

# SIS Conservation

*Publication of the IUCN SSC Stork, Ibis and Spoonbill Specialist Group*

**ISSUE 1, 2019**

**SPECIAL ISSUE: GLOSSY IBIS ECOLOGY & CONSERVATION**



***Editors-in-chief:* K.S. Gopi Sundar and Luis Santiago Cano Alonso**

***Guest Editor for Special Issue:* Simone Santoro**

ISBN 978-2-491451-01-1

## The Glossy Ibis *Plegadis falcinellus* in Azerbaijan

Elchin SULTANOV

Institute of Zoology of National Academy of Sciences of Azerbaijan, A. Abbaszade str., passage 1128, block 504, Azerbaijan  
Corresponding author; e.mail: elchin\_sultanov@aos.az

### ARTICLE INFO

#### Article history:

Received 21 July 2018

Received in revised form 15 October 2018

Accepted 3 November 2018

### KEY WORDS

Glossy Ibis, Azerbaijan,  
number, distribution, dynamics,  
threats

### ABSTRACT

Glossy Ibis *Plegadis falcinellus* is a nesting species in Azerbaijan. Nesting occurs in large mixed colonies with up to 11 species, including herons, ibises and cormorants. The research was conducted on all main nesting sites in Caspian Sea coast and on inland lakes and water reservoirs of Kur-Araz lowland. The present study estimates Glossy Ibis abundance between 1990–2006 in Azerbaijan to be between 10,000–15,000 individuals. This is about two times less than a previous estimate published for the 1990s which reported 12,500–18,000 pairs (25,000–36,000 individuals). However, the dynamics seemed to be heterogeneous among different Azerbaijan sites. As an example, the population declined in Aggol (about four-fold) and in Mahmudchala lakes (>30-fold), whereas it increased in Gyzylagach SNR and Sarisu lake (up to 6,000–8,000); from other areas the data were not precise enough to infer net changes in numbers. Although absent in the list of species permitted for hunting, the Glossy Ibis is not a protected species in Azerbaijan. No special Protected Areas are dedicated for Glossy Ibis but, notably, two National Parks (Aggol and Shirvan) and one State Nature Reserve (Gyzylagach) include > 63% of all of the breeding population in the country. Main threats for the Glossy Ibis are illegal hunting and fluctuation of water level, due to the presence of dams or water extraction effectuated in most nesting sites. To improve the conservation status of the Glossy Ibis in Azerbaijan I recommend to: (i) increase the effectiveness of plans against illegal hunting, (ii) strengthen conservation work in Special Protected Areas, and (iii) develop and maintain a regular monitoring program of the species especially consisting of spring–summer counts in all key sites.

### Introduction

Glossy Ibis *Plegadis falcinellus* is a very common bird in Azerbaijan in certain habitats, namely the wetlands. Every big wetland (lake or just shallow water, sea gulf or sometimes water reservoir) in Azerbaijan hosts mixed colonies of *Ciconiiformes* and *Pelecaniformes* birds with up to seven species of herons: Black-crowned Night Heron *Nycticorax nycticorax*, Squacco Heron *Ardeola ralloides*,

Western Cattle Egret *Bubulcus ibis*, Little Heron *Egretta garzetta*, Great Egret *Ardea alba*, Grey Heron *Ardea cinerea* and Purple Heron *Ardea purpurea*. These colonies also as a rule include two species of ibises: Eurasian Spoonbill *Platalea leucorodia* and Glossy Ibis, and two species of cormorants: Great Cormorant *Phalacrocorax carbo* and Pygmy Cormorant *Microcarbo pygmeus*. During the 20<sup>th</sup>

century, the Glossy Ibis has undergone a population decline in 1940s–1960s (in 1940s in Mahmudchala Lake, in 1960s in Gyzylagach State Nature Reserve) and, subsequently, a population increase in 1970–1980s (Patrikeev 2004).

