

Studies of avian communities along river Drava, between 2000-2004 (Aves)

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FENYŐSI L.: *Studies of avian communities along river Drava, between 2000-2004 (Aves)*

Abstract: The monitoring of avian fauna (Aves) along river Drava was launched in 2000. According to our results total density in the floodland sample areas in 2000-2004 was found to range between 54.0-76.56 pairs/10 ha. In the study years a total of 5-14 pairs of *Sterna albifrons* and 50-90 pairs of *Sterna hirundo* bred annually in the Drava section between river kilometres 236-180, being distributed in 2-3 nest colonies. Between river kilometres 199-180 a minimum of 32-48 pairs of *Charadrius dubius* and minimum 5-15 pairs of *Actitis hypoleucos* occupied their territories in the studied years. The nesting of 1116-2370 pairs of *Riparia riparia* and 2-23 pairs of *Merops apiaster* was recorded in the Drava section between river kilometres 199-133 in the study years. During our investigations in the Berzence grassland habitat 10-15 bird species were found to breed annually, with total density varying between 9.28-13.34 pairs/10 ha. Data from the waterfowl surveys in 2001-2004 between river kilometres 199-184, 30 species occurred among the studied taxa, with the maximum number of specimens recorded in this section being 4650. The *Ciconia ciconia* population along river Drava decreased from 58 to 45 pairs in the studied years. During the monitoring studies we have gathered data on the occurrence of a total of 162 bird species.

Key words: Aves, Drava, biomonitoring, nature conservation

Introduction

The Government of the Hungarian Republic decreed in 1999 that a monitoring system of the Drava region be established, which is essential for analysing changes in the status of nature conservation areas. As part of "Drava Monitoring", the study of birds (Aves) was also launched, since the presence/absence of the target species and the densities and reproduction of the particular populations bear information in respect of tracing down changes in the condition of habitats. The "Protocol" completed in spring 2000 (Proposal for the Monitoring of Birds) included the proposed target taxa and project objectives. When choosing the species, the publication by BALDI et. al. (1997) was taken as a basis, with the authors specifying 82 taxa, of which 63 are part of the minimal, 74 as part of the optimal, and 82 as part of the maximal program. There are about 35 of these species occurring regularly along the Somogy county section of the Drava, of which 25 also nest there. Nester species are scattered in small numbers over large areas, with often only one or two pairs being present, therefore instead of species monitoring it seemed more reasonable to monitor avian communities, focusing on both rare and more frequent species that have suitable indicative capacity.

Being state border areas, river Drava and its environment used to be strictly guarded until the 1990s, therefore research work was practically not done there. Although there

were several intensive studies done in Belső-Somogy, there are almost no references to the Drava region in publications about the southern Somogy region (e.g. VASVÁRI 1937, SZÉCHENYI 1942, MARIÁN 1958, KÁRPÁTI 1979, MARIÁN & PUSKÁS 1985, BANK 1989). As of the 1990s, an increasing number of shorter articles have dealt with the avian fauna of the Drava, e.g. FENYŐSI 1993a, 1993b, BÉCSY, FENYŐSI & HORVÁTH 1995, FENYŐSI 1995a, 1995b, FENYŐSI et al. 1995, FENYŐSI & STIX 1996, 1998, JUHÁSZ 1995. The avian fauna of the Hungarian area affected by the planned hydroelectric power plant at Durdevac was investigated by BANK (1990) who provided evidence of the occurrence of 163 bird species from the region of Őrtilos and Gyékényes. FENYŐSI 1996 provided a summary of observations along river Drava between 1983-1996, with faunal as well as population estimation data being presented. Since the mid-1990s, the more interesting observation data have been published in corresponding issues of the journal *Tűzok* (HADARICS 1996-1999). Reports on Drava region populations were presented by FENYŐSI (1998a) and FENYŐSI & HORVÁTH (2000) on white storks, by FENYŐSI et al. (1998) on barn owls, and by HORVÁTH et al. 2002 on black storks. Short communications were released by FENYŐSI (1998b) on the little tern population nesting along river Drava, by FENYŐSI 1999 on Canada goose occurrence, and by HORVÁTH (2002) on lesser spotted eagle occurrence. Organized by the Hungarian Water Wildlife Research Group, the waterfowl monitoring of the Drava reach between Barcs and Szentborbás was launched in 1996. The results are found in the study volumes by FARAGÓ (1997, 1999, 2001) and in the papers by FENYŐSI (2000a, 2002), where it is reported that 27 water bird species occurred on the Barcs-Szentborbás Drava-reach in the studied period. The avian fauna of areas along the Hungarian section of river Drava was reported by PURGER (1998) to include 154 species based on observations between 1995-97, and 217 species based on available literature data. The results of bank swallow population surveys done between river kilometres 199-132 of Drava in 2000-2003 were presented by FENYŐSI (2003). Water birds occurring on the gravel-pit pond excavated in Gyékényes in the Drava gravel plateau were studied by MEZEI (2001, 2003). Further information is provided about the avian fauna of the Drava in the synthetic bibliographic study on the birds of the Barcs Juniper Woodland (FENYŐSI 2000b), and by the work analysing the checklist and ornithological literature of birds having occurred in Somogy county before 2000, in PURGER & FENYŐSI 2001. Publications on the avian fauna of Croatian and Slovenian territories of the Drava are released in the leaflets *Acrocephalus* and *Troglodytes*, especially from the regions of Maribor-Ptuj, Ormoz-Légrád and Donji Miholjac. Results of ornithological research in areas affected by the planned hydroelectric power plant are published by RADOVIC (1996), reporting on the occurrence of 95 bird species. The avian fauna of Croatian territories of the Drava between Gyékényes and Bélavár is dealt with by RADOVIC (2004).

The area investigated in this paper is primarily the 1-4 km wide stripe extending along Drava between Őrtilos-Gyékényes and Bélavár-Szentborbás, with data originating predominantly from these areas. Although the Drava section between Gyékényes and Bélavár is exclusively Croatian, some investigations were nevertheless done here too. The selected monitoring areas where regular sampling was done within Duna-Drava National Park are as follows:

- the water body of river Drava, both Hungarian and Croatian, with gravel shoals and high banks
- floodland forests near Őrtilos-Zákány and Vízvár
- Jalszina-meadow in Berzence

The Zákány hills in the westernmost pocket of the study area belong to the Zalaapáti-plateau small region. The other small region, of 1-4 km width, extending on the left side

of the Drava from Órtilos to Drávatamási, is the Middle Drava Valley. The Drava reach below Drávatamási belongs to the Drava Lowland small region, whereas areas of the Barcs Juniper Woodland are grouped with the small region of Eastern Inner Somogy. These small regions are characterised with moderately warm climate (with the annual mean temperature being around 10.0-10.5 °C), and with precipitation amounts decreasing from the northwest towards the southeast (mean: 750 mm).

Material and methods

The investigation of birds (Aves) within "Drava Monitoring" has, from the beginning, focussed on several significant taxa and has meant various methods. We believe that the selected communities and taxa well represent the avian fauna of the area, and, in the case of long term investigations, can reflect changes in the status of habitats. The monitoring of passerine communities in the Órtilos-Zákány and the Vízvár sampling areas was done using the method of "double-visit fixed radius point count technique" (MOSKÁT 1986, 1987). Members of *Passeriformes* species, as well as representatives of *Columbiformes* and *Piciformes* were recorded. Among shoal-nesters, the characteristic, nesting communities of *Charadrius*, *Actitis* and *Sterna* species, not observable anywhere else in Hungary, were monitored. The method followed was specimen counts and recording pairs and families moving together, as well as, in case of colony nesters, the counting of nests and incubating individuals. *Riparia riparia* and *Merops apiaster* populations were monitored between river kilometres 198-133 of the Drava. In the case of *Riparia riparia* the number of breeding pairs was calculated from counts of nest hollows, whereas *Merops apiaster* populations were recorded by individual counting. In recent years we have extended our surveys onto colonies found in Croatian Drava sections between river kilometres 236-198. On the Hungarian-Croatian river section between Bélavár (199 river km) and Heresznye (184 river km) migrating and overwintering populations of waterfowl are surveyed in January-March and October-December. Surveys are done primarily from boat, with species and number of individuals being recorded. In the Berzence Jalszina-meadow we use territory-mapping for investigating the nesting bird community. The open area is walked over 4-6 times in the nesting period, and the positions of individuals displaying nesting behaviour are fixed in a grid. The number of territories and nesting pairs can thus be determined. White storks are studied in 17 villages in the area between Órtilos and Szentborbás. Data recording inside the villages and in the outskirts is done in spring and in July, with parameters used in population surveys being recorded (HX, Hpa, HE, HPm, HPo, JZg, JZG, JZM, STD). Other faunal data are also continuously recorded in monitoring areas, thus creating a faunal database.

