

# **ADVANCED NDOWANA PROSPECTING APPLICATION: BIRD SPECIALIST STUDY**

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## **Terms of Reference for Bird Specialist Study at the Ndownana Advanced Prospecting Study Area as part of the Basic Assessment.**

1.1. A desktop study of the birds thought or known to occur in the area. An indication of which of these are endangered or threatened e.g. Red Data species and the specific categories, any special significance of any species.

1.2. Visit to both the upper and lower areas of the site to observe the specific habitats offered and an indication of the actual species seen or expected to occur on site owing to species observed, known records, habitat or feeding opportunities etc.

1.3 Describe the potential impact of the prospecting activities as described in the background information document, and then also in the revised table with

specific anticipated details of the prospecting activities, on the bird species specific to the study area and biodiversity regarding birds.

1.4. Supply records from the past five years showing how many birding groups or individuals have been taken out by Limpopo Birding in this area (on the Paeroa, Colberg and Paardevlei Portion 1) or the adjoining properties such as Doornhoek and Eastbrooke. Indicate if there are any other birding groups which operate in the area? Which areas are most commonly used by birding groups?

1.5. Give an indication of any mitigatory measures / recommendations that would alleviate the potential impact of the proposed prospecting activities on birds and biodiversity regarding birds.

1.6. Impact of birding on the area – positive and negative.

1.7. A breakdown of the quote.

## 2. Methodology

Include reference to assessment methodology, a description of assumptions and any gaps in knowledge.

## 3. Description of the Receiving Environment.

Summary of findings from field visit and include statement regarding biodiversity and conservation value of areas visited; socio-economic value; all other relevant observations or information which provide context to the assessment.

## 4. Impact Assessment.

Impact and potential impact of the proposed prospecting programme on bird species within the revised prospecting site and to a lesser extent the broader picture as per terms of reference given. Consider alternatives and include the no-go option i.e. of prospecting not going ahead.

A guide on providing an assessment of the significance of the impacts of the various activities on (specialist study field) is provided on a separate table (Table 1). Mitigation in place is also indicated on this table.

## 5. Recommendations

Please provide additional detail that will feed into the environmental management plan (EM Plan) and monitoring programme. Here we require additional detail in tabular form on Table 2 below.

## **Acknowledgements**

I gratefully acknowledge the support in preparing this report by Ben De Boer of Birdlife South Africa and Limpopo Birding.

## **Executive Summary**

A bird specialist study was demanded by several participants at the public hearing for the application for the Ndownana prospecting permit held in May, 2008.

The number of conservation important bird species recorded in the immediate vicinity of the proposed mine prospecting site is high. The bird fauna of the study area and surroundings provide a habitat for 7 Nationally threatened species, 1 Globally Near Threatened species and 8 Nationally Near Threatened species. In addition there are 15 species that are classified as having Restricted or Biome-Restricted ranges (Barnes & Tarboton, 1998). As a result of the bird richness in the Wolkberg area, the site has been registered as an Important Bird Area (SA 005) Wolkberg Forest Belt, having international recognition (Barnes). In contrast to the wide diversity of conservation important bird species in the district, the proposed prospecting site has relatively limited bird diversity. There are 8 bird species of high conservation importance that have been recorded in the immediate vicinity of the prospecting area and which could be recorded on the prospecting area. The grassland habitats are the most significant habitat for birds in the area. These grasslands are known to support 4 Nationally Threatened species including the Blue Swallow *Hirundo atrocaerulea* (critical), Striped Flufftail (vulnerable) and the Grass Owl *Tyto capensis* (vulnerable) and Broad-tailed Warbler (near threatened). Only one of these species, the Grass Owl, was almost certainly confirmed present.

To date, no Blue Swallow nest sites have been documented on the designated prospecting site. Over the past 4 years breeding has not occurred in the adjacent grasslands on Colberg but Blue Swallows have utilized these habitats for foraging on their north and south migrations. These grasslands are therefore still considered to be extremely important for conservation.

Other habitats including the scarp scrub, upland Protea communities and the mist belt forest, occur on the designated prospecting site. These are of lesser conservation importance to birds than the grasslands since they are not so restricted and occur along the length of the escarpment. A small population of South African endemic Gurney's Sugarbirds *Promerops gurneyi* are present in the stands of Silver Protea, *Protea roupelliae* and *P. rubroliposa*. Even though it is probable that this species breeds on the site, it is unlikely that there would be a significant impact on this species by prospecting including the prospecting infrastructure.

Almost half the natural vegetation along the lower eastern slopes of the site selected for prospecting has been transformed by commercial afforestation. The proposed prospecting on these transformed areas is of little significance to bird conservation.

Recommendations are made to closely monitor the presence of conservation bird species potentially impacted during the course of the prospecting and to investigate the development of selected prospecting pits as potential Blue swallow nesting sites on Colberg.

