

THE BREEDING OF PYGMY CORMORANT *Phalacrocorax pygmeus* IN MONTENEGRO: A REVIEW

Gnezdenje pritlikavega kormorana *Phalacrocorax pygmeus* v Črni gori: pregled

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There are currently three Pygmy Cormorant *Phalacrocorax pygmeus* breeding sites in Montenegro: Lake Skadar – the Pančeva oka and Crni žar reserves, Paratuk Island and Ada Bojana Island. In total, the number of breeding pairs of this species in Montenegro is roughly estimated at 2,200 to 2,500 pairs. It breeds in mixed colonies, together with Cormorant *Phalacrocorax carbo*, Squacco Heron *Ardeola ralloides*, Grey Heron *Ardea cinerea*, Little Egret *Egretta garzetta*, Night Heron *Nycticorax nycticorax*, Spoonbill *Platalea leucorodia* and Dalmatian Pelican *Pelecanus crispus*. The colonies are seriously disturbed by tourists and fishermen.

Key words: Pygmy Cormorant, *Phalacrocorax pygmeus*, Montenegro

Ključne besede: pritlikavi kormoran, *Phalacrocorax pygmeus*, Črna gora

1. Introduction

The Pygmy Cormorant *Phalacrocorax pygmeus* is the smallest of the three European cormorants. This species has a restricted geographical distribution from Italy to the western side of the Caspian Sea (CRIVELLI *et al.* 2000), but has occurred accidentally in Central Europe (CRAMP & SIMMONS 1977). The world population of this species was estimated at 21,965 to 27,285 pairs in the 1990s (CRIVELLI *et al.* 2000), whereas the Mediterranean population has been estimated at less than 2,500 pairs (UNEP MAP RAC/SPA 2003). The Cormorant Research Group estimates that in 2005 between 22,715 and 24,353 pairs bred in all known colonies (VOSKAMP *et al.* 2005).

In most of the countries where this species breeds, its population is stable or growing, thanks to implementation of the Action Plan for this species, in particular with regard to protection of habitats (GALLO-ORSI 2001). The largest breeding populations are in Azerbaijan (max. 12,000 pairs) (BIRDLIFE INTERNATIONAL 2004) and Romania (between 4,000 and 8,000 pairs) (SCHOGOLEV *et al.* 2005). In Turkey, Ukraine, and Albania are the

Pygmy Cormorant's populations decreasing (BIRDLIFE INTERNATIONAL 2004). As far as the Montenegro's neighbouring countries are concerned, Croatia has a maximum of 25 pairs (RADOVIĆ *et al.* 2003), Serbia 360 to 500 pairs (PUZOVIĆ *et al.* 1999 & 2004), Greece max. 1,310 pairs (NAZIRIDES *et al.* 2005) and Albania 220 pairs in Velipoja (VOSKAMP *et al.* 2005). The wintering population in Europe numbers up to 63,000 individuals (BIRDLIFE INTERNATIONAL 2004).

The species used to be classified as a globally near-threatened species (BIRDLIFE INTERNATIONAL 2000), vulnerable in Europe, but was recently re-classified as secure (BIRDLIFE INTERNATIONAL 2004). It is listed in Appendix II of the Bern Convention, Annex I of the EU Wild Birds Directive, Appendix II of the Bonn Convention and in the African-Eurasian Migratory Waterbirds Agreement (AEWA) developed under the Bonn Convention. For this species, the European Union prepared the Action Plan for its protection in 1994 (CRIVELLI *et al.* 1996).

Literature data and new data are presented on this species in Montenegro, where it breeds in three areas: Lake Skadar, Paratuk Island and Ada Bojana Island.

