

**POPULATION AND HABITAT OF JAVAN GREEN PEAFOWL
(*Pavo muticus muticus* Linnaeus 1758) AT ALAS PURWO
NATIONAL PARK, EAST JAVA**

***Populasi dan Habitat Merak Hijau Jawa (*Pavo muticus muticus* Linnaeus, 1758)
Di Taman Nasional Alas Purwo, Jawa Timur***

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Diterima 8 Juli 2006 / Disetujui 15 Oktober 2006

ABSTRAK

Kajian terhadap populasi dan habitat merak hijau jawa (*Pavo muticus muticus* Linnaeus, 1758) telah dilakukan selama 3 bulan, Agustus-Oktober 2004 di taman nasional Alas Purwo, Banyuwangi. Pengamatan terhadap populasi dilakukan dengan metoda langsung dengan menggunakan transek (fix width transect) di areal hutan tanaman jati, dan hutan alam masing-masing 2 jalur lebar 30 m dan panjang 1- 5 km di Pancur dan Rowobendo, sedangkan di padang penggembalaan Sadengan dengan metoda terkonsentrasi (counsentration count). Habitat merak hijau dikaji dengan pendekatan analisis vegetasi dengan metoda garis berpetak 1 jalur di hutan alam dan 2 jalur di hutan tanaman. Sedangkan di padang penggembalaan Sadengan dengan plot tunggal sebanyak 10 buah. Hasil penelitian menunjukkan bahwa, total populasi merak hijau jawa di TN Alas Purwo 46 – 50 ekor. Struktur umur rata-rata 80 % kelompok merak hijau dewasa, sedangkan yang muda hanya sekitar 20 %, seolah populasi kemunduran (regressive population), dan nisbah kelamin rata-ratanya 1 : 3, pola hidup polygami. Pola sebarannya di seluruh areal pengamatan adalah berkelompok. Kelimpahan populasi merak hijau jawa berbeda pada berbagai tipe habitat. Kelimpahan populasi yang paling tinggi pada habitat padang rumput sadengan. Habitat yang disukai merak hijau di alam yang berbatasan dengan tempat terbuka (rerumputan dan sesemakan). Tempat untuk mencari pakan, merak hijau menyukai tempat terbuka daerah rerumputan dan sesemakan ataupun di areal tumpang sari. Merak hijau memilih tempat tidur pada pohon yang tinggi, percabangan mendatar, dekat pohon untuk tidur terdapat tempat terbuka diantaranya pohon Apak, Bendo, Munung, dan Randu Alas. Sedangkan tempat untuk berteduh dipilih pohon yang rindang seperti pohon kesambi dan bungur. Untuk berlindung memilih vegetasi yang rapat

Kata kunci : Populasi, habitat, Alas Purwo, merak hijau

INTRODUCTION

Alas Purwo (AP) National Park is one of distribution range of javan green peafowl at Java Island. The national park has several types of habitats such as tropical low land forest, grazing area, teak forest and bamboo forest. Nowadays, possible habitats to support the green peafowl at Java are forest reserves (national park, game reserve, nature reserve and forested protected area) and teak plantation area.

The status of green peafowl has been protected since 1931 in Indonesia and ICBP nominated that bird as globally threatened in the newest ICBP check-list (Collar & Andrew 1988). Decreasing of javan green peafowl population is caused by poaching activities to the bird and degradation of their habitat due to the people encroaches to peafowl habitat. At every site, where green peafowl distributed closed to human settlement, the birds will have seriously problem.

Information and data of population and habitat of the javan green peafowl are very few at AP National Park. In most cases, no data are available on individual number,

habitat preferences etc. Even though, these data are very important in order to support the conservation efforts. Basic information like population and habitat of the bird should be collected soon.

The objective of study was aimed to obtaining data and information of the javan green peafowl population (individual number, sex ratio and population structure) and their habitat (feeding site, roosting site, shelter and nesting site).

MATERIALS AND METHODS

Research was conducted at Alas Purwo National Park, at least three month from August to October 2004. The study was focused at habitat of green peafowl such as Sadengan grazing area, tropical low land forest, beach forest and teak plantation.

Tools were used in this research: distribution of forest map of Alas Purwo National Park, compass, chronometer, binocular, tale camera, hagameter, metering-band, and tally sheet.

