

BLUE SWALLOW SURVEY REPORT

Bird Life Zimbabwe

Funded by: Vogelbescherming Nederland

Author: S.L. Childes

Report Period: April 2000 – May 2001

TABLE OF CONTENTS

1	INTRODUCTION.	2
1.1.	BACKGROUND.	2
1.1.1	<i>Morphology.</i>	2
1.1.2	<i>Distribution and Status.</i>	2
1.1.3	<i>Ecology and Biology.</i>	2
1.2.	RELATIONSHIP TO OTHER PROJECTS	3
1.3.	FUNDING	3
1.4.	AIMS OF THIS PROJECT.	3
2	METHODS	3
2.1	SIGHTING RECORDS AND GENERAL AWARENESS:	3
2.2	SURVEY METHODS.	4
2.2.1	<i>Mapping.</i>	4
2.2.2	<i>Field Work.</i>	4
2.3.	DATA CAPTURE:	4
3	RESULTS.	4
3.1.1	<i>Arrival and Departure Dates.</i>	6
3.1.2	<i>Breeding.</i>	6
3.1.2	<i>Other swallow species.</i>	6
3.1.3	<i>Altitudinal Range.</i>	6
3.1.4	<i>Vegetation Types.</i>	7
3.1.5	<i>Habitat Changes.</i>	7
3.1.6	<i>Population Numbers and Status.</i>	8
4	DISCUSSION.	12
5	CONCLUSION.	13
6	ACKNOWLEDGMENTS.	13
7	REFERENCES:	13
	APPENDIX 1	15

1 Introduction.

1.1. Background.

1.1.1 Morphology.

The Blue Swallow (*Hirundo atrocaerulea*) is a medium sized swallow, measuring 20-25cm length. It is unusual amongst the Hirundinae as it exhibits sexual dimorphism, the male having long (9-16 cm length) outer tail streamers as compared with the 6 cm long tail pin feathers of the female (Maclean, 1993). Both sexes are a glossy blue-black colour. The juveniles are duller with dark rufous brown breast feathers. In the field, adult males are easily identified, whilst the females and juveniles need careful checking as both have short tails. Females and juveniles may also be confused with the similar sized and fork-tailed Eastern Sawing (*Psolidoprocne orientalis*), but Eastern Sawings are matt dark green-black and have white under wing coverts.

The closest related species is *Hirundo nigrorufa* (Hall & Moreau, 1970) a bird of seasonally flooded open grasslands that occurs in Angola, Zambia and Malawi.

1.1.2 Distribution and Status.

The Blue Swallow is an endemic resident to Africa, migrating across the tropics. The species' distribution is very restricted, occurring as a series of isolated, disjunct populations on the rolling grassland plateaux of the eastern mountain chain of Central and Southern Africa. It breeds in summer in the southern parts: Zimbabwe, South Africa, Swaziland, Mozambique, Malawi, southern Tanzania and south eastern Zaire, Zambia; and winters in northern Uganda, north eastern Zaire and western Kenya (Keith, Urban & Fry, 1992).

In Zimbabwe the Blue Swallow is distributed from the Nyanga Highlands southwards to the Chimanimani Mountains (Irwin, 1981). The distribution information is based on museum collections, nest records and occasional sighting reports.

The species' status is frequent to common in Malawi and Tanzania, but uncommon to rare elsewhere in its breeding grounds. In South Africa and Swaziland populations are endangered, declining and close to extinction (Barnes, 2000). In Zimbabwe the species was considered vulnerable by Snell(1979) and Irwin (1981). The recently published Important Bird Areas of Southern Africa (Barnes, 1998) lists the Blue Swallow as a globally threatened species. Despite its endangered status in southern Africa, the species is not listed as a Specially Protected Species under the Zimbabwean Parks & Wild Life Act (1982). At present, it therefore has no legal protection in Zimbabwe. Zimbabwe have also not yet ratified the Convention on Migratory Species (Bonn Convention) which seeks to protect about 80 migratory bird species, including the Blue Swallow.

1.1.3 Ecology and Biology.

The montane grassland habitat is found on deep, highly leached, siallitic soils, often with a high level of plant endemism. The grasslands receive a high rainfall that percolates through the soil creating sinkholes, wetlands (or vleis) and underground streams that ultimately drain into larger rivers. In its southern breeding sites, the ecological niche of the Blue Swallow is the narrow mist belt of the mountains; the feathers are extremely water repellent (S. Evans, pers comm.) and the Blue Swallow is able to fly and forage in misty conditions that 'ground' other swallow species. Unfortunately the Blue Swallow habitat is ideal for the planting of the exotic ie. non-indigenous timber e.g. wattle (*Acacia mearnsii*, *A.dealbata*) and pine (largely *Pinus patula*). The montane grasslands are also suitable for potato farming and deciduous (cold climate) fruit orchards. Since the middle of the last century, vast tracts of the grasslands

have been converted to plantations and agriculture leaving a few, very small, isolated patches on private land or in national parks.

