

Mount Nilo, Tanzania: is it a key area for globally threatened birds?

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Introduction and background

Between 1st February and 20th February 2016, a field team consisting of five people visited and surveyed Nilo Nature Reserve (35km north of Amani).

Nilo Nature Reserve (NNR) has an area of 6,025 ha and was established in 2007 and published in the official gazette GN.234 resulting from upgrading the conservation status of Nilo Forest Reserve. The nature reserve is a part of the Eastern Arc Mountains Forest in Tanzania. It is the northern-most extension of the East Usambara Mountains, and falls under three district authorities, namely: Korogwe, Mkinga and Muheza, all in Tanga region. More than 30,000 people from 16 villages live adjacent to the reserve. The reserve is included in the East Usambara Man and Biosphere reserve (EUMAB) and has the highest biodiversity value of all of Tanzania's nature reserves.

The team had two major goals. First, the team needed to do a survey of the Long-billed Tailorbird *Artisornis moreaui* in order to assess the ecological requirements, population density, as well as threats to the survival of this Critically Endangered species in nine existing transects (45, 46, 47, 48, 49, 50, 51, 52 and 53). These transects were established in 2010, and each has 10 fixed points, making a total of 90 points. The second goal was to establish and survey five new transects: 54, 55, 56, 57 and 58. All these new transects were to cross new locations in Nilo Nature Reserve.

Apart from surveying the key species (Long-billed Tailorbird), the team also surveyed and recorded other bird species in the area such as Mombasa Woodpecker *Campethera mombassica* (LC), Fischer's Turaco *Tauraco fischeri* (NT), Southern Banded Snake-eagle *Circaetus fasciolatus* (NT), Red-capped Forest-warbler *Artisornis metopias* (LC), Red-tailed Ant-thrush *Necossyphus rufus* (LC), Uluguru Violet-backed Sunbird *Anthreptes neglectus* (LC), Banded (or Banded Green) Sunbird *Anthreptes rubritorques* (VU), Amani Sunbird *Hedydipna pallidigaster* (EN), Spot-throat *Modulatrix stictigula* (LC), Dapple-throat (or Dappled Mountain Robin) *Arcanator orostruthus* (VU), Usambara Thrush *Turdus roehli* (NT), and Pale-breasted illadopsis *Illadopsis rufipennis* (LC). Furthermore, we recorded White-chested Alethe *Chamaetylas fuelleborni* (LC), Sharpe's Akalat *Sheppardia sharpei* (LC), Kenrick's Starling *Poeoptera kenricki* (LC), and Usambara Weaver *Ploceus nicolli* (EN). The presence of these species highlights the importance of bird research and conservation of reserves to the national and international scientific and conservation communities like BirdLife International.

Methodology

We conducted bird counts early in the morning along the transects. A transect is 2km long and has ten point counts with 200m intervals. We spent ten minutes in each point count, with one minute performing the Long-billed Tailorbird playback recordings at the beginning and one minute of playback in the last 5 minutes. We recorded all Tailorbirds that responded. If the Long-billed Tailorbird was known from a point, we did not play the call any more. This helped to minimize the disturbance of this Critically Endangered species. We never used playback to attract other target species of birds.

For habitat types, we estimated percentage of different habitats inside a radius of 25m from the point count. Usually the habitat types included primary forest (where the domination percentage of the invasive tree *Maesopsis* is less than 5%), slight disturbance (where *Maesopsis* is between 5-15%), disturbed forest (where *Maesopsis* is above 15%), and tree plantations (e.g. *Eucalyptus*), traditional crops and tea plantation. Traditional crops are dominated by local food crops such as banana, cassava, cardamom, sugarcane and maize.