2. Study area and Methods

2.1. Study area

The study area is shown on Figure 1. Lake Skadar is situated in the very SE part of Montenegro (19° 30' N, 42° 30' E). It is the largest lake on the Balkan Peninsula, with its water surface covering between 354 and 506 km², subject to the season of the year and water level. It is 44 km long and 15 km wide. Its main water source is the Morača River, which provides more than 60% of the lake's water. Through the Bojana River it is connected with the Adriatic Sea. Lake Skadar is situated in a crypto-depression with an average depth of 5–6 m. Two thirds of the lake area are situated in Montenegro and one third in Albania. The two major breeding localities of the birds on Lake Skadar are the Pančeva oka (covering approx. 200 ha) and Crni žar reserves. The Montenegrin part was declared a national park in 1983 and given IBA status in 1989 (GRIMMETT & JONES 1989). Since 1995, this part of the lake is also a Ramsar site. The Albanian part of the Lake has been protected since November 2005 (IUCN 2005). On Lake Skadar, 281 bird species have been recorded so far (DHORA & SAVELJIĆ 2001). During the IWC (International Waterbird Census) in 1999, more than 250,000 water birds were counted on the Lake (VASIĆ *et al.* 2000), while in 2006 only 35,000 were counted (*own data*).

The Paratuk Island on the Bojana River is 120 m long and approximately 10 m wide. It is located 8 km from the mouth of the Bojana River in the Adriatic Sea. The island belongs to Montenegro and is located approximately 100 m from the shore of the Bojana River. It is covered with vegetation, mostly with willows *Salix* sp., alders *Alnus* sp. and poplars *Populus* sp.

Ada Bojana Island is the largest river island in Montenegro; from 1988, it has been connected with the mainland. It is triangular in shape, its surface covers 4.5 km² and its beach is 3,400 m long. Tourist infrastructure occupies only a small part of this peninsula. The rest is covered by wetland forests of oaks *Quercus* sp., alders, ashes *Fraxinus* sp., willows and poplars.

2.2. Methods

The new estimate of the number of Pygmy Cormorant in the Pančeva oka and Crni žar reserves was made during the 2002–2005 period, when the colony was visited several times in the breeding season by the ornithologists Ondrej Vizi and Nela Vešović, twice by Darko Saveljić (VIZI 2003) and once by Borut Rubinić (B. RUBINIĆ *pers.comm.*). In the spring of 2002, a mixed colony on Pančeva Oka was observed from a small aeroplane at an

altitude of some 300 m (SAVELJIĆ 2004). In 2002, this was also the breeding ground of around 2,000 pairs of Cormorant *Phalacrocorax carbo* and several hundred pairs of different heron species.

Due to its inaccessibility and the fact that the colony is mixed, it was very difficult to count the number of pairs of Pygmy Cormorant (VIZI 2003). Pančeva oka has more than 50 small lakes edged by Common Reed *Phragmites australis*, Narrowleaf Cattail *Typha angustifolia* and Common Cattail *T. latifolia* and located on quicksand called “Kako bilo”. For this area only a rough estimate of breeding Pygmy Cormorant pairs is possible, based solely on the number of birds observed and on an incomplete census of the mixed colony.

Ada Bojana Island and Paratuk Island were visited during 2002–2005, on average 4 times in each breeding season. Estimates of the number of pairs were made from the shore, using of binoculars.

I made also literature review for the whole area of Montenegro.

3. Results

3.1. Literature review

FIRER (1894) was the first to describe the breeding of Pygmy Cormorant in Montenegro, i.e. in the colony below the village of Omerbožović. REISER & FIRER (1896) observed the species breeding in the Bojana delta. On Lake Šasko, VASIĆ (1979A & B) found a noteworthy colony in 1969, while 9 years later he registered, in the same habitat, 100 birds sitting on their nests (VIZI 1986). In the Manastirska tapija ornithological reserve, the breeding of Pygmy Cormorants was registered as “most numerous” in the colony mixed with herons (IVANOVIĆ 1966). Later on, some 600 pairs were observed in the same area (IVANOVIĆ 1970). In the Bojana delta, the Pygmy Cormorant was at that time still registered as a breeding species, although without any accurate data (VASIĆ 1979A & B). In the early 1980s, the breeding population on Lake Skadar was estimated at 1,000 to 2,000 pairs (ŠOTI *et al.* 1981), although in another reference the Pygmy Cormorant was recorded as a rarity during the breeding season (VIZI 1986). For the needs of IBA designation, the colony on Lake Skadar was estimated at 2,000 pairs, on Lake Šasko at 50 and on the Bojana River at max. 2,000 pairs (GRIMMETT & JONES 1989). Vizi estimated the colony at Crni žar at 1,100 pairs (VIZI 1995). Total breeding population on Lake Skadar was estimated at more than 1,000 pairs (HAGEMEIJER 1996) and, eventually, at 2,000 pairs in 1997 (REICHHOLF 1997). Pygmy Cormorant was listed as a breeding species of the Montenegrin coast, although without mention of the breeding locality and

