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The return of lynx to north-western Poland

Although the lynx *Lynx lynx* has been eradicated in north-western Poland several hundred years ago, the currently conducted analysis of habitat suitability shows that in this part of Poland there are habitats suitable for lynx and prey populations no smaller than in the eastern part of the country. The plan for the reintroduction of the Eurasian lynx to western Pomerania is implemented by the Western Pomeranian Natural Society and financed under the Infrastructure and Environment Program 2014-2020. The approach is to use a combination of soft release of captive-born lynx and possibly translocation of wild lynx from the north-east European lowland population.

The Eurasian lynx has been eradicated several hundred years ago in north-western Poland (Bieniek et al. 1998). During the whole 20th century the range of the species included only the eastern and southern part of the country with a clear gap between the northern (Baltic population) and southern (Carpathian population) parts of its distribution in Poland. Farther restrictions of its occurrences were recorded in the 1960s and 1980s due to overhunting, when the species survived only in a few forest patches adjacent to the eastern border of the country. Beside of a few occasional wanderings the lynx has never been able to establish the population west of the Vistula River. Even after 1995 when it became a strictly protected species its range has not increased (Mysłajek et al. 2019). A habitat suitability analysis conducted by Huck et al. (2010) have shown that forested areas potentially suitable for lynx are still available in the western part of Poland, although habitat fragmentation by un-forested areas and major roads may constitute a barrier for successful dispersing. On the other hand, a genetic study conducted in north-eastern Poland confirmed that this population of lynx is characterised by lower variability than that from intensively forested areas of Estonia and Latvia (Schmidt et al. 2009). In addition, significant genetic differences were found (both in microsatellite genotypes and mtDNA haplotypes), which indicates reduced level of gene flow between these populations (Ratkiewicz et al. 2014), which may result from the existing environmental isolation between these areas. These facts suggest that unfavorable processes are currently affecting lynx in Poland that may be attributed to its location at the peripheral parts of the species range and habitat fragmentation. Therefore, active conservation measures are necessary to influence both the

extent of the area inhabited by the lynx and its genetic variability to increase the viability of the population.

Two reintroduction programs to expand the lynx distribution area and thus to enhance the lynx conservation in Poland took place so far. The project with captive born individuals was conducted in 1993–2000 in central Poland in Kampinos National Park located in the vicinity of the country capital – Warsaw (Böer et al. 2000). It is likely that lynx are still surviving and reproducing there, as their presence was recorded by photo-trapping in 2018 (Mysłajek et al. 2019). Another reintroduction project was conducted in north-eastern Poland in the Piska Forest over the years 2012–2015 – the area where lynx population was extirpated by overhunting in the 1980s (Jakimiuk 2015). While the Kampinos project was conducted along the western bank of the Vistula river, having thus little opportunity for reinforce-

ment through immigrations from the eastern natural populations, the Piska Forest lies within the range of the former north-eastern meta-population. If both projects will appear successful, they are however insufficient to warrant enhancing sustainability of the lynx within the territory of Poland. More population nuclei should be established to expand the species range and increase its population size. Due to the high fragmentation of habitats in Poland, and especially the large discontinuity of the forest cover along the Vistula valley, crossing the country from south to north, it is very unlikely that lynx could spontaneously inhabit western forests in foreseeable time. It is thus important to make efforts for the lynx return into the areas where it was extirpated long ago.

We have selected an area for lynx reintroduction in forests of Western Pomerania of Poland based on habitat suitability analyses conducted with use of the CORINE land cover maps (Huck et al. 2010) and additionally with use of a Digital Database of State Forestry that included data on detailed habitat structure and prey availability (Górny et al. 2017). High forest cover (44%), low fragmentation (2.37%) and a sparse road network (main and secondary roads with 0.08 and 0.10 km/km², respectively) create conditions suitable for restoring the lynx population. An additional advantage is the high availability of the food base (720 kg/km²) due to the high numbers of roe deer and red deer. Four potential areas were selected within Western Pomerania: Barlinek Forest, Smolarz Forestry, Drawno Military Compound and Mirosławiec Forestry (Fig. 1).

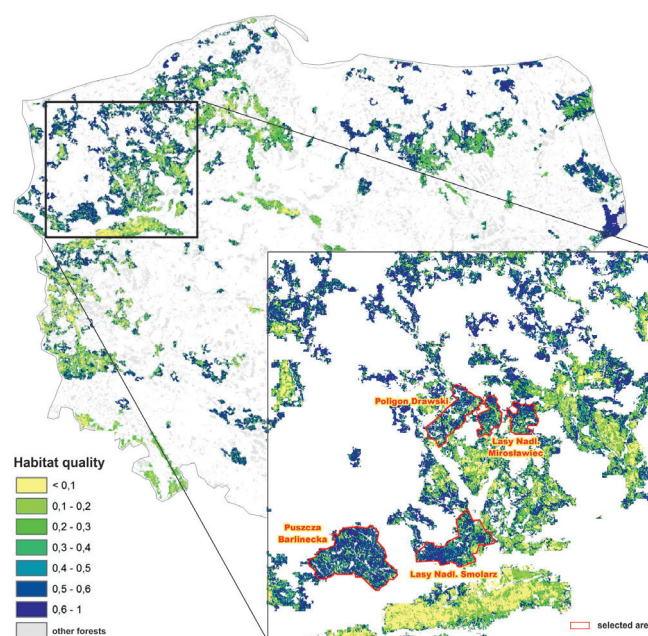


Fig. 1. Areas selected for lynx reintroductions in western Poland based on habitat suitability analysis..

