ISSN 2336-3193
DOI: 10.1515/cszma-2016-0022

Acta Mus. Siles. Sci. Natur., 65: 179-192, 2016
Published: online August 2016, in print 1st September 2016

Breeding avifauna of Niemodlin countryside (SW Poland) during the years 2002-2007, and its changes over the last 56 years (1962-2007)

Grzegorz Kopij

Breeding avifauna of Niemodlin countryside (SW Poland) during the years 2002-2007, and its changes during the last 56 years (1962-2007). – Acta Mus. Siles. Sci. Natur. 65: 179-192, 2016.

Abstract: Niemodlin countryside (c. 300 km^2) is situated in the south-western part of Opole Silesia, SW Poland. Forests occupy c. 40%, arable grounds – 1/3, and meadows and pastures – 7%. There are 31 fish-ponds with a total diked surface of 663 ha. The paper presents results of field investigations carried out during the years 2002-2007 and an analysis of changes in the breeding avifauna over the last 56 years. During the years 2002-2007, 123 breeding and 11 probably breeding bird species were recorded in this area. During the years 1962-2007 151 species were recorded as breeding residents; and additional five species – as probably breeding resident. The following species were recorded as breeding for the first time in 1962-2007: *Haliaeetus albicilla, Larus canus, Motacilla cinerea, Saxicola torquata, Locustella luscinioides, Ficedula albicollis, Corvus corax* and *Carpodacus erythrinus.* In the same period the following species became extinct: *Podiceps nigricollis, Anas clypeata, Milvus milvus,* and *Tringa glareola.* The following species increaed in numbers in 1962-2007: *Coturnix coturnix, Grus grus, Columba oenas, Apus apus, Dryocopus martius, Dendrocopos medius, Motacilla cinerea, Saxicola torquata* and *Corvus corax.* In the same period, *Tachybaptus ruficollis, Podiceps cristatus, Podiceps grisegena, Ciconia ciconia, Aythya nyroca, Perdix perdix, Gallinago gallinago, Larus ridibundus, Tyto alba, Alcedo atthis, Picus viridis, Riparia riparia* and *Corvus cornix* decreased in numbers. The areas with the highest concentration of rare and endangered species are postulated to be protected as nature reserves, landscape parks and other spatial forms of nature conservation.

Key words: censuses, population trends, nature conservation, fish-ponds, farmlands, villages, forest fragmentation.

Introduction

From the point of view of nature conservation, one of the most important studies are those on monitoring changes in numbers, structure and reproductive performance of populations of particular species or selected species assemblages (Sutherland 2000). Such monitoring programmes are especially interesting if the species are regarded as so called bioindicators. Among animals, many bird species are good bioindicators of environmental quality (Sutherland 2000). There are few larger areas in Silesia, where their populations have been monitored on irregular basis in the last 50 years and more. Waterbirds, and some other bird species in Milicz fish-ponds in the Barycz Valley have been monitored since 1946 (Szarski 1950; Mrugasiewicz, Witkowski 1962; Witkowski *et al.* 1995; Witkowski, Orłowska 2012); non-passerines and selected passerines, in Niemodlin countryside, since 1964 (Janowski 1967; Borowiec, Grabiński 1982; Kopij 2001, 2002); most non-passerines and selected passerines in so called Nysa Lakeland since 1969 (Dyrcz 1981; Stawarczyk *et al.* 1996; Kopij 1996, 2012a) and some uncommon bird species in Karkonosze Mts. since the late 1960's (Dyrcz 1973; Flousek, Gramsz 1999; Gramsz 2003).

In this paper, a summary of such monitoring is presented from the Niemodlin coutryside, together with the results of the most recent survey on birds of this area conducted during the years 2002-2007.

A first check-list of all bird species breeding in Niemodlin countryside was published by Schönermark (1922). However, no quantitative data, even in regard to rare species, were contained in this checklist. After II World War, Tomiałojć and Witkowski (1963) undertook in May 1962 reconnoitring studies on birds breeding in Niemdolin countryside. Two years later (1964-1965), more thorough investigations on water birds breeding in this area were carried out by Janowski (1967). In the next decade, Borowiec and Grabiński (1982) conducted an inventory of most watefo-

wl and wader species breeding in the fish-ponds. They quatified also breeding assemblages in a few selected plots in coniferous and mixed forests.

To date, the most thorough and complete investigations of the avifauna in Niemodlin countryside was conducted during the years 1980-1990 by students from high schools in Niemodlin and Tułowice. For the first time, studies on aspects of breeding ecology of some water bird and raptor species were also conducted in that period (Kopij 2001, 2002).

In the last decade of the 20th century, piloting survey on some rare species was conducted in so called Bory Niemodlińskie Protected Lanscape (it includes most of the study area) (Hebda, Wyszyński 2001), while waterfowl and waders autumn migration in the fish-ponds was quantified by Dobranowski (2002). In 20th century, the Niemodlin countryside was also a part of larger study area for counting a few selected bird species, such as *Ciconia ciconia* (Brinkmann 1933, 1939; Profus, Mielczarek 1981; Kopij *et al.* 1999; Kopij 2003a, 2013a, 2014; Profus 2006), *Larus ridibundus* (Stadie 1929, Brinkmann 1944), *Tyto alba* (Kopij 1992), *Riparia riparia* (Brinkmann 1938), *Corvus frugilegus* (Brinkmann 1932; Kopij 2003b) and Galliformes (Kopij 1992, 1997; Kopij, Profus 2014).

The aim of this study was to estimate the numbers of breeding pairs of less common species and relative abundance of more common ones in the whole Niemodlin countryside during the years 2002-2007. An attempt was also made to investigate changes in the numbers of breeding birds over the last 56 years in this area.

Study area

The study area is situated in Opole district (Niemodlin, Tułowice and part of Dąbrowa counties) and Brzeg district (part of Lewin Brzeski county), Opole Silesia province. The area is located between Nysa Kłodzka river to the west (the river is excluded from the study area), and edges of contigenous forests, called Puszcza Niemodlińska (the forests are also excluded from the study area) to the east. The north-eastern border runs along the forest edge from Siedliska to Ciepielowice, while the northern borders runs along the Opole-Brzeg-Wrocław railway. The southern border comprises the administrative northern borders of Korfantów and Łambinowice counties. The borders are, therefore, the same as those adopted in previous studies on birds of this area (Kopij 2000, 2001), where there is also detailed description of the natural environment of the whole study area.

The total surface of the study area is ca. 300 km^2, including ca. 120 km^2 of forests, ca. 20 km^2 od meadows and pastures, and 96 km^2 of arable gounds. There are 31 fish-ponds with a total diked surface of 663 ha; rivers, roads and human settlemnts comprise the remaining of the surface area (Kopij 2001).

Material and methods

The study was conducted during the years 2002-2007. The total time expenditure was 65 days, i.e.: March – 5, April – 17, May – 22, June – 12 and July – 9 days. In 2002 – 27, 2004 – 9, 2005 – 10, 2006 – 6 and 2007 – 13 days. Open habitats were usually explored by bicycle, while forests, river valleys and fish-ponds surroundings by foot. Observations were aided with 10x50 binoculars and were conducted only during the day, usually from sunrise till early afternoon.

Special attention was paid to species rare in Silesia (cf. Dyrcz *et al.* 1991). For each recorded bird belonging to such species, its breeding status was determined using the criteria adopted in the atlas method (Bibby *et al.* 1992, Sikora *et al.* 2007). All these sightings were ploted on a map 1: 50 000.

In the fish-ponds (N=13), birds were counted in 2002, 2004, 2006 and 2007. In 2002 and 2004, 3 counts were conducted at each fish-pond. In 2006, two counts were conducted at fish-ponds 3, 5, 7, 14, 15, 16 and 17 and single counts at remaining fish-ponds. In 2007, 3 counts were conducted at seven fish-ponds (Kopij 2009).

The field study was planned in such way as to cover the whole study area during the years 2002-2007. For most species, the number of recorded breeding pairs refers, threfore, to the whole study period. Only for some species, indicated in the text, the number refers to a specific year.

