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Recovery of wolves and their ecology in Western Poland 2001-2019

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Recovery of wolves and their ecology in Western Poland in 2001-2019

by

Dr. Sabina Nowak & Dr. Robert Mysłajek,

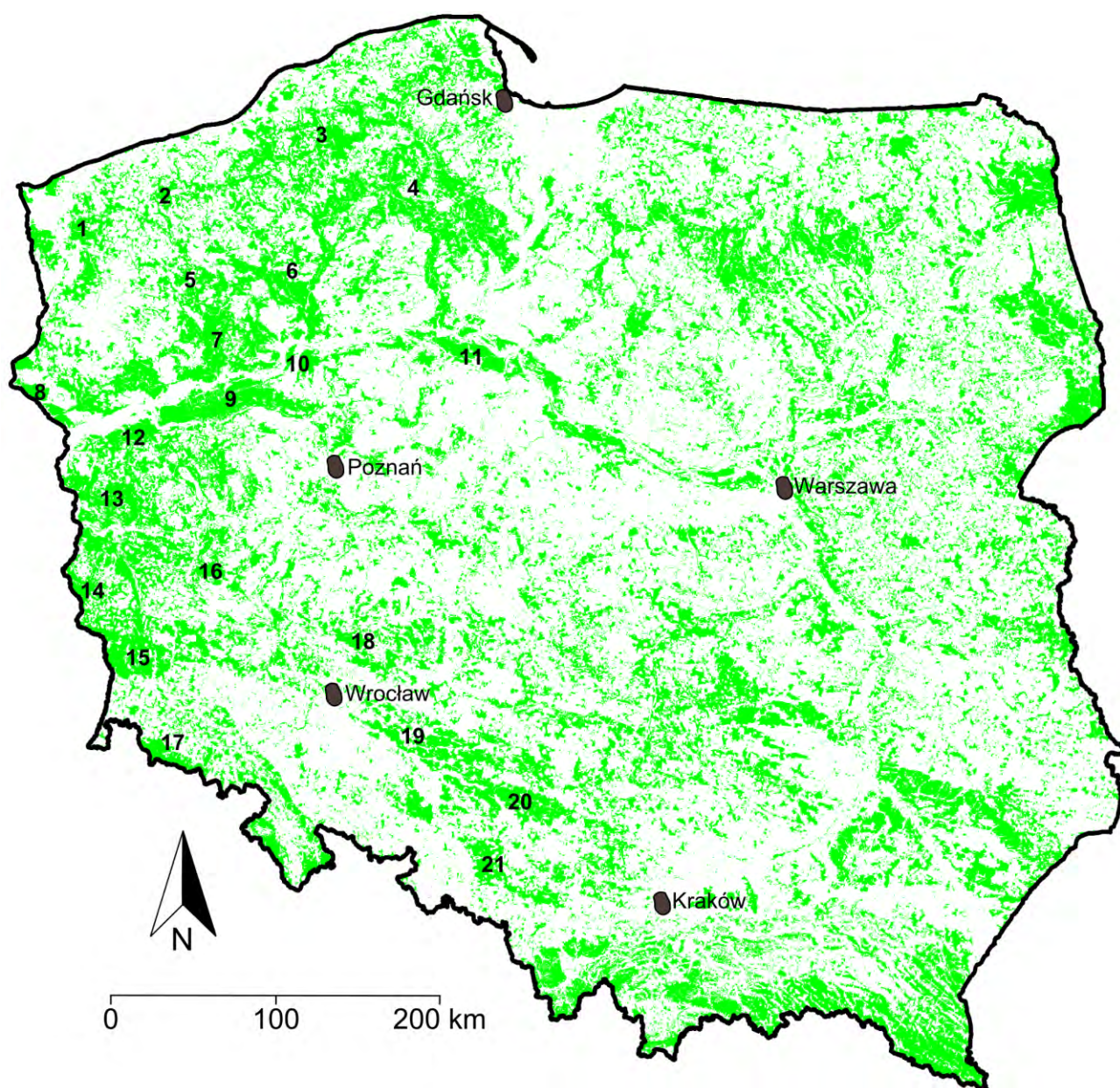
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Wolves became strictly protected species in whole Poland as early as in 1998, mainly due to campaign conducted by non-governmental organizations, including the Association for Nature "Wolf" and some wolf researchers (Niedziałkowski and Putkowska-Smoter 2020). Nevertheless, when Poland joined the European Union in 2004, it had to implement the Habitats Directive and thus ensured wolf's protective status and established a network of Natura 2000 sites to protect their habitats. In result, 22% of wolf habitats are protected in whole Poland in dozens Natura 2000 sites (Diserens et al. 2017).

