

**BREEDING DISTRIBUTION, POPULATION ESTIMATE,
AND NESTING HABITAT OF THE MARSH HARRIER
Circus aeruginosus IN BARANYA (EAST CROATIA)**

*Gnijezdeća rasprostranjenost, procjena populacije i stanište eje močvarice
Circus aeruginosus u Baranji (Istočna Hrvatska)*

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ABSTRACT

The Marsh Harrier is a regular breeding species in Croatia, nesting mainly in reedbeds of various wetland habitats. There was no systematic survey of breeding pairs of Marsh Harriers in Croatia and the population size was poorly assessed (40-60 pairs in total with 10-15 pairs in Baranya). This paper introduces the results of the first mapping of nesting pairs of Marsh Harriers in Baranya area in eastern Croatia. The study was conducted during 2017-2018 by surveying all suitable wetland habitats using the vantage point method. A total of 52 confirmed nesting pairs of Marsh Harriers was found on 37 locations, with an additional 12 probable pairs recorded, which gives an overall population estimate of 52-64 pairs. The majority of the pairs nested in old flooded reedbeds in the reclaimed alluvial areas of Drava, Danube, and Karašica rivers. Mostly they chose oxbows, wide channels and various reedbeds in natural depressions for nesting, occupying relatively small reedbeds with 77% of confirmed pairs nesting in vegetation less than 100 meters wide which was in 53% of the cases smaller than 10 ha in size. The habitat around the assumed nests was dominated by open agricultural fields (68.34%), typically intensively managed arable land. Monitoring of the breeding population of Marsh Harriers in Baranya is highly recommended, especially in the light of climate change and other human activities which may have negative effects on the habitat quality and prey abundance.

Keywords: Marsh Harrier, East Croatia, breeding, distribution, population, habitat

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INTRODUCTION

The Marsh Harrier *Circus aeruginosus* is a regular breeding and migrating species in Croatia (TUTIŠ 2013). Small numbers of usually females and immatures of unknown origin overwinter in both continental and coastal wetlands (IWC archive of CSBNP). It is unique among the European birds of prey by nesting primarily in reedbeds and similar marshland vegetation, even though, more and more cases of nesting in intensive agricultural fields have been known. They breed in single pairs or in loose colonies with males being sometimes polygamous (CLARKE 1995). In Croatia, nesting in dry habitats like crops or grasslands has not been published yet. Up to recently, there was no systematic study focussed on the mapping of precise breeding distribution of Marsh Harriers in Croatia, neither has the exact population size been assessed. In the period between 2003 and 2013, the two editions of the Red Data Book of Birds of Croatia gave an estimate of 40 and 40-60 pairs, respectively (RADOVIĆ 2003, BARIŠIĆ & RADOVIĆ 2013). The majority of the breeding population is concentrated in the continental alluvial wetlands and adjacent areas. In both editions, the breeding population of the species is categorized as Endangered (EN) with an unknown trend. The breeding population in Baranya region was estimated at 10-15 pairs. The second European Breeding Bird Atlas introduced a significant improvement in the knowledge of both the distribution and population size of Marsh Harriers in Croatia (KELLER *et al.* 2020). Nonetheless, the interpretation of the abundance map in transboundary area grid cells tends to be inconclusive when trying to get information regarding the breeding population on the Croatian side of this area. There are still gaps in some regions primarily due to incorrect estimates of breeding pairs. One of those areas is the middle and upper section of the river Drava (Podravina) which has been in the meantime surveyed (In prep.). The other area is Baranya (East Croatia) where the breeding population was estimated at ca. 20 pairs during the data provisioning phase for EBBA2 atlas, however, the coverage was insufficient. This is due to the fact that most data used for population size assessment was gathered during Natura Integration Project (NIP) which only sampled different habitats in Croatia, including Baranya, thus many appropriate habitats were not covered with this study. The aim of this study is to give a new estimate of distribution and population size of Marsh Harriers in Baranya, based on data gained with systematic field work, including some remarks on nesting habitat preferences.

