



**CONVENTION ON  
MIGRATORY  
SPECIES**

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14<sup>th</sup> MEETING OF THE CONFERENCE OF THE PARTIES  
Samarkand, Uzbekistan, 12 – 17 February 2024  
Agenda Item 31.4

**PROPOSAL FOR THE INCLUSION OF THE EURASIAN LYNX (*Lynx lynx*)  
IN APPENDIX II AND BALKAN LYNX (*Lynx lynx balcanicus*)  
IN APPENDIX I OF THE CONVENTION\***

Summary:

North Macedonia as proponent, Uzbekistan, Bosnia and Herzegovina and Albania as co-proponent have submitted the attached proposal for the inclusion of the Eurasian Lynx (*Lynx lynx*) in Appendix II and Balkan Lynx (*Lynx lynx balcanicus*) in Appendix I of CMS.

A revised version of the supportive statement to the listing proposal has been submitted by the proponent on 29 September 2023 to address the comments of the CMS Scientific Council (ScC-SC6 UNEP/CMS/COP14/Doc.31.4.1/Add.1). This has resulted in amendments to the supportive statement relating to:

- Whether the species has a conservation status that would benefit from international cooperation.
- The migratory behaviour of the species, taking into consideration aspects of the cyclical and predictable nature of movements, as interpreted in UNEP/CMS/Resolution 13.7 Guidelines for Preparing and Assessing Proposals for the Amendment of CMS Appendices.
- The proportion of the global population of the species that are transboundary populations.

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**PROPOSAL FOR THE INCLUSION OF THE  
EURASIAN LYNX (*Lynx lynx*)  
IN APPENDIX II AND BALAKN LYNX (*Lynx lynx balcanicus*) IN APPENDIX I OF THE  
CONVENTION**

**[Revised version 01\_Resubmission 29<sup>th</sup> of September 2023]**

## **1. Introduction**

### **A. PROPOSAL**

Inclusion of the Eurasian Lynx (*Lynx lynx*) in Appendix II and Balkan Lynx (*Lynx lynx balcanicus*) in Appendix I of CSM.

### **B. PROPONENT**

North Macedonia

*Co-proponents:*

Uzbekistan

Albania

Bosnia and Herzegovina (relevant environmental ministries from Republika Srpska and the Federation Bosnia and Herzegovina)

### **C. STATEMENT OF SUPPORT**

#### **1. Taxonomy**

1.1 Class: Mammalia

1.2 Order: Carnivora

1.3 Family: Felidae

1.4 Species: Eurasian Lynx, *Lynx lynx* (Linnaeus, 1758)

1.5 Scientific synonyms *Felis onca* (Linnaeus, 1758)

1.6 Common names, in all applicable languages used by the Convention.

English: Eurasian Lynx/Balkan Lynx; French: Lynx commun, lynx boréal; German: Luchs; Spanish: Lince; Macedonian: рис/балкански рис.

#### **2. General description**

The Eurasian Lynx (*Lynx lynx*) is a middle-sized, spotted felid and one of the four species belonging to the Lynx genus. It is considered to have one of the largest east-west distribution ranges and is the northern-most species of the Felidae family. *L. lynx* ranges through much of Europe, Central Asia, Siberia and East Asia (Nowell and Jackson 1996, Sunquist and Sunquist 2002). In Europe, Eurasian Lynx' native distribution stretches from Scandinavia and Fennoscandia in the north, the Carpathian Mountains in the east and the southwest Balkan Peninsula. In Central and Western Europe, the Eurasian Lynx has been widely extirpated within the past several hundred years, but some populations were reintroduced from the 1970's onward. The total is now estimated at only about 3,000 individuals, with little connectivity between subpopulations localized around mountain ranges (Breitenmoser et al. 2000, Chapron et al., 2014). Although the ten European populations are being researched and monitored on the regular basis (e.g. in Switzerland, Sterrer et al. 2022), very little robust information is available from the lynx's wide Asian range (Breitenmoser et al. 2015).

A particular challenge in Eurasian Lynx conservation is that the species is divided into six distinct subspecies (Kitchener et al. 2017) (Fig. 1), which are considered evolutionary significant units.



**Figure 1.** The distribution of the six Eurasian Lynx subspecies (<https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/lynx>)

The species is globally assessed Least Concern in the IUCN Red List (Breitenmoser et al. 2015), based on its wide distribution in southern Siberian woodland stretching through Russia from the Ural Mountains to the Pacific, as well as Central Asia and the Tibetan plateau. But some of the subspecies are threatened, with the Balkan Lynx (*Lynx lynx balcanicus*) being on the verge of extinction. The population of the latter is estimated to be less than 50 mature individuals distributed mainly in North Macedonia, Albania and few individuals in \*Kosovo<sup>1</sup>. There has not been recent evidence coming from Greece or Montenegro. However, no systematic monitoring is conducted in these two countries where dispersing individuals could have already appeared. Based on the population size estimates, the IUCN Red List assessment classifies the Balkan Lynx as Critically Endangered (CR: D) (Melovski et al. 2015). The main threats involve poaching, prey depletion, habitat destruction and inbreeding (Bazzicalupo et al., 2022). Other subspecies of the Eurasian lynx are in a need for thorough conservation evaluation according to the IUCN Red List criteria. Many populations of wide-spread subspecies could be hampered due to unsustainable development and fragmentation without realizing it because of their seemingly intact distribution range.

The home-range size in Eurasian Lynx varies between 50-60 km<sup>2</sup> in Asia Minor (Mengüllüoğlu et al. 2021) up to 2600 km<sup>2</sup> in the northern areas of its range (e.g. Scandinavia; Linnell, Mattisson & Odden, 2021). The diet is primarily consisted of lagomorphs in the sparsely vegetated areas in Central and East Asia (Matyushkin and Vaisfeld 2003) and the coniferous forests of Asia Minor (Mengüllüoğlu et al. 2018). Where ungulates are abundant, lynx prey ranges in size from the 15 kg Musk deer (*Moschus moschiferus*) to 220 kg adult male Red deer (*Cervus elaphus*), but show a preference for the smaller ungulate species, such as Roe deer (*capreolus capreolus*), Chamois (*rupicapra rupicapra*), Reindeer (*Rangifer tarandus*) and Musk deer. Occasionally, lynx also hunt foxes (*Vulpes vulpes*), hares (*Lepus* spp.), marmots (*Marmota* spp), wild boar (*Sus scrofa*), beaver (*Castor fiber*), ground dwelling birds or domestic animals such as sheep and goats, or, in Scandinavia, semi-domestic reindeer (Breitenmoser and Breitenmoser-Würsten 2008). Balkan Lynx diet consists of smaller ungulates (Roe deer and Chamois) with Brown hare (*Lepus europaeus*) as a second option (Melovski et al. 2020).

<sup>1</sup> \*In accordance with UNSCR 1244/99

The Eurasian Lynx is included on CITES Appendix II and protected under the Bern Convention (Appendix III). The Balkan Lynx is protected under Appendix II of the Bern Convention. The EU Habitat Directive protects the Eurasian Lynx in each state of the European Union under Annex II, (except the Estonian, Latvian and Finnish populations) and Annex IV (except the Estonian population).

The lynx listing under CMS is expected to increase the global awareness of its conservation status and support different conservation programmes, strengthen the monitoring activities in the range countries, provide possibilities for identifying green infrastructure to ensure the invaluable migration of the species, transboundary cooperation between range countries for implementation of conservation measures and action plans, act in a prompt manner to recover native populations that are at threat, motivate research of populations where data is missing, as well as strengthening the institutional capacities of all relevant national and international stakeholders in regards to the monitoring and conservation activities. While the two boreal subspecies, *L. l. lynx* and *L. l. wrangeli*, seem presently not to be of conservation concern, the other four subspecies are in need of conservation activities including transboundary cooperation. Indeed, the Northern Lynx in Europe has recovered over the past 50 years not at least thanks to a transboundary perception of the population.

### **3. Migrations**

#### **3.1 Types of movement, distance, cyclical and predictable nature of migration**

Eurasian Lynx have two main types of movement during their lives: Dispersal, which occurs when they are sub-adult to establish their own territories, and movement within their partly huge home ranges throughout their lives. The latter may show a seasonal pattern depending on the topography (mountains) and seasonal prey availability. The long-range dispersal of lynx in their second year of live is sex-dependent. While females are philopatric and only occasionally do long-range dispersal, such long distance movements (often of up to several hundred kilometres) are common in males. This dispersal pattern in lynx (and other cat species) on the one hand prevents inbreeding, on the other hand it is important for the exchange of genetic information, and hence safeguarding the genetic health of populations. Dispersal has also been associated with a species' range expansion (Thompson and Jenks 2010), which is particular important for the recolonization of areas where the species has been eradicated. In this respect, it is necessary to maintain or achieve connected populations and suitable habitats to guarantee the prevention of inbreeding and to guarantee a high level of genetic diversity and as a consequence the long-term survival. Outside the population of the large and continuous boreal forest belt, lynx populations exist in the form of meta-populations with partly unknown connectivity of the subpopulations and exchange of individuals. Movements within the established territories of the resident lynx are often cyclical/seasonal with core areas of their home-range being more utilized than the rest. Core areas usually possess features and resources that are of high value for the lynx: abundant prey, preserved forest, potential denning sites, low anthropogenic disturbance etc. The home-ranges are traversed within the lifespan of the individuals for the sake of marking, hunting and raising young. Mothers with kittens are usually constrained around the natal den from late May to the first half of July, after which they roam nearby territories in the search for prey.

