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Winter roosting of Rooks *Corvus frugilegus* in Wrocław

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Abstract. In the 1988/1989 and 1989/1990 seasons, the winter grouping of corvids in the city of Wrocław (Lower Silesia, Poland) included 200,000–250,000 individuals, of which 92–94% were Rooks, 6–8% Jackdaws *Corvus monedula* and about 0.1% Hooded Crows *Corvus corone cornix*. Young Rooks made up 5–6% of the population. Numbers were estimated by counting flocks during their flights to the roosts. Rooks wintering in Wrocław nest on the Russian Plain, but probably also include a small number of birds from the city itself.

In the course of the last 30 years, the size of the grouping of corvids has increased 10-fold, with numbers of Rooks increasing 20-fold and numbers of Jackdaws increasing by up to a half. Mean mortality of Rooks at the roosts was 0.74 individuals per night, i.e. 0.3‰ of the whole population per wintering season. Of the birds dying, one-third were young. Corvids roosted in several roosts which were used to different extents. At least two were used regularly as primary roosts and the oldest roost had been used for over 40 years. Corvids foraged within 15–20 km of the roosts. Flights between the roosts and the foraging areas followed regular, permanent air corridors, according to a permanent scheme of gathering in places which were stages in the flight. The Rooks kept quiet at the roosts and during their flights. They foraged by actively seeking out food and by passively waiting for food to be thrown out by people. Their behaviour was wary.

Key words: Corvid birds, Rook *Corvus frugilegus*, Wildlife of Wrocław, roosting of corvids, wintering of corvids

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INTRODUCTION

The literature concerning the winter roosting of Rooks is quite extensive. In Poland, search into this matter has mainly been carried out in towns and cities. In Wrocław studies were made by R. Kureń between 1957 and 1959 (M.Sc. thesis Wrocław Univ., 1960). A complex study of the wintering population in Kraków was made at the end of the 1960s, and the 1970s, by Grodziński (1971, 1976). In Poznań research conducted by A. Winiecki considered a roost of about 100,000 individuals between the years 1983 and 1985 (Ph. D. thesis, Poznań Univ., 1985). In Warsaw, R. Szczepanowski estimated the population of roosting Rooks at 220,000 individuals (in 1988) and 180,000 (in 1989) individuals, but the population wintering in the city proper in the years 1986–1990 was estimated by Luniak (1990) at 80,000 to 120,000. Outside Poland, the most detailed work has come from the former Czechoslovakia (Hubalek 1980, 1983). Amongst other foreign studies, particular mention should be made of those from Munro (1975) on Scottish roosts and from Grill (1981) on the grouping in Vienna.

The aim of this work was to obtain, 30 years after R. Kureń's research, up-to-date information on the size and species composition of the grouping of corvids in Wrocław, on the age structure and mortality of the population of Rooks, on the distribution of roosts and the flightpaths associated with them, and also on the behaviour of the birds at the roosts.

STUDY AREA

Work was carried out in the city of Wrocław (SW Poland) and within twenty kilometres of it. This region is the warmest climatic zone in Poland (Kondracki 1978). Winter here is short, spring early, and summer warm and dry.

The period with snow cover ranges from 50 to 60 days and mean temperatures are -1.1 °C in January and 8.7 °C for the year as a whole. However, the research was carried out in the winters of 1988/1989 and 1989/1990, which were exceptionally mild. Snow lay for only 13 and 11 days respectively and the average January temperatures were 1.8 °C and 3.5 °C (data from

the Dept. of Climatology and Meteorology Wrocław Univ.). The city covers an area of 293 km² and has a population of 637,000. Areas of field and garden cultivation take up 32% of the city's area, unmanaged areas (mainly with low greenery) cover 13%, woods and woodland parks – 7%, urban green space (parks and greenery, allotments and cemeteries) – 7%. The city uses four waste dumps, of which one is beyond the city boundaries. The edges of the city and the land beyond consist mainly of fields, meadows and pasture. There are few forests.

