Understanding the Characteristic of Roosting Sites of Green Peafowl (*Pavo muticus* Linnaeus, 1766) in Baluran National Park

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Abstract. National park is a means of establishing natural resource conservation efforts, as well as the protection of ecological elements and the buffer system of life developed as a research activity and nature tourism. Characterized with the savanna, Baluran National Park hold the suitable habitat for many species including green peafowl whose global population is decreasing. This research aims to characterize the types and map the distribution of trees that become the roosting sites of green peafowl and initiated by a habitat survey which is continued by mapping the trees with the signs of green peafowl occupation such as droppings or molted feathers and characterizing the roosting sites by measuring as well as identifying the trees. The results showed that the green peafowls form association with *Cervus timorensis* Blainville according to the traces found on the indicated roosting sites and that there are as many as 33 trees of different species namely *Acacia leucophloea* Willd, *Azadirachta indica* A Juss, *Tamarindus indica* L, and *Ziziphus mauritiana* Lam that are preferred by green peafowl to be their roosting sites. The diameter of the trees is in average is 2 m, with the height of 14 m, the average number of strata 4, as well as the canopy area of 221.81 m².

Keywords: roosting site, green peafowl, habitat characteristics, Baluran National Park.

1. Introduction

National Park is a conservation area of land conservation and water that has a ecosystem that is divided into zoning system, and has the function as a buffer system of life protection diversity of plants, animals and its ecosystem. Baluran is a conservation area of Baluran National Park which has the widest savanna in Java Island region many call Africa Van Java as replica of African savanna, famous mascot of Bull (*Bos javanicus*). The ecosystem in Baluran is divided into several groups within it, ranging from aquatic ecosystems, coastal forests, seasonal forests, savanna, to natural forest ecosystems [1].

Savana Baluran is one of the distinctive characteristics and identity of Baluran National Park which has a very important meaning when its sustainability is affected by other ecosystem. The widest savanna in Baluran is a savanna Bekol which has an area of 300 H, and this savanna is dominated by...
black soil.\textsuperscript{2} Characteristic of this type of soil is easy to landslide and muddy when the rainy season comes, conversely in the dry season, the soil will be split with a depth of approximately 10 cm \textsuperscript{2}. The area around the Savanna there are a variety of Wildlife that can be found such as bull (\textit{Boss Javanicus}), Buffalo (\textit{Bubalus bubalis}), Crested serpent eagle (\textit{Spilornis cheela}), Grey backed myna (\textit{Acridotheres tricolor}), as well as many other types of birds and one of the animals Which is often encountered is the Green peafowl (\textit{Pavo muticus} L.).

Population of Green peafowl (\textit{Pavo muticus} L.) in 2009 her threat status increased to Endangered \textsuperscript{3}, but was still relatively safe, based on the International Union for Conservation of Nature and Natural Resources (IUCN) of its Endangered (endangered) status in 2016 \textsuperscript{4}. Status based on Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) classified as Appendix II or endangered animals and the trade of these types of green peafowl must be controlled through a conservation system (Preservation or protection) in the year 2017 \textsuperscript{5}. Green peafowl (\textit{Pavo muticus} L.) have distinctive behaviors, both in the feed and other aspects of behavior. Green peafowl has a cruising distance to find a meal of about 1.5 – 2 km from the water source \textsuperscript{6}, other than that and is very sensitive when meeting people and predators, the bird will run and fly to a safe place if you see or hear something dangerous. Usually take refuge in the lush bush or choose perched on a tree that has own criteria, which is to choose a height tree with a large canopy and have small stems and branches and the leaves are not too lush For shelter from Predatornya \textsuperscript{7}. Green peafowl loved the tall grass and trees that were near the clean water source as his dwelling place \textsuperscript{8}. Resting behavior of Green Peafowl is generally done during the daytime when the environment temperature is quite hot \textsuperscript{9}.

\section{Methods}

\subsection{Time and Location}
The research was conducted in August 2018 - April 2019 at 05.00 – 09.00 wib and at 14.00 -18.00 wib in area savanna Bekol Baluran National Park East Java.

\subsection{Data Collection}
The data retrieval technique used is using the cluster method and point count. The cluster method is by grouping based on the same characteristics. This method is done for 3 days starting from 06.00 a.m. to 16.00 a.m. to determine the research venue. Next in do with point count method for the region that has the same tree characteristic is to mark using GPS, each time search data for 4 hours starting at 06.00 am is at 10.00 am. The study also observed the condition of research location, the conditions observed were the circumference of trees, tree height, number of tree strata, canopy area, and the location of supporters of green peafowl.

