

SIZE AND DISTRIBUTION OF BREEDING COLONIES OF GREY HERON *Ardea cinerea* IN LOWLAND CROATIA

Velikost in razporeditev kolonij sive čaplje *Ardea cinerea* v nižinskih delih Hrvaške

JOZSEF MIKUSKA¹, TOMISLAV BOGDANOVIĆ¹, TIBOR MIKUSKA², ALMA MIKUSKA¹, VLATKA ŠALIĆ¹

¹ Department of Biology, University of Osijek, Lj. Gaja 6, HR-31000 Osijek, Croatia

² Kopački rit Nature Park Management Office, Ul. Petefi Sandora 33, HR-31327 Bilje, Croatia,
e-mail: tmikuska@kopacki-rit.com

1. Introduction

Grey Heron *Ardea cinerea* is the most abundant of the nine species of the Heron family Ardeidae recorded in Croatia (MIKUSKA 1992, KRALJ 1997, LUKAČ 1998). The first national census was carried out in 1991, when 1529 pairs were counted in eight colonies (MIKUSKA 1992). This survey was continued throughout the decade and resulted in the discovery of new colonies, with consequent increase in the national population (MIKUSKA *et al.* 1994, DOLENEC 1997, MIKUSKA & MIKUSKA *unpubl.*). At the beginning of the 21st century the population was estimated at 1500 – 3000 pairs, which was the second largest of the neighbouring central European countries (Hungary 2500 – 3500, Serbia & Montenegro 2200 – 2500, Slovenia 500 – 600, Bosnia & Herzegovina 7 – 10 pairs; BIRDLIFE INTERNATIONAL 2004).

2. Methods

During 2004 we attempted to visit all the known colonies and count the breeding pairs, in order to establish the total national breeding population. Data on Grey Heron colony locations were obtained through communication with other ornithologists and our previous fieldwork. The research area was limited to the lowland areas (below 300 m a.s.l.) of Pannonian and continental Croatia bordered by the rivers Drava on the north, Danube on the east and Kupa and Sava on the south. Of the 22 recently identified Grey Heron breeding sites, we failed to census three smaller colonies that are distributed in the continental part of Croatia south of our research area: at Cvijanović Brdo near Slunj (with 15 pairs in 1998), near Milići village on the Kupa river (with 12 pairs during 1990) and one possible colony in Plitvička jezera national park (LUKAČ 2004).

Most censuses were made during the early breeding season in late March and early April and the numbers

of Apparently Occupied Nests were counted (BIBBY *et al.* 1992). At that time, most herons are incubating or their chicks are just hatching, so that the number of nests correlates with the number of breeding pairs (BIBBY *et al.* 1992). One or two observers entered each colony, and nests on the trees were counted from the ground with the help of binoculars. Since these colonies are built on hardwood trees (predominantly *Quercus robur* or *Fraxinus* sp.) and 20 – 30 metres high, the observer's view of the nests was not obstructed by leaves. From our experience, carrying out a census later in the season would give ambiguous results due to leaf cover on trees that would obstruct the view of nests. Slow and quiet movement through the colony did not create much disturbance to breeding birds who returned to the nest immediately after the observer had left the vicinity of the occupied tree. It took approximately half an hour to count a site holding up to 200 nests, and, even in the case of the largest colonies, the whole census took less than a 1.5 hour per site.

In a few cases, namely colonies at fishponds Donji Miholjac, Grudnjak and Našička Breznica, counts were made later in the season (June), during the execution of a ringing programme. These colonies are built on willow bushes *Salix* sp. and reedbeds *Phragmites communis* and several heron species breed there. For these reasons we avoided entering the colonies during the incubation period of late nesting species – such as Little Egret *Egretta garzetta*, Night Heron *Nycticorax nycticorax*, Great Egret *Ardea alba* and Purple Heron *A. purpurea* – in order to prevent unnecessary disturbance and possible nesting failure of breeding birds. During the census, observers walked through the colony and counted each nest with hatched chicks. At this time it was easy to distinguish between the Grey Heron nests with large or already fledged chicks and similar – sized nests of other heron species, namely Great Egrets and Purple Herons, which had eggs or up to two – week old chicks. The colony at Košutarica was also censused

later in the season because it was not accessible, due to exceptionally high flooding in March and April.