METHODS

Field research was carried out between September and March in winters 1988/1989 and 1989/1990, as well as in part of winter 1990/1991. Evening monitoring of roosts was also carried out on a few occasions in summer and early autumn. The origins of the birds wintering in Wrocław was established on the basis of ringing data obtained from the Ornithological Station of the Institute of Ecology Polish Acad. of Sc. The size of the roosting group was estimated by counting birds flying from a roost to a post-roosting concentration site, or from a pre-roosting concentration site to a roost. The observer divided flying flocks into groups of about 100, 200, 500 or 1000 individuals, depending on the intensity of the passage. The observer determined objects in the landscape between which there was a unit number of birds and followed with his eyes, throughout the time of passage between these objects, the birds bringing up the rear of the separate groups. After this zone had been passed by the birds whose progress had been followed, he commenced observing the next bird at the beginning of the next group entering the zone. Birds were also counted in the pre-roosting and post-roosting concentration sites. Subjective errors were corrected by analysing photographs of flocks flying over observation points, and photographs of birds perching at pre-roosting concentration sites. The age structure of the Rook population was researched by counting young and adult birds at foraging sites. The two were distinguished by observation of the feathering at the base of the bill. The dynamics of mortality were estimated by counting dead birds at roosts.

THE ORIGIN OF THE ROOKS AND THE WINTERING PERIOD

Ringing data (from 7 returns) attested to the north-eastern origin of the birds wintering in Wrocław and environs. Of these birds, 6 had been ringed in the pre-breeding and breeding seasons in the environs of Ryazan and Kaluga (on the Russian Plain). In addition, a dead Rook found in Wrocław had been ringed near Gdańsk during the breeding season, and it is probable that a small number of Rooks from Wrocław's own population were also wintering in the city. This last suggestion follows from the presence of several tens of birds recorded in summer at two of the roosts – in the course of observations made several times in July and August 1990.

Rooks wintering in Poland nest on the Russian Plain and in southern Russia, but records have also been made of the wintering of rooks which had bred in Kuybyshevsky District and in the foothills of the Urals.

Birds arrived at the wintering sites in Wrocław in several waves, and wintering birds departed from the city in similar fashion. After the arrival of the first flocks, the size of the roost stabilised over 10–20 days and remained unchanged until the onset of departures, which continued for about three weeks. The arrival and departure of wintering birds coincided with the period of migration of Rooks through Poland (Busse 1963). In Wrocław, in the three seasons in which research was carried out, arrivals were noted around 15 X 1988, 7 X 1989 and 20 X 1990. Desertion of the roosts began in the last third of February and continued into mid March. The period of functioning of the winter grouping lasted 155 days in the 1988/1989 season, 159 days in the 1989/1990 and 150–155 days in the 1990/1991 season. After the mass departure, a small number of birds remained in Wrocław. These continued to make use of the traditional roosts and flightpaths to the foraging areas. The wintering period described for the Rooks of Wrocław is similar to those observed by authors researching other groupings in Central Europe (including Wachsmuth 1935, Weisbach 1978, Bereszyński & Żołądkowski 1980). A. Winięcki recorded a similar period for the functioning of the winter grouping in Poznań.

THE SIZE AND COMPOSITION OF THE ROOSTING COMMUNITY

In the 1988/1989 and 1989/1990 seasons, the size of the roosting community was estimated at between 200,000 and 250,000 individuals. 6–8% of these were Jackdaws *Corvus monedula* (based on a sample of 18,791 individuals). The population of Hooded Crows *Corvus corone cornix* was estimated at 150–200 individuals (0.1% of the total). Young individuals made up 5–6% of the total population of Rooks wintering in Wrocław (based on a sample of 4242 individuals). The proportion of these rose at the end of the wintering season, as departures began. A number of groupings of corvids thousands strong and connected with towns and cities have been described in Europe. A total of 150,000 has been reported in Brest and Tovacov, Moravia (Hubalek 1980), 95,000 in Zidlichovice, Moravia (Hubalek 1980), 80,000–90,000 in Vienna (Grüll 1981), 100,000 in Poznań (A. Winięcki) and ca 200,000 in Warsaw (R. Szczepanowski). From this it can be seen that the grouping in Wrocław is the largest yet described.

A similar, though in general slightly higher, proportion of Jackdaws has been noted in the majority of the other groupings in European cities. In Poznań the figure is 10–15%, in Moravia 2–30% and in Kraków 5–10%. Jackdaws constituted 1/7 to 1/5 of the corvids feeding in the centre of Warsaw (information from W. Nowicki and R. Szczepanowski). At 100–200, the number of Hooded Crows roosting along with the Rooks in Poznań was similar to that observed in Wrocław.