It is considered that the specific prospecting proposed for this stage of mine operations will be of little negative significance impact on bird populations in the area concerned.

## **1. Introduction .**

A bird specialist study was demanded by several participants at the public hearing for the application for a prospecting permit held in May, 2008. The current report was prepared largely in response to the above demands. A 3 day site visit to the prospecting site was undertaken in mid October. The timing of the inspection was planned to coincide with the expected presence of migratory species including Blue Swallows and is also a period of the year when many species are breeding and vocal which would facilitate identification.

The motivations for the need for a bird specialist study included preserving the montane grasslands as a habitat for the critically endangered Blue Swallow.

A summary and responses to specific bird related stakeholder queries is included as Appendix 1

A comprehensive report on the avifauna of the larger prospecting area was prepared for the Environmental Management Plan that was prepared in February 2005. The above plan proposes a number of mitigatory measures including Operating Procedures for the different forms of prospecting proposed and procedures applicable to the Ndowana drilling sites. These are included as Appendices 8, 10, 13 and 14 in the above EMP. These procedures and mitigatory measures are fully endorsed. This report focuses specifically on the bird species of conservation importance in the redefined proposed prospecting area.

## **2. Methodology.**

Qualitative data were collected by traversing the various habitats identified by P. Winter until no further bird species were recorded. The time spent in each habitat depended on the size and complexity of the specific habitat.

Sound recordings of Broad Tailed Warbler *Schoenicola brevirostris* and Striped Flufftail *Sarothura affinis* calls were played in appropriate habitats.

Two assumptions were made. Firstly by spending time in each habitat type, documenting each species, until no further bird species were observed, that all species present would be recorded.

Secondly, by undertaking the sampling in mid October all the migrant species would have returned or be in passage through the area.

## **3. Description of the Receiving Environment**

The proposed prospecting site is located on the east facing slope of the Drakensberg Escarpment to the west of Tzaneen at an altitude of between 1600 and 1960msl. The escarpment is incised by Letaba and Olifant's River tributaries. The habitat is dominated by a steep rocky scarp face below which are grasslands and exotic plantations. The drainage lines are wooded while the plateau on the summit is dominated by Proteaceous woodland on quartzites. Each of these vegetation assemblages has its specific suite of bird species.

The number of conservation important bird species recorded in the immediate vicinity of the proposed mine prospecting site is high. The bird fauna of the study area and surroundings provide a habitat for 7 Nationally threatened species, 1 Globally Near Threatened species and 8 Nationally Near Threatened species. In addition there are 15 species that are classified as having Restricted or Biome-Restricted ranges (Barnes & Tarboton, 1998). As a result of the bird richness in the Wolkberg area, the site has been registered as an Important Bird Area (SA 005) Wolkberg Forest Belt, having international recognition (Barnes). In contrast to the wide diversity of conservation important bird species in the district, the proposed prospecting site has a relatively limited bird diversity. In this regard refer to Appendix 3.1. This list is not definitive but does put the prospecting site in perspective to the adjacent habitats with regard to bird diversity and birds of conservation significance. There are 8 bird species of high conservation importance that have been recorded in the immediate vicinity of the prospecting area and which could be recorded on the prospecting area. The grassland habitats are the most significant habitat for birds in the area. These grasslands are known to support 4 Nationally Threatened species including the Blue Swallow *Hirundo atrocaerulea* (critical), Striped Flufftail (vulnerable) and the Grass Owl *Tyto capensis* (vulnerable) and Broad-tailed Warbler (near threatened). Only one of these species, the Grass Owl, was almost certainly confirmed present. The presence of Grass Owls was reported by De Boer (Pers. Com.) and regurgitated owl pellets were found on the road at 7343700/797400 which resembled Grass Owl pellets.

Undoubtedly the flagship species for the grasslands in the district is the critically endangered Blue Swallow. The first evidence of Blue Swallows occurring in the Woodbush area are four specimens collected here in November by C.H.B. Grant in 1905 and a further specimen in December 1907 by J. Vaugh-Kirby (Sclater 1911: 431-432 in Tarboton, 1987). Tarboton further mentions that "the patches of grasslands on Iron Crown and Allandale 1108 L.S. were surveyed by the North eastern Bird Club in February, 1987 without success. These areas were judged to be too rocky for the birds".

An intensive study of the Serala Wilderness area of 22,000ha revealed an area of 513ha which was deemed suitable for Blue Swallows. The presence of 2 old nest rims in two holes indicated the historic presence of this species here. Tarboton, 1987. He suggests that birds migrate through the area and possibly stop over to breed in suitable years.