Results

Monitoring passerine communities

- Zákány sample area

The sample area was designated in the outskirts of the villages Zákány and Órtilos, in the floodland forest bordered by the railway line and river Drava (Fig. 1.). The survey was done in a 100 m radius circle in the case of 7 sampling points, and in a 100 m radius



Fig. 1.: Location of the Zákány sample area

semi-circle in 8 other sampling points (due to habitat characteristics). Thus, the studied area covers 34.54 ha. Results of the surveys between 2000-2004 in the sample area are shown in Tables 1-2.

There were 42 species nesting at least once in the monitoring area between 2000-2004; these are listed in Table 1. Among nesting species in the sample area the dominant ones were *Sylvia atricapilla* (D:11.31), *Turdus merula* (D:7.54), *Fringilla coelebs* (D:7.25), *Phylloscopus collybita* (D:6.09) and *Sturnus vulgaris* (D:6.67). The presence of the nest-

Table 1.: Checklist of species nesting in the Zákány sample area between 2000-2004

<i>Acrocephalus palustris</i>	<i>Locustella naevia</i>
<i>Aegithalos caudatus</i>	<i>Motacilla alba</i>
<i>Coccothraustes coccothraustes</i>	<i>Muscicapa striata</i>
<i>Carduelis chloris</i>	<i>Oriolus oriolus</i>
<i>Certhia brachydactyla</i>	<i>Parus caeruleus</i>
<i>Certhia familiaris</i>	<i>Parus major</i>
<i>Columba palumbus</i>	<i>Parus palustris</i>
<i>Corvus corone cornix</i>	<i>Phylloscopus collybita</i>
<i>Cuculus canorus</i>	<i>Phylloscopus trochilus</i>
<i>Dendrocopos major</i>	<i>Picus canus</i>
<i>Dendrocopos medius</i>	<i>Picus viridis</i>
<i>Dendrocopos minor</i>	<i>Remiz pendulinus</i>
<i>Dryocopus martius</i>	<i>Serinus serinus</i>
<i>Emberiza citrinella</i>	<i>Sitta europaea</i>
<i>Erithacus rubecula</i>	<i>Streptopelia turtur</i>
<i>Ficedula albicollis</i>	<i>Sturnus vulgaris</i>
<i>Fringilla coelebs</i>	<i>Sylvia atricapilla</i>
<i>Garrulus glandarius</i>	<i>Sylvia communis</i>
<i>Jynx torquilla</i>	<i>Troglodytes troglodytes</i>
<i>Lanius collurio</i>	<i>Turdus merula</i>
<i>Locustella fluviatilis</i>	<i>Turdus philomelos</i>

Table 2.: Results of the surveys done in the Zákány sample area between 2000-2004

Year	Number of species	Number of nesting pairs	Density (pairs/10 ha)
2000	30	209	60.61
2001	36	230	66.7
2002	33	261	75.69
2003	36	263	76.27
2004	36	264	76.56

ing populations of *Acrocephalus palustris* (8-17 pairs annually), *Dendrocopos medius* (1-2 pairs annually), *Ficedula albicollis* (3-5 pairs annually) and *Locustella fluviatilis* (6-17 pairs annually) in the sample area is considered to be an important nature conservation value.

- Vízvár sample area

The sample area is located south of the village Vízvár, in the floodland forest on the left side of the Drava (Fig. 2.). The survey was done in a 100 m radius circle in the case of 10 sampling points, and in a 100 m radius semi-circle in 5 other sampling points (due to habitat characteristics). Thus, the studied area covers 39.25 ha. Results of the surveys between 2000-2004 in the sample area are shown in Tables 3-4. There were 42 species nesting at least once in the monitoring area between 2000-2004; these are listed in Table 3. Among nesting species in the sample area the dominant ones were *Sylvia atri-capilla* (D:10.0-10.5), *Fringilla coelebs* (D:5.5-7.25), *Sturnus vulgaris* (D:4.25-6.25), *Turdus merula* (D:3.75-5.25) and *Phylloscopus collybita* (D:4.25-5.0). The presence of the populations of *Dendrocopos major* (6-9 pairs annually), *Ficedula albicollis* (1-8 pairs annually) and *Locustella fluviatilis* (3-6 pairs annually) in the sample area is considered to be an important nature conservation value.

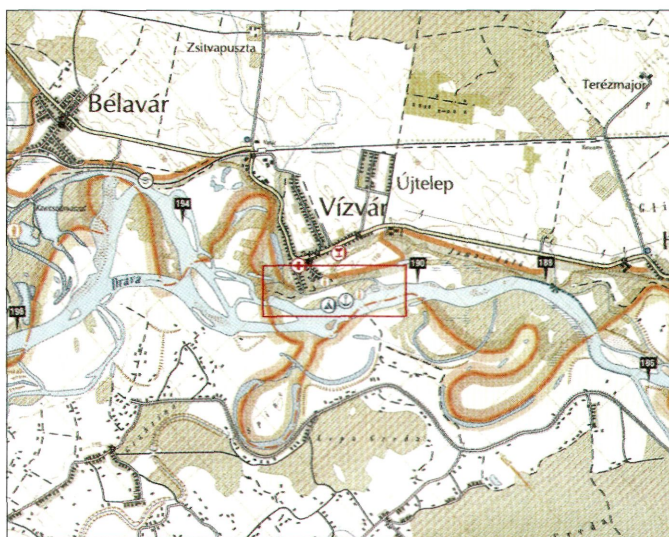


Fig. 2.: Location of the Vízvár sample area

Table 3.: Checklist of species nesting in the Vízvár sample area between 2000-2004

<i>Acrocephalus palustris</i>	<i>Oriolus oriolus</i>
<i>Aegithalos caudatus</i>	<i>Parus caeruleus</i>
<i>Coccothraustes coccothraustes</i>	<i>Parus major</i>
<i>Carduelis carduelis</i>	<i>Parus palustris</i>
<i>Carduelis chloris</i>	<i>Passer montanus</i>
<i>Certhia brachydactyla</i>	<i>Phylloscopus collybita</i>
<i>Certhia familiaris</i>	<i>Phylloscopus sibilatrix</i>
<i>Columba palumbus</i>	<i>Phylloscopus trochilus</i>
<i>Cuculus canorus</i>	<i>Picus canus</i>
<i>Dendrocopos major</i>	<i>Prunella modularis</i>
<i>Dendrocopos minor</i>	<i>Remiz pendulinus</i>
<i>Dryocopus martius</i>	<i>Serinus serinus</i>
<i>Emberiza citrinella</i>	<i>Sitta europaea</i>
<i>Erithacus rubecula</i>	<i>Streptopelia turtur</i>
<i>Ficedula albicollis</i>	<i>Sturnus vulgaris</i>
<i>Fringilla coelebs</i>	<i>Sylvia atricapilla</i>
<i>Garrulus glandarius</i>	<i>Sylvia borin</i>
<i>Locustella fluviatilis</i>	<i>Sylvia communis</i>
<i>Locustella naevia</i>	<i>Troglodytes troglodytes</i>
<i>Motacilla alba</i>	<i>Turdus merula</i>
<i>Muscicapa striata</i>	<i>Turdus philomelos</i>

Table 4.: Results of the surveys done in the Vízvár sample area between 2000-2004

Year	Number of species	Number of nesting pairs	Density (pairs/10 ha)
2000	25	136	34
2001	35	233	58.25
2002	34	216	54
2003	33	241	60.25
2004	32	254	63.5

The monitoring of shoal-nesters

Gravel shoals of the Drava are potential habitats for nesting communities unique in the Carpathian Basin, the species of which - *Actitis hypoleucos*, *Charadrius dubius*, *Sterna albifrons* and *Sterna hirundo* - can reliably indicate changes in the status of these habitats with their presence or absence. Surveying the gravel shoals is extremely difficult, due to special state border regulations, accessibility, and the erratic and unpredictable water regimes. The monitoring of shoal nesters is done as follows:

- Drava section between river kms 199-180 is a distinguished monitoring area (Fig. 3.), where a complete survey of shoal nesters (*Actitis hypoleucos*, *Charadrius dubius*, *Sterna albifrons* and *Sterna hirundo*) is done, with regular samplings

- populations of the the colony-nesting *Sterna* species are walk-surveyed in the entire Croatiaoan-Hungarian section of river Drava between Őrtilos (236 river km) and Bolhó (180 river km)

- for the more exact knowledge of *Actitis hypoleucos* and *Charadrius dubius* nesting populations, we also survey the Croatian river section between Őrtilos (236 river km) and Bélavár (199 river km), and also make population estimations.

