

RAPTOR'S VIEW – BIRD SURVEY AUGUST 2020 TO DECEMBER 2020

By
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Raptor's View is a small residential wildlife estate of about 1100 ha situated on the outskirts of Hoedspruit (Maruleng) in Limpopo. A survey of the birds of Raptor's View was undertaken from August to December 2020 using simplified timed surveys. During the surveys observers were asked to record all the birds they could see and hear in a 30-minute period in an area of approximately 2 ha. Observations were then uploaded into a spreadsheet for analysis.

25 observers started the survey in August but only 13 observers followed through the entire survey period to December. The number of survey samples per month is given in Table 1 below. December had the lowest number of samples largely as a result of observers being absent, travelling and being busy with the festive season! These 13 observer sites form the basis of this report. The observations from the 3 dam sites were not included in this analysis. For several months the dams were dry and so there were no real data, then when the rain came some birds turned up but these quickly gave way to other species that are irruptive in nature (e.g.

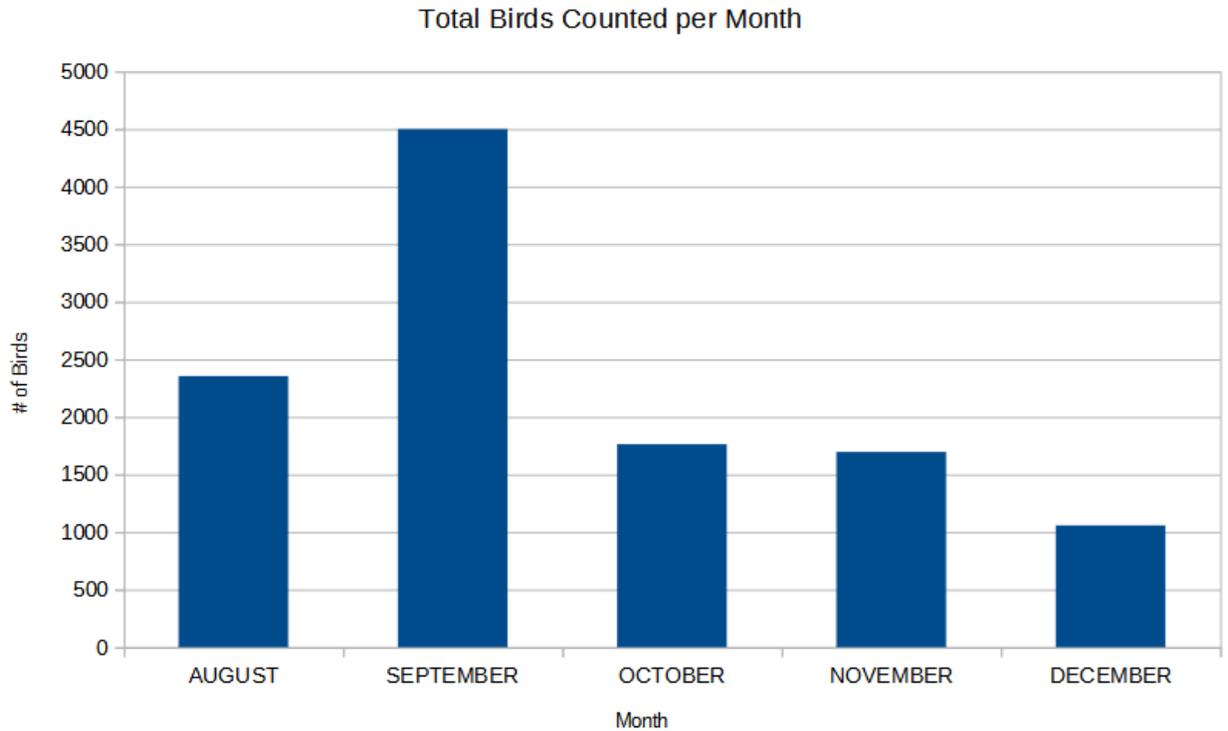
weavers, queleas) and this skewed analyses. These patterns are predictable to a large extent but a special effort could be made in the future to look at species turnover patterns at these sites. Bird species data was included in the total number of species observed during the survey.

Table 1: The number of birds (individuals) counted monthly during the survey. Samples refers to the number of 20 minute sampling periods during that month. The maximum and minimum values are those given by individual observers at a single site.

