

CONSIDERATIONS REGARDING THE SPECIES OF THE FAMILY ARDEIDAE PRESENT IN THE NATURA 2000 SITE ROSPA0137 PĂDUREA RADOMIR (ROMANIA)

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Abstract. The paper presents issues related to the bioecology of the Ardeidae species (herons and egrets) from the special protection area Pădurea Radomir (ROSPA0137), based on the analysis of the data from direct observations made in the area in the years 2014-2016 and specialized literature. The first part of the study presents the geographical origin, phenology, distribution within the site and the minimum number of specimens recorded in the years 2014 and 2016 for each species, and then, it addresses the issues of conservation and protection status.

Keywords: Ardeidae, special protection area Pădurea Radomir ROSPA0137.

Rezumat. Considerații cu privire la speciile familiei Ardeidae prezente în situl Natura 2000 ROSPA0137 Pădurea Radomir (România). Lucrarea prezintă aspecte legate de bio-ecologia speciilor de ardeide (stârci și egrete) din aria de protecție specială avifaunistică Pădurea Radomir (ROSPA0137), având ca suport de analiză datele rezultate din observații directe efectuate în arie, în anii 2014-2016 și din literatura de specialitate. În prima parte a studiului sunt prezentate originea geografică, fenologia, distribuția în sit și efectivele minime înregistrate în anii 2014 și 2016 pentru fiecare specie, apoi sunt abordate aspecte legate de statutul de amenințare și protecție al acestora.

Cuvinte cheie: ardeide, aria de protecție specială avifaunistică Pădurea Radomir ROSPA0137.

INTRODUCTION

The bird special protection area Pădurea Radomir (ROSPA0137) is located within Romanați Plain, on the territory of the localities Dioști from Dolj County and Drăghiceni from Olt County, covering a surface of 1,233 ha; it has been part of the European ecological network Natura 2000, starting with 2011 (according to Government Decision no. 971/2011).

The protected area is crossed by two erosional valleys – Eleșteului Valley and Bratei Valley, where there appear pools with a fluctuating level that collect rainwater and groundwater from the sand dunes that make up the landscape of this area. During heavy rains, standing water persists for long periods. In the area of the settlement, the two valleys discharge in an reservoir called Drăghiceni pond or lake (Fig. 1).