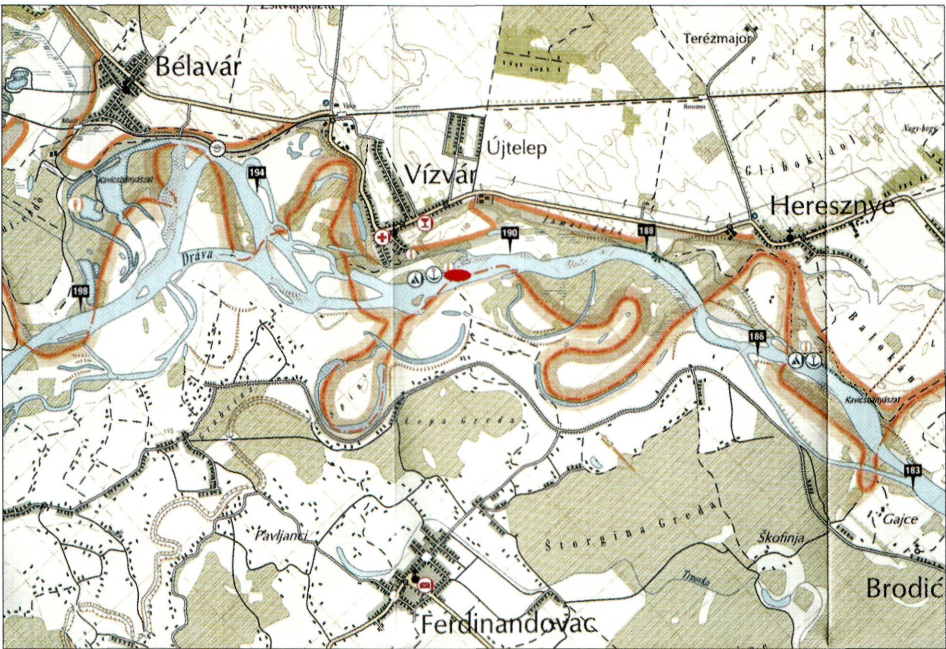


Fig. 3.: The Drava section between river kilometres 199-180

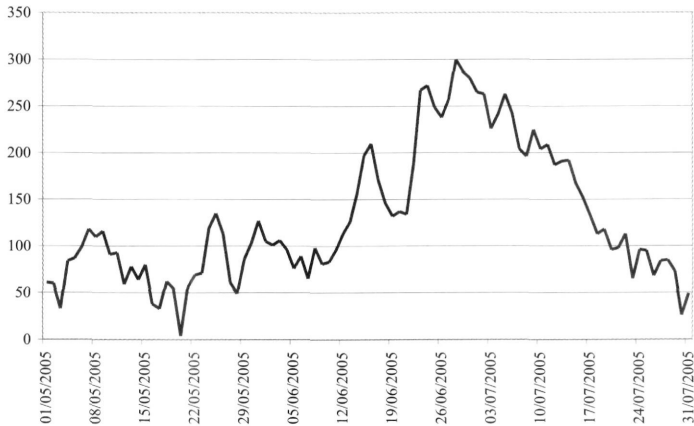
Population survey of *Sterna* species

Populations of *Sterna* species settling on gravel shoals were surveyed in the Drava section between Órtilos (236 river km) and Bolhó (180 river km) in 2000-2004 (there are no gravel shoals in the Drava section below Bolhó that are suitable for stern nesting, therefore new colonies are not expected to form). Between 2000-2004 there were 2-3 nest colonies annually in the Drava section between Órtilos (236 river km) and Bolhó (180 river km), with 5-14 pairs of *Sterna albifrons*, and 50-90 pairs of *Sterna hirundo* nesting there (Table 5.).

Unfortunately, nestings proceeded at a very low success rate in the studied period, due to late flood waves. According to earlier experience, water levels above 200 cm measured on the Barcs fluviometer are always with critical effect on nest colonies, these flood waves necessarily destroying the clutches. Daily water levels of the Drava, measured in Barcs in May-July 2004 are shown in Fig. 4.

Table 5.: Stern colonies in 2000-2004, between 236-180 Drava river kilometres

Year	Drava, 230-229 river km		Drava, 218 river km		Drava, 190-191 river km	
	<i>S. albifrons</i>	<i>S. hirundo</i>	<i>S. albifrons</i>	<i>S. hirundo</i>	<i>S. albifrons</i>	<i>S. hirundo</i>
2000	min. 8 pairs	min. 36 pairs	0	0	min. 6 pairs	min. 20 pairs
2001	min. 2 pairs	min. 45 pairs	0	0	min. 8 pairs	min. 45 pairs
2002	0	0	0	0	min. 5 pairs	min. 50 pairs
2003	0	0	min. 2 pairs	min. 15 pairs	min. 6 pairs	min. 40 pairs
2004	min. 1 pairs	min. 25 pairs	min. 2 pairs	min. 11 pairs	min. 4 pairs	min. 40 pairs

Fig. 4.: Daily water levels of the Drava, measured at Barcs in May-July 2004

Actitis hypoleucos and *Charadrius dubius* population survey between 199-180 Drava river kilometres

We attempted to do a complete population survey of *Charadrius dubius* and *Actitis hypoleucos* in the Hungarian-Croatian area of the Drava section between river kilometres 199-180 (cca. 650 ha). Population survey was done from both ashore and boat, completed with the walk-surveying of certain gravel shoals. Based on numbers of observed individuals, recorded pairs and incubating birds, nesting data of the studied species in 2000-2004 were found to be as presented in Table 6.

Our data show that annually at least 32-48 pairs of *Charadrius dubius* and at least 5-15 pairs of *Actitis hypoleucos* occupied nesting territories in the studied area (Table 6.). It was found that territory occupation and nesting success was considerably affected by water levels of the Drava. For example, due to prolonged high water levels, *Charadrius dubius* nested also in ploughland environments adjoining the river in several locations. Flood waves arriving in June-July tended to wash away a significant proportion of clutches, and, in certain years, replacement clutches as well.

Table 6.: Results of population survey between 199-180 Drava river kilometres in 2001-2004

Species	Bélavár 199-193 river km	Vízvár 192-188 river km	Heresznye 187-184 river km	Bolhó 183-180 river km	Total
2001					
<i>C. dubius</i>	8-10 pairs	15 pairs	8-10 pairs	4-5 pairs	35-40 pairs
<i>A. hypoleucos</i>	1-2 pairs	3-4 pairs	1-2 pairs	-	5-8 pairs
2002					
<i>C. dubius</i>	9 pairs	20 pairs	4 pairs	3 pairs	min. 36 pairs
<i>A. hypoleucos</i>	3 pairs	4 pairs	3 pairs	-	min. 10 pairs
2003					
<i>C. dubius</i>	15 pairs	22 pairs	6 pairs	5 pairs	min. 48 pairs
<i>A. hypoleucos</i>	4 pairs	5 pairs	2 pairs	1 pairs	min. 12 pairs
2004					
<i>C. dubius</i>	4 pairs	19 pairs	4 pairs	5 pairs	min. 32 pairs
<i>A. hypoleucos</i>	2 pairs	8 pairs	3 pairs	2 pairs	min. 15 pairs

Table 7.: Results of population estimations between Drava river kilometres 236-199, in 2002 and 2004

Species	236-229 river km	229-199 river km	Total
	2002		
<i>C. dubius</i>	8-10	40-60	48-70
<i>A. hypoleucos</i>	2-4	10-15	12-19
	2004		
<i>C. dubius</i>	min. 17	30-45	47-62
<i>A. hypoleucos</i>	min. 8	min. 16	24

Actitis hypoleucos and *Charadrius dubius* nesting population survey on the Drava section between Őrtilos (236 river km) to Bélavár (199 river km)

For the more exact knowledge of *Actitis hypoleucos* and *Charadrius dubius* nesting populations, we also surveyed river sections outside the monitoring area - between 236-199 river kms -, and made censuses and population estimations. The results are presented in Table 7.