	TOTAL	Average	Max	Min	
Samples					
AUGUST	55	2354	181	348	53
SEPTEMBER	50	4500	346	1109	91
OCTOBER	47	1763	136	223	35
NOVEMBER	51	1696	130	250	56
DECEMBER	38	1058	88	168	25

Table 1 shows the total number of individual birds counted monthly by observers. The numbers are highly variable both between months (look in the TOTAL column) as well as the maximum and minimum numbers counted at individual sites over a month. The monthly variability is heavily influenced

by the presence of a particular species, the most obvious being Red-billed Quelea which accounts for the highest number of individual birds seen in a month. The site at which 1109 birds were seen in September, recorded 950 of those as Red-billed Quelea – the remaining 159 birds comprised the other 41 species at that site for the month. In one set of data (not used in this analysis) an observers saw about 5000 quelea in the 4 survey periods at a particular site.



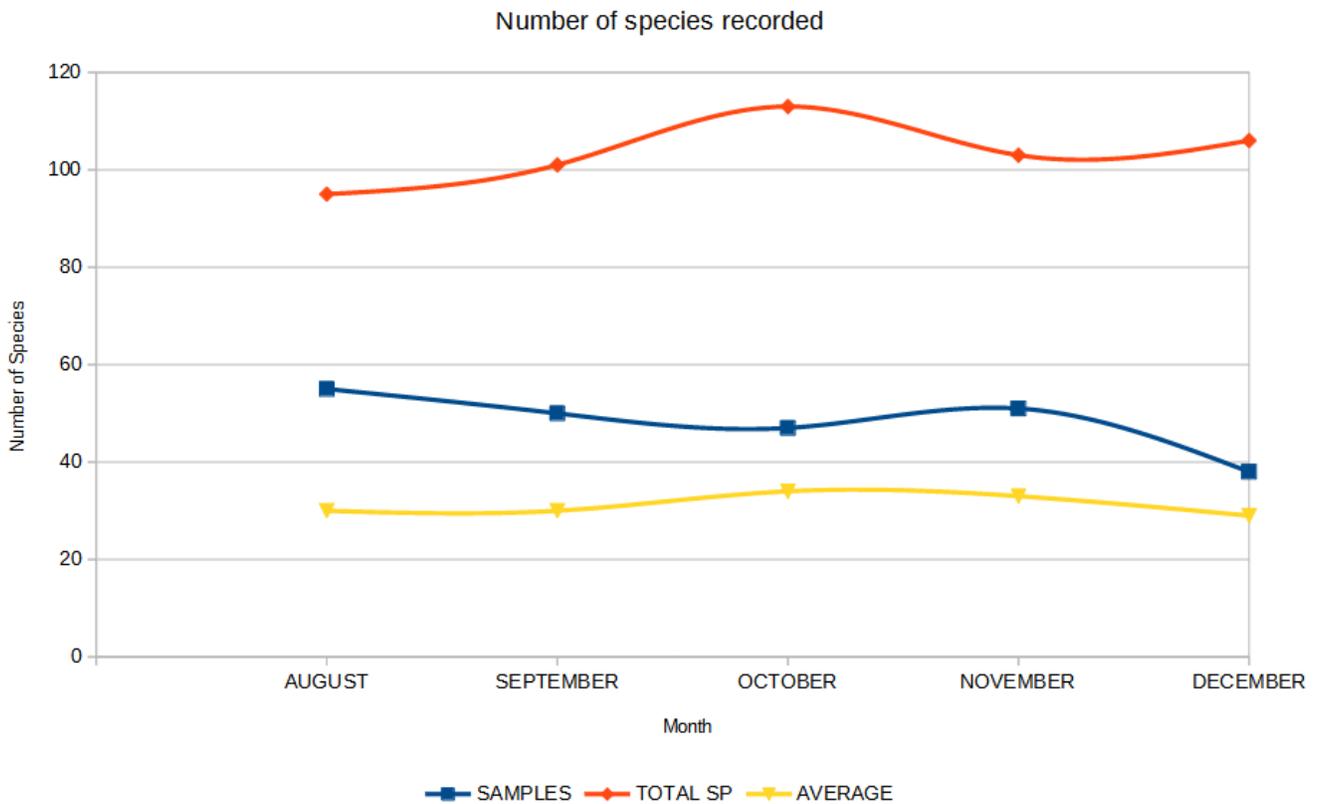
Graph 1: Total number of individual birds counted by observers by month. Numbers are strongly influenced by the presence of one species – Red-billed Quelea. In September 2660 quelea were counted, accounting for nearly 60% of all birds recorded.



Another factor that heavily influenced observations was the time of day. Some of the lowest totals (e.g. 53 birds of 15 species in August, 25 birds of 11 species in December) were made by observers late in the morning (0930-1000). Highest counts of species were made early in the morning.