Spring migration occurs from late March to Mid–May. Autumn migration occurs from Mid–August to earlier October but in some years extends through to November–December (Patrikeev 2004). Although sporadically observed in winter (Radde 1884; Vinogradov and Chernyavskaya 1965; Patrikeev 2004 -record in 1991- ), the Glossy Ibis is not a regular wintering species in Azerbaijan (Tuayev 1975, our data).

Nest building occurs during April in reed and tamarisk growth or on trees if they are achievable (only Varvara water reservoir (w.r.). The diameter of nest is 280–350 mm, depth 40–60 mm (Grekov 1965; Mustafayev and Kazimov 1965a, b, 1966). Average egg measurement is 52.4 x 35.8 mm (Mustafayev and Kazimov 1966). Eggs laying is mostly in late April–early May (Grekov 1965; Vinogradov 1967; Tuayev 1975) but on Mahmudchala Lake, it was registered in late May–early June (Patrikeev 2004). The number of eggs per clutch is 4–6 but can sometimes be up to nine if two females lay eggs in the same nest (Vinogradov 1967). Incubation by both parents lasts 19–23, on average – 21.2 days and chicks remain in the nests for 30–32 days mainly in first days of June and leave the nest mainly in the end of June–beginning July (Tuayev 1975). In Gyzylagach State Nature Reserve (SNR) in the 1960s, 13% of eggs were lost and 7.5% of chicks (Mustafayev and Kazimov 1965a, b, 1966). Just within the 1960s there was a sharp decline of this species in this reserve. On average 3 fledglings per pair were counted in Aggol State Nature Reserve (now National Park) in 1960s (Vinogradov 1967; Vinogradov and Tcherniavskaya 1969). Research on diet shows that 47% of all stomachs contained Marsh Frog, 24% fishes and 23% insects (Vasilyev 1975), mainly dragonfly larvae (Tuayev 1975).

### Study Area

In Azerbaijan, there are many lakes with shallow water (1–5 m depth) and coastal areas where water is

warm and it is covered by reed growth (*Phragmites communis*). They tend to not freeze during the winter (or do for only a very short time). Reed beds are a main component of plant community in these shallow waters especially during the breeding period when the majority of birds use them for nesting and nest building, shelter and, in some cases, even for feeding. Colonial species like the Glossy Ibis are commonly observed nesting together in big mixed-species colonies of *Ciconiiformes* and *Pelecaniformes* (herons, ibises and cormorants). Their nests are often distributed in two–three floors in reeds or bushes of Tamarisk (*Tamarix ramosissima* and *T. meyeri*). These colonies may host up to several thousand nests (in Gyzylagach SNR – several tens of thousands of nests).

Most inland lakes are supplied with water from channels of the Kura River (Lakes Jandar and Hajigabul) or from channels of the Mingachevir reservoir located on Kura River (Lakes Aggol, Sarisu and Bozgbu). Two inland lakes are Ramsar sites: Gyzylagach SNR and Aggol National Park (NP).

In Azerbaijan, the Glossy Ibis counts proceed mainly by two macro-areas (details may be found in Sultanov *et. al.* 2000; Sultanov *et al.* 2008): the Caspian Sea coast and the Kura–Araz lowland.

### Caspian Sea coast

Lake Agzibhir is 12 Km from Shabran (former Divichi) city in the direction of the Caspian Sea. The inflow and outflow of this coastal lagoon (1,600 – 2,200 ha, maximum depth – two meters) is mediated, respectively, by three rivers and one river which ends in the Caspian Sea; Kura River Delta, eight–10 km from Neftechala city. The area is about 30,000 ha. The wetland includes main and secondary branches of the river Kura with dense reed beds, many small dams connecting small islands and one major island. The straight-line distance (MD hereon) is about 20 Km in the Southeast direction; Gyzylagach SNR, 30 km from Lankaran city by the asphalt road (South-east Azerbaijan). This vast area (88,360 ha) is among the most important places both in Europe and in all of Western Palearctic for wintering and nesting waterbirds. It consists of four main parts: 1) open water of the Great Kyzylagach Gulf (area 40,000 ha,