As a summary of corresponding surveys, the *Charadrius dubius* population on the entire Hungarian-Croatian section of river Drava between Őrtilos (236 river km) and Bolhó (180 river km) can be estimated to at least 100-120 pairs, and the *Actitis hypoleucos* population to at least 30-40 breeding pairs. We believe that the stable populations of these bird species represent serious nature conservation values.

The monitoring of Riparia riparia (and Merops apiaster) populations

The monitoring area is the Drava section between Bélavár and Szentborbás (between 199 river km to 133 river km), where all the colonies on both the left and right side of the main river branch were surveyed each year. Nest hollows were counted, and, by assuming that 60% of hollows were occupied by nesting pairs (SZÉP 1991), their number was determined. Results are shown in Table 8.

Population size in the sample area in the studied period was found to be as shown in Fig. 5. In the Drava section at 65 river km, the number of colonies varied between 7-12, and the number of breeding pairs ranged between 1116-2370. In the studied period the

Table 8.: Results of riverbank surveys between Drava river kilometres 199-133, in 2000-2004

Year	Number of colonies	Number of <i>Riparia riparia</i> nest hollows	Number of <i>Riparia riparia</i> breeding pairs	Number of <i>Merops apiaster</i> breeding pairs
2000	12	3950	2370	14
2001	8	2540	1524	12
2002	12	1860	1116	5
2003	8	3265	1959	2
2004	7	2979	1787	23

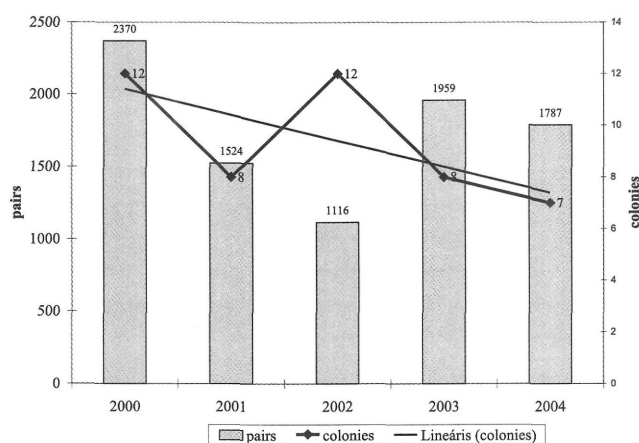


Fig. 5.: Changes in *Riparia riparia* population between Drava river kilometres 199-133

trend of population size changes was found to be decreasing. The distribution of colonies according to nest hollow numbers is shown in Fig. 6. From this figure it appears that the proportion of colonies with less than 200 nest hollows is considerably higher than the combined proportion of larger colonies. However, in 2003-2004 the distribution of colonies with different sizes is much more balanced. In each of the years, the largest colony formed near Heresznye (188 river km and 184-185 river km), with the largest colonies numbering 950-720-348-666-600 pairs, respectively, in successive study years.

For a more exact knowledge of *Riparia riparia* populations in the region, in addition to surveying the sample area, from 2001 we have also made censuses in three extra areas: in the mostly Croatian Drava section between 236-199 river kms, in the Viktorpuszta sand pit in the vicinity of the town Barcs, and at the waste-heap embankment of the Csíkos pit lake at Bélavár. The results are presented in Table 9.

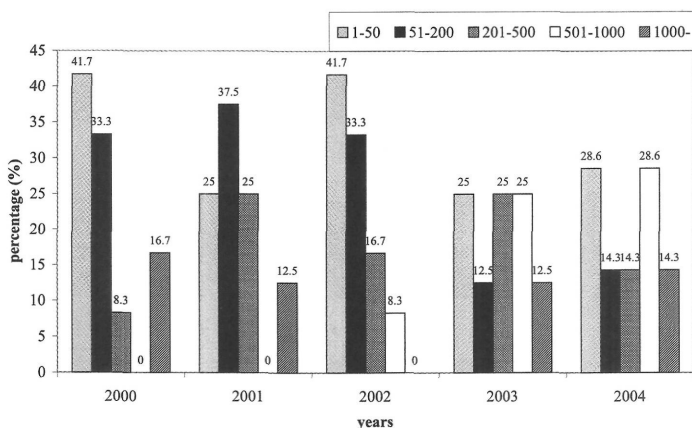


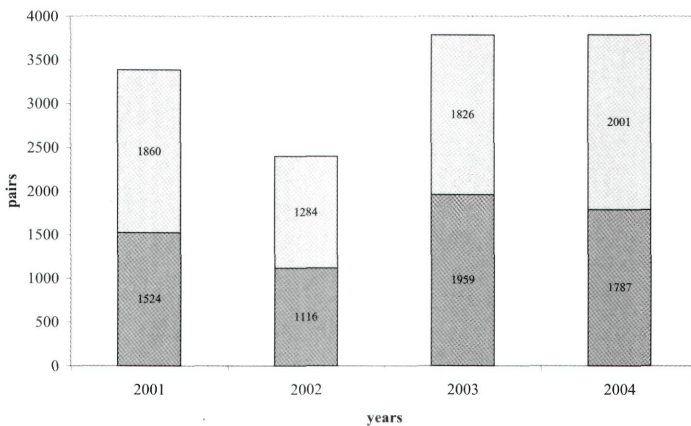
Fig. 6.: The distribution of nesting colonies, based on nest hollow numbers, between Drava river kilometres 199-133

Table 9.: Survey of other riverbank sites, 2001-2004

Year	Area	Number of colonies	Number of <i>Riparia riparia</i> nest hollows	Number of <i>Riparia riparia</i> breeding pairs	Number of <i>Merops apiaster</i> breeding pairs
2001	Drava 236-199 river km	3	2400	1440	0
	Barcs-Viktorpuszta	1	700	420	1
	Total	4	3100	1860	1
2002	Drava 236-199 river km	8	980	588	0
	Barcs-Viktorpuszta	1	1160	696	3
	Total	9	2140	1284	3
2003	Drava 236-199 river km	9	1190	714	0
	Barcs-Viktorpuszta	1	1820	1092	1
	Bélavár, Csíkos	1	35	21	7
	Total	11	3045	1827	8
2004	Drava 236-199 river km	9	2390	1434	1
	Barcs-Viktorpuszta	1	920	552	1
	Bélavár, Csíkos	1	25	15	10
	Total	11	3335	2001	12

As a summary of our investigations, we want to note the following:

- there was a decreasing trend of populations in the monitoring area during the studied period
- the entire Drava region - i.e. the Drava section between river kilometres 237-133, including the Viktorpuszta and Csíkos pits - is rather characterised with stability (Fig. 7.); yellow parts of the bars in Fig. 7. indicate population sizes of the monitoring-areas, whereas the green segments show populations of the other areas.
- although for determining the number of nesting pairs we employed the method known from the literature (i.e. 60% of nest hollows are considered to be occupied breeding pairs according to SZÉP 1991), we assume that due to the fact that Drava embank-

**Fig. 7.: *Riparia riparia* populations in the Drava region between 2000-2004**

ments are being continuously reproduced, the rate of occupied nests can be higher than 60%, at least 75% according to our estimation.

The monitoring of birds in the Jalszina-meadow at Berzence

The sample area is located near the village Berzence, in the Jalszina-meadow, covering 34 ha (Fig. 8.). During area surveys, the observed bird species and their numbers were recorded, and the position of individuals displaying territorial behaviour were fixed in a grid. The nesting bird community of the area was determined by evaluating the recording sheets and by marking the boundaries of territories. Although the number of samplings was less than usual for this method, this fact was balanced by the perfect observability of the meadow, by its relatively small extent, and the smaller (2x50m) stripe width applied. During the recordings in the successive years from 2001 to 2004, the number of bird species observed was 33, 24, 30, and 36, respectively. Of these, the number of species surely nesting in the area was 10 in 2001 (32 pairs), 12 in 2002 (35 pairs), 15 in 2003 (42 pairs), and 13 in 2004 (46 pairs) (Table 10.). The number of breeding pairs and density values are specified in Table 10.