Viable population of lynx, which live at very low densities, extend almost always across international boundaries. In Europe, researchers identified 11 different populations of Eurasian lynx (belonging to three different subspecies), of which 10 are transboundary (Tab. 1) and only the Harz population is constrained to Germany. However, not all of these populations are considered viable, mainly because the connectivity between them is not (yet) established (for example, the Vosges Palatinian and the Jura populations, Krebs et al., 2021).

**Table 1.** Transboundary European subpopulations

Population name	Countries
Scandinavian	Norway, Sweden
Karelian	Finland, Russia
Baltic	Estonia, Latvia, Lithuania, Poland, Ukraine, Belorussia
Bohemian-Bavarian-Austrian	Czech Republic, Germany, Austria
Carpathian	Romania, Slovakia, Poland, Ukraine, Czech Republic, Hungary, Serbia, Bulgaria
Alpine	Switzerland, Slovenia, Italy, Austria, France
Jura	France, Switzerland
Vosges Palatinian	France, Germany
Dinaric	Slovenia, Croatia, Bosnia & Herzegovina
Balkan	North Macedonia, Albania, *Kosovo

Outside Europe, the Caucasus lynx (*L. l. dinniki*) spreads over six countries: Turkey, Russia, Georgia, Armenia, Azerbaijan and Iran, and the Central Asia subspecies *L. l. isabellinus* is living in seven countries, namely Bhutan, Nepal, India, China, Kirgizstan, Tajikistan, and Uzbekistan. The latter is the least known of all subspecies; its conservation status and population trend is unknown. However, the sparse information indicate that it lives at low densities in linearly distributed and hence limited habitats. The fragmentation of the distribution range is not known, but the lynx is most likely not evenly distributed and connectivity across international borders is certainly very important to maintain the viability and genetic integrity of this subspecies.

The connectivity or rather fragmentation of the distribution of the Eurasian lynx populations in Russia is difficult to estimate. Karelian population (belonging to the nominal subspecies *Lynx lynx lynx*) stretches all the way south to northern Belorussian border (Matyushkin & Vaisfeld, 2003). New surveys indicate that the population is more fragmented than generally stated. According to the authors, the distribution in west Siberian region (rivers Ob, Irtysh and Yenisei) is more or less continuous, but with regionally changing densities, while the main threat is overhunting. The population in southern areas of west Siberia is shared with Kazakhstan. East of the Yenisei River is home to the *Lynx lynx wrangeli* subspecies, stretching all the way to Kamchatka in the far east. The lynx densities within this Middle Siberia region are lower than in the west and stretch all the way to the forested areas between Russia and Mongolia (Matyushkin & Vaisfeld, 2003). Altai region shares lynx population between Russia, Kazakhstan, China and Mongolia, with relatively low densities as the lynx were overhunted in the 1980's (Matyushkin & Vaisfeld, 2003). The Russia's Far East has a low abundance of lynx, but habitats are still well connected from northern areas of river Omolon, stretching to China and North Korea and the Vostok area of Russia (Matyushkin & Vaisfeld, 2003).

Approximately 75% of the northern range of the two subspecies *L.l.lynx* and *L.l.wrangeli* belong to Russia ([www.catsg.org](http://www.catsg.org)). Based on their distribution and population size, the accepted conservation status of the species is Least Concern (see Chapter 5.1). Although there seems to be no immediate conservation concern regarding the two northern subspecies, there is obviously a need for more research and improved monitoring both in Russia and Central Asian countries as far as part of the species' range.

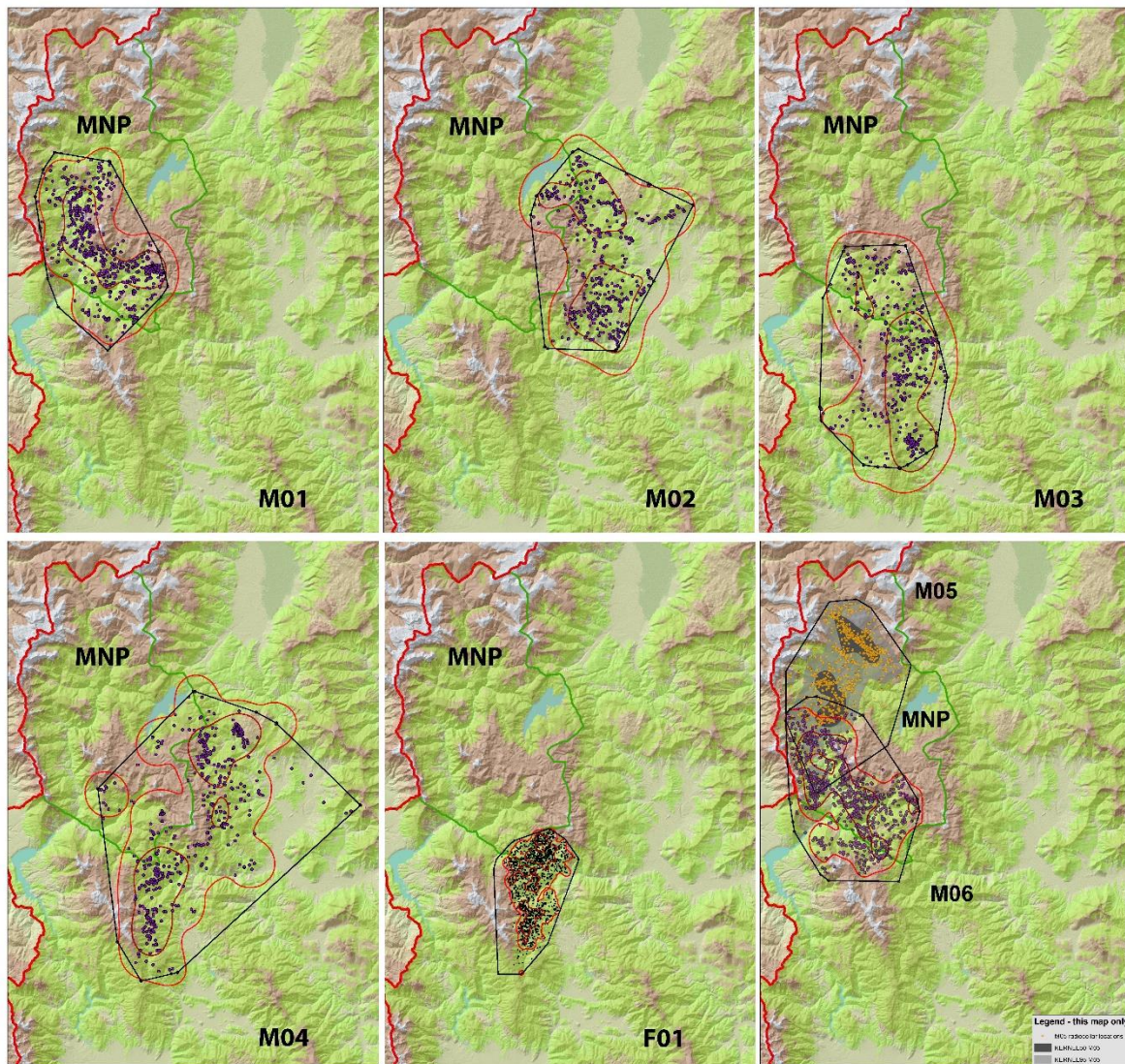
Each of the six Eurasian lynx subspecies are shared between several countries, which implies international approach in conservation, monitoring and research. This is again more important for the four southern subspecies, where anthropogenic fragmentation is much further advanced than in the boreal forest belt.

### **Land-tenure system**

Individual home range size varies widely from 100 to over 1,000 km<sup>2</sup> (Breitenmoser and Breitenmoser-Würsten 2008). Home ranges averaged 248 km<sup>2</sup> for males (n = 5) and 133 km<sup>2</sup> for females (n = 5) in a radio telemetry study in Poland's Bialowieza forest (Schmidt et al. 1997). Average home range sizes in Switzerland were 90 km<sup>2</sup> for females and 150 km<sup>2</sup> for male Lynx. Male home ranges generally enclose 1-2 female territories (Breitenmoser and Breitenmoser-Würsten 2008). In Slovenia, home range size varieties from 72 km<sup>2</sup>–598 km<sup>2</sup> (n=4 females and 2 males) (Krofel, 2012), whereas in Bohemian Forest Ecosystem the mean home range is 445 km<sup>2</sup> for males and 122 km<sup>2</sup> for females (n=10) (Magg et al. 2016).

Because of the large individual home ranges and the generally low density, viable Eurasian lynx populations need large areas of suitable habitats stretching over many thousands of square kilometres. As an example, an area of 25,000 km<sup>2</sup> is needed for around 500 lynx if an average density of 2 individuals per 100 km<sup>2</sup> is considered.