MD 29 Km, width 24 Km, maximal depth 3.5 m), Little Kyzylagach Gulf (16,000 ha, MD 16.7 Km, width 6.5 Km, maximal depth 2.5 m); 2) a maritime belt of reed beds is in Great Kyzylagach Gulf (width 2–2.5 Km) especially along the western and northern beach at about 200 m from them; 3) different shallow waters with reed beds and 4) semidesert plots on remaining territory of reserve. The Great Kyzylagach Gulf plays a major role for the Southern Caspian Sea region as a place with a concentration and growth of newly-hatched, economically-valuable species of fish, specifically in Lake Flamingo in Shirvan NP, with an area of about 2,000 – 4,000 ha (now decreasing). This lake was formed as a result of overflow of water from Shirvan Spillway Canal. The water level fluctuates. Reed beds are very developed and water is very shallow (often less than 0.5 m).

#### *Kura–Araz lowland*

Lake Aggol, 20 km from Agjabedi city with an area of about 10,000 ha (in the past only 4,500 ha). The lake is located at Mil steppe in Karabakh with a MD (west – east) of 25 km and a width of 1.4 – 5 km. The depth is 1.2 – 3.5 m, and in the coastal strip is 0.1 – 0.5 m. 75% of the area is covered with vegetation (basically reed beds). In the lake there are several islands of 2 – 10 ha, richly covered by vegetation. This site is especially important for wintering and breeding of many threatened waterbird species. Varvara water reservoir, created in 1956, covers an area of 2,140 ha near Mingachevir city with a water depth of 0.5 – 18 m. The reed beds are extensive and the reservoir is surrounded by shallow waters separated from it by a dam and narrow strips of land. This place is used for nesting and wintering by many rare and threatened species of birds (in summer large mixed breeding colonies of *Ciconiiformes* and *Pelecaniformes*); Lake Sarisu, an area of 11,000 ha in the Imishli, Kurdamir and Sabirhabad districts. This is one of the largest wetlands in Azerbaijan. More than half of the territory is covered by reed beds providing ideal conditions for nesting of a very large number of birds. Lake Mahmudchala is one of the largest wetlands (about 7,000 ha) in a flat part of Azerbaijan with an unstable water level located between Salyan and Bilasuvar cities. Owing to very

developed reed beds, this is one of the most important wintering and nesting site of rare and hunted species of birds. Lake Bozgob is located between the Aggyol and Sarisu lakes. This lake which is important for wintering and breeding of birds, receives water from Lake Aggyol and different collectors and canals. Reed beds are very developed. The oil fields near Bozgbu and the oil ponds are significant threats to this ecosystem. Lake Hajigabul covers 904 ha (with fishponds and neighbouring shallow waters – more than 2,500 ha) and is located between Hajigabul and Shirvan cities. This lake initially appeared as a gulf of the Caspian Sea and subsequently remained isolated from it, being supported by periodic overflows of the river Kure. Unlike the majority of other lakes of Azerbaijan, the reed vegetation is not abundant here although it is in the neighbouring shallow water and fishponds. The depth of this lake, important for temporary rest of migratory birds during migration, does not exceed 5 m.

#### **Methods**

Outside of the breeding colonies, direct bird counts were taken from road surveys. Inside of the breeding colonies, the number of birds was estimated by direct counts of adult birds and nests on randomly selected squares with subsequent extrapolation on the full area where breeding colonies were present. Binoculars and telescopes were used to identify the species. The data used for this study comes from surveys performed in the period between 1990 and 2006 from several areas located within the Caspian Sea coast and the Kura–Araz lowland.

#### **Results**

The following numbers of birds were estimated by direct counts in the two macro-areas (Figure 1).