From Table 10 it appears that the nesting bird community of the area was made up of 10-15 species in the various years. Among these, the species with the highest densities were usually *Alauda arvensis*, *Saxicola torquata*, *Miliaria calandra*, and *Acrocephalus schoenobaenus*, *Emberiza schoeniclus*, *Locustella naevia*. In 2003, and especially in 2004, extensive patches had long lasting water cover. This is what may have caused the appearance of species like *Anas* sp., *Fulica* and *Gallinula* for breeding, and also a significant change of density in certain species (e.g. *Saxicola rubetra*, *Acrocephalus schoenobaenus*). It is notable that the 3rd-4th highest density value in the studied years was reached by *Locustella naevia*. Table 11 includes the complete list of birds observed in the area (68 species). Among species listed in Table 11, we assume that *Ixobrychus*

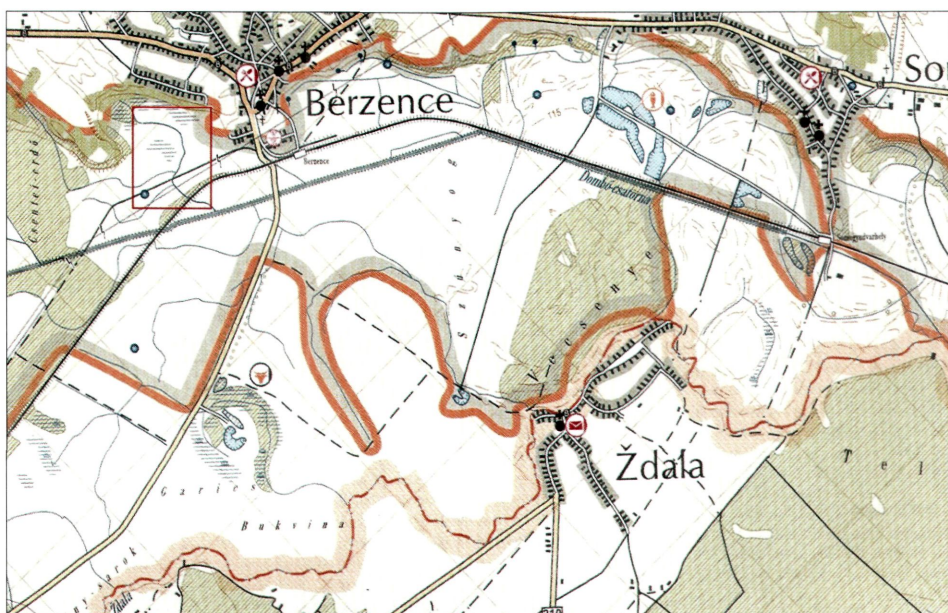


Fig. 8.: Location of the sample area in the vicinity of Berzence

Table 10.: Results of territory mapping in the Berzence meadow in 2001-2004

Species	2001		2002		2003		2004	
	Pairs	Density	Pairs	Density	Pairs	Density	Pairs	Density
<i>Anas platyrhynchos</i>	0	0	0	0	0	0	2	0.58
<i>Anas querquedula</i>	0	0	0	0	1	0.29	3	0.87
<i>Coturnix coturnix</i>	0	0	0	0	1	0.29	0	0
<i>Phasianus colchicus</i>	0	0	1	0.29	2	0.58	0	0
<i>Crex crex</i>	0	0	0	0	1	0.29	0	0
<i>Gallinula chloropus</i>	0	0	0	0	0	0	1	0.29
<i>Fulica atra</i>	0	0	0	0	0	0	4	1.16
<i>Cuculus canorus</i>	0	0	1	0.29	0	0	0	0
<i>Alauda arvensis</i>	0	0	5	1.45	7	2.03	4	1.16
<i>Saxicola rubetra</i>	1	0.29	2	0.58	1	0.29	5	1.45
<i>Saxicola torquata</i>	5	1.45	4	1.16	7	2.03	4	1.16
<i>Locustella naevia</i>	3	0.87	3	0.87	4	1.16	4	1.16
<i>Locustella luscinioides</i>	2	0.58	1	0.29	0	0	0	0
<i>Acrocephalus arundinaceus</i>	1	0.29	0	0	0	0	0	0
<i>Acrocephalus schoenobaenus</i>	5	1.45	4	1.16	1	0.29	8	2.32
<i>Acrocephalus palustris</i>	0	0	0	0	2	0.58	0	0
<i>Sylvia communis</i>	1	0.29	0	0	1	0.29	1	0.29
<i>Lanius collurio</i>	1	0.29	1	0.29	2	0.58	1	0.29
<i>Emberiza citrinella</i>	0	0	1	0.29	1	0.29	0	0
<i>Emberiza schoeniclus</i>	8	2.32	5	1.45	3	0.87	3	0.87
<i>Miliaria calandra</i>	5	1.45	7	2.03	8	2.32	6	1.74
Total	32	9.28	35	10.15	42	12.18	46	13.34

Table 11.: Checklist of all the observed bird species in the Berzence meadow in 2001-2004

<i>Acrocephalus arundinaceus</i>	<i>Falco tinnunculus</i>
<i>Acrocephalus palustris</i>	<i>Falco vespertinus</i>
<i>Acrocephalus schoenobaenus</i>	<i>Ficedula albicollis</i>
<i>Aegithalos caudatus</i>	<i>Fringilla coelebs</i>
<i>Alauda arvensis</i>	<i>Fulica atra</i>
<i>Anas acuta</i>	<i>Gallinago gallinago</i>
<i>Anas clypeata</i>	<i>Gallinula chloropus</i>
<i>Anas platyrhynchos</i>	<i>Garrulus glandarius</i>
<i>Anas querquedula</i>	<i>Haliaeetus albicilla</i>
<i>Anser anser</i>	<i>Hirundo rustica</i>
<i>Anthus pratensis</i>	<i>Íxobrychus minutus</i>
<i>Apus apus</i>	<i>Lanius collurio</i>
<i>Ardea cinerea</i>	<i>Locustella fluviatilis</i>
<i>Ardea purpurea</i>	<i>Locustella luscinioides</i>
<i>Aythya nyroca</i>	<i>Locustella naevia</i>
<i>Buteo buteo</i>	<i>Luscinia megarhynchos</i>
<i>Carduelis cannabina</i>	<i>Miliaria calandra</i>
<i>Carduelis carduelis</i>	<i>Motacilla alba</i>
<i>Chloris chloris</i>	<i>Oriolus oriolus</i>
<i>Ciconia ciconia</i>	<i>Parus major</i>
<i>Ciconia nigra</i>	<i>Phasianus colchicus</i>
<i>Circus aeruginosus</i>	<i>Philomachus pugnax</i>
<i>Corvus corax</i>	<i>Phylloscopus sibilatrix</i>
<i>Coturnix coturnix</i>	<i>Picus canus</i>
<i>Crex crex</i>	<i>Rallus aquaticus</i>
<i>Cuculus canorus</i>	<i>Saxicola rubetra</i>
<i>Cygnus olor</i>	<i>Saxicola torquata</i>
<i>Delichon urbica</i>	<i>Sylvia atricapilla</i>
<i>Dendrocopos major</i>	<i>Sylvia communis</i>
<i>Egretta alba</i>	<i>Sylvia nisoria</i>
<i>Emberiza citrinella</i>	<i>Tachybaptus ruficollis</i>
<i>Emberiza schoeniclus</i>	<i>Turdus merula</i>
<i>Erithacus rubecula</i>	<i>Turdus viscivorus</i>
<i>Falco subbuteo</i>	<i>Vanellus vanellus</i>

Table 12.: Occurring waterfowl species and their specimen numbers in the Drava section between river kilometres 199-184, in 2001

Species	03/02/2001	07/03/2001	07/04/2001	12/10/2001	09/12/2001
<i>Tachybaptus ruficollis</i>	8	14			9
<i>Podiceps cristatus</i>	1				
<i>Phalacrocorax carbo</i>	44	35	2	7	13
<i>Egretta alba</i>	9	3		3	6
<i>Ardea cinerea</i>	3		2	18	2
<i>Cygnus olor</i>	10	2		8	11
<i>Anas crecca</i>	41				60
<i>Anas platyrhynchos</i>	3810	8	27		1355
<i>Bucephala clangula</i>	1				3
<i>Mergus merganser</i>					1
<i>Haliaeetus albicilla</i>	3	1			2
<i>Pandion haliaetus</i>				1	
<i>Circus aeruginosus</i>			1		
<i>Gallinula chloropus</i>					1
<i>Fulica atra</i>	4				1
<i>Vanellus vanellus</i>		54	1		
<i>Charadrius dubius</i>			1		
<i>Actitis hypoleucos</i>			4		
<i>Tringa ochropus</i>	6	1	11		4
<i>Tringa nebularia</i>			1		
<i>Alcedo atthis</i>			2	4	2
Total	3940	118	52	41	1470

minutus and *Gallinago gallinago* are occasional nesters. It is remarkable from the complete list that the proportion of migrating species and those visiting the area for feeding is much higher (69.9%) than those of breeding there (30.1%).

