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Short Communication

# Diurnal attendance of nominate Lesser Black-backed Gulls *Larus f. fuscus* at a Ugandan lake: implications for the conservation of a globally threatened subspecies

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## Introduction

The nominate Lesser Black-backed Gull *Larus fuscus fuscus* has experienced dramatic population declines on its northern breeding grounds. The global population is assessed at 18,000–19,000 pairs (BirdLife Finland), compared with 175,000 pairs of the British form *graellsii* (Wetlands International 2002). Although the species as a whole is not regarded as threatened, nominate *fuscus* is listed in the Red Data Books of Finland, Sweden, Norway, Estonia and Russian Karelia, i.e. it is classified as Threatened over its entire current range, falling into the Endangered and Vulnerable categories in the IUCN Red List categories.

*Larus fuscus fuscus* breeds in eastern Fennoscandia and winters mainly in Africa (Kilpi and Saurola 1984, Kube *et al.* 2000). It is a true long-distance migrant, using the East European–Black Sea migration flyway. A varying proportion stays in the Mediterranean and in Ethiopia, but the bulk of the population flies to winter in the Great Lakes region of Kenya, Tanzania and Uganda (Malling Olsen and Larsson 2004).

In Uganda, the largest concentrations are encountered at Lake Victoria and the water bodies along the Western (or Albertine) Rift Valley, notably in the Queen Elizabeth National Park. Birds stay there from October–November to March–April, with the largest concentrations comprising up to 500–700 individuals (Byaruhanga *et al.* 2001, Carswell *et al.* 2005, H. Meltofte *in litt.* 1999). These concentrations were discovered in the 1990s, when the Ugandan BirdLife partner, *Nature*Uganda, undertook extensive waterbird counts under the auspices of Wetlands International (Byaruhanga and Arinaitwe 1996).

By far the largest numbers have been recorded at Lake Munyanyange, a saline crater lake at the western boundary of the Queen Elizabeth National Park. This report provides the first systematic daily counts of gulls at the lake and describes the effects of disturbance on the occurrence of gulls. It also addresses the conservation needs of this Globally Threatened subspecies in Africa.

## Study area and methods

Lake Munyanyange lies 0.5 km north of Katwe township (*c.* 00°05′S, 29°00′E) and is visible from the main road in the town. It is an ephemeral, closed-basin saline lake that mostly dries out in dry seasons (J. B. Kananura, verbally 2004). There are no fish in it, but periodically it holds very large numbers of foraging waterbirds, notably algae-eating Lesser Flamingos *Phoenicopterus minor* and Avocets *Recurvirostra avocetta*, and a large variety of Palearctic waders (Byaruhanga *et al.* 2001, Carswell *et al.* 2005, M. Wilson *in litt.* 2003). The shoreline consists of wet mud and short grass and sedge; the upper shores have pasture grassland and spectacular *Euphorbias*. The lake and its surroundings are used for grazing large stock. Human activity is intense.

During the period 9–15 January and also on 21 January 2004, I undertook either one morning (*c.* 07h00–13h00) or one afternoon (*c.* 16h00–19h00) session at the lake. Lesser Black-backed Gulls were readily seen and counted (at a distance of 200–500 m) from one spotting site on the southern lakeshore, using binoculars (×10) and a telescope (×20–60). With experience, the racial identification was straightforward based on the jet-black colour of the mantle and primaries (see e.g. Malling Olsen and Larsson 2004).

Large numbers of snare traps (probably for Egyptian Geese *Alopochen aegyptiacus*) were set around the lake shores, typically by young boys. The traps were primitive leg-hold snares, attached to sticks pressed in the mud. During trap-checking, people entered the shoreline causing birds to flush. A varying proportion of gulls then took flight, circled above the lake and left.

As the disturbance frequency was unpredictable, I was not able to schedule sampling at fixed intervals. I chose to make the sampling opportunistic by scoring the numbers separately for instances with no disturbance (within the preceding 30 min) and for those following a disturbance (within 30 min). The sampling unit is the total number of gulls loafing at the lake at each event. Results are expressed as percentages of individuals from daily peaks plotted against the time of day. To illustrate the difference of the scatterplot trajectories between disturbed and undisturbed situations I added a LOWESS smoother (locally weighted scatterplot smoother) to the graphical data (Wilkinson *et al.* 1992). Smoothing does not presuppose the shape of the function (only that it has a unique $Y$ value for every $X$). The procedure is purely descriptive, as neither the number of occurrences per time unit nor the duration of events is of interest, only the resulting effects on bird numbers.

## Results and discussion

### *Diurnal rhythm and the effect of disturbance*

Lesser Black-backed Gulls used Lake Munyanyange for diurnal roosting only, commuting en masse from foraging areas to the lake in the morning and out of it in the evening (Figure 1). During my stay, numbers were steadily rising, with daily peaks ranging from 153 on 9 January to 400 on 21 January ($r_s = 0.88$, $n = 8$, one-tailed $P < 0.01$). The morning arrival started at sunrise (*c.* 07h00) and was over by 10h00, when a 100% presence was reached. The evening departure started around 17h00 and was over by sunset at around 19h00, when the lake was empty of gulls.

