

## FAUNA CONSERVATION AND RECOVERY IN LOGGED FOREST

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### Introduction

Studies have been conducted on the effects of logging on birds (Zakaria and Nordin 1998; Zakaria and Nordin 1997; Zakaria, 1994) and on mammals (Zainuddin, 1996). Some of the effects include a decrease in abundance and diversity of many species of wildlife. With time, species number return to pre-logging levels but species composition changes. Common species of birds invaded logged forests while rare primary forest birds disappeared (Zakaria and Francis In Press). A similar response has been observed with certain mammals (Zainuddin 1996). This study will examine in more detail the effects of logging on fauna and conduct post-logging surveys to determine the extent of recovery of the fauna. Each component of the study will focus on a particular group of fauna. Together with past research findings, the information on the recovery of these animals in logged forest can be obtained, and suitable reduced impact logging guidelines and conservation strategies can be formulated in this study.

### Materials and Methods

The study area is located at Sg. Lalang Forest Reserve in Semenyih, Selangor. Three compartments were selected for comparison namely primary forest, 4 year-old logged forest and 9 year-old logged forest. The study will be divided into two main components of fauna: **Birds** – the composition, relative abundance and distribution will be determined using distance sampling method and mist-netting. Surveys will be conducted on a monthly cycle. During each survey cycle, no less than 14 days will be spent at each study site surveying for the presence of bird species. In addition, at least 10 days of mist-netting activities will be conducted in each month. **Mammals** – the composition, relative abundance and distribution will be determined using distance sampling methods, live trapping (rodents and squirrels) and spot observations. Surveys will be conducted on a monthly cycle. During each survey cycle, no less than 14 days will be spent at each study site surveying for the presence of mammalian species.

### Results and Discussion

The study is still in progress and will continue for at least another 12 months. Therefore, results presented here were only preliminary results. The estimation of species and certain groups of species densities were calculated using the latest technology of animal density estimation called DISTANCE 2.2 software (Zakaria and Francis 1998). Results showed that most of the large mammal species such as Tapir, Deer and primates were significantly decreased in logged forests compared to primary forest. However, the mammal species composition remained the same between the two forest types. Results on birds also indicated that most of the species that present in primary forests were also present in logged forests. However, their individual numbers were significantly re-

duced in logged than in primary forests. Exceptions were species that belong to the family Pycnonotidae (bulbuls). These species were significantly abundant in logged than in primary forests. These results indicated that logged forests could still maintain most of the forest mammals and birds (depending on logging intensity). However, the forests have become unattractive to most species. The main reasons for these phenomena might be that: (1) the animals' habitats have been damaged or altered in logged forests. Most of the animals preferred areas of low light intensity and cool condition. During logging, all the big trees particularly dipterocarp species were harvested. This would open the forest and create a lot of gaps. As a result, higher level of light intensity penetrated the forest floor and thus, increased the forest temperature. This was the reason why bulbul species were abundant in logged forests. They were colonising species and able to tolerate high temperature (Zakaria and Nordin 1998). (2) the food sources were also decreased in logged forest. Even though only the dipterocarp species were harvested, the non-dipterocarp species were also destroyed during the logging activities (Zakaria 1997, Zakaria 1994). Most of this non-dipterocarp species were fruit trees important to fruit-eating mammals and birds. Therefore, many wildlife species would prefer to forage in primary than in logged forests. They would easily locate fruiting trees there. Furthermore, the insect's abundance has also been shown to decrease in logged forests. This would result in insectivorous animals to forage more in primary than in logged forests. This was the main reason why the insectivores were detected more in primary than in logged forests.

### Conclusions

Most of the mammal and bird species could still survive in logged forests but their numbers were lower than in primary forests. This might depend on the logging intensity. The higher the intensity, the bigger the damage to the forest. This would affect the habitats and the food sources of the animals. Further study will reveal whether the animals in logged forests can recover to the same original condition as in primary forests. The information obtains will assist us towards better understanding of the responses of fauna to habitat change that result from logging and in formulating strategies for fauna conservation and management in tropical forest.

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