



CALVINIA

URBAN WATER PROVISIONING SYSTEM UPGRADE

BIODIVERSITY REPORT: BIRDS

November 2020

Introduction

The town of Calvinia in the Hantam Karoo needs an upgrade of the current urban water provisioning system, with more boreholes and pipelines added to the system. The Hantam Municipality appointed the consulting civil engineering firm BVi of Upington to undertake the project. Projects of such a dimension requires an Environmental Impact Assessment (EIA). Enviro Africa of Somerset West was appointed to conduct the EIA. One of the statutory requirements for the EIA is a Biodiversity Report. This report is of several parts, one of which deals with the avifauna. Dr Dirk van Driel of WATSAN Africa in Cape Town was appointed to produce the bird-part of the biodiversity report.

Team

A site visit was conducted for the 17 to 19 November 2020 for an Environmental Impact Assessment. This was for the new boreholes and pipelines, an expansion to the Calvinia urban water scheme. The team looking out for birds were the specialist scientist that were appointed for the EIA. These were Dr Dirk van Driel (Fresh Water Specialist, previous Conservation Officer of the Tygerberg Bird Club for a period of 6 years), Bernard de Witt (Director, Enviro Africa), Jan Engelbrecht (Archaeologist) and Peet Botes (Botanist). Team members knowledge of the local birds varied from acutely sharp to a working knowledge.

Observations were made and recorded during the course of field work and not specifically for the purpose of finding birds. The birds that were found have been recorded in Table 2.

The Project

The boreholes and the pipelines are depicted in Figure 1. The area stretched wide, from the Loeriesfontein Road at the north west, Klipwerf Road at the north east and the Ceres Road to the south. The pipelines are to follow the roads, on the road reserve, from the boreholes to the Calvinia water purification works in town.