Recently (4 years ago) 2 breeding pairs of Blue Swallows were recorded on the grasslands of Colberg, 1169L.S. De Boer, B and Evans, S. (Pers Com).the grasslands on Colberg 1169 L.S. To date, no Blue Swallow nest sites have been documented on the designated prospecting site. Over the past 4 years breeding has not occurred in the adjacent grasslands on Colberg but Blue Swallows have utilized these habitats for foraging on their north and south migrations. These grasslands are therefore still considered to be extremely important for conservation. (See Wakelin's responses under Appendix1).

Kemper et al. (1992), found a direct correlation between “clouds” of plant species in the grassland communities of Graskop with foraging and breeding of Blue Swallows. Areas that had similar plant compositions however did not all support Blue Swallows and this was attributed to management practices. No detailed surveys of the plant communities have been undertaken on these grasslands to compare the assemblages of species to other known habitats.

Only one quantitative study has been undertaken on the diet of Blue Swallow, (Hawkes, 2000). 127 Faecal samples from Kaapsehoop revealed that these swallows feed on Hemiptera, Diptera, Coleoptera, and Hymenoptera. Of the latter Family, Formicidae (ants) formed over 61% of recognizable items.

The populations of Blue Swallow have been declining steadily in South Africa. This trend was noted by James Wakelin 2008 (refer to Appendix: 1) who predicts their extinction with the next half decade.

Other habitats including the scarp scrub, upland Protea communities and the mist belt forest, occur on the designated prospecting site. These are of lesser conservation importance to birds than the grasslands since they are not so restricted and occur along the length of the escarpment. The Scarp including the krantz's support a pair of Black Storks which are Nationally Threatened, together with endemic Jackal Buzzards. Although seen soaring over the prospecting site with Cape Vultures *Gyps coprotheres* (Vulnerable), no nests were located on the site. A small population of South African endemic Gurney's Sugarbirds *Promerops gurneyi* are present in the stands of Silver Protea, *Protea roupelliae* and *P. rubroliposa*. As Gurney's Sugarbirds breed from November to February no breeding was recorded. Even though it is probable that this species breeds on the site, it is unlikely that there would be a significant impact on this species by prospecting including the prospecting infrastructure.

Almost half the natural vegetation along the lower eastern slopes of the site selected for prospecting has been transformed by commercial afforestation. The proposed prospecting on these transformed areas is of little significance to bird conservation (Allan et. al,1997).

Most of the range restricted bird species recorded by Barnes and Tarboton in (Barnes, 1998) are associated with the forest biome and include Cape parrot *Poicephalus robustus robustus*, Forest Buzzard *Buteo trizonatus*, Knysna Lourie *Turaco corythaix*, Grey Cuckoo Shrike *Coracina caesia*, Bush Blackcap *Lioptilus nigricapillus*, Black fronted Bushshrike *Thelophorus nigrifrons* Orange Thrush *Zoothera gurneyi*, Chorister Robin *Cossypha dichroa*, White-Starred Robin *Pogonocichla stellata*, Brown Robin *Erythropygia signata* and Barratt's Warbler *Bradypterus barratti*. These species were not recorded in the patches of forest present on the study site during the site visit in October. These species occur along the escarpment in suitable habitat. It is considered that the specific

prospecting on the site and will be of little to no local significance to their overall populations.

On enquiry to members of the community involved in guiding birding tours, it became apparent that no organized birding groups have visited Paeroa 1083 LS, Colberg 1169LS and Paardevlei 201KS over the past four years (De Boer, Pers Com) . Most bird tours take place in the local indigenous forests such as Black Mountain Forest and Woodbush.

Birding tours in the Haenertsburg District are offered by Ben de Boer (ben@limpopobirding.co.za), Black Forest Mountain Lodge (www.birdingroutes.co.za) , by Cheerio Valley (www.birdingroutes.co.za), and accommodation for birders is available also at Cair Paravel Lakeside Cottages, Owl Cottage (ww.owlcottage.co.za), Kurisa Moya Nature Lodge ([www.krm.co.za](http://www.krm.co.za)) and Magoebaskloof Hotel ([www.magoebaskloof.co.za](http://www.magoebaskloof.co.za)).

No alternative activities to prospecting apart from the “no go” option were considered since this is primarily a water catchment area being managed for biodiversity conservation. If prospecting did not take place the status quo would remain.

It is considered that birders will have very little impact on the birds of the designated prospecting site. The impact of numbers of birders on the sensitive grasslands on Colberg could be far more negative should the Blue Swallows return to breed and other rare species such as the Black-rumped Button Quail *Turnix nanus* , Striped Flufftail *Sarothura affinis* and Broad- tailed Warbler be regularly recorded which is not presently the case.

