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Recent Waterbird Counts in Gyzylagach, the Azerbaijan Republic's Most Important Ramsar Site, with Comments on Conservation

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Abstract: Gyzylagach State Reserve is one of the most important places for wintering and breeding waterbirds in the Western Palearctic. It comprises four main parts: 1) Great Gyzylagach Gulf and Little Gyzylagach Gulf; 2) a maritime belt of reed growth in Great Gyzylagach Gulf; 3) an extensive area of shallow waters and reeds; 4) areas of semi-desert in the rest of the reserve. Three different methods were used for counting waterbirds (from motor boats, from helicopters and traditional ground counts from the shore). Helicopter counts have been the most useful in determining the dynamics of bird numbers during the greater part of the year. The reserve is ideal for wintering waterbirds such as Lesser White-fronted Goose *Anser erythropus,* Greater Flamingo *Phoenicopterus roseus,* Pygmy Cormorant *Phalacrocorax pygmeus,* Dalmatian Pelican *Pelecanus crispus* and Great White Pelican *P. onocrotalus*. About 500,000 waterbirds winter here, and the numbers of many species exceed internationally agreed conservation criteria, *e.g.* for Lesser White-fronted Goose*,* Greylag Goose *Anser anser,* Greater White-fronted Goose *A. albifrons,* Common Pochard *Aythya ferina* and Tufted Duck *A. fuligula*. Over 76,000 herons, spoonbills, ibises and cormorants were counted in a huge mixed breeding colony of waterbirds in 2006.

Keywords: Gyzylagach, reserve, waterbirds, wintering, breeding, counts, conservation, Caspian Sea, Azerbaijan Republic.

INTRODUCTION

Gyzylagach (Kyzylagach) State Reserve (38°55'–39°18'N, 48°50'–49°10'E), *c.* 88,360 ha, 26.5 m below sea level) comprises the Gyzylagach Ramsar site (a Strict Reserve of 88,360 ha) and Gyzylagach Sanctuary (99,060 ha; 39º07'N, 48º59'E). It lies in a dry subtropical climate zone, the mean temperature in July being 25.6°C; in winter, the temperature may fall as low as –15°C. The annual precipitation is 400–600 mm in the south of the reserve and 200–400 mm in the north.

The plant community comprises 360 species, including two species of blue-green *Chara* algae and six green algae. The latter provide an important food supply for birds at the time when the entire Little Gulf and the greater part of shallow waters with seasonally fluctuations are fresh water. These algae cover up to 30% of this area. Some 47 species of the family Gramineae occur in the reserve, the dominant species being the reed *Phragmites communis*. Fields of barley *Hordeum* sp. in the reserve are especially valuable as a food supply for migrant waterbirds such as geese in early winter, and are also used by Black Francolin *Francolinus francolinus*.

STUDY AREA

The Gyzylagach State Reserve and Ramsar site is located in the Kura-Araz(s) lowlands, part of the Lankaran plain comprising much of the Lankaran Rayon (Province) of the Azerbaijan Republic. It lies 30 km north of the town of Lankaran and 20 km south-southwest of the town of Neftechala. During the 20th century, Sara island first turned into a peninsula as water levels dropped, and then after a pier was built across to the mainland, the accumulation of material formed a strip of land that separated Great and Little Gyzylagach Gulfs. As the Caspian Sea level rose again, Kurdili Peninsula became two islands and the Great Gulf was rejoined with the sea by a strait whose width constantly increases.