Based on literature data, the changes in the abundance of breeding species were traced back to 1960. The following study periods (decades) were distinguished (cf. Table 1):

1. Years 1960's, based on Tomiałojć & Witkowski 1963; Janowski 1967
2. Years 1970's, based on Borowiec & Grabiński 1982
3. Years 1980's, based on Kopij 2001, 2002
4. Years 1990's, based on Hebda & Wyszyński 2001
5. Years 2000's, based on this study

SYSTEMATIC REVIEW OF SPECIES BREEDING IN THE NIEMODLIN COUNTRYSIDE DURING THE YEARS 2002-2007

Cygnus olor. In each year, dozen or so pairs were breeding (Table 2). In 2002, 16 pairs with chicks and 3 unsucessfully breeding pairs were recorded (Table 2). The maximal flock size of 98 individuals was recorded on 13.07.2002 at Sangów fish-pond.

Anser anser. In each year, 13-25 pairs were recorded (in 2002 – 25 pairs) (Table 2).

Anas strepera. In each year, each 2 pairs nested at Sangów and Książęcy fish-ponds.

Anas querquedula. In 2002, single pairs were recorded at Kamaszka, Olszowy and Loża fish-ponds, and each 1-2 pairs at Sangów and Książęcy fish-ponds.

Anas platyrhynchos. It nested in fish-ponds, rivers and canals. In 2002, ca. 100 pairs were recorded in fish-ponds (Table 2), while in 2007, at least 20 pairs were recorded on Ścinawa Niemodlińska (Kopij 2013b).

Anas crecca. Single pairs nested probably at Książęcy, Olszowy and Sangów fish-ponds.

Aythya ferrina. About 60 breeding pairs were recorded in fish-ponds (Table 2). Not recorded in other habitats.

Aythya fuligula . It was recorded in fish-ponds only, where ca. 100 pairs nested each year (Table 2).

Aythya nyroca. In 2001, 1-2 pairs nested at Sangów fish-pond. On 04.04.2002, a female with two males was observed at Wołowski fish-pond.

Perdix perdix. During the years 2002-2007, only 3 pairs were recorded, but this figure is probably underestimated.

Coturnix coturnix. During the years, 2002-2007, 7 pairs were recorded (Fig 2).

Phasianus colchicus. Much more common than *P. perdix*.

Tachybaptus ruficollis. During the years 2002-2006, 15 pairs were recorded, all nested in fish-ponds (Table 2).

Podiceps cristatus. Each year 40-60 pairs nested. In 2002, 46 breeding pairs were recorded (Table 2). In 2007, 15 pairs were counted in Lipno fish-ponds complex (Kopij 2009). During the years 2002-2007, one pair nested on a small island in a gravel-pit near Lewin Brzeski.

Podiceps grisegena. In 2002, single breeding pairs were recorded at Ławnik and Zofia fish-ponds, and each 2 pairs at Loża and Pustelnik fish-ponds. Several pairs were also recorded in next years (Table 2 and Kopij 2009).

Botaurus stellaris. In each year, 5-14 pairs were recorded, most of them nested in Lipno fish-ponds complex (Table 2).

Ixobrychus minutus. During the years 2002-2006, single pairs were recorded at Sangów, Loża and Hutnik fish-ponds.

Ardea cinerea. During the years 2002-2007, a few pairs nested in an afforested island in Sangów fish-pond.

Ciconia nigra. In each year, single pairs probably nested around Loża, Książęcy and Sangów fish-ponds.

Ciconia ciconia. In each year, 9-12 pairs nested (Kopij 2013a).

Haliaeetus albicilla. During the years 2002-2007, one territory was occupied around Sangów fish-pond, and another one around Pustelnik fish-pond.

Milvus migrans. In 2003, one pair probably nested around Sangów fish-pond.

Circus aeruginosus. In each year, dozen or so breeding pairs were recorded; in 2002 – 18 pairs (Table 2).

Accipiter gentilis. In each year, 6 breeding pairs were recorded (Fig 2), but this figure could have been underestimated.

Accipiter nisus. One pair probably nested in a forest N of Sangów fish-pond.

Buteo buteo. In each year, at least 50 pairs nested in forests.

Rallus aquaticus. In 2002, single pairs were recorded at Książęcy and Olszowy fish-ponds. This number is probably underestimated.

Porzana porzana. One pair probably nested in 2002 at Książęcy fish-pond.

Crex crex. In 2007, 2 calling males were heard in Ścinawa Niemodlińska river valley (Kopij 2013b). On 18.07.2008, one male was heard in meadows NE of Ławnik fish-pond; this record was, however, made ouside the study period.

Gallinula chloropus. During the years 2002-2006, no more than10 pairs were recorded in fish-ponds, but this figure could have been underestimated (Table 2). Single breeding pairs were also recorded in small water-bodies in Przecza and N of Szydłów.

Fulica atra. During the years 2002-2006, ca. 100 pairs were counted, while the whole breeding population was estimated at 120-150 pairs (Table 2).

Grus grus. During the years 2002-2007, 6 pairs nested in the study area (Fig 3).

Charadrius dubius. In 2002, single pairs nested at Olszowy, Loża, Sangów, Kamaszka, Wołowski fish-ponds and in a gravel-pit near Lewin Brzeski.

Vanellus vanellus. Small colonies, each one with 2-3 pairs, were located on meadows between Goszczowice and Tułowice, on arable grounds between Wołowski and Młyński fish-ponds, and SE of Kamaszka fish-pond. Single pairs nested also on arable grounds N of Grodziec and on Mała Loża and Tadeusz fish-ponds (both fish-ponds were not filled with water).

Tringa ochropus. In 2002, one pair probably nested in the alder forest between Sangów and Młyński fish-ponds.

Larus ridibundus. In 2001, 200-300 pairs nested in Sangów fish-pond. In 2002 – ca. 30 pairs nested in a fish-pond near Szydłowiec, and in 2004, a small colony was established in Loża fish-pond. In 2007, 3 small colonies were recorded, with a total of ca. 30 pairs (Kopij 2009).

Larus canus. In 2004 and 2005, a pair nested in a gravel-pit near Lewin Brzeski.

Sterna hirundo. In 2005, a pair probably nested at Książęcy fish-pond.

Columba livia f. domestica. In each year, a few dozen pairs nested in Niemodlin, and 3-4 pairs in a bell-tower in Stroszowice.