Table 2: The number of bird species recorded during the survey. The total refers to the total number of species recorded by all recorders at all sites for that month. The maximum and minimum values are those at a single site. S/m refers to the range of samples per month per site. Efficiency is given as a percentage of the number of observations in a month divided by the theoretical maximum (65) efficiency.

Month	Sample #	TOTAL SP	Average	Max	Min	S / m	Efficiency
AUGUST	55	95	30	49	15	4-5	85%
SEPTEMBER	50	101	30	42	18	3 -5	77%
OCTOBER	47	113	34	53	16	1-5	72%
NOVEMBER	51	103	33	47	22	3-5	78%
DECEMBER	38	106	29	41	11	1-5	58%



Graph 2: Species numbers recorded during the survey. Monthly totals and averages are shown in relation to the total number of monthly samples.

The total number of species recorded per month during the survey remained remarkably constant. August had the lowest number of species (95) which is not surprising as many species are silent or absent (migrants) during this period. This low variability in species numbers provides some validation of the technique used during the survey – we got good, consistent data over an extended period. Sampling efficiency was high with most observers putting a lot of effort into getting at least 3 or 4 surveys done per month. This tailed off markedly in December but did not significantly change the number of species (although total numbers – Table 1 – were markedly down).



Sampling efficiency was high relative the theoretical maximum of doing 5 samples per site per month. Statistical analyses of daily records were done on a wide range of sites (more than is shown in this report) and shows that sampling needs to be done at least 3 times a month at each site in order to get a consistent result. For most sites sampling efficiency was around 4 samples a month, with a slight downturn in October (travel opportunities following COVID restrictions) and a significant change in December (holiday season and travel).

During the 5 months of the survey 231 species were recorded in all habitats, including the dam sites. This represents about 89% of the total known species on the estate, again giving some validation of the method used in the survey. Several new species were added to the Raptors list. These included species such as African Black Swift and Amethyst Sunbird which are known from the area, but also out of range species such Scaly-throated Honeyguide. There is almost definitely some movement of bird species from higher altitudes down into the lowlands at times and careful long-term monitoring may well pick up these movements and add new species to the list.

One of the key aspects of the survey that will require training in the future, is the recognition of bird calls. Most species have characteristic calls which are easily recognisable with a bit of experience. It is clear from the data that some observers recorded certain species (e.g. Long-billed Crombec) often compared to other observers who were counting in similar habitat close by. Calls also influenced the seasonality of recording certain species which we know are resident. An example of this is Crested Barbet which was absent (or very low numbers) from most sites until December when they shot up to about 75 % frequency – this is the time they start breeding and become markedly territorial.

Abundance & Frequency

One of the most fundamental questions asked in bird surveys is “What are the commonest birds in the survey area?”. The survey was set up in a way that the question could be answered in two ways:

1. What are the commonest species in terms of their numbers on Raptor’s View? This is what is referred to here as abundance – the number of individuals of a species on Raptor’s at any one time. This is calculated: $\text{TOTAL NUMBER OF INDIVIDUALS OF SPECIES A} / \text{TOTAL NUMBER OF INDIVIDUAL BIRDS RECORDED}$ expressed as a percentage. For example, 112 Laughing Doves were recorded out of 4500 birds in October, giving an abundance of about 2.5 %. This was calculated per



month only and averaged (Table 3 below). Daily abundance values varied tremendously, and it was difficult to draw conclusions from these data easily.

2. What species are we most likely to see on Raptor's? This is referred to here as the frequency – the likelihood of seeing a species on Raptor's over a given time period (in our case 30 minutes). Frequency is calculated by: $\text{TOTAL NUMBER OF OBSERVATION PERIODS PER SPECIES} / \text{TOTAL NUMBER OF ALL OBSERVATION PERIODS}$ as a percentage. For example, Species A was recorded during 36 observation periods out of a maximum of 55 for August. This gives a frequency of about 65%.

Frequency was calculated per month and then averaged for the survey period (Table 4 below).

Table 3: Monthly abundance values (given as a percentage) for the 30 most abundant species from the August and September surveys.