The Ramsar site (Strict Reserve) and Gyzylagach Sanctuary (which comprises two-

thirds of Little Gulf) consist of four main sections totalling up to 115,000–120,000 ha of wetlands: 1) Great and Little Gyzylagach Gulfs – Great Gyzylagach Gulf is about 40,000 ha in area, 29 km long and 24 km wide, and has a maximum depth of 3.5 m, while Little Gyzylagach Gulf is about 16,000 ha in area, 16.7 km long and 6.5 km wide, and has a maximum depth of 2.5 m: 2) a maritime belt of reed growth between 2 and 2.5 km wide in Great Gyzylagach Gulf; 3) about 28,000 ha of shallow fresh water with reed growth; and 4) about 20,000 ha of semi-desert on the remaining territory of the reserve. Areas of shallow freshwater marsh and semi-desert are situated along the western and northern sides of the Great Gulf. The Great Gulf and Little Gulf are interconnected by three man-made canals. The Rivers Vilyashchay, Gumbashichay and Bolgarchay flow into the Little Gulf. The bottom of the Great Gulf is comprised of silt and sand or silt and shells. The northern part of the Great Gulf is suffering from gradual encroachment by reeds.

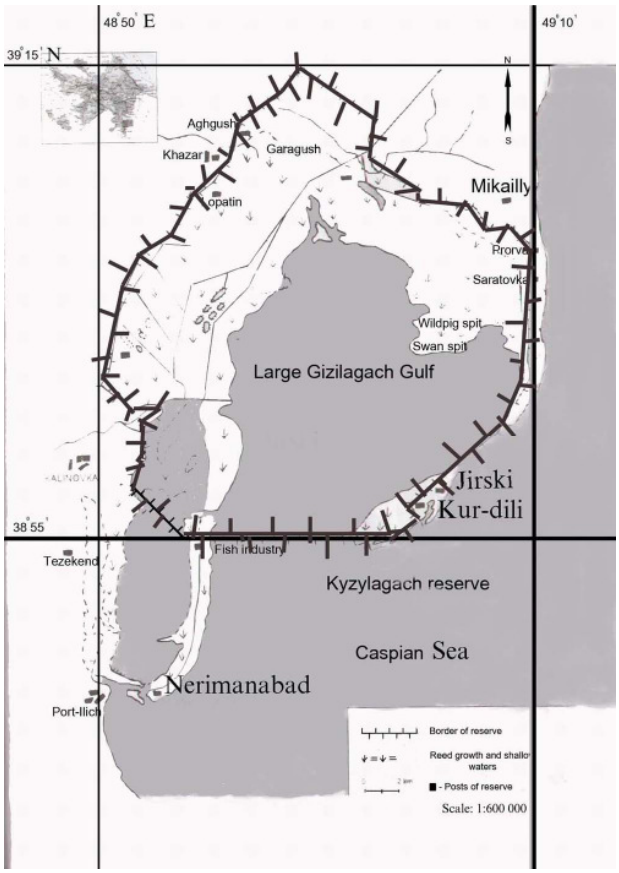

Figure 1. A schematic map of Gyzylagach State Reserve (after Sultanov *et al.* 2000).

MATERIALS AND METHODS

Birds are counted in the Gyzylagach Ramsar site by a variety of techniques to overcome problems of accessibility. In general three main methods of counting were used: 1) counts from motor boats, with two observers using binoculars, one counting the number of birds in the flocks, and the other identifying as many birds as possible to determine the species composition of the flocks; the total number of each species present can then be determined by extrapolation; 2) ground counts from the shore using telescopes – these are total counts of all birds visible, with identification of each bird to species level; 3) counts from helicopters, with a minimum of four observers counting by eye, two from the right side of the helicopter and two from the left. Sultanov *et al.* (1993) give details of the methodology used in the helicopter counts. Helicopter counts have a serious limitation in that the counts are often limited to species-groups, the distance and movement of the birds and the speed of the helicopter making species identification impossible. In our surveys, we did not attempt to identify cormorants, pelicans and

Figure 2. The coast of Great Gyzylagach Gulf, December 2005. © E. Sultanov.

most ducks to the species level. Grebes were difficult to discriminate from ducks in the helicopter counts, but certain species were easier to identify from the air than others, *e.g.* Grey Heron *Ardea cinerea,* Purple Heron *A. purpurea,* Black-crowned Night Heron *Nycticorax nycticorax,* Greater Flamingo, Common Shelduck *Tadorna tadorna,* Ruddy Shelduck *T. ferruginea,* Eurasian Coot *Fulica atra,* Pied Avocet *Recurvirostra avosetta* and Smew *Mergellus albellus*. During the ground

counts, participants were mostly moved around by car, but they also reached some of the less accessible count points on foot. For large areas of reed-beds, extrapolation was often necessary.

