

Deforestation of Deciduous-Broadleaf Forests Causing Population Decline of Golden Snub-Nosed Monkeys on the Qinling Mountains in China

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ABSTRACT

Golden snub-nosed monkeys are found in the mixed deciduous-broadleaf forests on the Qinling Mountains as well as other mountainous forests in China. Their populations have been steadily decreasing for the past 40 years mostly due to deforestation that resulted in habitat loss.⁶ A study was conducted from June 2000 to October 2001 to test the usage by these monkeys of four habitat stages that result after clear cutting: grassland, shrub forest, young forest and primary forest.⁹ Another group of researchers conducted habitat assessments at the Shennongjia Nature Preserve, an area similar to the forests on the Qinling Mountains, to identify areas that remain suitable for golden snub-nose monkey habitation.¹¹ It was found that these monkeys selectively preferred to inhabit primary forests year-round. They rarely used young and shrub forest areas and never used grassland.⁶ Results from the habitat assessments have shown that there are very few areas left in the Shennongjia region that are currently suitable for golden snub-nosed monkey populations.¹¹ This is likely the case on the Qinling Mountains as well but further research must be conducted. Areas that have undergone clear-cutting are difficult to restore to a high-quality habitat suitable for the golden snub-nosed monkeys. Conservation of areas that have identified as suitable habitats should be given priority and clear cutting should be prohibited in such areas.⁹

Group of Golden-Snub Nosed Monkeys



Figure 1. A group of golden snub-nosed monkeys on the Qinling Mountains huddled together. Image taken by Stephen Belcher.¹ They typically form subpopulations of around 100 individuals.⁶

INTRODUCTION

Rhinopithecus roxellana, or the golden snub-nosed monkey, is a species of primate indigenous to China. Currently, their populations have been reduced to inhabit six isolated mountainous forests including the deciduous-broadleaf forests on the Qinling Mountains.⁶ The diet of the golden snub-nosed monkey consists of a variety of fruits, seeds, lichens, leaves, bark, twigs, and buds.⁵ Golden snub-nosed monkeys are currently listed as an endangered species with deforestation being a major contributor to their habitat loss and subsequent population decline.⁹ Their population structure consists of clusters of individuals gathered in subpopulations. Major topographical structures as well as habitat fragmentation restrict their populations geographically.⁶ Physical separation have decreased the amount of genetic diversity within these subpopulations, further increasing their risk of extinction.²

Seasonal Forest Make-Up on the Qinling Mountains

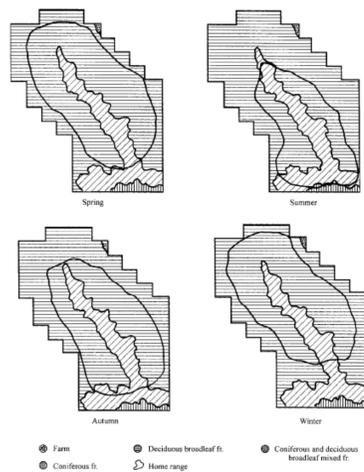


Figure 3. Seasonal make up of the forests on the Qinling Mountains. Home range of the golden snub-nosed monkey during each season is encircled. These areas are composed of either deciduous broadleaf forest or a mix of coniferous and deciduous broadleaf forests.⁷

METHODS AND RESULTS

Scientists conducted a study from June 2000 to October 2001 in the Shennongjia Nature Preserve to determine which stages of secondary succession after clear cutting could provide suitable habitats for the golden snub-nosed monkey. They observed two separate groups of golden snub-nosed monkeys for 7 months during this study period, taking some observations during each season. Out of the four types of land present, the golden snub-nosed monkey favored primary forests and sometimes inhabited young forests. They were observed to scavenge around shrub forests occasionally but they never used grassland areas.⁹ Another group of researchers conducted several land assessments in the Shennongjia area to determine which areas remained suitable for golden snub-nosed monkey habitation. They located six isolated patches.⁶

Secondary Succession Following Clear-Cutting

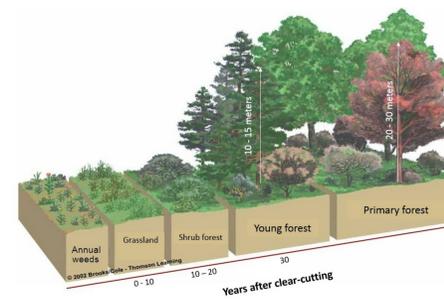


Figure 4. Secondary succession of forest after clear-cutting. Image edited from a picture taken from a presentation created by Ralf Gregory on SlidePlayer.⁴ The golden snub-nosed monkey favors primary forests, can sometimes inhabit young forests, rarely use shrub forest, and never use grassland areas.⁹

