

PROJECT DESCRIPTION

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MOHAMED KIBAJA (Academic staff UDSM)

DEPARTMENT OF ZOOLOGY AND WILDLIFE CONSERVATION

P. O BOX 35064 UNIVERSITY OF DAR ES SALAAM

DAR ES SALAAM, TANZANIA

UNIVERSITY OF OSLO (Guest Researcher)

OSLO, NORWAY

TITLE

VERIFICATION SURVEYS OF THE ENDANGERED RONDO GALAGO (*Galago rondoensis*) IN UNSURVEYED COASTAL FOREST PATCHES IN HANDENI, TANGA REGION, TANZANIA

INTRODUCTION

The Endangered Rondo Galago (*Galagoides rondoensis*) is endemic in coastal forest patches of Tanzania. It is classified as endangered by IUCN (Perkin, 2019; 2020) due to its extremely limited and fragmented range in a few remnant patches of coastal forests, notably, Pugu-Kazimzumbwi, Zaraninge, Pande, Rondo, Litio, Ziwani, Chitoa, Ruawa and Ndoto forest patches (Honess, 1996; Honess et al., 2008; Gwegime *et al.*, 2013; Gwegime, 2016). Their present status is unknown. Among those forest patches only the Zaraninge Forest fragment was annexed to the famous Saadani National Park, the some being managed as nature forest reserves while other village land. In Tanzania, those forest patches occur roughly close to the coast of Indian Ocean (about 2-50 km). Coastal forest fragments away (about 300 km) or the outliers of coastal forests have never been surveyed specifically for this endangered species. These forest patches away from the geographical range of the species harbor similar endemic plant species and fauna which have prompted the government to involve the local community to conserve the forest. Successful conservation of a primate species requires detailed knowledge on its distribution, numbers and threats. The first two are important to determine conservation priorities and design management plans for the species (Kühl et al. 2008), guiding the creation of protected areas, corridors, buffer zones, boundary demarcation and tourism planning. A baseline population size is indispensable for future monitoring (Plumptre and Cox 2006). Threat assessment surveys allow identifying the types and sources of threats and evaluating their impact to the species survival. These are important to identify areas of high conservation value and evaluate the effectiveness of protection and management strategies (Kühl et al. 2008) and to guide conservationists in designing alternative activities for specific community groups that carry out the threat activities.

Intensification of anthropogenic activities such as deforestation, agriculture, logging, urbanization and infrastructure development of roads and railway lines also provide strong rationale for conducting primate surveys. Different forms of habitat alterations threaten most primates with extinction (Estrada and Garber, 2022; Estrada *et al.*, 2017). Most of those activities have been reported to affect *G. rondoensis* and its habitats across various parts of coastal forests

including the Pugu Nature Forest Reserve (Gwegime, 2016). Even though primate species respond variously to different forms of habitat alterations, some species for example, respond by declining after habitat modification (Estrada and Garber, 2022) while others become compressed in small forest fragments (Decker, 1994; Siex, 2003). Population compression result in large density for some primate species in such small fragments and this could have a profound effect on their behaviour patterns as well (Siex, 2003). Many studies have been carried out, describing their taxonomy, morphology, distribution and ecology for nocturnal primates along coastal forests of East Africa (Perkin, 2007).

Anthropogenic activities have severely affected most coastal forests and their biodiversity (Clarke and Dickson, 1995). Most, human activities in coastal forests target dry evergreen forest for agriculture (e.g. farming) and the woodland for harvesting the Mpingo tree (*Dalbergia melanoxylon*) for carving work. These activities have been making most coastal forest fragments and woodlands potentially vulnerable to changes. The Central government of Tanzania has encouraged local communities across coastal villages to set aside some forested land for conservation. As a consequence, a net work of different sized forest fragments have been set aside for conservation of coastal endemics. The initiatives were prompted because of concentration of endemic flora and yet to be described fauna in these very fragile coastal forest fragments. However, emphasis was not rendered for primates especially these endangered primates (e.g. Rondo galago). Therefore, there is a strong need to carry out surveys for the endangered primates. Thus, it is critical to obtain data on the galago's distribution patterns, population status and threats in this area in order to include priority forest fragments into the officially known Participatory Forest Management (PFM) scheme. The major purpose of this proposed project is to contribute to the conservation of Endangered Rondo galago in Tanzania by: 1) determining its distribution, extent of cooccurrences in unsurveyed forest areas in Handeni, Tanzania 2) determining their population size and 3) assessing its conservation threats for the species.