**Balkan Lynx** home range ranges from 220 to 700 km<sup>2</sup> for males and from 100 to 200 km<sup>2</sup> for females (Fig. 2). On average, home ranges were established after 147 days (SD=78.7 days). The overlap of the territories of the two males that were tracked simultaneously in 2019, is 112 km<sup>2</sup> for 100% MCP (32% overlap) and 40 km<sup>2</sup> for href\*0.7 95% KDE (17% overlap) (Melovski et al. 2020). Minimum and maximum straight-line distances per day ranged from 0 to 24.8 km for males, whereas the female displacement ranged from 0 to a maximum of 13 km. On average, males' displacement was around 4 km/d throughout the year, while the female's average was 2.4 km/d. Season-wise, males' furthest displacement was in the winter months (January–March) with 5.09 km/d, and lowest from July to September, 3.18 km/d.



**Figure 2.** Home range estimates of 6 male (M01-Mo06) and one female (F01) Balkan Lynx in North Macedonia. MNP – Mavrovo National Park represents the core area of the population (Melovski et al. 2020).

## Dispersion

Lynx populations are vulnerable to fragmentation. Population connectivity is impeded by a variety of habitat barriers, e.g. broad valley bottoms with watercourses, settlements, main traffic routes, or high mountains. Linear infrastructures can split lynx populations, threaten their connectivity and, in the long run, genetic integrity. As any terrestrial animal, Lynx struggle to cross such barriers and are exposed to many dangers. Dispersal is vital to population maintenance, but only a quarter of all lynx reach adulthood and become part of the resident population. Especially the dispersal phase (the second and partly third year of life) with the movements across unknown ground is a period of high mortality. To establish themselves in the long term and successfully reproduce, they must first find and occupy a free area.

Lynx kittens stay with their mother on average for 10 months, after which they disperse. Dispersal age usually varies from 8 to 24 months (Breitenmoser et al. 1993; Schmidt 1998; Zimmermann et al. 2005; Samelius et al. 2012). In Eurasian Lynx, a male-biased dispersal is detected, while females often show philopatric behaviour (Samelius et al. 2012; Herrero et al. 2020). In Central Europe, Eurasian Lynx dispersal distances are substantially shorter than those in Scandinavia, although individual variation is considerable. In Central Europe, males

dispersed 4.5–129 km, compared to 32–428 km in Scandinavia (Breitenmoser et al. 1993; Schmidt 1998; Zimmermann et al. 2005; Samelius et al. 2012). Females in Central Europe dispersed 2–81 km compared to 3–215 km in Scandinavia (Samelius et al. 2012).

#### 4. Biological data (other than migration)

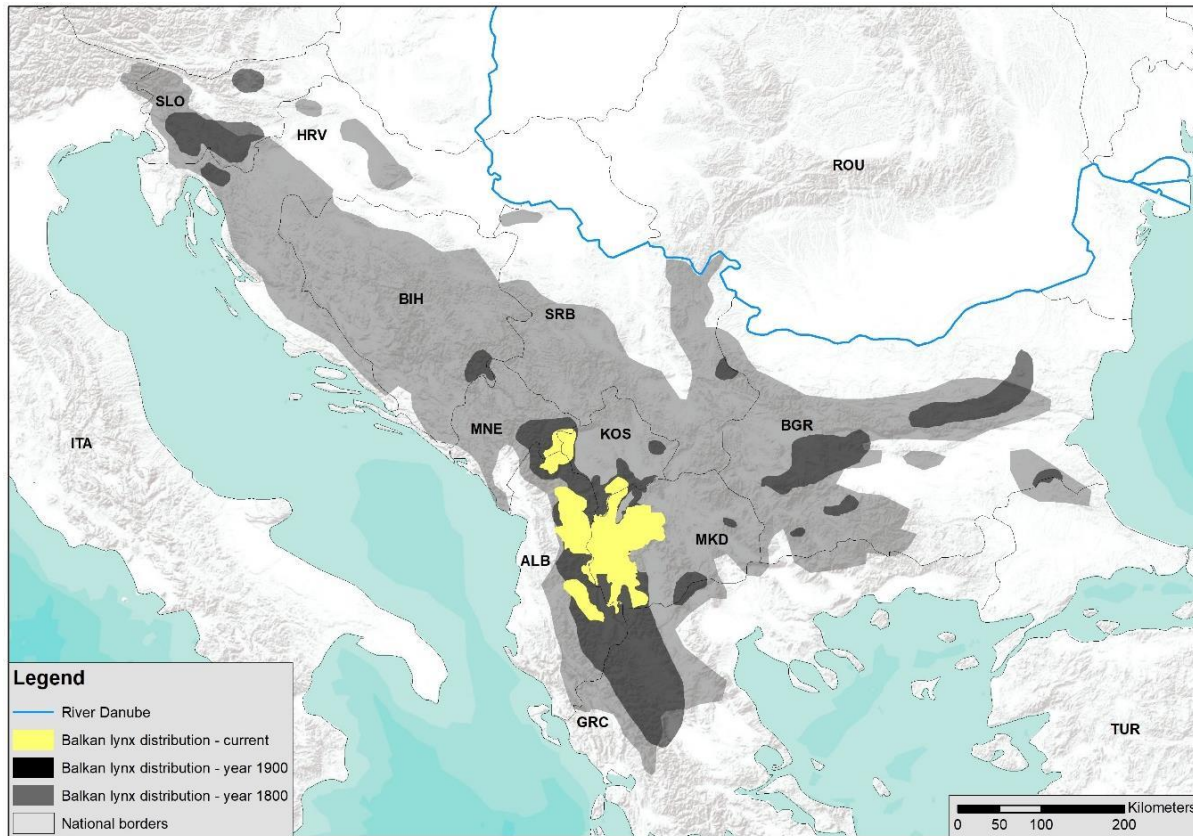
##### 4.1 Distribution (current and historical)

The Eurasian Lynx has an extensive distribution (Fig. 1). It occurs along forested mountain ranges in South-eastern and Central Europe and from Northern and Eastern Europe through the Boreal forest belt of Russia, down into Central Asia and the Tibetan Plateau (Kaczensky et al. 2012, Nowell and Jackson 1996, Sunquist and Sunquist 2002). The lynx's stronghold is the boreal forest belt stretching from the Atlantic coast to the Ural Mountains and to the Pacific (Matyushkin and Vaisfeld 2003). Subspecies in the southwest of its range (Europe and Asia Minor) are generally small and widely separated.

In Europe, lynx have been extirpated from most of Western and Central Europe except for the Carpathian Mountains. It also survived in a small area in the Balkans (Greece, North Macedonia, Albania, \*Kosovo and Montenegro). Lynx have been reintroduced in several countries of Europe in an effort to bring back this elusive predator, including in Switzerland, Slovenia, Italy, Czech Republic, Austria, Germany and France (IUCN 2007). The reduction of the distribution range of the Caucasian and Central Asian subspecies was likely less prominent, but their historic distribution ranges are not really known.

The **Balkan Lynx** is distributed in the South-west Balkans, Albania, North Macedonia and \*Kosovo. Potentially, Montenegro and Greece are also sharing this scattered and fragmented population (Fig. 3). Albania: lynx occur on Munella Mt. and its surroundings in central-north Albania (Trajçe et al. 2014) and Shebenik-Jablanica NP on the eastern border with North Macedonia and Polis-Guri I Zi-Valamara in the south-west of the country. Reproduction was detected in Munella and Polis-Guri I Zi-Valamara. Reports of lynx sightings in northern Albania (the Albanian Alps) have not been confirmed by photos from local inhabitants. North Macedonia: western part, mainly in the areas in and between Mavrovo, Galichica and Pelister national parks, but also in the Shar Planina NP, Jablanica Mt., Stogovo-Karaorman, Ilinska-Plakenska Mts. as well as Jakupica massif. In December 2010, a camera-trapping survey revealed individuals in the central-north part of North Macedonia (Jasen PA) (Melovski et al. 2013). The sightings were confirmed in 2020 and 2021 with camera-trapping and telemetry studies. \*Kosovo: a camera-trap photo confirmed two lynx present in Prokletije Mt. (Bjeshket e Nemuna) in March 2015 with subsequent detection until 2022. Montenegro: A Baseline Survey in 2013 revealed that two individuals had been killed in 2002 at the southern border with Albania and \*Kosovo (Prokletije Mt.). Their current presence is, however unlikely. Greece: periodically single, unconfirmed observations are reported from the border regions of Greece with North Macedonia and Albania. Assumed lynx occurrence at the Nestos River delta, east Greece, close to the Turkish border (Panayotopoulou and Godes 2004) was never confirmed by any reliable evidence. Their current presence in Greece is unlikely (Melovski et al. 2015).





