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SAVE Foundation wolf research and monitoring – 6th interim report

Wolf monitoring in the Świętokrzyskie (Holy Cross) Mountains region

Methods and area of monitoring

We continued the systematic wolf survey in the entire region with a special focus on four areas with known wolf packs: Świętokrzyska Forest (PS, forest districts of Suchedniów and Zagnańsk), Niekłań-Bliżyn Forest (LNB, forest districts of Stąporków and Skarżysko Kamienna), Przysucha-Barycz Forest (PB, forest districts of Przysucha and Barycz) and Iłżecka Forest (PI, forest districts of Starachowice Marcule and Ostrowiec Świetokrzyski). We extended the monitoring to Siekierzyńskie Forest (LS, forest districts of Suchedniów and Skarżysko Kamienna), Kołomańskie Hills (WK, forest district of Zagnańsk) and Majdowskie Forest (LM, forest districts of Skarżysko Kamienna). Sporadically, we patrolled Czarna Konecka river valley south of Końskie (forest district of Stąporków and Barcza) and Klonowskie Hills (forest district of Suchedniów and Świetokrzyski National Park) (Fig. 1).

Between 1st of February 2016 and 28th of February 2017, we spent 72 days in the field, searching for wolf tracks, scats and other signs of wolf presence by patrolling forest road and trails. We set photo-traps at places regularly used by wolves. From July to October, we systematically tried to stimulate wolves to howl to check for presence of pups to confirm pack breeding. The stimulation was carried out at night, by two teams communicating via radio. We stopped our vehicles 2-3 kilometers apart, howled simultaneously and then listened for a possible wolf response. We repeated the procedure until we had covered the entire forest complex. In the winter 2016/17, snow appeared in January and lasted until mid February. The snow cover enabled us to estimate the size of packs by following fresh tracks in the snow. As in the previous periods, fieldwork was supplemented by information received from the Forest Service, hunters and local residents. We also monitored places where wolves can potentially cross the highway S7, which divides the wolf habitat in the region.

Status of the monitored packs

We recorded 16 direct observations of wolves, 95 scats, wolf tracks at 78 locations, one howling response and a spontaneous howling. We confirmed the presence of packs in four forest complexes that we monitored in previous years: PI, PS, LNB and PB. Moreover, we recorded presence of wolves in Lasy Siekierzyńskie (LS), Kołomańskie Hills (WK), Lasy Majdowskie (LM), Czarna Konecka river valley and Cisowsko-Orłowinski Forest located in the southern Świętokrzyskie Mountains.

Iłżecka Forest

During summer and fall of 2016, the PI pack did not respond to howling stimulation. However, on 23rd of December 2016, Wojciech Chmielarski recorded 10 wolves (Photo 1) with a photo-trap set about 3 km

from the 2015 rendezvous site of this pack. On 22nd of January 2017, we recorded tracks of 10 wolves about 500 m from the 2015 rendezvous site. During the winter of 2015/16, we recorded six wolves in that forest. The growth of the monitored family indicates the pack successfully reproduced in 2016. It is the fourth consecutive year that the pack has reproduced and its size is the largest we recorded in the Świętokrzyskie region, and one of the largest ever recorded in Poland.

Świętokrzyska Forest

Wolves of the PS pack responded to the howling stimulation in August 2016. There were at least eight wolves howling, including four pups. They howled at nearly the same place as where they responded to our stimulation in the previous two years, which indicates this was a rendezvous site. Within a few hundred meters from this site, we recorded adult wolves by photo-traps on three occasions (Photo 2).

Wolves have been seen 10 times in PS. In two cases two wolves were observed, in the other cases single individuals. In November 2016, a 2.5 year old male was killed by a car in the village Samsonów-Ciagłe, on road 0437T, near the southern part of PS (Photo 3). In February 2016, we recorded a group of five wolves, which we had already observed in November 2015 (Report 5). This suggests that during the winter 2015/16 the pack consisted of at least five wolves. In the winter of 2016/17 we twice recorded groups of four wolves and several times groups of one to three wolves.