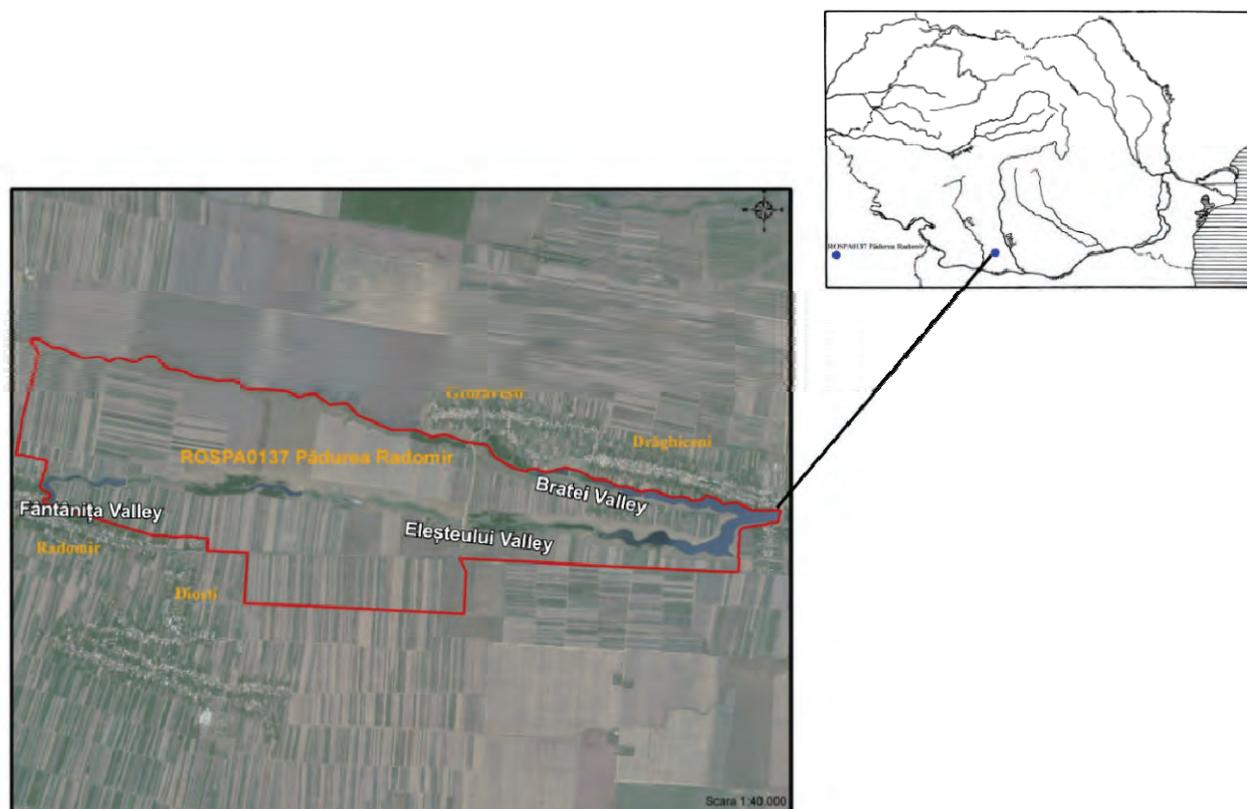


Figure 1. Perimeter of Nature 2000 site ROSPA0137 Pădurea Radomir (after: RIDICHE et al. 2014a; www.padurearadomir.ro).

Most of the site surface is covered by terrestrial biotopes (arable lands - 76%, pastures – 14.6%, surfaces covered by forest vegetation – 1.6%) and less by aquatic (pools – 4.76%) and semiaquatic biotopes (reed beds and moorlands – 1.12%). Although the studied area belongs to the forest steppe, characterized by scarce vegetation and relatively reduced fauna diversity, the bird community within the site includes 69 species, 27 of them being mentioned in the standard data sheet of the site; most of them are nesting species within all the habitats of the site (RIDICHE et al., 2014a). We mention that the standard data sheet of the site ROSPA0137 comprises 39 species, but according to our personal research 12 species were not identified. However, during our research we identified other species of community interest requiring special conservation measures to maintain within the site, species that are not mentioned in the standard data sheet (RIDICHE et al., 2014b). In this situation, among other species, we mention the species of the Ardeidae Family (*Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Ardea purpurea*, *A. alba*), which represent the subject of this study.

Our interest in the community of Ardeidae species from SPA Pădurea Radomir starts with the premise that, since 1995, the species of Ardeidae have been considered criteria for describing Important Bird Areas (MUNTEANU, 2004) and in Annex I of the Birds Directive/147/2009/EC; egrets (*Egretta* sp.) and most species of herons (*Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Ardea purpurea*) are listed as qualifying species for the designation of Natura 2000 sites (SPA), for which measures of habitat conservation are imposed.

MATERIALS AND METHODS

This study includes the results of our observations made in the years 2014 and 2016, covering the following environmental aspects: prevernal (March 1 - May 1); vernal (May 1- June 15); aestival (June 15 - July 15), serotinal (15 July – September 15), autumnal (September 15 - November 1), in fixed locations (near bird nesting, feeding or resting sites) or in motion, along before set tracks, as well as counting of the specimens in the areas where they usually gathered.

As research materials in the field, we used binoculars (Zeiss Jena 10x50 and Bushnell 12x40), the Bird Guide (BRUUN et al., 1999) and a camera (Sony15 x).