The green peafowl census was carried out by transect method with fixed width plot and concentration count method. Two transect were made 30 m wide and length 1 – 5 km at Payaman, Pancur and Rowobendo. The concentration count used at Sadengan grazing area. The census was done for 10 days replication at every plot. The census started every morning at 5.00 and lasted until 7.00 a.m. The counting of individual numbers was based on direct visual contact or the calling of green peafowl during census. The population data taken from the census was analyzed with statistical average and the confident limit of the individual number in concentration area, used with the formula as follow :

$$P = x \pm t SE$$

where :

P = population (total number individual number in each transect or sample area

x= total average number in each transect or sample area

SE= standar error

t= t student

Statistical analysis for the spatial distribution of green peafowl has follow the criteria such as

$\sigma^2 = \mu$ is *random* distribution

$\sigma^2 > \mu$ is *clumped* distribution

$\sigma^2 < \mu$ is *systematic* distribution

σ^2 can be predicted by S^2 , and μ can be predicted by x

The green peafowl habitat was described by vegetation analyzed approach. The structure and composition of vegetation at green peafowl habitat used quantitative value, it was analyzed using the important index value (IVI) method after Curtis and Cottam (1964) as follows :

$$IVI = RF+RD+RDo$$

where:

RF= Relative Frequency;

RD= Relative Density;

RDo= Relative Dominance.

Data were collected from trees, poles and sapling is: species, number, dbh (diameter at breast height) and height. Meanwhile for seedling only described: number and

species. The species and number of herbs, shrubs and grasses were also recorded.

To describe roost sites, nesting site and feeding site used by green peafowl direct observation was done and its recorded such as: species of vegetation, height, number, frequencies of used and some of habitat characteristics condition. To know vegetation function at green peafowl habitat (feeding sites, roosting sites, covering sites and sheltering sites) was analyzed by percentage of habitat used with the formula as follow:

$$Fh = F/TF$$

where:

Fh = Function of green peafowl habitat feeding area, roosting sites, covering sites and sheltering sites);

F = Frequencies green peafowl using function of habitat;

TF = Total Frequencies green peafowl using function of habitat.

To know preference of habitat used by the birds, Yates Correction Test were used as follow:

Hypothesis

Ho = the green peafowl does not prefer to certain habitat;

H1 \neq the green peafowl prefer to certain habitat.

$$\chi^2 = \sum (| O - E | - 0.5)^2 / E$$

O = Individual number were observed

E = Individual number were expected

Test criteria

$\chi^2_{\text{ calculation}} > \chi^2_{\text{ table}} \rightarrow$ refuse Ho

$\chi^2_{\text{ calculation}} < \chi^2_{\text{ table}} \rightarrow$ excepted Ho

RESULTS AND DISCUSSION

Local Distribution and Individual Number of Javan Green Peafowl

The javan green peafowl distributed in Alas Puwo National Park at Sadengan grazing area, tropical low land forest and teak plantation at Rowobendo resort. The local distribution of bird are listed at Table 1.

Table 1. The local distribution of the javan green peafowl at Alas Purwo National Park

No	Habitat type	Frequencies of encounter	The population abundances	Distribution	Number of group
1	Sadengan grazing area	30	31 ± 0.99	Clumped	10
2	Teak plantation – intercropping at Rowobendo resort	20	17 ± 0.62	Clumped	8

The distribution pattern of the javan green peafowl ($S^2 = 51.46 > x = 49.60$) mostly clumped at every site. Clumped distribution is quite normally for the green peafowl population. Solitary or clumped distribution pattern is connected to strategy or adaptation of green peafowl on their live.

The total individual number of the javan green peafowl at sample area is differ (Table 1). The variation of average individual number is caused by different composition and structure vegetation at the sample area. Total individual number of green peafowl at sample area

was 46-48 birds. Compared to Supratman (1998) result, that population number at same area (46 birds) did not differ.

Sex Ratio and Age Structure

The bird sex ratio is different at Sadengan grazing area and teak plantation-intercropping (Table 2). It was 1: 2 at Sadengan, but 1: 4 at teak plantation. From these fact, that the sex ratio at Sadengan was nearly at monogamous system, but normally the peafowl life at polygamous system. Hernowo (1995) mentioned that green peafowl have sex ratio about 1: 4 at Baluran. Those indication that bird life in normally clump and polygamous system.