Table 1: The breeding of Pygmy Cormorant *Phalacrocorax pygmaeus* in Montenegro**Tabela 1:** Podatki o gnezdenju pritiklavega kormorana *Phalacrocorax pygmaeus* v Črni gori

Site / Območje	Breeding grounds/ Gnezdišče	No. of pairs/ Število parov	Year/ Leto	Source / Vir
Lake Skadar				
	Manastirska tapija	breeding / gnezdi	1966	IVANOVIĆ (1966)
	Manastirska tapija	72	1970	IVANOVIĆ (1970)
	Manastirska tapija	600	1970	IVANOVIĆ (1970)
		2000	1977	REICHHOF (1977)
		breeding / gnezdi	1981	VIZI (1981)
		1000–2000	1981	ŠOTI <i>et al.</i> (1981)
		low numbers breeding/ gnezdi, maloštevilni	1986	VIZI (1986)
		2000	1989	GRIMMET & JONES (1989)
		2000	1992	VASIĆ <i>et al.</i> (1992)
	Crni Žar	1100	1995	VIZI (1995)
		1000	1996	HAGEMEIJER (1996)
		1100–1600	1977	VOSKAMP <i>et al.</i> (2005)
		breeding / gnezdi	2003	VIZI (2003)
		2200–2500	2005	this work / to delo
Lake Šasko				
		large colony recorded/ opažena velika kolonija	1969	VASIĆ (1979A & B)
		breeding / gnezdi	1977	VIZI (1986)
		50	1989	GRIMMET & JONES (1989)
Paratuk Island				
		170	2003	SCHNEIDER <i>et al. in prep.</i>
		200	2005	this work / to delo
Ada Bojana Island				
		breeding / gnezdi	1894	FIRER (1894)
		125	2003	ŠTUMBERGER <i>et al.</i> (2005)
		35–50	2004	SCHNEIDER (2004)
		breeding / gnezdi	1979	VASIĆ (1979A & B)
		breeding / gnezdi	1998	VIZI (1998)
		50	2005	this work / to delo
Bojana River delta				
		max 2000	1989	GRIMMET & JONES (1989)
		365	2003	ŠTUMBERGER <i>et al.</i> (2005)

the number of pairs (VIZI 1998). In the area of the Bojana River delta, on the Montenegrin side, 365 breeding pairs were registered in 2003 (ŠTUMBERGER *et al.* 2005). For the literature review see Table 1.

3.2. Recent status

In Montenegro, the Pygmy Cormorant breeds in three areas: Lake Skadar, Paratuk Island on the Bojana River, and on the Ada Bojana Island. The census results are presented in Table 1.

On Lake Skadar, it breeds in mixed colonies with Cormorant, Squacco Heron *Ardeola ralloides*, Grey Heron *Ardea cinerea*, Little Egret *Egretta garzetta*, Night Heron *Nycticorax nycticorax* and Dalmatian Pelican *Pelecanus crispus* at two localities, Pančeva oka and Crni žar, some 3–4 km apart. Earlier on, it also bred in the Manastirska tapija reserve (VIZI 1997, IVANOVIĆ 1966 & 1970), but due to disturbance the colony was relocated to Crni žar. The colony has more recently moved every three years on average from Pančeva oka to Crni žar, and vice versa. The most likely reasons are disturbance by tourists,