##### *Caspian Sea coast*

Lake Agzibir (Divichi Lagoon)  $\geq 85$  individuals were counted in 1998 (Sultanov and Agayeva 2003). Kura River Delta – in June 1996 in a mixed colony with about 1,100 nests, 50 nests of Glossy Ibis ( $\leq 5\%$  of total); in Gyzylagach SNR in 1950s there were

between 50,000 pairs (Grekov 1965) and 150,000 individuals (Dunin 1960), their number decreased to  $\geq 3,000$  pairs in 1980s and  $\geq 1,800$  in 2006. In Lake Flamingo in Shirvan NP – no information about the number of breeding birds because the colony was inaccessible. M.V. Patrikeev registered two individuals on the 21 May 1990 (Patrikeev 1991b).

**Figure 1. Nesting sites of Glossy Ibis in Azerbaijan in the last two decades: 1-Aggol NP; 2-Lake Mahmudchala; 3-Varvara w.r.; 4-Lake Sarisu; 5-Shallow waters near the Lake Hajigabul; 6-Lake Bozgbu; 7-Gyzylagach SNR; 8-Kura Delta; 9-Divhichi Liman (Lake Agzibhir); 10-Shirvan NP, Lake Flamingo. Big red circles 500 – 4500 individuals; small red circles  $\leq 500$  individuals**



### Kura–Araz lowland

More than 8,000 pairs were observed on Lake Aggol in 1988–1990 (Patrikeev 2004), according to data collected by A.F. Jabbarova (2006) in the first half of July 2004. 4,230 individual (23.5% of total) Glossy Ibis were registered in a mixed colony of 18,000 individuals. 50 – 60 pairs on Varvara water reservoir were counted in 1980 – 1990 (Sultanov and Agayeva 2003; Patrikeev 2004). In April 2006, only 20 individuals of Glossy Ibis were observed in two mixed colonies of about 900 individuals. Lake Sarisu had  $\geq 100$  pairs in 1990 (Patrikeev 2004),  $\geq 130$  individuals (Sultanov and Agayeva 2003) in 1998 and 953 individuals in 2000 (pers. obs.). Lake Mahmudchala, where this species disappeared in the

1950s and then returned in 1980s had 5,500 – 6,000 pairs counted in 1990 (Patrikeev 1991a). According to our data for 1998, 250 individuals (10% of the total number of birds in the mixed breeding colony) were counted with 63 individuals outside the colony on shallow waters of the lake (Sultanov *et al.* 1998; Sultanov and Agayeva 2003). Also, some colonies with Glossy Ibises have been observed in Lake Bozgbu and in shallow waters near the Lake Hajigabul (20 individuals were registered in the end of May 1998, pers. obs.) where, due to inaccessibility of shallow waters, exact data about the number of breeding birds does not exist.

**Table 1. Distribution and number of Glossy Ibis in Azerbaijan according to our data. Ind.: Individuals**

Site	Trend		% in mixed breeding colony
	Min.	Max.	
1. Aggol National Park	4,230 ind. in 2004	8,000 pairs in 1990s	↓ 24%
2. Lake Mahmudchala	313 ind. (1998) 932 ind. (2000)	6,000 pairs (1990)	↓ 12%–34%
3. Varvara Water Reservoir	20 ind. (2006)	60 pairs (1990)	↓ 12% (1998)
4. Lake Sarisu	>100 pp 1900s	953 ind. 2000	↑ 9–31%
5. Shallow waters near the Lake Hajigabul	20 ind. 1998	?	↓ 28%
6. Lake Bozgbu	Regular in breeding season	?	? ?
7. Gyzylagach SNR	50 pairs in 1960s	>3,000 pairs in 1990s, >1,800 in 2006	Fluctuation 14.5%
8. Kura Delta	50 nests in 1996		? ?

Site	Trend		% in mixed breeding colony
	Min.	Max.	
9.Divhichi Liman (Lake Agzibhir)	85 ind. in 1998		?
10.Shirvan NP, Lake Flaming	2 ind. in 1990		?
<b>Total</b>	<b>2,574 pairs</b>	<b>&gt;17,536 pairs</b>	

## Discussion

According to current data we estimate general numbers of Glossy Ibis in Azerbaijan for the research period spanning 1990-2006 as 10–15 thousand individuals. This is about 2 times less than the estimate made by M.V. Patrikeev for the 1990s which was 12,500–18,000 pairs. This takes into account the decrease of in the numbers in Aggol (about 4 times) and Mahmudchala lakes (which decreased more than 30 times), the increase in the number in Gyzylagach SNR and Sarisu lake (up to 6,000-8,000 individuals together) and no precise data from Divichi lagoon, Shirvan NP and Kura river Delta (where we can propose important numbers of this species).