RESULTS AND DISCUSSION

According to the literature, almost 270 species of birds have been recorded in Gyzylagach State Reserve (see reference list); 132 of these are waterbirds (see Table 1).

Table 1. Results of helicopter counts in Gyzylagach State Reserve in five months in 1996, and total waterbirds in 1993 and 1996 (Sultanov 2004, Paynter *et al,* 1997a).

Birds	Jan.	Mar.	Apr.	Sep.	Oct.	Dec.
Grebes* (Great Crested *Podiceps cristatus,* Black-necked *P. nigricollis,* Red-necked P. *grisegena,* Horned *P. auritus,* Little *Tachybaptus ruficollis*)						27
Pelicans (Dalmatian *Pelecanus crispus,* Great White *P. onocrotalus*)	413	61		27	47	97
Cormorants (Great *Phalacrocorax carbo,* Pygmy *P. pygmeus*)	120	3346	9	884	2242	6080
Grey Heron *Ardea cinerea*	1	97	118	444	540	280
Purple Heron *Ardea purpurea*			48	199		
Great Egret *Casmerodius albus*	7	475	639	5151	3052	4157
Black-crowned Night Heron *Nycticorax nycticorax*				300		
Greater Flamingo *Phoenicopterus roseus*	13	3242	1025		110	3750
Swans (Mute *Cygnus olor,* Whooper *C. cyqnus,* Bewick's *C. columbianus bewickii*)	10					43
Geese (Greylag *Anser anser*, Greater White-fronted *A. albifrons,* Lesser White-fronted *A. erythropus*)	808	1473	7			73015
Ducks	287,411	25,817	15,095	26,454	76,406	259,266
Predators (mainly Western Marsh Harrier *Circus aeruginosus,* Hen Harrier *C. cyaneus,* White-tailed Eagle *Haliaetus albicilla*)	39	48	31	35	50	45
Eurasian Coot *Fulica atra*	79,215	10,785	7047	9644	19,995	57,988
Purple Swamphen *Porphyrio porphyrio**	187					
Waders	220	4950	3223	3264	5490	23,100
Large Gulls (Caspian *Larus cachinnans,* Great Black-headed *L. ichthyaetus*)	86			2917	4674	859
Gulls and terns (Gulls: Black-headed *L. ridibundus,* Little *L. minutus,* Slender-billed *L. genei*. Terns: Gull-billed *Gelochelidon nilotica,* Common *Sterna hirundo,* Sandwich *S. sandvicensis,* Little *Sternula albifrons,* Black *Chlidonias niger,* White-winged *C. leucopterus,* Whiskered *C. hybrida*)		3908	3655	1727		
Total	**368,530****	**54,202**	**30,897**	**51,046**	**112,606**	**428,707**
Partial count in 1993	**71,351**					
Total in 1996 (count from land and motor boat)	**490,002**					

* Counts from helicopters do not reflect the real number of these species.
** The count does not cover the eastern part of the Great Gulf.

Wintering waterbirds

In 1938–39, the number of surface-feeding ducks alone was estimated at 3.5–4 million (Grekov1965a). By the end of the 1950s, the wintering waterbirds included about 4 million surface-feeding ducks, one million diving ducks and 2–3 million Eurasian Coot (Grekov 1965a, Vinogradov & Chernyavskaya 1965). By 1966–67, the number of wintering waterbirds had declined to 1.2 million (Mikheyev & Orlov 1972), while during the period 1971–78 numbers fluctuated between 338,000 and 715,000 (Krivonosov & Morozkin 1984). In recent years, almost 500,000 waterbirds have wintered annually in the reserve (Table 1). Large numbers of swans occur in some years, *e.g.* 9,200 individuals in 1984, but only a few

