

MONITORING RESULTS OF GREY HERON (*ARDEA CINEREA*) COLONY OF BAVNA FOREST, DURING 2007 – 2016

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ABSTRACT: This paper presents the results of 10 years of monitoring of grey heron (*Ardea cinerea*) colony of Bavna Forest, Maramureș county, Romania. The Bavna Forest Reserve grey heron colony, represents the main reproduction perimeter of this species in the lower Somes, only one in Baia Mare Depression. The census was conducted between 2007- 2016, by ground counting of all nests. The number of recorded nests was between 80 (2014) and 163 (2010) and the trees used for nesting between 17 (2014) and 40 (2010). During the monitoring period, the colony had a slightly downward trend. The continuation of the monitoring program is a necessity to supplement the information on the evolution of the gray heron breeding population in the area.

Key words: Grey Heron, colony, Bavna Forest, monitoring, breeding population.

INTRODUCTION:

The Bavna Pedunculate Oak Tree Reserve was established as protected area by Law no. 5 of 6 March 2000, Section III.2 - nature reserves and natural monuments, position 2575. The Bavna Pedunculate

Oak Tree Reserve is located in Satulung village, Fersig locality, (Maramureș county, Romania), with a surface of 26, 00 ha (www.anpm.ro) (Figure 1).



Fig.1. The Bavna Pedunculate Oak Tree Reserve location. (http://eunis.eea.europa.eu/sites/183991#interactive_map)

The forest is formed by pedunculate oak trees (*Quercus robur*), having 150 years old (www.marasilva.ro), with an average trunks diameter of 75-90 cm, the overall height and the mean circumference of the crown of about 35 m (Figure 2).

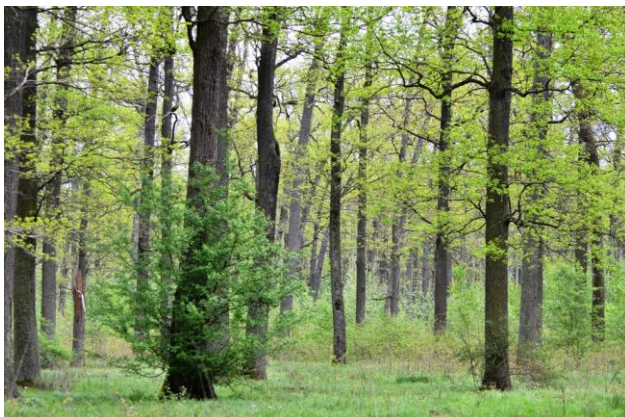


Fig.2. Oak Trees in the Bavna Forest Reserve (orig).

The pedunculate oak tree forest is a remnant of the ancient forests of Somes Meadow, which today are restricted to forest "islands" surrounded by agricultural crops (www.anpm.ro) (Figure 3). The Bavna forest it is placed in Baia Mare depression into the Somes River Meadow occupying I- river terrace at an altitude of 170-171m.

The Bavna Forest Reserve shelters a colony of grey heron (*Ardea cinerea*), representing the main reproduction perimeter of this species in the lower Somes, only one in Baia Mare Depression. The colony occupies an area of about 1 ha in the NW corner of the protected area (Figure 4).



Fig. 3. Image of the Bavna forest in the colony area (orig).



Fig.4. Bavna forest north western corner (orig).

Grey Heron, *Ardea cinerea* (Figure 5), is a species found in wetland, in any kind of shallow water, either fresh, brackish or saline, standing or flowing, and shows a preference for areas with trees as it is commonly an arboreal rooster and nester (BirdLife International, 2017). It occurs from sea-level up to 500 or even 1000 m, occasionally breeding much higher

(Snow and Perrins, 1998). The European population is estimated at 223000 - 391000 pairs, (BirdLife International 2017) and a breeding population of 139000-266000 pairs in the EU27. Romanian breeding population is estimated at 4500 - 6000 pairs (<http://bd.eionet.europa.eu/>). In Romania can be found all over the country, all year round (SOR, 2015).



Fig. 5. Grey Heron, *Ardea cinerea* in Bavna Forest Reserve (orig).

The species commonly nests in colonies, typically situated 2 - 38 km from preferred feeding areas (BirdLife International, 2017). The nest built of sticks is often re-used over successive years and usually positioned in tall trees, up to 50 m, but also on the ground or on cliff edges, in reedbeds or in bushes (Snow and Perrins 1998). Its diet consists predominantly of fish, as well as amphibians, crabs, mollusks, crustaceans, aquatic insects, snakes, small rodents, small birds (Snow and Perrins, 1998).

Although the Bavna Forest colony is known and mentioned in the literature (Ardelean, 2000; Nădișan & Cherecheș, 2002; Ardelean et al, 2009), data provided are sporadic. Grey heron colony monitoring, in this context, can provide precise information on the breeding population status of the species in Baia Mare depression, and indirectly on biodiversity and health of aquatic habitats in the area (Gregory et al, 2003).

MATERIAL AND METHODS

The census was conducted by ground counting of all nests and recording all apparently occupied nests (AON) This method is suitable in easily accessible, small and monospecific heronries, where birds are not disturbed by observers (Fasola et al, 2011).