**Figure 3.** The historic and current distribution of the Balkan Lynx (Melovski, 2022).

#### 4.2 Population (estimates and trends)

The global population trend of the Eurasian Lynx is estimated as stable with no severe fragmentation in the boreal range (Breitenmoser et al. 2015). The European lynx population (excluding Russia and Belarus) has been estimated at 9,000-10,000 (Breitenmoser et al. 2015). The autochthonous populations in north and east Europe (Scandinavian, Karelian, Baltic and Carpathian) number each around 2000 individuals and are thought to be stable or even increasing (Tab. 2). These populations went through a severe bottleneck in the early 20<sup>th</sup> century, but have recovered not at least thanks to a good transboundary cooperation. The re-introduced lynx populations all number less than 200 or even less than 100 animals, are mostly isolated and classified as Critically Endangered or Endangered. The **Critically Endangered Balkan Lynx population** is thought to be stable with only 20-39 individuals remaining (Tab. 2). Also, the Bohemian-Bavarian and the Vosges Palatinian populations are stable and decreasing and are estimated at 120 and 19 animals, respectively. In the Ukraine the lynx is considered to be low and further decreasing. Its population in the Carpathian region has been estimated at 350-400 (and may be interrupted in the Ukraine) and the one in the Polysya region (excluding Belarus) in the north of the country at 80-100 animals (Breitenmoser et al. 2015).

The status of the Eurasian Lynx in Asia is not well known. Rough estimates exist only for a few countries and trends in many countries are poorly understood due to a lack of data. The Lynx population in China was estimated at around 27,000 by the State Forestry Administration in 2009 and is listed as Vulnerable (Wang 1998, Bao 2010). Its population and range are thought to be increasing in Inner Mongolia. In 2003 the lynx population in Mongolia was estimated to be 10,000 (Tab. 2). In Afghanistan the presence of the lynx has been confirmed by camera trap surveys in the Wakhan District of Badakhshan and in the Northern Plateau, Yakawlang District of Bamyán provinces, since 2006. The lynx population in Russia was estimated to number around 22,510 animals in 2013 (Tab. 2). The lynx estimations in different

regions of Russia are based on different methods, but mainly on winter tracking, harvest data, and expert opinions. Lynx has been estimated to number 1,940 in the Central region, 4,110 in the North-western region, 680 in the Northern Caucasus, 40 in the Southern region, 2,400 in the Volga region, 1,070 in the Ural, 6,390 in the Siberian region and 5,890 in the Russian Far East for 2013 (Monitoring and supervision centre for game animals and their habitats (CentrOkhotControl) and with help of V.V. Rozhnov 2014). In Armenia lynx is thought to be a common species. In Azerbaijan and in Kyrgyzstan, lynx populations are thought to be stable. In Iran the lynx is proposed as Vulnerable and from Iraq since 2011 no observations exist. In Nepal and Pakistan the lynx is considered to be decreasing and in Tajikistan it is considered rare, found in the southern part of the country in the Darvaz range, westernmost part of the Pamir Mountains, the Ghunda valley and the Wakhan valley. In 2003 the lynx population in northern Pakistan was estimated to be 80-120 animals (Tab. 2) and the permanently occupied area in the entire country at around 25,252 km<sup>2</sup> (Sheikh and Molur 2004). In Uzbekistan, the lynx is considered Vulnerable and thought to be decreasing, but it seems to be stable in the Gissar Nature Reserve, with an estimated population of 130 in 2013 (Breitenmoser et al. 2015).

Densities are typically 1-3 resident adults per 100 km<sup>2</sup>, although higher densities of up to 5/100 km<sup>2</sup> have been reported from Eastern Europe and parts of Russia and lower densities of 0.3/100 km<sup>2</sup> from Scandinavia (Jedrzejewski et al. 1996, Schmidt et al. 2011, Sunde et al. 2000). In the Saihanwula Nature Reserve in Inner Mongolia, the density was estimated at 1.7-2.1/100 km<sup>2</sup> by camera trapping and track survey (Breitenmoser et al. 2015). In Turkey, a density of 4.2/100 km<sup>2</sup> has been estimated for the Ciglikara Nature Reserve, Antalya. However, this high lynx density may be temporarily and may decline with primary prey (hare) fluctuation (Avgan et al. 2014).

The **Balkan Lynx population** is estimated at 20-39 adult individuals (Melovski et al. 2015), and the density fluctuates between 0.8 to 2 individuals per 100 km<sup>2</sup> in the core area (Mavrovo NP in North Macedonia) using deterministic camera-trapping surveys conducted from 2008 until 2022 in seven occasions (Melovski pers comm). The population is considered stable, but no systematic abundance estimates have been done outside this core area.

**Table 2.** Estimated population size and trends of Eurasian Lynx populations. Red list assessment of European populations is also given according to von Arx (2020). (LC = Least Concern, VU = Vulnerable, EN = Endangered, CR = Critically Endangered)

Population/Country	Size	Trend	RLA Europe
Scandinavian	1,300 – 1,800	Decline	VU
Karelian	ca. 2,500	Stable	LC
Baltic	ca. 1,500	Slight decrease	LC
Bohemian-Bavarian-Austrian	120 (Wölfel, 2020)	Slowly increasing	CR
Carpathian	2,300-2,400	Stable	LC
Alpine	163	Slowly increasing	EN
Jura	140	Slowly increasing	EN
Vosges Palatinian	20 (Idelberger et al. 2021)	?	CR
Dinaric	130	Stable or decrease	EN
Balkan	20 – 39	Stable	CR
Harz	55 (Middelhoff & Anders 2018)	Increase	CR
China	27,000	Decreasing	
Georgia	160	/	
Mongolia	10,000	/	
Pakistan	80-120	Decreasing	
Russia	22,700	Stable	
Uzbekistan	130	Stable- Decreasing	

### 4.3 Habitats

The Eurasian Lynx occurs in a wide variety of environmental and climatic conditions (Schmidt et al. 2011). Throughout Europe and Siberia, it is primarily associated with forested areas with good ungulate populations that provide enough cover for hunting. It inhabits extended, temperate and boreal forests from the Atlantic in Western Europe to the Pacific coast in the Russian Far East (Breitenmoser and Breitenmoser-Würsten 2008).

In Europe it can be found from the Mediterranean forests up to the transition zone of taiga to tundra and lives from sea level up to the tree line (Breitenmoser and Breitenmoser-Würsten 2008).

In Central Asia, *L. l. isabellinus* occur in more open, sparsely wooded areas and steppe habitats. The species probably occurs throughout the northern slopes of the Himalayas, and has been reported both from thick scrub woodland and barren, rocky areas above the tree line (Nowell and Jackson 1996, Matyushkin and Vaisfeld 2003, Breitenmoser and Breitenmoser-Würsten 2008). Lynx occur sporadically throughout the Tibetan plateau, and are found throughout the rocky hills and mountains of the Central Asian desert regions (Nowell and Jackson 1996). In Armenia, lynx are strongly associated with forests and arid sparse forests and, to a lesser extent, with subalpine meadows.

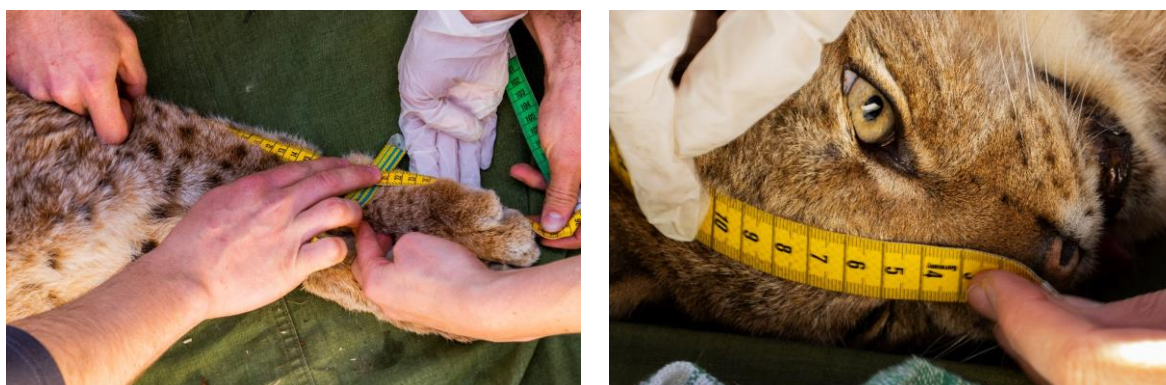
**The Balkan Lynx** occupies mixed deciduous and evergreen forests in the mountainous areas in the south-western Balkans. Deciduous forests consist of predominantly European beech, *Fagus sylvatica* and several oak species (*Quercus* spp.), mixed forests comprise more than 18% (mainly beech–fir mixed forests), nearly 10% are shrublands and around 1% are coniferous trees (Macedonian fir, *Abies borisii-regis* and European spruce, *Picea abies*) (Ivanov et al. 2018). The elevation in which Balkan Lynx are found stretches from 500 to 1,800 m, with rare exceptions when they venture into the high-mountain pasture above 1,800 m (up to 2,100 m) crossing territories or hunting Chamois.

According to the results of the “Assessment of the status of ecosystems in protected areas” (2020)<sup>2</sup>, the natural habitats of the Balkan lynx in North Macedonia (specifically the national parks) and the identified ecosystems are assessed with very good to excellent status/condition. This in turn proves the existence of the necessary natural conditions for the existence of the Balkan lynx, and requiring implementation of measures to maintain and improve the status, thus enabling for the protection and conservation of the species.