Columba oenas. During the years 2002-2006, 9 pairs were recorded (Fig 4).
Columba palumbus. In 2 forest districts (2714 ha), 39 pairs were recorded (Kopij 2009). In forests, the proportion of breeding pairs of *C.palumbus : C. oeanas : Streptopelia turtur* was 0.57 : 0.28 : 0.15 (n=69 pairs of all species).
Streptopelia decaocto. At least 140 pairs were recorded in 45 villages surveyed in 2002-2006 (the highest numbers were in Gracze – 28 pairs, and Grabina – 15 pairs), and at least 63 pairs in Niemodlin (Kopij 2009). In the same years, several pairs were also recorded on forest edges far from human settlements.
Streptopelia turtur. During the years 2002-2006, at least 26 pairs were recorded (Fig 5), while the whole population was estimated at 30-40 pairs.
Cuculus canorus. During the years 2002-2007, 40-60 male territories were mapped.
Tyto alba. During the years 2002-2006, it nested at a tower of the protestant church in Tułowice.
Strix aluco. Much more common than *Asio otus*.
Asio otus. During the years 2002-2007, only few pairs were recorded.
Apus apus. During the years 2002-2006, 100-125 pairs nested in 8 colonies (Table 1).
Alcedo atthis. During the years 2002-2006, 6 breeding pairs were recorded, including 4 pairs on Ścinawa Niemodlińska (Fig 6).
Upupa epops. In 2002, a pair nested in the vicinity of Sangów fish-pond.
Jynx torquilla. During the years 2002-2006, 5 pairs were recorded (Fig 7).
Picus canus. During the years 2002-2006, 5 pairs were recorded (Fig 8).
Picus viridis. In each year, a pair nested on Ścinawa Niemodlińska near Tułowice (Fig 8).
Dryocopus martius. During the years 2002-2006, 33 pairs were recoded (Fig 9).
Dendrocopos major. A subdominant species in forests (2.6-4.4%). In 2 forest districts (2714 ha) at least 167 pairs were recorded (Kopij 2009).
Dendrocopos medius. During the years 2002-2006, 8 pairs were recorded (Fig 10).
Dendrocopos minor. During the years 2002-2006, 5 pairs were recorded (Fig 10).
Alauda arvensis. The most common species in arable grounds.
Lulula arborea. During the years 2002-2006, 11 pairs were recorded, most on the edges of pine forests (Fig 11).
***Riparia riparia*.** The largest colony was situated in a gravel-pit near Lewin Brzeski. In 2004, the colony comprised ca. 60 holes, in 2007 – 120 holes. The second colony, with ca. 35 holes in 2002, was located in a gravel-pit on Ścinawa Niemodlińska near Stroszowice; the third colony, with dozen or so holes, was located in the bank of Wołowski fish-pond.
Hirundo rustica. One of the most common breeding species in villages.
Delichon urbica. It nested in some (at least 33%) villages and in Niemodlin (Kopij 2009).
Anthus campestris. On 29.04.2002, one individual was recorded on a wasteland near Goszczowice.
Anthus trivialis. In 2 forest districts (2714 ha) at least 30 singing males were recorded (Kopij 2009).
Anthus pratensis. On 10.04.2004, 2 singing males were heard in meadows between Goszczowicami and Tułowice.
Motacilla flava. It nested in farmlands, where recorded in 19 out off 38 (46%) transects (their total length: 62.6 km) (Kopij 2009).
Motacilla cinerea. In 2007, 4 pairs were recorded, all on Ścinawa Niemodlińska (Fig. 12).
Motacilla alba. Recorded in 14 out off 45 villages surveyed, but only in 6 out off 28 (62.6 km) transcects in farmlands (Kopij 2009). More common near fish-ponds.
Troglodytes troglodytes. A subdominant species in forests (3.0%) (Kopij 2009).
Prunella modularis. At least 38 pairs were recorded in 2 forest districts (2714 ha).
Erithacus rubecula. A dominant species in forests (6-8%) (Kopij 2009).
Luscinia megarhynchos. During the years 2002-2006, 54 pairs were recorded (Fig. 13), including 30 pairs in Ścinawa Niemodlińska valley (Kopij 2013b).
Phoenicurus ochruros. It is a breeding species in all settlements, in 30 of them at least 56 pairs were recorded, including 17 pairs in Niemodlin (Kopij 2009).
Phoenicurus phoenicurus. A rare species in pine forests and in human settlements (recorded only in two villages: Gościejowice Małe and in a school garden in Tułowice).
Saxicola rubetra. It was recorded in 9 out off 38 (19%) transects in farmlands (Kopij 2009).
Saxicola torquata. First breeding record in Niemodlin countryside was made in 1983. In 1983 – 1, 1984 – 2, 1986 – 6, 1990 – 12 pairs (Kopij 2002), 2002-2006 – 16 pairs (Fig 14).
Turdus merula. A dominant species in forests. The proportion of breeding pairs of *T. merula : T. philomelos : T. viscivorus* in forests was as: 0.72: 0.24: 0.04 (n=425 pairs of all species).
Turdus pilaris. Less common than *T. merula* and *T. philomelos*, but more common than *T. viscivorus* (Kopij 2009).
Turdus philomelos. In particular forests, it comprised 1-3% of all breeding birds (Kopij 2009).
Turdus viscivorus. During the years 2002-2006, 19 pairs were recorded (Fig 15), including 10 pairs in 2 forest districts (2714 ha) (Kopij 2009).
Locustella naevia. During the years 2002-2006, 27 singing males were recorded (Fig16), including 16 pairs in Ścinawa Niemodlińska valley (Kopij 2013b).
Locustella fluviatilis. During the years 2002-2006, 16 singing males were recorded (Fig 17), including 13 pairs in Ścinawa Niemodlińska valley (Kopij 2013b).
Locustella luscinioides. During the years 2002-2006, 8 singing males were heard (Fig17).

Acrocephalus schoenobaenus. Only 4 pairs were recorded (Hutnik and Kamaszka fish-ponds, a fish-pond near Szydłowiec, and a gravel-pit on Nysa Kłodzka near Lewina Brzeski). The number could have been, however, underestimated.

Acrocephalus palustris. The most common species of the genus. It nested on the banks of rivers, canals and some crop (mainly rape) cultivations (Kopij 2009).

Acrocephalus scirpaceus. In each year, 124-150 pairs were recorded (Table 1). On 29.05.2004, 41 singing males were heard in Sangów fish-pond.

Acrocephalus arundinaceus. In each year, 57-70 pairs were recorded (Table 1). On 29.05.2004, 13 singing males were heard in Sangów fish-pond.

Hippolais icterina. Single pairs were recorded only in 6 (20%) out of 30 villages surveyed in 2002 (Kopij 2009). It nested also in some afforestations.

Sylvia nisoria. On 22.06.2002, an individul showing territorial behaviour was recorded on a forest edge SW of Szydłowiec.

Sylvia curruca. It was recorded in 20 out off 45 settlements, with a total number of 34 pairs (including 8 pairs in Niemodlin) (Kopij 2009).

Sylvia communis. It was one of the commonest species in farmlands; recorded in 38% of transects in farmlands (Kopij 2009).

Sylvia borin. It nested on the banks of rivers, fish-ponds and other water bodies. Much less common than *Sylvia atricapilla* and *S. communis*.

Sylvia atricapilla. It was a subdominant species in forests, where it was also the most common representative of the genus. In forests, the proportions among breeding pairs of *S. atricapilla : S. communis : S. curruca : S. borin* was 0.79: 0.12: 0.04: 0.01 (n=208 pairs of all species) (Kopij 2009).

Phylloscopus sibilatrix. The least common species of the genus. It was commoner than other congenerics only in some wet forests.

Phylloscopus collybita. The commonest species of the genus in forests and afforestations. The second to *Fringilla coelebs* most common of all bird species in forests. The proportion among breeding pairs of *P. collybita: P. trochilus : P. sibilatrix* was 0.73: 0.19 : 0.08 (n=522) (Kopij 2009), therefore it was very much the same as in Nysa Land (Kopij 2007a).

Phylloscopus trochilus. A subdominant species in forests. Common also in some afforestations.

Regulus regulus. It nested in coniferous forests only, where it comprised 1-2% of all breeding birds (Kopij 2009). The proportion between breeding pairs of *R. regulus* and *R. ignicapillus* was 0.76: 0.24 (n=115 pairs of both species).

Regulus ignicapillus. During the years 2002-2007, fairly common breeding in coniferous forests; 27 pairs were recorded in 2 forest districts (2714 ha) (Kopij 2009).

Muscicapa striata. It nested in forests and afforestations. Less common than *F. hypolecuca*.

Ficedula albicollis. Nesting recorded in old stands of deciduous forests. The least common species of the family Muscicapidae. During the years 2002-2006, 11 pairs were recorded (Fig 18).

Ficedula hypoleuca. It was much more common than the sibling species (Kopij 2009). It nested in coniferous forests only.

Aegithalos caudatus. Nesting recorded in forests, afforestations and gardens (Kopij 2009).

Parus palustris. Nested in more humid fragments of forests and afforestations (Kopij 2009).

Parus montanus. The least common species of the genus. In two forest districts (2714 ha) only 2 pairs were recorded.

Parus cristatus. In two forest districts (2714 ha), 31 pairs were recorded (Kopij 2009).

Parus ater. A subdominant species in forests (Kopij 2009).

Parus caeruleus. A subdominant species in forests (2-3%) (Kopij 2009).

Parus major. In all forest types, it was a dominant species (5-6%); the commonest species of the genus. In forests the proportion of breeding pairs of the *Parus*-species: *P. major : P. caeruleus : P. ater : P. cristatus : P. palustris* was 0.45: 0.19: 0.26: 0.06: 0.04 (n=528 pairs of all species) (Kopij 2009).

Sitta europaea. A dominant species in forests (3-4%) (Kopij 2009).