The counting can be done in very good conditions due to the characteristics of the colony (Figure 6):

- the colony is accessible
- the nest's visibility is very good if the count is carried out before foliage development (15 – 20 of may), after which some of the nests are not visible from the ground level (Figure 7).
- nests being built at height (25-30 m), birds do not feel threatened during the count, so the disturbance is minimal. During the monitoring were used: 10 X 42 binoculars, 20-60 x 100 spotting scope, Garmin eTrex GPS, photo camera.



Fig. 6. Grey Herons and nests in Bavna Forest colony (orig).



Fig. 7. Grey Heron nests in Bavna Forest colony (orig).

RESULTS :

The results of the counts conducted during 2007 – 2016 are presented in table 1. The number of nests was

between 80 (2014) and 163 (2010) and the trees used for nesting was between 17 (2014) and 40 (2010).

Tab. 1.
Ardea cinerea colony situation during 2007 - 2016.

Nr. n/tr	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016	
	tr	n	tr	n	tr	n	tr	n	tr	n	tr	n	tr	n	tr	n	tr	n	tr	n
1	8	8	8	8	4	4	8	8	10	10	5	5	5	5	2	2	2	2	4	4
2	5	10	7	14	10	20	9	18	7	14	4	8	5	10	1	2	4	8	5	10
3	6	18	6	18	7	21	5	15	3	9	2	6	6	18	3	9	4	12	7	21
4	8	32	6	24	7	28	7	28	5	20	3	12	1	4	4	16	3	12	3	12
5	5	25	4	20	1	5	4	20	4	20	1	5	1	5	1	5	4	20	5	25
6	2	12	1	6	1	6	1	6	3	18	2	12	2	12	3	18	1	6	2	12
7	1	7	2	14	2	14			2	14	4	28	3	21	1	7	2	14		
8	1	8	1	8			1	8			1	8	3	24					1	8
9	3	27	2	18	2	18	1	9	1	9									1	9
10					1	10	1	10							1	10	1	10		
11					1	11					1	11			1	11				
12			1	12			2	24					1	12					1	12
13									1	13										
14	1	14	1	14					1	14										
15																				
16																				
17							1	17												
Total	40	161	39	156	36	137	40	163	37	141	23	95	27	111	17	80	21	84	29	113

Nr n/l tr= number of nest /1 tree; tr = number of trees; n = number of nests

DISCUSSIONS:

As shown in Table 1, in the period under study, the colony had a slightly downward trend and was relatively stable between 2007 and 2011. The average number of nests in the colony during this period was 137.71, with a sharp decline in 2012, which was

continued further in 2014. The decrease of the peak recorded in 2010 is very high and there is a no documented explanation thereof. Currently, the colony show a slight upward trend compared to the minimum in 2014 (Figure 8)

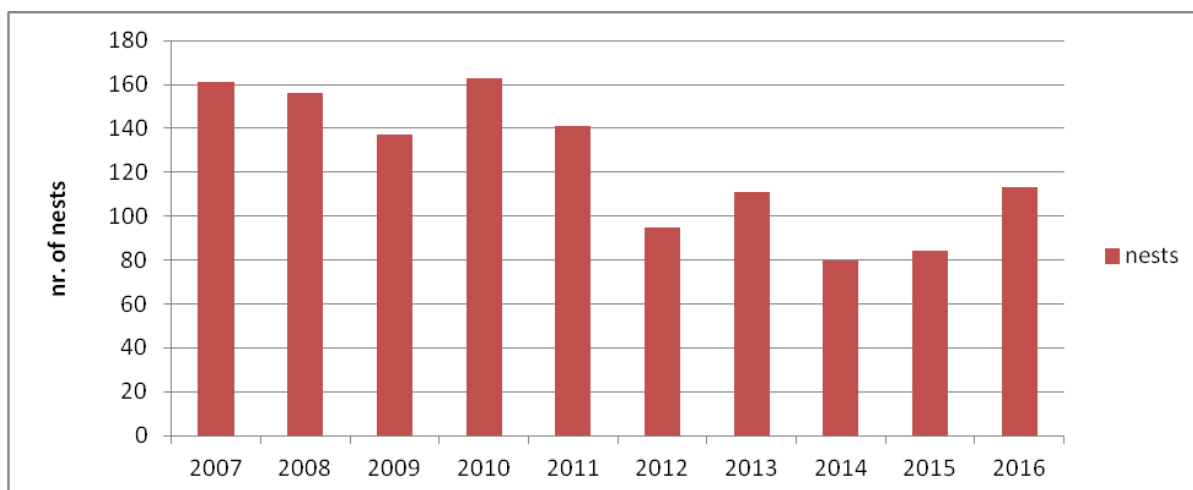


Fig. 8. The evolution of *Ardea cinerea* colony between 2007 – 2016.