RESULTS AND DISCUSSIONS

Ardeidae species (herons and egrets), from the systematic point of view, belong to the Ardeidae Family, Ciconiiformes Order, while from the ecological point of view, they are typical aquatic species playing an important role in the natural balance of the ecosystems they inhabit. Ardeidae species from the bird special protected area Pădurea Radomir (ROSPA0137) are represented by most species present in our country (Table 1).

Table 1. List of Ardeidae species from the site Natura 2000 ROSPA0137 Pădurea Radomir, zoogeography, phenology, minimum number of specimens and species distribution within the site.

No.	Species	Zoogeographical type	Phenological type	Minimum number		Distribution of the species within the site
				2014	2016	
1	<i>Ixobrychus minutus</i>	OW	SV - B	4-6 p.	8-10 p.	It nests and feeds in the areas with reed thickets from Eleșteului Valley (area of Drăghiceni village) and Fântânița Valley (Radomir settlement).
2	<i>Nycticorax nycticorax</i>	Co	SV - B	8-10 p.	30-35 p.	Breeding: mixed colony stationed in Grozăvești Forest Feeding: along Eleșteului Valley.
3	<i>Ardeola ralloides</i>	Et	SV - B?	3-5 s. (ad.+juv.)	2-4 s. (ad.+juv.)	Frequent in the western end of the site - Fântânița Valley (Radomir settlement). Juvenile specimens observed annually during the aestival and serotinal seasons can be considered a clue regarding the breeding of the species in this part of the site.
4	<i>Ardea cinerea</i>	P	SV - B	8-10 p.	10-12 p.	Breeding: colony in the trees of <i>Populus alba</i> and <i>Quercus</i> sp. from Grozăvești Forest; feeding: the shores of the pools formed along Eleșteului and Bratei Valleys or the meadows located in their proximity.
5	<i>Ardea purpurea</i>	T-M	SV - B?	10-12 s. (ad.+juv.)	6-10 s.	Observed only in the eastern half of Eleșteului Valley, on the accumulation pools covered by dense reed thickets from the area of Drăghiceni settlement. Juvenile specimens observed during the aestival and serotinal seasons can be considered a clue regarding the breeding of the species in this part of the site.
6	<i>Ardea alba</i>	Co	P	8-12 s.	6-8 s.	In the area of the pools formed along Eleșteului and Bratei Valleys, but also in the adjacent arable fields.
7	<i>Egretta garzetta</i>	OW	SV - B	10-12 p.	20-25 p.	Breeding: mixed colony stationed in Grozăvești Forest. Feeding: the pools along Eleșteului and Bratei Valleys.

Legend: Zoogeographical type: LV – Old World, Co – cosmopolite, Et – Ethiopian, P – Palearctic, T-M – Turkestan-Mediterranean.
Phenological type: SG – summer visitor, P – passage species. B – breeding. **Number:** s. – specimens, p. – pairs, ad. – adults, juv. – juveniles.

From the geographical origin point of view (according to MUNTEANU, 1974), two species (*Ixobrychus minutus*, *Egretta garzetta*) belong to the Old World (they are distributed within the vast continental surface of Eurasia and Africa), other two species (*Nycticorax nycticorax*, *Ardea alba*) are cosmopolite (distributed on almost all continents), while the rest of the species belong to the types: Palearctic (the cold, temperate and tropical zones of Eurasia) - *Ardea cinerea*, Ethiopian (Sub-Saharan areas) - *Ardeola ralloides* and Turkestan-Mediterranean (south of Europe and Asia) - *Ardea purpurea*.

With regard to the phenological category or their seasonal dynamics, except for the great egret (*Ardea alba*), which is a passage species (it stays in the area from the end of July until November), the other species are frequent summer visitors starting with the end of March until the end of August, but their density progressively decreases after the end of the breeding season (end of June – beginning of July) when birds (young and adult) leave the colony and settle within the site and/or in its proximity.

