Ecological survey and status of Blue Swallow *Hirundo atrocaerulea* in Ruma National Park, Kenya

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Introduction

Blue Swallow *Hirundo atrocaerulea* is a globally threatened species classified as Vulnerable under the IUCN Red List of threatened species. It is a rare intra-African migrant locally classified as Endangered by the East Africa regional Red Data List (Bennun and Njoroge 1996), and is listed in Appendix I and II on the Convention on the Conservation of Migratory Species of Wild Animals (www.cms.int). The species is endemic to sub-Saharan Africa and its range spans three African countries during its non-breeding season: Uganda, Kenya and Democratic Republic of Congo while its breeding range spans seven other countries: South Africa, Swaziland, Zimbabwe, Mozambique, Malawi, Zambia and Tanzania (IUCN 2011). In Kenya, it winters in moist-grassland habitats in Ruma National Park and Busia Grasslands Important Bird Areas (IBA) (Bennun and Njoroge 1999). The species faces several threats continentally, some of which International Blue Swallow Action Plan (Evans *et al.* 2002) enumerates as habitat degradation and conversion, local hunting and specialized habitat requirements.

The Blue Swallow occurs in low numbers in restricted areas of habitat over a wide geographic range. This is because it has specialised habitat, breeding and feeding requirements (grassland with intermixed areas of wetland/drainage channels). The types of habitat occupied are different in the breeding and non-breeding areas. These requirements will inevitably prevent it from ever being a widespread species (Evans *et al,* 2002). In Kenya, Blue Swallows only occur in shrubby grasslands in the western region from April to September with the species described as rare and occurring in Ruma National Park, Mumias, Busia and Bungoma (Zimmerman *et al.* 1996).

The Blue Swallow is not an easily identifiable species that nests individually, often underground and out of sight – therefore it is not well known by the general public (Evans *et al,* 2002). Adult *H. atrocaerulea* appears black at a distance with deeply forked tail with long almost wire-like outer feathers. They have black and white feathers on the sides and flanks normally concealed but sometimes showing as conspicuous white patches in perched birds. Immatures and juveniles appear sooty black with brownish throats and no long outer tail feathers and may be confused for Black Saw-wing (Zimmerman *et al.* 1996). The latter however appears to have slimmer wings than the former (M. Odino pers. obsv.).

The conservation profile of the Blue Swallow and protection of its habitats is low in Kenya largely as a result of lack of adequate scientific information on its current status to guide species and habitats monitoring and management. Studies on the species in its non-breeding range are less (Evans *et al.* 2002) hence information on its population trends and habitat status is scarce and local conservation action is poor. This is despite deductable threats due to its occurrence in and outside protected area network in Kenya. We conducted a survey of Blue Swallows in collaboration with Kenya Wildlife Service (KWS) and local people at the Ruma National Park in western Kenya.

Aim

This study surveyed the ecological and conservation status of the Blue Swallow in Ruma National Park, western Kenya.

Study objectives

The objectives of this study were to:

i. Confirm the presence of Blue Swallows in Ruma National Park and estimate their numbers
ii. Investigate habitat requirements of Blue Swallow during the non-breeding season, focusing on habitat/microhabitat use, perching and foraging.
iii. Determine spatial distribution of suitable and potential Blue Swallow habitats within Ruma National Park
iv. Identify current threats facing the Blue Swallow in Ruma National Park

Methodology

Study area

Ruma National Park (**Fig. 1**) is a designated Important Bird Area (IBA) number 40 in Suba and Ndhiwa Districts of Nyanza Province. Its central co-ordinates are 0°35'S, 34°12'E, at an altitude of between 1,200–1,600 m above sea level (Bennun & Njoroge 1999). Ruma National Park lies on the flat floor of the Lambwe valley, bordered by the Kanyamwa escarpment (and including a section of Lambwe Hills Forest Reserve) to the south-east. The terrain is mainly rolling grassland, with tracts of open woodland and thickets dominated by species of Acacia and Balanites. The soils are largely 'black cotton' clay. The surroundings area is settled, with a mix of small-scale cultivation and grassy pasture-land (Bennun & Njoroge 1999).