MATERIALS AND METHODS

The survey of breeding territories of Marsh Harriers was conducted in the area of Baranya in eastern Croatia. All potentially suitable wetland habitats which could hold Marsh Harrier nests were covered. These included the follow-

ing habitat types: fishponds, oxbows, wide channels, reedbeds formed in natural depressions, and artificial ponds. They all contained various sizes of reedbeds consisting mostly of the Common Reed *Phragmites communis* and sometimes the Broadleaf Cattail *Typha latifolia*. The reedbeds of floodplain area of Kopački rit Nature Park were excluded from the survey because it is previously known that Marsh Harriers avoid nesting here due to extreme fluctuations of the water level (A. Tomik *unpublished data*). The vantage point method was applied during the fieldwork (HARDEY *et al.* 2013). This included one hour observation on every point from a position allowing a good overview of the surveyed habitat. The number of vantage points per locality varied from one to four depending on the habitat size. The distance between the observer and the outer edge of the habitat varied from 50 to 300 meters. During the stay at vantage points, the adjacent agricultural fields were also scanned in case the returning males would bring the prey to the crops. Every location was checked only once. When Marsh Harriers were detected, breeding evidence was gathered by observing the bird(s). The breeding status was accepted as confirmed in the case of the following behaviour: female or both sexes flying into the reeds carrying nesting material; male returning with prey and passing food to female coming out from the reeds; nest with eggs or young seen; female carrying food to reeds; fledged young seen together around the assumed nest site; parents transferring food to the fledged young around the assumed nest site. Observation of displaying males or pairs present was considered as occupied territory and probable nesting. Observation of lone birds foraging (males or females) was not considered as breeding territory. Observations were performed using a Minox 10x42 binocular and a Minox 15-45x zoom telescope.

The fieldwork was carried out between late April and late June in 2017 and 2018. The fieldwork typically occurred from early morning until early afternoon. During high temperatures, the survey was aborted after 11 AM. Working in harsh weather conditions (rain, strong wind) was avoided. According to personal observations, Marsh Harriers can be observed in their breeding territories in Baranya from mid-March with high activity of displaying and calling males throughout April. Nest building occurs from mid-April to mid-May but birds carry nesting material throughout the breeding season in order to repair the nest if necessary. During May and part of June, the female incubates while the male hunts and carries food to the female. Upon returning to the nest site the male calls, the female comes out from reeds and the food pass occurs mostly in the air. From June the male hunts for both the female and the already hatched chicks. Later, both sexes hunt and carry food to the nest. The nest is usually placed in reeds above the water but can also be built on the ground (CLARKE 1995).

The following data were recorded on the field: date, time range spent on a vantage point, name of GPS point, habitat type, vegetation type, presence of water in the habitat if possible, number and sex of Marsh Harriers if present as well as their behaviour, breeding status, distance and compass bearing of the

assumed nest site, number of chicks/juveniles (if possible), other comments (if needed). The data were processed using MS Office package, Google Earth, and QGIS programs. The habitat structure was defined in a circle of 1 km around the assumed nest site using Google Earth satellite images and tools.

As a part of the Pannonian Basin, the Baranya area (1147 km²) is predominantly a plain with less than 100 m a.s.l. On the northern part of the area, there is a hill with a peak of 243 m a.s.l. Baranya is characterized by continental climate and with average precipitation of 642 mm it is one of the most arid areas of Croatia. The area lies in the Pannonian biogeographical region with the vegetation cover of Pannonian-pontic forest-steppe zone. The alluvial plain makes up about 63% of the area including the Kopački rit floodplains between the Danube and Drava rivers. About 48% of the area is in intensive agricultural use while the forest cover (oak-hornbeam, willow-poplar and mixed forests) makes roughly 20%. There is also a melioration channel network more than 1000 km in length (BOROVAC 2002).

RESULTS

During 2017 and 2018, 94 localities were surveyed altogether in 9 municipalities in Baranya. A total of 52 confirmed nesting pairs of Marsh Harriers was found on 37 locations, with an additional 12 probable pairs recorded on 12 locations, which gives an overall population estimate of 52-64 pairs recorded on 41 locations. The remaining 53 surveyed localities showed no sign of occupancy. The review of available localities as possible breeding places for Marsh Harriers in Baranya compared to the occupied localities and the number of pairs shown by four habitat characteristics suggests that the water level and the vegetation type are the main factors affecting the breeding territory selection (Table 1). The detailed list of all nesting sites including remarks on habitat is shown in Appendix 1. All pairs except two were found in the reclaimed alluvial areas of Drava, Danube and Karašica rivers, all outside the floodplains. The distribution and density of confirmed breeding pairs is presented on the 5x5 km grid map (Fig. 1). In most cases, the nesting territory was confirmed by observing aerial food pass between the male and female during the incubation period. This was also used to estimate the probable position of the nest.