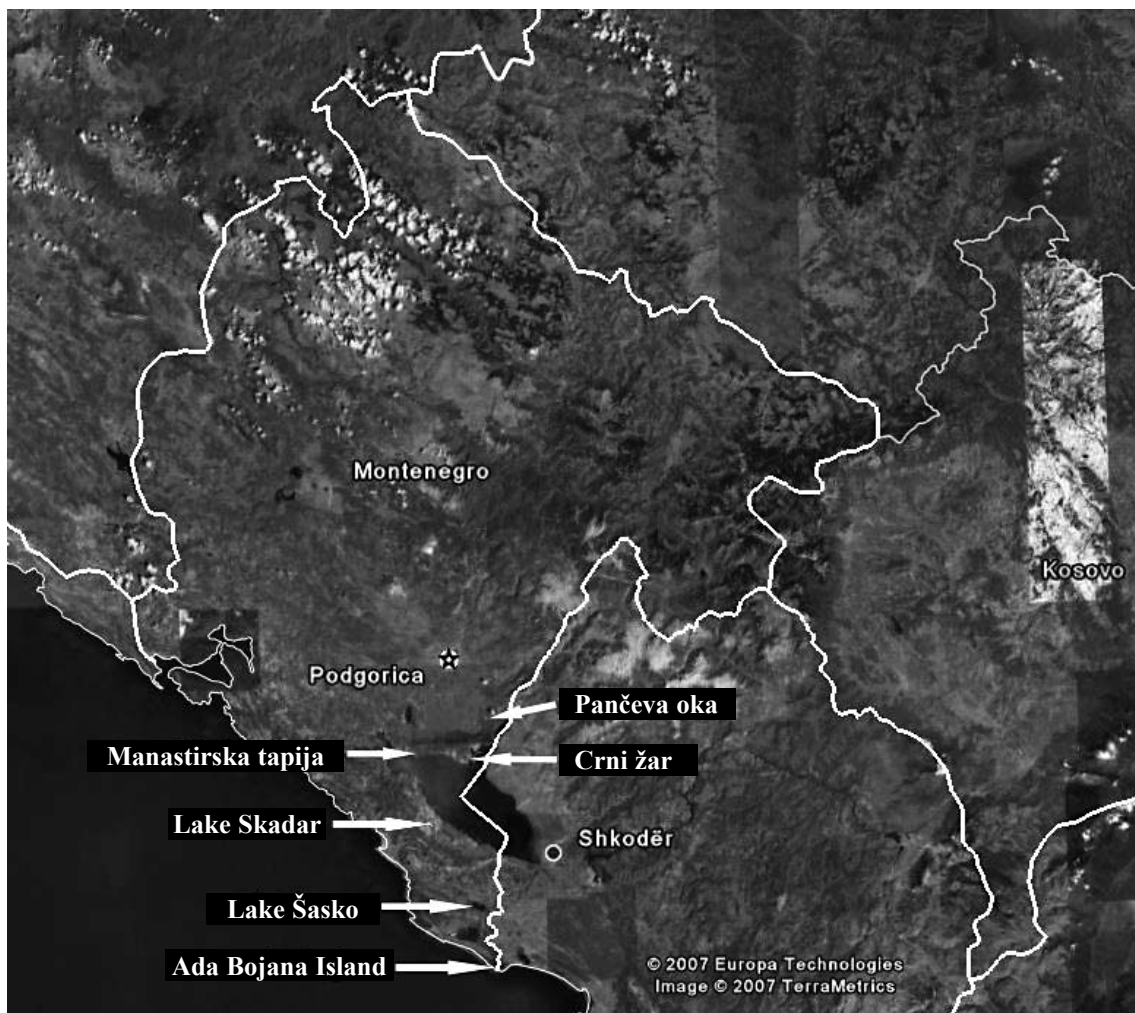


Figure 1: The colonies' locations of Pygmy Cormorant *Phalacrocorax pygmeus* in Montenegro

Slika 1: Lokacije kolonij pritlikavega kormorana *Phalacrocorax pygmeus* v Črni gori

reed burning during the winter months and disturbance by fishermen. Pygmy Cormorants are victims of the closeness of the colony of Dalmatian Pelicans, which are of special interest to tourists and others (SAVELJIĆ *et al.* 2004).