Certhia familiaris. The proportion between breeding pairs of *C. familiaris* and *C. brachydactyla* was 0.49 : 0.51 (n=63 pairs of both species) (Kopij 2009).

Certhia brachydactyla. In 2 forest districts (2714 ha) at least 32 pairs were recorded (Kopij 2009).

Remiz pendulinus. It nested in Ścinawy Niemodlińska valley (at least 6 pairs in 2007) and around some fish-ponds (Table 2).

Oriolus oriolus. It nested regularly all over the study area (Kopij 2009).

Lanius collurio. It was recorded only on 5% of transects in farmlands (Kopij 2009).

Lanius excubitor. It was recorded in 2002 in Ścinawa Niemodlińska valley above Ligota Tułowicka, and in 2006 – in a farmland N of Rzędziwojowice.

Garrulus glandarius. It comprised ca. 2% of all breeding birds in forests (Kopij 2009).

Pica pica. Recorded only in 7 out off 45 (14.6%) villages surveyed (Kopij 2009). More common in farmlands, especially around Gracze.

Corvus monedula. Each few pairs nested at Rynek and in the castle in Niemodlin (in total ca.10-15 pairs), 2 pairs were recorded at a farmstead near Oldrzyszowice and one pair in Gościejowice Małe.

Corvus cornix. In 1990, 29 pairs were recorded (Kopij 2002), but in 2002-2006 –5 pairs only (Fig 19). It is probably dislocated by *C. corax*.

Corvus corax. For the first time it was recorded in Niemodlin countryside as a breeding species in 1980. In1983 – 2 pairs, 1990 – 3-4 pairs (Kopij 2002), in 2002-2006 – 21 pairs (Fig 19).
Sturnus vulgaris. A subdominant species in forests. One of the commonest species in villages (Kopij 2009).
Passer domesticus. It nested in human settlemens only, where it is one of the commonest species.
Passer montanus. It nested in human settlements as well as in some afforestations.
Fringilla coelebs. The most numerous species in all forest types. In particular forest districts, it comprised 18-19% of all breeding birds. In farmlands, it was recorded on 41% transects (Kopij 2009).
Serinus serinus. It nested in villages, on forest edges and in farmalnds (Kopij 2009).
Carduelis chloris. It nested in farmlands, where recorded on 16% transects (Kopij 2009).
Carduelis carduelis. Recorded in 21 out off 45 villages surveyed (Kopij 2009). In farmland hedges, it is a common breeding species; recorded on 46% transects (Kopij 2009).
Carduelis spinus. It probably nested in some boggy pine forests.
Carduelis cannabina. Recorded in 19 out off 45 surveyed villages (42.2%) (Kopij 2009).
***Loxia curvirostra*.** Probably a rare breeding resident in some coniferous forests.
Pyrrhula pyrrhula. Uncommon breeding resident.
Coccothraustes coccothraustes. A subdominant species in some forests, with a high contribution of *Carpinus betulus* and *Fagus sylvatica* (Kopij 2009).
Emberiza citrinella. One of the commonest breeding species in farmlands. The proportion among breeding pairs of *E. citrinella : Miliaria calandra : E. hortulana* in farmlands was as 1.00 : 0.84: 0.16 (n=88 pairs of all three species). It was also fairly common in forests, comprising 1-3% of all breeding birds (Kopij 2009).
Emberiza hortulana. During the years 2002-2006, 18 pairs were recorded (Fig 20). The figure could have been underestimated.
Emberiza schoeniclus. During the years 2002-2006, 33 pairs were recorded, and the whole population was estimated at 40-60 pairs (Table 1)
Miliaria calandra. During the years 2002-2006, it was one of the commonest breeding bird in farmlands, recorded in 60% out off 38 transects (Kopij 2009).

Characterization of the breeding avifauna

During the years 2002-2007, 134 breeding and probably breeding bird species were recorded in Niemodlin countryside. This comprises 58.0% of all species recorded as breeding in Poland during the years 1990-2004 (Sikora *et al.* 2007) and 70.9% of species recorded as breeding in Sielsia during the years 1978-87 (Dyrcz *et al.* 1991). In the period 1980-1990, slightly more (n=144) breeding species were recorded in Niemodlin countryside (Kopij 2001, 2002) than in 2002-2007. However, the study period was longer and the time expenditure was much higher in 1980-1990, if compared with 2002-2007.

Out of 123 bird species recorded as breeding in Niemodlin countryside in 2002-2007, 58 (47.2%) were Non-Passeriformes, while 65 (52.8%) were Passeriformes. The most speciose orders in the former group were Anseriformes (9), Piciiformes (7), Charadriiformes (7) and Accipitriformes (6 species). Most non-passerine birds belonged to two ecological groups: water birds (30) and raptors (9 species).

The number of breeding species recorded in Niemodlin countryside in 2002-2007 is close to that recorded in the neighbouring areas of a similar surface area size: Korfantów county – 121 (Kopij 2011), Łambinowice county – 123 (Kopij 2012), Grodków Land – 121 species (Kopij 2006a).

Table 1: Breeding colonies of the Common Swift in Niemodlin countryside during the years 2002-2006.

Settlement	Nesting site	Number of pairs
Niemodlin	tenements, Rynek	ca.40
	old brick factory bldg., Opolska Str.	5-10
Tułowice Małe	block buildings, 2-storied	20-30
Tułowice	block buildings, 3-storied	ca.10
	church tower	5-10
Gracze	block buildings, 3-storied	5-10
Krasna Góra	block buildings, 2-storied	ca.10
Rogi	church tower	ca.5
Total		**100-125**

Chaneges in the breeding avifauna during the years 1962-2007

During the years 1962-2007, a total of 151 breeding and 5 probably breeding species (*Actitis hypoleucos, Tringa glareola, Bubo bubo, Aegolius funereus* and *Lanius senator*) were recorded in Niemodlin countryside.

The following species were recorded for the first time as breeding in 1962-2007 in Niemodlin countryside: *Haliaeetus albicilla, Larus canus, Motacilla cinerea, Saxicola torquata, Locustella luscinioides, Ficedula albicollis, Corvus corax* and *Carpodacus erythrinus*. In the same period, the following species became locally extinct: *Podiceps nigricollis, Anas clypeata, Milvus milvus* and *Tringa ochropus*.

For the following species an increase in their numbers has been evidenced during the years 1962-2007: *Botaursu stellaris, Cygnus olor, Anser anser, Coturnix coturnix, Grus grus, Columba oenas, Apus apus, Dryocopus martius, Dendrocopos medius, Motacilla cinerea, Saxicola torquata* and *Corvus corax.*

In the same period, decrease in numbers was evidenced for species such as *Tachybaptus ruficollis, Podiceps cristatus, Podiceps grisegena, Ciconia ciconia, Aythya nyroca, Perdix perdix, Gallinago gallinago, Larus ridibundus, Tyto alba, Alcedo atthis, Picus viridis, Riparia riparia* and *Corvus cornix.*

Conservation of the avifauna

The following 19 bird species breeding in Niemodlin countryside are listed in Annex 1 of the Bird Directive (Directive 79/403/EEC from 02.04.1979): *Ixobrychus minutus, Ciconia nigra, Ciconia ciconia, Haliaaetus albicilla, Milvus migrans, Circus aeruginosus, Porzana porzana, Crex crex, Grus grus, Sterna hirundo, Alcedo atthis, Dryocopus martius, Picus canus, Dendrocopos medius, Lullula arborea, Sylvia nisoria, Ficedula albicollis, Lanius collurio,* and *Emberiza hortulana*.

A serious threat to birds nesting in wetlands and meadows in Niemodlin countryside may be posed by their abadonoment, draining and conversion into arable grounds or afforestation. Affacted species may include *Ciconia ciconia, Gallinago gallinago, Vanelus vanellus* and *Acrocephalus schoenobaenus*. In arable grounds, some species (e.g. *Perdix perdix, Emberiza citrinella, Alauda arvensis*) may be negativelly affected by merging small peasant plots.