3. Results and discussion

During 2004 we recorded 3674 nests of Grey Herons in 19 colonies (Table 1). The number suggests that the Croatian national breeding population is currently higher than the latest estimates and that the breeding population threshold should be set to 3000 – 4000 pairs. This result is in accordance with the overall trend of the European population, which is stable or increasing (BIRDLIFE INTERNATIONAL 2004). Despite the fact that we lack recent population values for neighbouring countries, our data suggest that Croatia has the largest proportion of breeding Grey Herons in the Pannonian plain.

Given the lack of previous records, we cannot exclude the possibility that a few additional colonies remain

to be discovered along the Drava River, as well as along the Sava river floodplain east of Slavonski Brod. However, breeding of Grey Herons in the mountainous or Mediterranean parts is unlikely. The only mixed species heron colony in the Mediterranean region is situated on Vransko lake near Biograd, but Grey Herons are not breeding there (V. DUMBOVIĆ – RUŽIĆ *pers. comm.*). Further, heron colonies in the delta of the Neretva River have not existed since the seventies of the 20th century (RUCNER (1970), D. KITONIĆ *pers. comm.*).

The colonies are distributed primarily in lowland Croatia bordered by the floodplains of large rivers – Danube, Drava, Sava and Kupa (Figure 1). Based on colony size we can distinguish three categories:

1. Large colonies comprising over 200 pairs (Kopački rit – Čošak šume, Mrsunjski lug, Berek, Piljenice and Košutarica) – these are situated along the large

Table 1: Breeding of Grey Herons *Ardea cinerea* in lowland Croatia during 2004

Tabela 1: Gnezdenje sive čaplje *Ardea cinerea* v nižinski Hrvaški leta 2004

Colonies on hardwood trees, nests 20 – 30 m above the ground/ Kolonije na listavcih, gnezda 20 – 30 m nad tlemi				
	Locality / Lokaliteta	UTM	Date / Datum	No. of nests / Št. gnezd
1	Berek	XL46	07.04.	412
2	Čepin	CR14	05.04.	29
3	Črnc	WL91	01.04.	155
4	Jastrebarsko	WL56	01.04.	168
5	Kopački rit - Čošak šume	CR35	04.04.	885
6	Košutarica	XL51	09.06.	243
7	Kravorsko	WL84	01.04.	89
8	Mokrice	WL69	07.04.	41
9	Mrsunjski Lug	YL20	29.04.	479
10	Piljenice	XL43	28.03.	383
11	Razljev	XL25	01.04.	130
12	Slovinci	XL21	01.04.	165
13	Topusko	WL71	01.04.	26
14	Trebovec	XL06	01.04.	157
15	Vrpolje	BR91	07.04.	27
16	Veliki Strug 2	XL60	during April 2004	37
Colonies on willows <i>Salix</i> sp. and reedbeds, nests up to 5 m above the ground/ Kolonije na vrbah <i>Salix</i> sp. in trstju, gnezda do 5 m nad tlemi				
17	Donji Miholjac fishpond	BR77	16.06.	30
18	Grudnjak fishpond	YL35	08.06.	83
19	Našička Breznica fishpond	BR84	02.06.	135
Total / Skupno				3674