Wolves in western Poland were scarce in 2001, when Association for Nature „Wolf” (hereafter AfN Wolf) started the project „Monitoring of wolf population in western Poland” supported by IFAW and other sources as EuroNatur (Germany), Wolves and Humans Foundation (UK), private donors and AfN Wolf. The reasons for scarcity of wolves in this region were analysed using all available historical data (from 1951 to 1997) to distinguish between permanent and sporadic wolf presence in this part of the country (Nowak and Mysłajek 2017). These analyses proved, that despite the presence of very large and good quality wolf habitats (63% of all habitats available in the country), which could host at least 790 wolves (Jędrzejewski et al. 2008), in 1975-1997 under hunting management, only loners or single ephemeral wolf groups were present in western Poland. Most of these groups were hunted in the first year after detection. Several years persistence was recorded in only three wolf packs, but finally all were shot down by hunters.

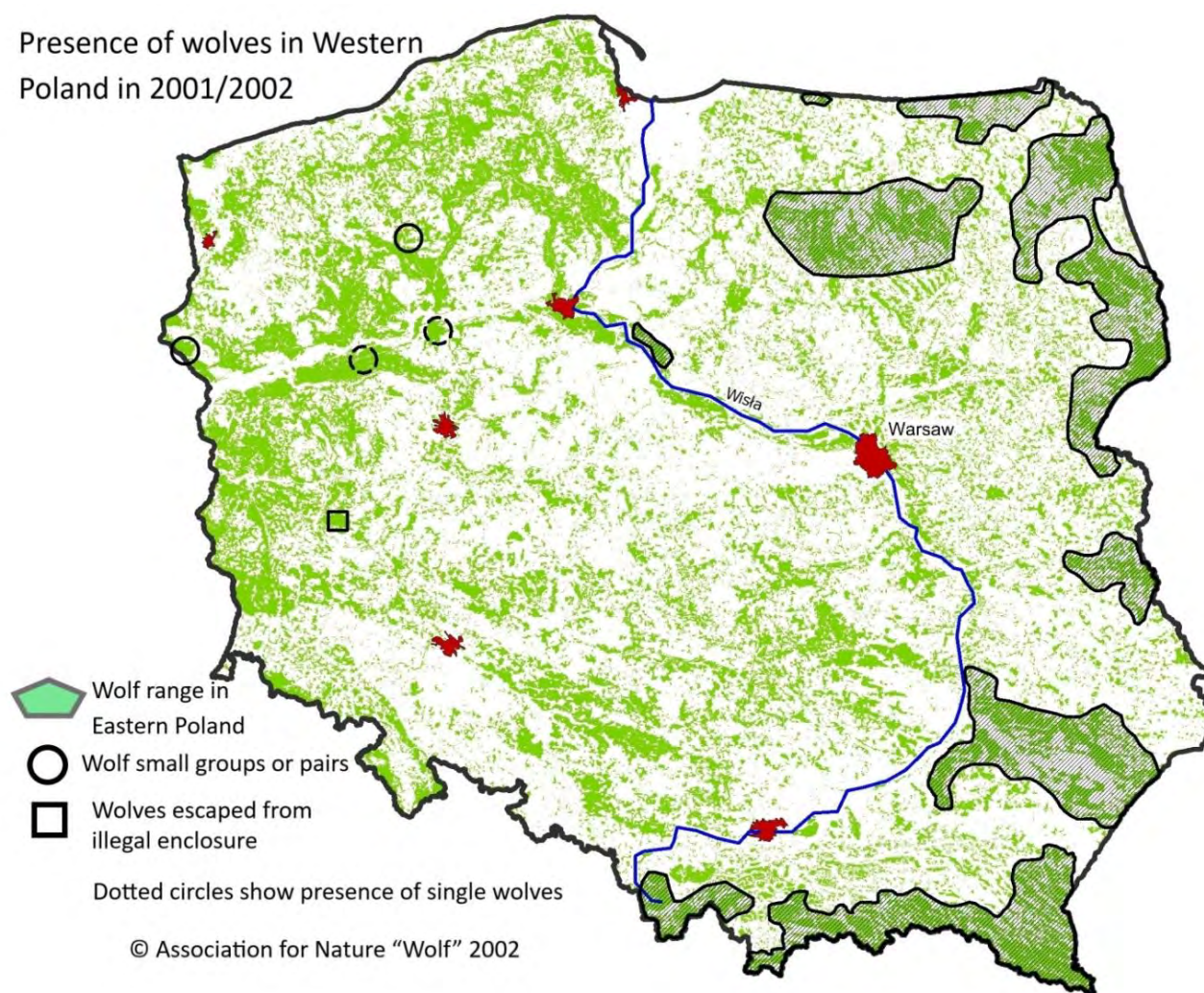
The rarity of wolves in western Poland was confirmed by the first National wolf and lynx census in 2000/2001 (Jędrzejewski et al. 2002). Afterwards, in 2001 and 2002, wolf experts from the AfN Wolf checked all larger forests in WPL, including these few areas where wolf presence was reported during National wolf and lynx census. Our team applied advanced monitoring methods including year-round wolf tracking, detection of scent-marking and wolf prey, howling stimulation and later camera trapping, which according to standards of CE wolf monitoring provide reliable data of C1 and C2 category (Reinhardt et al. 2015). In winter 2001/2002 only few wolves were present in WPL. Their distribution is shown on the Map1.