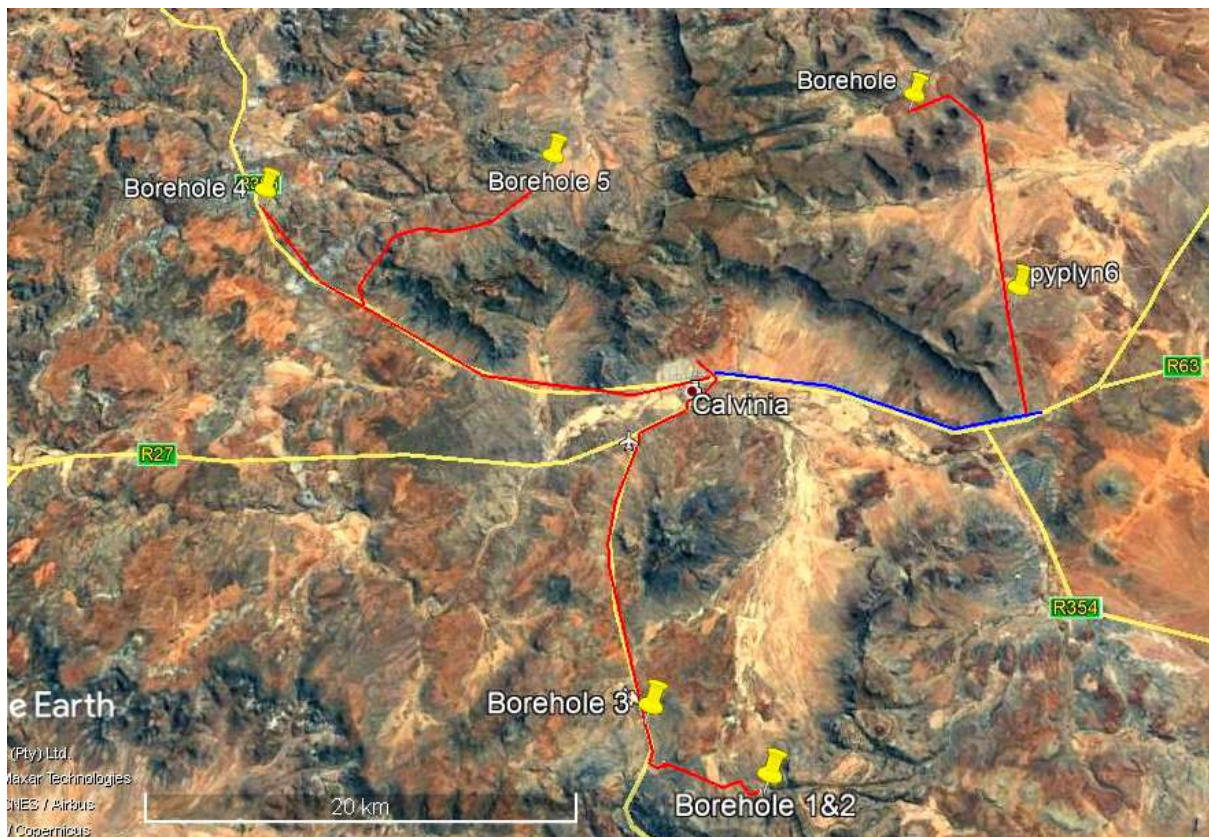


Figure 1 Project

Habitat

The pipelines are mostly on stony flat land of weathered Ecca shale, wide valleys of the open Karoo, with the prominence of the Hantam Mountains to the north and adjacent to the town of Calvinia. These stones are mostly of broken-up slate. The vegetation of these expanses of level ground is mostly low, drought-resistant shrub.

The birds of these parts are adapted to the harsh karroid environment.

The land is interspersed by numerous, mostly dry drainage lines. These drainage lines only carry water during and shortly after large rainfall events, which are few and far between in these semi-arid regions. The drainage lines are tributaries of the Oorlogkloof River. The drainage lines to west are tributaries of the Sak River. These rivers only flow for a short while when it rains. Some of the drainage lines have higher vegetation, maintained by shallow ground water. Trees are only present along the upper reaches of the drainage lines, against the slopes of the mountains. This vegetation is most important, as it adds to habitat variability of an otherwise featureless and level landscape. Moreover, it offers habitat to birds.

There are a few small *Phragmitis* reeds beds along some of the more prominent drainage lines.

The habitat includes the town of Calvinia, as the pipelines end at the water purification works.

For more information of the habitat, this account should be read along with the Fresh Water Report and the Botanical Report.

Methodology

Individual team members travelled along the sites of the new pipelines to do a variety of work, as was required for the EIA. They observed and recorded the birds that they encountered along the way. The birds that were spotted are listed in Table 1.

A list of birds was sourced from data on the SABAP2 webpage for the pentad 3125-1945. This is the pentad in which Calvinia is located. Pentads to the east, west and south were included as well. The list pentad of Calvinia included all of the birds and more that were listed for the other three pentads.

Table 1 Rating

Rating	Description
0	Absent. There is no possibility that the species of bird occurs on the site.
1	Slight possibility. Bird species may fly over the site.
2	Reasonable possibility. These are seasonal, migratory species and naturally scarce birds or difficult to spot.
3	High possibility. Species are almost always present.

The chances of finding any listed bird species at the boreholes and along the proposed pipelines are rated in Table 1. The rating is according to the experience of the specialist scientist, as aided by the information of the SABAP 2 species list.

Water birds received a 0 rating, as there was no standing water in any of the drainage lines during the site visit.

Possible impacts

Boreholes and Pipelines

The construction of the pipeline will cause some disturbance to the avifauna, with men at work and with trench-digging machinery. Once the pipe is underground, this disturbance will be over and done with and will cause no further disturbance.

The operation of the pipeline will cause no disturbance at all.

Should the pipe fail, with leakages, the pipe will have to be uncovered and repaired, with local disturbances. It is foreseen that very little maintenance will be required over the expected financially viable life time of the pipeline, that is over at least the next 15 years.

The boreholes have already been sunk. No further disturbance is foreseen.

Boreholes and pipelines are all low-impact and deleterious effects on avifauna is not foreseen.

Power Lines

The submersible pumps in the boreholes require electricity, for which supply lines will have to be constructed.

Of particular concern is Ludwig's bustard, which is IUCN listed as "Endangered" and as the South African bird most likely of all to collide with power lines.

However, the power supply to the boreholes hardly resemble anything like high voltage power lines. The upright poles will be 11 metres long, 2 metres of which will be dug into the ground, thus only 9 metres will project above ground level.

