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BIRD DISTRIBUTION DYNAMICS

BIRD DISTRIBUTION DYNAMICS 4 – GLOSSY IBIS *PLEGADIS FALCINELLUS* IN SOUTH AFRICA, LESOTHO AND SWAZILAND

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Introduction

This is the fourth paper of a new series in *Biodiversity Observations.* The objectives are to report on the ranges of bird species as revealed by the Second Southern African Bird Atlas Project (SABAP2, 2007 onwards) (Underhill 2016) and to describe how these ranges have changed since the first bird atlas (SABAP1, mainly 1987–1991). The two atlas projects are about two decades apart.

This series of papers is also made feasible by the development of two new standards for the presentation of maps, firstly pentad-scale distribution maps derived from SABAP2 data, and secondly range-change maps showing how distributions have changed between SABAP1 and SABAP2 (Underhill & Brooks 2016a, b). Because the papers in this series use these two new maps, the rules for interpretation are not provided in detail in each paper in this series.

The paper deals with the Glossy Ibis *Plegadis falcinellus*, a waterbird of the family Threskiornithidae (Figure 1). This is a cosmopolitan species with a “Least Concern” threat status.

Figure 1. Glossy Ibis Plegadis falcinellus *at a wetland near Benoni, Gauteng. Photograph © Reinier Terblanche from the BirdPix section of the ADU Virtual Museum (see http://vmus.adu.org.za/?vm=BirdPix-6621).*

Glossy Ibis *Plegadis falcinellus* I

Background to the species

The early books on southern African birds described the Glossy Ibis (Figure 1) as a migrant to the region from the Palearctic with most records being made in summer (e.g. Stark & Sclater 1906, Roberts 1940). Austin Roberts (1940) wrote: "It is a rare migrant to South Africa from the Northern Hemisphere." Breeding was first recorded in southern Africa in 1950, when nests were found at Springs in Gauteng in a heronry, containing also Cattle Egret *Bubulcus ibis*, Black-crowned Night-heron *Nycticorax nicticorax*, Purple Heron *Ardea purpurea* and African Sacred Ibis *Threskiornis aethiopicus* (Anon 1951, Tarboton 1968, Tarboton et al. 1987). The first recorded breeding attempts in the Western Cape were made in 1955 (not successful at Rondevlei Bird Sanctuary, Cape Peninsula) and then in 1967 (successful at the farm Kersefontein, Hopefield) (Middlemiss 1955, Hartley et al. 1968).

It breeds colonially, often a minor species in a large heronry, and so its breeding frequently goes undetected. An amusing anecdote along these lines is provided by Ernest Middlemiss, the professional ornithologist at Rondevlei Bird Sanctuary: "I never saw the two Glossy Ibises [myself] during the 39 days they were known to be present. [The first observation was made by] a carpenter building a shore observation tower who reported that he had seen two strange, dark birds with long, curved beaks flying over the water." Citizen science to the forefront! The nest was subsequently discovered more by accident than design.

In the 1980s, describing its status in the area south and west of the Olifants and Breede Rivers of the Western Cape, Hockey et al. (1989) wrote: "Uncommon resident and summer visitor, breeding September to February. Although uncommon, both numbers and range are increasing." They attributed this increase to the construction of artificial waterbodies, such as farm dams and sewage works.

SABAP2 distribution

On the pentad scale, the SABAP2 distribution map (Figure 2) shows that the core of the range of the Glossy Ibis lies in degree cell 2628, the southeastern degree cell of the "Four Degrees" region of Greater Gauteng (Ainsley 2016). Many of the pentads in this degree cell are shaded dark blue, indicating a reporting rate exceeding 53.5%; those shaded light blue have a reporting rate between 34.6% and 53.5% (Figure 2). From this core region, the distribution extends mainly westward and eastward across the grasslands of the Free State and Mpumalanga, with another focal point in the Senekal–Bethlehem–Harrismith district of the southeastern Free State. Elsewhere in South Africa, Lesotho and Swaziland there are centres of abundance in northwestern KwaZulu-Natal and in the Western Cape, on the Cape Flats near Cape Town, on the West Coast along the Berg River estuary and at Verlorenvlei, and near the estuary of the Gouritz River at the western end of the Garden Route. Elsewhere there is scattering of records, where Glossy Ibises have been observed in many pentads, presumably mainly at wetlands (Figure 2).