#### **4. Prospecting Project Description**

Ndowana Exploration Two (Pty) Ltd, a joint venture between Mvelaphanda Resources (Pty) Ltd. and De Beers Consolidated Mines Limited has been carrying out prospecting in the Haenertsburg area based on an authorisation (a Prospecting Right and an Environmental Management Plan, EMPLan) issued by the Department: Minerals and Energy (DME) in terms of the Mineral and Petroleum Resources Development Act and related regulations on 25 January 2007. This work is ongoing.

Prospecting follows a phased approach and is driven by the results of each preceding phase. The initial prospecting results indicated that it was necessary to go into the next phase on a much smaller area. This 57ha area includes parts of the farms Paeroa 1083 LS, Paardevlei 201 KS (portion 1) and Colberg 1169 LS. Locality maps are indicated in the Basic Assessment Report.

One of the conditions of the original EMPLan was that if further prospecting activities were necessary in the areas identified as “sensitive areas” then a more detailed environmental assessment (Basic Assessment) would be carried out for

these areas. The current assessment being conducted is in line with this commitment. Where the manual pitting or narrow diameter drilling are necessary in areas not identified as “sensitive areas”, they will proceed. The majority of stakeholders are familiar with the EIA regulations, promulgated in terms of Section 5(54) of the National Environmental Management (NEMA) Act No. 107 of 1998 and it therefore seemed best practice to use this process, whilst still meeting the requirements of DME. (There is currently a Memorandum of Agreement between DME and the Department of Environmental Affairs and Tourism (DEAT) on this issue.) In terms of the “Listed Activities” in the regulations, a Basic Assessment EIA is necessary for the activities envisaged and the Limpopo Department of Economic Development, Environment and Tourism have been consulted in this regard (Ref. 12/1/9/N-C224).

This second phase of prospecting aims firstly to define the extent of the kimberlite(s) and then establish whether the size and grade warrant going on to the final phase of prospecting. If the size and grade specifications are not met, the prospecting project will probably stop at this point. If they do meet requirements, the final phase, which is bulk sampling, will commence following a scoping and full EIA ( **Update:** the current NEMA regs out for comment specify that all prospecting operations will require a Basic Assessment, and Mining will necessitate a Scoping and full EIA. These are not yet finalized. ) and only then, if the deposit(s) warrants mining, there will be an EIA conducted to convert the prospecting right to a mining right. Both these steps will involve the required public participation. The proposed prospecting outlined here will offer limited part-time employment to a small number of persons living nearby.

The three properties fall within the Lepelle-Nkumpi Local Municipality but as access is via Haenertsburg which falls in the Greater Tzaneen Local Municipality, both local municipalities have been involved in the process and have had the opportunity to raise any concerns.

The study area straddles the contact between the granite-gneiss and older rocks on the northern lower part of the site and the quartzite and shale dominated rocks of the southern higher lying upper part of the site. The escarpment is incised by Letaba and Olifant’s River tributaries. The vegetation, reflective of the geology and soils, consists of the Northern escarpment quartzite sourveld (Gm 23) and Woodbush granite grassland (Gm 25) by Musina *et al* (2006). The habitat, which lies between 1600 and 1960m is dominated by a steep rocky scarp face below which are moist grasslands and exotic plantations. The drainage lines are wooded while the plateau on the summit is dominated by Proteaceous woodland and moist grassland on quartzites.

The proposed prospecting activities include shallow manual pitting (90 pits – 45 on each of the sites – 1m x1m up to 2m deep, 1m of disturbance allowed around the edge so footprint for each given as 9m<sup>2</sup>), the drilling of 20 narrow diameter drill holes by a modular, man-portable drill rig and mini bulk sampling done in one

of two ways, or a combination of each, namely 12 large diameter boreholes and 4 mechanised pits (6 drill holes and 2 pits on each site). A footpath of 600m is envisaged on the upper site, and an overall extension of the existing tracks by about 1km to facilitate access to sites. The details of the total footprints for each activity, the use of vehicles, use of water and approximate time frames are given in a table in the Basic Assessment Report. It is estimated that the total time for this phase of prospecting, including the times of inactivity when results are awaited from the laboratory, will be two years. The prospecting will provide 12 – 20 persons from the area with short term contract work. Workers will be transported out to the site each day and will not overnight on site. The access routes to be used are indicated on the infrastructure maps in the Basic Assessment Report.

Waste generated will include a limited number of empty fuel drums, oil and grease cans, general waste from lunch food, possibly wire, cables, collected hydrocarbon contaminated soil, some recycled water and silt from the drilling. The silt from drilling will have the hydrocarbon skimmed off for disposal as hazardous waste and then be used in the bentonite for grouting the drill holes. The contractor will provide portable toilets, using an environmentally friendly reagent which will be emptied regularly and disposed of at a water treatment works. Waste management will be according to the De Beers Waste Management procedure which is part of their ISO14001 certified environmental management system. The methods of rehabilitation will be specified in the amended EMPlan. The water used in the drilling programmes will not be obtained from site, unless this arrangement is made with the landowner, but will be sourced from a registered water provider. The total quantity of water required is in the region of 920m<sup>3</sup>.