At the time of the early morning arrival, very little disturbance occurred at the lake, and the numbers built up rapidly. The boys checking the snares usually appeared on

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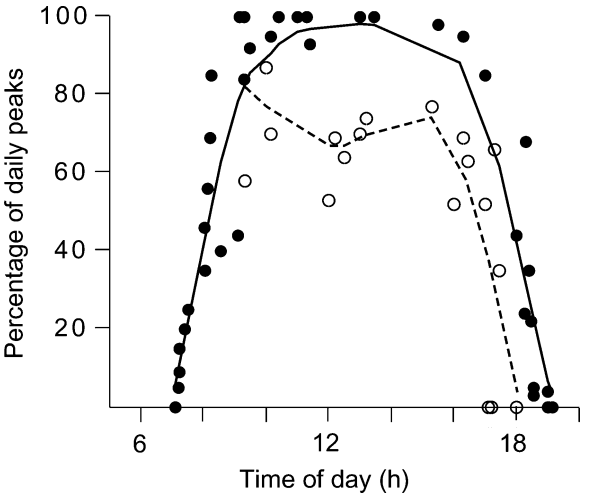


Figure 1. Diurnal pattern of attendance of Lesser Black-backed Gulls at Lake Munyanyange expressed as percentages of daily peak numbers during instances with no disturbance (filled circles) and during instances following a disturbance (open circles). The lines give the smoothed (LOWESS) curves of the respective trajectories. There were no counts between 13h00 and 15h40.

the shore by noon, after which the attendance pattern of gulls became clearly affected by their presence (Figure 1). Having been flushed, a varying proportion of the gulls left the lake, so that there were always 20–45% fewer birds on the lake after disturbance compared with undisturbed situations. In days with frequent disturbances, the numbers of gulls gradually decreased throughout the day so that the lake was empty of the birds already by late afternoon. Departing birds flew to Lake Edward, or disappeared in the direction of the Kazinga Channel in the National Park.

As the occurrence of Lesser Black-backed Gulls at Munyanyange is markedly affected by the disturbance caution needs to be exercised when using single-count data in population monitoring. Gulls are best counted around 10h00, but after that time the numbers are prone to highly random variation, depending on the frequency of disturbance.

### *Diet of gulls at the site*

When undisturbed, gulls roosted in large flocks on the shoreline of Lake Munyanyange, preening and sleeping ('loafing'). There they produced large quantities of pellets. Forty pellets preserved and subsequently examined consisted solely of bones and otoliths of small-sized fish, with no traces of insects or other items. Thus, gulls during my stay at Lake Munyanyange seemed to be predominantly piscivorous, as they are on their breeding grounds in Finland (Hario 1990).

The clear-cut diel cycle observed here is presumably a result of the nightly movements of fish schools in local water bodies. Fish move towards the surface at dusk and towards the lakebed at dawn (J. Sarvala *in litt.* 2001); gulls depend on vision to feed, and foraging would, indeed, be expected to peak at dusk and dawn when fish still occur close to the surface and are visible. According to local fishermen at Lake Edward,

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gulls do not forage during the night, but are highly active there at dawn. However, their roosting sites are unknown. During my stay, flying flocks disappeared over the vast lake horizon at dusk, in the direction of the Congolese border.

### *Attraction to lakes*

What makes Lake Munyanyange so attractive to gulls if they are not feeding there and the disturbance frequency seems so high? The numbers are higher than in any other known permanent overwintering site in Africa (as deduced from the data in Fishpool and Evans 2001).

Gulls were in active wing moult, intensively preening and bathing in the lake. One explanation for this odd attraction could be that the alkaline water provides chemicals profitable for growing quills, particularly sulphur amino-acids which are known to be essential for feather keratin production (Farner and King 1972). Attraction to Lake Edward, on the other hand is, no doubt connected to the easy availability of fish there.

I did not witness any instance of snare-trapping yielding a catch even though the trap density was high (roughly 30 traps/km shoreline). The boys I interviewed said that they wanted to trap Egyptian Geese, yet goose numbers were low during my stay, 18 individuals being the highest daily score at Lake Munyanyange. It is difficult, therefore, to imagine that snare-trapping would make any substantial contribution to household economies in Katwe township and it may be just a hobby of young boys. However, as numerous gangs of boys have to check their traps daily, the frequency of disturbance is very high and this may pose a continuing threat to the use of the lake by gulls.

Currently there is a BirdLife International project at the lake, and it is to be hoped that its public awareness campaign will help to develop a conservation ethic among school pupils whilst also promoting ecotourism and benefits for local enterprises.

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