Niekłań-Bliżyn Forest

The situation in this area remains the same as in 2014 and 2015. The pack did not respond to howling stimulation despite our intensive efforts in July, August and September of 2016. During summer and fall, we recorded scats and tracks of wolves in the area, but these were never from groups of more than two wolves. In January 2016, we snow-tracked a group of three wolves, which was the maximum number recorded in the area. Therefore, it seems that three wolves inhabit the area. We did not observe any signs of breeding.

Majdowskie Forest

In January 2016 we for the first time recorded presence of wolves in this area (Fig. 1). We found tracks of two wolves in fresh snow on the forest road from Skarżysko-Kamienna (Bernatka dam lake) to Łazy village. In January and February 2016, Mateusz Orynek twice saw a wolf crossing the road between Majdów and Szydłowiec. In November 2016 we recorded tracks of single wolves in the vicinity of Łazy village, in January 2017 a wolf track at the forest road between Majdów and Mroczków villages, and in February 2017 wolf scats in the forest between Łazy village and road DK7 (Photo 4).

On 10th of June, we observed an 11-12 week-old wolf pup crossing the road between Kierz Niedźwiedzi and Sadek, east of the town of Szydłowiec. Since pups at this age do not move far from the rendezvous our observation proves that wolves are breeding in the forest near Szydłowiec. In the same forest complex, near Jagodne village, Mariusz Machowski registered an adult wolf with a photo-trap on 10th of

May 2016. This forest is a continuation of LM forest, separated by the construction site of the S7 express road.

Przysucha Barycz Forets

As in 2015, during summer and fall of 2016 we attempted to stimulate the packs to howl, but we did not get a response. In January 2017, we patrolled the forests roads five times in search for snow tracks. On a few occasions we found tracks of single wolves and once the tracks of two wolves.

Siekierzyńskie Forest

In March 2016 we tracked a group of three wolves in the southern part LS. On 19th of January 2017, Wiktor Król recovered remains of a roe deer freshly killed and eaten by wolves, next to the road between Rataje and Wąchąck, at the northern edge of LS. On 15th of January 2017, we located tracks of a group of two and three wolves separated by about 2 km. Both sets of tracks were very fresh and visible despite the snowfall. Two kilometers to the north an drive hunt was taking place and it seems that the wolves were disturbed by hunters and forced to move south. These circumstances and the freshness of the tracks point to two groups of different individuals, possibly from the same pack.

Kołomańskie Hills and Czarna Konecka river valley

Kołomańskie Hills (WK) is a forest west of Holy Cross Forest (PS), divided from PS by road 0437T between Samsonów and Odrowąż. We have heard about signs of wolf presence in this forest for the last three years. While patrolling the forest in December 2016 we collected two fresh wolf scats. In early February we found fresh snow-tracks of a group of three wolves. A week later, on 12the of February, we found fresh tracks of two wolves, which were urine marking intensively. The urine of one of the wolves was bloody, apparently a female in estrous. Therefore, there are at least three wolves inhabiting the WK, including a receptive female. Either these wolves are an already established family or they will breed this year for the first time.

In the forest north of WK, which extends along the Czarna Konecka river valley, we recorded the sporadic presence of wolves for the last three years, for example near Piekło village. Forester Eugeniusz Wierzbicki of the Stąporków Forest District informed us in February 2017 that signs of wolf presence are now seen frequently. When patrolling the area in February, we collected scats and recorded snow tracks of three wolves. On 19th of February we saw a wolf near the Modrzewina village. Several days earlier, on 15th of February, Krzysztof Pietras observed a wolf crossing the road 728 between Końskie and Sielpia. The forest along the Czarna Konecka river valley is interconnected with WK, therefore we cannot establish if wolves observed in both areas belong to the same pack.