Wattle originates from the mist belts of Tasmania and Australia, and pine from South America. Out of their native environment, the trees are free of their natural predators and controls and have become highly invasive plants that are costly and difficult to control. Wattle and pine plantations make irreversible and indelible changes to the diverse montane grassland habitat: grassland becomes a mono-specific thicket or forest, soil nutrients and pH change, water uptake by the trees is increased, thus lowering the watertable and runoff into the rivers.

The swallows pair soon after arrival in the southern breeding grounds. The males exhibit a distinctive fluttering courtship flight just above the females, calling with a high-pitched twitter. Pairs nest solitarily in holes in the ground: sink holes, old antbear (aardvark) burrows, road cuttings and occasionally under the eaves of buildings. An important requirement for the selection of nest site is that the entrance is free of vegetation and the birds have a clear 'flight path' (Snell, 1979). The cup shaped nest is constructed from mud, rootlets and pieces of grass and lined with white feathers. The clutch size is normally 3, and a pair may double or treble brood in a season. The female incubates the eggs and both parents feed the chicks.

1.2. Relationship to other projects

BirdLife Zimbabwe is part of the regional African Blue Swallow Working Group. This current research work integrates with other projects in the species range (BirdLife South Africa and Endangered Wildlife Trust in South Africa, and East African Natural History Society in Tanzania).

1.3. Funding

Vogelbescherming Nederland generously sponsored the project for the period April 2000 – May 2001. This funding covered a monthly stipend for the researcher, field work mileage and subsistence, photocopying, mapping and report production costs.

1.4. Aims of this project.

The aim of this project was to survey the whole of the known range of the Blue Swallow in Zimbabwe, extending from Nyangui in Nyanga north down to the Chipinge uplands in the south (see Fig. 1 location of study area and Fig. 2 sketch map of study sites). This includes the 4 IBA sites that were designated on the basis of containing significant breeding grounds of the Blue Swallow. It follows on from previous surveys undertaken by Childes (1988) in Nyanga National Park and by a brief combined BirdLife Zimbabwe / On Safari survey of the Nyanga District in 1996 (unpublished).

This report only refers to the recent 2000-2001 survey and does not include the data from earlier surveys. These data, together with older records will be reported upon and analysed fully in a future paper.

2 Methods

2.1 Sighting records and general awareness:

It was hoped that volunteer birdwatchers resident in the Eastern Highlands would monitor the swallows on a regular basis throughout the season. This method was successful in South Africa (S.Evans, pers. comm.) and serves the dual purpose of increasing the flow of information about the species as well as giving birdwatchers a specific project on which to focus their attention. Letters were sent in August 2000 to selected BirdLife Zimbabwe members and other interested birdwatchers in the Eastern Highlands enlisting their support.

They were asked to check known Blue Swallow sites on a regular basis over the 2000-2001 season. All BirdLife Zimbabwe members were advised of the Blue Swallow Survey through the general newsletter *Babbler*, and asked to send sighting records to the author.

Three poster displays at public functions featured the Blue Swallow (amongst other threatened and vulnerable birds of Zimbabwe) and three talks were given in the past year to BLZ members, the Veterinary Association and Border Timbers staff in Chimanimani (see Fig. 3 photos).

2.2 Survey methods.

2.2.1 Mapping.

1:250 000 scale woody cover maps (Forestry Commission 1996), were superimposed over 1:250 000 scale contour maps (Surveyor General, 1990) so that areas of grassland that were known or potential Blue Swallow habitat could then be delineated. The 1200m a.s.l. contour was used as the lower limit of the swallows' range on the eastern (wet) sides of the mountains. On the western (drier) sides the 1500m was taken as the lower altitudinal limit.

1:50 000 scale 1998 aerial photographs were obtained for the Nyanga area but were not available for the southern part of the Eastern Highlands. These photos, together with 1:50 000 scale Surveyor General maps, were consulted for patches of grassland that were too small to discern on the 1:250 000 scale maps.

2.2.2 Field Work.

The objective of the field work undertaken by the author was to cover as much potential habitat as possible. It consisted of driving slowly through potential Blue Swallow habitats, watching for the swallows characteristic flight and listening for their distinctive calls. Once a swallow had been sighted the vehicle was stopped and the birds observed carefully through binoculars. Numbers, sex, age, activity, habitat, weather, the presence of other swallow species and detailed locality (GPS co-ordinates or grid reference) notes were made (see Appendix 1- field data sheet). While this method of surveying is limited to the road network, the open grasslands and high vantage points make viewing and birdwatching relatively easy over a distance of several kilometres.