Ruma is the only protected area in Kenya where the Blue Swallow, a scarce intra-African migrant, is regularly recorded (Bennun & Njoroge 1999) where it utilizes the ideal seasonally flooded grasslands at the site.

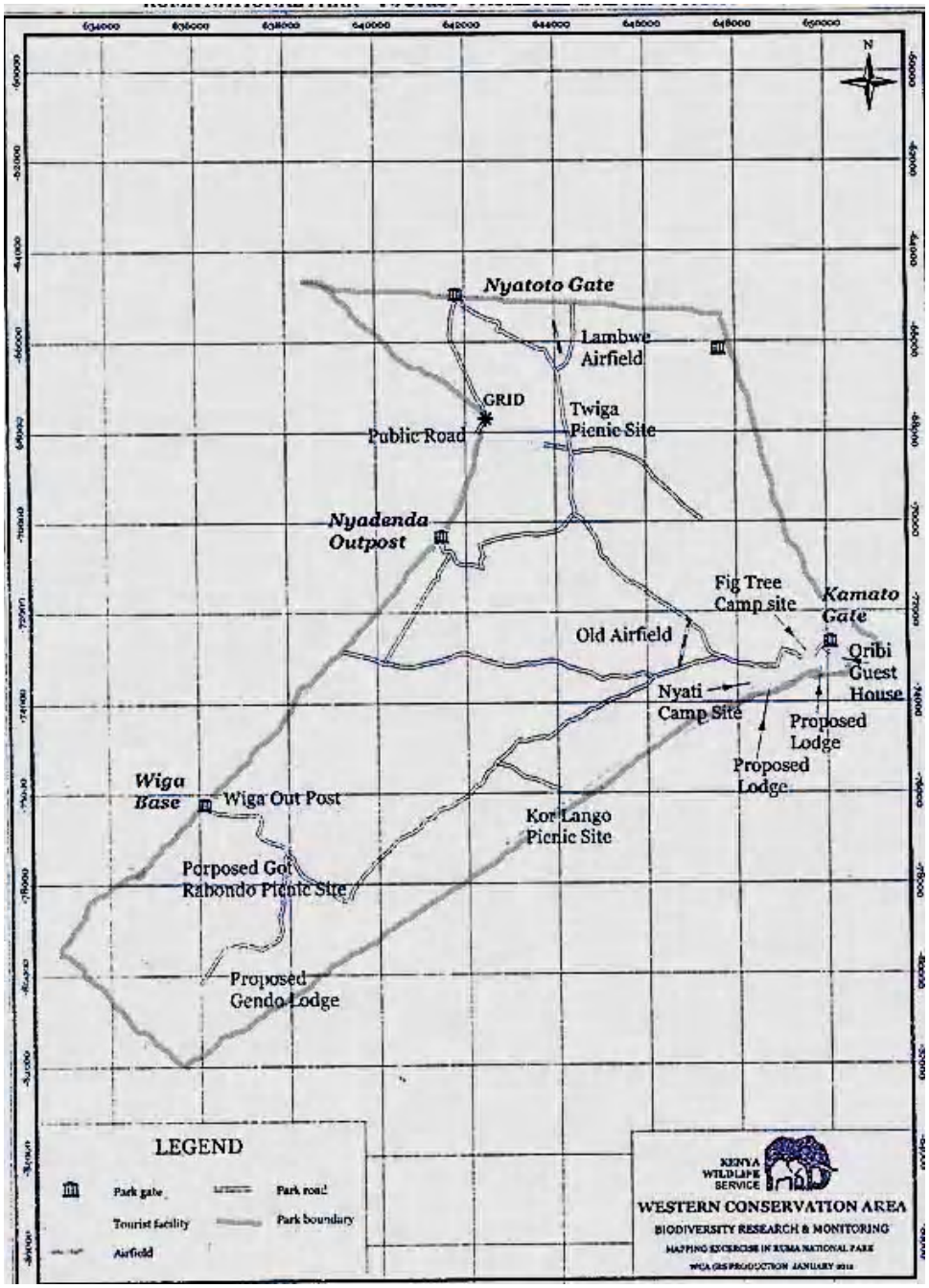

Fig. 1: Map of Ruma National Park. Source: Edited from Kenya Wildlife Service map, RUMA NATIONAL PARK-TOURIST FACILITIES & ADMINISTRATIVE POINTS.