Range change between SABAP1 and SABAP2

In Figure 3, the approach described in Underhill & Brooks (2016b) was used to classify the quarter degree grid cells into six categories of increase and decrease. The relative increases and decreases are estimated using the Griffioen transformation (Underhill & Brooks 2016b), and involve an assumption that, in pentads where Glossy Ibis occurs, they are randomly distributed across the landscape, i.e. they are not clustered or in flocks. For the Glossy Ibis, this is probably at best only partially true, so the results need to be treated with some caution.

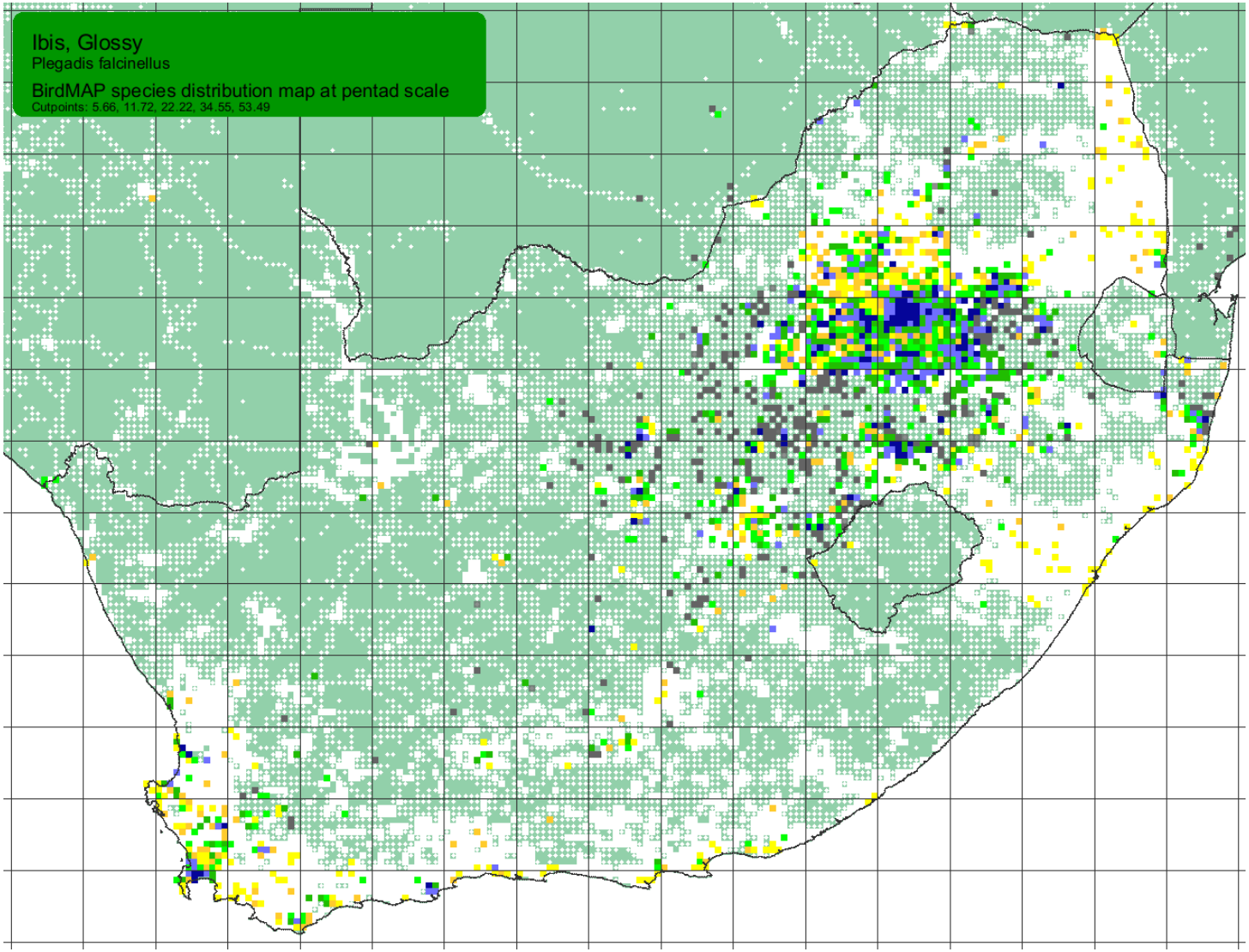

Figure 2: SABAP2 distribution map for the Glossy Ibis, on pentad scale, downloaded 29 December 2016. The detailed interpretation of this map is provided by Underhill & Brooks (2016a). Pentads with four or more checklists are either shaded white, species not recorded, or in colour, with shades based on reporting rate: yellow 0–5.7%, orange 5.7–11.7%, light green 11.7–22.2%, dark green 22.2–34.6%, light blue 34.6–53.5% and dark blue 53.5–100%. In pentads shaded grey or with white dots, there are one, two or three full protocol checklists, or there are ad hoc lists, or incidental records. In pentads shaded grey, the species was recorded as present; in pentads with white dots the species has not been recorded. If a pentad has four or more checklists, and the species has been recorded on an ad hoc checklist or as an incidental recorded, it is shaded yellow, indicating that the species has a small reporting rate.