Current Areas Suitable for Inhabitation in the Shennongjia Nature Preserve

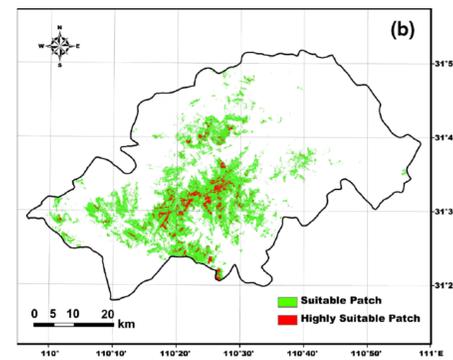


Figure 5. Areas left in the Shennongjia area in China that are suitable for *Rhinopithecus roxellana* habitation. Suitable areas are represented in green. Highly suitable areas are represented in red. Researchers have identified 6 main patches.¹¹

DISCUSSION

At least 30 years of regrowth is required for land after being clear-cut to develop into a young forest and provide a potential habitat for golden snub-nosed monkey populations. More likely, these primates will not begin to inhabit the area until it becomes a primary forest. Primary forests have a larger biomass and therefore are able to provide access to a much larger food source of new leaves, buds, and fruits that golden snub-nosed monkeys require to survive. Most trees in deciduous-broadleaf forests that provide these food resources take 20 to 40 years before they start bearing fruit.⁹ Thus, most of the trees in shrub forests and even young forests are too young. In addition, lichens are very important for these monkeys and are their main source of food in the winter months when other food sources are scarce.³ However, the trees that make up shrub forests and young forests are too small to have substantial amounts of lichen if they have any lichen at all. Furthermore, the taller trees that make up primary forests also serve as better protection and provide more cover to hide from predators.⁹

Diet of Golden Snub-Nosed Monkeys

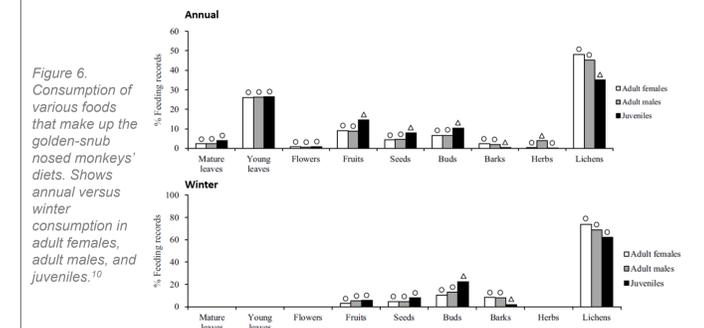


Figure 6. Consumption of various foods that make up the golden snub-nosed monkeys' diets. Shows annual versus winter consumption in adult females, adult males, and juveniles.¹⁰

CONCLUSIONS

Further tests and assessments need to be conducted on the Qinling Mountains to determine how much and which areas are still suitable habitats for golden snub-nosed monkeys. Areas that have already been identified should be conserved and protected from clear-cutting.⁹ Some conservation efforts have already been put into effect but more policies directed towards conservation will be needed to stop the decline of golden snub-nosed monkey populations and allow for them to recover.⁹

Animal Conservation and Environmental Protection

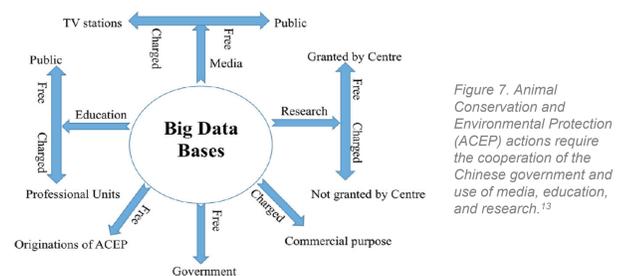


Figure 7. Animal Conservation and Environmental Protection (ACEP) actions require the cooperation of the Chinese government and use of media, education, and research.¹³

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Areas Currently Inhabited by Golden-Snub Nosed Monkeys

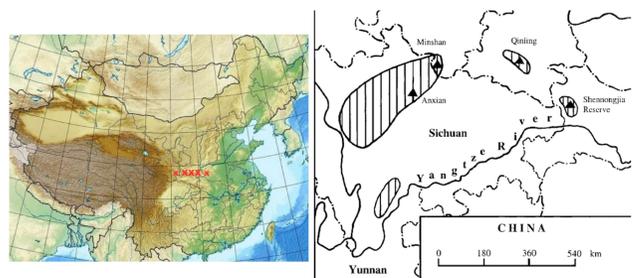


Figure 2. Left: Qinling Mountains marked in red on map serves as a natural boundary between Northern China and Southern China. Image created by David A. Mason.¹² Right: Current locations inhabited by the golden snub-nosed monkey shown by encircled vertically lined areas on the map.⁹