Field data collection

We conducted intensive field surveys from 10.00 hrs to 17.00 hrs. Two major transects were surveyed for comparison being regarded as different basing on land use intensity. These were surveyed on the first and second days respectively. Transect 1 which was approximately 12km was from the forking from Kamato gate- Lambwe Airstrip junction-Nyatoto gate. This transect lay in the low land use zone. Transect 2, also 12km long was from the forking from Kamato gate-Wiga (Old) airstrip-Wiga base (we could not go beyond Got Rabondo picnic site) was located in the high land use zone. The land use hence transect categorization was according to KWS Zonation map (See Appendix i).

Fig. 2: Project team members at Ruma NP. From left: Rodgers Oywer (KWS), Martin Odino (NMK), Onyango (Ecofinder Kenya) and Maurice Ogoma (project co-ordinator)

Opportunistic observations and total counts were employed to collect data on presence, distribution and behaviours of the species. The information was noted down accordingly by the scribe. We drove at 20-40km/hr with two observers, one at the front

passenger seat and one at back-right seat on alert and making occasional stopovers where swifts and swallows were observed. We surveyed the whole park for the presence of Blue Swallows using transects running across the park. We used odometer readings to obtain corresponding distance on the park road at the points of sighting. These would correspond to the GPS points where the Blue Swallows were observed.

Results

A cumulative count of 87 Blue swallows were observed and counted during the 2 survey days. We however believe that the mean of 43 birds were encountered during the survey. The Blue Swallows were encountered at the same 2 localities, 1 kilometre apart from each other on the first transect (low land use transect) and at about the same time on other days of the surveys. No Blue Swallows were encountered on the second transect (high land use transect).

The habitat at the first site (7km from Nyatoto gate) where Blue Swallows were observed was mostly constituted of grasslands about 1m tall on the average. The woodland habitat was constituted of *Acacia drepanolobium* shrubs of average height of about 2m and estimated density of 1 *A. drepanolobium* shrub per m^2 with a few *Balanit*es *aegyptica* trees of which only 7 were counted within about 150m radius that we could positively identify the Blue Swallows. There was no obvious flooding or pools of water at this site.

The second site (6km from Nyatoto gate) where Blue Swallows were observed was constituted of longer grasslands almost the same height as the 2m shrubs of interspersed *Acacia drepanolobium*. There were also more *Balanites aegyptica* of which 12 trees were counted within the 150m observation radius. There were also pools of stagnant water at this site, 2 of which were adjacent to the park road and an apparent dry stream bed stretching eastwards.

Blue swallows were observed to be flying or perched either on the plants (bare terminal parts of *Acacia drepanolobium* only) or on the bare ground on the road. At the second site, Blue Swallows were in addition seen to be drinking water on the shallow roadside pools. The flying Blue Swallows were observed to occur in a transient manner whereby there were moments of absence when the entire flock would move from east to west

and vice versa but still coming back to the site i.e. moving to and fro along but within a certain stretch of the site. The flying Blue Swallows were further observed in stratified association with other swallows and swifts. The Blue Swallows seemed to be the lowest flying at a height of under 15m but mostly just overflying the 2m tall *Acacia drepanolobium.* The other species seen together with the Blue Swallow were Barn Swallow (H*irundo rustica),* Angola Swallow (*Hirundo angolensis*), Mosque Swallow (*Cecropis senegalensis*), Rufous-chested Swallow (*Cecropis semirufa*) Little Swift (*Apus affinis*) and Nyanza Swift (*Apus niansae*). Madagascar Bee-eaters (*Merops superciliosus*) were also seen foraging at the first site (nearest to Kamato gate forking) that the Blue Swallows were observed.