	AUG	SEP	OCT	NOV	DEC	AVERAGE
Quelea - Red-billed 2	16.2	59.2	6.9	13.2	6.1	20.3
Waxbill - Blue 3	9.0	3.3	3.6	3.8	2.6	4.5
Dove - Laughing 3	4.1	2.5	2.7	4.8	4.0	3.6
Hornbill - Southern Yellow-billed 3	5.0	2.0	3.8	2.4	3.2	3.3
Sunbird - White-bellied 3	4.0	1.9	4.3	3.0	3.0	3.2
Hornbill - Southern Red-billed 3	6.3	1.7	2.8	2.1	3.1	3.2
Starling - Cape Glossy 3	2.0	1.5	2.8	3.4	4.7	2.9
Bulbul - Dark-capped 3	1.4	1.6	3.5	4.2	3.7	2.9
Vulture - White-backed 2	2.6	1.7	2.6	3.9	2.6	2.7
Guineafowl - Helmeted 3	2.9	2.0	4.7	2.0	1.0	2.5
Dove - Ring-necked 3	3.1	1.2	1.2	3.3	3.0	2.4
Dove - Emerald-spotted 3	3.0	0.8	1.5	3.0	2.8	2.2
Helmet-shrike - White-crested 3	3.6	1.8	2.3	1.4	1.6	2.1
Batis - Chinspot 3	2.0	1.1	3.1	1.8	2.3	2.1
Sparrow - Grey-headed 3	3.9	1.2	0.9	0.9	2.2	1.8
Wood-hoopoe - Green 3	1.5	1.0	2.4	2.3	1.8	1.8
Shrike - Southern White-crowned 2	1.5	0.5	1.8	3.0	1.8	1.7
Drongo - Fork-tailed 3	1.1	0.7	2.0	1.3	1.9	1.4
Puffback - Black-backed 3	0.8	0.2	1.9	2.4	1.3	1.3
Canary - Yellow-fronted 2	2.0	1.3	1.2	1.3	0.4	1.2
Francolin - Crested	0.6	0.5	2.4	0.8	1.8	1.2
Babbler - Arrow-marked 3	1.2	0.3	1.5	1.2	1.8	1.2
Robin - White-browed Scrub 3	1.1	0.6	1.2	1.0	2.0	1.2
Go-away-bird - Grey 3	1.5	0.7	0.8	0.6	2.0	1.1
Firefinch - Red-billed 3	2.5	0.5	0.6	0.2	0.4	0.8
Tit - Southern Black 3	0.7	0.4	1.1	0.5	1.4	0.8
Oxpecker - Red-billed 3	0.8	0.3	0.9	0.8	1.3	0.8
Crombec - Long-billed 3	0.8	0.4	1.3	0.7	0.8	0.8
Mousebird - Red-faced 3	0.6	0.1	0.7	0.8	0.5	0.5
Firefinch - Jameson's 3	1.0	0.2	0.9	0.4	0.2	0.5
Apalis - Yellow-breasted 3	1.0	0.4	0.7	0.2	0.3	0.5
Total	88	92	68	71	66	77



By far the most abundant species was Red-billed Quelea with several thousand having been recorded during the survey period. They accounted for up to 59 % of all birds seen during one month (September) and were the most abundant species in all months. Their numbers skew the data significantly and reworking the data without RBQ may illustrate the importance of other species. However, the totals given at the bottom of the table indicate that these 30 species accounted for a high percentage (66-88 %) of all birds recorded and so are indicative of the real situation on the ground. Around some of the dam sites queleas and weavers (highly social species) occurred at the highest numbers.

The high abundance values for water or food dependent species may indicate that surveys occurred too close to houses. An example of this is Blue Waxbills which were a high abundance, high frequency species in those sites close to dwellings compared to those sites that were surveyed a long way from dwellings (3 sites) where numbers and sightings were significantly lower. The same is true of the two common hornbill species.

Aerial species such as raptors (vultures in particular) were generally of low frequency (not seen that often) but when they were they were seen in largish numbers, probably in thermals. Most of the observations of these species were made during surveys made later in the day (close to 10 00 am). A group of aerial species (swallows/martins and swifts) were under-recorded – this may as a result of observers not looking up that often or the time of day being a major influence. Relatively large numbers of these species can be seen over Raptor's View (particularly following or during wet weather).

Cryptic or difficult to identify species such as larks and cisticolas were very rarely recorded. Rattling Cisticola, which is quite common in suitable habitat, was recorded twice and larks were recorded on a handful of occasions.

Migrant species are not adequately reflected in either the abundance or frequency analyses and do not occur in the tables (derived from most abundant species in August and September). Easily identified species such as Woodland Kingfisher were absent from August to October, with first records coming through in November. By December this species was at 75 % frequency and 2.6 % abundance. European Bee-Eaters showed a typical passage migrant pattern of occurrence with high numbers in October as they arrived quickly passing South and occurring at low numbers during November and December. Further analysis is needed where migrants are dealt with separately (intra-African, Palaearctic) and compared to resident species.

Table 4: Monthly frequency values (as a percentage) of the 30 most abundant species occurring on Raptor's View. The 30 species were selected as the 30 most abundant species during the August and September surveys.

