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BIRD DISTRIBUTION DYNAMICS

BIRD DISTRIBUTION DYNAMICS 13: THE GREBES OF SOUTH AFRICA, LESOTHO AND SWAZILAND

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Introduction

This 13th paper in the bird distribution dynamics series in *Biodiversity Observations* deals with the three species of grebes (Podicipedidae) that occur in southern Africa. The objective of this series of papers is to report on the ranges of bird species as revealed by the Second Southern African Bird Atlas Project (SABAP2, 2007 onwards) and to describe how their ranges have changed since the first bird atlas (SABAP1, mainly 1987–1991), 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.

In this paper, the three species of grebes that occur in South Africa, Lesotho and Swaziland are covered. For each species, four items of information are presented: the SABAP1 distribution map using quarter-degree grid cells, the SABAP2 distribution map, using pentads (five-minute grid cells, so there are nine pentads per quarter-degree grid cell), the range-change map, showing estimated changes in relative abundance between SABAP1 and SABAP2, and a table which provides counts of the numbers of grid cells in each of six colours in the range change map. In contrast to earlier papers in this series, minimal commentary on each species is provided.

Great Crested Grebe *Podiceps cristatus*

Inland, Great Crested Grebes (Figure 1) occur on both permanent and temporary wetlands, such as dams and endorheic pans, whereas in the coastal regions it also occurs on lakes (Clinning 1995, Dean 1997). It does not occur where the water depth is shallow. During both SABAP1 and SABAP2, the Great Crested Grebe was mainly recorded across central South Africa, and the Western Cape (Figures 2 and 3). It is distributed patchily across Eurasia and Australasia, with the southern African population being the largest of isolated populations across Africa; the others are in a few high altitude lakes in Ethiopia and in the Rift Valley in East Africa (Del Hoyo et al.1992, Clinning 1995, Dean 1997, Simmons et al. 2015).

Figure 1. Great Crested Grebe, Rietvlei, Western Cape. Photographer © Gregg Darling. Record 21895 in the BirdPix section of the ADU Virtual Museum. Full details at http://vmus.adu.org.za/?vm=BirdPix-21895

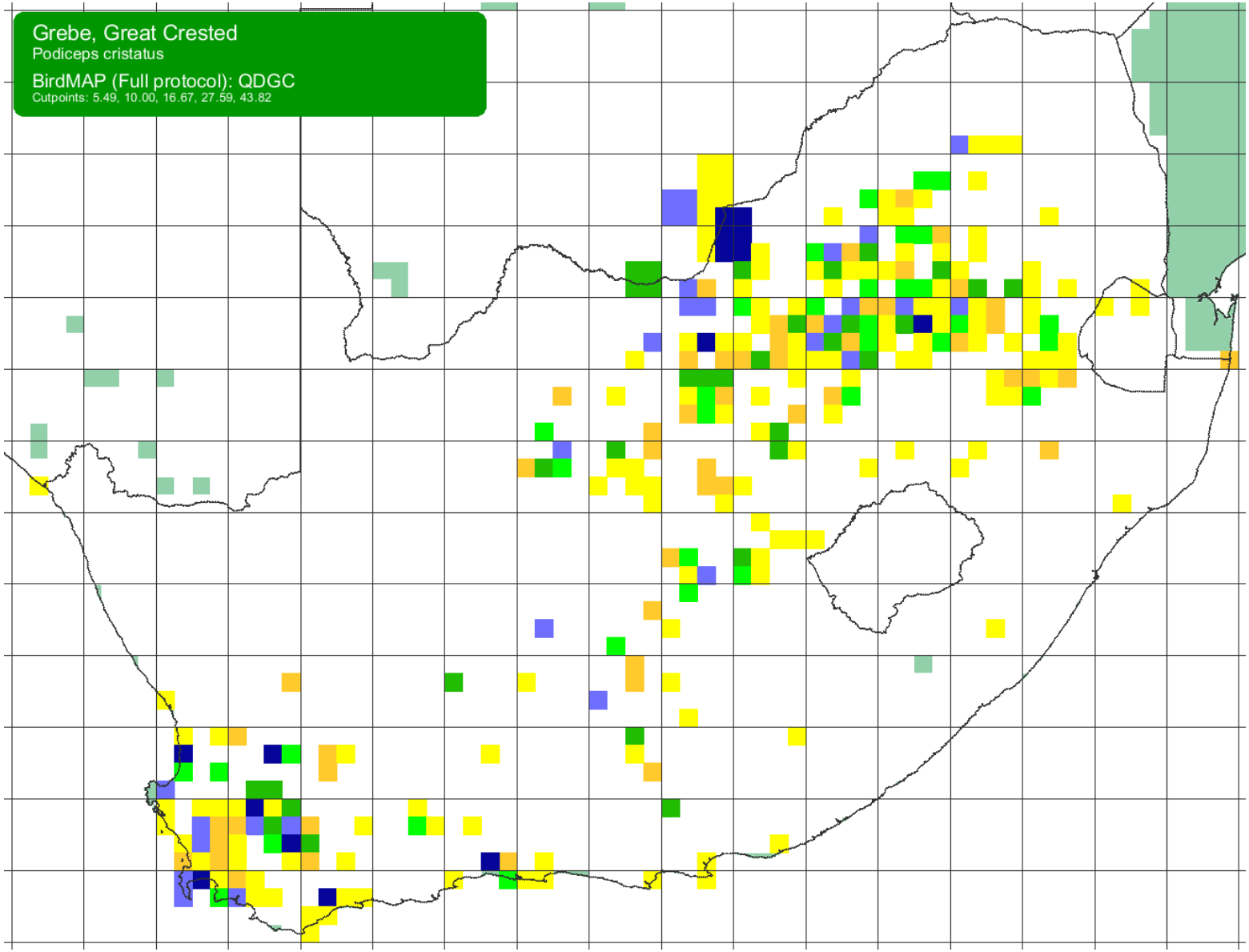

Figure 2. SABAP1 distribution map for the Great Crested Grebe. Note that quarter degree grid cells shaded turquoise had no SABAP1 data (Mozambique, Botswana, Namibia and one in the former Transkei). The colours represent reporting rates, and the cutpoints for the different colours are the same as used for SABAP2, see Figure 3.