STATEMENT OF THE RESEARCH PROBLEM

The Rondo Galago (*Galagoides rondoensis*) is endemic in coastal forest patches of Tanzania. It is classified as Endangered by IUCN due to its extremely limited and fragmented range in a nine

remnant patches of coastal forests (Honest et al., 2008; Gwegime *et al.*, 2013; Gwegime, 2016; Perkin, 2020). Among the remaining forest patches, only the Zaraninge Forest was annexed to the famous Saadani National Park while the rest are threatened with anthropogenic activities. The current distribution range of Rondo galago constitutes the southern range (Pwani and Lindi Regions) which was subject to previous surveys (e.g. Gwegime et al., 2013; Kiwia, 2006; Murphy 2015), but not the northern coastal strip of the Indian Ocean (Tanga Region). Thus, northern coastal strip was not surveyed for any primate species. Ad-hoc interviews with local people at Kiva ward in Handeni DC provide a strong evidence for the presence of dwarf galagos known to inhabit community forest patches since time immemorial. My impromptu visits in two forest patches in Kiva ward in Handeni in 2021, recorded advertisement calls similar to the ones heard from Pugu-Kazimzumbwi and Ruvu South Nature Forest Reserves, thus prompting a proposed study to affirm their (dwarf galagos) presence. This project aims to confirm/affirm the presence of Rondo galago in unsurveyed coastal forest fragments in Tanga Region by focussing on its distribution, population status and conservation threats. Surveys of the endangered galago in the proposed study area will serve as a flagship to conserve diverse endemic flora and fauna including primates in study area. This project will also conduct conservation awareness activities in this area.

SIGNIFICANCE OF THE STUDY

Because successful conservation of a primate species requires detailed knowledge on its distribution, numbers and threats, the findings of this study will serve to determine conservation priorities and design comprehensive management plans for the species targeting its entire geographical range. The results will also provide strong impetus or catalyst to win community support in coastal forest patches owned by local communities. This will depend on a well designed community conservation education. A baseline population size will also serve for future monitoring in surveyed forests. The results for the conservation threat assessment will enable the identification of the types and sources of threats and evaluating their impact to the species survival. These are important to guide conservationists in designing alternative activities for specific community groups that carry out the threat activities.

OBJETIVES

GENERAL OBJECTIVE

The general objective for this proposed project is to carry out confirmation surveys for the Endangered Rondo galago (*Galago rondoensis*) in unsurveyed forest patches of coastal forests in Handeni, Tanzania.

SPECIFIC OBJECTIVES

- i) To determine Rondo galago presence, distribution, extent of occurrences in Handeni.
- ii) To determine the Rondo galago population status in unsurveyed forest areas in unsurveyed forests in Handeni
- iii) To assess its conservation threats for the species across the study areas.

RESEARCH OUTPUTS

- i) The presence of Rondo galago in selected forest patches in Handeni will be ascertained. Their current extent of occurrences across the species range in Tanzania will also be produced.
- ii) Their current population size at various forests in Handeni will be known.
- iii) The types of human signs threatening Rondo galagos will be identified and their encounter rates will be computed.

METHODS

STUDY AREA AND SITES

The field study will be conducted in coastal forest patches (or coastal outliers) in the Handeni District Council and Handeni Town Council in Tanga Region. The districts' land is characterized by ridges or gently undulating topography, with a few hills rising over 500 m above sea level (Mwihomeke et al., 1998). Rains in this area the rains vary from 700 mm to 1,000 mm per

annum. There are two main types of natural forest vegetation: semi-deciduous miombo of the Zambezian centre of endemism and the undifferentiated forests of the Zanzibar-Inhambane regional mosaic (Mwihomeke et al., 1998). However, currently its natural vegetation has been reduced in size due to rampant agro-pastoral activities (e.g. Rugambwa et al. In Press). Surveys will be conducted in the following forests: Handeni Hill Forest Reserve (TFS), Manchinda and Masala village Forests in Handeni Town Council and Kiva Hill Forest (TFS), Kwechijela, Ugonamzungu, Kwahuzi, Mgana, Kweisonga, Chikuyuni, Chilungule, Kwamsangazi, Masalaka in Kiva ward (Handeni Rural DC). The Handeni Hill (Handeni Town Council) and Kiva Hill forests (Handeni Rural DC) are centrally managed by Tanzania forestry Services (TFS) Agency while the rest are under either Joint Forest Management (JFM) or Community based Forest Management (CBFM) (see Mbwapbo et al., 2013) or Village Forest Reserves.