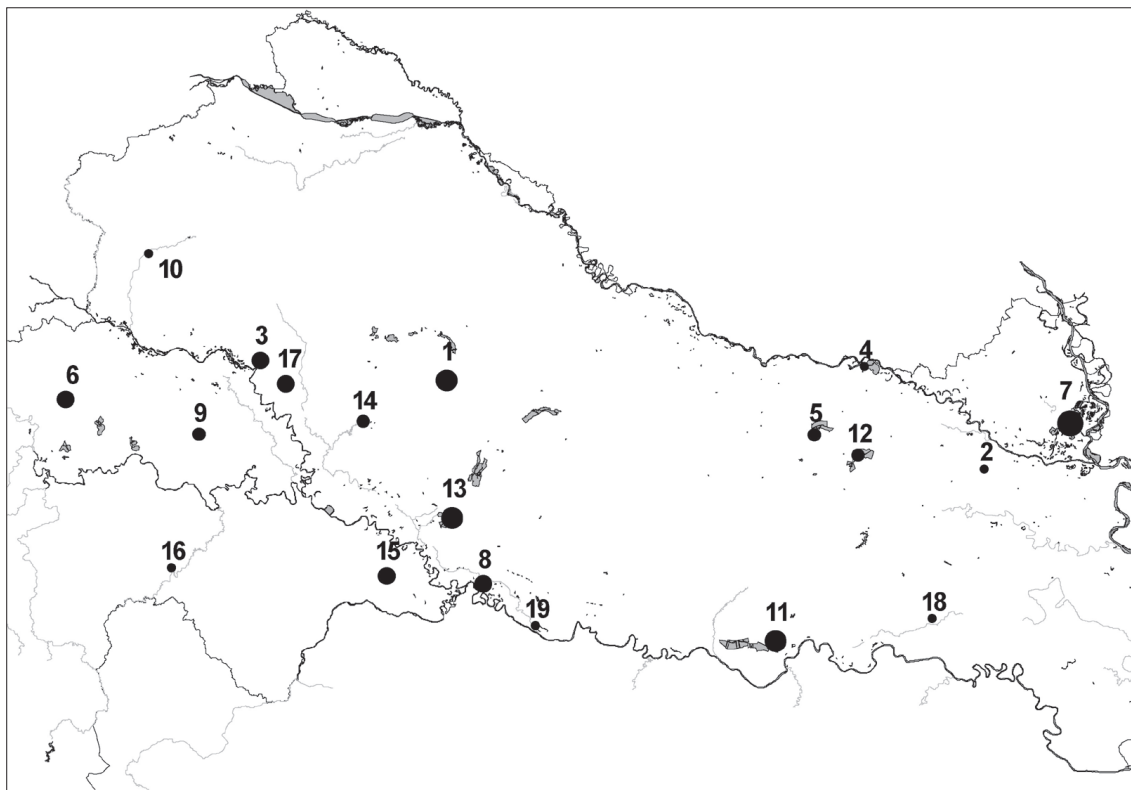


Figure 1: The location of the colonies of Grey Heron *Ardea cinerea* in lowland Croatia in 2004: 1) Berek, 2) Čepin, 3) Črnc, 4) Donji Miholjac fishponds, 5) Grudnjak fishponds, 6) Jastrebarsko, 7) Kopački rit – Čošak šume, 8) Košutarica, 9) Kravarsko, 10) Mokrice, 11) Mrsunjski lug, 12) Našička Breznica fishponds, 13) Piljenice, 14) Razljev, 15) Slovinci, 16) Topusko, 17) Trebovec, 18) Vrpolje, 19) Veliki Strug 2

Slika 1: Kolonije sive čaplje *Ardea cinerea* v nižinski Hrvatski leta 2004

areas of the remaining floodplains of the Danube and Sava rivers. Commercial fishponds that were built on former wetlands (Podunavlje fishponds at Kopački rit, Jelas fishponds near Mrsunjski lug, and Lipovljani fishponds near Piljenice) have helped to sustain these colonies, or even increase the number of breeding pairs after part of the wetland was drained and converted to agricultural land. For example, the number of breeding pairs in Kopački rit – Čošak šume increased from 400 during 1991 to over 1000 pairs during 2002. This increase is probably related to the abandoning of fish production on a large 200 ha pond that resulted in decrease in the water level, making a larger area suitable for foraging. An exception to this rule is the colony at Berek, that is situated in a remote forested area, exactly halfway between two commercial fishponds – Narta and Končanica – from where herons make daily foraging flights.