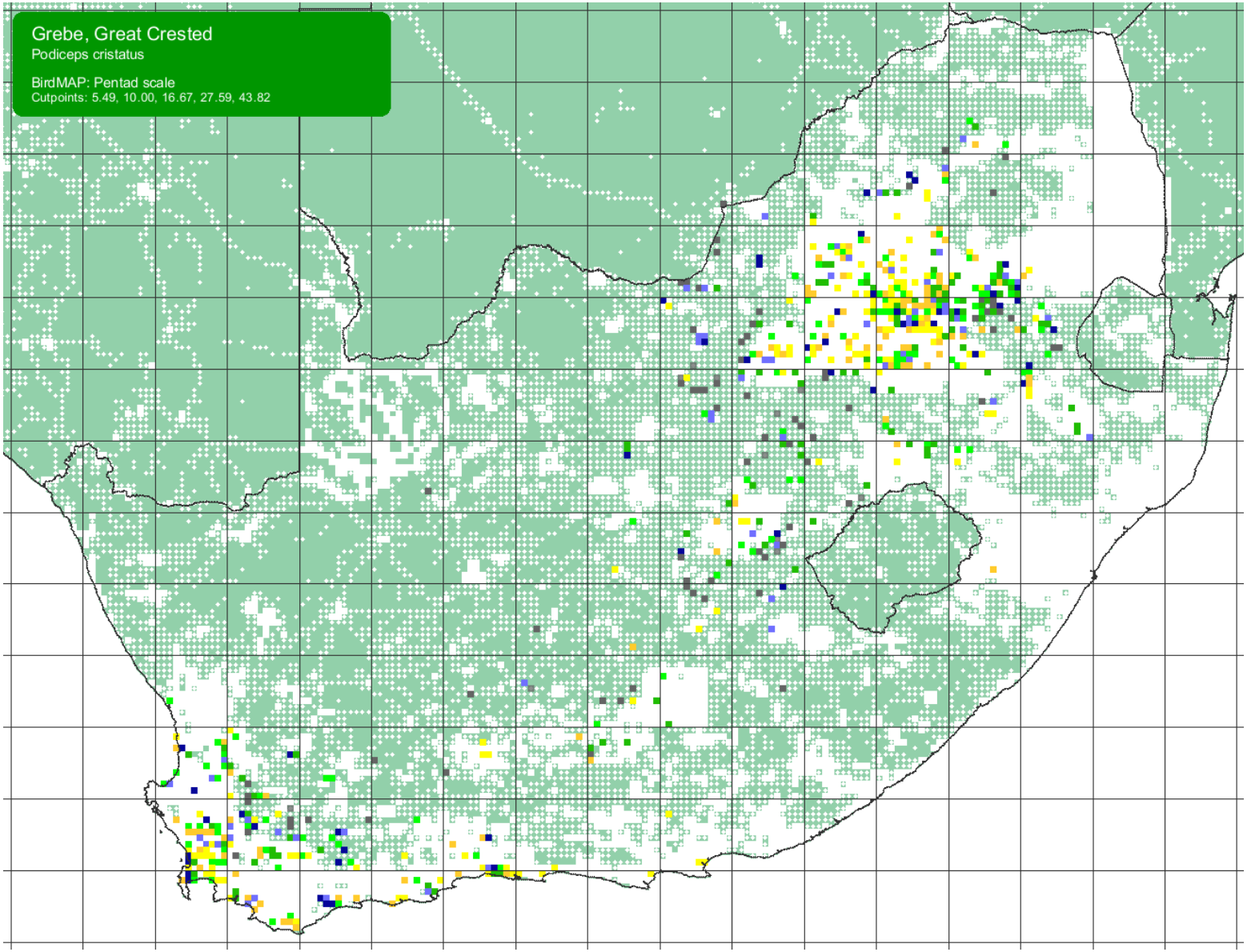

Figure 3. SABAP2 distribution map for the Great Crested Grebe, downloaded 24 April 2017. The detailed interpretation of this map is provided by Underhill & Brooks (2016a) and see text. Pentads with four or more checklists are either shaded white, species not recorded, or in colour, with shades based on reporting rate: yellow 0–5.5%, orange 5.5–10%, light green 10–16.7%, dark green 16.7–27.6%, light blue 27.6–43.8% and dark blue 43.8–100%.