As was confirmed through continuous wolf monitoring by AFN Wolf and (since 2005) genetic analyses of non-invasive sampling, in the following years the wolf recovery in western Poland sped up. The wolf population increased to 140 wolves, living in 30 family groups in 2012/2013. Genetic analyses revealed that wolf packs living in north-eastern Poland were the source of young wolves which settled and successfully re-colonized Western Poland (Czarnomska et al. 2013).



Numbers mark the following forests in Western Poland: 1—Goleniów; 2—Rymań, 3—Słupsk, 4—Tuchola, 5—Drawsko, 6—Wałcz, 7—Drawa, 8—Cedynia, 9—Noteć, 10—Sarbia, 11—Bydgoszcz, 12—Lubuskie, 13—Rzepin, 14—Lubsko, 15—Lower Silesian, 16—Sława, 17—Sudety Mountains, 18—Milicz, 19—Stobrawa, 20—Lubliniec, 21—Rudy.

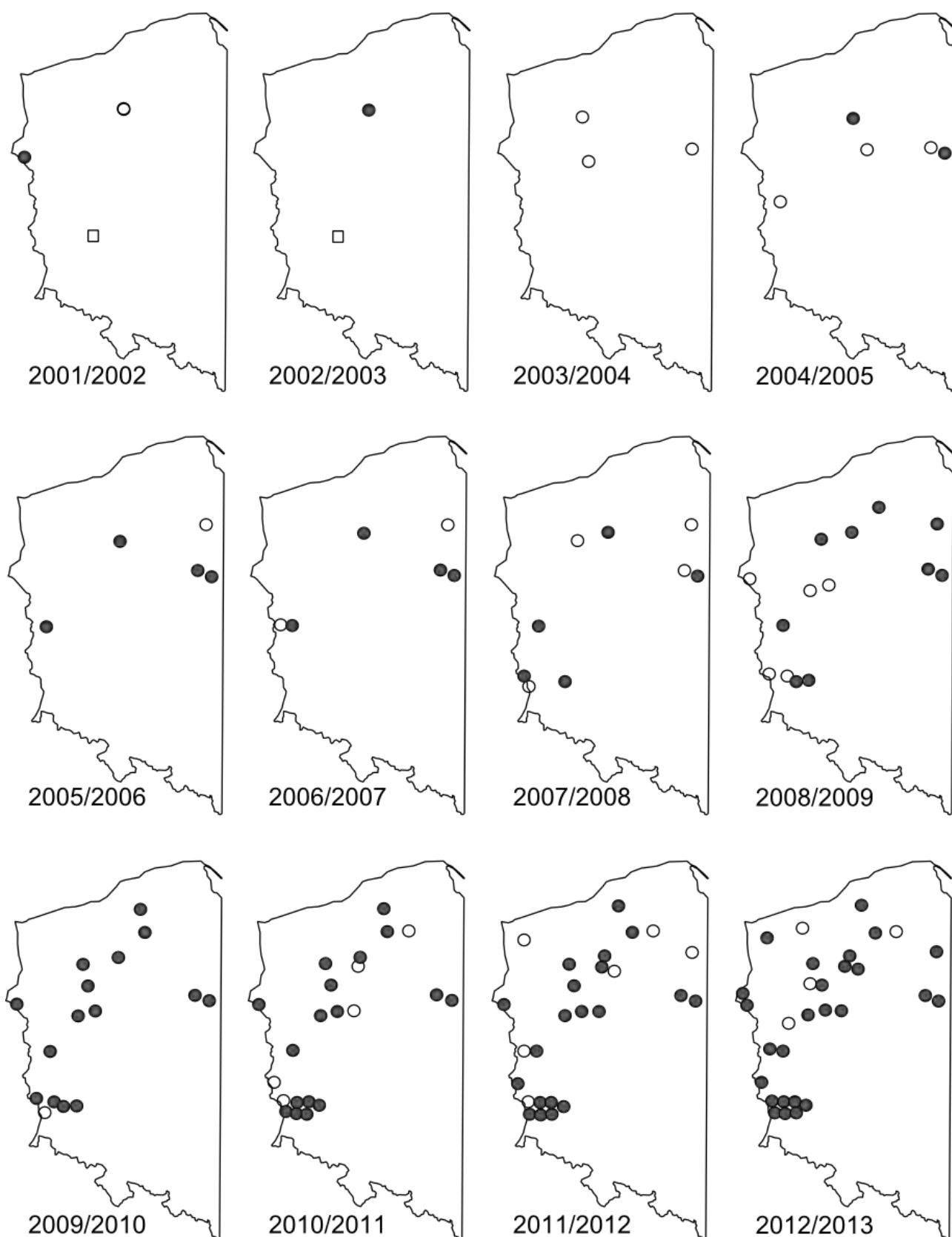
Presence of wolves in Western Poland in 2001/2002