DATA COLLECTION

Night surveys will be carried out along pre-existing paths (herein referred as line transects) in the several forest patches in Handeni. In cases, pre-existing paths are not available, then trails will be established by cutting and marking them using red coloured boundary/flagging tape. Cutting will be kept to the minimum required to make the transect line visible and passable at night. All transects will be tracked using GPS in order to present them in a digital map of all forest patches in the districts.

The surveys will be done during the first half of the night hours (18:30 hrs to 23:00 hrs (herein referred as night walks)) and last third of night hours (03:30 to 06:30 hrs) (herein referred as morning walks)). At least four hours per night of night walks and three hours per night of morning walks will be conducted (e.g. De Jong and Butynski, 2009). The plan is to have each forest patch visited for 3-5 days within the 12 month period.

At the start of each systematic night walk, the location, time, date, weather conditions, moon phase and a description of the dominant vegetation type on the tape will be recorded (De Jong and Butynski, 2009). During the night census walks, galago vocalisations will be sound recorded for aiding species identification. Vocalisations will be recorded using a cheap modern tape recorder (Sony pcm-A10, Zoom H1n). Start and finish times will also be noted as well as time taken to record and/or observe animals (e.g. De Jong and Butynski, 2009; Kibaja et al., In Press).

Recording galago vocalisations, particularly the ‘species specific advertising call’, provides a reliable way of recognising galago species in the field and is an important field survey tool, especially where it is difficult to trap individuals (Bearder *et al.*, 2013; Zimmermann, 1990). A reference database of galago vocalizations is held at Oxford Brookes University, UK. However, in the meantime, the galago calls will be identified in the field by the Rondo galago scientist.

To obtain enough data for mapping the focal *G. rondoensis* species live trapping using Sherman traps and opportunistic recordings of *G. rondoensis* will also be made at at-least two locations in each forest (purposely chosen). Traps will be baited with “mnazi” local brew and ripe bananas and pineapples to attract the bush babies (Kibaja et al., In Press). When Rondo galago is trapped, it will be transferred into a well ventilated cage before taking measurements. It will be later released back to the site where it was trapped (Kibaja et al. In Press).

DATA ANALYSIS

Galagos sightings and vocalization from systematic night surveys (census night walks), opportunistic encounters and live trapping will be used to obtain data on presence or absence of the Rondo galago. The GPS location for the presence of Rondo galago from the presence/absence survey, traps and night galago walks surveys (including sightings and vocalizations) will be plotted in Google Earth maps in order to produce a distribution map for the Rondo galago. Google Earth maps are very informative as they clearly show vegetation types where galago species were recorded.

The number of encounters and their percentages of all *G. rondoensis* will be computed in each forest and these will be used as indicators of their abundances in forest patches. In this survey, population density will first be computed in each transect/trail, by dividing the total number of encounters (including sightings and vocalizations) of galagos divided by the product of the total distances walked from pre-existing transects/trails and the fixed strip width of 50 m (0.05 km) or [(25 m (0.025 km) either side of transect)]. The mean population density will be obtained by averaging the total density from the transects/trails.

PROPOSED TIME PLAN AND FRAME

Time table	Activity
December 2024-May 2025 (6 months)	Presence/absence surveys and transects to assess distribution and population status in Handeni
December 2024-May 2025 (6 months)	Threat assessment surveys in Handeni
June 2025- August 2025 (3 months)	Trapping of Rondo galago, using live Sherman and releasing trapped animals back to the field.
September 2025-November 2025 (3 months)	Drafting a manuscript for the Rondo galago to be sent to the International Journal of Primatology (IJP). Draft a report to the TAWIRI (permit granting institute) and International Primatological Society-IPS (Funder)

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