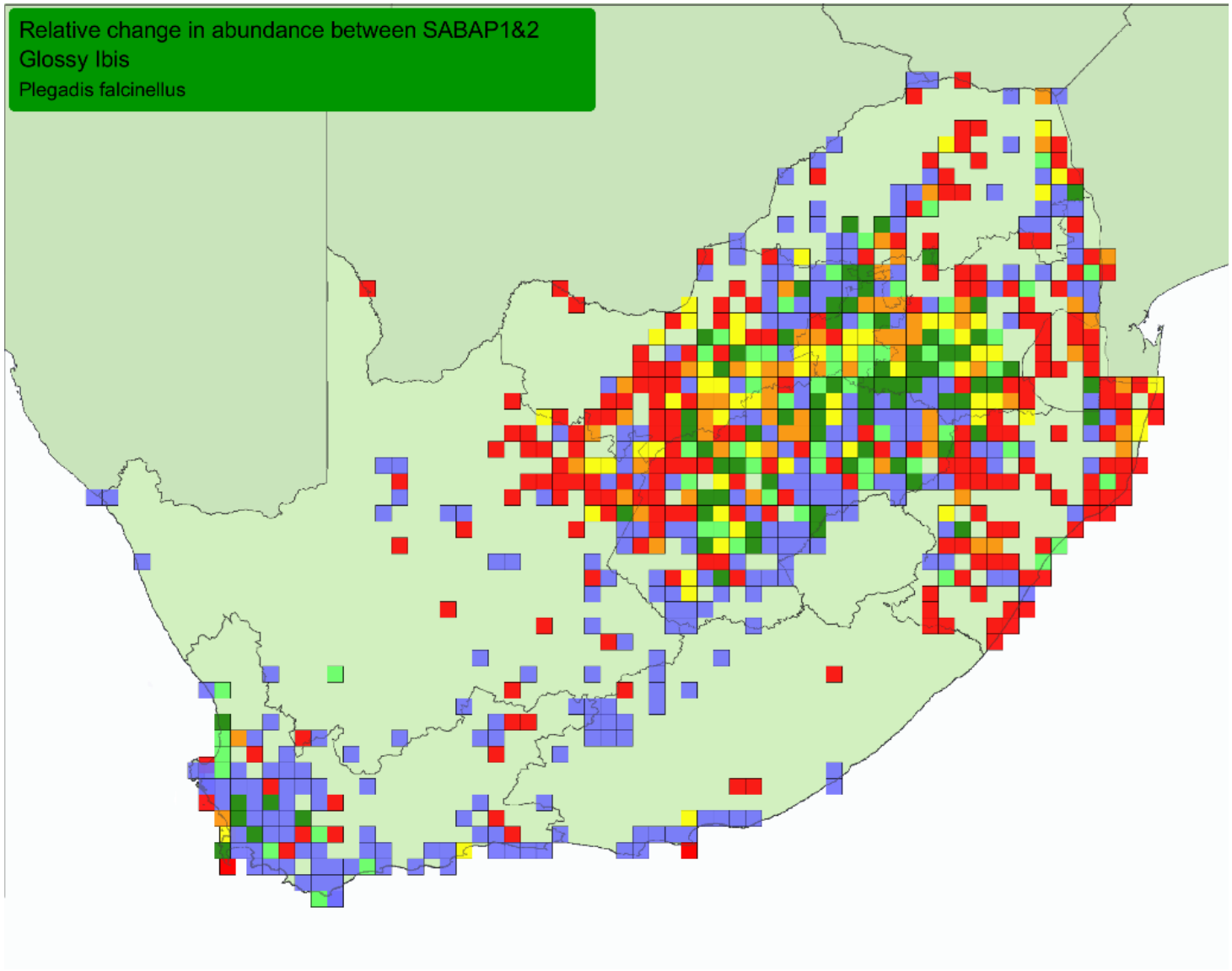

Figure 3: Range-change map between SABAP1 and SABAP2 for the Glossy Ibis, downloaded 29 December 2016. Red, orange and yellow represent quarter-degree grid cells with very large, large, and small relative decreases and blue, dark green and light green represent grid cells with very large, large and small relative increases. A count of the number of grid cells in each category is provided in Table 1. Only grid cells with at least four checklists in both SABAP1 and SABAP2 are shown. All these gird cells had Glossy Ibis recorded in them either in SABAP1 or in SABAP2 or in both. Fuller information on the interpretation of this range-change map is provided in Underhill & Brooks (2016b).