Map. 1. Distribution of wolves in Western Poland in 2001/2002

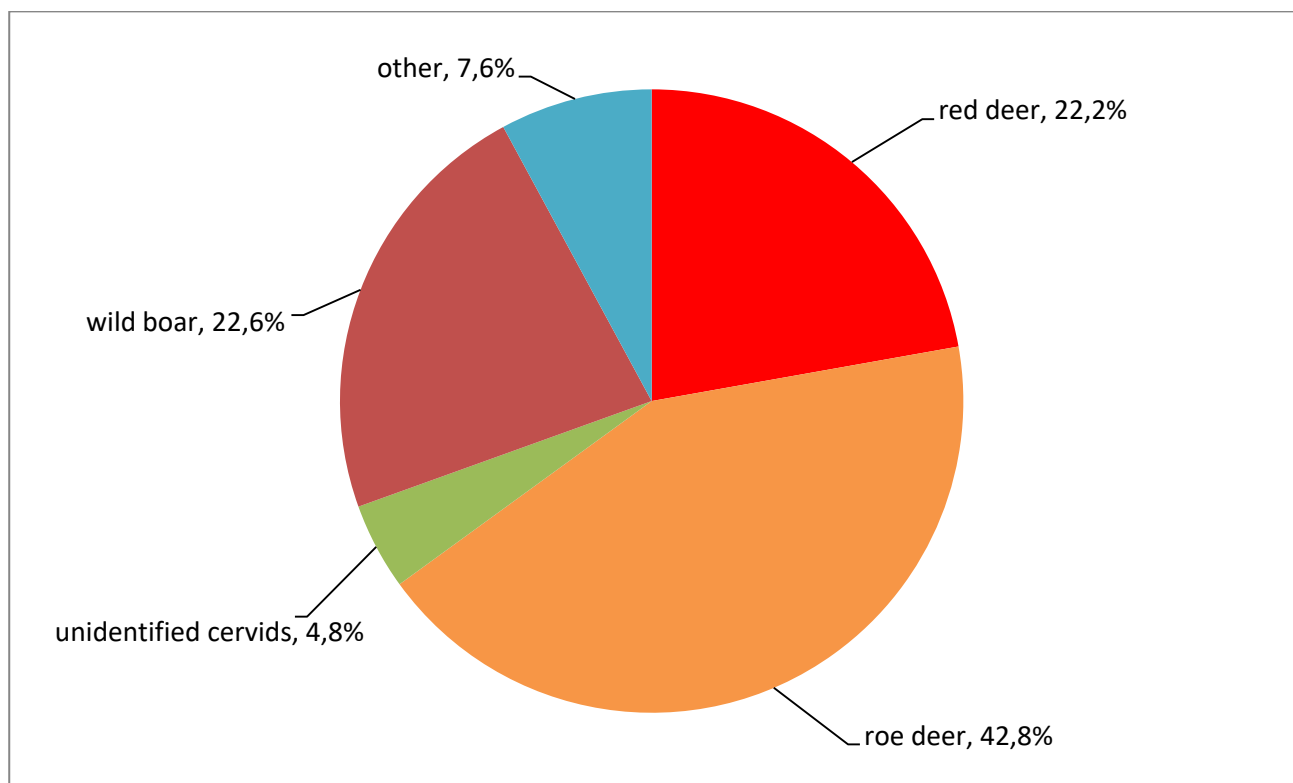
The area permanently inhabited by wolves in WPL increased from 600 km² to 10,900 km², and the area of sporadic occurrence rose from 900 km² to 3,600 km². Thus, in 2012 wolves occupied in total 14,500 km² of forest in Western Poland, which amounted about 30% of habitats suitable for wolves. The number of forests inhabited by wolves increased from 4 in 2002 to 14 in 2012. The largest wolf population, which included seven resident groups, occurred in the Lower Silesian Forest (where two large military training areas, active and unused are present), close to Saxony (Germany). Other woodlands inhabited by more than one wolf group were: Noteć, Wałcz and Drawa (three wolf groups in each), Bydgoszcz, Tuchola, Rzepin and Cedynia (two groups in each). The remaining forests were inhabited by single groups. On the beginning of recovery the distance between wolf packs territories was 163-260 km, but it decreased to an average of 25 km in 2012/2013. In the first phase of recolonisation (between 2001 and 2005), half of the settlements efforts by wolves failed after 1-2 years, whereas in 2006-2009 only one-fifth of newly settled wolves failed to persist >2 years (Nowak and Mysłajek 2016).

The increase of wolf packs number from 2001 to 2012 is showed on the Map 2.



Map. 2. Distribution of wolf groups in Western Poland in winter seasons 2001/2002 – 2012/2013. Filled circles denote groups with confirmed reproduction, open circles groups with no evidence of reproduction, squares – group established by wolves that escaped from captivity. (Source: Nowak & Mysłajek 2016).