There may be some competition between Glossy Ibis and Spoonbill that exists, as the presence of one species is often accompanied by the absence or important decrease in number of the other species. For example, in lake Sarisu, 130 Glossy Ibises and 0 Spoonbills were recorded in 1998, 22 Glossy Ibises and 67 Spoonbills were recorded in 1999, and 953 Glossy Ibises and 1 Spoonbill in 2000. In Lake Mahmudchala, 313 Glossy Ibises and 8 Spoonbills were counted in 1998, and in Varvara water reservoir 123 Glossy Ibises and 0 Spoonbills were recorded in 1998. A similar pattern has been observed with the Grey Heron if the presence of Glossy Ibis is consistent (> 100 individuals).

### *Conservation and economic importance*

The Glossy Ibis is not a protected species in Azerbaijan although it is absent in the list of species permitted for hunting. No special Protected Areas are

dedicated to the Glossy Ibis; however, two National Parks (Aggol and Shirvan) and one State Nature Reserve (Gyzylagach) include more than 63% of all breeding population. No specific actions for the conservation of the species have ever been planned or implemented.

Main threats for the Glossy Ibis are illegal hunting (up to 50% of pairs lose one partner as a result of hunting) (Litvinova 1986) and fluctuations of water level. This is due to the presence of dams or water extraction effectuated in most lakes (for example, Mahmudchala lake) that can totally destroy all mixed breeding colony.

### *Gaps and recommendations for future*

Unfortunately, there is no detailed information about numbers of breeding birds in lakes Flamingo (Shirvan NP), Agzibir, Bozgobu, Sarisu, and Hajigabul. Similarly, there is no knowledge about the effect of lead shots, which represents a well-known cause of poisoning in waterfowls (Scheuhammer and Norris 1996), and about the interaction with fishers as it is known they can disturb breeding colonies and even be responsible of illegal hunting of this and other bird species. To improve the conservation of the Glossy Ibis in Azerbaijan I recommend the following actions to be taken:

- 1) Increase of effectiveness of fighting illegal hunting.
- 2) Strengthening conservation work in Special Protected Areas
- 3) Regular spring–summer counts on all key sites.

### **Acknowledgements**

The author is grateful to Embassy of Kingdom of Netherlands in Ukraine for support of some expeditions connected with this work in 1990s. The author also is grateful to Dr. Aytekin Jabbarova, Dr. Tahir Kerimov, Dr. Sevinj Humberova, Dr. Arzu Mammadov, Ms. Nigar Agayeva – researchers of Azerbaijan Ornithological Society, former deputy director of Aggol National Park Ms. Abulfat Samadov and former worker of Gyzylagach State Nature Reserve Aim Talibov for participation and support in organization of joint expeditions for

collecting of data, Dr. Simone Santoro for great help in editing of this paper.