#### 4.4 Biological characteristics

The Eurasian Lynx is a medium-sized cat with a body length ranging from 80 to 110 cm and a shoulder height 50–60 cm. The males are on average 20–25% larger than females. In Europe, adult males have a weight that varies from 20–26 kg, females 16–20 kg. The Caucasian lynx in Asia Minor are much smaller, with females weighing 13.1 kg while males are 16.6 kg on average (Melovski et al. 2022). Five different coat patterns are described with different representation in the species' distribution range. Most lynx are either of the large spotted (41.5%) or unspotted (uniform, 36.2%) phenotype. The remaining patterns (rosettes, small spots and pseudo-rosettes) are represented in 11.0%, 7.4%, and 3.9% of samples, respectively (Darul et al. 2022).

Out of 13 measured adult **Balkan Lynx** (7 males and 6 females), the average body size is 101 cm for males and 93 cm for females and their weight is 21.7 and 16.3 kg, respectively (Fig. 3) (Dime Melovski pers. comm.). Four coat types have been documented in the Balkan population: large spots, small spots, unspotted and (rarely) rosettes.



**Figure 4.** Measurements of Balkan Lynx named Lisa in 2020. Photos: Sebastian Kennerknecht.

Eurasian Lynx is a solitary felid reproducing once per year. During the mating season, lynx can be active during the day more often than usual. During this time, the adults most often use calls for communication. The general timing of the reproductive cycle of the Eurasian Lynx is mating in late winter/early spring (from March to mid-April) and giving birth after a gestation period of 66–70 days (Mattison et al. 2022). Between late May and early June, one to four

<sup>2</sup> Assessment performed within the framework of the “Nature Conservation Program in North Macedonia” financed by the Swiss Development Cooperation, with the objective to support the country in providing greater protection of the rich biodiversity and natural ecosystems through promotion of their sustainable management and use

(average two) blind cubs are born in a protected den (cave, fallen tree). The female rears its young alone. Young lynx nurse primarily on milk until the age of about two months, when they can follow the mother to a kill site. The cubs stay with the mother for roughly ten months before becoming independent and seeking their own territories. Life expectancy is up to 20 years in the wild.

#### 4.5 Role of the taxon in its ecosystem

Throughout the distribution range of the Eurasian Lynx, they act as a top predator in Europe (alongside the wolf). In Asia, a part of the Eurasian lynx distribution overlaps with much larger felids, the tiger and the leopard. As top predators such, they can influence the population sizes, distribution, and behaviours of some prey species. Ungulates make up most of their diets and a single lynx can consume 1 to 2.5 kg of meat per day. In regions where game hunting is not practised, Eurasian Lynx may play a role in controlling deer populations. They can kill from 10 to 40% of Roe deer, Red deer, and Chamois populations annually. This is highly dependent on lynx density, ungulate density, and other causes of ungulate mortality. The greatest impact is usually seen in Roe deer and Chamois populations. Like other species of the genus, the Pleistocene Lynx(es) in Eurasia were likely hunters of lagomorphs, but modern Eurasian lynx seem to have coevolved in the post-glacial times with the roe deer (*Capreolus capreolus* and *Capreolus sibiricus*), although in parts of their range, hares remain the staple food. As highly efficient hunters, Lynx therefore have a strong influence on number, distribution and behaviour of smaller ungulate species in their realm. Eurasian Lynx are also affected by numerous internal and external parasites. (Molinari-Jobin, et al. 2002). Besides this, the Eurasian Lynx can control mesopredators through the so-called mesopredator release, where increased abundances of medium-sized predators have detrimental effects on prey communities (Pasanen-Mortensen et al. 2013).

### 5. Conservation status and threats

#### 5.1 IUCN Red List Assessment (if available)

IUCN classifies the Eurasian Lynx as Least Concern given its wide range and stable populations in the north of Europe and large parts of its range in Asia (Bao 2010, Bersenev et al. 2011, Kaczensky et al. 2012, Moqanaki et al. 2010, Matyushkin and Vaisfeld 2003). A recent assessment of the status of Eurasian Lynx in Europe shows that some isolated subpopulations remain Critically Endangered or Endangered (Kaczensky et al. 2012) (Tab. 2). Among the subspecies, *L. l. lynx* and *L. l. wrangeli* are likely to be considered Least Concern, whereas the status of the other subspecies is either unknown or should be considered within the threat categories. However, only the Balkan Lynx has been assessed at the subspecies level, so far. **Balkan Lynx** was listed as Critically Endangered in 2015 based on small population size, criterion D, as the number of mature/adult individuals is estimated to be less than 50. The population is estimated to be 27-52 independent (adult and sub-adult) animals, corresponding to about 20–39 mature individuals. Currently, its distribution is restricted to three countries: North Macedonia, probably hosting around 70% of the population and Albania and \*Kosovo, with the rest of the individuals. The range is divided into two nuclei, indicating population fragmentation (Melovski et al. 2015). Activities under CMS and its instruments to be initiated with the listing would mainly include improving the surveys and assessments of the southern subspecies and fostering the transboundary strategic cooperation to conserve and monitor all lynx populations south of the boreal forest belt.

#### 5.2 Threats to the population (factors, intensity)

The major threats to lynx in Europe are low acceptance due to conflicts with hunters (and in northern Europe also with livestock farmers), persecution, habitat loss and fragmentation mainly due to infrastructure development, poor management structures and accidental

mortality (Kaczensky et al. 2012). In the Jura Mountains human-related mortalities (traffic accidents, poaching) were responsible for 70 % of the known losses (Breitenmoser-Würsten et al. 2007).

All small and isolated populations already suffer from loss of genetic variation or may suffer in the future. Most reintroduced population show a low genetic diversity (Breitenmoser-Würsten and Obexer-Ruff 2003, Kaczensky et al. 2012, Schmidt et al. 2011, Sindjic et al. 2013, Mueller et al. 2022) as a consequence of inbreeding and genetic drift. But also isolated autochthonous populations – which all went through severe bottlenecks in the 19<sup>th</sup> and/or 20<sup>th</sup> century – may suffer from genetic deterioration if they remain isolated.

The general and most serious threats to the Balkan Lynx population are: small population size, limited prey base, habitat degradation (especially in Albania) and poaching. The fact that the population size is estimated to be only 20-39 mature individuals is posing a significant threat of extinction to the Balkan Lynx also from the perspective of genetic erosion and potential inbreeding depression (conclusions from the Genetic Workshop held in Zäziwil, Switzerland 02-04. Nov. 2022).

In Asia the major threats are habitat loss and fragmentation mainly due to livestock farming, infrastructure development, resource extraction and logging activities, and poaching, mainly as retaliatory killing due to livestock depredation or for the fur trade (Kretser et al. 2012, Mousavi et al. 2014). In areas where livestock is the primary livelihood source, the conflict is even enhanced. Other threats include accidental mortality through trapping or dogs and human disturbance (Bao 2010). In Russia the Lynx is still important for the skin market and the pelt industry. In Azerbaijan, Mongolia and Pakistan prey base depletion due to poaching is considered a major threat (Clark et al. 2006, Ud Din and Nawaz 2010). In Turkey and Nepal low population size is assumed to be problematic.

In Ukraine, poor management structures, insufficient law enforcement, and the lack of capacity and funding facilitate poaching and lead to higher habitat fragmentation, aggravating the situation of the lynx (Shkvyria 2012).

Climate change is an overarching threat that, rather than affecting the lynx directly on a physiological level, can act as an amplifying factor to any or all of the existing threats. While the precise impacts and mechanisms remain largely unstudied, several authors have warned for climate change's potential to impact lynx populations based on modelling efforts taking into account climate predictions. Climate change has been noted to increase the risks associated with population-level low genetic variability<sup>3</sup>.

It impacts current habitat characteristics and has been predicted to reduce the extent of suitable habitat in a number of populations (decreasing trends have been predicted in Europe, Iran, and Central Asia, as well as in Canada and continental US for the Canada lynx *Lynx canadensis*<sup>4</sup>). Mechanisms remain unclear, but habitat suitability may decrease either by reducing snow cover or vegetation cover needed for successfully hunting prey, or by impacting the (i) size, (ii) distribution and/or (iii) movement patterns of prey populations.