Staff from the Ornithology Research Unit of the Department of National Parks and Wild Life Management assisted with the field surveys in Chimanimani and Nyanga in February 2000-2001.

2.3. Data Capture:

The information on the field data sheets was transferred onto an MS Excel spreadsheet and the sightings plotted on a set of 1:50 000 Surveyor Generals' maps. If a GPS had been used for the locality, the co-ordinates were converted to a 6 figure UTM grid reference.

(As an on-going part of the database project, as many possible sources of information are being explored, including nest record cards, Atlas cards, *Honeyguide*, Special Species survey cards and the literature. The database is continually being updated).

3 Results.

Table 1 below shows the potential Blue Swallow habitat sites and those that were investigated during this survey.

The survey suffered from two major constraints: political unrest and fuel / transport shortages. Despite this, volunteer observers at Nyazengu, Bvumba and Sawerombi managed to make

records throughout the 2000-2001 season. The author undertook a brief visit to Martin, Tarka and Chisengu Forests in October 2000, and an extensive survey of the Nyanga District in December 2000. In February 2001 the author and Ornithology Research Unit staff surveyed part of the Chimanimani District. Areas that were not surveyed, or only briefly checked were: Rukotso, Udu Dam and Claremont Orchards, Mutarazi/ Honde, Stapleford Forest, Banti Forest, Himalayas / Tsetsera, Nyambewa Forest, Cashel, Tandai Forest and the Chipinge Uplands.

Table 1: Areas surveyed from September 2000 to April 2001.

Potential Sites	Date surveyed
Nyanga Highlands	
1. Nyangui Forest (Forestry Commission)	Dec. 2000
2. Rukotso (private land)	Dec. 2000 (part)
3. Nyanga Downs and Nyamoro Farm (private land)	Dec. 2000
4. Troutbeck and Bracken Hills (private land)	Dec. 2000
5. Connemara and World's View (private land)	Dec. 2000
6. Nyafaru and Gairezi (Resettlement and Communal Land)	Dec. 2000 (part)
7. Kwaraguza, upper Nyangombe valley (National Park)	Dec. 2000
8. Nyanga village, middle Nyangombe (Nyanga RDC /National Park)	Dec. 2000
9. Udu Dam and Claremont Orchards (National Park side)	
10. Mare, Purdon and Gulliver Dams (National Park)	Dec. 2000
11. Inyangani, Nyazengu, upper Pungwe (National Park)	2000 - 2001
12. Chirwe, upper Gairezi and eastern side of Nyangani (National Park)	
13. Pungwe scenic drive, Erin Forest, Chingamwe Forest (Forest Land)	Dec. 2000 (part)
14. Mutarazi Falls and Honde View (National Park)	Dec. 2000
15. Claremont Orchards, Juliasdale (private land)	Mar. 2001 (part)
16. Brondesbury Park, Bonda Mission road (private land)	Mar. 2000
17. Juliasdale – Mutare road, Erin Forest and Wattle Co. (Forest Land)	
18. Stapleford Forest (Forest Land)	
Penhalonga / Mutare	
19. Mountain Home (private land)	2000 - 2001
Bvumba Highlands	
20. Seldomseen and environs (private land)	2000 -2001
21. Partridge Hill (private land)	2000 - 2001
Banti / Himalayas / Tsetsera (Forest Land and Resettlement Land)	
Nyambewa / Cashel / Tandai (Forest Land)	
Chimanimani District	
22. Chimanimani Village and environs (RDC land and private land)	Feb. 2000 & 01
23. Chimanimani Mountains (National Park)	Feb. 2000 & 01
24. Sawerombi Estate (Forest Land)	2000 - 2001
25. Musapa Range (Sawerombi Estate – Forest Land)	Feb. 2001
26. Eland Sanctuary and Bridal Veil Falls (National Park)	Feb. 2000 & 01
27. Martin, Tarka and Chisengu Forests (Forest Land)	Oct. 2000
Chipinge District	
28. Chipinge Uplands (private land)	

The Nyanga Highlands, Stapleford Forest, Bvumba Highlands, Banti Forest and Chimanimani Mountains are Important Bird Areas (Childes & Mundy in Barnes, 1998).

Fig. 4 illustrates the approximate location of the sightings.

3.1. Analysis of Data.

The data collected during the survey are shown in Table 2. An analysis of these data shows the following.

3.1.1 Arrival and Departure Dates.

In Nyanga, the earliest record for the 2000-2001 season was on 30 September 2000. On 2 October 2000, 4 adult birds were seen circling high over the Matenderere river in Nyanga and may have been in passage. The last record was on 25 March 2001 and by the author's visit in mid April 2001, no Blue Swallows were seen at Nyazengu, Mare or Claremont-Juliasdale area. The arrival and departure dates for Penhalonga are not known. In the Bvumba Highlands, the birds were first noted on 5 October 2000 and were last seen on 26 March 2001. In Chimanimani the earliest sighting of 4 birds was on 3 September 2000 up on the Bundi Plain in the Chimanimani Mountains, followed by a record of 5 birds on 30 September 2000. The latest record was 4 March 2001.