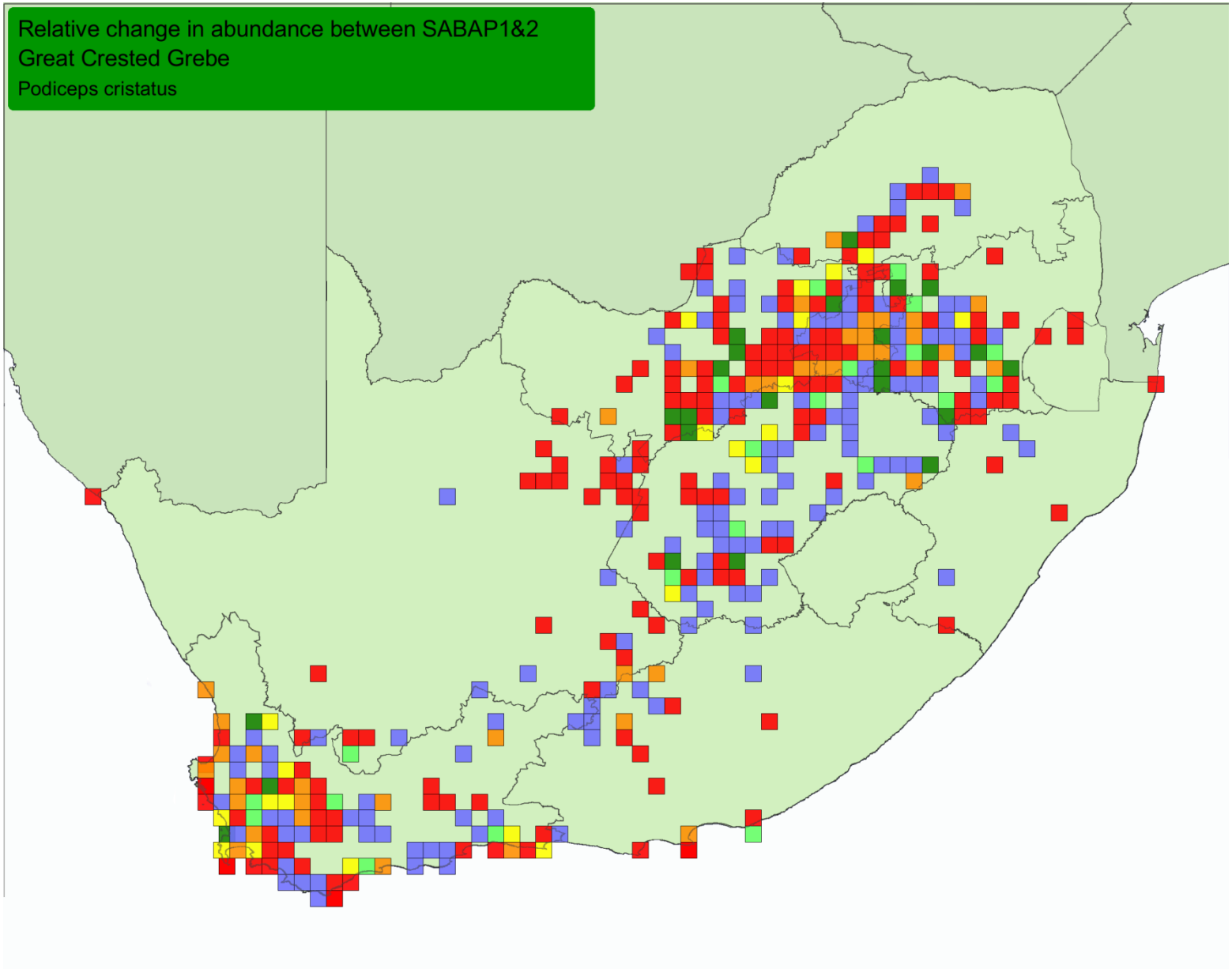

Figure 4. Range-change map between SABAP1 and SABAP2 for the Great Crested Grebe, downloaded 24 April 2017. Red, orange and yellow represent quarter-degree grid cells with very large, large, and small relative decreases and blue, dark green and light green represent grid cells with very large, large 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. Fuller information on the interpretation of this range-change map is provided in Underhill & Brooks (2016b).

Table 1. Range-change summary for the Great Crested Grebe between SABAP1 and SABAP2. Numbers (and percentages) in each colour category of Figure 4, for which there are at least four checklists per quarter degree grid cell in both SABAP1 and SABAP2. 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	4+ checklists for SABAP1 and SABAP2		30+ checklists for SABAP1 and SABAP2	
	Count	%	Count	%
Red (very large decrease)	165	40	101	39
Orange (large decrease)	43	10	38	15
Yellow (small decrease)	22	5	17	7
Light green (small increase)	21	5	15	6
Dark green (large increase)	24	6	15	6
Blue (very large increase)	138	33	73	28
Total	413	100	259	100

Overall, the Great Crested Grebe has had slightly more decreases than increases across its distribution; a substantial proportion of the increases are in the Free State, where Earlé & Grobler (1987) had considered it as scarce in the mid-1980s (Figure 4, Table 1). Clinning (1995) gave examples of the disappearance of this species from wetlands where it had previously occurred, and considered this to be attributable to water pollution and human disturbance. He suggested that Great Crested Grebes had potential as an indicator of water quality.

Black-necked Grebe *Podiceps nigricollis*

To breed, the Black-necked Grebe (Figure 5) colonizes ephemeral pans after periods of flooding (Dean & Underhill 1997). It is an unpredictable, nomadic species; it does not breeding annually. Non-breeding periods are spent at refuges where there is permanent water: saltworks, dams, sewage works, sheltered bays, etc, and it is considered that they increased in abundance and distribution during the 20th century (Del Hoyo et al. 1992, Clinning 1995, Dean & Underhill 1997). Black-necked Grebes have a patchy distribution from the west coast of North America, across southern Europe and central Asia as far as Japan. The southern African population is isolated.

The overall distribution pattern, for both SABAP1 (Figure 6) and SABAP2 (Figure 7), is broadly similar to that of the Great Crested Grebe (Figures 2 and 3), mainly in central South Africa and the Western Cape. There are similar proportions of grid cells showing increases and decreases, with no particular regional pattern clearly evident (Figure 8, Table 2). This is not surprising, given the nomadic nature of breeding. What is not clear from the SABAP2 data is whether the increases in range and abundance observed in the 20th century have continued into the 21st.

Figure 5. Black-necked Grebe, Strandfontein Sewerage Works, Western Cape. Photographer © Michael McSweeney. Record 873 in the BirdPix section of the ADU Virtual Museum. Full details at http://vmus.adu.org.za/?vm=BirdPix-873