birds were present in 1998 (Table 1). The region holds up to 25,000 geese, a total that rises to 60,000–70,000 during the mass migration in early December, *e.g.* in 1998 (Table 1). Many of these geese are Lesser White-fronted Geese *Anser erythropus* (Paynter *et al.* 1996, 1997; Sultanov *et al.* 1998) and the rest are Greylag Geese *A. anser* and Greater White-fronted Geese *A. albifrons*. Over 4,000 Lesser White-fronted Geese were counted in just one part of the reserve in the winter of 1998/1999. The Red-breasted Goose *Branta ruficollis* is seldom observed nowadays and not annually (with numbers varying from single birds up to as many as 100), whereas in the 1960s, up to 24,000 birds regularly wintered here. Surface-feeding ducks were the dominant species-group in winter in the past (Tugarinov & Kozlova-Pushkaryova 1938, Tuyaev 1957, 1970, Sultanov 1997), and this remains the case (Paynter *et al.* 1996), with this group numbering about 317,000 in recent winters (Table 2). No fewer than 19 species of waders have been recorded, including Common Redshank *Tringa totanus,* Green Sandpiper *T. ochropus,* Common Snipe *Gallinago gallinago,* Jack Snipe *Lymnocryptes minimus* and Pied Avocet (Rezanov in Vinogradov *et al.* 1990 and pers. obs.). The maximum number of wintering Greater Flamingos was 13,500 individuals in 1995 (pers. obs.), but since 2000, an average of 3,500–4,000 individuals have wintered, mostly on the shores at Kurdili (Sultanov 1998), although during the very severe winter of 2002–3, the wintering population reached 30,000.

Breeding waterbirds

Very large mixed breeding colonies of Pelecaniformes and Ciconiiformes occur in the reserve (Litvinova 1979, Morozkin 1975, Mustafayev & Kyazimov 1966), but the numbers have been decreasing since the 1950s. In 1956, the total number of nesting birds of Pelecaniformes and Ciconiiformes was estimated as 4–5 million individuals (Grekov 1965). In 1957, there were 541,000 birds in a single breeding colony in a 15 ha area of the shallow waters (Dunın 1960), but this population decreased to 400,000 in 1964 and 303,000 in 1967 (Mustafayev & Kyazimov 1965; Vasilyev *et al.* 1972). By the early 1970s, the number of birds nesting here had decreased to 160,000–200,000 (Vinogradov *et al.* 1990), and according to Tuayev & Israfilov (1979), there were only 60,000 birds present in 1976. This trend continued through to 1995, when there were only 33,200 birds (Table 3). However, there has been some recovery in numbers in recent years, and over 76,000 birds were counted in 2006 (Table 3).

Table 2. The maximum number of ducks, waders and rails (except for Eurasian Coot *Fulica atra* and Purple Swamphen *Porphyrio porphyrio*) in winter at Gyzylagach State Reserve in the late 1990s (Paynter *et al.* 1996b, Sultanov & Haddow 1997, Sultanov 2005 with additional data [pers. obs.]).

Species	Max. Number
Black-necked Grebe *Podiceps nigricollis*	3516
Little Grebe *Tachybaptus ruficollis*	6969
Great Cormorant *Phalacrocorax carbo*	1516
Pygmy Cormorant *Phalacrocorax pygmeus*	8354
Great Egret *Casmerodius albus*	1083
Greater Flamingo *Phoenicopterus roseus*	4780
Mallard *Anas platyrhynchos*	80,000
Eurasian Wigeon *Anas penelope*	120,000
Eurasian Teal *Anas crecca*	70,000
Northern Pintail *Anas acuta*	7000
Northern Shoveler *Anas clypeata*	40,000
Marbled Duck *Marmaronetta angustirostris*	200
Red-crested Pochard *Netta rufina*	40,000
Tufted Duck *Aythya fuligula*	61,091
Greater Scaup *Aythya marila*	1965
Common Pochard *Aythya ferina*	75,000
Common Goldeneye *Bucephala clangula*	1244
Water Rail *Rallus aquaticus*	2000
Common Moorhen *Gallinula chloropus*	5000
Eurasian Golden Plover *Pluvialis apricaria*	1526
Pied Avocet *Recurvirostra avosetta*	4250
Black-tailed Godwit *Limosa limosa*	1234
Northern Lapwing *Vanellus vanellus*	4775
Dunlin *Calidris alpina*	2742
Green Sandpiper *Tringa ochropus*	4060
Common Redshank *Tringa totanus*	1510