Discussion

In this survey, Blue Swallows were only observed in transect 1 or the Low Land Use Zone transect. These were mostly moulted sub-adults with generally black and patchy shiny blue plumage with short streamers. At least 3 mature adults were seen with shiny blue plumage and long streamers. One immature with still evident brown feathers moulting into blue adult feathers and no streamers was also seen.

Fig. 3: Observed Blue Swallows of various age-groups. Photo by M. Ogoma and Martin Odino

The actual sites where the birds were observed were somewhat centrally located in the park with the topography of the region being predominantly gently rolling. The distance between the 2 major park gates, Kamato and Nyatoto is 14km. Blue Swallows were seen at 7 km from both gates and 1km nearer to Nyatoto gate. The species distribution at the centre of the park may therefore suggest probable preference to minimal or no human disturbance by the bird at the wintering site. Transect 2 or High Land Use transect where no Blue Swallows were encountered is located proximal and running parallel to the southerly border fence of the park. This zone is gently rolling at the foothill of Lambwe Hills and was said to have been fenced off more recently compared to the rest of the park. The area was therefore last to be liberated from human activities inclusive of grazing, firewood collection and poaching (R. Oywer pers. comm.).

The habitat in which Blue Swallows were observed in transect 1 averaged 1-2meters grassland habitat and 2m high *Acacia drepanolobium* with a few taller *Balanites aegyptica* woodland species. One of the sites was also characterized by few (2) open-water areas or pools

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Fig. 4: Site 1 where blue swallows were observed;~1m tall grassland, 2m tall *A. drepanolobium* and few *B. aegyptica. Photo by M. Odino*

Fig. 5: Site 2 where Blue Swallows were observed; longer grasses about same height as the interspersed *A. drepanolobium* in the middle ground and more *B. aegyptica* trees. *Photo by M. Ogoma*

In transect 2 where no Blue Swallows were observed, the habitat was constituted of a 2 km stretch of grassland and woodland (mostly *Acacia drepanolobium*) recovering from fire while the rest was predominantly 2-3meter tall grass and more wooded with *Balanites aegyptica, Acacia xanthophloea* and *Acacia drepanolobium.* The latter 2 species of woodland vegetation were also much taller in this transect than transect 1. Majority of both were between 3m to 15 meters tall.

Fig. 6: Transect 2-habitat with more woodland vegetation. *Photo by M. Odino*

Fig. 7: Transect 2-habitat constituted of taller *A. drepanolobium. Photo by M. Odino*

Transect 2 was also more continuously swampy than transect 1 with the swampy ground being soggy wet or where there were pools, these were closely disrupted by thick vegetation. It is therefore likely that the Blue Swallows prefer the shorter vegetation habitat because they are habitual, low flyers. This could further suggest that the swallows hunt lower flying insects, generally just above the 2m tall vegetation. It is also likely that the Blue Swallows seen to be highly mobile to and fro within the site at low height in generally unidirectional waves need more open habitat rather than many tall trees which would disrupt the straight, low level flight. The recurrence by the Blue Swallows at these sites in the short moments of presence and absence as well as being encountered at the same sites during the 2 survey days suggests faithfulness to these sites hence the reason why we used the mean of their observed numbers. The open pools in transect 1 seem to have been watering points as the Blue Swallows as well as Barn Swallows were seen to swoop just above the water surface drinking while in flight.