2. Medium sized colonies comprising 50 – 200 pairs – these are situated along the remaining, but much smaller, floodplain areas along the Sava and Kupa rivers (e.g. Črnc, Trebovec, Razljev and Slovinci along Sava, as well as Kravarsko along the Kupa) or are attached to one of the existing commercial fishponds (e.g. Grudnjak, Jastrebarsko or Našička Breznica). The size of the colonies on these fishponds is influenced by the disturbance accompanying the execution of Cormorant culling programmes (mainly by shooting throughout the year) or by water and vegetation management (e.g. the pond with a colony at Grudnjak fishponds was drained and burnt during 2004).
3. Small colonies comprising less than 50 pairs – these are situated at the edge of the Croatian breeding population and in less suitable habitats without larger wetlands (Mokrice in Zagorje or Topusko in the hilly part of the Croatia). As a curiosity, colonies

at Čepin and Vrpolje are situated near large pig – farms. The wetland areas along these colonies are limited to several large melioration ditches, suggesting that the birds take advantage of the large rodent populations that are common at these sites rather than feeding on the aquatic food source. However, further studies are needed to explore this hypothesis.

Summary

Grey Heron *Ardea cinerea* is the most abundant heron species in Croatia, with an estimated population of 1500 – 3000 pairs. We conducted a survey of existing colonies during the 2004 breeding season and counted 3674 pairs in 19 colonies. Based on this data the Grey Heron breeding population thresholds should be increased and set to 3000 – 4000 pairs. The colonies are distributed primarily along the remaining floodplains of the Danube, Drava, Sava and Kupa rivers as well as on commercial cyprinid fishponds.

Povzetek

Siva čaplja *Ardea cinerea* je najštevilčnejša med vsemi vrstami čapelj na Hrvaškem, saj je bila populacija ocenjena na 1500 do 3000 parov. Avtorji so napravili pregled obstoječih kolonij v gnezdilni sezoni leta 2004 in našli 3674 parov v 19 kolonijah. Na osnovi teh podatkov pa se je ocena populacije te vrste povišala na 3000 – 4000 parov. Kolonije so bile razporejene predvsem na poplavnih ravninah Donave, Drave, Save in Kolpe ter na ribnikih s krapovci.

References

- BIBBY, C.J., BURGESS, N.D. & HILL, D.A. (1992): Bird Census Techniques. – Academic Press Ltd., London.
- BIRDLIFE INTERNATIONAL (2004): Birds in Europe: Population estimates, trends and conservation status. – BirdLife International, Cambridge.
- DOLENEC, Z. (1997): Grey Heron (*Ardea cinerea* L.), new breeding species of Hrvatsko Zagorje. – *Larus* 46: 128.
- KRALJ, J. (1997): Croatian ornithofauna in the last 200 years. – *Larus* 46: 1–112.
- LUKAČ, G. (1998): List of Croatian Birds. Spatial and temporal distribution. – *Natura Croatica* Vol. 7, Suppl. 3: 1– 60.
- LUKAČ, G. (2004): Ptice nacionalnog parka Plitvička jezera. – *Plitvički bilten* 6: 29–70.
- MIKUSKA, T. (1992): Gniježđenje čaplji (Ardeidae) u Hrvatskoj. – Diplomski rad – Prirodoslovno – matematički fakultet Sveučilišta u Zagrebu, Zagreb.

MIKUSKA, T., MIKUSKA, J. & ŠETINA, M. (1994): Stanje čaplji (Ardeidae) u Hrvatskoj u periodu 1990 – 1993. – Zbornik sažetaka priopćenja Petog kongresa biologa Hrvatske, pp. 379–380. Hrvatsko biološko društvo, Zagreb.

RUCNER, D. (1970): Nadopuna poznavanju ptica doline Neretve III. – *Larus* 21/22: 99–114.

Prispelo / Arrived: 24.3.2005

Sprejeto / Accepted: 19.9.2005