Table 3. Trends in bird numbers in mixed breeding colonies at Gyzylagach State Reserve (according to Konovalova 1979, A.F. Gabbarova pers. com. and pers. obs.).

Species	1957	1967	Max. 1972–77	1995	2006
Great Cormorant *Phalacrocorax carbo*	1350		1000	210	
Pygmy Cormorant *Phalacrocorax pygmeus*	10,100	5000	3200	11,200	33,844
Grey Heron *Ardea cinerea*	675		18		183
Purple Heron *Ardea purpurea*					4686
Squacco Heron *Ardeola ralloides*	135,000	168,000	29,000	3800	5138
Cattle Egret *Bubulcus ibis*	54,000	6800	16,000	4300	8270
Great Egret *Casmerodius albus*	1350		4		1960
Little Egret *Egretta garzetta*	135,000	85,000	11,100	5000	15,391
Black-crowned Night Heron *Nycticorax nycticorax*	47,200	38,700	15,200	3500	4740
Eurasian Spoonbill *Platalea leucorodia*	1350		4	800	559
Glossy Ibis *Plegadis falcinellus*	155,300	150	6400	2400	1792
Total	**541,325**	**303,650**	**77,726**	**33,205**	**76,569**

Since 1983, Purple Herons have bred in the mixed colonies (Vinogradov *et al.* 1990), and about 4,700 were recorded in 2006. Approximately 200 pairs of Greater Flamingo sometimes breed in the reserve. Breeding colonies of hundreds of Black-winged Stilt *Himantopus himantopus,* White-winged Tern *Chlidonias leucopterus* and Whiskered Tern *C. hybrida* have also been reported. The total number of Purple Swamphens *Porphyrio porphyrio* is estimated at about 10,000–11,000 individuals; these were assessed as 'probably breeding' because of the count dates in March and April (Vinogradov *et al.* 1990). The numbers of this species fluctuate, as they do for Black Francolin (sometimes by a factor of 10 or more), after severe winters, which occur about once every 6–10 years.

Threats

The reserve is a very dynamic ecosystem. As a result of rises and falls in the level of the Caspian Sea, the areas of land, shallow water and the Gulfs themselves fluctuate in size. Because of water extraction from rivers, there has been a gradual reduction in the extent of the shallow waters, overflows and Little Gulf itself. The increasing area of reed-beds will lead to a sharp decrease in biodiversity, because most of the birds and other wildlife avoid dense stands of reeds.

Fish-farming has long been established, and the land surrounding the reserve is used for winter pasture and also for cotton plantations and wheat and alfalfa crops. As a result, there is no buffer zone around the reserve. Another problem is the absence of fencing on the reserve boundaries, allowing cattle from the winter pastures to wander on to the fragile semi-desert areas of the reserve. Poaching is widespread, and probably causes a severe degree of disturbance. Prohibiting this activity will be difficult, because the reserve is so large and the local human population is large. The southern two-thirds of the Little Gulf is not part of the reserve but is classed as 'Yasaglyg' (roughly a sub-reserve or sanctuary) for birds, but here there is an official fishing industry with a motor vessel, another source of disturbance for birds.

The traditional hunting activities of the local people now comprise the most serious threat to the reserve because of the scale and development of these activities. Some traditional activities have been banned by law, but are continued as illegal poaching. The problem now is that modern firearms and modern nets are available to hunters. In the past, the autocratic application of Soviet-originated laws helped protect the reserve, but enforcement by democratic methods requires adequate funding. It is not difficult to estimate roughly the amount of poaching simply by counting the gunshots, but there has been no formal research to quantify the effects.