Cisowsko-Orlowińskie Forest

Wolf monitoring of the SAVE Foundation does not cover the forests of Cisowskie and Orłowińskie Hills, located south-east of Kielce. However, we have been informed that in November 2016 wolves attacked two dogs near Cisów village in this region. We went there and talked to the forester of Łagów Forest

District who witnessed the event. According to the forester, four wolves attacked two dogs during the hunt. One dog was killed immediately, the other died later from its injuries. Two days later, the forester heard wolves howling in the late evening. His description of the howl indicates the presence of a wolf pack including the young from that year. We also learned that signs of wolf presence (tracks, scats and visual observations) have been observed in the area for at least the last three years. During the inspection of the attack site we collected wolf scats on a fresh track. Information from the forester as well as the wolf tracks and scats indicate wolf presence and presumably breeding in the area for several years.

Passage on highway S7

The national road DK 7 has a high traffic volume of 16,000-22,000 vehicles per day. The road divides the subpopulation of wolves inhabiting the Świętokrzyskie region in half (Fig. 1). Between Kielce and Skarżysko-Kamienna, DK7 is a fenced highway (S7) and is therefore impossible for wildlife to cross. There are three passages along this part of S7 that potentially allow larger wildlife, including wolves, to cross the highway.

The first passage is an underpass near Występa village (50°58’06’’N, 20°43’54’’E, Photo 6), along the railway, which crosses under the S7. Both sides of the highway are covered with forest at the underpass. On the western side the forest is connected to PI and on the eastern side state forest connects to Świętokrzyski National Park (ŚPN). We recorded wolf tracks on this passage in November 2016. Forester Dariusz Zbroszczyk informed us about wolf tracks and wolves seen east of the crossing, which suggests that wolves from PI may regularly travel through the passage. ŚPN staff also told us that wolf presence was occasionally recorded in the western part of ŚPN called Klonowskie Hills. Our searches for wolf snow tracks at Klonowskie Hills in January 2017, however, were unsuccessful.

The S7 highway overpass at Baranowska Hill (51°04’40’’N, 20°50’11’’E) is a green bridge constructed especially for large wildlife (Photo 7). Through the forest surrounding Rejów dam lake, the bridge connects PS and LS. Tracks of wolves and other large mammals were recorded at the overpass by forestry personnel. We regularly recorded tracks of wolves in mud at the eastern edge of the bridge in 2016 and 2017.

The third place where wolves can cross the highway is the bridge over the river Kamienna, located 2 km north of the green bridge (51°05’44’’N, 20°50’09’’E, Photo 8). Wolves can travel along the Kamienna river valley under the bridge. We recorded wolf tracks in this location in 2015 (V Report SAVE) and in 2016. West of the bridge, the river valley towards the northern edge of PS is relatively natural. Further east, the river flows into the urbanized area of Skarżysko-Kamienna, where it is regulated. Although wolves can cross the highway under the bridge, the urbanized area prevents this passage from serving as a migration corridor.

Survey of attitudes towards wolves

In cooperation with the Technische Universität München and the Museum and Institute of Zoology (Polish Academy of Sciences), we conducted a survey on public attitudes towards wolves. The questionnaire (Fig. 2) survey was completed in six locations that have various histories of wolf presence: Bieszczady Mountains, Białowieża Forest, Augustowska Forest, Świetokrzyka Forest, Lower Silesia Forest and Drawska Forest. The areas differ in wolf numbers, habitat quality and human density. In each site, we surveyed two groups of people: foresters and rural citizens.