3.1.2 Breeding.

The breeding season started soon after the birds' arrival as males were observed displaying on 1 and 2 October in Nyanga. No nests were found during the survey. Juvenile birds were seen in mid December in Nyanga, and judging from the males' behaviour, the adults were still breeding. On several occasions the adult males were seen chasing the juveniles (out of the breeding territory?). J.Meikle noted very poor breeding success with the swallows on Mountain Home near Penhalonga and attributed this to the high rainfall and prolonged cold, misty weather. In the Bvumba juvenile birds were only seen mid February onwards suggesting a late breeding success. In Chimanimani a pair were thought to be nesting in an old rubbish pit near the Sawerombi house / office (K.Kidd). Juveniles were noted on 27 November and then again on 5 January in this vicinity.

3.1.2 Other swallow species.

Blue Swallows were seen with 8 other species of swallows and swifts (see Table 3). Eastern Sawings were most commonly found with the Blue Swallow, followed by European Swallows and Mottled Swifts. Interactions were noted between male Blue Swallows and White throated Swallows – presumably the former were defending their territories.

Table 3: Frequency of sightings with other swallows and swift species.

Species	No. observations.
Eastern Sawing (<i>Psalidoprocne orientalis</i>)	14
European or Barn Swallow (<i>Hirundo rustica</i>)	9
Mottled Swift (<i>Apus aequatorialis</i>)	7
White-throated Swallow (<i>H. albigularis</i>)	4
Greater Striped Swallow (<i>H. cucullata</i>)	3
Cliff Swallow (<i>H. spilodera</i>)	2
European House Martin (<i>Delichon urbica</i>)	1
Red-breasted Swallow (<i>H. semirufa</i>)	1

3.1.3 Altitudinal Range.

In Nyanga the lowest altitude recorded was at 1620 m a.s.l. near Nyafaru School and the highest was 2320 m up at Connemara. Birds were found as low as 1079 m in the Haroni river valley of Chimanimani, but ranged up to 1954 m on Pork Pie mountain in the Eland Sanctuary.

3.1.4 Vegetation Types.

The birds are not found in rocky areas or against steep cliffs, preferring the grassy river valleys and hillsides. Their distribution is clearly linked to areas of open short microphyllous shrubland and grassland less than 0.5 m height. The vegetation type occurs along the mountain plateaux and rolling hillsides, drained by numerous small fast flowing streams lined with sedges and the woody shrub *Leucosidera sericea*. While grasses such as *Loudetia sp.*, *Themeda trianda*, *Monocymbium sp.*, *Eragrostis acraea* are common, the type is dominated by perennial shrubs and forbs, particularly *Helichrysum sp.*, and bulbs eg. *Hypoxis sp.*, *Disa sp.*, *Bulbostylis sp.* Many of these plants have yellow flowers that attract pollinating insects. The swallows forage low (less than 1m high) over the grassland on the leeward side, just below the plateaux.

Bracken (*Pteridium aquilinum*) is also found in this type; its presence is linked to soil disturbance and fire. Carpets of bracken are relatively sterile and not favoured by the swallows.

The birds were also found flying along the edges of dwarf *Brachystegia spiciformis* woodland in Nyanga. This woodland occurs on hill slopes on the western drier side of the mountains and is interspersed with wet grasslands or vleis in the river valleys. The birds were observed feeding along the edges of the woodland, but returning to swoop low over the wet grasslands and streams. The same feeding behaviour was noted with plantations of wattle and pine: the trees acted as a wind barrier and helped trap the insects that had been blown up from the valley grasslands.

Large multispecies flocks of swallows were seen feeding over old potato fields that had been planted with a fallow crop of *Eragrostis curvula*. This habitat obviously provides a plentiful food source.

In Chimanimani the open grassland / shrubland is similar and composition to Nyanga, although there are more endemic plants (Wild, 1964). The rocky, quartzite cliffs in the mountain chain are not suitable habitat and the birds are only found along the grasslands of the river valleys. At lower altitudes on mountain slopes, the shrubland gives way to patches of miombo woodland, dominated by *B. microphylla* and *Uapaca kirkiana*.

In all areas there is a clear association between the presence of open water (stream, river, dam) and the swallows. It soon became apparent on the surveys that even if there was a potentially suitable area of open grassland, one was not likely to find the birds unless there was a water source nearby (+/- 1 km away). They were seen to drink frequently from the fish ponds at Nyazengu by W.Mtetwa.