The monitoring of wintering and migrating water birds on the Drava section between Bélavár (199 river km) and Heresznye (184 river km)

Wintering and migrating water birds on the Drava section between Bélavár (199 river km) and Heresznye (184 river km), as well as in side-branches associated with this river section were monitored in 2001-2004, from autumn to spring (from September to March). Bird censuses were made from ashore (Hungarian areas), and from boat (Hungarian-Croatian areas). The results of the recordings are presented in Tables 12-15, from where it appears that during 24 samplings, a total of 30 species belonging to the studied taxa were observed. As our results suggest, higher abundance values and species numbers in this Drava section can be expected in the period between December-February; the highest values were observed on 20th January 2002, with 15 species and 4650 individuals. Based on the recordings, the most frequent *A. platyrhynchos* (91.7%) is followed by *Phalacrocorax carbo* (79.2%), *Egretta alba* (79.2%), *Ardea cinerea* (75%), *Cygnus olor* (62.5%) and *Haliaeetus albicilla* (54.2%). It was found that 92% of all bird specimens observed (17 884) were *Anas platyrhynchos*, therefore this species turned out to be the absolutely dominant one.

Table 13.: Occurring waterfowl species and their specimen numbers in the Drava section between river kilometres 199-184, in 2002

Species	20/01/2002	25/02/2002	30/10/2002	10/12/2002
<i>Tachybaptus ruficollis</i>	8		9	4
<i>Podiceps cristatus</i>	1	1	1	
<i>Phalacrocorax carbo</i>	9	56	113	27
<i>Egretta alba</i>	3		6	
<i>Ardea cinerea</i>	5	3	2	
<i>Cygnus olor</i>	2	17		
<i>Anas crecca</i>	23			
<i>Anas platyrhynchos</i>	4580	4	10	238
<i>Anas acuta</i>	1			
<i>Aythya ferina</i>	1			
<i>Aythya fuligula</i>	4			
<i>Bucephala clangula</i>	4			5
<i>Mergus albellus</i>	6			
<i>Haliaeetus albicilla</i>	1	3	2	1
<i>Tringa ochropus</i>	2	5	1	
<i>Alcedo atthis</i>			1	
Total	4650	89	145	275

Table 14.: Occurring waterfowl species and their specimen numbers in the Drava section between river kilometres 199-184, in 2003

Species	20/02/2003	27/03/2003	04/09/2003	30/09/2003	14/10/2003	22/10/2003	14/11/2003	02/12/2003	11/12/2003
<i>Gavia arctica</i>								1	
<i>Tachybaptus ruficollis</i>	5					2			
<i>Podiceps cristatus</i>	1								
<i>Phalacrocorax carbo</i>	17	7		4				5	25
<i>Egretta alba</i>	3		4	8	9	8			5
<i>Ardea cinerea</i>	6	4	2	8		2	1		
<i>Ciconia nigra</i>			6						
<i>Cygnus olor</i>	16		3				1		23
<i>Anas crecca</i>	5								
<i>Anas platyrhynchos</i>	735	32	400	7	20	10		500	50
<i>Anas acuta</i>	1								
<i>Bucephala clangula</i>	4								
<i>Mergus albellus</i>	3								
<i>Haliaeetus albicilla</i>	2	2				1			
<i>Pandion haliaeetus</i>				1					
<i>Rallus aquaticus</i>						1			
<i>Gallinula chloropus</i>						1			
<i>Tringa nebularia</i>				6					
<i>Tringa ochropus</i>	3								
<i>Alcedo atthis</i>		1	2		1	2	2		
Total	801	46	417	34	30	27	4	506	103

Table 15.: Occurring waterfowl species and their specimen numbers in the Drava section between river kilometres 199-184, in 2004

Species	27/01/2004	15/02/2004	04/09/2004	15/10/2004	17/11/2004	07/12/2004
<i>Tachybaptus ruficollis</i>	4	6		3	5	5
<i>Phalacrocorax carbo</i>	13	56		59	20	65
<i>Egretta alba</i>	10	7	1	2		6
<i>Ardea cinerea</i>	3	5		5	2	6
<i>Cygnus olor</i>	12	6		2	3	6
<i>Anas penelope</i>	22					
<i>Anas crecca</i>	30	8		4		60
<i>Anas platyrhynchos</i>	2130	1085	10	190	280	980
<i>Aythya ferina</i>						6
<i>Aythya fuligula</i>					1	
<i>Bucephala clangula</i>		4				4
<i>Haliaeetus albicilla</i>	2		1	1		
<i>Fulica atra</i>	1					
<i>Tringa nebularia</i>			2			
<i>Tringa ochropus</i>	1			2		
<i>Larus cachinnans</i>						1
Total	2228	1176	14	268	311	1139

The monitoring of white stork (Ciconia ciconia) populations

The sample area along river Drava selected in 2000 is made up of 17 village districts between Órtilos and Barcs. The extent of the area including both outskirts and inner village areas is 511 km². During the surveys we also visited, in addition to nests inside the villages, those few that are located in the outskirts. The following abbreviations and parameters are used for presenting the results:

HX: uninhabited nest

HE: solitary individual

HPa: number of breeding pairs

HPo: unsuccessful nesting

HPm: successful nesting

JZG: number of young birds leaving the nest

The most notable findings of the surveys between 2000-2004 are presented in Figures 9-10. From Fig. 9 it appears that between 2000-2004 the number of nesting pairs (HPa) decreased from 58 to 45 (by almost 20%). Associated with this trend, the number of uninhabited or abandoned nests (HX) in the same period grew to fivefold the initial value (increased from 3 to 15). The number of young birds leaving the nests varied between 79-108 in 2000-2004 (Fig. 10). It is seen from Fig. 10 that the high number of fledgelings in 2000 is unparalleled in the rest of the study years. The rate of successful (HPm) vs. unsuccessful (HPo) nestings in the studied period appeared to be balanced, with minor fluctuations (Fig. 10).