Stratified association of the Blue Swallows with other swallows and swifts may further support the tendency to forage on lower flying insects compared to the other swifts and swallows that were observed flying up to over 50meters high

Blue Swallows also perched at a height of 1-2meters on bare *A. drepanolobium* aerial twigs further suggesting tendency to preference to low height. Perched birds were relaxed and no apparent activity associated with the perching was observed. This shrub-perching behaviour seemed predominant in the late afternoon than late morning

into the early afternoon during which times the surveys were conducted. Only one Blue Swallow was observed to be perched at 1215hrs while 2 and 6 Swallows were seen perched at 1530hrs and 1640hrs. This may suggest that the earlier time perching corresponded to random resting which was not seen of many birds as earlier times of the day are characteristic predominant feeding times and many birds will not break or rest until they are well fed. The late afternoon or evening perching may have suggested roosting by the birds therefore the second site was a possible roosting site. This is however not conclusive as we were not able to observe the birds late into the evening. However, while we stayed late (up to 1900hrs) in the park on the last day following vehicle breakdown, there was rain and thunderstorm that may have affected the birds variously. A unique behaviour of shrub-perching by the Blue Swallows was that the birds returned to the same plants even after they were flushed. This was observed of the birds as one of the surveyors, M. Odino attempted to photograph the birds. Again this perch faithfulness may suggest that we saw the same birds on different occassions hence justifying the mean of their numbers as the actual number of observed birds during the survey days.

Blue Swallows were further observed to perch on the ground on the earth road in the park in the late morning and early afternoon while none was observed in the early evening. Ground perching was associated with preening. This behaviour was observed of the Rufous-chested Swallow as well that associated with the Blue Swallows. This may have been as a result of instability in perching on the twigs of woody plants hence preference to groom on the ground which is associated with a lot of body twisting movements as opposed to the dormant state when perched on shrubs. Disturbed ground-perched grooming birds kept moving to a seeming safe distance where they would perch again and the birds did not necessarily return to the previous points. The ground may therefore purely serve as stable perch for the birds with no other apparent reason for ground perching.

Some of the key challenges facing the conservation including that of Blue Swallows in Ruma NP include (i) there is very little involvement of local community in conservation and management activities at Ruma NP (ii) poor park accessibility due to poor access road

network around the park (iii) lack of local community sensitisation on matters related to conservation (iv) poor local and political governance and resource allocation around the park.

Conclusion

Blue Swallows occur in Ruma National Park in seemingly isolated subpopulations in the remote part of the Park. Ruma National Park as a closed sanctuary is therefore a vital site for the protection of the species during the winter period.

The entire low land use zone is a potential occurrence zone for the species since both sites where the Blue Swallows were observed were in this zone. If we consider level of human activity as a measure of remoteness which seems to favour the species hence inference of land use, the current high land use zone has equal potential of being favoured by the species as it is now also fenced off and should just be equally remote as the rest of the Park.

Blue Swallows are low-flying species that associate with other hirundines and some swifts. The species at this wintering site seems to thrive in grassland and *Acacia drepanolobium* habitat with some open water pools and generally undulating topography. The relevance of the taller, woody plants such as *Balanites sp.* is not apparent but this does not mean that they are not necessary. Some bare ground surface is also important for preening probably because most of the individuals have just moulted and it may be necessary to preen the new developing and developed feathers to get them in perfect condition prior to their return flight to wintering grounds.

Recommendations

1. An off-road survey following the rangers' tracks under the guidance of the park rangers should be conducted just in case the unsurveyed eastern section has favourable sites used by the Blue Swallows. This is because Ruma National Park has only 2 major roads running across median and the southerly sections of the park. These constituted the 2 main surveyed transects. There is also a peripheral road running along the western end which was also surveyed. The eastern end however has no infrastructural access. We noted during this survey that there were many swallows in the eastern section yet those could not be identified because they were too far and there was no way of reaching them.

2. An expert should be deployed at Ruma National Park during the migration seasons for a couple of years to be able to effectively monitor the trends of the species. These include conducting counts for the species, evaluation of their distributional patterns and assessment of possible intrinsic threats to the species at site.