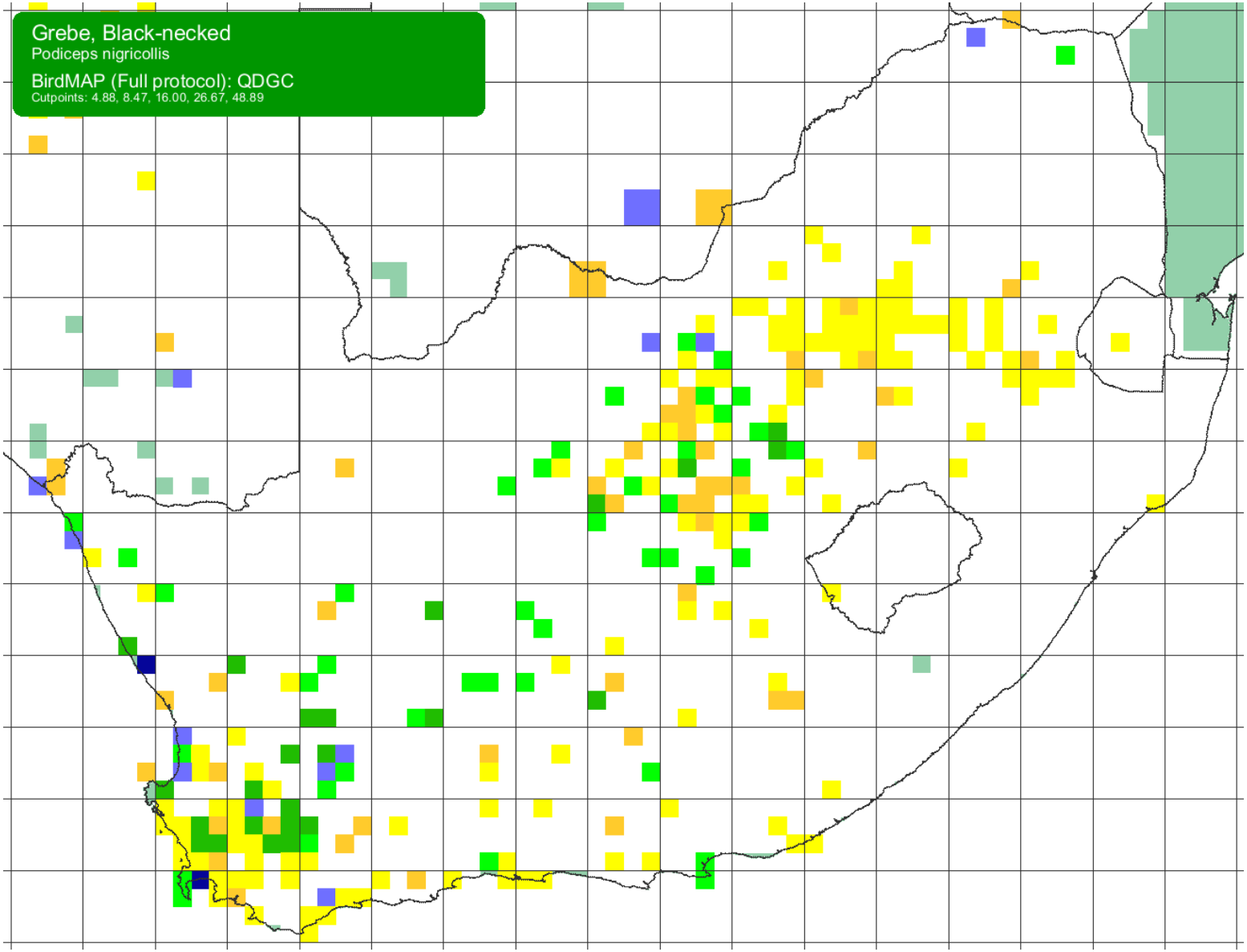

Figure 6. SABAP1 distribution map for the Black-necked Grebe. Note that quarter degree grid cells shaded turquoise had no SABAP1 data (Mozambique, Botswana, Namibia and one in the former Transkei). The colours represent reporting rates, and the cutpoints for the different colours are the same as used for SABAP2, see Figure 7.

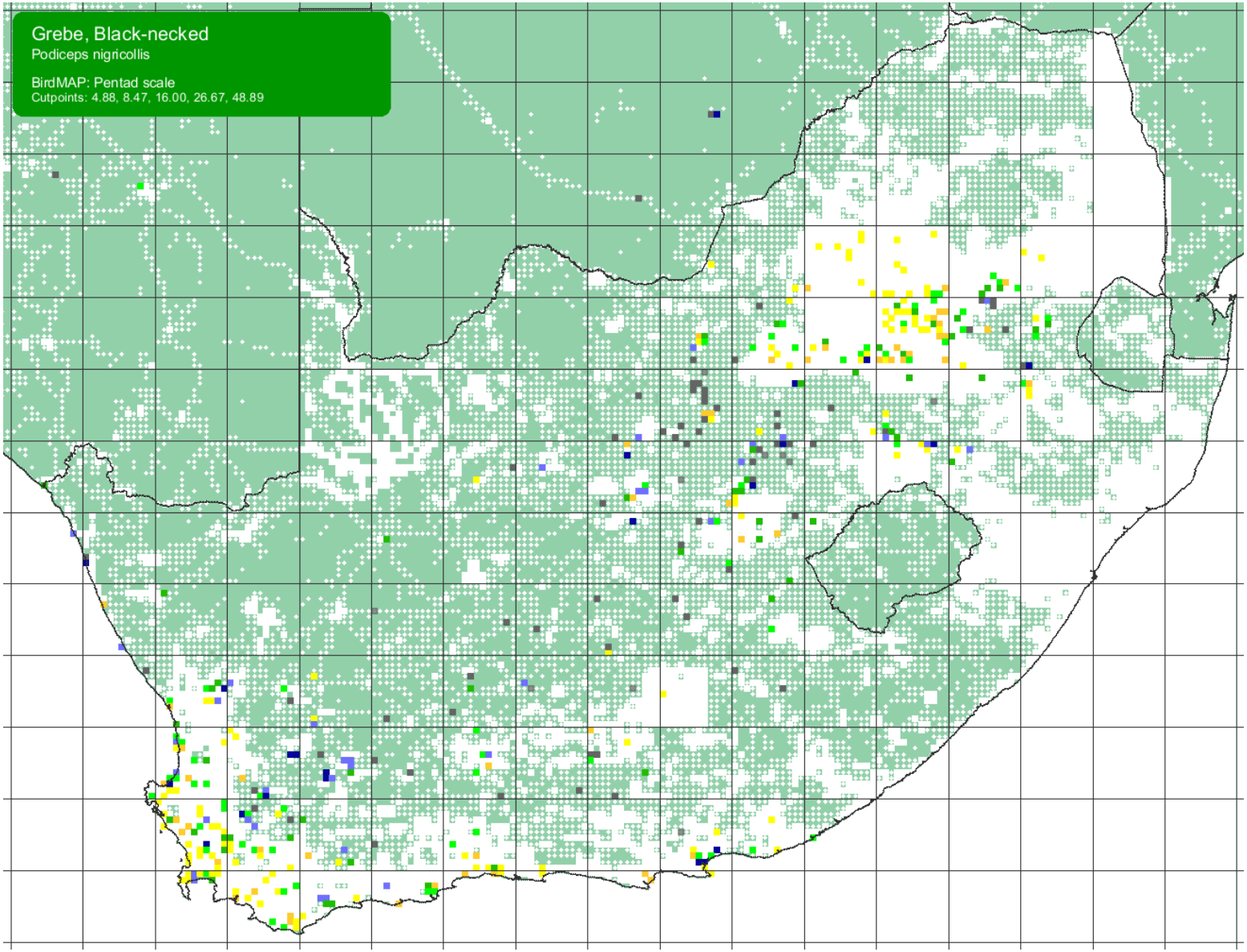

Figure 7. SABAP2 distribution map for the Black-necked Grebe downloaded 24 April 2017. The detailed interpretation of this map is provided by Underhill & Brooks (2016a) and see text. Pentads with four or more checklists are either shaded white, species not recorded, or in colour, with shades based on reporting rate: yellow 0–4.9%, orange 4.9–8.5%, light green 8.5–16%, dark green 16–26.7%, light blue 26.7–48.9% and dark blue 48.9–100%.