The species first arrived within the site are *Ardea cinerea*, *Nycticorax nycticorax* and *Egretta garzetta* that make up a mixed colony in the forest grove located in the south-eastern half of the site (Grozăvești Forest, Elesteului Valley). In Grozăvești Forest, there is a clump of old and spontaneous trees (mainly represented by *Quercus robur* and *Q. pedunculiflora*, but also rare specimens of *Populus* sp., *Ulmus* sp., *Fraxinus* sp., etc.) and a clump of young trees belonging to *Quercus* sp., *Fraxinus* sp. and *Robinia pseudacacia*. The proximity of the chain of pools formed along Elesteului Valley, which has various trophic resources (small fish, amphibians, reptiles, etc.), makes this forest sector a highly appreciated habitat by the aforementioned species of Ardeidae. The competition for nests is very well observed from the early days of April, being amplified by the presence of a large number of rooks, which live in a numerous colony (over 150-200 nests) stationed also in the tree vegetation of the same area.

According to our direct observations from 2014, it was noticed the cohabitation of the three species of herons the colonies of which (located in the area covered by old and spontaneous trees) were found in an approximately equal numerical ratio; however, during this year (2016), the quantitative composition changed as a result of the expansion of the mixed colony in the segment with young planted trees. The species that started building new nests in the young plantation was *Nycticorax nycticorax* (vernal-aestival season 2015), followed in 2016 year by *Egretta garzetta*, which enabled a significant numerical increase of both species. However, the numerical ratio between the two species was not equal, *Nycticorax nycticorax* registering an almost double number compared to *Egretta garzetta*. During the inventory carried out at the end of the breeding period 2016 year, respectively on the 17th of August, we identified a total of 84 newly built nests in the young plantation, mainly in the trees of *Quercus* sp. and *Fraxinus* sp., at heights ranging from 2.50 to 3.50 m and dimensions between 20-30 cm diameter. The number of nests located on a single tree ranged between 1 and 3, with a distance of about 0.5-1 m from each other, but some of them have not been used to lay egg clutches. Some of the used nests were relatively poor and not big and / or compact enough to support all chickens resulting from hatching, which resulted in the loss of some of them, which were found dead on soil. (Figs. 2a, b).



Figures 2a, b. Dead specimens - chicken of *Nycticorax nycticorax* (originals).

A small increase of the number of specimens was also registered in case of the species *Ardea cinerea* that remained in the old nests mainly located in the tall trees of *Populus* sp.

The species *Ixobrychus minutus*, *Ardeola ralloides* and *Ardea purpurea* were noticed only in the areas with reed tickets and water surface, but their frequencies were different. The most numerous identifications (direct observations, acoustic signals) were noticed in case of the little bittern (*Ixobrychus minutus*) and this is why we estimate a doubling of the number of specimens in 2016 compared to 2014, while the squacco heron (*Ardeola ralloides*) and the purple heron (*Ardea purpurea*) registered approximately the same number and frequency. Although we observed juvenile specimens in case of the last two species by the end of the reproduction season, their breeding within the protected area is still uncertain for us.

A schematic situation of the Ardeidae species certainly breeding and numbers of pairs registered in 2014 and 2016 is rendered in Fig. 3.