On Paratuk Island, the Pygmy Cormorant breeds in a mixed colony with Cormorant, Squacco Heron, Grey Heron, Little Egret, Night Heron and Spoonbill *Platalea leucorodia*. The Paratuk colony was estimated at 200 pairs in 2005. From earlier observations, starting in 1999, the number of pairs rose from 170 to 220 pairs, which is a maximum for this island due to the lack of breeding space (SCHNEIDER *et al. in prep.*).

On Ada Bojana Island, Pygmy Cormorant breeds in a mixed colony with Cormorant, Squacco Heron, Grey Heron, Little Egret, Night Heron and Spoonbill. The number of breeding pairs was estimated at 125 pairs in 2003 (SCHNEIDER *et al. in prep.*) and at approx. 50 pairs in 2005.

In total, the number of Pygmy Cormorant breeding pairs in Montenegro is estimated at 2,200 to 2,500 pairs, although we cannot exclude a greater observation error outside this range, due to the extreme inaccessibility of the species' most important breeding grounds on Lake Skadar.

4. Discussion

Literature data on the breeding of Pygmy Cormorant in Montenegro date from 1894 (FIRER 1894). Since then, several colonies have been registered: at Manastirska tapija, Pančeva oka and Crni žar, on Lake Šasko, on Ada Bojana Island and on Paratuk Island on the Bojana River.

Pygmy Cormorants have often been subjected to serious disturbance on Lake Skadar, while the colonies on Paratuk Island and Ada Bojana Island have enjoyed complete peace, thanks to the strict protection by the Army. The colony on Lake Šasko does not exist any more.

Disturbance on Lake Skadar has been intense in the past (VIŽI 1995). Consideration of Pygmy Cormorants as their competitors led to the fish-processing factory on Lake Skadar – Rijeka Crnojevića – to be set up, in 1970, a working group to destroy their nests at Manastirska tapija. In the ensuing year, the colony moved to Crni žar (VIŽI 1997). In the Pančeva oka and Crni žar reserves they are currently seriously disturbed, especially during the breeding period, by tourists and fishermen (SAVELJIĆ 2004). This is why it is necessary to implement zoning of the Lake, in order to stop people approaching the immediate vicinity of the colony, especially in the breeding period, when they are most vulnerable (KAREN *et al.* 1996). This is the reason why the colony often changes its nest site, as registered at Mikri Prespa (CATSADORAKIS 1996). The quite significant

population fluctuations noted on Lake Skadar have been also ascribed to human disturbance (VASIĆ 1983). During the winter, 5,000–11,000 individuals were counted during the IWCs on Lake Skadar, which is 20% of the total Mediterranean / Black Sea population (VASIĆ *et al.* 1992). Global problems facing the protection of Pygmy Cormorants are water drainage, tourism, water pollution, fishery, disturbance by hunters (TUCKER & EVANS 1997) and, in some countries, e.g. Albania, people hunt them for food (RADOVIĆ *et al.* 2003, VANGELUWE *et al.* 1996). On Lake Skadar, the greatest problem is disturbance. On Paratuk Island and Ada Bojana Island, disturbance is not as serious, although there is a danger that, as soon as shipping on the Bojana River is established, these colonies will also be threatened to a considerable extent.

5. Povzetek

V Črni gori trenutno obstajajo tri območja gnezdenja pritlikavega kormorana *Phalacrocorax pygmaeus*: rezervata Pančeva oka in Crni žar na Skadarskem jezeru, otok Paratuk in otok Ada Bojana. Po grobih ocenah naj bi v Črni gori gneznilo med 2200 in 2500 parov. Kolonije vznemirjajo turisti in ribiči.

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