3. There is urgent need to conduct similar surveys in other areas where Blue Swallow is said to occur to enable comparisons of populations in these sites with those at Ruma NP. These surveys should entirely target the unprotected Busia Grasslands IBA where no surveys have been done before in the last 10 years. There is also need to assess the current status of the Blue Swallow habitats in Busia owing to the apparent growing local human population, suspected hunting of birds for food/sale, and increasing human activities especially sugarcane cultivation and subsistence agriculture.

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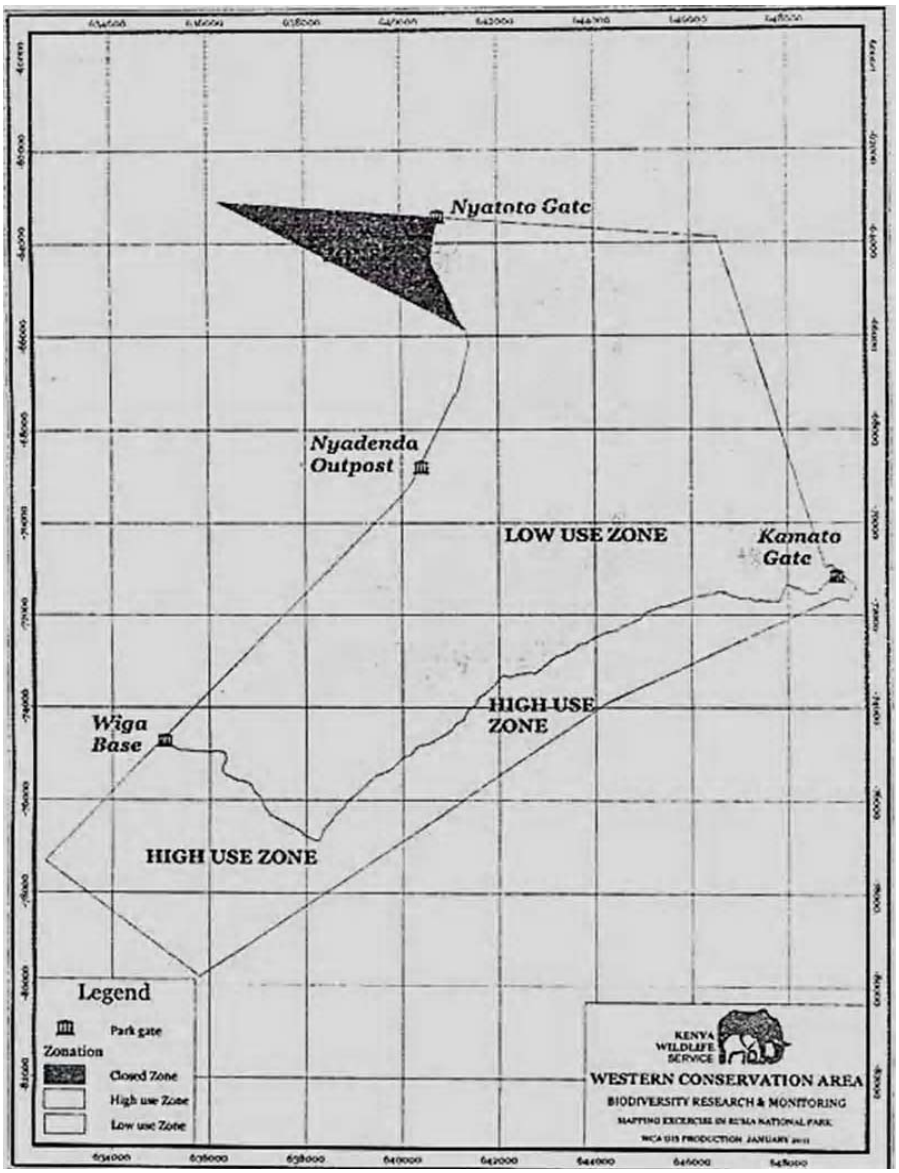
Appendix: Ruma National Park-Zonation



Map of Ruma National Park land use zones. Source: Edited from Kenya Wildlife Service map, RUMA NATIONAL PARK-ZONATION.