Table 2. Number of male and female of the javan green peafowl at the sample area

Site observations	Adult male (birds)	Adult female (birds)	Sub adult (birds)
Sadengan grazing area	8	16	7
Teak plantation – intercropping at Rowobendo resort	3	11	3

The age structure at Sadengan shown that adult is dominant presented by 24 birds (77.42%), and 7 young birds (23.58%). Meanwhile, at teak plantation appear same phenomenon 14 adult birds (82.35%) and 3 young birds (17.65%). Those, age structure indicated that population categorized as regressive.

Habitat

Feeding and Drinking Site

The javan green peafowl habitat is places where the bird can feed and drinking, roosting, covering, sheltering, breeding and all activities with their living. The major component of green peafowl habitat has relation with structure and vegetation composition. For feeding, the bird

chosen open area such as Sadengan grazing area and shrubs area at teak plantation or at intercropping area. The green peafowl search water at small stream or at hollow area for drinking.

Sadengan grazing area is one of the best places for local distribution of the green peafowl at Alas Purwo National Park. That place was as a concentration area for javan green peafowl at AP National Park. Sadengan grazing area covered an area of about 80 ha and it has been surround by low land forest and teak plantation. At centre of these grazing area occur small stream as water resources for many species of wild animals. Composition grasses and shrubs at Sadengan grazing area were listed at Table 3.

Table 3. The Importance Value Index (IVI) of grasses and shrubs analysis sample plot at Sadengan

No	Local Name	Grass species	RD (%)	RF (%)	IVI (%)
1	Teki rawa	<i>Cyperus rotundus</i>	24.28	8,92	33.20
2	Teki	<i>Kylinga monocephala</i>	1.14	0.99	2.13
3	Putihan	<i>Paspalum conjugatum</i>	6.38	6.93	13.31
4	Paitan	<i>Axonopus compressus</i>	5.07	7.92	12.99
5	Bambangan	<i>Ischaemum timorensis</i>	5.81	6.93	12.74
6	Lamuran	<i>Polytrias praemorsa</i>	3.60	4.95	8.55
7	Kawatan	<i>Cynodon dactylon</i>	0.57	0.99	1.56
8	Tuton	<i>Echinochloa colona</i>	0.16	0.99	1.15
9	Kolojono	<i>Brachiaria mutica</i>	0.33	0.99	1.32
10	Rayapan	<i>Oplismenus burmanii</i>	0.33	0.99	1.32
11	Jawen	<i>Panicum crusgalli</i>	0.08	0.99	1.07
12	Alang-alang	<i>Imperata cylindrica</i>	5.15	0.99	1.56
13	Domdoman	<i>Andropogon aciculatus</i>	4.74	1.98	6.14
14	Enceng-enceng	<i>Crotalaria sp</i>	3.03	6.93	9.96
15	Kirinyuh	<i>Eupatorium odoratum</i>	4.99	3.96	8.95
16	Pegagan	<i>Centrella asiatica</i>	0.90	1.98	2.88
17	Kaki kambing	<i>Pseuderanthernum diversifolium</i>	7.44	6.93	14.37
18	Sidaguri	<i>Sida acuta</i>	7.03	6.93	13.96
19	Legetan	<i>Urena lobata</i>	0.25	1.98	2.14
20	Semanggi gunung	<i>Oxalis corniculata</i>	10.63	3.96	14.59
21	Lantasan	<i>Pluchea sp</i>	0.16	0.99	1.15
22	Meniran	<i>Phyllanthus niruri</i>	1.88	4.95	6.83
23	Patikan	<i>Euphorbia hirta</i>	0.16	1.98	2.14
24	Sontoloyo	<i>Hyptis capitata</i>	2.53	5.94	8.48

From 24 important species of grasses and shrubs at Sadengan grazing area, 16 species were feed by the green peafowl. The bird feed on leaf, flower and seed of grasses or shrubs such as *Sida acuta*, *Polytrias amaura*, *Echinochloa colona*, *Echinochloa crusgalli*, *Centrella asiatica*, *Cynodon dactylon*, *Brahiaria mutica*, *Oplimemus broimanii*, *Panicum crusgalli*, *Cyperus rotundus*, *Axonopus compressus*, *Paspalum conjugatum*, *Phyllanthus niruri*, *Althernanthera phyloxeroides*, *Pseuderanthernum diversifolium* and *Heteropogon contortus*.