The two most common habitat types the Marsh Harriers chose for nesting (confirmed and probable pairs considered together) were various reedbeds formed in natural depressions (34.4%) and wide channels with reedbed belts or reed islands (29.7%). Oxbows in progressed state of succession were also favoured (21.9%) while artificial ponds and fishponds were of minor importance for the species. No pairs were seen nesting in agricultural fields adjacent to the surveyed wetlands. The distribution of confirmed and probable breeding pairs of Marsh Harriers among each habitat type is shown in Table 1. Regarding the vegetation type, the majority of Marsh Harrier pairs (90.6%) occupied the reedbed of Common Reed and only 6 pairs chose the bed of Broadleaf Cattail. The

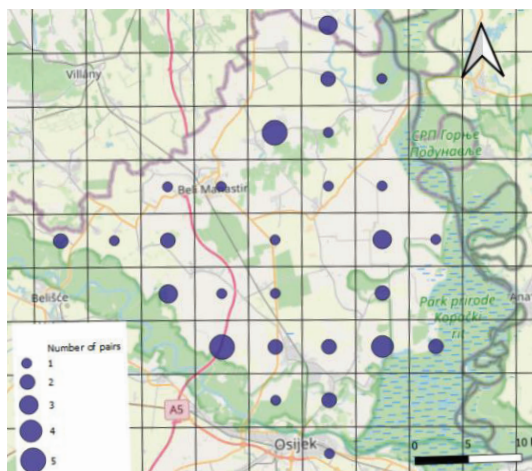


Figure 1. The distribution and density of breeding pairs of Marsh Harriers in Baranya (Source of map: QGis Desktop 3.8.2.)

Slika 1. Rasprostranjenost i gustoća gnijezdećih parova eje močvarice u Baranji. (Izvor karte: QGis Desktop 3.8.2.)

Table 1. Number of available localities (n=94), number and percentage of occupied localities (n=41) and number of breeding pairs of Marsh Harriers shown by selected habitat characteristics.

Tablica 1. Broj prikladnih lokaliteta, broj i postotak zauzetih lokaliteta te broj parova eje močvarice po pojedinim karakteristikama staništa.

		Available	Occupied		
		No.	No.	%	No. of pairs
Habitat type	other reedbeds	40	18	45	18-22
	channel	20	9	45	15-19
	oxbow	18	7	38.9	11-14
	artificial pond	14	5	35.7	5
	fishpond	2	2	100	3-4
Vegetation type	reed	83	36	43.4	46-58
	cattail	11	5	45.5	6
Max. width of vegetation (m)	5-50	45	16	35.6	14-17
	51-100	22	9	40.9	16-18
	101-200	19	10	52.6	15-21
	>200	8	6	75	7-8
Water	flooded	56	32	57.1	44-54
	seasonally flooded	25	9	36	8-10
	dry	13	0	0	0

nests were always built in old dry vegetation, typically in more than one-year-old reedbeds. Marsh Harriers also favoured habitats with permanently flooded vegetation (84.4% of pairs) and only 10 pairs were found in temporarily flooded habitats with the unknown water level at the time of the survey. No pairs were found in permanently dry vegetation.

The habitat structure in a 1 km circle around the assumed nest was dominated by open agricultural fields (68.34%), typically intensively managed arable land intersected by a network of melioration channels and very few hedgerows or tree rows. The share of forest was less than 11%, followed by reedbed/marsh vegetation with only 5.2%. The so-called "rit" habitat type is a heterogeneous mosaic of trees, shrubs, and high herbaceous plants, with some reeds and sedges, was represented by a share of 4%. The other habitat types were present with only small percentages (Fig. 2).