Table 1. Range-change summary for the Glossy Ibis between SABAP1 and SABAP2. The table provides a count of the number of quarter degree grid cells of each colour in Figure 3. Also shown are the same summaries when the analysis is restricted to grid cells with at least 30 checklists for both SABAP1 and SABAP2.

Status	Four checklists for SABAP1 & SABAP2		30 checklists for SABAP1 & SABAP2	
	Count	%	Count	%
Red (very large decrease)	221	29	106	25
Orange (large decrease)	65	9	43	10
Yellow (small decrease)	60	8	40	9
Light green (small increase)	59	8	45	10
Dark green (large increase)	75	10	44	10
Blue (very large increase)	279	37	153	35
Total	759	100	431	100

Results are shown in Figure 3 for only the 759 quarter degree grid cells for which there are four or more checklists for both SABAP1 and SABAP2 and in which Glossy Ibis occurred in either SABAP1 or SABAP2 (Table 1). In other words, grid cells in which Glossy Ibis did not occur in either project are not included in this analysis.

Of these 759 quarter degree grid cells, the numbers of grid cells shaded blue (very large increase) and dark green (large increase) are 279 (37%) and 75 (10%) respectively. At the other end of the scale 221 (29%) grid cells are red (very large decrease), and 65 (9%) are orange (large decrease). The groups of blue grid cells suggesting very large increases extend across the Western Cape, along the Eastern Cape coastal strip, and along an axis running from Beaufort West in the Western Cape, just west of Lesotho to Volksrust in the Free State. There is also an axis of blue running from Rustenburg in North West to Polokwane in Limpopo. There are large groups of red cells over much of KwaZulu-Natal and in a triangle formed roughly by the towns of Kimberley, Hotazel and Lichtenburg covering parts of the Northern Cape, North West and Free State. It needs to be borne in mind that some of the increases and decreases are off a low base (see Figure 2). Apart from the Western Cape, the patterns of increases and decreases are complex. In the Western Cape, the comment of Hockey et al. (1987) almost certainly remains true: “both numbers and range are increasing.”

Repeating the quantitative count of Figure 2 and Table 1 using grid cells with 30 or more checklists in both SABAP1 and SABAP2, the sampling error is considerably smaller than with four checklists for both projects, but there are now only 431 grid cells which meet this criterion (Table 1). In this restricted analysis, 35% of grid cells show large or very large decreases, and 45% show large or very large increases. The two sets of results are similar.

Conclusions and recommendations

Overall, the conclusion has to be that the Glossy Ibis certainly seems to have increased in both range and abundance over the Western Cape in the two-decade period between SABAP1 and SABAP2. Its fortunes appear to be mixed over the remainder of South Africa, with some clear regions of increase and some clear regions of decrease. The atlas database does not provide reasons for the changes, it only highlights the patterns, which then need further and more detailed investigation.

The Glossy Ibis is not an easy species to monitor using regular waterbird counts. It is erratic in occurrence at particular wetlands, and

numbers tend to vary considerably (Taylor et al. 1999). Ring recoveries also point to nomadic movements (Underhill et al. 1999).

This is clearly an interesting and enigmatic species. Yet, there seems to be no full-length paper devoted to any aspect of the biology of the Glossy Ibis in southern Africa (as revealed by a check of the references contained in Barnes 2005). Genetic analyses would probably reveal whether the species did indeed only start breeding in South Africa in the middle of the 20th century. We still do not know if any of the Glossy Ibises occurring in South Africa are migrants from Eurasia. This is a species for which tracking devices would generate fascinating data. We have little preconceived ideas of what such a study would reveal. The only safe prediction is that, given the species is nomadic, the devices would show patterns of movement. But we do not know whether this movement would be on scales of tens of kilometres, hundreds of kilometres or thousands of kilometres.

Acknowledgements

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