<sup>3</sup> <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2907.2010.00180.x>

<sup>4</sup> [https://www.researchgate.net/profile/Bahman-Shams-Esfandabad/publication/340064870\\_Potential\\_impact\\_of\\_climate\\_change\\_on\\_the\\_distribution\\_of\\_the\\_Eurasian\\_Lynx\\_Lynx\\_lynx\\_in\\_Iran\\_Mammalia\\_Felidae/links/5ef36ed2299bf15a2e9d4d6d/Potential-impact-of-climate-change-on-the-distribution-of-the-Eurasian-Lynx-Lynx-lynx-in-Iran-Mammalia-Felidae.pdf](https://www.researchgate.net/profile/Bahman-Shams-Esfandabad/publication/340064870_Potential_impact_of_climate_change_on_the_distribution_of_the_Eurasian_Lynx_Lynx_lynx_in_Iran_Mammalia_Felidae/links/5ef36ed2299bf15a2e9d4d6d/Potential-impact-of-climate-change-on-the-distribution-of-the-Eurasian-Lynx-Lynx-lynx-in-Iran-Mammalia-Felidae.pdf)  
<https://www.mdpi.com/2071-1050/14/15/9491>  
<https://conbio.onlinelibrary.wiley.com/doi/full/10.1111/j.1523-1739.2007.00719.x>  
<https://www.nature.com/articles/nclimate1954>  
<https://www.scielo.br/j/cerne/a/QLHfV/MBKQSQS38SzyfwBy6Tw/>

### 5.3 Threats especially related to migration

The already established network of motorways in Central and Western Europe pose a serious connectivity problem for the already fragmented and small reintroduced lynx populations. In particular, there is a big effort to connect the Dinaric population ranging in Bosnia, Croatia and Slovenia with the Alpine population in Italy (<https://www.lifelynx.eu/about-the-project/>). The motorway connecting Ljubljana and Trieste poses a permanent barrier with only few possibilities for crossings. Connecting the rest of the Alpine populations (in Switzerland, France and Austria) remains a challenge and will mostly depend on translocations and reintroductions, as it was done in Kalkalpen National Park (Upper Austria) in 2011 and 2013 (Fuxjäger 2014). The most important area for the Alpine lynx population is in the north-western Alps (western Switzerland), followed by north-eastern Switzerland and the south-eastern Alps (Italy and Slovenia). These populations are the result of reintroductions in the early 1970s with very few founder animals, and both populations show a high inbreeding coefficient today. Two other smaller nuclei lie in the Chartreuse (France) and the Kalkalpen region (Schnidrig et al. 2016). The German Alps are still without a reproducing lynx nucleus and the nearest lynx sub-populations are found in north-eastern Switzerland (distance 70 km) and in Slovenia (distance 180 km), besides the population in the Bohemian Forest Ecosystem, which is however separated from the Alps by open agricultural land (Schnidrig et al. 2016). Although the Alpine lynx population is still far from being (genetically) viable, it is the only mountain range in Western and Central Europe that could host an isolated viable population considering its suitable habitat. The Alps are hence a future stronghold for the species and also crucial concerning connecting with neighbouring populations, e.g. the Dinaric, Bohemian-Bavarian-Austrian, Black Forest and Jura Mountains populations (von Arx et al. 2021; Molinari-Jobin et al. 2021). The overall goal is to build up a large Central European metapopulation (Bonn Lynx Expert Group 2021). However, the strong anthropogenic fragmentation of otherwise good habitat patches may require a partly managed metapopulation (e.g. assisted dispersal), what requires a range-wide strategy and a sensible cooperation between all range states concerned.

The situation in the South-western Balkans, **the native range of the Balkan Lynx**, is still relatively well connected regarding fragmentation. However, the non-EU countries are in the phase of rapid development, which foresees meeting their increasing economic and energetic demands. This potentially means fragmentation caused by traffic (e.g. highways) and hydropower infrastructure construction (artificial lakes on rivers). Due to the highly mountainous terrain of western parts of North Macedonia and eastern Albania, major infrastructure projects circumvent the main distribution patches of the Balkan Lynx, but the future potential of dispersal could be hampered if such projects are done without any structures for crossing.

### 5.4 National and international utilization

In Sweden, Finland and Romania the lynx is protected, but a limited number of lynx can be killed under derogation. In Estonia and Norway, the lynx is listed as a game species with an open hunting season and in Latvia lynx can be exploited to a limited extent by sports hunting (Kaczensky et al. 2012). The lynx is also subject to hunting in Iraq and Russia. In Russia, the lynx is hunted in places where it is abundant as in some areas of the Central region and the Volga region, in most areas of the North-Western region, the Ural, the Siberian region and the Russian Far East (Breitenmoser et al. 2015). Legal harvest (possibly with exception of Iraq) is presently not believed to be a major threat to the populations.

## 6. State of protection and management of species

### 6.1 National protection status

The lynx is protected and hunting is prohibited in Afghanistan, Albania, Austria, Azerbaijan, Belarus, Bulgaria, China, Croatia, Czech Republic, France, Georgia, Germany, Greece, Hungary, Iran, Italy, Kazakhstan, Kyrgyzstan, Liechtenstein, Lithuania, North Macedonia, Nepal, Pakistan, Poland, Serbia, Slovakia, Slovenia, Switzerland, Tajikistan, Turkey, Turkmenistan and Uzbekistan (Breitenmoser et al. 2015).

**The Balkan Lynx** is listed as strictly protected in all three range countries: North Macedonia, Albania and <sup>1</sup>Kosovo, and a compensation system for damage to livestock has been established in North Macedonia (Melovski et al. 2018). The Balkan Lynx has been under strict protection since 1951, which is relevant for both North Macedonia and \*Kosovo which were part of Yugoslavia until 1991 (Melovski, 2022).

### 6.2 State of international protection

The Eurasian Lynx is protected by the EU Habitats Directive: Annex II (designation of special areas of conservation for these species, which must be managed according with the ecological needs of the species) and Annex IV (strict protection – protected from killing, disturbance or destruction of their habitats).

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) lists the Eurasian Lynx under Appendix III (protected fauna species - special protection through 'appropriate and necessary legislative and administrative measures', of the listed wild fauna species). **The Balkan Lynx**, as a subspecies, is listed under Appendix II (Strictly protected fauna species) in 2017 during the 37<sup>th</sup> meeting of the Standing Committee of the Convention.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) lists the Eurasian Lynx under the Appendix II. This includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.

### 6.3 Management measures

From most range states outside Europe, there is only sparse information available on the lynx populations. Data on population sizes and trends is mainly missing. There is a need for management improvement, better monitoring and more research on lynx ecology and distribution in Asia to increase the knowledge on the population status and trend, as well as on threats and conservation needs (Moqanaki et al. 2010, Bao 2010). This is very relevant for designing conservation measures that are lacking for the Asian populations. (See also Concerted Action proposal submitted CMS COP 14.)

On the European level, an European regional assessment in the IUCN Red List of Threatened Species (von Arx 2018) was done, and number of European or regional strategies were produced, e.g. the Action Plan for the Conservation of Eurasian Lynx (*Lynx lynx*) in Europe (Breitenmoser et al. 2000), the Pan-Alpine Conservation Strategy for the Lynx (Molinari-Jobin et al. 2003), the Conservation Strategy and National Action Plans for the conservation of the Critically Endangered Balkan Lynx (Council of Europe 2011), the Key Actions for Large Carnivore Populations in Europe (Boitani et al. 2015), or the Lynx in the Alps: Recommendations for an internationally coordinated management (Schnidrig et al. 2016). None of these mainly expert-driven plans however led to the envisaged improvement of the



formal transboundary cooperation or population-wide conservation and management coordination.

While the scientific cooperation in Europe is satisfying, the institutional cooperation of countries sharing a population or subspecies needs to be improved. The conservation measures in place for the **Balkan Lynx** have been implemented through the Balkan Lynx Recovery Programme, a partnership project between NGOs from North Macedonia, Albania and \*Kosovo, with expert guidance from partners from Switzerland, Germany and Norway (Breitenmoser et al. 2008) that started in 2006. The programme is ongoing and represents an interdisciplinary approach to species conservation, which rests on three pillars of species protection, habitat protection and human dimensions aspect. The Regional Conservation Strategy that was prepared in 2008 and never properly implemented; a new multi-national strategy and action plan is urgently needed. A new plan needs to consider the recently confirmed high degree of inbreeding (Bazzicalupo et al. 2022), and the potential need for reinforcing the population (Melovski et al. 2022).