Most of the colony trees have between 1 and 5 nests, averaging between 3,805 nests/1 tree in 2009 and 4,705 in 2014 (Table 2). The maximum number of

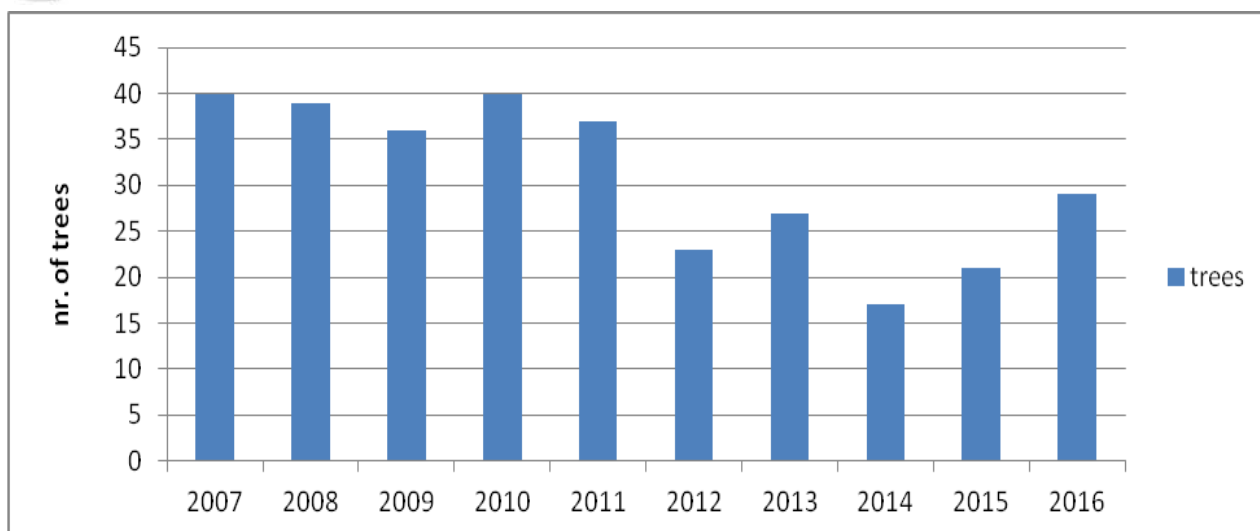
nests recorded on one tree was 14 în 2007, 2008, 2011 and 17 în 2010 (Figure 9).

Tab. 2.

Ardea cinerea colony structure during 2007 - 2016.

Nr. n/tr	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	8	8	4	8	10	5	5	2	2	4
2	5	7	10	9	7	4	5	1	4	5
3	6	6	7	5	3	2	6	3	4	7
4	8	6	7	7	5	3	1	4	3	3
5	5	4	1	4	4	1	1	1	4	5
6	2	1	1	1	3	2	2	3	1	2
7	1	2	2	0	2	4	3	1	2	0
8	1	1	0	1	0	1	3	0	0	1
9	3	2	2	1	1	0	0	0	0	1
10	0	0	1	1	0	0	0	1	1	0
11	0	0	1	0	0	1	0	1	0	0
12	0	1	0	2	0	0	1	0	0	1
13	0	0	0	0	1	0	0	0	0	0
14	1	1	0	0	1	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0
17	0	0	0	1	0	0	0	0	0	0
tot. n.	161	156	137	163	141	95	111	80	84	113
tot. tr.	40	39	36	40	37	23	27	17	21	29
mean n/tr.	4.03	4.00	3.81	4.08	3.81	4.13	4.11	4.71	4.00	3.90

Nr n/1 tr= number of nest /1 tree; tr = number of trees; n = number of nests



CONCLUSIONS:

Information obtained from the colony monitoring enables a realistic evaluation of breeding population size of *Ardea cinerea* in Baia Mare Depression.

During the monitoring period (2007 – 2016), the colony had a slightly downward trend. The number of nests was between 80 (2014) and 163 (2010) and the trees used for nesting between 17 (2014) and 40 (2010).

Nesting conditions provided by the Bavna Forest for the Grey heron are very good. The human disturbance that can affect the breeding success (Jakubas, 2005; Kitowski & Krawczyk, 2005; Jakubas & Manikowska- Slepowska, 2013), is very low, due to the distance to human settlements and height of trees harboring nests.

Ten years of monitoring period is too short to draw conclusions about breeding population trend. For large birds, with the long generation time, such studies have to encompass decades (Fasola et al, 2011) but can provide valuable information about the current state of the colony.

The continuation of the monitoring program is a necessity to supplement the information on the evolution of the gray heron breeding population in the area. Long-term monitoring is also relevant to identify potential threats and to formulate management measures to maintain or improve their nesting conditions (SOR, 2014).

ACKNOWLEDGEMENT:

This paper was supported by the project “Natural resources and sustainable development of Oaş area, county of Satu Mare”, funded by UEFISCDI (Executive Agency for Higher Education, Research, Development and Innovation Funding - National Plan for Research, Development and Innovation 2007-2014, NP II, Human Resources Program, Subprogram “Young research teams”, contract no. 332/1.10.2015 (PN II-RU-TE-2014-4-1552) and was conceived within the doctoral research coordinated by the “Vasile Goldiș” Western University of Arad.

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