# BIRD DENSITIES IN COASTAL RENOSTERBOSVELD OF THE BONTEBOK NATIONAL PARK, SWELLENDAM, CAPE PROVINCE

By

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The place where the censuses which are the main concern of this paper were made is the Bontebok National Park, three miles south of Swellendam and on the left bank of the Breede River. A general description of the bird habitats and a list of the species recorded in the Park has already been published (Winterbottom, 1967). The bulk of the Park carries vegetation classified by Acocks (1953) as Coastal Renosterbosveld. In a much more detailed analysis, Grobler and Marais (1967) recognise 13 plant communities in three groups. Of these, one group (Tree-group) does not concern us here since no attempt was made to count birds in it.

The Renoster-Bush group is confined to the flats and lower slopes of the hills (roughly to the alluvium), while the leucodendron group occurs mainly on the gravel, sand and boulders covering the rest of the Park, whose geology has been reported on by Theron (1967). Bird counts were confined to Renosterbush and Leucodendron groups, but no counts were made in the *Protea repens* community (see below) or the narrow belt of the *Cliffortia fuscifolia* community on the steep slope at the south-west corner of the Park. The relatively small *Erica diaphana* community should be mentioned because one of the most numerous plants in it, *E. versicolor* Wendl, when in flower, attracts the three species of Sunbird *Nectarinia* recorded from the Park.

The counts on which this paper is based were made only in the Coastal Renosterbosveld and not in the thick bush along the Breede River or the dense stands of Protea which fill one or two of the kloofs; and although the cut-over veld was included in the count when the line on which we were working happened to cross it, the strips (see below) were chosen to cover as little of it as possible. Since Coastal Renosterbosveld, like other formations of indigenous vegetation in the South West Cape, is liable to fires, it was felt that it would not give a representative sample of the counts were confined solely to the better bushed areas. The avi-

fauna of Coastal Renosterbosveld in general has been described elsewhere (Winterbottom, 1966).

The counts were made in strips. The author (and his wife, when she was present) walked in a straight line across the veld, counting all birds occurring in a strip ten yards on either side. Knowing the length of his stride, it was a simple matter to convert distance into area. The method was originally developed by Forbes (1914) and is more fully discussed by Graber and Graber (1963). For relatively open country, the results are pretty accurate; and out of the breeding season or where the non-breeding population forms a significant part of the total, it is a far more realistic approach to the problem than any other. It is not, however, suitable for dense bush, for reed-beds or for forest; but I know of no method that is. In particular, the method much used by Holarctic ornithologists of censusing breeding birds only, seems to me open to grave objections, of which the more important are that it is spread in time over the whole breeding season; that even singing males are liable to be missed (see Enemar, 1959); and that no allowance is, or can be, made for non-breeding birds, whose presence may, even in the Holarctic and certainly in Africa, be of considerable proportions, as indicated below.

The counts were made in April and August, 1965, September and November, 1966, and February and June, 1967. In this way, all seasons of the year were covered. The detailed results are set out in Table I. It will be noted that the density per 100 acres varies comparatively little, from 131 in June, 1967, to 177 in September, 1966, with an overall average of 151. The highest densities are during the main breeding season (August and September), with another peak in autumn (April), though this last, being based on only 30 acres, may be merely a sampling error.

TABLE I.

*Bird Censuses in Bontebok National Park.*

| Date | | | | | | | Totals |
|---|---|---|---|---|---|---|---|
| Acreage covered ... ... ... | 30 | 70 | 100 | 172 | 109 | 134 | 615 |
| Sagittarius serpentarius ... | — | — | 1 | — | — | — | 1 |
| Plectropretus gambensis ... | — | — | 1 | — | — | — | 1 |
| Struthio camelus ... ... ... ... | — | 2 | 1 | — | — | — | 3 |
| Buteo buteo ... ... ... ... ... | — | — | — | 1 | — | — | 1 |
| Falco tinnunculus ... ... ... | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| F. naumanni ... ... ... ... ... | — | — | — | — | 57 | — | 57 |
| Francolinus africanus ... ... | — | 1 | — | — | — | 8 | 9 |
| Corturnix corturnix ... ... | — | — | 5 | 1 | 2 | — | 8 |
| Turnix hottentota ... ... ... | — | 1 | — | — | 1 | — | 2 |
| Otis denhami ... ... ... ... ... | — | 2 | — | — | — | — | 2 |
| Afrotis afra ... ... ... ... ... | — | 1 | 1 | 1 | 1 | — | 4 |

