

Project Update: October 2023

In an effort to reach out to the younger generation, the research team involved two young senior biology students (4th year) in the group. As part of their senior research project, the students were given a mini-project to investigate seasonal variations in the diversity and relative abundance of birds along the Asmara sewage system, known as Mai-Bella, and its surrounding farmlands. The study area includes wastewater irrigated farmland; water bodies- mainly small reservoirs with suspended aquatic vegetation, and the Mai-Bella wastewater stream which carries the sewage load of Asmara city. It extends up to Tsaedachristian, west of Asmara, from Radar in the northwest and Track-C in the west through AdiSegdo and Unagudu.



Fig. 1: *An overview of the study area.*

In addition to habitat type, seasonality has a significant impact on bird species diversity, relative abundance, and range. It affects the food and cover availability of the birds, which in turn bearing on breeding success and, ultimately, survival of the birds. The project determines seasonal change in species diversity, abundance, and distribution of birds relative to habitat characteristics. Moreover, potential threats were identified, and possible solutions were recommended for future management strategies. The study is believed to contribute to the comprehensive species checklist for the study area and, likewise, for the country.

Point-count method was employed, and permanent survey stations (counting points) were established systematically at 200m intervals across the walking path to minimizes the probability of multiple counts of individual birds (Bird Studies Canada,

2003). To maximise species detectability and collect significant data, each sampling site was visited three times during the dry and wet seasons, and migration period. All birds identified by direct sight or call were counted. The number of individuals per bird species was counted.

The total list of birds was generated by pulling together all the species recorded for all the seasons; and species richness, diversity and abundance, relative to seasonal variation, was computed and evaluated using different diversity indices.

During the study period, a total of 117 bird species belonging to 39 families and 15 orders were recorded. Wattled Ibis, Moccoa duck and Rouget's rail are regionally endemic to Eritrea and Ethiopia (John and Atkins, 2009). Rüppell's griffon, a Critically Endangered (CR) species, was recorded in the study area, which signifies the importance of the area as a refuge site for threatened species. Moreover, both Sudan golden sparrow (*Passer luteus*) and Senegal tick knee (*Burhinus senegalensis*) were recorded in the area (previously not reported). They are breeding residents in the eastern and western lowlands below 400m and 1900m respectively (Nigel *et al.*, 2011).

Of the total individual recorded (# 12311), 6021 birds were encountered during the migration season compared to 2139 in the wet season, mainly due to the fact that many Palearctic migratory species are using the site either as stopover location, to refuel during the long journey, or wintering ground to overcome drought and avoid competition in the breeding area. Anthropogenic activities are identified as the root causes for disturbance and habitat destruction of birds.

The students presented and defended their findings in the department of biology, Mai-Nefni College of Science (MCS). All biology staff members and other departments, all biology students (2nd and 3rd year), invited guests, family members and friends, and interested individuals attended the presentation.





Fig. 2: Students presenting their findings to the College community.

Finally, the students recommend the need of conservation education and awareness programs for the farmers, students and people that live in the surrounding area. Publication of factsheets, checklists and pocket guides about biodiversity of the study area could help to widen the local knowledge.

Moreover, seminar was organized for college students under the assistance of MCS entitled "Birds and Birding in Eritrea" which includes the resent research work undertaken.



Fig. 3: Slide presentation.



Fig. 4: Seminar organized for college students.