Comparisons with other European populations imply relatively low proportions of young individuals in the populations of Rooks wintering in Wrocław and Poznań. Studies have shown that young individuals made up 39% of the Rook population in Brunswick (Greve & Dornieren-Greve 1982), 38% in Saxony (Bährmann 1960) and 10% in Basle (Böhmer 1973). This phenomenon may be reference to the greater tendency of young individuals to migrate.

ROOSTS

Location and characteristics of roosts

Wrocław's roosting community of corvids spent the night at several roosts (Fig. 1). These were used to differing extents and with different degrees of regula-

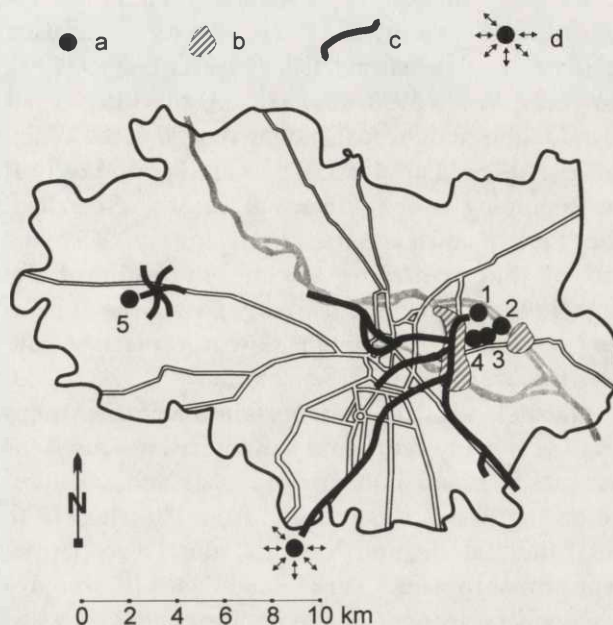


Fig. 1. Location of roosts (a), main pre-roosting and post-roosting concentration sites (b), course of the main flightpaths (c) as well as pre-foraging and post-foraging concentration sites (d), against the background of the main communication routes and watercourses in Wrocław. 1. Zalesie, 2. Chrobry, 3. Park I, 4. Park II, 5. Leśnica

[Ryc. 1. Lokalizacja noclegowisk (a), głównych miejsc koncentracji przed- i ponoclegowiskowej (b), przebieg głównych tras przelotów (c) oraz miejsca koncentracji przed- i pozerowiskowej (d) na tle głównych tras komunikacyjnych i cieków wodnych Wrocławia.]

riety. In general, they were situated in dense complexes of trees, close to water courses. Growing most often in these areas were oaks and ashes, beech trees and smaller numbers of trees of other species, which were almost always broadleaved. Corvids also passed the night in areas with more scattered trees.

Roosts were quiet places, but were not in general too remote from built-up areas. Many authors (including Grill 1981) have observed roosts in river valleys, as is the case in Wrocław. The distances of the Moravian roosts from human settlement ranged from 0.2 to 2.5 km. Cases of roosts being established at some central point in a city have only been reported in Kraków (Grodziński 1971, 1976) and Moscow (Konstantinov *et al.* 1982).

The utilization of roosts

Roosts were used to differing extents and their boundaries shifted considerably in the course of the

season. The "Zalesie" roost was used regularly through all three seasons. The "Chrobry" roost was used regularly in the seasons 1988/1989 and 1989/1990. However, in the 1990/1991 season, corvids did not spend nights at this roost, having moved to the "Zalesie" roost. The "Park I" roost was used periodically at the beginning of the wintering seasons researched. The "Park II" roost was used from January 1989 to the end of that wintering season. Throughout the 1990/1991 season, birds regularly passed the night at the "Leśnica" roost. There is however a lack of data from this area in the first winters.

Hubalek (1983) divided roosts into permanent ones (used over many years) and temporary ones (used for 1–2 seasons), and into primary ones and satellites. According to this classification from Hubalek (1980, 1983), the "Zalesie" and "Leśnica" roosts were permanent primary roosts. "Park I" and "Park II" were respectively permanent, and temporary satellite, roosts.

As a rule, groupings create only one primary roost. An exception occurs in Poznań, where there are two. Cases are known of Rooks passing the night in the same place for several tens of years. In Scotland, Munro (1975) reported that the oldest roost had been used for 120 years, and in Vienna one of the roosts was shown by Grüll (1981) to have been used since 1897.