**Table 1. Rating of significance of Prospecting Activities on Birds and Birdlife Biodiversity on the Study Area.**

Duration / Sensitivity	5 = Permanent (irreplacable or irreversible), 4 = Long term, 3 = Medium term, 2 = Short term or intermittent, 1 = negligible
Extent	5 = impact extends significantly beyond the area of activity, 3 = impacts extends beyond the area of activity, 1 = impact only at area of activity
Probability	10 = definite (where the impact will occur regardless of any prevention measure), 7 = highly probable (where it is most likely that the impact will occur), 5 = probable (where there is a distinct possibility that the impact will occur), 1 = improbable

Discretion may be used to assign values between these ones defined above.

Any aspect rated at 64% and above is considered to be significant

ACTIVITY of concern	ASPECT of the activity which interacts with the environment	IMPACT	SEVERITY = Duration + Extent		SEVERITY	PROBABILITY	SIGNIFICANCE = Severity x Probability	MITIGATION List Mitigation in Place at the Time of Rating or Proposed Mitigation for second rating
			Duration / Sensitivity	Extent				
Mini bulk sampling at 7343600/747403	Physical disturbance of site	Impact on Grass Owl habitat	1	1	2	5	10	Field workers to be trained to ID GrassOwls. Should a nest be located this should be avoided until breeding is complete
Shallow manual pitting on Transitional Grasslands	Physical disturbance of site	Possible Impact on Blue Swallow foraging habitat	1	1	2	1	2	Prospecting pits to be rehabilitated. Selected pits in suitable habitat could be engineered to provide possible new nesting sites for Blue Swallows
Shallow manual pitting on Transitional Grasslands	Physical disturbance of site	Possible Impact on Striped Flufftail habitat	1	1	2	1	2	Prospecting pits to be rehabilitated

**Table 2: Suggested Mitigation and Monitoring**

MITIGATION : Physical disturbance of the site through manual pitting.					
Mitigation (Description)	Actions/Methods	Timing	Suggested / Recommended Responsibility	Legal Requirements	Costs
Engineer selected prospecting pits to simulate sinkholes and solution cavities on lower altitude grassland areas	Identify specific prospecting pits which may be suitable to be modified to act a potential Blue Swallow nesting sites	- Any time	Sites to be identified by Blue Swallow specialist/s together with local SA Birdlife representative	EIA's must identify possible positive impacts. The development and occupation of new nest sites by Blue Swallows would be a very positive conservation action	The additional costs would be insignificant. A standard barbed wire fence located approximately 3m around the hole to prevent accidental livestock accidents.
MONITORING:					
Indicator		Frequency	Responsibility	Costs	
- Utilization of pits for breeding by Blue Swallows		At least one visit per breeding season.	Birdlife SA representative	Approximately R100.00 per visit	

As no breeding presently takes place on the site this mitigation measure will not lower the significance of the impact rating.

## **5. Recommendations**

The following recommendations are made with respect to the proposed prospecting:

1. From a bird conservation view point, the prospecting measures proposed could be permitted provided the procedures outlined in the EM Plan are strictly enforced with regard to how the activities are undertaken.
2. With regard to the Colberg grasslands in particular, special consideration must be given to taking precautionary measures when prospecting in the grasslands by reducing trampling and the creation of paths to a minimum. If the proponent is alerted to the fact that Blue Swallows have returned, then the prospecting methods and timing of prospecting in these grasslands should be discussed and reviewed with the Blue Swallow Working Group and the bird specialist. This would be in line with the acceptance by Ndowana that “No Blue Swallow is expendable” as stated in the review by Dr John Ledger in the original prospecting authorisation.
3. With regard to rehabilitation, specific prospecting pits on suitable sites could be excavated to reflect solution cavities which are natural breeding sites for Blue Swallows and left open. Sites on steep Colberg grassland could be excavated in the form of an adit with an overhang at the one end while vertical pits could be left in Colberg grassland with a more gentle gradient. This operation will be relatively inexpensive and make positive use of the pits. (See diagrams at end of report)
4. A specialist on Blue Swallows should identify specific pits for Blue swallow potential nest sites. Detailed designs for the specific identified pits on the pit matrix would be developed by the specialist. These modified prospecting pits should be fenced with a Bonax/chicken mesh fence to prevent livestock, especially goats entering the pit. The fence should be approximately 5m outside the pit. The planting of tree ferns *Alsophila dregei*, could be considered in these pits to resemble mature solution cavities. This action would result in a positive impact from a conservation view point rather than a negative one.
5. Prospecting within the Colberg grasslands need not be restricted to only the months when swallows are not in the area, unless it is found or noticed that the Blue Swallows return. Should this happen, the timing of the prospecting on Colberg grasslands should be reviewed in consultation with the Blue Swallow Working Group or a Blue Swallow expert.
6. Prospecting team leaders should be given identification material on the Red Data bird species potentially occurring within the study site. Should any of the five rare species be identified on site ( Blue Swallow, Grass