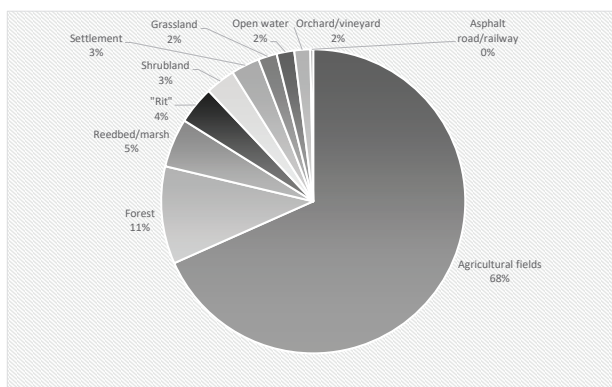


Figure 2. The average share of various habitat types in 1 km circles around assumed nests of Marsh Harriers (n=52).

Slika 2. Prosječni udio pojedinih tipova staništa u krugu od 1 km oko vjerojatnog mjesta gnijezda eja močvarica (n=52).

Table 2. The share of confirmed breeding pairs of Marsh Harriers (n=52) in each category of marsh vegetation width and size.

Tablica 2. Udio potvrđenih gnijezdećih parova eje močvarice u pojedinim kategorijama širine odnosno površine močvarne vegetacije.

Vegetation width (m)	No. of pairs	%	Vegetation cover (ha)	No. of pairs	%
10-50	21	40.38	0.1-10	28	53.85
51-100	19	36.54	10-30	17	32.7
101-200	6	11.54	30-50	5	9.6
>200	6	11.54	>50	2	3.85

The average width of the marsh vegetation (maximum distance of the area of vegetation measured from one end to another) with the assumed nest (n=52) was about 95 meters (ranging between 10 and 840 meters) with a median value of 73 meters. About 40% of the confirmed pairs used vegetation 10-50 meters wide for nest building, with a similar share of pairs using vegetation 51-100 meters wide (about 36%) (Table 2). The span of marsh vegetation area (mostly reed) inside the 1 km circle around the assumed nest ranged between 0.11 and 129 ha, 16.3 ha on average and the median value was 9.7 ha. Only two sites had reedbeds more than 100 ha in size with the rest of them all being smaller than 50 ha (Table 2).

DISCUSSION

During this study, a significant breeding population of Marsh Harriers was revealed in Baranya. The estimated 52-64 pairs highly surpass not only the previous estimate of ca. 20 breeding pairs in Baranya, but also the whole Croatian population of 40-60 pairs estimated by the Red Data Book of Birds of Croatia (BARIŠIĆ & RADOVIĆ 2013). This estimate is based on extensive survey so it is thought to be precise as it can be. Few undetected pairs, however, could still be present in some remote parts of the area, but there is no reasonable way to predict or measure this. It is clear that the national population estimate of this species needs a significant update. Thus, this study is meant to be the first in the series of similar surveys yet to come, in order to investigate and map the distribution and population size of Marsh Harriers in Croatia. As of writing these lines, the mapping of Marsh Harriers has already been completed along the middle and parts of the upper sections of river Drava, covering all relevant habitats dominated by oxbows. It is hard to assess the correct size of the national population since there are still gaps in knowledge with areas poorly or not at all surveyed and data yet to be processed from areas with already completed surveys. Population sizes of the neighbouring countries are as follows: 5200-6700 pairs in Hungary (PAPP *et al.* 2016), 347-464 pairs in Serbia (PUZOVIĆ *ET AL.* 2015), 30-50 pairs in Bosnia and Herzegovina (EU GREENWAY SARAJEVO 2013), 1-4 pairs in Slovenia (MIHELIČ *et al.* 2019). The population size of Marsh Harriers in Hungary is prone to some fluctuations depending on the availability of prey. Thus, more pairs would begin to breed in years with an abundance of small rodents in agricultural fields (PAPP *et al.* 2016). Regular monitoring is needed to study if this is the case in Baranya, too, since the local Marsh Harrier population greatly relies on small rodents in arable fields.

The trend of the national population was never defined, yet the EBBA2 Atlas indicates some gain, even though it is not clear if there was a real population growth, or it is due to increased field effort, or possibly both. Interestingly, the species was classified as declining in Croatia by BIRDLIFE INTERNATIONAL (2004).