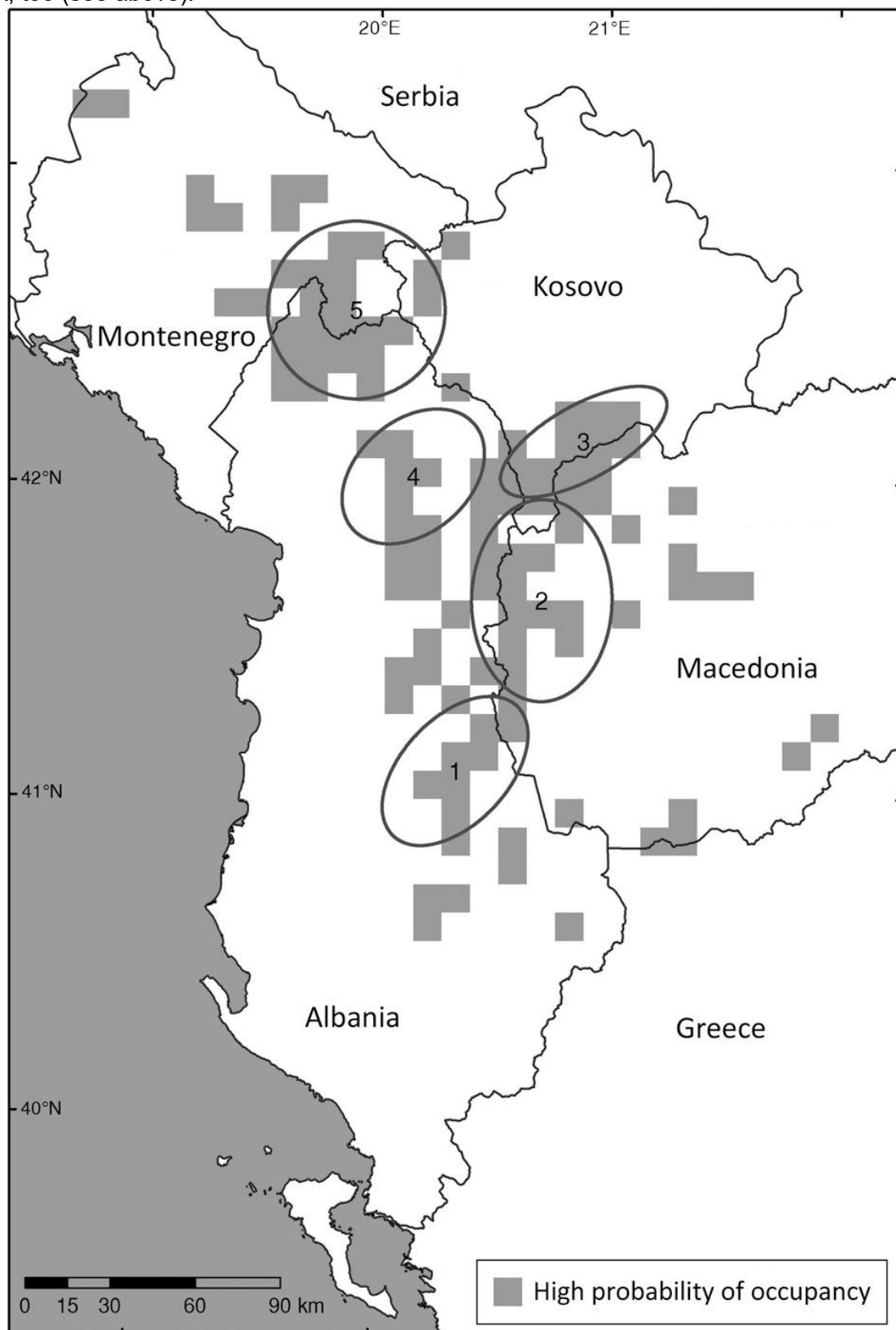
A similar situation – but on a larger spatial scale – faces the Carpathian lynx, which consists of a partly fragmented autochthonous population and a number of small and genetically deprived reintroduced populations. The long-term and large-scale approach would be to build a large west-central-European metapopulation (Bonn Lynx Expert Group, 2021) with a coordinated conservation of the Carpathian population, a consistent genetic remedy of the reintroduced populations (as e.g. presently implemented by the LIFELynx project (<https://www.lifelynx.eu/about-the-project/>)), and the further connection of the populations e.g. through stepping-stone reintroductions (Molinari et al. 2021). The creation and maintenance of a central European lynx metapopulation requires a cooperation of all range countries concerned that needs to be organised under the auspice of international treaties.

The conservation of the Caucasus lynx and the Central Asian needs to be initiated by means of systematic surveys. In some countries (e.g. Iran, Moqanaki et al. 2010) first attempts for country-wide surveys were made, but a reliable monitoring has not been implemented anywhere. These two subspecies require – besides the improved range-wide cooperation – more research and robust surveys, and hence capacity building for scientist, wildlife managers and national institutions. Like the snow leopard (*Panthera uncia*) and the Persian leopard (*Panthera pardus saxicolor/tulliana*), *L. l. isabellinus* and *L. l. dinniki* would largely profit from listing under CMS and eventually inclusion into the CMS' Central Asian Mammals Initiative (CAMI), as it would allow a synergistic approach in capacity building, survey and monitoring, and transboundary cooperation.

#### 6.4 Habitat conservation

Forest degradation, which has been reported as one of the main conservation threats for lynx throughout Europe (Breitenmoser et al. 2000), appeared to be intensive throughout the entire potential range of the **Balkan Lynx**, including the core areas (Melovski et al. 2018). Five priority conservation areas for the Balkan Lynx have been confirmed to be of utmost importance for the population. Two of these areas emerge as the core areas: Mavrovo National Park in North Macedonia and the Munella Mountains in central-north Albania (Fig. 4, areas 2 and 4, respectively). The other three areas that should be considered important for the recovery of the Balkan Lynx and protected effectively are the Macedonian part of the Shar Planina Mountains (Fig. 4, area 3), the Shebenik–Jablanica Mountains (Fig. 4, area 1) and the Albanian Alps (Fig. 4, area 5) (Melovski et al. 2018). All these areas are under a certain category of protection, areas 1, 2, 3 and 5 are national parks (IUCN Category II), while area 4 is a nature park (IUCN Category IV) (Fig 4.). These protected areas could further be affected by the climate change mostly in relation to the suitable habitat changes and prey composition.

No relevant information on habitat conservation pertaining to the Eurasian lynx is available for Asia, but it must be expected that climate change might affect the Central Asian habitats of lynx, too (see above).



**Figure 5.** Five important areas for the conservation of the Balkan Lynx, identified based on occupancy modelling and questionnaire surveys: 1, Shebenik–Jablanica and surroundings; 2, Mavrovo National Park and surroundings; 3, Shar Planina Mountain; 4, Munella Mountains and surroundings; 5, Albanian Alps. (Melovski et al. 2018).

## 6.5 Population monitoring

With regard to connecting all central-west European populations into one meta-population, systematic and coordinated demographic, genetic, and health monitoring is important. The pan-European review of the conservation status of the European lynx populations was coordinated by the Large Carnivore Initiative for Europe (LCIE). A comprehensive assessment is performed every six years based on the IUCN Red List assessment procedures (von Arx 2018; von Arx et al. 2021). The pan-European assessment is a compilation of population and country-oriented information ranging from expert opinion to robust quantitative abundance estimations. A number of countries have adopted specific protocols for the monitoring of lynx (e.g. Breitenmoser et al. 2006; Reinhardt et al. 2015; Gimenez et al. 2019; Zimmermann 2019), and for several populations, a transboundary coordinated monitoring scheme or at least a procedure for the common interpretation and release of monitoring reports have been established (e.g. the Norwegian-Swedish Instructions for lynx monitoring; Alps, Molinari-Jobin et al. 2021; Bohemian-Bavarian-Austrian population, Wöfl et al. 2021). Monitoring the conservation status of a species includes information on distribution, population size, population dynamics (demography), health, genetic status, threats and conflicts (Bonn Lynx Expert Group [2021](#)).

Besides monitoring the distribution and population abundance, one of the recommendations from the Bonn Lynx workshop in 2021 was a regular genetic monitoring (Bonn Lynx Expert Group [2021](#)). Genetic monitoring is important for all small, reintroduced, isolated, and fragmented populations and those that went through a severe historic bottleneck. In other words: for all European lynx populations. The reintroduced populations will not be (genetically) viable in the foreseeable future, so they need short- to long-term genetic management.

In the Asian range of the Eurasian lynx, figures related to the surveillance of game and wildlife animals is done in Russia, based on unclear methods used. Otherwise, no systematic monitoring of the species is implemented.

The **Balkan Lynx** population's systematic monitoring of abundance and density is taking place through the Balkan Lynx Recovery Programme (see chapter 6.3). The camera-trapping monitoring started in 2008 in the Mavrovo NP core area. So far, 7 deterministic sessions have been completed and the density fluctuates between 0.8 and 2 individuals per 100 km<sup>2</sup> (see chapter 4.2). During the project's current phase, a genetic monitoring will be conducted yearly due to the recently discovered high inbreeding coefficient (Bazzicalupo et al. 2022).

## 7. Effects of the proposed amendment

### 7.1 Anticipated benefits of the amendment

Eurasian Lynx populations are typically shared between several countries, compelling transboundary approaches for research, monitoring, conservation and management. On the one hand, most of the European populations are nationally protected, but national populations are typically below viable size. National distribution ranges in Asia are generally larger (as countries are larger), but best or, respectively, least affected lynx habitats are found in border areas, where transboundary movements of wildlife is often hindered by border fences. Listing the Eurasian Lynx on the Appendix II and the Balkan Lynx on Appendix I of the Convention of the Migratory Species, will ensure the many benefits:

- ✓ Increased global awareness of the conservation status of the Eurasian Lynx;
- ✓ Proving an additional important instrument/tool in the international and national policies for nature protection and conservation, including the populations of the Eurasian lynx species and the Balkan lynx as subspecies;

- ✓ Increased support for ongoing national and regional lynx conservation programmes;
- ✓ Contribution to the implementation of the National Biodiversity Strategies, the National Nature Protection Strategies, as well other strategic/planning documents of range countries;
- ✓ Support to the implementation of the EU Habitats Directive, specifically the Natura 2000 provisions;
- ✓ Contribution to fulfilment of the objectives of the Global Biodiversity Framework, UN Convention on Biological Diversity (CBD), EU Biodiversity Strategy, the EU Green Deal (Biodiversity Pillar);
- ✓ Contribution to the implementation of the commitments stemming from the Bern Convention;
- ✓ Contribution to the implementation of programmes and activities of the IUCN Species Survival Commission;
- ✓ Integrated protection of the lynx by establishing a transboundary cooperation within the protected areas networks/Emerald and Natura2000 sites;
- ✓ Strengthening the monitoring activities in the range countries of the Eurasian lynx;
- ✓ Provides possibilities for identifying green infrastructure to ensure the invaluable migration of the lynx, especially through the (climate-proofed) existing bio-corridors, protected areas and ecological networks;
- ✓ Strengthening the institutional capacities of all relevant national and international stakeholders in regards to the monitoring activities;
- ✓ Strengthening the institutional capacities of the Balkan lynx range countries for development and implementation of projects within the framework of the EU LIFE Program and various aspects related to the protection of the Balkan lynx and its natural habitat;
- ✓ Motivation and capacity building for surveys and research of populations in Eastern Europe and Asia, where these are deficient;
- ✓ Foster better monitoring of the Asian population for more accurate global and regional assessment of populations, ESU and/or subspecies;
- ✓ Possibility of agreements (e.g. concerted actions, memoranda of understanding) between range states sharing populations for cooperative implementation of conservation measures and action plans, which is especially relevant in Asia, where this would be possible in the frame of the CMS CAMI and so allow synergistic approach for several cat and prey species;
- ✓ Motivate governments in the CMS signature states of the Eurasian Lynx distribution range to work on shared conservation strategies and measures to maintain or recover native populations that are threatened.