Elizabeth Gosling of the Technische Universität München analyzed the results from four locations (Bieszczady Mountains, Świetokrzyka Forest, Lower Silesia Forest and Drawska Forest) as part of her master thesis. The results indicate that foresters had more negative attitudes towards wolves than other residents in the regions (Fig. 3). Respondents from the Bieszczady Mountains had the most negative attitudes towards wolves, including the highest levels of fear (Fig. 4). Only 27% of foresters supported strict legal protection of wolves, and 65% thought that wolves should be a game species with a closed season. Forty-two per cent of rural citizens supported wolf protection, but 42% would support seasonal wolf hunting. In both groups there was little support for unrestricted hunting (12% and 7% of foresters and rural residents respectively). The comprehensive analysis of data from the six regions will be the subject of a special publication.

Research on wolf ecology in the Lower Silesia Forest

From February 2016 to February 2017, we continued the research on wolf ecology in the Lower Silesia Forest. We used GPS telemetry, photo-traps and snow-tracking to monitor the behavior of two wolf packs: Ruszów and Pieńsk. Several students from Poland and abroad participated in the work; the results became part of two finished graduate theses and two theses in progress.

The story of Pumpak

From January to May 2016, we monitored two wolves of the Ruszów pack via telemetry: the breeding female Orzechowa and her one year old son, Pumpak (Photo 9). The information obtained via telemetry combined with snow-tracking showed that Pumpak and his sister spent most of their time separated from their parents. The breeding wolves moved and hunted over a much larger area than Pumpak, but the parents met their offspring regularly (Photo 10). After Orzechowa gave birth again in May 2016, Pumpak actively participated in taking care of his four younger siblings; we recorded this behavior with photo-traps after Pumpak lost his radio collar (Photos 11-13).

In fall 2016, Pumpak left his natal territory and stayed for a few months in Saxony (Germany), where he was observed close to human settlements, even during daylight hours, feeding on leftovers of food. His identity was confirmed genetically thanks to genetic samples collected by ourselves and the German organization LUPUS. The Saxonian authorities considered the behavior of the young wolf as dangerous to human safety and in January 2017 they issued a permit to shoot him. This decision sparked a strong outcry from both sides of the border, which manifested in almost 100,000 signatures on the online

petition “Pumpak must live!” (Pumpak muss weiterleben) and many letters sent to Saxonian authorities by German and Polish non-government organizations and Polish local authorities. Pumpak left the area and the shooting permit was not carried out.

Wolf kill sites

In spring 2016 we continued microhabitat analyses of kill sites of the Ruszów and Pieńsk packs. The results of this study, including the analyses previously conducted by Magdalena Kwiatkowska as part of her master thesis at Jagiellonian University, have been accepted for publication in the journal “Forest Ecology and Management”. The comparison of microhabitat parameters at 66 kill sites and 66 reference sites showed that sites where wolves killed their prey were more frequently located close to habitat edges, water and forestry fences than other wolf locations. Wolves killed red deer in the vicinity of waterbodies and habitat edges, whereas they killed roe deer close to fences surrounding forest plantations (Photo 14).

Wolf resting sites

Between April and May and 2016, Luca Maugeri of the Technische Universität München investigated microhabitat characteristics of wolf resting sites for his master thesis. The analyses of habitat parameters (visibility, accessibility, habitat type) of 177 resting sites showed that wolves chose more concealed places when resting during the day or resting close to forest roads. Resting wolves selected sites located farther away from public roads, regardless of the time of the day (Photo 15).
Interns are currently conducting analogous measurements at reference sites, to better understand the choice of resting sites by wolves.

Use of forest roads for movement and marking behavior by wolves

The data obtained from 600 km of snow-tracking in 2012-16 were analyzed by Joanna Sulich from Jagiellonian University as part of her bachelor thesis. Sixty-seven per cent of markings (urine, scat and scratchings) were located on roads and 29% at road intersections (Photo 16). Joanna is currently analyzing the data from last winter.

Use of forestry fences by wolves for hunting

Since January 2017, Verena Weber of the Technische Universität München has been studying the influence of forestry fences on wolf hunting behavior. Together with interns from her university, Verena created a detailed map of forestry enclosures and identified damaged fences allowing animals to enter the enclosures. Since February, the students have been monitoring the holes in fences to assess the intensity of their use by wolves and ungulates. The study will finish in April this year (Photo 17).