Human disturbance in breeding season may affect negativelly *Haliaeetus albicilla, Ciconia nigra* and *Accipiter gentilis* in forests (especially through logging), and *Anser anser*, grebs Podicipedidae, some ducks Anatidae and rallids Rallidae in the fish-ponds. The highway along the fish-ponds near Rzędziwojowic affects negatively bird species nesting there.

Some water bird species, especially ducks, grebs and rallids may suffer haevy predation by the invasive carnivore species, such as *Neovison vison, Nyctereutes procyonoides* and also by *Sus scrofa* and *Lutra lutra.*

Most of the study area is situated within so called Bory Niemodlińskie Protected Landscape (Makowiecki, Koziarski 2001). As it is widely known, this form of protection is inefficient in nature conservation, especially in regard to habitat and species protections. More precious vegetation types, unique geological sites, as well as sites with rare and protected plant and animal species should be protected in the form of landscape park. Due to high densities of water birds and the occurrence of rare and protected species, the fish-ponds complex near Lipno (Loża, Olszowy, Pustelnik and Pietruszka fish-ponds), and Sangów and Książęcy fish-ponds should be protected as nature reserves. Ścinawy Niemodlińska valley between Przechód and Ligota Tułowicka and between Niemodlin and Szydłowiec should be protected as a greenland.

References

Borowiec M. & Grabiński W. (1982): Awifauna leśno-stawowego kompleksu Ziemi Niemodlińskiej z uwzględnieniem badań ilościowych w borach. – Acta Univ. Wratislav. 487, Pr. zool. 12: 1-54.

Brinkmann M. (1932): Die Saatkrähenkolonien in Oberschlesien. – Schrifftenr. Ver. Oberschl. Heimatkd. 5: 15-25.

– (1933): Fünf Jahre Storchbeobachtung in Oberschlesien. – Schriftenr. oberschles. Heimatkd., Oppeln 7: 1-26.

– (1938): Die Uferschwalbenkolonien in Oberschlesien. – Oberschelsier 20: 411-423.

– (1939): Neues von unseren Storch. Heimatkd. Falkenberg.

– (1944): Veranderungen des Lachmöwenbeständes in Oberschlesien. – Ver. schl. Orn. 28: 43-46.

Dobranowski H. (2002): Przeloty jesienne ptaków wodno-błotnych na stawach koło Tułowic. – Przyr. Śląska Opol. 8: 15-20.

Dyrcz A. (1973): Ptaki polskiej części Karkonoszy. Ochrona Przyrody 38: 213-284.

– (1981): Ptaki Zbiornika Otmuchowskiego. – Acta zool. cracov. 25: 69-102.

Dyrcz A., Grabiński W., Stawarczyk T. & Witkowski J. (1991): Ptaki Śląska – monografia faunistyczna. Wrocław: Uniwersytet Wrocławski.

Flousek J. & Gramsz B. (1999): Atlas hnízdního rozšíření ptáků Krkonoš (1991-1994). Správa KRNAP, Vrchlabí.

Gramsz B. (2003): Liczebnośc i rozmieszczenie rzadszych gatunków ptaków lęgowych Karkonoszy w latach 1990-2003. –Przyroda Sudetów 6: 153-170.
Hebda G. & Wyszyński M. (2001): Świat zwierząt. In: Makowiecki J. & Koziarski S. (eds). Walory przyrodnicze Obszaru Chronionego Krajobrazu Bory Niemodlińskie, Opole, Uniwersytet Opolski, pp. 117-147.
Janowski K. (1967): Niektóre ptaki obserwowane w powiecie niemodlińskim w latach 1964-1965. – Acta orn. 10: 243-253.
Kollibay P. (1906): Die Vögel der Preussischen Provinz Schlesien. Breslau.
Kopij G. (1989): Ptaki okolic Korfantowa w okresie lęgowym. – Ptaki Śląska 7: 98-114.
– (1990): Rozmieszczenie i liczebność płomykówki (*Tyto alba*) na południowej Opolszczyźnie. – Not. orn. 31: 43-52.
– (1992): Dokumentacja zanikania kuraków Galliformes na Śląsku Opolskim. – Chrońmy Przyr. ojcz. 48(6): 81-87.
– (1996): Awifauna lęgowa Przedgórze Paczkowskie i Obinżenie Otmuchowskie. – Chrońmy Przyr. ojcz. 52(1): 83-89.
– (1997): Pozyskanie kuropatwy *Perdix perdix* i bażanta *Phasianus colchicus* w województwie opolskim w latach 1963-1989. – Przyr. Śląska Opol. 3: 44-46.
– (1999): Awifauna lęgowa Płaskowyżu Głubczyckiego. – Chr. Przyr. ojcz. 55(2): 34-51.
– (2001): Awifauna Stawów Niemodlińskich. – Chr. Przyr. ojcz. 57(1): 46-80.
– (2002): Ptaki lasów i terenów otwartych Ziemi Niemodlińskiej. – Prz. przyr. 13: 131-148.
– (2003a): Wyniki inwentaryzacji gniazd bociana białego *Ciconia ciconia* na Ziemi Niemodlińskiej, Nyskiej i Prudnickiej w latach 1974-1991. – Przyr. Śląska Opol. 9: 1-7.
– (2003b): Zmiany liczebności gawrona *Corvus frugilegus* w regionie Nysy na przestrzeni XX wieku. – Przyr. Śląska Opol. 9: 15-16.
– (2006a): Awifauna lęgowa Ziemi Grodkowskiej. – Prz. przyr. 17: 87-106.
– (2006b): Rzadkie gatunki ptaków obserwowane w woj. opolskim do roku 2000. – Przyr. Śląska Opol. 12: 6-21.
– (2009): Badania ilościowe nad ptakami lęgowymi okolic Niemodlina. – Przyr. Śląska Opol. 15: 1-23.
– (2011): Monografia Przyrodnicza Gminy Korfantów. Korfantów: Urząd Miasta i Gminy Korfantów.
– (2012a): Awifauna lęgowa Ziemi Nyskiej. – Chrońmy Przyr. ojcz. 68(4): 259-287.
– (2012b): Awifauna lęgowa gminy Łambinowice na Śląsku Opolskim. – Przyr. Śląska opol. 18: 1-20.
– (2013a): Reproductive performance in relation to population dynamics in the White Stork *Ciconia ciconia* nesting in the neighboring woodlands and farmlands. – Alauda 81(3): 233-236.
– (2013b): Ptaki lęgowe dolnego odcinka Ścinawy Niemodlińskiej. – Przyr. Śląska Opol. 19: 34-35.
– (2014): Bocian biały *Ciconia ciconia* w byłym powiecie niemodlińskim w 1937 r. – Przyr. Śląska Opol. 20: 42.
Kopij G., Jeszka W. & Jakubiec Z. (2001): Wyniki inwentaryzacji gniazd bociana białego *Ciconia ciconia* na Śląsku Opolskim w drugiej połowie XX wieku. – Przyr. Śląska Opol. 7: 1-36.
Kopij G. & Profus P. (2014): Występowanie i liczebność kuraków leśnych (Galliformes) na Śląsku w latach 2002-2014 i zmiany w ich liczebności na przestrzeni ostatnich 140 lat. – Chr. Przyr. ojcz. 70: 387-409.
Makowiecki J. & Koziarski S. (eds) (2001): Walory przyrodnicze Obszaru Chronionego Krajobrazu Bory Niemodlińskie. Opole, Uniwersytet Opolski.
Mrugasiewicz A. & Witkowski J. (1962): An ornithological skatch of Barycz Valley in Poland. – British Birds 55: 245-272.
Profus P. (2006): Bocian biały w województwie opolskim w roku 2004. In: Guziak R. & Jakubiec Z. (eds). Bocian biały *Ciconia ciconia* (L.) w Polsce w roku 2004. Wrocław: PTPP „pro Natura", pp. 177-199.
Profus P. & Mielczarek P. (1981): Zmiany liczebności bociana białego *Ciconia ciconia* (Linnaeus, 1758) w południowej Polsce. – Acta zool. cracov. 25: 139-218.
Pax F. (1925): Wirbeltierfauna von Schlesien. Berlin, Gebrüder Borntraeger.
Schönermark R. (1922): Brutvögel des Kreises Falkenberg Ob./Schl. – Ber. Ver. Schles. Orn. 8: 41-48.
Sikora A., Rohde Z., Gromadzki M., Neubauer G. & Chylarecki P. (eds) (2007): Atlas rozmieszczenia ptaków lęgowych Polski 1985-2004. Poznań, Bogucki Wyd. Nauk.
Sutherland WJ. (2000): The conservation handbook: research, management and policy. Oxford: Blackwell Publishing.
Stadie R. (1929): Beiträge zur Biologie der schlesischen Lachmöwenkolonien. – Ber. Ver. Schles. Orn. 15: 23-46.
Stawarczyk T., Grabiński W. & Karnaś A. (1996): Migracje siewkowych Charadriiformes na zbiornikach Nyskim i Turawskim w latach 1976-1994. – Ptaki Śląska 11: 39-80.
Szarski KW. (1950): Obserwacje ornitologiczne w pradolinie Baryczy w latach 1946-49. – Ochrona Przyrody 19: 163-178.
Tomiałojć L. & Stawarczyk T. (2003): Awifauna Polski – rozmieszczenie, liczebność i zmiany. Wrocław: PTPP 'proNatura'.
Tomiałojć L. & Witkowski J. (1963): Ptaki obserwowane na terenie powiatu Niemodlin i Opole w dniach 26 i 27.V.1962. – Acta orn. 7: 293-296.
Witkowski J., Orłowska B., Ranoszek E. & Stawarczyk T. (1995): Awifauna doliny Baryczy. – Not. orn. 36: 65-74.
Witkowski J. & Orłowska B. (2012): Zmiany ilościowe w awifaunie lęgowej stawów milickich w okresie 1995-2010. – Ornis polon. 53: 1-22.