We also estimated the percentage of canopy and ground cover. At each point we counted, three measurements were recorded in three different directions (N, SE, and SW) with canopy scope instruments including compass directions. The canopy scope can range from zero (very dense canopy) to 16 which is a clear view of the sky with no vegetation. This is how we estimated and measured the percentage of canopy cover. The percentage of ground cover was estimated by using the chequered board half-disappearance distance method. For this, one observer (always the same person) stood at the point count centre, and the other walked away from the observer holding the chequered board at breast height. The distance between the observer was measured precisely by measuring tape, at the point when the person at the point centre was able to see only 8 out of 16 squares. Three measurements were taken as well: north, north-west and south-east.

Various supplementary techniques were used during the Mount Nilo survey to measure *Maesopsis* abundance and human disturbance. *Maesopsis* is an invasive tree species and one of the indicators of disturbance, which is why its density was estimated. For *Maesopsis* abundance we counted all trees with > 15cm diameter and the number of *Maesopsis* >15cm diameter within a radius of 20m. For signs of human disturbance, we counted the number of woody stems (tree or shrub) that showed signs of human damage (cuts or any other signs of human activities) within a radius of 5m from the point count (a measuring tape was used to get accurate data).

Results

In Nilo Nature Reserve the main habitat is primary forest dominated by tall trees associated with vines and climbers. This is why the number of birds that were recorded by hearing was quite high compared with the ones by sighting. In these four new transects we discovered seven new territories of Long-billed Tailorbird and fourteen individuals were recorded. In the old transects we recorded possibly seven to ten new territories, but this needs confirmation based on our previous data. Furthermore, two territories of Long-billed Tailorbird were recorded in opportunistic observations.

Unfortunately, we were not able to establish and survey transect number 58 which is located in the southern part of Nilo Nature Reserve. This was because it crossed through private farms. We tried to negotiate with the owners through Village Environmental Committees, but we did not get permission to work in their farms. There are three territories of Long-billed Tailorbird at the beginning of transect 58 in the first points. We recorded them as opportunistic observations a few years ago. We hope to agree with the farms owners that we will protect the territories by giving financial compensation annually.

Vegetation and forest disturbance

The abundance of *Maesopsis eminii* seems to be low in Nilo Nature Reserve. *Maesopsis* is not a big problem overall, although in some places which were disturbed, especially the southern part (Kizerui, Zirai), *Maesopsis* was beginning to colonise the area.

In the southern part of Nilo (Zirai, Kwelumbizi and Kizerui villages), the human settlements are expanding all the time so there will be future pressures on the forest in terms of requirements for cultivated land. Similarly, the demand for dead firewood can be expected to increase rapidly in the future. During our survey we found that the *Eucalyptus* that demarcated public and forest land have been chopped down for timber and instead farmers have extended the cardamom farms into the reserve because the public land seems to be less fertile. This could become a very serious issues for conservation if it is not controlled.

Recommendations

The current rate of chain-saw use in the public land and its future sustainability should be investigated and stopped. The forest in the public land provides habitat for some globally threatened bird species such as Banded Green Sunbird, Amani Sunbird, Fisher's Turaco, Kenrick's Starling, Uluguru Violet-backed Sunbird, and Southern Banded Snake-eagle.

Environmental education activities in the villages such as Misalai, Zirai, Kwelumbizi, and Kizerui should be initiated so as to both protect the reserve and provide a basis for sustainable development in the future. The cardamom farms observed that had extended into the Nature Reserve should be removed, and the boundary needs to be well marked by replanting a fast-growing, non-invasive exotic species such as *Eucalyptus* sp. Also, there should be a strong patrol to work with the foresters of Nilo Nature Reserve to make sure that the boundary is well clarified by regular clearing.

Amani and Nilo Nature Reserves host rich and unique biological communities. The Long-billed Tailorbird has an important distribution in Nilo, particularly in the south. This is also an area with recent past disturbances. Therefore there is an urgent need for an effective long-term programme not only to help secure the survival of this globally threatened bird species, but also to preserve the catchment forest on which many locals as well as people in the city of Tanga depend for water.

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Illustration 1: Mt Nilo Park Headquarters



Illustration 3: Illegal logging in the Mt Nilo forest



Illustration 4: Habitat assessment during the survey



Illustration 5: Campsite near Mt Lutindi Peak