3.1.5 Habitat Changes.

3.1.5.1 Nyanga.

With the exception of small areas of Rukotso, Nyanga Downs, Connemara, World's View and Juliasdale, much of the suitable habitat outside of the national park has already been planted to wattle and pine or been developed for agriculture and residential sites. The northern section of Nyangui Forest has been recently planted to pine. Unfortunately this area was an ideal habitat for the swallows. The Forestry Commission has not replied

to the author's inquiries about whether an Environmental Impact Assessment was done for this planting of virgin grassland. Presumably the vulnerable status of the species and its habitat requirements were simply ignored.

Elsewhere in Nyanga there is continual loss of habitat through agricultural expansion, urban development and the extension of forestry plantations of wattle and pine. This is particularly important in the Nyanga Downs, Troutbeck and Connemara areas. The urbanisation and disturbance of the open shrublands of the World's View – Connemara area has led to an increase in the invasion of feral pine and wattle.

The survey showed that the invasion of wattle and pine into the open grasslands of the Nyanga National Park has increased since the study in 1987 (Childes, 1997). A park management policy of using hot fires to control pine invasion has had some success in the upper Nyangombe river valley. Elsewhere the pine and wattle trees continue encroaching from commercial plantations bordering the park and from residual plantations within the park.

The prime habitat for Blue Swallow is the upper Pungwe and Matenderere river valleys in the national park and in the privately owned Nyazengu Estate (see Fig. 5 photo). The owners of the latter property have applied a successful eradication programme and most alien wattle and pine has been removed from the upper Pungwe and Matenderere valleys.

3.1.5.2 Bvumba.

The general threat of wattle and pine continues in the Bvumba, coupled with an expansion of agriculture. The swallow's habitat is already very restricted and likely to remain so.

3.1.5.3 Chimanimani.

Apart from in the Chimanimani National Park itself (the mountains), Pork Pie (in the Eland Sanctuary) and some small areas of Sawerombi, most of the open shrubland / grassland ie potential Blue Swallow habitat has been planted over to pine, wattle or eucalyptus (Fig.6 photo). Through the international Forestry Stewardship Certification (FSC) process, both Border Timbers and the Forestry Commission have now retained some grassland sites to remain unplanted, as well as protecting wetland sites. Whether these areas are sufficient to maintain a viable population of Blue Swallows remains to be verified. In some instances the 'protection' of grassland sites was more a result of unsuitability for planting to pine (shallow soils, rocky, steep slopes, no road access), rather than a genuine desire to conserve the grassland habitat.

A key area outside the parks estate that probably contains suitable swallow habitat is a private farm bordering the Eland Sanctuary (owned by Mr Duncan). Nhuka Farm (owned by the late Mr F. Elias) was also a well known site for Blue Swallows but this has been re-settled and has not been visited because of the current political unrest.

3.1.6 Population Numbers and Status.

Although the survey failed to achieve complete coverage of all potential Blue Swallow sites in the Eastern Highlands, some useful population data were collected. Table 4 lists the approximate number of adults seen and the number of adult males seen during the current survey. Assuming all adult males are breeding, an estimate of minimum numbers of breeding pairs can be derived. The status of the sub-populations was judged by the imminent or potential changes to the habitat.

Table 4: Minimum numbers of adult birds and adult males seen during the survey.

Sites	No. adults	No. males
<u>Nyanga District</u>		
1. Nyangui Forest (Forestry Commission)	18	11
2. Rukotso (private land)	4	1
3. Nyanga Downs and Nyamoro Farm (private land)	7	5
4. Troutbeck and Bracken Hills (private land)	1	1
5. Connemara and World's View (private land)	8	3
6. Nyafaru and Gairezi (Resettlement and Communal Land)	4	3
7. Kwaraguza, upper Nyangombe valley (National Park)	4	3
8. Nyanga village, middle Nyangombe (Nyanga RDC /National Park)	6	5
9. Udu Dam and Claremont Orchards (National Park side)		
10. Mare, Purdon and Gulliver Dams (National Park)	3	3
11. Inyangani, Nyazengu, upper Pungwe (National Park)	42	15
12. Chirwe, upper Gairezi and eastern side of Nyangani (National Park)		
13. Pungwe scenic drive, Erin Forest, Chingamwe Forest (Forest Land)	3	2
14. Mutarazi Falls and Honde View (National Park)		
15. Claremont Orchards, Juliasdale (private land)	14	3
16. Brondesbury Park, Bonda Mission road (private land)	15	3
17. Juliasdale – Mutare road, Erin Forest and Wattle Co. (Forest Land)	0	0
18. Stapleford Forest (Forest Land)		
<u>Penhalonga / Mutare</u>		
19. Mountain Home (private land)	20	
<u>Bvumba Highlands</u>		
20. Seldomseen and environs (private land)	4	2
21. Partridge Hill (private land)	0	0
Banti / Himalayas / Tsetsera (Forest Land and Resettlement Land)		
Nyambewa / Cashel / Tandai (Forest Land)		
<u>Chimanimani District</u>		
22. Chimanimani Village and environs (RDC land and private land)	26	
23. Chimanimani Mountains (National Park)	23	
24. Sawerombi Estate (Forest Land)	14	5
25. Musapa Range (Sawerombi Estate – Forest Land)	48	
26. Eland Sanctuary and Bridal Veil Falls (National Park)	19	
27. Martin, Tarka and Chisengu Forests (Forest Land)	0	0
<u>Chipinge District</u>		
28. Chipinge Uplands (private land)		