Behaviour at the roost

During the night, corvids were very quiet at their roosts. However they were alert, and flew to other trees if a person came too close or clapped his hands. Birds only perched at the tops of the highest branches of the trees. When passing the night, they were not distributed evenly, but were instead concentrated in certain places, while some trees had fewer birds passing the night, or none at all. Birds roosted in both the centres and edges of patches of trees, but tended to move elsewhere more often when in the latter situation. In the evening occupation of a roost, the places at edges of patches of trees were also taken last, though this rule did not apply to trees growing along channels. During the night, parts of flocks sometimes moved to other trees within the roost, or even to other roosts. For example, in December 1989, several tens of thousands of birds moved to another roost at about 2 a.m. Birds remaining at the roost in the day were ill ones which were unable to fly to foraging grounds. Wrocław's Hooded Crows spent the night in one pla-

ce, on the edge of the "Chrobry" roost. They occupied places at the roost before the Rooks and Jackdaws arrived. A similar phenomenon was observed by R. Kureń in his observations in the area during the 1950s.

FLIGHTS AND FORAGING

Leaving the roost

Birds awoke and became vocal less than an hour before dawn. After 10–20 minutes they began to fly to neighbouring trees, whilst the birds which had spent the night in the latter trees flew further. The intensity of such moves increased, and at this time, single Rooks flew from roosts towards post-roosting concentration sites. Mass departures from the roost began only after their return. Birds roosting in one tree did not all take off at the same time, but rather left in several waves. Departures from a roost to a post-roosting concentration site began at dawn and continued for about half an hour. The detachment of single Rooks from the group prior to the mass departure from roosts and from places of intermediate concentration was also observed by R. Kureń in the period 1957–1959. These birds fly to the next stage and then return to the main flock.

Post-roosting concentration sites

After departing from a roost, corvids concentrated in permanent places from which they made flights to the foraging areas. Post-roosting concentration sites were between several tens of metres and three kilometres from the roosts themselves. Birds perched mainly on trees, with up to a thousand on a single tree. They also used the roofs of certain buildings, or the ground. Corvids flew along several air corridors to the largest post-roosting concentration site.

The courses of these corridors were dependent on the place at which the night had been spent at the time. Their arrival at this place continued for 30–45 minutes, occurring in groups of several thousand to several tens of thousands of individuals. Birds spent 20 minutes to half an hour at the post-roosting concentration site. Earlier, still before dawn, single rooks flew to these places, but returned to the main flocks at the roost after a short time. Departure from post-roosting concentration sites was similar. Flying away first were single birds, which returned to these places before the remaining birds flew off.

A. Winiecki stated that Poznań's Rooks omitted post-roosting concentration sites. Other authors (Wachsmuth 1935, Lückner 1975, Schlögel 1987) described only pre-roosting concentration sites and made no reference to morning concentration at the same places.

Flight to foraging areas

Flight occurred in groups using permanent air corridors. The birds did not follow the shortest possible routes, but navigated by reference to the course of streets and watercourses. Konstantinov *et al.* (1982) were of the opinion that the birds gain shelter from the wind in this way. The routes of the morning and evening flights were largely the same. The destinations of the morning flights were preforaging concentration sites. Here, the huge flocks were divided into small foraging groups, which kept in vocal and visual contact with each other during the day. These groups fanned out from the initial point. Prior to this division into foraging groups, birds perched on trees or on the ground. The morning flight was more hurried than the evening one.

Foraging areas and foraging

For some time after their arrival at the foraging areas, a group of Rooks remained at concentration sites. Only later did they disperse.

Birds remaining in the city most often looked for food in gardens and on lawns. They also foraged in cemeteries, in meadows along watercourses and on wasteland. They took the leftovers of grocery from pavements and often also took the leftovers from rubbish skips and bins. They gathered at waste tips in exceptionally large numbers. The distribution of feeding Rooks in the city was not even. They occurred in larger numbers in areas close to the roosts. Outside the city they preferred fields to meadows or pasture and at the end of the winter, they gathered in large numbers in freshly-ploughed fields.

A foraging group usually included several to several tens of birds. Attempts to steal food were very frequent. Feeding together with Rooks were Jackdaws, most often several individuals. Hooded Crows also fed frequently in these same foraging areas, but co-operation was not observed between this species and Rooks or Jackdaws. In the city, young individuals were noted feeding together with adults. Larger gatherings of young birds (together with adults) were

observed on the edges of the city. Here young birds could even constitute several tens of percent of feeding groups. Young were noted sporadically in the neighbourhood of roosts. It was not general for all the individuals in a group to feed at the same time. Most often, in areas with trees, one or more birds would perch on them warning of danger by cawing. Disquiet among the Rooks was caused, for example, by the appearance of a cat.