The flyways are not known at this stage, but if collisions occur more often in certain stretches of the lines, these can be marked. There are a number of designs available for rendering lines more visible to flying birds.

Nevertheless, this raises a red flag, along with the question if it would be a viable option to rather have an underground power supply.

The two species of crow extensively use telephone poles as nesting sites. Rock kestrels take over disused crow nests. It is expected that the same will happen with the electrical supply line poles. These poles must be of such a design that birds are

discouraged to use it as nesting sites. In particular, the power lines must be positioned apart far enough so that birds cannot electrocute themselves.

Conclusions

The impacts of the envisaged additions to the Calvinia urban water supply system are very low. On account of this finding, the project should be approved.

However, there is one provision with regard to the endangered Ludwig's bustard, which is prone to colliding with power lines, often with fatal results. If affordable at all, power lines should be underground.

Reference

Shaw, J.M.; Reid, T. A.; Schutgens, M.; Jenkins, A.R.; Ryan, G.R. 2018. *High power line collision mortality of threatened bustards at a regional scale in the Karoo, South Africa*. Ibis. 160 (2): 431–446.



Ludwig's bustard

Bird Species List

	Common name	Genus	Species	Observed	Rating
1	Barbet	Acacia Pied	<i>Tricholaema leucomelas</i>	X	2
2	Bee-eater	European	<i>Merops apiaster</i>	X	2
3	Bishop	Southern Red	<i>Euplectes orix</i>	X	3
4	Bokmakierie	Bokmakierie	<i>Telophorus zeylonus</i>	X	3
5	Bulbul	African Red-eyed	<i>Pycnonotus nigricans</i>		1
6	Bulbul	Cape	<i>Pycnonotus capensis</i>		1
7	Bunting	Cape	<i>Emberiza capensis</i>		1
8	Bunting	Lark-like	<i>Emberiza impetuani</i>	X	1
9	Bustard	Ludwig's	<i>Neotis ludwigii</i>	X	1
10	Buzzard	Steppe	<i>Buteo vulpinus</i>		1
11	Canary	Black-headed	<i>Serinus alario</i>		1
12	Canary	Cape	<i>Serinus canicollis</i>		1
13	Canary	White-throated	<i>Crithagra albogularis</i>	X	3
14	Canary	Yellow	<i>Crithagra flaviventris</i>	X	3
15	Chat	Anteating	<i>Myrmecocichla formicivora</i>	X	3
16	Chat	Familiar	<i>Cercomela familiaris</i>	X	3
17	Chat	Karoo	<i>Cercomela schlegelii</i>	X	3
18	Chat	Sickle-winged	<i>Cercomela sinuata</i>		3
19	Cisticola	Grey-backed	<i>Cisticola subruficapilla</i>	X	3
20	Cisticola	Levaillant's	<i>Cisticola tinniens</i>		2
21	Coot	Red-knobbed	<i>Fulica cristata</i>	X	0
22	Cormorant	Reed	<i>Phalacrocorax africanus</i>		0
23	Cormorant	White-breasted	<i>Phalacrocorax carbo</i>		0
24	Crombec	Long-billed	<i>Sylvietta rufescens</i>		1
25	Crow	Cape	<i>Corvus capensis</i>	X	3
26	Crow	Pied	<i>Corvus albus</i>	X	3
27	Dove	Laughing	<i>Streptopelia senegalensis</i>	X	3
28	Dove	Namaqua	<i>Oena capensis</i>	X	3
29	Dove	Red-eyed	<i>Streptopelia semitorquata</i>		2
30	Dove	Rock	<i>Columba livia</i>	X	3
31	Duck	Maccoa	<i>Oxyura maccoa</i>		0
32	Duck	Yellow-billed	<i>Anas undulata</i>		0
33	Eagle	Booted	<i>Aquila pennatus</i>		1
34	Eagle	Martial	<i>Polemaetus bellicosus</i>		1
35	Eagle	Verreaux's	<i>Aquila verreauxii</i>	X	2
36	Eagle-owl	Spotted	<i>Bubo africanus</i>		2
37	Egret	Cattle	<i>Bubulcus ibis</i>		2
38	Eremomela	Karoo	<i>Eremomela gregalis</i>		2
39	Eremomela	Yellow-bellied	<i>Eremomela icteropygialis</i>		2
40	Fiscal	Common (Southern)	<i>Lanius collaris</i>	X	3
41	Fish-eagle	African	<i>Haliaeetus vocifer</i>		0
42	Flamingo	Greater	<i>Phoenicopterus ruber</i>		0
43	Flycatcher	Chat	<i>Bradornis infuscatus</i>		2