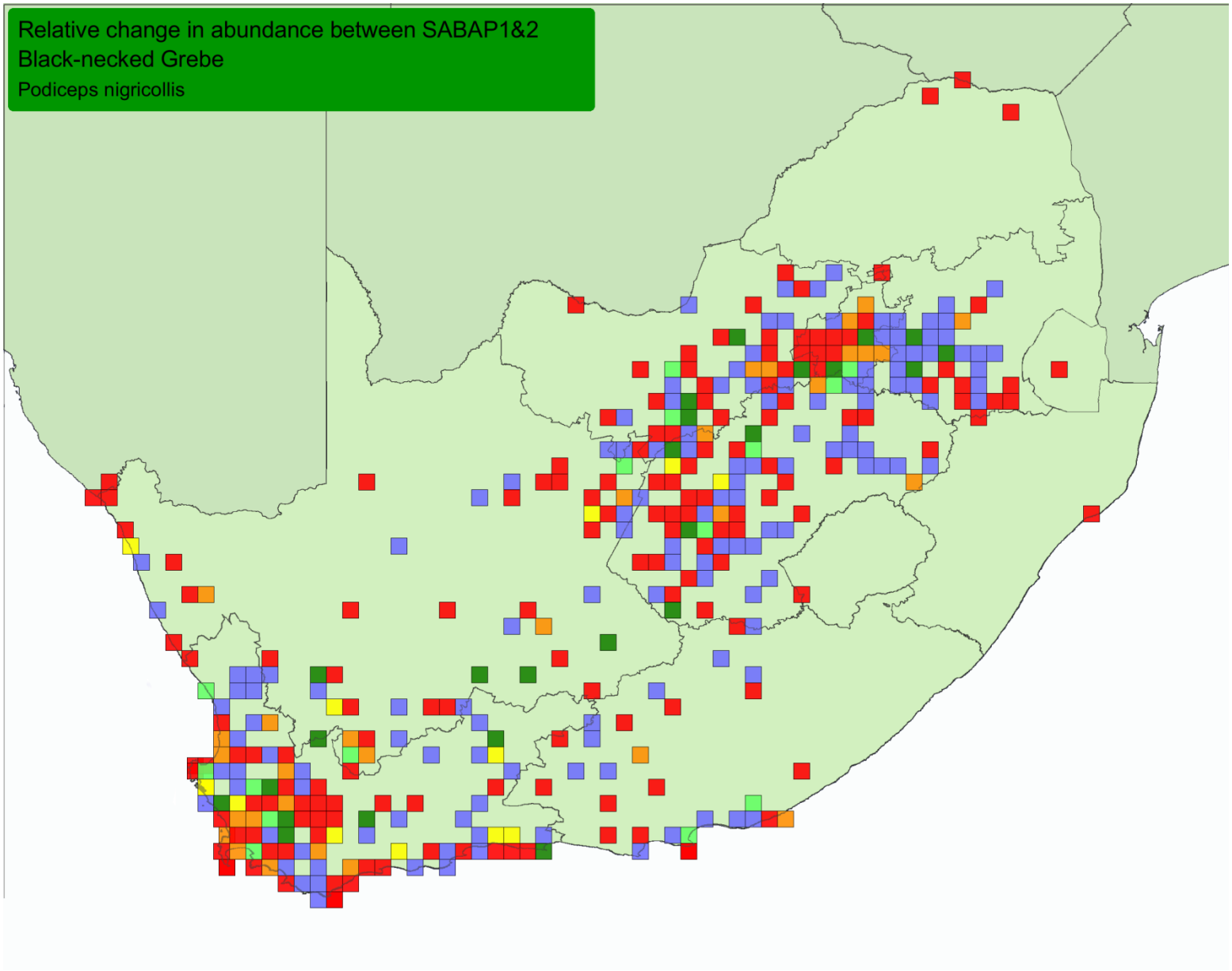

Figure 8. Range-change map between SABAP1 and SABAP2 for the Black-necked Grebe, downloaded 24 April 2017. Red, orange and yellow represent quarter-degree grid cells with very large, large, and small relative decreases and blue, dark green and light green represent grid cells with very large, large and small relative increases. A count of the number of grid cells in each category is provided in Table 2. Only grid cells with at least four checklists in both SABAP1 and SABAP2 are shown. Fuller information on the interpretation of this range-change map is provided in Underhill & Brooks (2016b).

Table 2. Range-change summary for the Black-necked Grebe between SABAP1 and SABAP2. Numbers (and percentages) in each colour category of Figure 8, for which there are at least four checklists per quarter degree grid cell in both SABAP1 and SABAP2. 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	4+ checklists for SABAP1 and SABAP2		30+ checklists for SABAP1 and SABAP2	
	Count	%	Count	%
Red (very large decrease)	161	42	81	37
Orange (large decrease)	31	8	24	11
Yellow (small decrease)	15	4	9	4
Light green (small increase)	15	4	10	5
Dark green (large increase)	25	6	14	6
Blue (very large increase)	140	36	83	38
Total	387	100	221	100

Little Grebe *Tachybaptus ruficollis*

The Little Grebe (Figure 9) occurs over Africa south of the Sahara Desert, and then in North Africa, in western Europe from Ireland, through the Mediterranean basin and the Middle East and across southern and southeastern Asia as far east as Japan, with multiple subspecies (Del Hoyo et al. 1992). During both SABAP1 (Figure 10) and SABAP2 (Figure 11), its distribution can be characterized as being widespread in the more mesic south and east of the atlas region, with records in the arid regions being scattered (Dean 1997). The pentad scale distribution of SABAP2 provides valuable insights into the fine structure of the distribution (Figure 11).