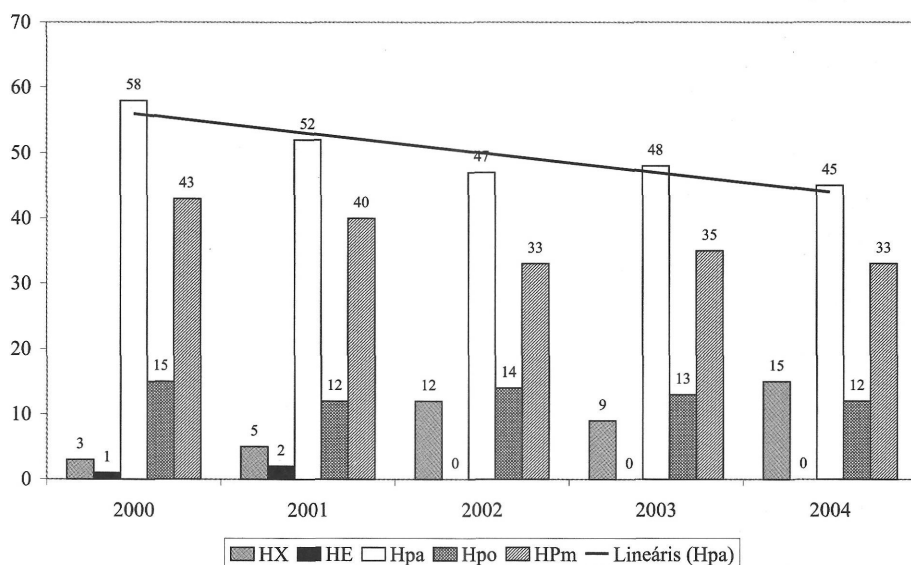


Fig. 9.: White stork population in the studied area in 2000-2004

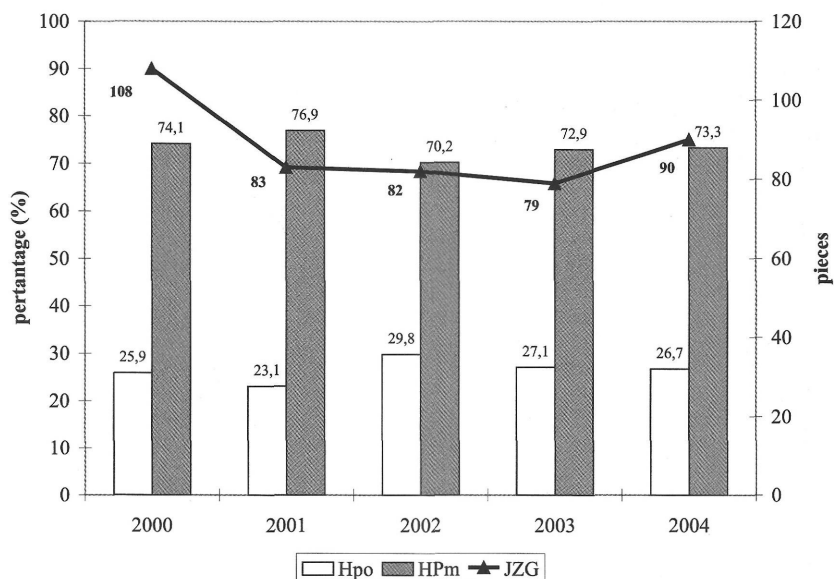


Fig. 10.: Changes in the rate of unsuccessful (HPo) and successful (HPm) nestings, and in the number of young birds leaving the nest (JZG), from 2000-2004

Faunal data

Between 2000-2004 között a we could provide evidence on the occurrence of 142 bird species in the monitoring areas, and on another 20 species in other Drava areas and national park habitats. Accordingly, we have data about a total of 162 bird species along river Drava in the period 2000-2004 (Table 16). According to the legal categorization by the 13/2001. (V.9.) decree of the Ministry of Environment, out of these 162 bird species the following 25 are strictly protected:

Ardea purpurea
Athene noctua
Aythya nyroca
Chlidonias niger
Ciconia ciconia
Ciconia nigra
Circus pygargus
Crex crex
Egretta alba
Egretta garzetta
Falco peregrinus
Falco vespertinus
Haliaeetus albicilla

Himantopus himantopus
Ixobrychus minutus
Limosa limosa
Merops apiaster
Milvus migrans
Numenius arquata
Nycticorax nycticorax
Pernis apivorus
Phalacrocorax pygmeus
Recurvirostra avosetta
Sterna albifrons
Tringa totanus

The 25 species listed above make up 31% of the 81 Hungarian strictly protected birds, and 13 of them is now proved to breed in the studied areas.

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Table 16.: Species checklist of birds in the studied area, 2000-2004.

<i>Gavia stellata</i>	<i>Haematopus ostralegus</i>	<i>Phoenicurus phoenicurus</i>
<i>Gavia arctica</i>	<i>Himantopus himantopus</i>	<i>Saxicola rubetra</i>
<i>Tachybaptus ruficollis</i>	<i>Recurvirostra avosetta</i>	<i>Saxicola torquata</i>
<i>Podiceps cristatus</i>	<i>Charadrius dubius</i>	<i>Oenanthe oenanthe</i>
<i>Podiceps grisegena</i>	<i>Phvialis squatarola</i>	<i>Turdus merula</i>
<i>Podiceps nigricollis</i>	<i>Vanellus vanellus</i>	<i>Turdus pilaris</i>
<i>Phalacrocorax carbo</i>	<i>Calidris ferruginea</i>	<i>Turdus philomelos</i>
<i>Phalacrocorax pygmeus</i>	<i>Philomachus pugnax</i>	<i>Turdus viscivorus</i>
<i>Íxobrychus minutus</i>	<i>Gallinago gallinago</i>	<i>Locustella naevia</i>
<i>Nycticorax nycticorax</i>	<i>Scolopax rusticola</i>	<i>Locustella fluviatilis</i>
<i>Egretta garzetta</i>	<i>Limosa limosa</i>	<i>Locustella luscinioides</i>
<i>Egretta alba</i>	<i>Numenius phaeopus</i>	<i>Acrocephalus palustris</i>
<i>Ardea cinerea</i>	<i>Numenius arquata</i>	<i>Acrocephalus schoenobaenus</i>
<i>Ardea purpurea</i>	<i>Tringa totanus</i>	<i>Sylvia nisoria</i>
<i>Ciconia nigra</i>	<i>Tringa nebularia</i>	<i>Sylvia communis</i>
<i>Ciconia ciconia</i>	<i>Tringa ochropus</i>	<i>Sylvia borin</i>
<i>Cygnus olor</i>	<i>Tringa glareola</i>	<i>Sylvia atricapilla</i>
<i>Anser fabalis</i>	<i>Actitis hypoleucos</i>	<i>Phylloscopus sibilatrix</i>
<i>Anser albifrons</i>	<i>Larus ridibundus</i>	<i>Phylloscopus collybita</i>
<i>Anser anser</i>	<i>Larus canus</i>	<i>Phylloscopus trochilus</i>
<i>Tadorna tadorna</i>	<i>Larus cachinnans</i>	<i>Regulus regulus</i>
<i>Anas penelope</i>	<i>Sterna hirundo</i>	<i>Muscicapa striata</i>
<i>Anas crecca</i>	<i>Sterna albifrons</i>	<i>Ficedula albicollis</i>
<i>Anas platyrhynchos</i>	<i>Chlidonias niger</i>	<i>Ficedula hypoleuca</i>
<i>Anas acuta</i>	<i>Columba palumbus</i>	<i>Aegithalos caudatus</i>
<i>Anas querquedula</i>	<i>Streptopelia decaocto</i>	<i>Parus palustris</i>
<i>Anas clypeata</i>	<i>Streptopelia turtur</i>	<i>Parus caeruleus</i>
<i>Aythya ferina</i>	<i>Cuculus canorus</i>	<i>Parus major</i>
<i>Aythya nyroca</i>	<i>Athene noctua</i>	<i>Sitta europaea</i>
<i>Aythya fuligula</i>	<i>Strix aluco</i>	<i>Certhia familiaris</i>
<i>Bucephala clangula</i>	<i>Asio otus</i>	<i>Certhia brachydactyla</i>
<i>Mergus albellus</i>	<i>Apus apus</i>	<i>Remiz pendulinus</i>
<i>Mergus merganser</i>	<i>Alcedo atthis</i>	<i>Oriolus oriolus</i>
<i>Pernis apivorus</i>	<i>Merops apiaster</i>	<i>Lanius collurio</i>
<i>Milvus migrans</i>	<i>Upupa epops</i>	<i>Lanius excubitor</i>
<i>Haliaeetus albicilla</i>	<i>Jynx torquilla</i>	<i>Garrulus glandarius</i>
<i>Circus aeruginosus</i>	<i>Picus canus</i>	<i>Corvus frugilegus</i>
<i>Circus cyaneus</i>	<i>Picus viridis</i>	<i>Corvus corone cornix</i>
<i>Circus pygargus</i>	<i>Dryocopus martius</i>	<i>Corvus corax</i>
<i>Accipiter gentilis</i>	<i>Dendrocopos major</i>	<i>Sturnus vulgaris</i>
<i>Accipiter nisus</i>	<i>Dendrocopos medius</i>	<i>Passer domesticus</i>
<i>Buteo buteo</i>	<i>Dendrocopos minor</i>	<i>Passer montanus</i>
<i>Pandion haliaetus</i>	<i>Alauda arvensis</i>	<i>Fringilla coelebs</i>
<i>Falco tinnunculus</i>	<i>Riparia riparia</i>	<i>Serinus serinus</i>
<i>Falco vespertinus</i>	<i>Hirundo rustica</i>	<i>Carduelis chloris</i>
<i>Falco subbuteo</i>	<i>Delichon urbica</i>	<i>Carduelis carduelis</i>
<i>Falco peregrinus</i>	<i>Anthus pratensis</i>	<i>Carduelis spinus</i>
<i>Coturnix coturnix</i>	<i>Anthus spinoletta</i>	<i>Carduelis cannabina</i>
<i>Phasianus colchicus</i>	<i>Motacilla flava</i>	<i>Carpodacus erythrinus</i>
<i>Rallus aquaticus</i>	<i>Motacilla cinerea</i>	<i>Pyrrhula pyrrhula</i>
<i>Porzana porzana</i>	<i>Motacilla alba</i>	<i>Coccothraustes coccothraustes</i>
<i>Crex crex</i>	<i>Troglodytes troglodytes</i>	<i>Emberiza citrinella</i>
<i>Fulica atra</i>	<i>Prunella modularis</i>	<i>Emberiza schoeniclus</i>
<i>Grus grus</i>	<i>Erithacus rubecula</i>	<i>Miliaria calandra</i>
<i>Gallinula chloropus</i>	<i>Luscinia megarhynchos</i>	