Conservation

Gyzylagach State Reserve represents exceptional value as the richest natural resource for bird and fish populations in the Azerbaijan Republic because it has the greatest biodiversity and highest concentration of rare and valuable species in the Republic (Tugarinov 1950, Vorobyova 1979, Sultanov *et al.* 1993). Of the 52 Important Bird Areas (IBAs) designated in the Azerbaijan Republic, Gyzylagach is possibly the most important (Patrikeev 2004). Amongst the terrestrial birds, the population of Black Francolin is Azerbaijan's largest at about 2000 birds (Litvinov 1979). Up to 7500 Little Bustards *Tetrax tetrax* normally winter in the semi-desert areas, and numbers reached 30,000 in 1982. In milder winters, many of these birds winter elsewhere. The numerous raptors include White-tailed Eagle *Haliaetus albicilla,* Osprey *Pandion haliaetus,* Western Marsh Harrier *Circus aeruginosus* and Hen Harrier *C. cyaneus*.

Almost 500,000 waterbirds winter here, and many species meet the criterion of more than 1% of the flyway population including Little Grebe *Tachybaptus ruficollis* (6,000), Black-necked Grebe *Podiceps nigricollis* (3,500), Mallard *Anas platyrhynchos* (80,000), Northern Pintail *A. acuta* (7,000), Northern Shoveler *A. clypeata* (40,000), Pygmy Cormorant *P. pygmeus* (34,000), Dalmatian Pelican *Pelecanus crispus* (≥300), Lesser White-fronted Goose (≥5,000), Greylag Goose (near 10,000),, Red-crested Pochard *Netta rufina* (≥40,000), Common Pochard *Aythya ferina* (75,000), Tufted Duck *A. fuligula* (60,000), Eurasian Teal *A. crecca* (70,000) and Eurasian Wigeon *A. penelope* (120,000; Sultanov *et al.* 2005; Tables 1 & 2). Several Globally Threatened and Near Threatened species occur here in significant numbers, *e.g.* Pygmy Cormorant, Dalmatian Pelican, Lesser White-fronted Goose, Red-breasted Goose, Marbled Duck *Marmaronetta angustirostris,* Little Bustard, Ferruginous Duck *Aythya nyroca,* White-headed Duck *Oxyura leucocephala* and Lesser Kestrel *Falco naumanni*. In the past, the Slender-billed Curlew *Numenius tenuirostris* also occurred in this area (Satunin 1907). Other notable species mentioned in the Red Data Book of Azerbaijan (Adigozalov 1989) include Great White Pelican *Pelecanus onocrotalus,* Eurasian Spoonbill *Platalea leucorodia,* Greater Flamingo, Mute Swan *Cygnus olor,* Purple Swamphen, Osprey, White-tailed Eagle and Black Francolin. Additional species of conservation concern within a European context (BirdLife International 2004) include Purple Heron, Squacco Heron *Ardeola ralloides,* Black-crowned Night Heron *Nycticorax nycticorax,* Northern Pintail, Gadwall *Anas strepera,* Smew, Pied Avocet, Black-tailed Godwit *Limosa limosa,* Eurasian Curlew *Numenius arquatus* and Dunlin *Calidris alpina*.

The Gyzylagach reserve has been designated as a State Nature Reserve, which means that there is a complete embargo on economic activity, except in the southern Little Gulf as explained above. Important conservation measures proposed for the reserve (Vinogradov & Morozkin 1979) but not yet implemented include strict enforcement of the reserve boundaries, suppression of poaching, cessation of grazing by cattle and sheep, and the building of fences and gates to prevent unauthorised access to all the protected territory. In relation to ornithology and other biological specialisations, Gyzylagach State Reserve is perhaps the best known locality in the Azerbaijan Republic.

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