As a rule, birds perching in trees were the first to notice that People had thrown down some food, and were the first to fly to it. Several, even several tens of Rooks flew off immediately after the first. A bird which obtained a piece of food flew with it to a neighbouring tree. It was most often in such situations that birds stole food from each other. People who fed Rooks constantly claimed that the Rooks recognized them, since birds cawed in reaction to their appearance or to the opening of a window from which food was usually thrown. Such behaviour was also observed by Sassi (1943). Rooks fed less intensively during periods of snowfall or rain. At these times they mostly perched on trees with their feathers fluffed out. They circled in the air in times of strong winds. After 2 p.m. the birds fed less intensively, and gradually gathered in foraging concentration sites. 1.5–2 hours before dusk, they left the foraging areas to gather in post-foraging concentration sites. Rooks from Wrocław fed within 15–20 km of roosts. Distances between foraging areas and the roosts of groupings described in the literature range from 10–40 km (Wachsmuth 1935, Böhmer 1987, amongst others). Rooks were observed feeding under trees in some of Wrocław's parks.

The evening flight

The evening flight was basically a reversal of the morning one. Pre- and post-foraging concentration sites and pre- and post-roosting concentration sites were in the same places. The pre-roosting concentration of some individuals occurred on fields and on grassy areas.

The evening flight to pre-roosting concentration sites occurred in stages, with birds using several intermediate stations on the way. They perched on trees or circled over buildings. Before the main flock covered each stage, single birds covered it and then returned. Departure from a station occurred only after their return. The arrival at the largest pre-roosting concen-

tration site and the occupation of places continued for about an hour, until dusk.

Other authors, such as Wachsmuth (1935), Grüll (1981) and A. Winiecki, have observed the regularity and staged nature of rooks' flights from roosts to foraging grounds and back again.

The occupation of the roost

At dusk, when the last individuals were still flying to pre-roosting concentration sites situated close to the Szczytnicki and Zwierzyniecki Bridges, the flight to the roosts began. This flight was silent, and occurred in several waves which took off one by one, and which used separate air corridors. By the time the last birds flew to the roost it was already dark. As was the case with other stages of the morning and evening flights, single Rooks first flew over a roost and then returned to the pre-roosting concentration site before the rest of the birds departed. Having arrived over the roosts, corvids circled over it for a while, and then began to perch on the trees. It often happened that latecomers scared away individuals which had taken better places earlier. Birds circled over the roost for several more minutes after the flight of the column had ended. Activity at the roost died down in 20–30 minutes, and silence descended over it. Birds roosting at the "Chrobry" roost went to sleep several minutes earlier than those at other roosts. There was a similar delay in leaving the roost. Other authors have also observed the occupation of, and departure from, the roost at the boundary between day and night.

MORTALITY

In the 1988/1989 season, mortality at the roosts extended to 156 individuals. In the 1989/1990, 75 individuals died. Both winters were exceptionally mild, although the winter of 1989/1990 was slightly warmer. The majority of the losses amongst the several tens of Wrocław wintering Rooks studied by dissection and toxicological tests were caused by food poisoning or old wound induced by shooting (information from J. Okulewicz). For the two seasons combined, the average mortality at the roosts was 0.74 per night, which is approximately equivalent to 0.3‰ of the whole population per winterING season. The highest mortality in the 1988/1989 wintering season was

noted at the beginning and the end. Phenological differences were less visible in the second season. Mortality reached a clear minimum at the beginning of December 1989 and maxima were attained at the beginning of the season, and in mid January 1990. One-third of all the birds dying at roosts were in their first year of life, 32% in the 1988/1989 season and 35% in 1989/1990. On the basis of ringing results, authors have stated that mortality in the first year of life is higher than in other age classes (Riabov 1955, Busse 1963, 1969, Beklova & Pikula 1985).

