Project Update: March 2018

Data collection

Site selection

The two first fieldwork trips took place from August to December 2017 and from January to March 2018. The sampling locations for the collection of the population density and lemur presence and absence data were selected according to different survey designs for the two species. We first gathered information regarding lemur's locations from available studies (Nadhurou et al 2016); Louette et al. 2004); local NGOs also provided precise information on *lemur's* locations.

Second, the sampling sites were informed by our wish to sample areas in which a wide variety of habitats were available. This range of habitats is necessary when sampling occurrence data in order to compare sites in which a species is present with sites in which it is absent.

Presence and absence of lemurs

To locate lemur occurrence data, the prospection was carried out at dusk and after nightfall from 17:30 to 20:30. In each location, data was collected (when available) along trails and roads in open areas suggested by our local guides. Whenever possible, we selected routes that crossed different types of habitat (preserved forest, degraded forest or agricultural land) to allow the detection of lemur in different habitats within a geographical area. In dense vegetation, transects from 1 to 2 km in length were cleared by our team. The starting point of a transect was randomly selected and the trail followed the altitudinal gradient. During each prospection, when animals were observed at a distance of between 0 and 50 m from the centre of a transect (the distance varied depending on visibility), a plot with a 25 m radius was delineated around the tree hosting the lemur and the geographic location was recorded. During the dusk/nightfall surveys, a site was considered to be absent of lemurs if no individuals were observed during 30 minutes of prospection. After this duration, a 25 m radius plot was delineated to define the location.

Lemur density

To estimate lemur population density, we conducted nocturnal lines transect using distance sampling survey (Buckland *et al.*, 2001; Meyler *et al.* 2012; Ibouroi et al. *et al.* 2013) commonly used for forest dwelling primates (Buckland *et al.*, 2010). We established transects lines and mostly used existing trails when available. To facilitate the walk during the nocturnal observations, each transect and trail was marked by flags each 20 m and was surveyed three times by a two to three member teams walking slowly (0.5km/h) between 18.00 and 21.30 with headlamps. When an animal or group of animals was seen, the following information were recorded: time of observation, the GPS point, the height where the animal was seen on the tree, the number of individuals and an estimated perpendicular distance between the animal and the line transect. This last information is crucial for the calculation of the density and therefore is carefully collected. During our field works for population density, we observed 69 individuals of the Mongoose lemur from 39 social groups.

Habitat characterization

Habitat characteristics such as forest type (natural or degraded), density of trees, canopy height, canopy openness, and intensity of tree cutting were recorded for

each of the 25 m radius plot. Tree density was considered as the number of trees with a diameter at breast height (dbh) of more than 15 cm. Intensity of tree cutting was estimated by counting the number of trees felled down in each plot. Tree height and dbh were recorded for each tree that hosted lemurs. Tree height and the percentage of canopy openness were visually estimated by three to four people (two experienced researchers from our team and one or two local guides) and the mean value was recorded. All these information are necessary to interpret the factors impacting lemur's habitat selections population density.

Semi-structured questionnaire

Interviews were conducted during our fieldwork. Based on an interview guide made of 30 questions, we conducted semi-structured interviews that aim at getting information regarding natural resource uses and their consequences on forests (Ibouroi 2017). Individual interviews were carried out by two researchers in isolated place to avoid all influence of the discussion by other persons. Discussions and information records took about one hour each. All responses were recorded with a Dictaphone. In total, 27 persons were interviewed in the entire area of the Comoros Islands.

In addition to the interviews with local population, a Q-methodology was applied to reveal local population subjectivity and attitudes towards natural resource use and long-term biodiversity conservation. It specifically aims at underlying patterns among the targeted population that have broad shared common points and divergences. Our previous semi-structured interviews with local population (see above) were used to select an ensemble of 60 opinion statements expressed by the participants. The statements were then grouped into five main topics: (i) land use, (ii) living activity of local population, (iii) importance of forest and biodiversity for local population, (iv) relevance of a protected area in order to allow long term conservation of biodiversity and natural habitats. In order to have the opinion of each participant and their common and divergence points, participants were asked to sort a list of 33 items according to a nine-point scale of agreement/disagreement (4, 3, 2, 1, 0, -1, -2, -3, -4) forcing them to rank their opinions (figure 1).

The aim of this socio-economic study was to assess relationships between the local community and natural resource uses and their impacts on natural habitats. More specifically we assessed (1) how rural informants perceive benefits from natural resources and how they impact biodiversity, (2) the various knowledge, perceptions and attitudes towards biodiversity as well as conservation actions in general. As social factors such as age, activity, level of formal education, and geographic localisation can affect knowledge and determine attitude and perceptions, we assessed what factors might be related to positive or negative perception towards forests, biodiversity and flying foxes conservation. Such information might help to understand the representation of the local community for this biodiversity, to interpret the on-going natural habitat evolution and to predict its future allowing us to subsequently propose some relevant long-term conservation actions and habitat management.

All these data will be completed by other field data during our lasrt sampling session and will be analyzed using ecological modeling including Species Distribution Modeling, Distance Sampling Approach and Q-Methodology approaches in order to reinforce conservation strategies of the mongoose lemur in the Comoros Islands.

Diurnal line transect survey in Moheli. ©Anziza.

Eulemur mongoz from Moheli. ©Thani.