TABLE I *(continued).*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Gallinago nigripennis ... | — | 1 | — | — | — | 2 | 3 |
| Streptopelia capicola ... ... | — | 1 | 1 | 1 | — | — | 3 |
| Apus caffer ... ... ... ... ... | 1 | — | — | — | 3 | — | 4 |
| A. melba ... ... ... ... ... ... | 20 | — | — | — | — | — | 20 |
| Colius indicus ... ... ... ... ... | — | — | 2 | — | — | — | 2 |
| Mirafra apiata ... ... ... ... | — | 9 | 7 | 20 | 3 | 3 | 42 |
| Calendula magnirostris ... | 1 | — | — | 7 | — | 3 | 11 |
| Calendrella cinerea ... ... | — | 15 | 3 | — | — | — | 18 |
| Hirundo rustica ... ... ... ... | 1 | — | — | 1 | 4 | — | 6 |
| H. albigularis ... ... ... ... ... | — | — | — | 1 | — | — | 1 |
| H. cucullata ... ... ... ... ... | — | — | 1 | 1 | — | — | 2 |
| H. rupestris ... ... ... ... ... | — | 1 | 1 | — | — | 2 | 4 |
| Riparia cincta ... ... ... ... | — | — | 1 | — | — | — | 1 |
| Corvus capensis ... ... ... ... | — | 1 | 1 | 3 | — | — | 5 |
| C. albicollis ... ... ... ... ... | — | — | 2 | — | 2 | — | 4 |
| Saxicola torquata ... ... ... | 3 | 2 | 3 | 13 | 10 | 1 | 32 |
| Erythropygia coryphaeus | 1 | 8 | 4 | 6 | 1 | 4 | 24 |
| Sphenoeacus afer ... ... ... | — | — | 1 | — | — | — | 1 |
| Cisticola textrix ... ... ... ... ... | 1 | — | 14 | 32 | — | 2 | 49 |
| C. subruficapilla ... ... ... ... | 12 | 24 | 63 | 52 | 31 | 31 | 213 |
| C. fulvicapilla ... ... ... ... | — | — | 1 | — | — | — | 1 |
| Prinia maculosa ... ... ... ... | — | 1 | 10 | 8 | 9 | 11 | 39 |
| Motacilla capensis ... ... ... | — | — | 1 | — | — | — | 1 |
| Anthus novaeseelandiae ... | 6 | 12 | 10 | 34 | — | 9 | 71 |
| A. leucophrys ... ... ... ... ... | — | — | 7 | 7 | — | — | 14 |
| Macronyx capensis ... ... | 1 | 2 | — | 2 | 2 | — | 7 |
| Lanius collaris ... ... ... ... ... | — | 3 | — | — | 1 | — | 4 |
| Malaconotus zeylonus ... | — | 3 | 9 | 2 | 1 | 2 | 17 |
| Spreo bicolor ... ... ... ... | — | — | — | — | 1 | — | 1 |
| Nectarinia famosa ... ... | — | 8 | 9 | 12 | 4 | 30 | 63 |
| N. violacea ... ... ... ... ... | — | 2 | 4 | 3 | 12 | 4 | 25 |
| N. chalybea ... ... ... ... ... | 2 | — | — | — | 15 | — | 17 |
| Promerops cafer ... ... ... | — | — | 5 | — | — | 2 | 7 |
| Euplectes capensis ... ... ... | — | — | 1 | 2 | — | — | 3 |
| Ortygospiza fuscocrissa ... | — | — | — | 18 | 6 | 2 | 26 |
| Estrilda astrild ... ... ... ... ... | — | — | — | 5 | — | — | 5 |
| Serinus canicollis ... ... ... | — | — | 6 | — | — | 56 | 62 |
| S. flaviventris ... ... ... ... ... | — | 10 | 1 | 1 | — | — | 12 |
| Emberiza capensis ... ... ... | — | 5 | 1 | 6 | 2 | 2 | 16 |
| E. impetuani ... ... ... ... ... | — | — | — | 1 | — | — | 1 |
| Unidentified ... ... ... ... ... | — | — | — | 1 | 2 | — | 3 |
| Totals ... ... ... ... ... ... ... | 50 | 115 | 177 | 242 | 170 | 176 | 930 |
| Birds/100 acres ... ... ... ... | 167 | 166 | 177 | 144 | 156 | 131 | 151 |

If all the birds were stationary residents, the expected pattern would be a peak in November, immediately after the breeding season, and the minimum population would be in August, at the start of the next breeding season. A glance at Table I, however, shows that these condtions do not obtain. Thus, the April total was swelled by a flock of 20 Alpine Swifts, *Apus melba,* which do not breed in the Park; and the February one by 57 Lesser Kestrels Falco naumanni, which are non-breeding visitors from the Palaearctic.

As already mentioned, the flowering of *Erica versicolor* attracts considerable numbers of sunbirds to the Park; and when this coincides with the flowering of *Protea repens,* much relished by the Malachite Sunbird *Nectarinia famosa,* the effect is increased, as is shown by the total of 30 of the species in June, 1967. As noted above, the dense stands of this plant along the eastern border of the Park were not included in the counts, partly because the nature of the vegetation made the census method employed impracticable; and partly because dense stands of Protea are classified as a distinct habitat by Winterbottom and Skead (1962); but the sunbirds moved freely between the Protea stands and the rest of the veld.

