

GRAZING HABITAT OF RUSA TIMOR (*Cervus timorensis*) AT THE NATURAL PASTURE OF THE UPLAND KEBAR

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SUMMARY

Approximately one quarter of the Earth's land surface is grassland where livestock and wildlife, in turn, depend on for nutrition and shelter. This study aimed to analyze the potency of the grassland community at the upland Kebar as grazing habitat of the Rusa Timor (*Cervus timorensis*) in Papua. Research was conducted during the dry season in approximately 375 ha of sampling area. Quantitative estimation of forage production carried out by measuring a biomass harvest in fresh weight bases. All vegetation was recorded, collected by clipping to the ground about 6-7 cm in height, and separated and weighed based on plant species. Importance value, relative frequency, relative dominance of each species was computed to obtain the most dominant species within the study site. Eleven grass species and five legume species were identified. Among the eleven grass species, five were found eaten by the deer: *Imperata cylindrica*, *Paspalum conjugatum*, *Themeda arguens*, *Melinis minutiflora*, and *Cyperus rotundus*. The most preferred species were *T. arguens*, *M. minutiflora*, *C. rotundus* and *I. cylindrica*. Four species considered to be the most dominant species in the study site were *I. cylindrica* (55.74%), *P. conjugatum* (22.18%), *E. brownii* (9.37%), and *T. arguens* (8.94%). The productivity of grassland was 30.36kg/ha fresh weight. It was encountered during the study that the native grassland communities has been lost because they are being converted to the provincial highway construction.

Key words: grazing habitat, upland Kebar, grassland.

INTRODUCTION

Grasslands are mostly found in arid and semi-arid zones where rainfall is sparse and unpredictable, or in humid zones where topography is steep or temperatures low. Their existence is also determined by cultural factors, distance to markets or the presence of low fertility or stony soils, salinity or seasonal flooding (Harris, 2000)

Grassland Conservation Group (2004) indicates that the grassland biome covers about one quarter of the Earth's land surface. Unique from most other biomes, grasslands are relatively simple in structure but rich in number of species. However, most areas of the prairie have experienced serious declines in biodiversity.

In Indonesia, large areas of grassland are found in Sumatra, Kalimantan, Sulawesi, Nusa Tenggara, and Irian Jaya (Ivory and Siregar, 1984). The pasture consists of many grasses and legumes, with the commonest genera being *Imperata*, *Paspalum*, *Chloris*, *Eleusine*, *Themeda*, *Tetrapogon*, *Polytrias*, and *Desmodium*. During dry season, the land is almost bare because of overgrazing and uncontrolled burning.

With the development of the West Papua Province, more remote areas are being opened and most forestlands are competing with other intensified land use purposes (logging concessionaires, mining, agriculture development, new infrastructure improvement, transmigration), these also influence the grasslands including in the upland Kebar of West Papua, Indonesia.

In other side, climatic conditions also pressure on grazing land in some areas. As a consequence, the sustainability of use of many grasslands are being questioned. Grasslands are dynamic ecosystems and therefore are often a changing resource. In order to prepare suitable information on sustainable management of grassland community in the upland Kebar, assessment is required to document current condition of grassland in the upland Kebar, Manokwari, West Papua. It is expected that the result could be contributed in future development of grasslands area in West Papua, Indonesia.

The general objective of the study was to provide a current information on grasslands and its future development plan for a sustainable forage management in upland Kebar, West Papua. Specifically, the study aimed to:

1. Document upland Kebar condition, geographically and culturally;
2. Analyze the potency of grassland area as deer grazing habitat in upland Kebar;
3. Identify factors that will influence the future development plan of grassland community in upland Kebar, West Papua, Indonesia.

MATERIALS AND METHODS

Time and Place of Study

The study was conducted in the upland areas of Kebar district, during the dry season from August to October 2003. Upland Kebar is known to be a natural grassland area in Manokwari where a large concentration of deer species could be found. The settlement area is situated about 500-1000m above sea level. At 1000-2000m above sea level are forested areas.