Nonetheless, the European population is stable or increasing (BIRDLIFE INTERNATIONAL 2004, 2015, KELLER *et al.* 2020). More monitoring work is needed to assess the population trend in Croatia. Interestingly, there has been a significant population growth of Marsh Harriers in some agricultural regions, including intensified farmlands, e.g. in the Ebro Basin in Spain (CARDADOR *et al.* 2009).

The landscape of Baranya was largely formed by the influence of two major rivers, the Danube and the Drava. Much of the former floodplain areas was drained by building dikes and melioration channels. This activity resulted in the isolation, reduction, and transformation of marshes which have still survived in some extent in the former floodplain areas of the two rivers. The remaining small patches of marshland are of high value conserving biodiversity in the largely intensified agricultural landscape. These are mostly oxbows in a progressed stage of succession, various reedbeds, small ponds, and wide marshy sections of some of the channels. They all share one important feature – they are generally not influenced by the very dynamic and significant water level change occurring regularly on the Danube and Drava rivers including their current floodplains. Due to this, all of the 64 confirmed and probable pairs were found nesting in these flood-free habitats, whereas no nesting pairs were observed inside the active floodplains. The Kopački rit Nature Park has huge areas of floodplain reedbeds which would otherwise be perfect for nesting even in dry or semi-dry conditions which are more and more common recently. However, having in mind the risks of flooding, the pressure from mammalian predators, and the high population of Wild Boars, it is clear why Marsh Harriers avoid nesting in the floodplain. In Poland, Marsh Harriers were shifting nest positions inside the vegetation towards the deeper water after the increase of the Wild Boar population (WITKOWSKI 1989).

In line with this, the Marsh Harriers mostly chose habitats with relatively stable water levels during the breeding period, like reedbeds formed in natural depressions, wide channels with reedbed belts, and oxbows. The occupancy of these habitat types is similar, showing no evidence that Marsh Harriers favour one certain habitat type over others, but rather that they chose them because they were the most common in the study area. The low share of fishponds is due to the fact that only one small pond is active (supporting 2-3 pairs) in Baranya, whereas in other parts of lowland Croatia, carp fishponds are a very important and stable breeding habitat for Marsh Harriers (BARIŠIĆ & RADOVIĆ 2013). It seems that the size of the vegetation cover in the habitat is not a crucial factor during the breeding territory selection with only slightly increased occupancy rate of the bigger reedbeds but similar share of pairs. The habitat choice was most highly influenced by optimal water level and the vegetation type (Table 1). Indeed, the majority of breeding pairs were recorded in permanently flooded beds of Common Reed, whereas only a few pairs chose beds of Broadleaf Cattail. This was

usually the case when no other suitable habitat was present in the area except small artificial ponds with deep water unable to support reedbeds. This strong preference for reedbeds is in accordance with the literature data from other European countries, e.g. in UK 86% of the pairs were found nesting in reedbeds during the 1983 – 1995 period (CLARKE 1995) with 90% of Marsh Harriers using reedbeds during 1997 – 2008 in Ebro Basin in Spain (CARDADOR *et al.* 2011). In Baranya, Marsh Harriers favoured marshlands with permanently flooded vegetation. Only a small proportion of the pairs chose suboptimal water level conditions with reedbeds presumably dry or covered with very shallow water and no pairs were recorded in permanently dry vegetation. To date, there is no confirmed nesting of Marsh Harriers in non-marshland habitats like grasslands or agricultural fields in Baranya. Even though this study has not included survey of agricultural fields except the ones surrounding the wetlands, but other sources like the abovementioned NIP project, the PECBMS (Common birds monitoring of agricultural habitats), various other surveys which included also agricultural areas like monitoring of bird mortality on electricity infrastructure, and non-systematic field trips have not recorded signs of nesting in crops either. Thus, there was a reasonable claim that Marsh Harriers have not bred in agricultural fields in Baranya during the study period, and therefore no additional pairs were added to the current estimate of the population size. This situation is similar as in other parts of Croatia and also in surrounding countries (HARASZTHY 1998, ŠĆIBAN *et al.* 2015), unlike regions in mainly western Europe where nesting in dry habitats is not uncommon (CLARKE 1995). However, the few recent cases of unconfirmed possible nesting in winter cereals in Croatia may indicate that similar trends could start here, too.