Owl, Striped Flufftail, Broad-tailed Warbler or Black-rumped Button quail), the local branch of Birdlife South Africa should be informed immediately

## **6. References**

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- Hockey, P.A.R., Dean, W.R.J, and Ryan, P.G. *Roberts Birds of Southern Africa*, V11 Edition
- Kemper, N.P. and Niemand, R. 1992. *A habitat suitability assessment for the Blue Swallow in Transvaal*. Internal report: Chief Directorate of Nature and Environmental Conservation.
- Tarboton, W.R. 1987. *report on the Blue Swallow in South Africa*. Blue Swallow Working Group (Transvaal Provincial Administration, Natal parks Board and Endangered Wildlife Trust.
- Barnes K.N. and Tarboton, W.R.T, 1998. *Important Bird Areas in the Northern Province*. In *The Important Bird Areas of South Africa*, Barnes ,K.N. (ed.) Birdlife South Africa

## Appendix 1. Stakeholder concerns related to birds

Comment by	Organisation	Concern	Answer
Ben de Boer	Birdlife Limpopo	Specialist studies should be undertaken over one year	It is doubtful whether any significant additional information will be obtained to guide the prospecting application by surveying the bird population in the revised prospecting site for a year. The species of birds present have been recorded and are known from previous studies and observations and are complemented by the present survey. Monitoring activities should be extended for at least five seasons after prospecting if the mitigatory proposals are implemented
Cathy Dzerefos	Botanical Society	Entire area sensitive	The afforested areas are not considered ecologically sensitive
		Ecological functioning	The ecological function is unlikely to be disrupted by the prospecting proposed
		Correct timing of studies	The timing of the bird study was appropriate. All the migrants considered of conservation importance have returned by Mid October
		Cumulative impacts	It is not considered that there will be cumulative negative impacts on the avifauna of the affected area.
		Colberg is a protected area	The section of Colberg within the proposed prospecting site does not have any Red Data bird breeding records. No Red Data birds were recorded on this section of Colberg during the present survey with the possible exception of the Grass Owl which still needs to be confirmed. There may be potential to develop some of the lower proposed prospecting pits on Colberg into potential nest sites for Blue Swallows

A number of key questions on the future prospects of Blue Swallow survival in South Africa were posed by Ben de Boer to James Wakelin shortly before he was tragically killed in a light aircraft crash in Mozambique. It was considered that these issues should be reflected in the current report and they were considered when preparing the recommendations.

The questions posed by Ben de Boer of Limpopo Birding and kindly forwarded to me for my attention.

Do you have any opinion on why the swallows are not nesting in the area any more?

I firmly believe that we are below the critical number of breeding individuals to maintain a population of this species in the long term in South Africa. In my opinion I expect that the species will not persist, in SA anyway, more than for the next 30 years or so. The population just cannot deal with the stochasticity that a healthy population can. Look at the principles behind island biogeographic for the impacts associated with habitat loss and fragmentation. These are primarily the leading cause of the Swallows disappearance in SA. Loss of suitable over-wintering habitat is also a major issue. I am trying to unravel the mysteries around relatedness of the over-wintering populations to ours in SA. So far it is clear that we have separate groupings which fits logically with the loss of smaller breeding sites. The slow attrition of the smaller cohorts indicates things going wrong on the over-wintering ground. Which is a reasonable assumption considering the high clutch number and breeding attempts made in SA over the breeding.

What do you think the possibility is of swallows returning to the area if the populations increase again?

I don't expect they ever will. I don't think that the meta-population can ever recover from the losses it has endured – habitat related and therefore a carrying capacity issue. This is still no reason to condemn the grasslands they used to breed in as these grasslands could still be supporting the birds breeding further south as one of their critical stop-overs

Do you believe that the grassland areas of the Limpopo play any role in the Blue Swallow's feeding strategies when they are migrating through the area. Are these grassland important to the Blue Swallows in any other way, other than nesting?

Yes, any grassland is important. Especially those on a migratory route. Although we don't have a clue where and how the migration takes place yet, however it is very likely that they play a more involved role than we currently understand simply because the species have nested there before – a true measure of this grasslands suitability for the species. The Limpopo moist grasslands should not be transformed nor impacted upon in any negative manner whatsoever. It should in fact be improved and increased and surely put under some permanent conservation status/management.