During the field works from 2002 to 2009 over 470 wolf faeces were collected, mostly in four large forest complexes, where wolves firstly recovered in western Poland: Bydgoszcz Forest, Wałcz Forest, Rzepin Forest and Lower-Silesian Forest, but also 31 samples in other forests (Noteć, Tarnowska, Rudy and Swietokrzyska forests). Analyses of these faeces showed that the wild ungulates make up 94.8% of the total biomass of food consumed by wolves, with the most common being roe deer (42.8%), wild boar (22.6%) and red deer (22.2%). Supplementary preys were: fallow deer (2.7%), brown hare (2.5%) and Eurasian beaver (1.4%). Domestic animals, exclusively dogs and cats, made up 1.0% of food biomass. There was a strong specialization of wolves in one group of prey – wild ungulates. The Wałcz forest was the only site where wolves fed more on medium-sized wild mammals, including European beaver, which comprised 5.1% of food biomass. In contrast to wolves in north-eastern Poland and the Carpathians, which among the available prey positively selected red deer and avoided wild boar, in wolves in western Poland no such preferences were found. They hunted wild ungulates proportionally to their relative abundance in forest complexes (Nowak et al. 2011).



Wolf diet in western Poland, 2002-2009, based on the analysis of scat's content (n=470), expressed as a biomass of consumed food.