---

REFERENCES

- Dunin, A.G. 1960. [Changes in ornithofauna of Lesser Kizil Agach Gulf throughout its desalination]. In: [Okhrana prirodi i ozeleneniye], vol. 4 (in Russian).
- Grekov, V.S. 1965. [The colony of wading birds and cormorants in Kizil Agach Nature Reserve]. *Ornitologia*, 7: 258–265 (in Russian).
- Jabbarova, A.F. 2006. [Dynamics of number of Ciconiiformes in Aggol National Park during nesting time]. Pp. 246–251. In: [Proceedings of conference of post-graduate students of National Academy of Science of Azerbaijan]. Baku (in Azerbaijani).
- Mustafayev, G.T. and K.D. Kiazimov. 1965a. [The nesting colony of fish-eating birds in Kizil Agach Nature Reserve]. Pp. 43–50. In: Proceedings of Azerbaijan State University, boil. ser., No.2 (in Russian).
- Mustafayev, G.T. and K.D. Kiazimov. 1965b. [On breeding of fish-eating birds in Kizil Agach Reserve]. Pp. 253–235. In: *Novosti ornitologii: Proceedings of 4th All-Union Ornithological Conference*. Alma-Ata, Nauka (in Russian).
- Mustafayev, G.T. and K.D. Kiazimov. 1966a. [Present status of nesting colonial birds in Kizil Agach Nature Reserve]. Pp.17–22. In: Proceedings of Azerbaijan State University, boil.ser., No.4 (in Russian).
- Patrikeev, M.V. 1991a. [On the study of wading birds and cormorants of lakeMahmud-chala (southern Azerbaijan)]. Pp. 88–89. In: [Data on diversity, distribution and ecology of birds of the Northern caucasus], Stavropol (in Russian).
- Patrikeev, M.V. 1991b. [On spring-summer avifauna of southeastern Shirvan and adjacent territories]. Pp. 30–35. In: [Fauna, population and ecology of birds of the Northern Caucasus], Stavropol (in Russian).
- Patrikeev, M.V. 2004. *The birds of Azerbaijan*. Pensoft, Sofia – Moscow, 380 p.
- Radde, G. 1884. [Ornithological fauna of the Caucasus (Ornis Caucasica)]. Caucasian Museum Press, Tiflis, (in Russian). 451 p.
- Scheuhammer, A. M. and S. L. Norris. 1996. The ecotoxicology of lead shot and lead fishing weights. *Ecotoxicology*, 5(5), 279-295.
- Sultanov, E., N. Agayev and T. Kerimov. 1998. The state of population of Ferruginous Duck and other rare birds in Azerbaijan. Pp. 60–61. In: Proceedings of conference: [Krayevedeniye i zashita okrujayushey sredi]. Baku (in Russian).
- Sultanov, E., T. Kerimov, S. Aliyev, S. Humbatova and N. Agayeva. 2000. [Potential Ramsar sites of Azerbaijan]. Baku, Wetlands International – AEME Publication, 152 p. (in Azerbaijani and Russian).
- Sultanov, E. and N. Agayeva. 2003. The current breeding status of Ferruginous Duck *Aythya nyroca* in Azerbaijan. *Sandgrouse* 25 (1):41–49.
- Sultanov, E.H., T.A. Kerimov, V.A. Mammadov and S.I. Aliyev. 2008. Modern ecological situation of Lake Hajigabul. Baku, Azerbaijan Ornithological Society, 134 p. (in Azerbaijani with English summary).
- Tuayev, D.G. 1975. [On fauna and ecology of waterfowl of Kura-Araz Lowland]. Pp.151–188. In: *Materiali po faune i ekologii azemnikh pozvonochnikh Azerbayjana*. Baku, Elm, (in Russian).
- Vasiliev, V.I. 1975. [Feeding habitats of fish-eating birds and their effects on fisheries in Azerbaijan]. Pp.189–216. In: [Data on fauna and ecology of terrestrial vertebrates of Azerbaijan]. Baku, Elm, (in Russian).
- Vinogradov, V.V. 1967. [Biological resources of wetlands of the Mil Steppe, their productivity and prospects for commercial use]. In: Proceedings of Natural Reserves of Azerbaijan, Moscow, Lesnaya promishlennost, vol.2, 144 p. (in Russian).
- Vinogradov, V.V. and S.I. Tcherniavskaya. 1965. [On avifauna of Kizil Agach State Nature Reserve]. Pp. 22–79. In: [Proceedings of Natural Reserves of Azerbaijan]. Moscow, vol.1, (in Russian).
- Vinogradov, V.V. and S.I. Tcherniavskaya. 1969. [A study of nesting colonies of herons and ibises at lake Aggol in Azerbaijan] Pp.108–112. In: *Ornitologia v SSSR: Proc.5th All-Union Ornithological Conference*, vol.2 (in Russian)