The range change map (Figure 12) hints at decreases in the Limpopo River valley, the Kruger National Park and the lowveld of Limpopo Province and Mpumalanga, Swaziland and northern KwaZulu-Natal, with suggestions of increases in the Karoo and coastal Northern Cape. The numbers of grid cells with increases and decreases roughly balance (Table 3).

The abundance of Little Grebes increased during the 20th century as a result of the construction of wetlands, large and small, permanent and ephemeral (Dean 1997). It is not clear from the SABAP2 data whether this increase continued into the 21st century. Of the three grebe species in southern Africa, the Little Grebe has the largest tolerance of water conditions, occurring both in shallower water, and in more eutrophic wetlands than Great Crested Grebe and Black-necked Grebe (Clinning 1975, Dean 1977). Like these species, it moves locally in response to rainfall events.

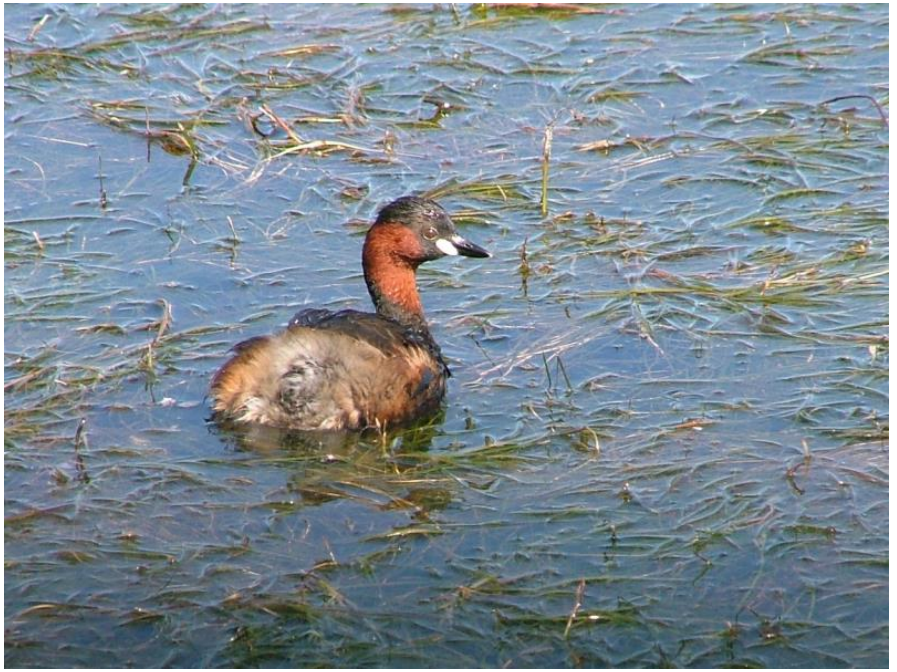

Figure 9. Little Grebe, Langvlei, Western Cape. Photographer © David Kennedy. Record 3313 in the BirdPix section of the ADU Virtual Museum. Full details at http://vmus.adu.org.za/?vm=BirdPix-3313

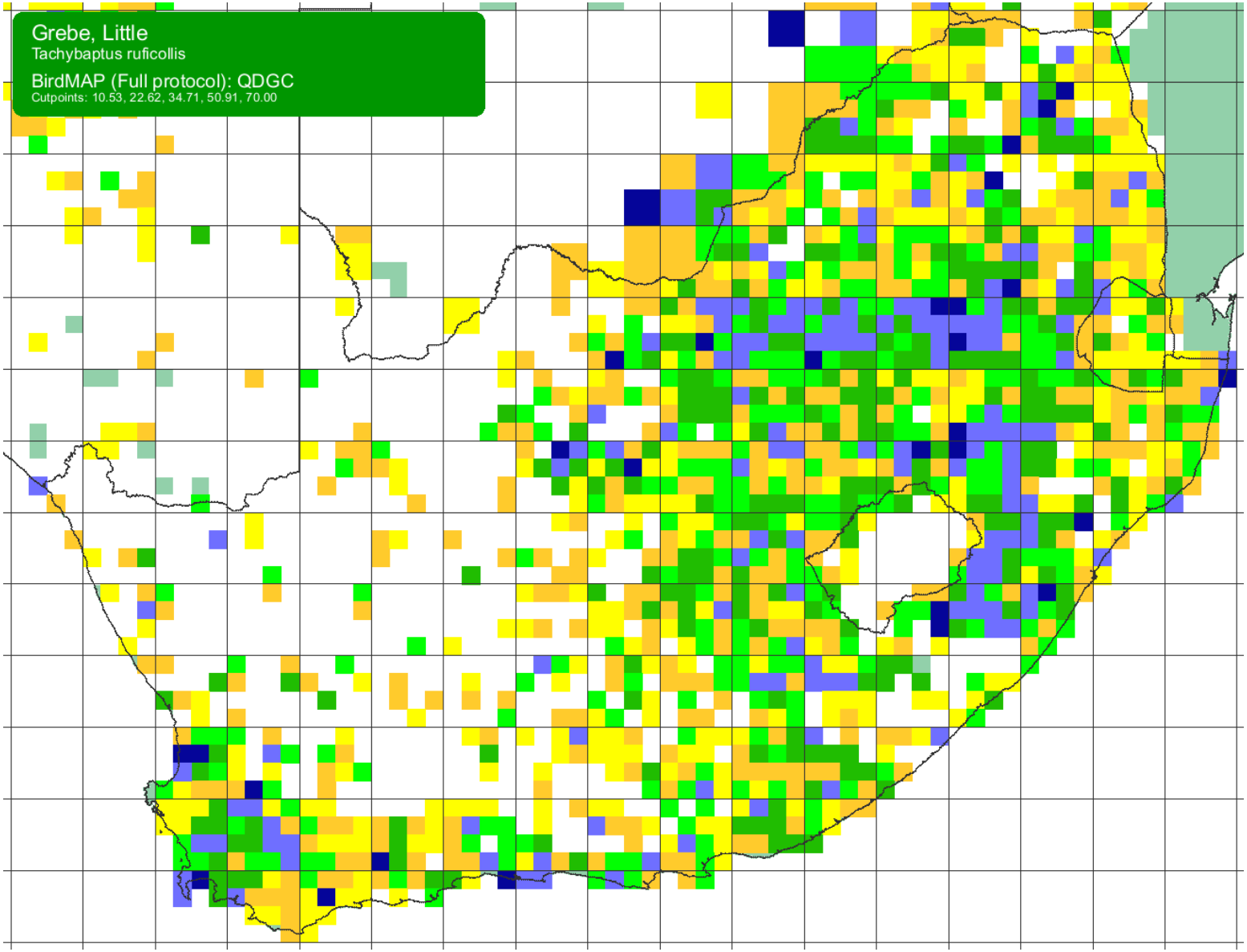

Figure 10. SABAP1 distribution map for the Little Grebe. Note that quarter degree grid cells shaded turquoise had no SABAP1 data (Mozambique, Botswana, Namibia and one in the former Transkei). The colours represent reporting rates, and the cutpoints for the different colours are the same as used for SABAP2, see Figure 11.