44	Flycatcher	Fairy	<i>Stenostira</i>	<i>scita</i>		2
45	Fringin	Grey-winged	<i>Scleroptila</i>	<i>africanus</i>		1
46	Goose	Egyptian	<i>Alopochen</i>	<i>aegyptiacus</i>		0
47	Goshawk	African	<i>Accipiter</i>	<i>tachiro</i>		1
48	Goshawk	Southern Pale Chanting	<i>Melierax</i>	<i>canorus</i>	X	3
49	Grebe	Black-necked	<i>Podiceps</i>	<i>nigricollis</i>		0
50	Grebe	Little	<i>Tachybaptus</i>	<i>ruficollis</i>		0
51	Greenshank	Common	<i>Tringa</i>	<i>nebularia</i>		0
52	Guineafowl	Helmeted	<i>Numida</i>	<i>meleagris</i>		2
53	Harrier-Hawk	African	<i>Polyboroides</i>	<i>typus</i>		0
54	Heron	Black-headed	<i>Ardea</i>	<i>melanocephala</i>		1
55	Heron	Grey	<i>Ardea</i>	<i>cinerea</i>		1
56	Hoopoe	African	<i>Upupa</i>	<i>africana</i>	X	3
57	Ibis	African Sacred	<i>Threskiornis</i>	<i>aethiopicus</i>		2
58	Ibis	Hadedda	<i>Bostrychia</i>	<i>hagedash</i>	X	3
59	Kestrel	Greater	<i>Falco</i>	<i>rupicoloides</i>		1
60	Kestrel	Rock	<i>Falco</i>	<i>rupicolus</i>	X	3
61	Kite	Black-shouldered	<i>Elanus</i>	<i>caeruleus</i>		2
62	Kite	Yellow-billed	<i>Milvus</i>	<i>aegyptius</i>		2
63	Korhaan	Karoo	<i>Eupodotis</i>	<i>vigorsii</i>	X	3
64	Lapwing	Blacksmith	<i>Vanellus</i>	<i>armatus</i>		2
65	Lapwing	Crowned	<i>Vanellus</i>	<i>coronatus</i>		2
66	Lark	Cape Clapper	<i>Mirafr</i>	<i>apiata</i>	X	3
67	Lark	Karoo	<i>Calendulauda</i>	<i>albescens</i>	X	3
68	Lark	Karoo Long-billed	<i>Certhilauda</i>	<i>subcoronata</i>		2
69	Lark	Large-billed	<i>Galerida</i>	<i>magnirostris</i>	X	3
70	Lark	Red-capped	<i>Calandrella</i>	<i>cinerea</i>		2
71	Lark	Spike-heeled	<i>Chersomanes</i>	<i>albofasciata</i>	X	3
72	Martin	Brown-throated	<i>Riparia</i>	<i>paludicola</i>		1
73	Martin	Rock	<i>Hirundo</i>	<i>fuligula</i>	X	3
74	Masked-weaver	Southern	<i>Ploceus</i>	<i>velatus</i>	X	3
75	Mousebird	Red-faced	<i>Urocolius</i>	<i>indicus</i>		1
76	Mousebird	White-backed	<i>Colius</i>	<i>colius</i>	X	3
77	Ostrich	Common	<i>Struthio</i>	<i>camelus</i>	X	3
78	Palm-swift	African	<i>Cypsiurus</i>	<i>parvus</i>		1
79	Pigeon	Speckled	<i>Columba</i>	<i>guinea</i>	X	X
80	Pipit	Nicholson's	<i>Anthus</i>	<i>nicholsoni</i>		0
81	Plover	Three-banded	<i>Charadrius</i>	<i>tricoloris</i>		1
82	Pochard	Southern	<i>Netta</i>	<i>erythrophthalma</i>		0
83	Prinia	Karoo	<i>Prinia</i>	<i>maculosa</i>	X	0
84	Raven	White-necked	<i>Corvus</i>	<i>albicollis</i>	X	3
85	Reed-warbler	African	<i>Acrocephalus</i>	<i>baeticatus</i>	X	2