3.1.6.1 Nyanga.

1. Nyangui Forest had at least 18 adult birds, of which 11 were males, giving a minimum of 22 breeding pairs. These were all found in an area of virgin pine plantation and will disappear from this site within the next 2 years.
2. Rukotso Estate was not fully surveyed but had 2 adults, a minimum of 1 breeding pair, probably 2. Much of the grassland that is not already under pine is being developed into fruit orchard and potato fields. The Rukotso radio mast area was not surveyed but appears

to be suitable habitat. However, it is threatened with illegal settlement, overgrazing by livestock and spreading agriculture.

3. Nyanga Downs: Nyamoro Farm has at least 1 breeding pair; the fields around the Nyanga Downs airstrip had 7 adults, of which 5 were male, indicating a minimum of 5 breeding pairs.
4. Troutbeck Estate and the Bracken Hills area are largely covered with plantations of pine and wattle interspersed with private houses and gardens, fruit orchards and flower fields. The available habitat is therefore rather limited and only 1 adult male was seen – his behaviour indicated that the female was probably brooding.
5. Connemara and World's View have fortunately not been planted as extensively as Troutbeck and Bracken Hills, although the area has a fairly dense housing development. Feral pine and wattle are invading the remaining grasslands. There were at least 11 adults seen in a multispecies flock, and judging from their behaviour, probably 5 breeding pairs.
6. Nyafaru and Gairezi resettlement areas superficially appear to be suitable for Blue Swallows but only 4 adult birds, of which there were 3 males (suggesting 3 breeding pairs), were seen. The area is heavily overgrazed and subjected to hot annual fires. In addition, a large part of the grasslands have been recently planted to Eucalyptus, further reducing the suitable habitat.
7. Kwaraguza and the upper Nyangombe valley are relatively free of invasive pine and wattle. 4 adults were found, including 3 males indicating at least 3 breeding pairs. This area needs a more detailed survey as it is possible birds were missed in the more inaccessible parts of the upper Nyangombe valley.
8. Nyanga Village and middle reaches of the Nyangombe river. Although no birds were found in the environs of Nyanga village, a pair was seen at the Troutbeck road turnoff and another 4 pairs at the bridge across the Nyanoro river, giving a total of at least 5 pairs. Another 4 males were seen near Chawomera Fort.
9. Udu Dam and the western side of Claremont Orchards and Rugarara Estate were not surveyed.
10. Mare, Purdon and Gulliver Dams are in the midst of dense wattle and pine plantations. Not surprisingly, only 3 males were seen in the December survey, although 7 males had been observed earlier in the season in October. These may have been passage birds.
11. Inyangani mountain (base), Nyazengu, upper Pungwe and Matenderere river valleys are the prime areas for Blue Swallow with a minimum population of 24 breeding pairs.
12. Chirwe river, upper Gairezi and the eastern side of Nyangani mountain were not surveyed, but records from A. Jana at Aberfoyle indicate that there are at least 6 breeding pairs. Unfortunately the exact location of his sightings is not clear.
13. Pungwe Scenic Drive, Erin Forest and Chingamwe Forest were briefly surveyed. 2 males were found at the boundary of Erin Forest and the upper Pungwe valley in the national park.
14. Mutarazi Falls and Honde View were not surveyed.
15. Claremont Orchards (eastern side). Although this farm is very developed, 4 adults (at least 1 pair) were seen on Loch Moodie in late September.
16. Brondesbury Park and environs, Bonda Mission road are considerably warmer and drier than the eastern areas. However, 5 adults (2 or more males) were seen at Raudzi School on the Bonda road in October 2000, and 2 pairs were found in the same area in March 2001. A flock of up to 11 adults was seen in March and were probably passage birds.
17. The Juliasdale-Mutare road (upper Odzi river valley) was checked in December 2000, and parts of Erin Forest and Wattle Company Forest. No birds were seen.
18. Stapleford Forest was not surveyed.