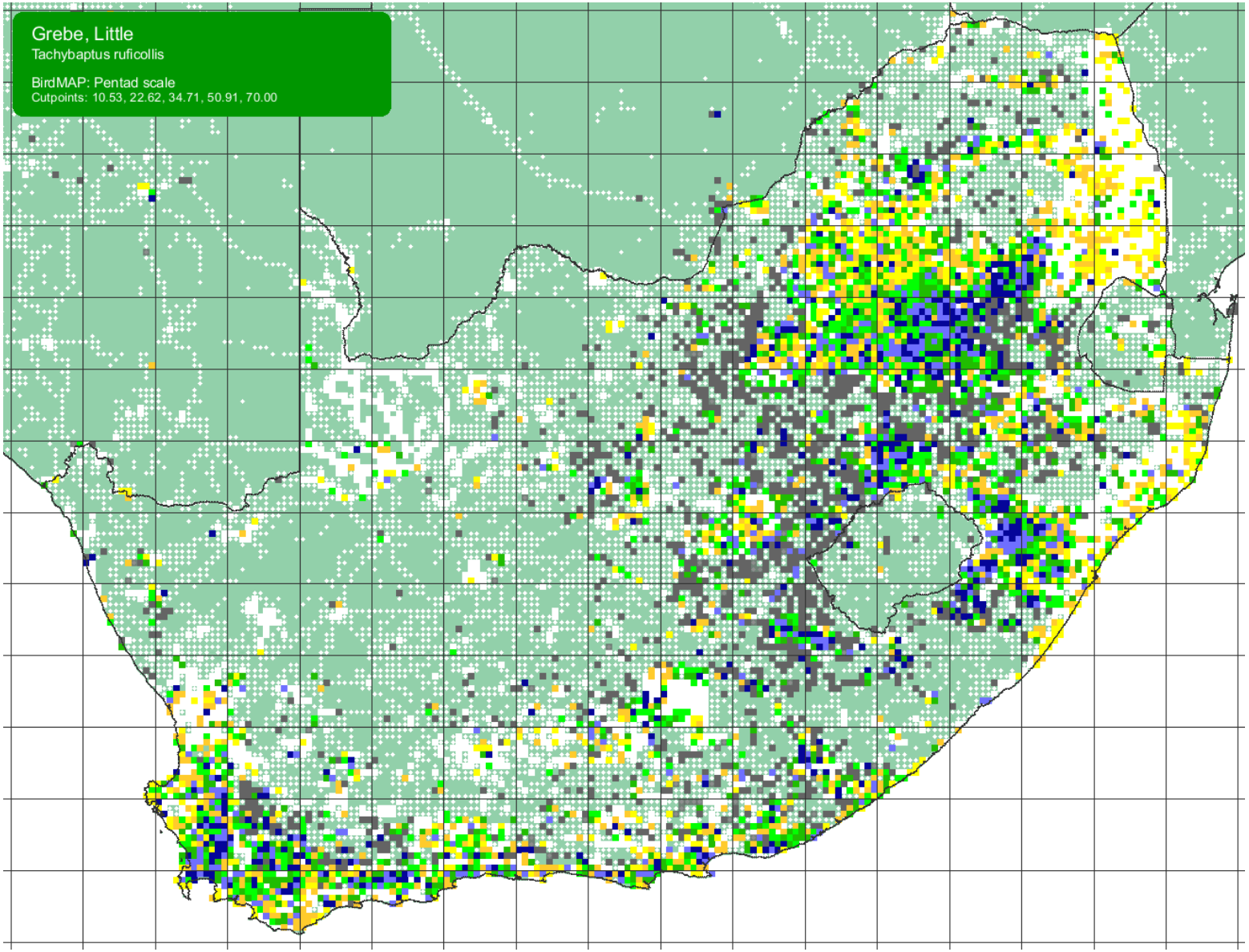

Figure 11. SABAP2 distribution map for the Little Grebe, downloaded 24 April 2017. The detailed interpretation of this map is provided by Underhill & Brooks (2016a) and see text. Pentads with four or more checklists are either shaded white, species not recorded, or in colour, with shades based on reporting rate: yellow 0–10.5%, orange 10.5–22.6%, light green 22.6–34.7%, dark green 34.7–50.9%, light blue 50.9–70% and dark blue 70–100%.