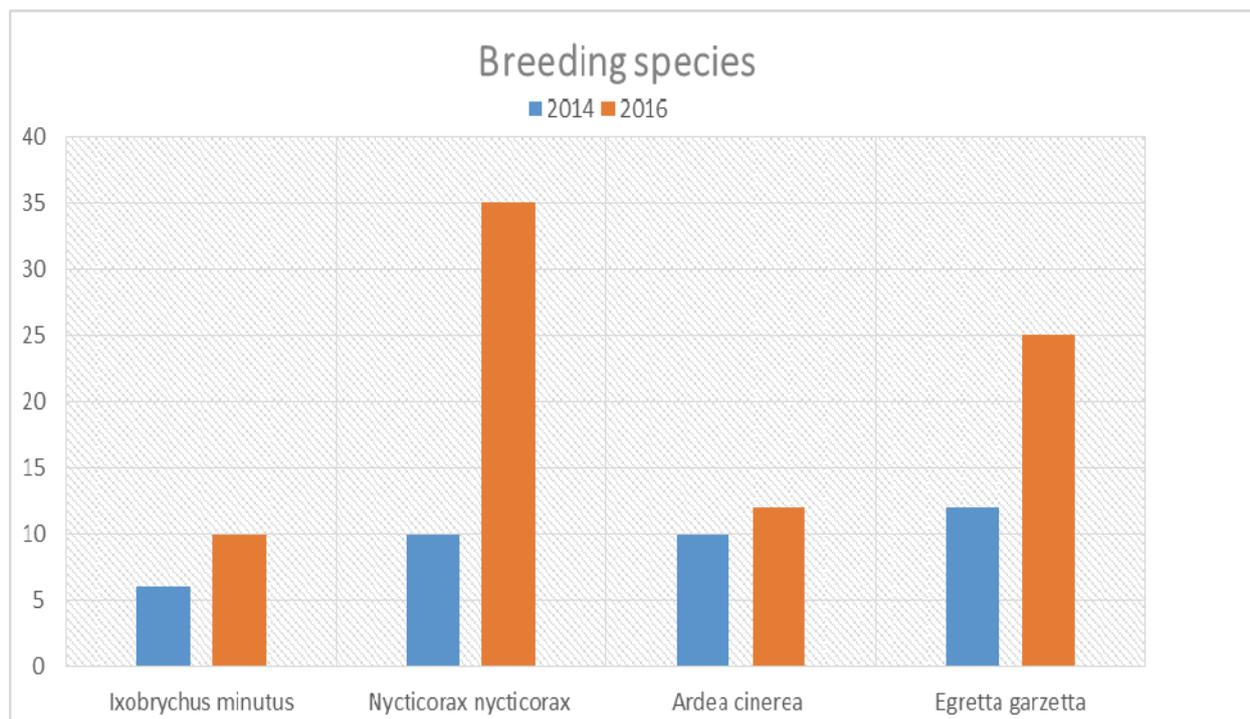


Figure 3. Graphical representation of the breeding Ardeidae species and number of pairs registered in 2014 and 2016 within the site Natura 2000 ROSPA0137 Pădurea Radomir.

According to the European Red List (BIRDLIFE INTERNATIONAL, 2015), all the Ardeidae species analysed in the present study present a favourable conservation status at European level, but in Romania (according to MUNTEANU, 2005), most of them present different threatening degrees (Table 2). The main factors that threaten the stability of the Ardeidae species are: degradation or reduction of the breeding and feeding habitats; poaching or destruction of nests; human activities disturbing the nesting habitat; pollution and poor management of wetlands; (MUNTEANU, 2005; C. N. D. D., 2015). Some of these factors represent a pressure for the site ROSPA0137 Pădurea Radomir (RIDICHE et al., 2014b). By current law regulations, Ardeidae species, except the grey heron (*Ardea cinerea*), are included in Annex 3 of Government Decision no. 57/2007 / Law no. 49/2011 (transposed in Annex I of the Birds Directive 147/2009/EC), thus becoming target species in the conservation efforts of Natura 2000 sites - Table 2.

Table 2. Conservation and protection status of the Ardeidae species present within the site ROSPA0137 Pădurea Radomir.