The most numerous species, the Grey-backed Cisticola *Cisticola subruficapilla* is a resident species and shows a closer approximation to the expected variation in numbers, though it is most abundant at the height of the breeding season (September) rather than after it is over; and anomalously numerous in April.

The area of the Park amounts to 6,863 acres and all but the riverine strip, the Protea-filled kloofs and a small area of dense Aloes on a rocky hillside is covered with Coastal Renosterbosveld, so that we may calculate the approximate bird population of this part of the Park as 9,000-12,000, with an estimated biomass of 51,000 gr., about the same as on the coastal plain of Mexico (Grant, 1966.)

Coastal Renosterbosveld is one of the four vegetation types classified by Acocks (1963) as Temperate and Transitional Forest and Scrub; but two of these do not occur in the western Cape. The only other one that does is Coastal Macchia. Unfortunately, the only census figures which exist for this formation are for counts made by me on the Cape Flats east of Muizenberg between August and October in 1957 and 1958; others made under my supervision by members of the Percy FitzPatrick Institute of African Ornithology Field Schools at De Hoop, Bredasdorp District, in September and October, 1961, 1962 and 1965; and a count I made near Cape L'Agulhas in December, 1952. The results of none of these have been published. It is clear that the three different areas involved and the narrow seasonal range indicate that caution is needed in interpreting the results.

The Cape Flats results gave an average density of 455 birds per 100 acres over 81 acres in 1957; but only 254 over 24 acres in 1958,

when the rainfall was much lower. The De Hoop figures, on the other hand, are remarkably consistent, being 213 per 100 acres in 1961, 245 in 1962 and 216 in 1965; and agreed more closely with the Flats figure for 1958 than that for 1957. The Agulhas count, over 45 acres, agreed with the Flats figure for 1957, being 451 birds per 100 acres. Only the 1957 Flats count and those for De Hoop (all of the latter being counts of over 100 acres) are really extensive enough to be free from sampling errors; and these make it clear that Coastal Macchia supports 2 - 4 times the bird population which can live in Coastal Renosterbosveld.

In Coastal Renosterbosveld, the most numerous species is the Grey-backed Cisticola *C. subruficapilla,* which comprises nearly 23% of all the birds counted. Next comes the Tawny, or Richard's, Pipit *Anthus novaeseelandiae,* with 71, the Malachite Sunbird *N. famosa* with 63 and the Cape Canary *Serinus canicollis* with 62. This last, however, is another example of the big part played by non-breeding visitors in the bird population for 55 of the 62 were recorded in a single flock in June. It is interesting to note that three of the four species (as well as the next most numerous one) are predominantly insectivorous.

In Coastal Macchia, the Grey-backed Cisticola is again the most numerous species but accounts for less than 16% of the total of all species. Second comes another warbler, the Karoo Prinia Prinia maculosa, about two-thirds as numerous. The Cape Bulbul *Pycnonotus capensis,* Yellow Canary *Serinus flaviventris,* the two small Sunbirds, the Orange-breasted *N. violacea* and Lesser Double-collared *N. chalybea* and the Cape Bunting *Emberiza capensis* are other numerous forms. Only four of the total individuals, those for 13 species must be counted in Coastal

In Coastal Renosterbosveld, 50% of the individual birds fall into five species, those listed above plus the Lesser Kestrel *F. naumanni;* and only the first four reach an overall density of 10 birds per 100 acres. By contrast, in Coastal Macchia, 50% of the individual birds represent eight species, which do not include any non-breeding migrants; and seven of them exceed a density of 10 birds per 100 acres. To make up 75% of the total individuals, those for 13 species must be counted in Coastal Renosterbosveld and for 23 in Coastal Macchia. Of the six most numerous species in Coastal Renosterbosveld, only the Grey-backed Cisticola appears in the list of the 23 most numerous in Coastal Macchia, though of the eight most numerous in Coastal Macchia, six occur in the list of the 13 most numerous Coastal Renosterbosveld species.

## SUMMARY

1. Counts of birds in Coastal Renosterbosveld in the Bontebok National Park by the strip method in six different months gave an overall average density of 151 birds per 100 acres, with a maximum of 177 in September and a minimum of 131 in June.

2. The importance of both local movements and migration in evening out the population is pointed out.

3. The most numerous species is the Grey-backed Cisticola *C. subruficapilla,* which comprised 23% of all birds counted.

4. The population is compared with that of the botanically-related Coastal Macchia and the greater richness of the latter and the lower percentage of insectivorous species noted.


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