Counting from the 2000-2001 data and ignoring possible duplications, the population for Nyanga is a minimum of 71 pairs. However not all the area was surveyed so this must be an absolute minimum number. In 1988 Childes estimated the population in the National Park alone to be around 200-400 birds, whilst in the 1996 survey 261 birds were sighted in and

around the park. Given that the present habitat has been reduced since the earlier surveys, 200-250 birds are a reasonable estimate for the Nyanga area.

3.1.6.2 Penhalonga / Mutare.

19. J. Meikle recorded up to 20 birds on Mountain Home, although some of these were actually across the border into Mozambique.

3.1.6.3 Bvumba Highlands.

20. Around Seldomseen and the neighbouring land there were 4 adults (2 breeding pairs). Here the habitat is very restricted and the entire Bvumba population is probably not more than 10 birds.
21. The absence of the species from Partridge Hill dam is of concern as they were reported to breed under the eaves of a small building there for 6-8 years (C. Donald, pers. comm.).

3.1.6.4 Banti / Himalayas / Tsetsera.

These areas were not surveyed.

3.1.6.5 Nyambewa / Cashel / Tandai Forest.

These areas were not surveyed.

3.1.6.6 Chimanimani.

22. A flock of 22 adult birds and 4 juveniles were seen in February on Green Mount, an grassy mountain side near Chimanimani village. This site is threatened through the recent virgin plantings of pine, from urban / squatter village expansion and overgrazing by livestock.
23. In the Mountains themselves, up to 23 adults were seen in February 2001, of which at least 12 birds were seen around the Mountain Hut and on the Bundi Plain. At the same time the previous season the same observer noted an extraordinary number of 280 birds. This was a few days before Cyclone Eline hit the area and presumably these birds were moving north ahead of the storm. It is impossible to tell whether these birds were from the immediate area or from further south as the cyclone hit South Africa and Mozambique before entering Zimbabwe. As long as invading wattle and pine trees are kept under control, the population in the Chimanimani Mountains is not threatened.
24. Sawerombi house and office area had up to 6 adults during the season. Elsewhere on Sawerombi, another 11 birds were sighted. The population is therefore about 20 birds. This population is threatened by the recent virgin plantations of pine and will be reduced or disappear within the next few years.
25. On the Musapa Range (northern part of Sawerombi Estate) a flock of 48 birds were seen in February 2001. This was possibly a congregation prior to migrating north. The lower slopes of this site are threatened by illegal settlement and the consequent spread of agriculture and overgrazing by livestock. The grassland plateau on the summit is not easily accessible and has not been planted to pine.
26. In the Eland Sanctuary 15 adults and at Bridal Veil Falls 4 adults were seen. This part of National Parks Estate is seriously threatened by the uncontrolled spread of wattle and this must be a priority for park management.
27. Martin, Tarka and Chisengu Forests. No birds were seen during a brief visit in October, although it is possible that the northern grassland on Martin Forest, bordering Sawerombi sustain a population. This needs to be verified.

The large flock sizes recorded at Musapa Range (48), Pork Pie (15) and Green Mount (26) in February 2001 and similar numbers were recorded in February 2000. These birds may not be from the immediate area, but immigrants from further south.

The population in Chimanimani (including Sawerombi) is therefore approximately 100-120 birds.

3.1.6.7 Chipinge District.

28. The Chipinge Uplands were not surveyed.

4 Discussion.

The survey was relatively successful as useful data on swallow distribution and numbers were obtained, although the full distribution range of the species was not investigated. Additional insights into the habitat requirements for the species were gained, particularly the association with water sources (c.f. Msuha & Sutherland, 2001) and the yellow flowered *Helichrysum* shrubs. Clearly this aspect requires a great deal of further research - the results of which will provide essential baseline information for habitat protection of the species. The fragmentation of habitats and isolation of islands of montane grassland within wattle and pine plantations (island biogeography and minimum viable area concepts) have important implications for the survival of the species outside parks estate. One of the basic questions commercial forest managers ask is how much montane grassland do the swallows need to maintain their population? An adjunct to this is the question is what makes a quality habitat for the species?

The survey re-confirmed the importance of the Nyanga National Park, the Chimanimani National Park and the Eland Sanctuary as key swallow breeding and feeding areas. Park management has to take into account the habitat requirements of this species and control of invasive wattle and pine should be a priority for the authorities.

The owners of Nyazengu in Nyanga must be commended for clearing a prime Blue Swallow area from wattle and pine, thus securing the place for the swallows. Their methods and programme should be used to control the invasion in other important Blue Swallow sites in the Nyanga National Park, namely, the Nyangombe, Kwaraguza and upper Gairezi areas.

In Chimanimani, the Eland Sanctuary and Bridal Veil Falls areas need immediate action to clear the wattle and protect the swallow habitat and park management should treat this as a priority.