LONG-TERM CHANGES IN POPULATIONS

R. Kureń estimated that there were 20,000–25,000 individuals in the grouping of wintering corvids in the years 1957/1958 and 1958/1959. The size of the grouping has therefore increased about 10-fold in the last 30 years. The percentage representation of the different species has also changed. At the end of the 1950s, the grouping was mainly composed of more-or-less equal numbers of Rooks and Jackdaws, together with

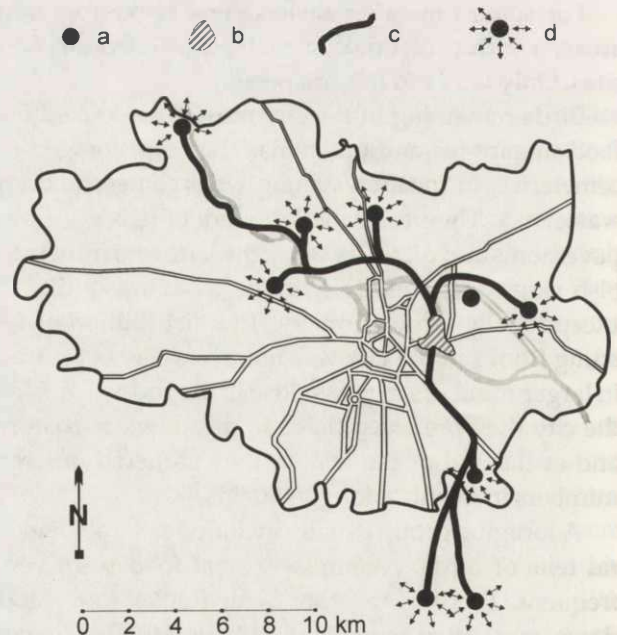


Fig. 2. Location of the principal roost at the end of the 1950s (on the basis of the description made by R. Kureń. Legend as in Fig. 1.

[Ryc. 2. Lokalizacja noclegowiska podstawowego, pod koniec lat 50-tych (na podstawie opisu R. Kurenia). Oznaczenia jak na Ryc. 1]

a small number of Hooded Crows. There has therefore been around a 20-fold increase in the number of Rooks wintering in Wrocław. In contrast, Jackdaws have increased by at most a half, and may have stayed at the same level.

In R. Kureń's time the primary roost was located in small woods between the Olympic Stadium, the flood relief channel and Paderewski Street (Fig. 2). It covered an area of about 8 ha. Z. Jakubiec (inf.) also observed this roost in the late 1940s early 1950s. A satellite roost was located on the floodbank between the channels in the environs of the Warsaw Bridge, the Jagiellonian Bridges or between bridges, or in the small wood in Kowale. About 3000 birds spent the night there. The basic flightpaths from the late 1950s were also used at the end of the 1980s and the beginning of the 1990s, though the number of flightpaths has increased considerably in the last 30 years.

CONCLUSIONS

1. In the years 1988/1989 and 1989/1990, Wrocław's winter roosts of corvids were found to include 200,000–250,000 individuals and were thus probably the largest so far recorded within the entire range of the species. The large number of wintering birds has been favoured by the particular mildness of the climate in Lower Silesia as well as by the considerable representation of green areas within the city.

2. Rooks constituted 92–94% of the roosting community, Jackdaws 6–8% and Hooded Crows about 0.1%. 5–6% of the Rooks were young birds.

3. Recorded in the studied grouping were birds originating from the environs of Ryazan and Kaluga (on the Russian Plain). There were probably also a small number of individuals from the local breeding population.

4. Rooks passed the night in several roosts with different degrees of permanence. At least two of these were regularly-used primary roosts. The morning flight from roosts, and the evening return to them, occurred in stages – birds flew gradually to the sites of staging concentrations.

5. At the roosts the average mortality amongst rooks was 0.74 individuals per night, i.e. c. 0.3% of the population per wintering season. The highest values were attained at the beginning and end of the wintering period.

The main causes of death were food poisoning and old wounds created by shooting. One third of the birds dying at roosts were young individuals.

6. The size of the roosting population has increased about 10-fold in the last 30 years; the numbers of Rooks wintering in Wrocław has risen about 20-fold and the number of Jackdaws by at most a half. This is connected with a general increase in the size of the eastern European population, which winters in Poland amongst other places, as well as with the tendency towards shorter migrations which has been observed (particularly among older birds).

7. The roosting population exhibited a long-term attachment to roosts which is typical for corvids. However, the area of these has increased several-fold in the last 30 years. The oldest of the Wrocław roosts has been used for at least 40 years.