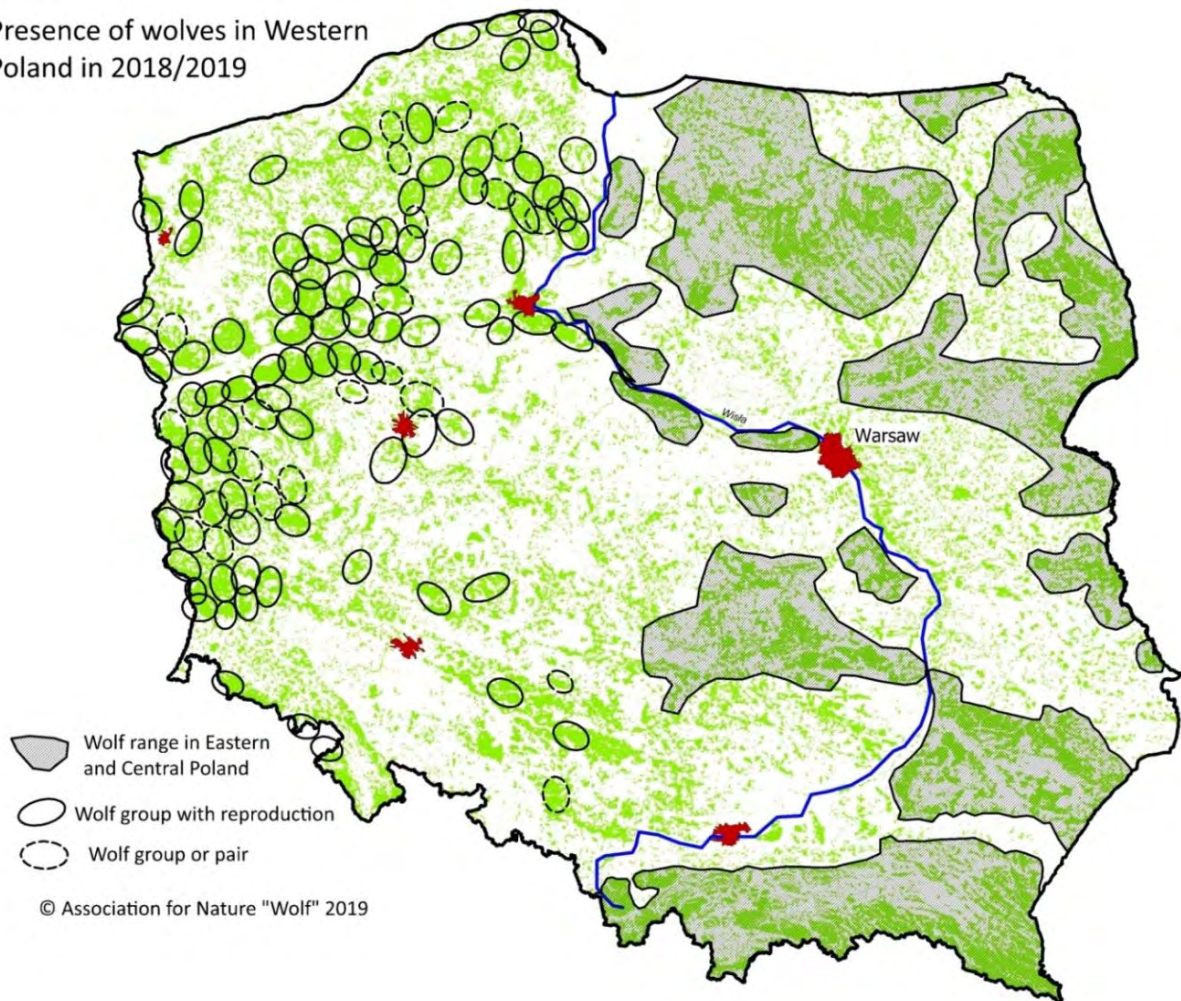
Later analyses of 165 adult and 79 wolf pup faeces collected in the Drawa forest, one of the largest forest in western Poland (2,500 km²), in 2010-2015 allowed to assess the differences in diet of adult wolves and their pups in this area. Adult wolves preyed mostly on wild ungulates (94.8% of food biomass), with roe deer (45.0%) and red deer (37.8%) being the most important food sources, and occasionally on beavers (5.6%). Pups ate less ungulates (76.3%), but much more

beavers (19.8%). This analyses documented the importance of beavers as a food source for wolf pups in regions recolonized by the species.