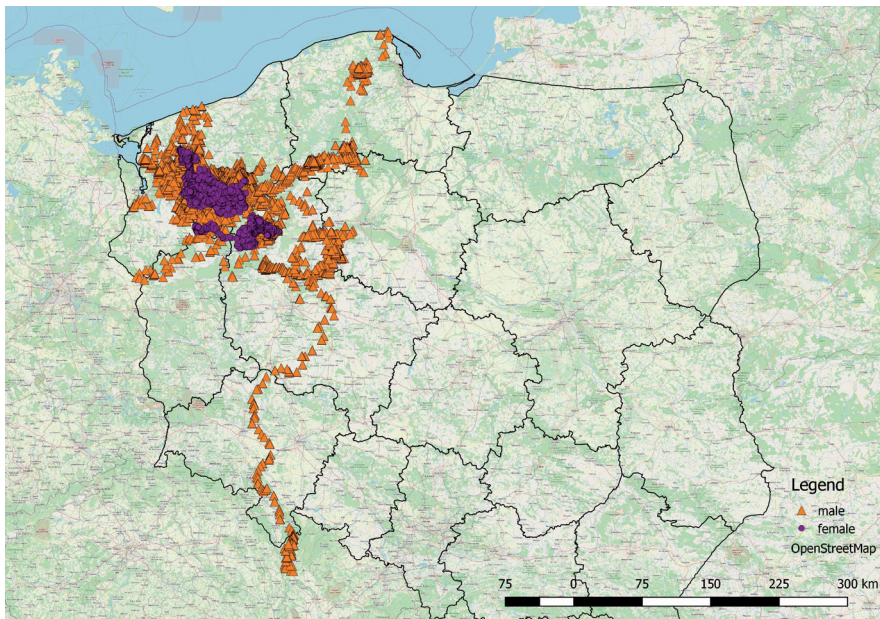


Fig. 2. Combined movements of 38 still living in Poland GPS-collared lynx released between 2019–2021 within the framework of reintroduction program. Two lynxes emigrated to Germany, the female definitely lives in Germany, there is no information about the male.

The plan for the reintroduction of the Eurasian lynx to western Pomerania has been implemented by the Western Pomeranian Natural Society and financed under the Infrastructure and Environment Program 2014–2020. The approach is to use a combination of soft release of captive-born lynx and possibly translocation of wild lynx from the north-eastern European lowland population, but also importing individuals from breeding centers. During the project five breeding and adaptive enclosures have been built. The lynx are bred in captivity, trained for hunting wild prey and released. It is aimed that the lynx used in the program are of Baltic population origin. Either blood or hair samples are collected from all individuals and genotyped for 20 autosomal microsatellite loci coupled with control region (mitochondrial DNA) sequencing. Breeding is only allowed for pairs of genetically proved Baltic origin and unrelated individuals. Before releasing, the lynx are fitted with GPS (280 g) collars.

Sixty-one lynx (26 females, 35 males, including 59 individuals imported from the breeding centers and 2 born in captivity) were released until July 2021. Fifteen lynx (24.6%) did not survive due to vehicle collisions (4), diseases (8, mostly mange), predation (1) or unknown reasons (2). Another six are missing due to lack of GPS contact. All the remaining animals have well settled in the field and are efficient hunters. They are very rarely observed by people. The majority of individuals spread and established home ranges

within the radius of 100 km from the release sites and only few males attempted longer explorations across the country. All females showed clearly restricted movements as compared to males (Fig. 2, data in preparation). We recorded nine certain cases of reproduction of lynx released into the wild. Two females gave birth twice in two consecutive years. There were from 2 to 4 kittens per litter (2.4 on average). The project is continued.

The results of the population viability analysis conducted with Vortex software (Górny et al. 2017) suggest that in the case of a successful reintroduction of lynx under the current project, one should ultimately strive to maximize the size and distribution of the population so that most of the forest environments available in Pomerania are occupied. All habitats together, useful for lynx in this area, characterised by large numbers of forest complexes connected by a network of numerous forest corridors, and at the same time by a large abundance of good quality habitats and high densities of ungulates can constitute a biotope for at least 80 individuals of this species. Such a population of lynx guarantees the survival of 100 years at the level of 57% if isolated (Górny et al. 2017). Therefore, it may still need to be managed.

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