The habitat structure in a 1 km circle around the assumed nests is very indicative for the lowland landscape of Baranya dominated by intensively managed agricultural fields. Indeed, the small patches or linear wetland habitats are almost always surrounded by large arable fields. This landscape has typically very low biodiversity and at first looks hostile for a middle-sized wetland-dwelling bird of prey. Most of the Marsh Harriers, however, selected this kind of landscape for breeding, occupying relatively small reedbeds with 77% of the confirmed pairs nesting in vegetation less than 100 meters wide, often below 50 meters. More than half of the confirmed pairs nested in vegetation covering less than 10 ha, including 9 pairs nesting in very small patches of less than 1 ha. Similarly, in the intensive agricultural landscape in Spain, Marsh Harriers inhabited small wetlands with an average vegetation cover of 8.4 ha (range 0.5-103 ha) (CARDADOR *et al.* 2011). Shift towards smaller reedbed patches as nesting habitats was also documented in the UK after the population growth of the Marsh Harriers (CLARKE 1995). This is usually a homogenous reedbed with no or very small areas of open water and thus mostly inadequate for hunting. According to personal observa-

tions, this is why a majority of the Marsh Harriers in Baranya forages in open agricultural fields with low vegetation (cereals, lucerne, pastures, ditches) which are rich in rodents and smaller birds. A similar preference for small rodents from agricultural fields was recorded in Hungary in pairs nesting in small marshland patches where rodent prey could reach up to 80% of their diet in rodent-rich years (Tóth 2007). Adaptation to nest in small marshland patches in combination with exploiting farmlands for food seems to be the key to the success of Marsh Harriers in Baranya, too.

As future prospects, monitoring of the breeding population of Marsh Harriers in Baranya is highly recommended, especially in the light of climate change and other human activities which may have negative effects on the habitat quality and prey abundance for Marsh Harriers. This negative trend is already showing well, with extreme weather conditions, severe droughts, drying-out, and disappearing wetland patches occurring in Baranya in recent years. Marshlands with unsuitable water levels or completely dried-out reedbeds have already been recorded since the 2017-2018 study period. Thus, some of the previously recorded breeding pairs could have been lost by now. Exactly for this reason, one of the aims of this study was to create baseline data of the breeding population of Marsh Harriers in Baranya, fearing that significant changes may happen in the near future. Worryingly enough, the Climatic Atlas of European Breeding Birds (HUNTLEY *et al.* 2007) predicts the disappearance of the species from much of the Carpathian basin until the end of the century.

Appendix 1. The list of nesting sites of Marsh Harriers in Baranya during 2017/2018 with remarks on habitat characteristics
Dodatak 1. Popis mjesta gniježđenja eje močvarice tijekom 2017/2018. godine u Baranji uz napomene o karakteristikama staništa.

Municipality	Settlement	Locality	Habitat type	Vegetation type	Max. width of vegetation (m)	Flooded	No. of confirmed pairs	Estimated no. of pairs
Beli Manastir	Šumarina	Mala Karašica 1	other reedbeds	reed	216	?	1	1
Bilje	Bilje	Stara Drava kod Meca(l)	oxbow	reed	262	+	1	11-14
Bilje	Bilje	Janči bara	oxbow	reed	74	+	1	
Bilje	Bilje	Bilje - Kopačevo	other reedbeds	reed	24	?	1	
Bilje	Kopačevo	Šrokerde	fishpond	reed	210	+	1	
Bilje	Kopačevo	Batsiget	other reedbeds	reed	985	+	1	1
Bilje	Vardarac	Mali Dunav	channel	reed	100	+	6	
Čeminac	Kozarac	Kozarac (bajer)	artificial pond	cattail	50	+	1	
Darda	Darda	Švajcerova ada	oxbow	reed	201	+	2	
Darda	Darda	Milošev lap	oxbow	reed	151	+	1	9-11
Darda	Darda	Topolik-Barbara kanal	channel	reed	118	+	2	
Darda	Darda	Suručka bara	other reedbeds	reed	139	+	2	
Darda	Darda	VB-Tatina bara	artificial pond	cattail	26	+	1	
Darda	Uglješ	Kličev lap	artificial pond	reed	17	+	1	1

