

Bamboo for people, mountain gorillas, and golden monkeys: Evaluating harvest and conservation trade-offs and synergies in the Virunga volcanoes

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There are conflicting demands on bamboo (*Yushania alpina* (K. Schum.) Lin.) in Mgahinga Gorilla National Park (Virunga Volcanoes), Uganda. Local people lost legal access to bamboo when the park was gazetted in 1991 - but still request harvesting rights. Bamboo sprouts provide a key food for conservation significant Mountain gorillas (*Gorilla beringei beringei*) and African golden monkeys (*Cercopithecus mitis kandti*).

We examined the impact of a localised harvest of mature bamboo on the production of new stems. We used a grid of 540 variable area plots to record and assess 9420 stems (including 1268 cut stems) and 1981 sprouts. Mean densities were 3.96 stems m² and 0.68 sprouts m². Densities and diameters were lower in areas with tree shade compared to those without. Densities of new stems were positively related to densities of older stems. Diameters of young stems were positively correlated with the diameters of older stems but younger stems were, in general, significantly larger. Cutting of mature stems had no detectable impact on either the density or diameter of subsequent new stems. Statistical power analysis adapted from pharmaceutical assessments indicates that a minor positive or negative impact remains possible (a positive effect appears more probable). We conclude that the bamboo is in a "building phase", that densities and sizes of young stems are determined by the extent of the underground rhizome, and that this plot relationship is not detectably influenced by harvesting older stems. Nonetheless, negative impacts may arise with repeated harvesting. Guidelines for future harvest are suggested.

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