

An assessment of the terrestrial mammal diversity in a sustainably logged forest in east Gabon: Impact of camera trap placement strategy on the detected species

Davy Fonteyn 1, Daniel Cornélis 2, Nicolas Deflandre 3, Adeline Fayolle 1, Jean-Louis Doucet 1, Cédric Vermeulen 1.

1 Université de Liège - Gembloux Agro-Bio Tech. Passage des Déportés, 2. BE-5030 Gembloux, Belgique

2 CIRAD, UPR Forêts et Sociétés, Univ. Montpellier, Montpellier Cedex 5, France

3 Precious Woods Gabon - CEB. BP 2262 Batterie 4. Libreville, Gabon.

Camera traps are widely used for assessing terrestrial vertebrate diversity across tropical forests. Non-random placement strategy is traditionally adopted, with camera traps oriented towards specific features such as game trails. However, this could artificially bias the capture rates of certain species. Here, we first assessed the terrestrial mammal diversity of sustainably logged forests in east Gabon. Then, we investigated the impact of placement strategy on the detected diversity by comparing game-trail based and systematically oriented camera traps. We followed a grid design replicated consecutively in four areas, composed of 15-17 sampling points placed every 2 km², and left for one month on the field. Each sampling point was composed of two cameras: the 'systematic camera' was placed close to the theoretical point and oriented towards a naturally cleared area, while the 'game-trail oriented camera' was located within a 20 m radius of the random camera. A total of 31 mammal species were identified, including gorillas, chimps, elephants, and leopards. Game-trail placement provided greater relative abundance for most species and the deviation to this pattern only concerned extremely infrequent species (sitatunga, golden cat). Multivariate analyses did not distinguish different species composition between the two strategies at the site scale (grid), although local differences did appear between pairs at the camera scale. When examining species occupancy, game-trail strategy does not seem to bias inventories compared to the random placement, and data from both strategies can be used in multi-site analyses, but this does not hold true for relative abundance. However, it is almost impossible to set up a strict random sampling and both strategies need a subjective decision when installing camera traps. We recommend maintaining game-trail orientation for large-scale camera trapping inventories conducted at species or community level.