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Madárközösségek vizsgálata a Dráva somogyi szakasza mentén, 2001-2004-ben

FENYŐSI LÁSZLÓ

A Dráva-mentén 2000-től a "Dráva Monitoring" keretén belül madártani vizsgálatokat végzünk. A rendszeres mintavételekkel érintett monitoring-terület a folyó magyar-horvát vízteste kavicszátonyokkal és magaspartokkal, az Őrtilos-Zákány és Vízvár határában húzódó ártéri erdők, illetve a berzencei Jalszina-rét. A madarak (Aves) vizsgálata a kezdetektől több fontosabb csoportot érint, illetve több módszert jelent, az alábbiak szerint:

- énekesmadár-közösségek monitorozása az Őrtilos-zákányi és vízvári mintaterületeken (a *Passeriformes* fajok mellett a *Columbiformes* és *Piciformes* rendfajait is vizsgáljuk)
- zátonyfészkelők (*Charadrius*, *Actitis* és *Sterna* fajok) monitorozása
- a *Riparia riparia* és *Merops apiaster* állomány monitorozása
- vonuló és telelő vízimadarak állományának monitorozása a Dráva 199-184 fkm-ei közötti folyószakaszon
- a berzencei Jalszina-réten fészkelő madárközösség monitorozása
- fehér gólya állomány monitorozása az Őrtilos-Szentborbás közötti területen

Énekesmadár-közösségek monitorozása

A zákányi mintaterületen 2000-2004-ben 42 faj fészkelését mutattuk ki, ezek közül dominánsnak a *Sylvia atricapilla* (Denzitás: 11,31 pár/10 ha), *Turdus merula* (D: 7,54) és *Fringilla coelebs* (D: 7,25) bizonyult. Jelentős természeti értéknek tartjuk az *Acrocephalus palustris* (évi 8-17 pár), a *Dendrocopos medius* (évi 1-2 pár), a *Ficedula albicollis* (évi 3-5 pár) és *Locustella fluviatilis* (évi 6-17 pár) fészkelőállományát. A vízvári mintaterületen 2000-2004-ben szintén 42 faj fészkelését mutattuk ki, dominánsnak a *Sylvia atricapilla* (D: 10,0-10,5), a *Fringilla coelebs* (D: 5,5-7,25) és a *Sturnus vulgaris* (D: 4,25-6,25) bizonyult. E mintaterületen jelentős természeti értéknek tartjuk a *Dendrocopos major* (évi 6-9 pár), a *Ficedula albicollis* (évi 1-8 pár) és a *Locustella fluviatilis* (évi 3-6 pár) állományát.

Zátonyfészkelők monitorozása

A Dráva Őrtilos (236 fkm) és Bolhó (180 fkm) közötti szakaszán - a 180. fkm alatt már nincsenek csérek megtelepedésére alkalmas zátonyok - 2000-2004-ben a telepesen fészkelő *Sterna*-fajok állományát vizsgáltuk. Eredményeink szerint a vizsgált időszakban évente 2-3 fészektelep alakult ki és *Sterna albifrons* 5-14 párban, *Sterna hirundo* 50-90 párban fészelt. 2000-2004-ben a Dráva 199-180 fkm-ek közötti magyar-horvát területén (cca. 650 ha-on) a *Charadrius dubius* és *Actitis hypoleucos* fajok teljes állományfelmérését végeztük. Eredményeink szerint e területen évente min. 32-48 pár *Charadrius dubius* és min. 5-15 pár *Actitis hypoleucos* foglalt revírt. A 236-199 fkm-ek között gyűjtött adatainkat is figyelembe véve a *Charadrius dubius* állomány az Őrtilos (236 fkm) és Bolhó (180 fkm) közötti teljes magyar-horvát szakaszán min. 100-120 párra, az *Actitis hypoleucos* állomány min. 30-40 költőpárra tehető! A Drávánál a *Sterna-Charadrius-Actitis* fajok alkotta fészkelőközösség, továbbá e fajok stabil állományai igen jelentős természeti értéket képviselnek.

Partfal-fészkelők monitorozása

2000-2004-ben a Dráva 66 fkm-es szakaszán (199-133 fkm-ek között) végzett felméréseink során a *Riparia riparia* telepek száma 7-12, a költőpárok száma 1116-2370 pár között változott, s a vizsgált időszakban az állomány nagyság csökkent. 2001-től három újabb területen végeztünk számlálásokat. Eredményeink szerint e területeken a telepszám 4-11 között, a költőpárok száma 1284-2001 pár között változott.

A berzencei Jalszina-rét madárvilágának monitorozása

A Berzence község határában található mintaterületen (kiterjedése 34 ha) a felvételezések során 2001-ben 33 madárfajt, 2002-ben 24 madárfajt, 2003-ban 30 madárfajt és 2004-ben 36 madárfajt észleltünk. Ezek közül a területen 2001-ben biztosan fészkel 10 faj 32 párban, 2002-ben 12 faj 35 párban, 2003-ban 15 faj 42 párban és 2004-ben 13 faj 46 párban. A vizsgált években a terület vízviszonyaitól függően az *Alauda arvensis*, *Saxicola torquata*, *Miliaria calandra*, illetve az *Acrocephalus schoenobaenus*, *Emberiza schoenichus* és *Locustella naevia* denzitása volt a legmagasabb. Figyelmet érdemel, hogy a vizsgált években denzitásban a 3-4. legmagasabb értékű a *Locustella naevia* volt.

Telelő és vonuló vízimadarak monitorozása a Dráva 199-184 fkm-ek közötti szakaszán

A Bélavár (199 fkm) és Heresznye (184 fkm) közötti Dráva-szakaszon, továbbá az e szakaszhoz kapcsolódó mellékágakban a vonuló és telelő vízimadarak vizsgálatát végeztük 2001-2004-ben, az ősztől-tavaszig terjedő időszakokban. A 24 mintavétel során a vizsgált csoportokból összesen 30 faj előfordulását sikerült megfigyelni. Eredményeink szerint magasabb faj- és egyedszámot december-február hónapokban észleltünk, egy felvétel során a maximum 15 faj és 4650 pd. volt. A gyakorisági sorrendben az *Anas platyrhynchos*-t (91,7%) a *Phalacrocorax carbo* (79,2%), *Egretta alba* (79,2%), *Ardea cinerea* (75%), *Cygnus olor* (62,5%) és *Haliaeetus albicilla* (54,2%) követi. Az összes észlelt egyed (17 884 pd.) 92%-a *Anas platyrhynchos* volt, így ez alapján is abszolút domináns fajnak számít.

Fehér gólya (Ciconia ciconia) állomány monitorozása

Az Órtilos és Barcs között található településeken (17 település) a 2000-2004. években elvégeztük a fehér gólya állomány monitorozását. Eredményeink szerint a vizsgált időszakban jelentősen - közel 20%-al - csökkent a költőpárok száma, 58-ról 45-re. Ezzel együtt az eltelt időszakban a lakatlan fészkek száma megötszöröződött (3-ról 15-re nőtt).

Faunisztikai adatok

2000-2004 között a monitoring területeken 142 madárfaj, illetve a Dráva-mentén további 20 madárfaj előfordulását sikerült bizonyítanunk. E szerint a Dráva-mentén 2000-2004-ben mindösszesen 162 madárfaj előfordulásáról van adatunk, melyek közül 25 fokozottan védett madárfaj.