaric	19.01.2020-1.7.2020	NA	0	0	0	unknown	78
Niko	F1	Dinaric	6.12.2020-20.4.2022	NA	0	0	0	alive	322
Bojan*	remnant	Dinaric	1.12.2019-3.3.2021	NA	0	0	0	suspected dead	212
Petra	remnant	Dinaric	1.03.2021 - present	NA	3	3	7	alive	164
Martina	remnant	Dinaric	1.03.2020 - 2.6.2021	NA	0	0	0	dead	/
Bor	remnant	Dinaric	18.01.2022 - 15.12.2023	NA	0	0	0	alive	115

Klif	remnant	Dinaric	4.02.2022-present	NA	2	2	6	alive	209.5
Igi	remnant	Dinaric	17.02.2022-3.5.2022	NA	0	0	0	dead	52
Pandora	remnant	Dinaric	30.03.2022-15.5.2023	NA	0	0	0	alive	165
Josip	remnant	Dinaric	4.02.2022-5.4.2023	NA	0	0	0	alive	190
Neža	F1	Dinaric	13.2.2022 - 11.5.2022	NA	0	0	0	dead	/
Valentina	F1	Dinaric	13.2.2022 - 7.4.2023	NA	0	0	0	unknown	34
Meri	F1	Alpine	25.12.2022-present	NA	0	0	0	alive	242
Flori	F1	Alpine	3.03.2023-present	NA	0	0	0	alive	307
Andrej	F1	Alpine	15.03.2023-present	NA	0	0	0	alive	200
Rozi	F1	Alpine	14.01.2023-present	NA	0	0	0	alive	131
Slavko	remnant	Dinaric	21.07.2023-present	NA	0	0	0	alive	139
Matic	F1	Dinaric	22.01.2024-present	NA	0	0	0	alive	131
Miha	F1	Alpine	14.3.2024-present	NA	0	0	0	alive	/

*Lynx were monitored with telemetry within other projects (Interreg 3lynx, ULyCAproject)

Discussion and conclusions

This report offers an assessment of the status of the released lynx, their survival, reproduction, predation and integration into the existing population. In addition, we provide comparison with GPS-tracked remnant lynx and offspring of the translocated animals.

The main goal of the LIFE Lynx project was to prevent the extinction of the Dinaric – Southeastern Alpine lynx population, with successful translocation of Carpathian lynx and their integration in the remnant population representing the central part of the project. We translocated 18 animals to Slovenia (12) and Croatia (6), with 12 lynx being released in Dinaric mountains and 6 lynx into the Slovenian Alps. Best practices from other countries guided our plan, focusing on ensuring the survival and territory establishment of translocated lynx (Wilson 2018). Monitoring with GPS-telemetry collars enabled us a good assessment of their integration success. In Dinaric mountains, we can confirm that 9 (75%) lynx out of 12 have successfully integrated into the existing population. Only Maks, Doru and Pino were not successful. In the Alps, 5 (83%) lynx were integrated as a stepping stone population with only lynx Lukaš not making it. Beside translocations in the Alps within the LIFE Lynx project, 4 additional lynx were released in Italian Alps in scope of ULyCA2 project. Out of those, one female (Talia) integrated into the population in the Slovenian Alps and we still monitor one animal (Jago) that could potentially become included into the Alpine population.

Six months post-release, the survival rate of translocated lynxes (86%) surpassed the average reported in similar previous projects (66%) (Thomas et al. 2023). The majority (54%) already successfully reproduced, which crucial for combating the population threat of inbreeding. Initial high survival rates may be attributed to the use of wild-caught individuals, which was likely enhancing their hunting prowess. Swift adaptation to capturing large prey and comparable kill rates to local lynxes in novel environments likely averted starvation, a common translocation mortality factor (Devineau et al. 2010). Illegal killing appears to be the primary mortality factor for translocated lynx

and their offspring, which is consistent with trends in other large carnivore translocations and Eurasian lynx populations across Continental Europe (Heurich et al. 2018) and will require further efforts to address it also in the Dinaric and Alpine regions.

Beside tracking translocated lynx with telemetry, we also captured 11 remnant lynx and 10 offspring of translocated lynx. This enabled us to compare the ecology of translocated and remnant lynx, which confirmed successful integration of the translocated lynx in novel ecosystems. Telemetry data enabled comprehensive monitoring of lynx kills in the field, revealing roe deer as the primary prey species (mostly focused on adult females), comprising 82% of identified kills, followed by red deer, similar to previous studies in the Dinaric Mountains (Krofel et al. 2011, 2014). The most common scavenger species observed at lynx kill sites included red foxes, brown bears, and beech martens, underscoring lynx's role in supporting ecosystem biodiversity.

Similar to previous research on carnivores and other terrestrial animals (Resende et al. 2021; Thomas et al. 2023), we found higher integration success and lower dispersal rates in the post-release movements among the soft-released compared to hard-released methods. In addition, the presence of conspecifics of both sexes appeared to have an important impact on post-release movements, suggesting a need for further analysis.

Results of the individual monitoring confirm that the translocation efforts conducted within LIFE Lynx and ULYCA2 projects were overall a success. This is also supported at the population level by marked increase in lynx numbers in the Dinaric population and considerable decrease in the inbreeding levels (Fležar et al. 2024; Konec et al. 2024). The creation of a new stepping-stone subpopulation in the Julian Alps represents a major advance towards reaching this long-term vision. Next step is creation of additional stepping stones that could eventually re-establish connectivity across the Alpine arc with the small and isolated lynx occurrence in the North-eastern Alps (Austria) and the larger population in the North-western Alps (Switzerland). However, the high disappearance rates observed in Austria will likely be a major obstacle in achieving this goal. This calls for a targeted, multi-sectoral approach, similar to the efforts of the LIFE Lynx project that appeared effective in the given cultural setting.

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