Education and promotion

WILKnet

WILKnet is a cooperation of Polish wolf researchers and conservationist supported by the SAVE Foundation through web hosting and programming assistance, while the website is edited voluntarily by WILKnet participants. The idea is to exchange information from projects concerning wolf monitoring, research and conservation in Poland to disseminate science-based wolf knowledge among the public.

In 2016, two new participants from north-east Poland joined WILKnet. We posted over 50 notes regarding activities of wolf projects and other wolf news. The notes were illustrated with photos, figures and videos. WILKnet is promoted on social media and the WILKnet logo appeared on cycling jerseys of the Skarżysko Cycling Club (Photo 9)

Lectures and other educational activities

- Talk about wolves at Travellers' Festival „Włóczykijki" in Barlinek (January 2016)
- Interview about wolves in the Świętokrzyskie region for Kielce Radiobroadcasting (February 2016)
- Workshops on field methods of studying wolves in Lower Silesia Forest for students of the Theriological Section of the Student-Naturalists Society of Jagiellonian University (February 2016)
- Talk on wolf biology for students of the Adam Mickiewicz High School (lyceum) in Kraków (April 2016)
- Lecture on wolf dispersal at the 15th Meeting of Citizens of the Bird Republic (Słońsk, April 2016)
- Talks about wolves for pupils of primarily schools in Ruszów, Parowa and Bożejowice (June 2016, Photos 20 and 21)
- Education stand about wolves at the annual Blueberry Summer festival in Ruszów (July 2016, Fig. 5)
- Supervision of the running event "Wolf Run", associated with the annual Pottery Summer festival in Gozdnica (July 2016). A quiz competition about wolves was conducted after the run.
- Field game about wolves for teenagers from Wrocław (Polana, December 2016)
- Presentation of wolf ecology for workers of the Forestry Administration of Węgliniec (February 2017)
- Presentation of wolf research for students from the Student-Naturalists Association of Jagiellonian University (Odrzechowa, February 2017)

Promotion

SAVE Fundation sponsored the logo of the WILKnet webpage and the logo promoting wolves in the Świętokrzyskie region to be placed on cycling jerseys of the Skarżysko Cycling Club (STC) (Photo 22). STC is an association of over 80 amateur cyclists and it promotes sport activities, fitness and a healthy lifestyle. STC cyclists train three times a week, cycling on road and mountains bikes along the wolf range in the Świętokrzyskie region, from the towns of Przysucha in the west to Ostrowiec Świętokrzyski in the

east. During one road cycling training session in June of 2016, cyclists saw a wolf pup crossing the road near Szydłowiec town.

Publications

Bojarska K., M. Kwiatkowska, P. Skórka, R. Gula, J. Theuerkauf & H. Okarma 2017. Anthropogenic traps: where do wolves kill their prey in a commercial forest? Forest Ecology and Management, http://dx.doi.org/10.1016/j.foreco.2017.04.013.

Gosling E. 2016. Attitudes towards wolves and wolf management in Poland. MSc thesis, Technische Universität München, 66 pp.

Kwiatkowska M. 2016. Habitat characteristics of wolf kill sites in commercial forest. MSc thesis, Uniwersytet Jagielloński, 43 pp.

Maugeri L. 2016. Characteristics of wolf resting sites in relation to human disturbance in an anthropogenic modified habitat. MSc thesis, Technische Universität München, 43 pp.

Milanowski A. i Gula R. 2016. Powrót wilków. Las dobre sąsiedztwo – magazyn Leśnego Kompleksu Promocyjnego Puszcza Świętokrzyska, Oficyna Wydawnicza Forest: 20-21.