The commercial forestry companies bordering the parks should recognise their environmental responsibilities and assist in the long term clearance of wattle and pine in the national parks. Environmental Impact Assessments (an FSC requirement) on any planting of virgin grasslands must take into account the Blue Swallow's requirements. However, until the bird is legally protected, there is little conservationists can do to prevent the planting of pine or wattle into Blue Swallow habitat, beyond raising awareness with the forestry companies.

Other environmental factors that affect the breeding success of Blue Swallows are:

- Prolonged cold temperatures with mist and rain mean reduced feeding and increased chances of hypothermia, particularly with the chicks. This species does not range into the warmer lower altitudes as Eastern Sawing and White throated and Greater Striped Swallows do, nor does it fly as high (generally) as the swifts. Interspecific competition for food may become important as the grassland habitat is reduced. The energetics of feeding and breeding would make an interesting study.
- Fire. Increased frequency of fire in the grasslands changes the plant community structure and increases the incidence of weedy or ruderal species such as bracken. The impact of this needs further study. The timing of fires may also be important as pre-rain burns in late September – October will probably lead to decreased food availability over the burnt sward. On a positive note, late fires may help clear nest holes of unwanted plants that block the entrances.

- Agricultural expansion. The fact that the swallows favour old potato fields as feeding grounds means not all agricultural expansion is necessarily detrimental. However, with any development and increased human interference, there will be a consequent decrease in the antbear population as the animals are either hunted or fenced out. Since antbear holes are a favourite nesting site for the swallows, one can hypothesise that the decrease in antbears has led to a decrease in potential nesting sites (D.Rockingham Gill, pers. comm.). This needs to be tested.
- It is possible that the urbanisation of Troutbeck, Connemara and Juliasdale and consequent housing development is also favouring White throated Swallow and Greater Striped Swallows – potential competitor species for the Blue Swallow (Irwin, pers. comm.). Intra specific competition becomes important as suitable nest sites become limited. Although Blue Swallows have been recorded nesting under the eaves of buildings, they are easily chased off by the more aggressive Lesser Striped Swallows (own obs. at Seldomseen).

The poor response from BLZ members was disappointing but not entirely unexpected. A great deal more work needs to be done to raise the awareness amongst BLZ members and the general public of the plight of this species and the need for useful records. In future, the best approach to this type of study is for the co-ordinator to do as much field work as possible, with brief visits to the on-site volunteer observers to maintain their interest and verify their data.

5 Conclusion.

The status of the Blue Swallow in Zimbabwe remains ‘vulnerable’ (IUCN Red Data Book criteria) but the species is still under serious threat through habitat loss, habitat fragmentation and loss of breeding sites. It is obvious that protection and correct conservation of all remaining Blue Swallow habitat is vital to the long term survival of this species.

6 Acknowledgments.

I wish to thank Tracey Couto, Jack Amonie and Gift Jonasi of the Ornithology Research Unit, Department of National Parks and Wild Life Management for their assistance with the field work. Dominick Kwesha and his mapping team at Forestry Commission are thanked for the base maps. The following people are sincerely thanked for their contributions throughout the season: Willie Mtetwa, Peter Mwadziwana, Buluwezi Murambiwa, William Chadder, Kennedy Kidd, John Meikle. It is hoped they will continue records in future seasons and thus add to the database. My husband and children also participated in the field work with enthusiasm and dedication, for which I am very grateful.

7 References:

Barnes, K.N. (1998). The Important Bird Areas of Southern Africa. BirdLife South Africa, Johannesburg.

Barnes, K.N. (2000). The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg.

Childes, S.L. (1989) Preliminary report on the Blue Swallow Survey, Nyanga National Park. Departmental report, Dept. National Parks & Wild Life Management, Harare, Zimbabwe : 4 p + map.

Childes, S.L. (1997) Invasive alien plants - a serious biological threat to the high altitude grasslands and microphyllous shrubland of the Nyanga National Park. Poster presented at XVth AETFAT Congress, Harare.

Hall, B.P. & Moreau, R.E. (1970). An atlas of speciation in African Passerine birds. Trustees of the British Museum (Natural History), London.

Irwin, M.P.S. (1981). Birds of Zimbabwe.

Keith, S., Urban, E.K. & Fry, C.H. (1992). The Birds of Africa Vol. IV. Academic Press Limited. London.

Maclean, G. L. (1993). Roberts' Birds of Southern Africa. 6th ed. Trustees of the John Voelcker Bird Book Fund, Cape Town.

Msuha, M. & Sutherland, W.J. (2001). The habitat requirements of the Blue Swallow. *BirdLife Africa Newsletter* **3.1**: 11.

Snell, M.L. (1979). The vulnerable Blue Swallow. *Bokmakierie* **31(4)**: 74-78.

Wild, H. (1964). The endemic species of the Chimanimani mountains and their significance. *Kirkia* **4**: 125-157.

Appendix 1