No.	Species	Conservation status		Protection status		Mentioned in the standard data sheet of the site
		European Red list	Romania Red list	Birds Directive (Annex I)	G. D. 57/2007	
1	<i>Ixobrychus minutus</i>	LC	-	x	x	-
2	<i>Nycticorax nycticorax</i>	LC	VU	x	x	-
3	<i>Ardeola ralloides</i>	LC	VU	x	x	-
4	<i>Ardea cinerea</i>	LC	-	-	-	-
5	<i>Ardea purpurea</i>	LC	EN	x	x	-
6	<i>Ardea alba</i>	LC	EN	x	x	-
7	<i>Egretta garzetta</i>	LC	EN	x	x	x

Legend: Conservation status: LC – Least Concern, V – Vulnerable, EN – Endangered.

In the standard sheet of the site ROSPA0137 Pădurea Radomir, there is listed only the little egret (*Egretta garzetta*), which obliges the custodians of the protected area to the implementation of protective measures for this species only. In order to ensure the requirements of sustainable conservation of other Ardeidae species present within the site and taking into account the existing legal framework, we propose the completion of the standard sheet of the site according to the data resulted from recent research and application of appropriate conservation measures able to counter the present or future threats for bird species. We mention the following measures: banning the trees cutting in the forest where there are colonies and applying coercive measures for illegal cuttings; prohibiting forest treatments during the breeding periods (April 1 - August 1); providing a quiet area during breeding by limiting the access within a radius of 200 m around the colonies; informing / raising awareness of local people about the importance of the area and faunistic value of the species, etc.

CONCLUSIONS

Within the bird special protection area Pădurea Radomir (ROSPA0137) there are seven species of Ardeidae (egrets and herons), representing most of the species present in our country. The data referring to the geographical origin indicate that two species belong to the Old World - *Ixobrychus minutus* and *Egretta garzetta*; two species are cosmopolite - *Nycticorax nycticorax* and *Ardea alba*; one species is Palearctic - *Ardea cinerea*, one species is Ethiopian - *Ardeola ralloides* and one species is Turkestan-Mediterranean - *Ardea purpurea*.

With regard to the phenology, we notice that most of the species are summer visitors, present in the area from the end of March to the end of August, and only one species (*Ardea alba*) is a passage species.

The species *Nycticorax nycticorax*, *Egretta garzetta* and *Ardea cinerea* arrive within the protected area by the end of March – the beginning of April and are the best represented numerically, making up a mixed colony located in the forest clump from the south-eastern part of the site (Grozăvești Forest, Eleșteului Valley). As the colony extended in a young plantation of *Quercus* sp. and *Fraxinus* sp., the number of the specimens of the species *N. nycticorax* (30-35 pairs in 2016) and *E. garzetta* (20-25 pairs in 2016) significantly increased compared to 2014, when we registered 8-10 pairs for *N. nycticorax* and 10-12 pairs for *E. garzetta*.

Ixobrychus minutus also registered an increase of the number of specimens (8-10 p.) in 2016 compared to 2014 (4-6 p.), while the squacco heron (*Ardeola ralloides*) and the purple heron (*Ardea purpurea*) present almost the same numerical values and frequencies.

According to the Red List, the Ardeidae species from our study present a favourable conservation status at European level; however, in our country, they have different threatening degrees, namely three species are endangered (*Ardea purpurea*, *A. alba*, *Egretta garzetta*), two species are vulnerable (*Nycticorax nycticorax* and *Ardeola ralloides*), and two species are included in least concern category (*Ixobrychus minutus*, *Ardea cinerea*).

In the standard sheet of the site ROSPA0137 Pădurea Radomir, there is listed only the little egret (*Egretta garzetta*), but, according to the present regulations (Directive 147/2009/EC, Government Decision no. 57 / Law no. 49/2011), all species are subject to conservation in Natura 2000 sites, except the grey heron (*Ardea cinerea*), that is why **we propose the completion of the standard sheet of the site according to results of recent research** and application of appropriate conservation measures to counter present and future threats and ensure the requirements of long-term living in the protected area.

Overall, it can be concluded that the situation of Ardeidae within ROSPA0137 Pădurea Radomir is a favourable one, with a positive trend, if the state of habitats does not change and there are applied appropriate measures for their preservation within the site.

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