Correlation between Deforestation and Habitat Selection of Mammals in Higashiyama, Kyoto

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1. INTRODUCTION

Since Meiji era, Higashiyama area in Kyoto has been protected by several scenic area regulations that control many activities in the protected area. However, the overprotection by the regulations shut people away from the forest then it has been abandoned. Recently Higashiyama has been suffered from pine wilt disease and expansion of *Castanopsis* species, and then the scenic of Higashiyama has been damaged. The local governments have been trying to maintain the scenic of forests of the temples and shrines that were registered in Cultural heritage in 1994, by deforestation. It is proved that deforestation influences vegetation diversities. However the information of an influence of deforestation to mammals is limited. In this study, I investigated the correlation between deforestation and habitat selection of mammals by comparing the captured number of wood mice, the appearance number of mammals, and the habitat environment in deforestation and non-deforestation in Higashiyama Kyoto.

2. STUDY AREA and METHODS

The study was carried out in Japanese Red Pine forest and *Castanopsis* forest at Honenin temple in Higashiyama, Kyoto. 0.3ha of the Red Pine forest was deforested by local government in 2006. Also 0.2ha of the *Castanopsis* forest was deforested in 2005. The study sites (40m×50m) were located within these two deforested forest and two non-deforested forest adjacent in each deforested forest.

Sherman Traps were used to capture wood mice. 20 traps were set at 10 m interval within each site. A three day trapping was conducted once a month from September, 2009 to November, 2009. Captured mice were released after recording its species, sex, and weight. Camera-trapping was used to count the number of appearance of mammals in each site from May, 2009 to December, 2009. Habitat environment in each site was measured. The measured items were herb cover, herb height, litter depth, log cover, and the numbers of fruits fell into seed traps in each site.

3. RESULTS and DISCUSSION

The result of the captured number of mice, the appeared number mammals, and herb cover percentage were showed in Table 1. Both number of mice and mammals showed the highest number in the deforested pine forest where herb cover was well recovered after deforestation. The captured number of mice was highly related with the herb cover percentage of the study site. For mice, herb cover works as hidings from predators such as fox and weasel, thus the herb cover is very important element for mice to select their habitat. Therefore, it could be said herb recovery after deforestation would increase wood mice population.

The appeared number of mammals did not show great differences among each site. However, it was proved that there were mammals whose habitat selection was correlated with the deforestation, and whose was not. The middle-sized predators, such as fox showed strong correlation with the deforestation. Predators would have been seeking mice in well-recovered deforestation site, then their habitat selection indicated a tendency to the deforestation where their food was abundant. On the other hand, more omnivorous mammals, such as Japanese raccoon and wild boar did not show the correlation and they appeared in every site. Only Japanese squirrels showed negative correlation with the deforestation. They were mainly appeared in the non-deforested pine forest. They live in Red Pine forest environment and like to eat pinecone, therefore the deforestation of pine forest resulted in destruction of their habitat.

In conclusion, the deforestation that leads enough herb cover recovery would effect the recovery of mammal diversity as well as vegetation diversity.

Table 1 The captured number of mice, appeared number of species, herb cover percentage in each study site.

	Deforested pine forest	Non-deforested pine forest	Deforested *Castanopsis* forest	Non-deforested *Castanopsis* forest
Captured number of mice	14	0	2	2
Appeared number of mammals	10	6	7	6
Herb cover (%)	52.5	4.5	15.5	21.2