Table 2: Distribution and numbers of breeding pairs of selected water bird species in Niemodlin fish-ponds during the years 2002-2006. Explanations: **H** – Hutnik fhish-pond, **O** – other fish-ponds, ***** - nest, **x** – counts were not conducted, **-** – not recorded.

		Number of fish-ponds								Numbers of fish-ponds						
Species	**Year**	**near Lipno**								**near Rzędziwojowice**						
		10	**12**	**14**	**18**	**19**	**20**	**H**	**O**	**26**	**27**	**28**	**29**	**30**	**31**	**O**
Tachybaptus ruficollis	2002	1	2	5	4	2	1	-	-	-	-	-	-	-	-	-
	2004	-	-	-	-	1	-	-	1	1	-	1	-	-	-	-
	2006	-	-	-	-	x	-	-	-	x	-	x	1	-	-	-
Podiceps cristatus	2002	-	4	4	2	6	9	1	1	2	-	3	5	3	4	1
	2004	-	4	4	4	-	-	-	-	5	1	2	2	4	3	2
	2006	-	-	-		x	-	-	-	x	-	x	5	-	x	-
Botaurus stellaris	2002	-	-	4	2	2	1	-	-	1	-	-	-	1	3	-
	2004	-	1	1	1	-	1	-	-	2	-	-	1	-	-	-
	2006	-	-	3	1	x	-	-	-	x	-	x	1	-	x	-
Circus aeruginosus	2002	2	1	1	2	2	2	1	-	1	-	-	1	1	3	1
	2004	1	1	-	1	1	1	-	-	2	-	-	1	1	1	-
	2006	1	1	1	1*	x	1	-	-	x	-	x	1	1	x	-
Cygnus olor	2002	1	1	2	1	1	1	1	-	3	1	1	2	1	2	1
	2004	1	1	1	1?	-	-	1	-	2	-	-	1	1	-	1?
	2006	-	1	2*	1*	1	1	-	-	x	-	x	1?	1?	x	1
Anser anser	2002	1	2	5	2	1	2	-	-	-	-	-	1	2	3	1
	2004	1	-	3	2	-	1	-	-	4	-	-	-	2	-	-
	2006	1	-	2	2	x	2	-	-	x	2	x	2	1	x	5
Anas platyrhynchos	2002	9	10	5	5	4	7	5	23	6	13	1	-	-	7	5
	2004	6	-	-	2	-	4	2	-	8	5	1	4	-	-	2
	2006	29	5	5	10	x	10	-	-	x	5	x	3	-	x	-
Aythya ferina	2002	1	6	10	15	-	2	1	1	-	10	-	1	-	3	-
	2004	1	8	-	-	-	-	-	-	-	3	-	1	-	-	16
	2006	3*	2	1*	1	x	2	-	-	x	8	x	-	-	x	-
Aythya fuligula	2002	3	4	8	9	3	1	2	8	8	10	-	3	14	3	17
	2004	1	3	-	7	1	-	-	-	10	5	-	1	-	-	-
	2006	6	-	2	2	x	2	-	-	x	5	x	4	-	x	-
Fulica atra	2002	2	10	14	8	8	4	1	1	25	1	1	2	-	4	10
	2004	3	-	-	6	-	-	1	1	-	1	1	1	-	-	10
	2006	8*	9	16	4	x	5	-	-	x	-	x	4	-	x	-
Galinulla chloropus	2002	-	-	-	2	-	-	-	1	-	1	-	1	-	-	-
	2004	-	-	-	1	-	-	-	-	3	-	-	-	-	-	-
	2006	1	2	-	-	x	-	-	-	x	-	x	-	-	x	-
Acrocephalus arundinaceus	2002	4	2	6	-	2	2	2	-	-	3	-	5	4	8	2
	2004	5	2	9	5	3	3	1	-	13	2	1	5	4	-	4
	2006	3	2	3	2	x	2	-	-	x	-	x	-	4	x	-
Acrocephalus scirpaceus	2002	1	1	18	-	2	2	1	3	-	2	-	5	4	6	-
	2004	2	1	17	21	-	1	1	1	44	6	3	5	8	6	8
	2006	-	3	3*	-	x	5	-	-	x	-	x	-	6	x	-
Locustella luscinioides	2002	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-
	2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2006	-	-	1*	-	x	-	-	-	x	-	x	-	-	x	-
Emberiza schoeniclus	2002	-	-	8	-	-	-	1	-	-	1	-	-	-	3	-
	2004	1	-	8	7	-	-	1	-	8	2	-	1	2	2	1
	2006	4	-	x	x	x	-	-	-	x	-	x	3	2	x	-