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We thank the personnel of Ruszów and Wymiarki Forest Districts for supporting our wolf research in Lower Silesia Forest and numerous students and volunteers for their active participation in fieldwork. We thank Wielisława and Sebastan Zwierz for allowing us to use their house in Polana as a research station in the Lower Silesia Forest. Jörn Theuerkauf and Elizabeth Gosling provided valuable suggestions to an earlier version of this report.

Fig. 1. Results of the monitoring of wolves in the Świętokrzyskie Mountains region from 1st of February 2016 to 28th of February 2017 Pentagrams represent wolf families (packs) identified by locating the breeding sites and snow-tracking. Numbers of wolves given for each area are the largest recorded during snow-tracking, howling stimulation or spontaneous howling. PI – Iłzecka Forest, LS – Siekierzyńskie Forest , PS – Holy Cross Forest, WK – Kołomańskie Hills, LM – Majdowskie Forest, LNB – Niekłań-BliżynForest, PB – Przysucha-Barycz Forest.

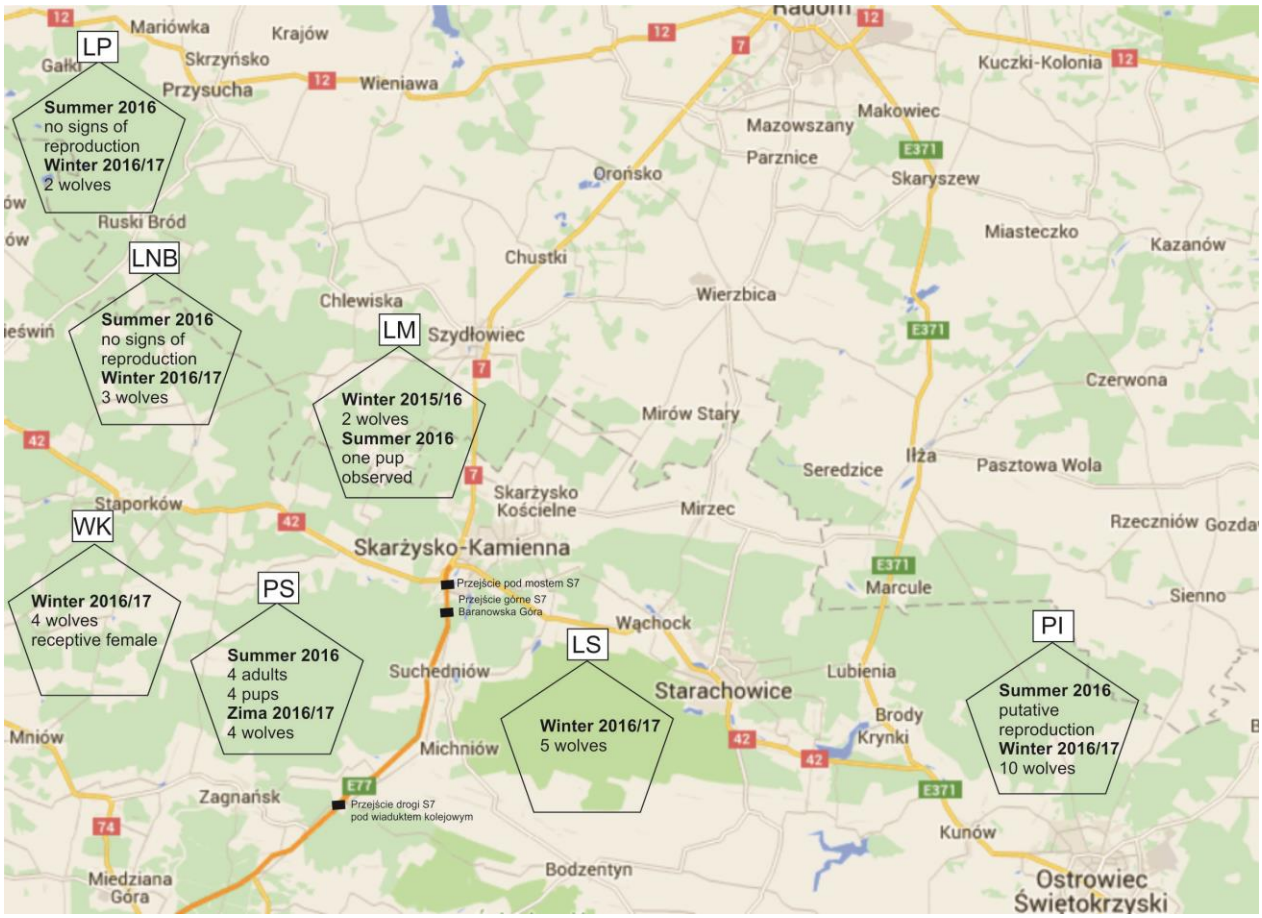

Fig. 2. Questionnaire used in survey of human attitudes for wolves carried out in six regions of Poland.

Co sądzicie o wilkach?

Badania opinii publicznej

Szanowni Państwo,

Muzeum i Instytut Zoologii PAN, Uniwersytet Techniczny w Monachium i Fundacja SAVE prowadzą badania sondażowe dotyczące opinii mieszkańców obszarów, na których występują wilki na temat tych zwierząt.

Prosimy o poświęcenie około 10 minut na odpowiedzi na pytania zawarte w naszej ankiecie - Państwa opinia jest dla nas bardzo istotna. Prosimy o przemyślane odpowiedzi.

Ankieta jest anonimowa, a Państwa odpowiedzi nie zostaną ujawnione.

Dziękujemy!

Technische Universität München

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Fig. 3. Differences in attitudes towards wolves between rural residents and foresters.

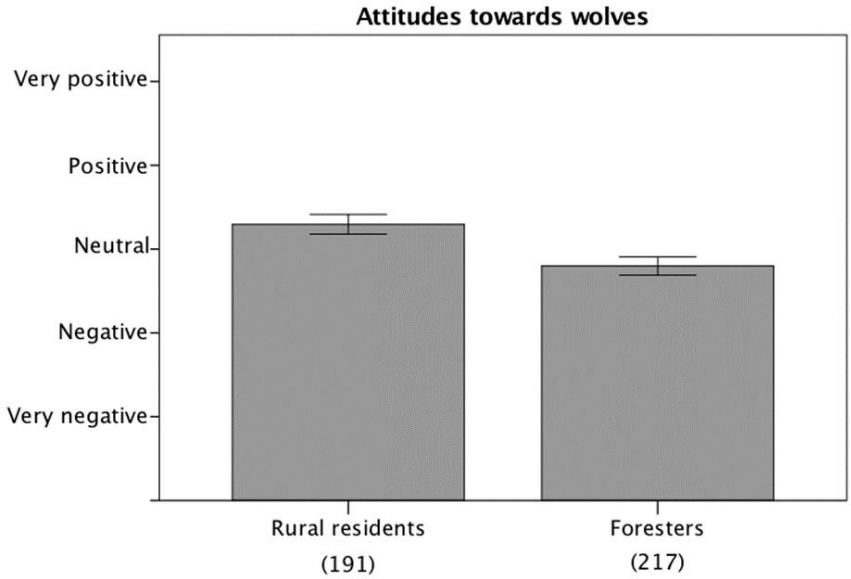

Fig. 4. Differences in attitudes towards wolves between regions of Poland.