Translated from Polish by dr. James Richards

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STRESZCZENIE

[Zimowe zgrupowanie noclegowiskowe gawronów *Corvus frugilegus* we Wrocławiu]

Liczebność zgrupowania oszacowano na przelotach między noclegowiskami a miejscami koncentracji przed- i ponoclegowiskowej. Lecące stada dzielono na grupy o określonej liczebności i ustalano przedmioty terenowe między którymi mieściła się liczona grupa osobników. Ptaka kończącego wydzieloną grupę prowadzono wzrokiem przez cały czas przelotu między tymi przedmiotami terenowymi, po czym w podobny sposób śledzono przelot przez tę strefę ptaka na końcu następnej wydzielonej grupy. Wrony liczono w czasie ich przebywania na noclegowisku. Udział kawek ustalono licząc osobno ptaki należące do różnych gatunków (próba 18,791). Podobnie ustalono udział ptaków młodych w populacji gawronów (próba 4,242), wynosił on 5–6%.

Badane zgrupowanie krukowatych liczyło w sezonach 1988/1989 i 1989/1990 200–250 tys. osobników, w tym 92–94% gawronów, 6–8% kawek i ok. 0.1% wron.

We Wrocławiu stwierdzono zimowanie gawronów gnieźdzących się w Rejonie Riazania i Kaługi (Równina Rosyjska). Prawdopodobnie zimowała tu też niewielka liczba ptaków lokalnej populacji legowej.

W ciągu ostatnich 30 lat liczebność całego zgrupowania wzrosła 10 razy, w tym gawronów 20 razy, a kawek najwyżej o połowę. Wiąże się to z ogólnym wzrostem liczebności populacji wschodnioeuropejskich, oraz tendencją do skracania wędrówek, szczególnie przez osobniki starsze. Dynamikę śmiertelności gawronów zbadano licząc na noclegowiskach martwe ptaki. Średnia śmiertelność dobową na noclegowiskach wynosiła 0.74 osobnika, czyli 0.3% populacji. Najwyższa była śmiertelność na początku i końcu sezonu zimowania.

Przyczyną śmierci większości z kilkudziesięciu badanych (sekcja i badania toksykologiczne) przez J. Okulewicza (inf.) gawronów zimujących we Wrocławiu były zatrucia pokarmowe i dawne postrzały. 1/3 ptaków padłych na noclegowiskach stanowiły osobniki młode.

Krukowate zgrupowania wrocławskiego nocowały na kilku noclegowiskach o niejednakowym statusie (Fig. 1), co najmniej dwa z nich były używane regularnie jako noclegowiska podstawowe. Najstarsze z noclegowisk liczyło co najmniej 40 lat (Fig. 1 i 2). Większość wrocławskich noclegowisk leżała blisko siebie (od kilkuset metrów do dwóch kilometrów), jedno oddalone było od pozostałych o ok. 15 km. Noclegowiska położone były w pobliżu cieków wodnych i mieściły się w zadrzewieniach liściastych, głównie dębowych. Noclegowisko "Chrobry" obejmowało część wału oddzielającego kanały nieco na NW od Mostów Chrobrego (Most Swojczycki) oraz zadrzewienia na ich brzegach. Teren noclegowiska porastały dęby rosnące w dużych odstępach. Znajdowały się tu też zamieszkane zabudowania.

Noclegowisko "Zalesie" obejmowało zadrzewienie między Stadionem Olimpijskim, kanałem powodziowym i ul. Paderewskiego, a także drzewa rosnące między kanałami powodziowym a nawigacyjnym, zadrzewienia przyległej do kanału części Stadionu Olimpijskiego, drzewa rosnące nad kanałem od strony Stadionu i zadrzewienia między ul. Paderewskiego a Mostami Jagiellońskimi. Teren ten porastały głównie dęby.

Noclegowisko "Park I" obejmowało najbardziej naturalną, przyległą do Stadionu Olimpijskiego część

Parku Szczytnickiego i okresowo drzewa rosnące po obu stronach ulicy Paderewskiego. Rosły tu dęby i buki.

Noclegowisko "Park II" położone było w zadbanej części Parku Szczytnickiego w rejonie ulic Mickiewicza, Dicksteina i Kopernika. Tu także dominowały dęby i buki, nie tworzyły one jednak zwartego drzewostanu.

W odległości ok. 15 km od opisanego wyżej kompleksu noclegowisk znajdowało się noclegowisko "Leśnica". Był to fragment lasu liściastego. Rosły tu głównie dęby, olchy, wiązy, jesiony, lipy, kasztanowce zwyczajne i buki.