Besides, grasses and shrubs were eaten by the peafowl, also the bird feed on insect like, grasshoppers, white ant, cricket and caterpillar. During observation was not found the green peafowl feed on fruit.

More than 20 times ($n > 20$) was observed, peafowl drink at small stream and hollow area at sadengan grazing area. The bird drunk at morning around 06.00 to 08.00 a. m

or evening 15.00 – 17 00 p. m. Number of sucking water were varied from 18 – 46 times.

Sheltering Site

Usually, green peafowl got shelter if the day became hot around 10.00 AM. They came to under trees with luxuriant leaves or perch on not so tall trees. The trees are most preferred for sheltering site were recorded at sadengan grazing area such as *Schleichera oleosa*, *Lagerstroemia speciosa*, and *Protium javanicum*..The preference trees as resting site was recorded as table 4. The characteristics of sheltering trees are (1) the trees are luxuriant leaves, (2) the trees height are more than 7 meters. The bird was sheltering at branch above 2 meters or at ground, (3) the branches of trees a relatively upright angle to the stem.

Table 4. The trees are preferred as resting site for green peafowl at sadengan Grazing area

No	Species Vegetation	Local Name	Frequency	Percentage
1	<i>Lagerstroemia speciosa</i>	Bungur	10	23.81
2	<i>Schleichera oleosa</i>	Kesambi	10	23.81
3	<i>Protium javanicum</i>	Trenggulun	10	23.81
4	<i>Ficus infectoria</i>	Apak	6	14.29
5	<i>Artocarpus elastica</i>	Bendo	4	9.52
6	<i>Bombax vuletoni</i>	Randu alas	2	4.76

Roosting Site

Not all trees selected by green peafowl as roosting site. The bird has chosen certain trees for roosting. The trees are most preferred for roosting and sunning site were recorded at Table 5. The Characteristics of roosting trees are (1) the trees are tallest (more than 20 meters) or emergent tree, (2) the leaves are not dense, rather open, (3) not far from the trees present the open area, (4) branches of the trees form a

relatively upright angle to the stem, (5) usually, near the roosting trees occur other smaller trees, and (6) the trees have a function as roosting site with the crown shape like an umbrella. Besides for roosting site, the trees have function as sunning site. The trees are used as roosting site was recorded at Alas Purwo national park such as *Ficus infectoria*, *Artocarpus elastica*, *Sterculia campanulata*, *Bombax vuletoni*, and *Neuclea pallida*.

Table 5. The trees are preferred as roosting and sunning site for green peafowl

No	Species Vegetation	Local Name	Frequency	Percentage
1	<i>Ficus infectoria</i>	Apak	17	53.13
2	<i>Artocarpus elastica</i>	Bendo	5	15.63
3	<i>Sterculia campanulata</i>	Munung	5	15.63
4	<i>Bombax vuletoni</i>	Randu alas	4	12.50
5	<i>Nauclea pallida</i>	Gempol	1	3.13

Display Area

Usually, peacock will display during the breeding season if peahen get close to him. The male bird will dance at ground in open places. During the mating season, the peacocks prefer open areas which are relatively clean like sadengan grazing area. The male was found also dance on arenas below tree but clean from shrubs and herbs. The peacocks select flat places as display areas. Those open places were not so large, with diameter of about 3 m. The places were in patchy with few trees and grasses.

area. The abundances of differ due to different on habitat type. Sadengan grazing area most preferred habitat for javan green peafowl. The bird sex ratio was 1 : 3 and age structure composed around 80% adult and 20% young. The population of javan green peafowl at Alas Purwo National Park was categorized as regressive population

The green peafowl prefer on open area for feeding, where grasses and shrubs grow or at (Sadengan grazing area) intercropping area. Roosting site are selected by green peafowl on certain trees, where is a tall tree, the leaves are not so dense and the branches a relatively upright angle to the stem, surround the tree occur open area. Sheltering site are chosen by the bird a luxuriant tree and it is not far from feeding site.