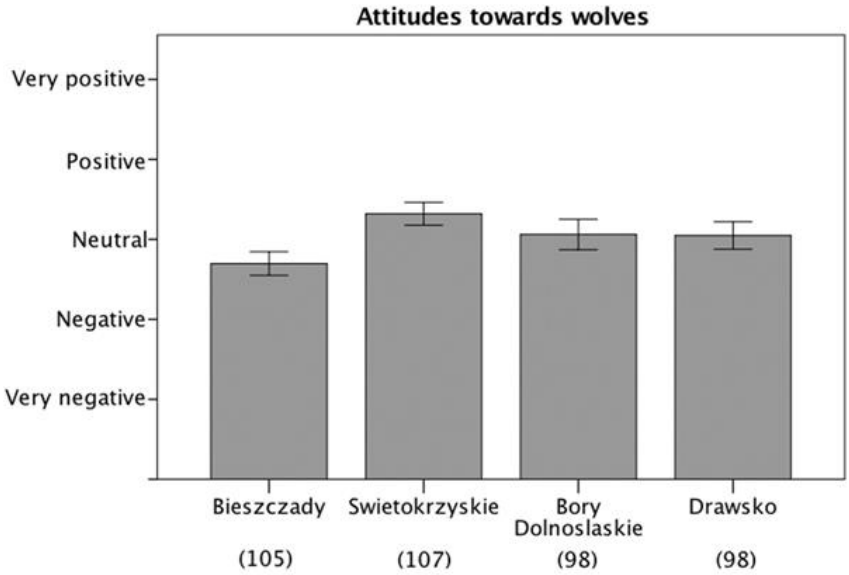

Fig. 5. Graph illustrating structure of wolf families, which we used during classes on wolf biology for pupils in Lower Silesia.

Photo 1. Picture extracted from the movie recorded by photo-trap by Wojciech Chmielarski, Iłżecka Forest. The entire movie in which all 10 wolves are visible is available at https://www.youtube.com/watch?v=CPe-JLGj9zw&feature=share

Photo 2. Wolf from Holy Cross Forest recorded by photo-trap near the rendezvous of the pack in May 2016.

Photo 3. Two and half year old male killed in a car accident close to Holy Cross Forest in November 2016.

Photo 4. Vehicle of SAVE Foundation during the snow-tracking of wolves in Holy Cross region (green) and Lower Silesia Forest (yellow), January 2017.

Photo 5. Wolf recorded by Mariusz Małachowski near the town of Szydłowiec in May 2016.

Photo 6. S7 highway bridge over the railway near Zagnańsk village. Potential dispersal passage interconnecting Holy Cross Forest and Klonowskie Hills in Świętokrzyski National Park.

Photo 7. Green bridge over S7 highway used by wolves. Baranowska Hill, near Skarżysko-Kamienna.

Photo 8. Bridge on the Kamienna river, close to Skarżyska-Kamienna. Wolves use the passage under the bridge sporadically.

Photo 9. Wolf Pumpak, son of female Orzechowa, winter 2015/16. Picture by Cezary Korkosz.

Photo 10. Pumpak and his sister playing, winter 2015/16. Picture by Cezary Korkosz.

Photo 11. Pumpak looking after his younger siblings, spring 2016. Picture taken with the photo-trap.

Photo 12. Pumpak looking after his younger siblings, spring 2016. Picture taken by the photo-trap.

Photo 13. Pumpak enlarging the den, the shelter of his younger siblings, spring 2016. Picture taken by the photo-trap.

Photo 14. Killing site of red deer next to pine thickets, Lower Silesia Forest.

Photo 15. Resting site of wolves, Lower Silesia Forest.

Photo 16. Urine marking at the forest road crossing, Lower Silesia Forest.

Photo 17. Red deer stuck in forest fence and killed by wolves, Lower Silesia Forest.

Photo 18. Poster about wolves prepared by pupils of VI High School in Kraków during Earth Day celebrations in 2016.

Photo. 19 Students of Jagiellonian University checking GPS locations of wolves. Wolf Workshop 2016, Lower Silesia.

Photo 20. Class on wolf ecology for primary school pupils in Bożejowice.

Photo 21. Class on wolf ecology for primary school pupils in Parowa.

Photo 22. Logo of Wolves in Holy Cross Region and of the WILKnet webpage which appeared on cycling jerseys of Skarżysko Cycling Club in 2017, due to sponsorship of SAVE Foundation.