86	Robin-chat	Cape	<i>Cossypha</i>	<i>caffra</i>		3
87	Sandgrouse	Namaqua	<i>Pterocles</i>	<i>namaqua</i>	X	3
88	Scrub-robin	Karoo	<i>Cercotrichas</i>	<i>coryphoeus</i>		3
89	Shelduck	South African	<i>Tadorna</i>	<i>cana</i>		0
90	Sparrow	Cape	<i>Passer</i>	<i>melanurus</i>	X	3
91	Sparrow	House	<i>Passer</i>	<i>domesticus</i>	X	3
92	Sparrowlark	Grey-backed	<i>Eremopterix</i>	<i>verticalis</i>	X	2
93	Spoonbill	African	<i>Platalea</i>	<i>alba</i>		0
94	Spurfowl	Cape	<i>Pternistis</i>	<i>capensis</i>		2
95	Starling	Cape Glossy	<i>Lamprotornis</i>	<i>nitens</i>		2
96	Starling	Common	<i>Sturnus</i>	<i>vulgaris</i>	X	3
97	Starling	Pale-winged	<i>Onychognathus</i>	<i>nabouroup</i>		2
98	Starling	Pied	<i>Spreo</i>	<i>bicolor</i>	X	2
99	Stilt	Black-winged	<i>Himantopus</i>	<i>himantopus</i>		0
100	Stonechat	African	<i>Saxicola</i>	<i>torquatus</i>		2
101	Sunbird	Dusky	<i>Cinnyris</i>	<i>fuscus</i>		2
102	Sunbird	Malachite	<i>Nectarinia</i>	<i>famosa</i>		2
103	Sunbird	Southern Double-collared	<i>Cinnyris</i>	<i>chalybeus</i>		2
104	Swallow	Barn	<i>Hirundo</i>	<i>rustica</i>		2
105	Swallow	Greater Striped	<i>Hirundo</i>	<i>cucullata</i>	X	3
106	Swallow	Pearl-breasted	<i>Hirundo</i>	<i>dimidiata</i>		1
107	Swallow	White-throated	<i>Hirundo</i>	<i>albigularis</i>		1
108	Swamp-warbler	Lesser	<i>Acrocephalus</i>	<i>gracilirostris</i>	X	1
109	Swift	Alpine	<i>Tachymarptis</i>	<i>melba</i>		1
110	Swift	Common	<i>Apus</i>	<i>apus</i>		1
111	Swift	Little	<i>Apus</i>	<i>affinis</i>	X	3
112	Swift	White-rumped	<i>Apus</i>	<i>caffer</i>		3
113	Teal	Red-billed	<i>Anas</i>	<i>erythrorhyncha</i>		0
114	Thick-knee	Spotted	<i>Burhinus</i>	<i>capensis</i>		2
115	Thrush	Karoo	<i>Turdus</i>	<i>smithi</i>	X	3
116	Tit	Grey	<i>Parus</i>	<i>afer</i>		2
117	Tit-babbler	Chestnut-vented	<i>Parisoma</i>	<i>subcaeruleum</i>		2
118	Tit-babbler	Layard's	<i>Parisoma</i>	<i>layardi</i>		2
119	Turtle-dove	Cape	<i>Streptopelia</i>	<i>capicola</i>		3
120	Wagtail	Cape	<i>Motacilla</i>	<i>capensis</i>	X	3
121	Warbler	Namaqua	<i>Phragmacia</i>	<i>substriata</i>		2
122	Warbler	Rufous-eared	<i>Malcorus</i>	<i>pectoralis</i>		2
123	Waxbill	Common	<i>Estrilda</i>	<i>astrild</i>	X	2
124	Weaver	Cape	<i>Ploceus</i>	<i>capensis</i>		2
125	Wheatear	Mountain	<i>Oenanthe</i>	<i>monticola</i>		2
126	White-eye	Cape	<i>Zosterops</i>	<i>virens</i>		1
127	White-eye	Orange River	<i>Zosterops</i>	<i>pallidus</i>		1