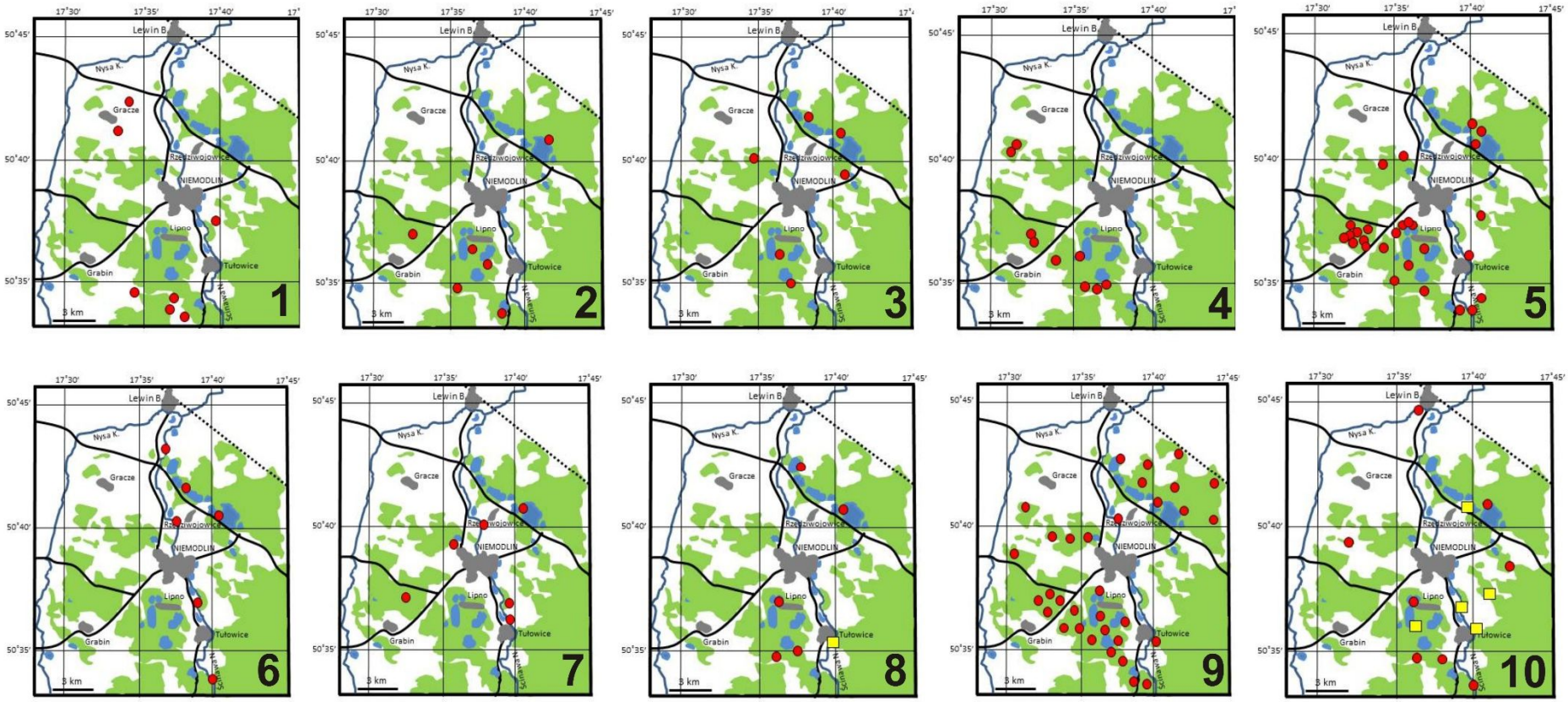
Table 3: Population changes of breeding bird species in Niemodlin countryside in the second half of 20th century and in the first decade of 21st century – for explanation of symbols see page 192.

Species	Number of breeding pairs in particular decade					
	1960	1970	1980	1990	2000	Trend
Cygnus olor	+	5	13	*	16-19	↑
Anser anser	3	2	11	>2	20-24	↑
Ans strepera	1	2	6	1	4	
Anas crecca	*	*	8	-	3?	
Anas platyrhynchos	*	*	200	*	>120	↔
Anas querquedula			3-4	-	5-7	↑
Anas clypeata			1-3	-	-	↓
Aythya ferrina			175	*	60	↓
Aythya nyroca			18	2	2-3?	↓
Aythya fuligula	2	1	110	*	90	
Bonasa bonasia			1-2	-	-	
Perdix perdix	*	*	*	*	*	↓
Coturnix coturnix	-	-	4-5	*	7	↑
Phasianus colchicus	*	*	*	*	*	
Tachypaptus ruficollis	*	*	38	*	15-19	↓
Podiceps cristatus	*	*	73	*	46	↓
Podiceps grisegena	4	2	18-20	>3	6	↓
Podiceps nigricollis	3	*	15	*	-	↓
Botaurus stellaris	1	4	15	>8	16-20	↑
Ixobrychus minutus	1-3	-	2-3	4	3-4	
Ardea cinerea	3	-	-	-	1-2	
Ciconia nigra	1	1-2	3	2	3?	↔
Ciconia ciconia	*	27	16-25	17-24	9-14	↓
Pernis apivorus	1	2	1	1	-	
Milvus migrans	-	-	1	-	1?	
Milvus milvus	+	1	-	-	-	
Haliaeetus albicilla	-	-	-	1	2	↑
Circus aeruginosus	12	5	22	15-20	18	↑
Accipiter gentilis	+	1	9	*	>6	
Accipiter nisus	-	-	2	?	1	
Buteo buteo	*	*	>68	*	*	
Falco tinnunculus	?	?	3-4	?	-	
Falco subbuteo		1	1	1	-	
Rallus aquaticus			5	*	2	
Porzana porzana	*	1-2	2	3	1?	
Crex crex	-	-	1-2	2	3	
Galinulla chloropus	*	*	*	*	12	↓?
Fulica atra	*	*	*	*	100	↓?
Grus grus	1	2	3	2	6	↑

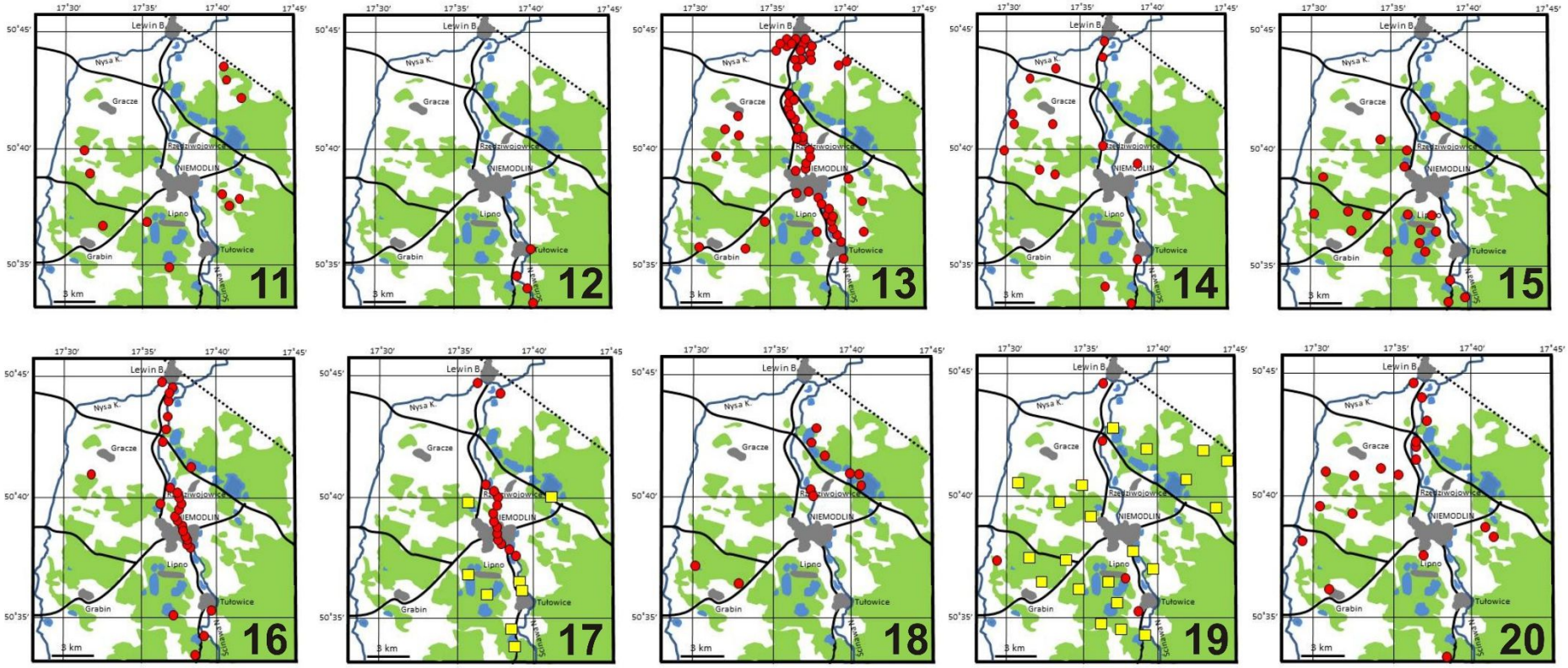
Species	Number of breeding pairs in particular decade					
	1960	1970	1980	1990	2000	Trend
Charadrius dubius			6	>1	6	
Vanellus vanellus	*	*	*	*	9-12	↓?
Gallinago gallinago	*	*	5-10	1	-	↓
Scolopax rusticolus	-	-	2	?	-	
Tringa ochropus			2-3	2	1?	
Tringa glareola	+	-	-	-	-	
Actitis hypoleucos				-	+	
Larus ridibundus	10-15	600	1500	*	100-200	↓
Larus canus			-	-	1	
Sterna hirundo			-	-	1?	
Columba livia			5-20	*	40-60	
Columba oenas		2	+	2	9	↑
Columba palumbus	*	*	*	*	*	
Streptopelia decaocto	*	*	250-450	*	>220	
Streptopelia turtur	*	*	*	*	>26	
Cuculus canorus	*	*	*	*	*	
Tyto alba	?	?	6	1	1	↓
Bubo bubo	-	-	+	-	?	
Athene noctua	-	-	1-2	-	-	
Asio otus	*	*	8-10	*	*	
Strix aluco	*	*	*	*	*	
Aegolius funereus	-	-	-	+	?	
Caprimulgus europaeus	-	-	1-2	?	?	
Apus apus	*	*	25-40	*	90-115	↑
Alcedo atthis	3	5	17	3	6	↓
Upupa epops	-	+	1-2	3	1	
Jynx torquilla	?	*	5	*	5	
Picus canus	?	3-4	3-4	*	5	↑
Picus viridis	?	*	4	*	1	↓
Dryocopus martius	*	*	10-11	*	33	↑
Dendrocopos major	*	*	*	*	*	
Dendrocopos medius	?	*	3	4	8	↑
Dendrocopos minor	-	-	9	*	5	
Galerida cristata	*	1	-	-	-	
Lullula arborea	*	*	*	*	11	
Alauda arvensis	*	*	*	*	*	
Riparia riparia	*	*	830	*	170	↓
Hirundo rustica	*	*	*	*	*	
Delichon urbica	*	*	*	*	*	