## **7.2 Potential risks of amendment**

None.

## **7.3 Intent of the proponent on the development of an Agreement or Concerted Action**

The Eurasian lynx in Europe is relatively well monitored (though not by consistent methodology in all range states) and the exchange of information is organised through the IUCN SSC Large Carnivore Initiative for Europe (<https://www.lcie.org/>), the EUROLYNX (European Lynx Information System) platform, an open, collaborative project based on a spatial database that stores shared Eurasian lynx data and also through the six-year reporting

of the EU member states in the frame of the Habitats Directives. However, the recovery and maintenance of wide-spread viable populations especially in Western and Central Europe (e.g. in the realm of the Carpathian lynx) would require much more rigorous international and transboundary cooperation, what could also be facilitated by CMS in cooperation with other Conventions.

Most of the basic information to assess the conservation status and suggest sensible conservation approaches are missing for the vast range of the European lynx in Asia, including climate impacts on habitat and prey. But the distribution range shows that the populations of the two southern subspecies in Asia are mostly transboundary and probably at very low population density. Here, exchange of information, capacity building for research and monitoring, and eventually transboundary cooperation for the conservation of the species is needed. CMS could – especially in the frame of its Central Asian Mammal Initiative (CAMI) – facilitate the cooperation of the Range States and the creation of a sound knowledge base.

The **Critically Endangered Balkan lynx** (proposed to be added to Appendix I) urgently needs immediate implementation of conservation actions. The only confirmed reproduction in the last years was in the border area of North Macedonia and Albania, with dispersing lynx occasionally showing up in other countries in the south-western Balkan Peninsula. Very close cooperation among the present Range States is needed, and CMS could here facilitate the development and implementation of a common, transboundary conservation strategy.

## 8. Range States

Resident status: Afghanistan; Albania; Armenia; Austria; Azerbaijan; Belarus; Bosnia and Herzegovina; Bulgaria; China; Croatia; Czech Republic; Estonia; Finland; France; Georgia; Germany; Hungary; India; Iran, Islamic Republic of; Iraq; Italy; Kazakhstan; Korea, Democratic People's Republic of; \*Kosovo; Kyrgyzstan; Latvia; Liechtenstein; Lithuania; Mongolia; Nepal; North Macedonia; Norway; Pakistan; Poland; Romania; Russian Federation; Serbia; Slovakia; Slovenia; Sweden; Switzerland; Tajikistan; Turkey; Turkmenistan; Ukraine; Uzbekistan.  
Presence uncertain: Bhutan; Greece; Moldova; Montenegro.

## 9. Consultations

Early 2023, the UNEP Vienna Programme Office has approached the Macedonian Ministry of Environment and Physical Planning with a proposal/initiative for a possible listing of the Eurasian Lynx in Appendix II and the Balkan Lynx (as subspecies of the Eurasian lynx) in addition to the Appendix II also in Appendix I to the Convention for Conservation of Migratory Species of Wild Animals.

If accepted, this initiative is expected to contribute greatly to the conservation of this endangered species, especially in terms of protection on policy level, has potential to attract more funds to implement further conservation measures, as well as improve transboundary cooperation between neighbouring and range countries.

Following the initiative, the **Ministry of Environment and Physical Planning of North Macedonia** has conducted the national consultation process and reached out to the key relevant institutions, resulting with UNANIMOUS POSITIVE SUPPORT. A summary of the responses is provided in the following table (original letters provided as attachment to the proposal):

Institution	Opinion
CSO "Centre for research and information on the environment" Eko-Svest Skopje	Positive and supportive Will bring benefits for the lynx and other species in its natural area
Macedonian Academy of Sciences and Arts MANU	Full support of the initiative
National Park Mavrovo (core area of the Balkan lynx)	Fully supportive Another international mechanism for protection and conservation of the species
Faculty of Natural Sciences and Mathematics UKIM Skopje	Fully supportive Protection not only at national, but also at international/transboundary level International monitoring and protection needed
CSO Macedonian Ecological Society MES Skopje	Fully supportive of the need for national, transboundary/international context/protection and monitoring Awareness raising Capacity building needs
National Park Pelister	Positive opinion
Multi-purpose area Jasen	Positive opinion
National Park Galichica	Positive opinion Welcoming additional mechanisms for protection
National Park Shar Planina/Mountains	Strong support for protection of the lynx and other species in its natural area

The initiative is also supported by the relevant authorities of two entities of **Bosnia and Hercegovina**. In Republika Srpska entity, the Lynx lynx is placed under protection with the Law on Hunting of RS and the Regulation/Decree on strictly protected and protected wild species of RS.

Similarly, the representative of the Federation Bosnia and Herzegovina have indicated that the Lynx lynx is part of the Red List of endangered wild species and sub-species of plants, animals and fungi of FBiH and protected in line with the Rulebook on the measures for protection of strictly protected and protected species and sub-species of FBiH (Annex II).

The Ministry of Tourism and Environment of the **Republic of Albania** has shared the information that the Balkan lynx holds Critically Endangered (CR) status and is strictly protected since 1969. It is mainly threatened by illegal hunting, forest logging and habitat degradation, as well as the lack of prey. This subspecies is fully protected under the Albanian legislation, as well as by International Conventions. It is part of CITES and listed in Appendix II of Bern Convention. Based on this, the Republic of Albania fully supports and joins the initiative.

The proposal for inclusion of the Eurasian Lynx (*Lynx lynx*) in Appendix II and Balkan Lynx (*Lynx lynx balcanicus*) in Appendix I of CSM has been drafted by the Ministry of Environment and Physical Planning of North Macedonia (Nature Department) and the national expert PhD Dime Melovski, with support from international experts PhD Urs Breitenmoser, PhD Marco Heurich and PhD Maarten Hofman.

The proposal has been shared with and supported by the **Government of Uzbekistan**, the host of the CMS COP 14.

Following the CMS procedures, the proposal has been shared with the focal points of all range countries.

In addition, the representative of the Ministry of Agriculture (Biodiversity and Gene Conservation Department) of the **Republic of Hungary** has indicated that the proposal for listing the Eurasian Lynx (*Lynx lynx*) in CMS Appendix II, and for the inclusion of the Balkan Lynx (*Lynx lynx balcanicus*) in Appendix I, appears to be well-founded. According to the text of the Convention, the species seems to meet the criteria for migratory species, as its populations cross national borders, also during dispersion. Transboundary cooperation is required to implement coordinated and effective conservation measures to preserve or create the network of habitats in EU and non-EU countries to guarantee the connectivity between the subpopulations to prevent further fragmentation and to maintain genetic diversity, and to mitigate the threats – habitat loss, conflicts, persecution, poaching – both in Europe and Asia. The population of the Balkan Lynx of less than 50 adult individuals is extremely fragile. Considering the increasing pressure on large carnivores, the ongoing human-wildlife conflicts and the expanding human infrastructure, the addition of the Balkan subspecies to Appendix I is to be supported.

Furthermore, the CMS representative from the relevant ministry of the **Republic of France** had informed the team on the recent development of a new action plan to support the protection of the Lynx lynx ([pna lynx versioncnpnv2 annexes.pdf](http://pna.lynx.versioncnpnv2.annexes.pdf) ([developpement-durable.gouv.fr](http://developpement-durable.gouv.fr))).

Following the submission of the proposal to the CMS Secretariat and the received comments from the CMS Scientific Council, this version of the proposal has been updated and improved to address the following aspects:

- Whether the species has a conservation status that would benefit from international cooperation.
- The migratory behaviour of the species, taking into consideration aspects of the cyclical and predictable nature of movements, as interpreted in UNEP/CMS/Resolution 13.7 Guidelines for Preparing and Assessing Proposals for the Amendment of CMS Appendices;
- The proportion of the global population of the species that are transboundary populations;
- Editorial changes.

## 10. Additional remarks

None.

## 11. References

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