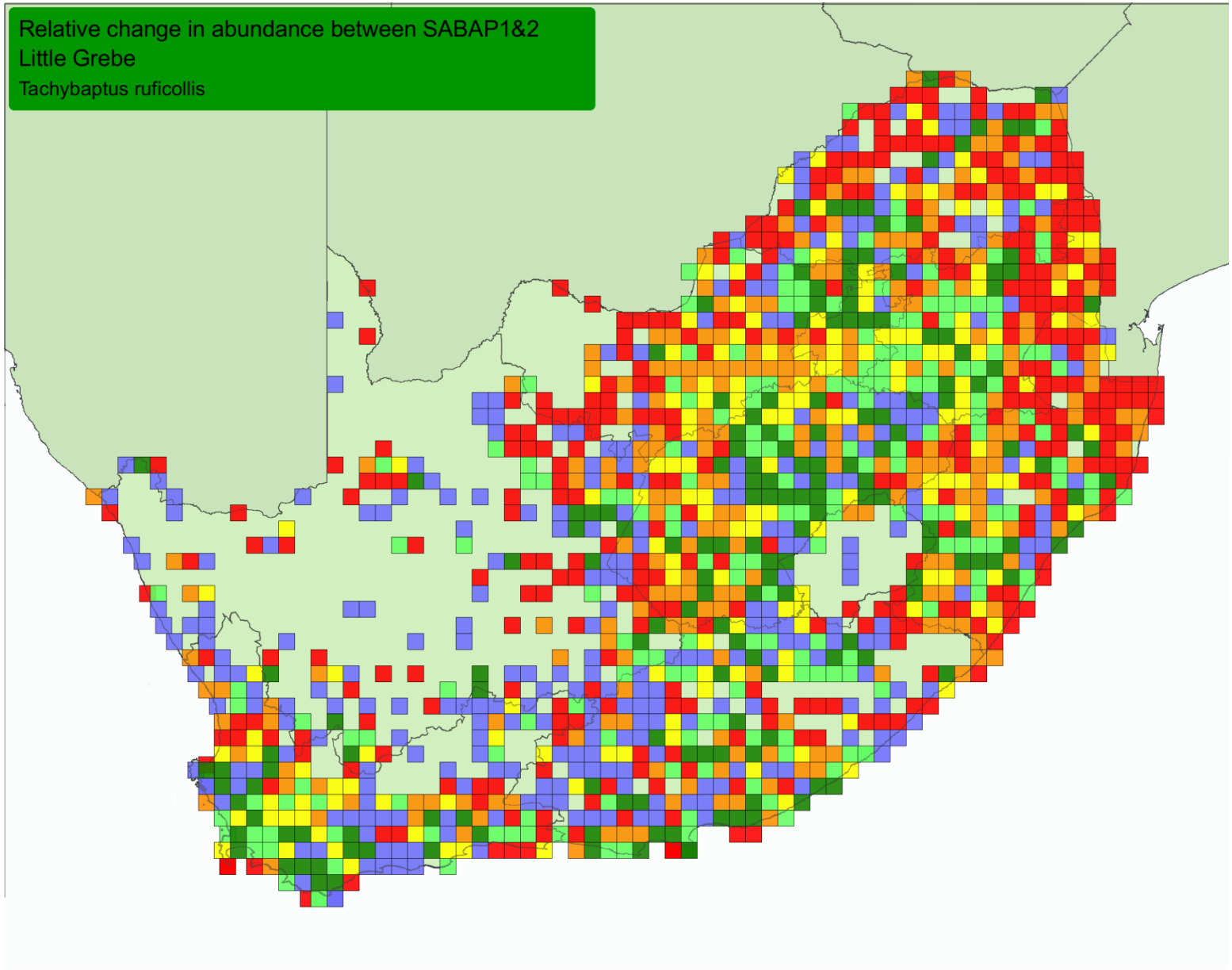

Figure 12. Range-change map between SABAP1 and SABAP2 for the Little Grebe, downloaded 24 April 2017. Red, orange and yellow represent quarter-degree grid cells with very large, large, and small relative decreases and blue, dark green and light green represent grid cells with very large, large and small relative increases. A count of the number of grid cells in each category is provided in Table 3. Only grid cells with at least four checklists in both SABAP1 and SABAP2 are shown. Fuller information on the interpretation of this range-change map is provided in Underhill & Brooks (2016b).

Table 3. Range-change summary for the Little Grebe between SABAP1 and SABAP2. Numbers (and percentages) in each colour category of Figure 12, for which there are at least four checklists per quarter degree grid cell in both SABAP1 and SABAP2. 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	4+ checklists for SABAP1 and SABAP2		30+ checklists for SABAP1 and SABAP2	
	Count	%	Count	%
Red (very large decrease)	351	24	131	21
Orange (large decrease)	241	17	121	19
Yellow (small decrease)	168	12	86	14
Light green (small increase)	195	14	115	18
Dark green (large increase)	176	12	98	16
Blue (very large increase)	304	21	76	12
Total	1435	100	627	100

Overview and conclusions

Clinning (1995) pointed out that, at most southern African wetlands where one or more of the three grebes occur, they constitute a small minority of the waterbird population. He noted, from the perspective of biomass: “Grebes contribute little to wetland ecology in southern Africa.” In spite of their comparative rareness, all three species are classified as Least Concern in South Africa, Lesotho and Swaziland (Taylor et al. 2015). In Namibia, the national conservations status for Great Crested Grebe is “Critically endangered” and that for Black-necked Grebe is “Near-threatened” (Simmons et al. 2015).

For all three species, the estimates of the sizes of the southern African populations are described by Wetlands International as either “best guess” or “expert opinion” rather than being “census based” (Wetlands International 2017). Likewise, decisions about trends and the 1% thresholds for Ramsar Convention status are uncertain.

For the Great Crested Grebe, the population in southern Africa of the subspecies that occurs in Africa, *Podiceps cristatus infuscatus*, is estimated to fall in the extremely broad range 1–10,000 birds, with 100 birds at a wetland being set as the 1% criterion for Ramsar status. It is “unknown” whether the population trend is increasing, decreasing or stable. Simmons et al. (2015) provided a well-reasoned estimate of c. 7,000 Great Crested Grebes in Botswana, Namibia and South Africa.

The population of the subspecies of Black-necked Grebe *Podiceps nigricollis gurneyi* has been estimated by “expert opinion” to lie in the range 20,000–30,000; based largely on the estimate of the July population in Walvis Bay, Namibia (Simmons et al. 2015, Wetlands International 2017). The Ramsar 1% threshold is set at 240 birds. The population trend is thought by Wetlands International to be increasing; this was confirmed for Namibia by Kolberg (2010).

Wetlands International (2017) recognises 10 species of Little Grebe, none of which has a population estimate which is “census based”. The “best guess” of the population of subspecies *Tachybaptus ruficollis capensis*, occurring in Africa south of the Sahara Desert, is 100,000 to 1,000,000 birds, with the 1% Ramsar threshold set at 10,000 birds; it is unlikely that any wetland in Africa holds this number of Little Grebes. There is “no idea” whether the population trend is stable, increasing or decreasing.

Acknowledgements

This paper is part of a series which celebrates the contributions of thousands of citizen scientists to the databases of the first and second bird atlas projects in southern Africa (SABAP1 and SABAP2). From 2007 to March 2017, SABAP2 (Underhill 2016) was a partnership project of SANBI (South African National Biodiversity Institute), BirdLife South Africa and the Animal Demography Unit in the Department of Biological Sciences, University of Cape Town.

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