Species	Number of breeding pairs in particular decade					
	1960	1970	1980	1990	2000	Trend
Anthus campestris	-	-	-	1	1?	
Anthus trivialis	*	*	*	*	*	
Anthus pratensis	?	?	*	1	2	
Motacilla flava	*	*	*	*	*	
Motacilla cinerea	-	-	1	*	4	↑
Motacilla alba	*	*	*	*	*	
Troglodytes troglodytes	*	*	*	*	*	
Prunella modularis	*	*	*	*	*	
Erithacus rubecula	*	*	*	*	*	
Luscinia megarhynchos	*	*	*	*	54	
Phoenicurus ochruros	*	*	*	*	>73	
Phoenicurus phoenicurus	*	*	*	*	*	
Saxicola rubetra	*	*	*	*	*	
Saxicola torquata	-	-	12	*	16	↑
Oenanthe oenanthe	-	-	1	*	+	
Turdus merula	*	*	*	*	*	
Turdus pilaris	+	+	*	*	*	
Turdus philomelos	*	*	*	*	*	
Turdus viscivorus	?	?	12	*	19	
Locustella naevia	-	*	*	>13	27	
Locustella fluviatilis	?	?	*	*	16	
Locustella luscinioides	?	?	6-7	+	8	
Acrocephalus schoenobaenus	*	*	*	*	>4	
Acrocephalus palustris	*	*	*	*	*	
Acrocephalus scirpaceus	*	*	*	*	124-150	
Acrocephalus arundinaceus	*	*	47	*	57-70	
Hippolais icterina	*	*	*	*	*	
Sylvia nisoria	?	3-4	1	*	>1	
Sylvia curruca	*	*	*	*	*	
Sylvia communis	*	*	*	*	*	
Sylvia atricapilla	*	*	*	*	*	
Sylvia borin	*	*	*	*	*	
Phylloscopus sibilatrix	*	*	*	*	*	
Phylloscopus collybita	*	*	*	*	*	
Phylloscopus trochilus	*	*	*	*	*	
Regulus regulus	*	*	*	*	*	
Regulus ignicapillus	*	*	*	*	>27	
Muscicapa striata	*	*	*	*	*	
Ficedula parva	-	1	1	-	-	

Species	Number of breeding pairs in particular decade					
	1960	1970	1980	1990	2000	Trend
Ficedula albicollis	-	-	4	5	11	↑
Ficedula hypoleuca	*	*	*	*	*	
Aegithalos caudatus	*	*	*	*	*	
Parus palustris	*	*	*	*	*	
Parus montanus	*	*	*	*	*	
Parus cristatus	*	*	*	*	*	
Parus ater	*	*	*	*	*	
Parus caeruleus	*	*	*	*	*	
Parus major	*	*	*	*	*	
Sitta europaea	*	*	*	*	*	
Certhia familiaris	*	*	*	*	*	
Certhia brachydactyla	*	*	*	*	>32	
Remiz pendulinus	?		17	*	>6	
Oriolus oriolus	*	*	*	*	*	
Lanius collurio	*	*	*	*	*	
Lanius excubitor	?	?	5	1	2	
Lanius senator	-	+	+	-	-	
Garrulus glandarius	*	*	*	*	*	
Pica pica	*	*	40-45	*	*	↓
Corvus monedula	*	*	23-38	*	15-18	↓
Corvus cornix	*	*	29	*	5	↓
Corvus corax	-	-	4	*	21	↑
Sturnus vulgaris	*	*	*	*	*	
Passer domesticus	*	*	*	*	*	
Passer montanus	*	*	*	*	*	
Fringilla coelebs	*	*	*	*	*	
Serinus serinus	*	*	*	*	*	
Carduelis chloris	*	*	*	*	*	
Carduelis carduelis	*	*	*	*	*	
Carduelis spinus	-	-	-	*	*	
Carduelis cannabina	*	*	*	*	*	
Loxia curvirostra	-	-	-	*	*	
Carpodacus erythrinus	-	-	*	?	-	
Pyrrhula pyrrhula	?	*	*	*	*	
Coccothraustes coccothraustes	*	*	*	*	*	
Emberiza cintrinella	*	*	*	*	*	
Emberiza hortulana	?	?	?	>25	18	
Emberiza schoeniclus	*	*	*	*	40-60	
Miliaria calandra	*	*	*	*	*	



Figs 1–10: Maps with distribution of species from breeding avifauna of Niemodlin countryside – for captions to figures see page 192.



Figs 11–20: Maps with distribution of species from breeding avifauna of Niemodlin countryside – for captions to figures see page 192.

Explanation of symbols from Table 3:

Status: * breeding, + probably breeding, - non-breeding.
Trend (during the years 1962-2007): ↑ - decline, ↓- increase, ↔ - stable.

Sources: 1) **1960's**: Tomiałojć & Witkowski 1963; Janowski 1967; 2) **1970's**: Borowiec & Grabiński 1982; 3) **1980's**: Kopij 2001, 2002; 4) **1990's**: Hebda & Wyszyński 2001; **2000's**: this study.

Captions to Figs 1-20:

Fig 1: Distribution of *Coturnix coturnix* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 2: Distribution of *Accipiter gentilis* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 3: Distribution of *Grus grus* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 4: Distribution of *Columba oenas* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 5: Distribution of *Streptopelia turtur* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 6: Distribution of *Alcedo atthis* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 7: Distribution of *Jynx torquilla* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 8: Distribution of *Picus canus* (red dots) and *Picus viridis* (yellow square) breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 9: Distribution of *Dryocopus martius* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 10: Distribution of *Dendrocopos medius* (red dots) and *Dendrocopos minor* (yellow squares) breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 11: Distribution of *Lulula arborea* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 12: Distribution of *Motacilla cinerea* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 13: Distribution of *Luscinia megarhynchos* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 14: Distribution of *Saxicola torquata* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 15: Distribution of *Turdus viscivorus* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 16: Distribution of *Locustella naevia* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 17: Distribution of *Locustella fluviatilis* (red dots) and *Locustella luscinioides* (yellow squares) breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 18: Distribution of *Ficedula albicollis* breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 19: Distribution of *Corvus cornix* (red dots) and *Corvus corax* (yellow squares) breeding pairs in Niemodlin countryside during the years 2002-2006.

Fig 20: Distribution of *Emberiza hortulana* breeding pairs in Niemodlin countryside during the years 2002-2006.

Author's address: Grzegorz Kopij, Department of Vertebrate Ecology, Wroclaw University of Environmental & Life Sciences, Kożuchowska 5b, 51-631 Wrocław, Poland.
E-mail: grzegorz.kopij@up.wrpc.pl