What are the main invertebrates the swallows would be feeding on as they move through the area, if they do use the area as a feeding site on their migrations?

I wish we knew, without destructive sampling on the species there is no way of us finding out. Model chicks to solicit food from feeding adult birds might be the only way for us to “non-destructively” find out what their diet is all about. From my work on diet and insects in Blue Swallow habitat it appears that favoured food are the soft bodied flies (true flies). Some other info on this has also been published by Hawks in 2000.

What other indicators can / need to be looked out for to indicate that the area could be suitable for Blue Swallows?

Strangely enough, humic matter in and on the soil seems to be key. Grassland condition has not been correlated to breeding success, but it appears that the diversity and biomass of available food is very important. Thus humic content and matter on and in the soil is critical for insect production for the birds. Thus we must farm for insects not floristic diversity.

Suitable nesting sites are an obvious requirement, along with species such as oribi, striped weasel, serval etc. and other specialist ground birds such as Blue and Wattled Crane, some Francolin species, simple observations of Cisticola and Pipit diversity and abundance and Corncrake.

### Appendix 3.1: Ndwana Bird Checklist

Note I have numbered this Appendix 3.1 to reflect the numbering of the Bird appendix in the EMPR.

SPECIES	Present	Vicinity *	Red Data	Grassland	Scarp	Mistbelt Forest	Plantation	Shrubland	Passage
81 Hamerkop	x	x							x
84 Black Stork	x	x	NnT		x				x
94 Hadedda Ibis	x	x				x	x		
122 Cape Vulture	x	x	E.V		x				x
127 Black-shouldered Kite	x	x		x			x		
142 Brown Snake Eagle		x			x				
148 African Fish Eagle		x							x
149 Steppe Buzzard	x	x		x					
150 Forest Buzzard		x	E				x	x	
152 Jackal Buzzard	x	x	E	x	x				
155 Red-breasted Sparrowhawk		x		x			x		
158 Black Sparrowhawk		x					x		
160 African Goshawk		x				x			x
181 Rock Kestrel	x	x			x				
203 Helmeted Guineafowl	x	x		x					
Black- rumped Button Quail #			E.E						
210 African Paradise Flycatcher	x	x				x			
221 Striped Flufftail #		x	R						
349 Rock Pigeon		x			x				x
350 Rameron Pigeon		x			x	x	x		x
352 Red-eyed Dove	x	x				x	x		x
354 Cape Turtle Dove	x	x				x	x		

SPECIES	Present	Vicinity *	Red Data	Grassland	Scarp	Mistbelt Forest	Plantation	Shrubland	Passage
377 Red-chested Cuckoo		x				x			
393 African Grass Owl #	x		E.In						
411 European Swift	x	x			x				x
412 African Black Swift	x	x		x	x				x
418 Alpine Swift	x	x		x	x				x
424 Speckled Mousebird	x	x							
435 Brown-hooded Kingfisher	x	x							
438 European Bee-eater	x	x							x
451 African Hoopoe		x							
464 Black-collared Barbet		x							
488 Olive Woodpecker	x	x				x			
521 Blue Swallow #		x	C	x					
526 Greater Striped Swallow	x	x							
529 Rock Martin	x	x			x				
536 Black Saw-wing Swallow	x	x		x					x
545 Black-headed Oriole	x	x				x			
547 Black Crow	x	x							
548 Pied Crow	x	x		x	x				
550 White-necked Raven	x	x			x				x
568 Dark-capped Bulbul	x	x				x			
572 Sombre Bulbul	x	x				x		x	
577 Olive Thrush	x	x				x			
596 Stonechat	x	x		x	x				
598 Chorister Robin	x		E			x			
601 Cape Robin	x	x				x		x	

SPECIES	Present	Vicinity *	Red Data	Grassland	Scarp	Mistbelt Forest	Plantation	Shrubland	Passage
645 Bar-throated Apalis	x	x				x			
661 Cape Grassbird	x	x	E						
670 Wailing Cisticola	x	x		x	x				
679 Lazy Cisticola	x	x			x				
642 Broad Tailed Warbler#									
681 Neddicky	x			x					
686 Drakensberg Prinia	x		E	x					
690 Dusky Flycatcher	x	x				x	x		
700 Cape Batis	x	x	E			x	x	x	
716 Grassveld Pipit	x	x		x	x				
717 Long-billed Pipit	x	x			x				
727 Cape Longclaw	x	x	E						
732 Fiscal Shrike	x	x		x				x	
736 Southern Boubou	x	x	E		x	x	x	x	
740 Puffback	x	x				x	x		
750 Olive Bush Shrike	x	x	NE			x	x		
769 Red-winged Starling	x	x			x				
774 Gurney's Sugarbird	x		E						
775 Malachite Sunbird	x				x				
783 Southern Doublecollared Sunbird	x	x	E					x	
792 Black Sunbird	x	x							
796 Cape White-eye	x	x	E		x	x		x	
814 Masked Weaver		x							
827 Yellow-rumped Widow	x			x					