	AUG	SEP	OCT	NOV	DEC	Average
Sunbird - White-bellied 3	100	100	92	100	83	95
Hornbill - Southern Red-billed 3	100	100	100	85	75	92
Bulbul - Dark-capped 3	69	85	100	100	83	87
Starling - Cape Glossy 3	92	77	85	85	92	86
Hornbill - Southern Yellow-billed 3	85	85	92	85	75	84
Batis - Chinspot 3	92	85	92	69	75	83
Dove - Laughing 3	69	92	62	92	83	80
Dove - Emerald-spotted 3	77	69	85	92	67	78
Dove - Ring-necked 3	92	69	62	92	67	77
Waxbill - Blue 3	92	62	69	69	75	73
Go-away-bird - Grey 3	69	85	31	62	75	64
Robin - White-browed Scrub 3	62	62	62	46	83	63
Drongo - Fork-tailed 3	54	69	69	69	50	62
Puffback - Black-backed 3	54	31	77	100	33	59
Quelea - Red-billed 2	69	92	38	54	17	54
Wood-hoopoe - Green 3	54	31	62	62	50	52
Vulture - White-backed 2	46	46	38	69	33	46
Francolin – Crested	39	62	69	38	25	46
Guineafowl - Helmeted 3	39	39	46	54	42	44
Crombec - Long-billed 3	46	39	54	38	42	44
Tit - Southern Black 3	39	54	38	31	50	42
Sparrow - Grey-headed 3	69	39	38	23	42	42
Shrike - Southern White-crowned 2	62	23	31	46	42	41
Helmet-shrike - White-crested 3	54	62	38	23	8	37
Canary - Yellow-fronted 2	46	46	31	15	42	36
Apalis - Yellow-breasted 3	54	46	38	8	17	33
Oxpecker - Red-billed 3	23	31	38	38	33	33
Firefinch - Red-billed 3	69	39	15	15	25	33
Babbler - Arrow-marked 3	39	15	31	38	33	31
Firefinch - Jameson's 3	23	31	15	8	17	19
Mousebird - Red-faced 3	8	8	23	31	17	17

The frequency values given in the table indicate those species that you are most likely to see on Raptor's View regardless of the number of individuals of those species. White-bellied Sunbird was the most frequently recorded species along with Southern Red-billed Hornbill. The sunbird illustrates well the fact that a high frequency species can occur at a relatively low abundance (3.2%). Other species with a relatively high frequency (50 % plus) and low abundances (less than 1 %) include Grey-headed Bush Shrike, Brown-hooded Kingfisher, Black-headed Oriole and Black-collared Barbet.

The ranking of all the species known to occur in Raptor's was given as a 0 – 3 scale in the original master list at the start of the survey. This was done by a group of individuals based on their knowledge of the estate and the birds – a subjective analysis that served its purpose well. From the data gathered during the currently survey the frequency data for all species per month can be analysed, aggregated and then ranked using predetermined boundaries to give a more objective rating. Given the size of the current data set some conclusions can be drawn but it is largely from the dry season so may be skewed. Seasonality will not be adequately reflected.



The future!

The current August to December survey developed as an extension to some birding done during the hard lock down at the start of the COVID pandemic. Observers did a good job of gathering the required data and some interesting results and trends came from the analyses. Developing this further in the future to full blown, long term survey is an open question. Is there sufficient interest? How can it be improved? What needs to come out of it?

If there are enough observers who are keen to take this project on, we need to think carefully about a few things. This would include:

- Observers would need to do a bit of training – and this could be entirely voluntary. Basic identification skills, discussion of habitat preferences and general bird biology/ecology could form part of this. Call recognition is the one area of identification that would profit most observers (based on the analysis of the data!!).
- Everyone would need to understand the data collection process and methodology – and stick to it. The most time consuming aspect of the data analysis was having to transcribe all the data by hand because of comments, punctuation etc. etc. put into the spreadsheets. This does not allow for automated extraction of the data. Putting together a data input format through Google forms or similar might be a way round just getting numbers into the system! Dealing with ‘dirty’ data is very slow!
- If possible it would be very useful to evaluate the principal habitat types on the estate (vegetation composition, structure, land form characteristics, soils etc.) so that the habitat preferences of different bird species can be evaluated. Survey sites would have to be spread out through the estate and observers would need to do more than their home stands in order to get sufficient coverage. This means work! - but its only 30 minutes 3 or more times a month!

Any ideas on whether its worth taking this on and how to approach it would be most welcome – contact the author on pririt59@gmail.com

A very big THANK YOU to everyone for contributing to this survey.