\subsection{Data Analysis}
Analysis of the data used in this study to determine the type of tree and the characteristics of trees used green peafowl to perched by measuring the characteristics of covering tree circumference, tree height, tree strata and tree canopy area. Make a distribution map a roosting sites and explains habitat conditions and distribution of roosting sites green peafowl found in Baluran National Park Bekol savanna.

\section{Results and Discussion}

\subsection{Characterize the types and map the distribution of trees}
The result of the observed research locations that were observed were circumference tree, height tree, total of strata, canopy area and supporting trees found under roosting sites, can be seen in table 1.
Table 1. Types species and Characteristics roosting site trees

| No. | Species tree                  | Circumference tree (m) | Height tree (m) | Total strata of Broad Canopy tree (m²) | Supporting roosting site |
|-----|--------------------------------|-----------------------|----------------|----------------------------------------|--------------------------|
| 1.  | Acacia leucophloea tree (Acacia leucophloea) | 2,3 m                 | 7,7 m             | 4                                      | 154 m²                   | Feather |
| 2.  | Acacia leucophloea tree (Acacia leucophloea) | 1,7 m                 | 9,2 m             | 4                                      | 283 m²                   | Feather |
| 3.  | Acacia leucophloea tree (Acacia leucophloea) | 2 m                   | 11 m              | 4                                      | 31,4 m²                  | Feather |
| 4.  | Acacia leucophloea tree (Acacia leucophloea) | 2 m                   | 13 m              | 4                                      | 452 m²                   | Droppings |
| 5.  | Acacia leucophloea tree (Acacia leucophloea) | 3,2 m                 | 10 m              | 4                                      | 615 m²                   | Droppings |
| 6.  | Mimba tree (Azadirachta indica A. Juss.) | 1,3 m                 | 9,5 m             | 4                                      | 125 m²                   | Droppings |
| 7.  | Widara tree (Ziziphus mauritiana Lam.) | 1 m                   | 13 m              | 4                                      | 34,2 m²                  | Feather and Droppings |
| 8.  | Widara tree (Ziziphus mauritiana Lam.) | 1,3 m                 | 8 m               | 3                                      | 45,4 m²                  | Feather and Droppings |
| 9.  | Acacia leucophloea tree (Acacia leucophloea) | 1,5 m                 | 18 m              | 4                                      | 78,5 m²                  | Droppings |
| 10. | Acacia leucophloea tree (Acacia leucophloea) | 2,1 m                 | 12 m              | 4                                      | 95 m²                    | Droppings |
| 11. | Acacia leucophloea tree (Acacia leucophloea) | 2 m                   | 33 m              | 4                                      | 78,5 m²                  | Bulu |
| 12. | Asem tree (Tamarindus indica) | 4 m                   | 22 m              | 5                                      | 78,5 m²                  | Droppings |
| 13. | Asem tree (Tamarindus indica) | 4,5 m                 | 22 m              | 4                                      | 78,5 m²                  | Feather |
| 14. | Asem tree (Tamarindus indica) | 3,2 m                 | 21 m              | 4                                      | 660 m²                   | Feather and Droppings |
| No. | Species                  | Diameter (m) | Height (m) | Leaf Area (m²) | Notes          |
|-----|--------------------------|--------------|------------|----------------|----------------|
| 15  | Acacia leucophloea       | 1            | 17         | 4              | 150 m², Feather |
| 16  | Acacia leucophloea       | 1,3          | 13         | 4              | 83.3 m², Feather |
| 17  | Acacia leucophloea       | 1,7          | 12         | 3              | 219 m², Feather |
| 18  | Acacia leucophloea       | 1,86         | 16.5       | 4              | 269 m², Feather |
| 19  | Acacia leucophloea       | 1,5          | 16         | 4              | 214 m², Feather and Droppings |
| 20  | Acacia leucophloea       | 2,16         | 17         | 4              | 104 m², Feather |
| 21  | Acacia leucophloea       | 1,6          | 12         | 4              | 214 m², Feather |
| 22  | Acacia leucophloea       | 1,2          | 10         | 4              | 201 m², Feather |
| 23  | Acacia leucophloea       | 2            | 13         | 4              | 254 m², Feather |
| 24  | Mimba tree (Azadirachta indica A. Juss.) | 1,9 | 11 | 4 | 201 m², Feather |
| 25  | Acacia leucophloea       | 1,2          | 12.5       | 4              | 254 m², Feather |
| 26  | Acacia leucophloea       | 1,5          | 11.6       | 4              | 177 m², Feather |
| 27  | Mimba tree (Azadirachta indica A. Juss.) | 1,9 | 9.6 | 4 | 78.5 m², Feather and Droppings |
| 28  | Acacia leucophloea       | 2            | 14         | 4              | 177 m², Droppings |
| 29  | Mimba tree (Azadirachta indica A. Juss.) | 2 | 9.3 | 4 | 73.9 m², Feather |
| 30  | Acacia leucophloea       | 2,26         | 13         | 4              | 314 m², Droppings |
| 31  | Acacia leucophloea       | 1,2          | 15         | 4              | 314 m², Feather |
Table 2. Average characteristics each species of roosting sites of green peafowl