SPECIES	Present	Vicinity *	Red Data	Grassland	Scarp	Mistbelt Forest	Plantation	Shrubland	Passage
831 Red-collared Widow	X	X		X					
840 Blue-billed Firefinch	X	X						X	
850 Swee Waxbill	X	X	E				X		
869 Yellow-eyed Canary	X	X				X		X	
872 Cape Canary	X	X	E			X	X	X	
873 Forest Canary	X	X	E				X		
TOTAL	61	69	21						

\*: Vicinity includes past records

E= Endemic

NE= Near Endemic

E.E = Endemic/Endangered

NnT= Near Threatened

R= Rare

E.In= Indeterminate

C= Critically endangered

#= Birds not seen but known to occur

V=Vulnerable

1xNE

1xV

1xNnT

1xE.V

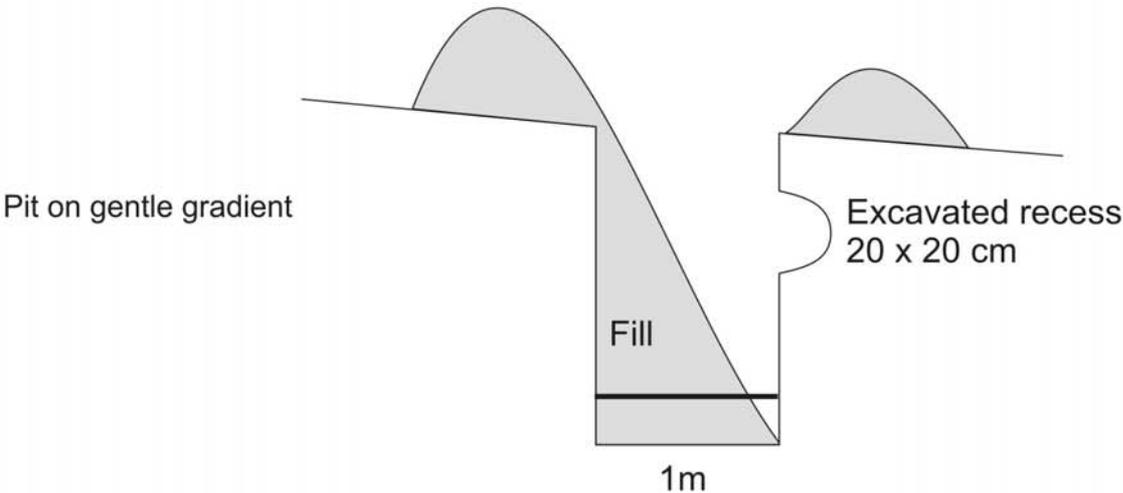
14xE

1xE. In

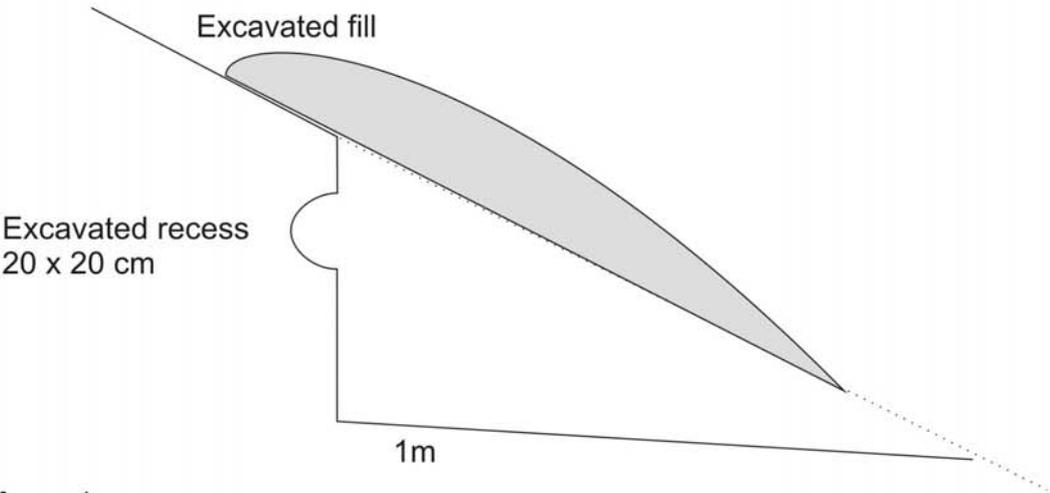
1xC

1xEE

Figure 1: Two suggested profiles for selected prospecting pits



Pit on steep gradient  
Viewed in section



Viewed from above