Rozmieszczenie ptaków na noclegowiskach było nierównomierne, a ich granice ulegały znacznym przesunięciom w ciągu sezonu. Ptaki najczęściej nocowały na drzewach położonych poza środkiem zadrzewienia, unikały jednak nocowania na samym jego brzegu. Krukowate w okresie nocowania zachowywały się cicho, były jednak czujne.

Jako żerowiska w mieście gawrony preferowały ogrody i trawniki, na terenach podmiejskich pola. Pod koniec okresu zimowania licznie gromadziły się na świeżo zaoranych polach. Największe stwierdzone odległości między noclegowiskami i żerowiskami wynosiły 15–20 km. Żerowanie odbywało się w grupach liczących od kilkunastu do kilkudziesięciu osobników. Część z nich nie żerowała, tylko obserwowała otoczenie, ostrzegając o niebezpieczeństwie.

Przeloty między żerowiskami a noclegowiskami odbywały się regularnie, stałymi korytarzami powietrznymi biegnącymi wzdłuż ulic i rzek. Konstantinov *et al.* (1982) sądzą, że ptaki wykorzystywały w ten sposób osłonę od wiatru. Przebieg korytarzy wykazywał wieloletnią trwałość. Przeloty poranne i wieczorne odbywały się etapami, podobnie jak w innych

zgrupowaniach. Po opuszczeniu noclegowiska gromadziły się na miejscu koncentracji ponoclegowiskowej. Stąd stada rozlatywały się promieniście w różnych kierunkach. Na kolejnych stacjach pośrednich następował podział na mniejsze grupy. Przelot wieczorny był odwróceniem przelotu porannego. Ptaki zgrupowań w Poznaniu (Winiecki – rozprawa doktorska na Uniwersytecie Adama Mickiewicza w Poznaniu 1985), Okręgu Frankfurt nad Odrą (Schlögel 1987) oraz między Viersen i Anrath (Lücker 1985) pomijały miejsce koncentracji ponoclegowiskowej. Koncentracja przednoclegowiskowa we Wrocławiu odbywała się podobnie jak w przypadku zgrupowań w innych miastach. Koncentracja przed- i ponoclegowiskowa oraz stacje pośrednie na przelotach porannych i wieczornych były w tych samych miejscach. Pora przelotów była skorelowana ze zmianą natężenia światła rano i wieczorem. Przed masowym odlotem z miejsca rozpoczynającego dany etap odlatywały pojedyncze gawrony, które po przebyciu etapu wracały do swojej grupy, pozostającej jeszcze na miejscu.

PODZIĘKOWANIA

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Redaktor pracy: prof. Maciej Luniak

INTERNATIONAL SYMPOSIUM

European Peregrine Falcon *Falco peregrinus peregrinus* – its status and future 7–11 November 1994, Ciechocinek, Poland

The Peregrine Falcon practically went extinct in Poland in the 60's. Work on aviary breeding of the species was started in Poland at the beginning of 80's. Between 1990 and 1993 - 35 young Peregrines were released. The aim of Polish program for the Peregrine reintroduction is to re-establish the population of the forest ecotype of the nominative subspecies. Thanks to the good results of these reintroductions, confirmed by numerous observations of adult released birds, there is a chance for a wild nest of released Peregrines to be created soon.

The problem of Peregrine Falcon concerns all of Europe. The aim of the Symposium is to provide an impulse for international cooperation in this field.

The Symposium is organized by the Polish Hunting Association, the Foundation "Active conservation of Threatened birds" in Włocławek and the local administration. It will be held under the patronage of International Council for Hunting and Game Preservation (CIC) and its Working Group on Falconry and the Preservation of Birds of Prey.

Scientific problems of the Symposium:

1. The situation of the subspecies in the countries of Europe, actual numbers and population trends in European countries, taxonomic problems of the subspecies.
2. The ecology of the forest and cliff (urban) ecotypes of the Peregrine Falcon.
3. Active protection: - Breeding in captivity, preserving pure genetic status of the subspecies, the problem of the inbreeding, methods of preparing Falcons for breeding and the creation of breeding pairs. - Reintroduction of cliff ecotype to cities, reintroduction of the forest ecotype.
4. Legal problems and perspectives for international cooperation in accordance with the Washington Convention (CITES).

Organizing Secretariate: – Polish Hunting Association, Provincial Branch in Włocławek.

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