| No. | Species tree | Circumference tree (m) | Height tree (m) | Total of strata | Broad Canopy tree (m²) |
|-----|--------------|------------------------|----------------|----------------|------------------------|
| 32. | Acacia leucophloea (Acacia leucophloea) | 1.45 m | 14.4 | 4 | 314 m² Droppings |
| 33. | Mimba tree (Azadirachta indica A. Juss.) | 1.2 m | 9.4 | 4 | 899 m² Feather |
|     | **Average** | **2 m** | **14 m** | **221.81 m²** | **Feather** |

The average circumference of the tree, the height of the tree, total of strata and the canopy area of roosting sites found in the Baluran savanna is showed in table 2.

The types of roosting site trees that have been found at the time of research in the Bekol savanna showed in Figure 1.

**Figure 1.** (a) Acacia leucophloea Tree (Acasia leucophloea), (b) Widara tree (Ziziphus mauritiana Lam.), (c) Asem tree (Tamarindus indica), (d) Mimba tree (Azadirachta indica A. Juss.)

Activities of green peafowls go to rest either perched on a tree or just shady under the tree during the day when the ambient temperature is hot and back to eat in a group or individual way. This activity is not only done during the daytime but is done in the afternoon when the evening starts as stated in Figure 2.
Figure 2. Green peafowl behavior (A) Green peafowl walking towards roosting sites in the afternoon, (B) Green peafowl perched for a break in the afternoon, (C) A flock of green peafowls to the water puddle.

The roosting sites green peafowl in the mark with his found feathers and feces of green peafowl, but not all trees in the mark with the presence of feathers and droppings. Some evidence supporting the roosting sites is listed in Figure 3.

Figure 3. Supporting roosting sites (A and B) Ornamental feathers from green peafowl under the roosting sites, and (C) Droppings of green peafowl under the roosting sites.

This is a map of the distribution roosting sites tree of green peafowls (*Pavo muticus* Linnaeus, 1766) in Savanna Bekol, Baluran National Park East Java.
4. Conclusion

The roosting sites of green peafowls (*Pavo muticus* Linnaeus, 1766) which has been found in the area Savanna Bekol Baluran National Park there are four types of trees that have different characteristics, namely Acacia leucophloea tree (*Acacia leucophloea*), Mimba tree (*Azadirachta indica* A. Juss), Widara tree (*Ziziphus mauritiana* Lam.) and Asem tree (*Tamarindus indica* L.) each tree has different characteristics ranging from wide canopy, height of the tree, and total of strata. The diameter of the trees is in average is 2 m, with the height of 14 m, the average number of strata 4, as well as the canopy area of 221.81 m$^2$. The distribution of trees that live in this area of Bekol Savanna research is approximately 167 trees with a distance between the tree group with a Keramat resort office limit of about 20 meters, while the distribution of roosting sites was found as many as 33 trees with 4 different types with a percentage distribution of 20%. Green peafowl also association with deers (*Cervus timorensis*) according to the traces found on the indicated roosting sites.

Many green peafowl is scattered in savanna Bekol precisely in the Bekol resort area of Baluran National Park. The Habitat of the green peafowls in Savanna Bekol is in the area near the water puddle where at the time of research found shelter trees and roosting sites green peafowls have an area of 15.34 ha. The distribution of total trees that lived in the area of the Savanna Bekol Resort Keramat is approximately 167 trees. The total percentage of the roosting site in this research area is 20%. Roosting sites that is liked by the green peafowls is a Acacia leucophloea tree (*Acacia leucophloea*) with a distribution of 14% and a second tree that is liked by the green peafowls is a Mimba tree (*Azadirachta indica* A. Juss.) with a percentage of 3%.

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