In 2013, GPS/GSM telemetry was applied as a next method to increase the knowledge on wolves re-colonizing western Poland. Information about activity of marked wolves delivered by collars compiled with genetic analyses based on non-invasive samples from scats, urine, oestrus blood and hair from wolf's lairs, as well as camera trapping and tracking allowed to assess wolf pack territories in the Drawa forest. This forest consists of areas under various human pressure, from the Drawa National Park (115 km²), throughout vast managed forests – mainly monocultures of the Scots pine, to the military training area in Drawsko Pomorskie (ca. 360 km²) used for training of army forces belonging to NATO. The home-ranges of three wolves followed with telemetry had an average size of 378 km² (MCP100%), which was much more than territories of wolves in the Białowieża Forest. The mean distance between neighbouring pup-rearing sites of six local wolf family groups, identified by genotyping of parental pairs and camera trapping, was 15.3 km. Population numbers increased from 14 individuals in four family groups in season 2013/2014 to 30 individuals in six family groups in 2016/2017. The density calculated for the areas of two family groups studied with telemetry accounted for 1.9 and 1.5 individuals/100 km², respectively. (Mysłajek et al. 2018).

Further intensive field works of wolf experts and trained volunteers from AfN Wolf in forests of western Poland provided evidences of the increase of the wolf population in this region in 2014-2019. In winter 2014/2015 they estimated the population size on at least 33 resident packs and 3 marking pairs. Also several roaming wolves were recorded there. Although, there were evidences of the first wolf reproduction in 2014 in the Czech Republic, south to the Sudety Mts., there were still no resident wolf packs in this mountain range in Poland. In spring 2016, the wolf population in western Poland increased to at least 53 resident family groups and pairs and in spring 2017 it was estimated on about 60 resident family groups and several wolf pairs. In spring 2018 the wolf population increased to at least 80 resident packs, and two wolf packs were recorded in the Sudety Mts. In early spring 2019 the wolf pack number was assessed at around 95 in western Poland, which is presented on the map below.

Presence of wolves in Western Poland in 2018/2019



As there are still suitable habitats available in western Poland, for 2020 wolf scientists expect further increase of wolf packs number.

Large-scale genetic studies (over 2,100 samples and 881 genetically identified individuals) conducted from 2011 to 2018 in close co-operation with the Association for Nature “Wolf” (Szewczyk et al. 2019) revealed strong west-east structuring in wolves inhabiting central Europe, resulting in clear distinction of Central European, Baltic and Carpathian subpopulations. This study confirmed that the process of dynamic recolonization of Central European lowlands lead to formation of a new, genetically distinct wolf subpopulation called the Central European wolf population (Szewczyk et al. 2019).

The recent recovery of wolves in Central Europe was possible because of the strict protection of this species in Poland, where the source population of wolf settlers existed in NE part of the country, but also protection regimes in other EU countries, where wolves just settled, i.e. Germany, Czech Republic, the Netherlands, Belgium, Denmark and Luxemburg. Analyses of historical and present data of wolf occurrence revealed that subpopulations of wolves living far from a source of immigrants, in areas heavily altered by humans, with good access to the most distant refuges due to a well-developed road network should be managed with big care. At the

edges of the species' range recreational hunting may have similar effects to intentional eradication. The current positive trend in the development of wolf population can easily turn into the negative, if protective measures and status are lifted, as history has demonstrated (Nowak and Mysłajek 2017).

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EuroNatur Foundation
Westendstraße 3
78315 Radolfzell
Germany

Fon: +49 (0) 7732 - 92 72 - 0
Fax: +49 (0) 7732 - 92 72 - 22

www.euronatur.org/en
[info\(at\)euronatur.org](mailto:info(at)euronatur.org)



International Fund for Animal Welfare
Max-Brauer-Allee 62 - 64
22765 Hamburg
Germany

Fon: [+49 \(40\) 866 5000](tel:+49408665000)
Fax: +49 (40) 866 500 22

www.ifaw.org
info-de@ifaw.org



Stowarzyszenie dla Natury „Wilk” - Association for Nature WOLF

Dr hab. Sabina Pierużek-Nowak - President
Fon: +48 606 110 046

sabina.nowak@polskiwilk.org.pl
<https://www.polskiwilk.org.pl/en/>