Draž	Podolje	Ada	other reedbeds	reed	70	?	1	7-9
Draž	Topolje	Topoljski dunavac	oxbow	reed	115	+	3	
Draž	Topolje	Ostrovac	oxbow	reed	120	+	2	
Draž	Topolje	Puškaš	other reedbeds	reed	362	?	1	
Jagodnjak	Bolman	Gakovac (mrtvaja)	oxbow	reed	76	+	1	8-10
Jagodnjak	Jagodnjak	Bodonja	channel	reed	41	+	1	
Jagodnjak	Jagodnjak	Karaševska bara	channel	reed	10	+	1	
Jagodnjak	Jagodnjak	Darovac	other reedbeds	cattail	25	+	1	
Jagodnjak	Jagodnjak	Duboka bara	other reedbeds	reed	99	+	1	
Jagodnjak	Novi Čeminac	Brešće	channel	reed	17	+	2	
Jagodnjak	Novi Čeminac	Jaukov slš	other reedbeds	reed	95	+	1	
Kn.Vinogradi	Kn.Vinogradi	Kn.Vinogradi-sjever	other reedbeds	reed	88	?	1	
Kn.Vinogradi	Mirkovac	Latona	channel	reed	16	+	1	
Kn.Vinogradi	Mirkovac	Peskara	other reedbeds	reed	147	+	1	
Kn.Vinogradi	Sokolovac	Sokolovac	channel	reed	22	+	1	
Kn.Vinogradi	Zlatna Greda	Čarna 3	channel	reed	110	+	1	
Kn.Vinogradi	Zmajevac	Karoca	other reedbeds	reed	24	+	1	
Petlovac	Novo Nevesinje	Biška	other reedbeds	reed	120	+	2	3-4
Petlovac	Petlovac	Dubrava	artificial pond	cattail	39	+	1	
Popovac	Branjina	Velika veka 1	other reedbeds	reed	72	?	2	6-7
Popovac	Popovac	Popovac-ribnjak	fishpond	reed	64	+	2	
Popovac	Popovac	Šumarina	other reedbeds	reed	21	?	1	
Popovac	Popovac	Mala veka	artificial pond	cattail	149	+	1	

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SAŽETAK

Eja močvarica redovita je gnjezdarica i selica u Hrvatskoj, a gnijezdi se uglavnom u tršćacima i sličnoj močvarnoj vegetaciji prvenstveno u kontinentalnim riječnim nizinama. Sukladno Crvenoj knjizi ptica Hrvatske, nacionalna gnijezdeća populacija eje močvarice procijenjena je na ukupno 40-60 parova, dok se u Baranji bilježilo 10-15 parova. Ovaj rad predstavlja rezultate prvog sustavnog kartiranja gnijezdećih parova eje močvarice na području Baranje u istočnoj Hrvatskoj. Istraživanje je provedeno tijekom 2017. i 2018. godine, a istraživanjem su pokrivena sva potencijalno pogodna močvarna staništa. Terenski rad se odvijao u kasno proljeće za vrijeme trajanja inkubacije ove vrste, a korištena je metoda promatranja s točke. Potvrđeno je gniježđenje 52 para eja močvarica na ukupno 37 lokacija, a zabilježeno je dodatnih 12 mogućih parova, što daje ukupnu procjenu populacije od 52-64 parova u Baranji. Većina parova gnijezdila se u višegodišnjim poplavljenim tršćacima u branjenom aluvijalnom području Drave, Dunava i Karašice. Za gniježđenje su većinom birale mrtvaje, široke kanale i tršćake u prirodnim depresijama, pritom zauzimajući relativno male tršćake. Ukupno 77% potvrđenih parova gnijezdilo se u vegetaciji širine manje od 100 metara, dok je u 53% slučajeva površina samog staništa bila manja od 10 ha. U strukturi staništa u krugu od 1 km oko vjerojatnog mjesta gnijezda eja močvarica dominiralo je otvoreno poljoprivredno područje (68,34%) - najčešće intenzivno obrađivane njive omeđene mrežom melioracijskih kanala. Gniježđenje eje močvarice u suhim staništima poput ratarskih kultura ili travnjaka nije zabilježeno. Redovito praćenje stanja gnijezdeće populacije eje močvarice u Baranji je vrlo preporučljivo, posebno u svjetlu klimatskih promjena i ljudskih aktivnosti koje mogu imati negativne učinke na kvalitetu staništa ove vrste i brojnost plijena.