CONCLUSION

Total individual number of the green peafowl at Alas Purwo National Park 48 ± 2 birds, which distributed at Sadengan grazing area and intercropping teak plantation

REFERENCES

- Collar NJ & Andrew P. 1998. *Birds To Watch*. ICBP tech. Publication 8. Cambridge. U K.
- Curtis JT & G Cottam 1964. *Plant Ecology Workbook*. Burgerss Publishing Co. Minneapolis.
- Del Hoyo, Elliot, Sargatal. 1994. *Handbook of the Birds of the World. Volume 2. New World Vulture To Guineafowl*. Birdlife International Lynx Editions. Barcelona.
- Delacour J. 1977. *The Pheasant of the World (2 nd Edition)* Spurr Publication. Saiga Publisng Co Ltd Surr GU 26 GTD. England
- Hoogerwerf A. 1970. *Ujung Kulon the Land of the Last Javan Rhinoceros*. E.J. Brill Leiden. Netherland.
- Hernowo JB. 1995. Ecology and Behaviour of the Green Peafowl (*Pavo muticus* Linnaeus 1766) In the Baluran National Park. East Java, Indonesia. Master Thesis . Faculty of Forestry Science, Georg August University Göttingen. Germany.
- 1997. Population study of Javan Green Peafowl (*Pavo muticus muticus* Linnaeus 1758) With Three Different Methods In Baluran National Park, East Java. *Media Konservasi, Vol V. No. 2 September 1997 : 61 – 66.*
- 1999. Habitat and Local Distribution Of Javan Green Peafowl (*Pavo muticus muticus* Linnaeus 1758) In Baluran National Park, East Java. *Media Konservasi Vol VI. No. 1 Agustus 1999 : 15 – 22.*
- Hernowo JB & E Hernawan. 2003. Population and Habitat Study of Javan Green Peafowl Habitat (*Pavo muticus muticus* Linnaeus 1758) at Ciawitali Teak Forest Plantation of BKPH Buah Dua and BKPH Songgom KPH Sumedang.. *Media Konservasi Vol VIII. No. 3 Desember 2003 : 117 – 126.*
- Hernowo JB & Y Palita. 2004. Study on Local Distribution and Behavior of Javan green Peafowl (*Pavo muticus muticus* Linnaeus 1758) at Meru Betiri National Park. *Media Konservasi Vol IX. No. 2 Desember 2004 : 69 - 76*
- Johnsgard PA. 1986. *The Pheasants of the World*. Oxford University Press. London
- King BF & Warren B. 1981. *Endangered Birds of the World*. The ICBP Red Data Book. Published by The Smithsonian Institute Press in Cooperation with International Council for Birds Preservation. Washington DC.
- Kuroda N. 1936. *Birds of Island of Java. Vol 2. Non – Passeres*. Tokyo.
- MacKinnon J. 1988. *A Field Guide to the Birds of Java and Bali*. Gadjah Mada Press. Yogyakarta.
- Mulyana. 1988. Studi Habitat Merak Hijau (*Pavo muticus* Linnaeus 1766) di Resort Bekol, Taman Nasional Baluran, Jawa Timur. Skripsi Jurusan Konservasi Sumberdaya Hutan Fakultas Kehutanan IPB. Bogor. Tidak Diterbitkan.
- Rini IS. 2005. Studi Ekologi Pakan dan Perilaku Makan Merak Hijau (*Pavo muticus* Linnaeus 1766) Di Taman Nasional Alas Purwo, Jawa Timur. Skripsi Jurusan Konservasi Sumberdaya Hutan Fakultas Kehutanan IPB. Bogor. Tidak Diterbitkan
- Supratman A. 1998. Kajian Pola Penyebaran dan Karakteristik Habitat Merak Hijau (*Pavo muticus* Linnaeus 1766) Pada Musim Tidak Berbiak Di Resort Rowobendo Taman Nasional Alas Purwo, Jawa Timur. Skripsi Jurusan Konservasi Sumberdaya Hutan Fakultas Kehutanan IPB. Bogor. Tidak Diterbitkan.
- van Balen B, DM Prawiradilaga, M Indrawan, A Marakarmah, IWA Dirgayusa & MA Isa. 19..? Notes on the Distribution and Status of green Peafowl on Java. World Pheasant Association – Worldwide Fund for Nature, Indonesia Programme. Bogor.
- Winarto R. 1993. Beberapa Aspek Ekologi Merak Hijau (*Pavo muticus* Linnaeus 1766) Pada Musim Berbiak Di Taman Nasional Baluran, Jawa Timur. Skripsi Jurusan Konservasi Sumberdaya Hutan Fakultas Kehutanan IPB. Bogor. Tidak diterbitkan.