Botanical Composition Analysis

After determining the approximate distribution area of the vegetation type, a 375 ha sampling areas were divided into five sampling plots (75 ha for each plot). Quantitative estimation of forage production was carried out by measuring a biomass harvest in fresh weight bases assisted by 100x100 cm quadrat as the sampling frame and laid every 2m interval along the transect line within the plots. The presence of all vascular species in each sampling frame was recorded and collected by clipping to the ground about 6-7 cm in height, and separated to plant species then weighed.

Productivity of the grassland was measured to estimate carrying capacity of deer. The clipped material used for biomass measurement was directly recorded as the production of the grassland area. This was expressed in kg/ha.

Occasional observations on ranging deer were done within habitat range with the aid of 7 x 50 binoculars. Grazed over and browsed-over plants were verified by actual visitation of grazed area. This permits the identification of practically everything that was eaten, including items that might not have been noticed from distant observations of the vegetation. Identification of vegetation species eaten by deer was done in the grassland because it is the only grazing area in upland Kebar. Herbarium specimens were collected. Descriptions were accomplished in the field for further investigation in the Manokwariense Herbarium, Biodiversity Research Center, Universitas Negeri Papua in Manokwari.

RESULTS AND DISCUSSION

Natural pasture known as grazing areas, in particular location dominated by *I. cylindrica* hence during the dry season it is easily burned. Several studies conducted in this area identified some potential forages that grow and distribute fairly within the valley such as: *Melinis minutiflora*, *Cynodon dactylon*, *Cyperus rotundus*, *Themeda arguens*, *Pennisetum purpureum*, *Phragmites karka*, *Tridax procumbens*, *Panicum maximum*, *Indigofera hirsuta*, *Leersia hexandra*, *Cenchrus ciliaris*, *Setaria geniculata*, *Paspalum conjugatum*, *Digitaria ciliaris*, and *Paspalum orbicularie*. There are leguminous plants found in the pasture such as *Crotalaria juncea*, *Centrosema plumeria*, *Leucaena leucocephala*, and *Desmodium* sp.

The study site is a natural airstrip of the Kebar District, which separates two villages. Result of analysis revealed that most of the species were the low layer vegetation found in five sampling plots in 375 ha grassland areas. Eleven grass species and five legume species were identified during the observation in the grassland areas in Kebar (Table 1).

Among the eleven species of low layer vegetation found in the grassland of Kebar, five were found to be eaten by deer. These include *I. cylindrica*, *P. conjugatum*, *T. arguens*, *M. minutiflora*, and *C. rotundus*. It was observed that *T. arguens*, *M. minutiflora*, *C. rotundus* and *I. cylindrica* were the most preferred feeds of deer.

Kencana (2000) explained that *T. arguens*, *C. rotundus* and *I. cylindrica* are the food plants of deer in the Rumberpon Island. In Wasur Merauke, potential forages identified as food plants for deer were *Setaria* sp., *Panicum maximum*, *P. purpureum*, *Setaria spachelata*, *Brachiaria decumbens* and *Melinis minutiflora* (Environment Study Center of Papua University, 2000). Sutrisno (1993) indicated that among the eleven species eaten by Javan Deer in Menipo Island, the most preferred were *Microlaena stipoides*, *Danthonia pilosa*, *I. cylindrica*, and *Paspalum scrobiculatum*.

Results of clipping of grassland vegetation showed that the total biomass harvest averaged 30.36 kg/ha fresh weight, with the highest account is by *I. cylindrica* (16.92 kg/ha) followed by *P. conjugatum* (6.73 kg/ha) fresh weight. Biomass harvest in this study is also considered as species productivity expressed in kg/ha fresh weight.

Data of biomass harvest was further analyzed to obtain frequency, relative frequency, relative dominance, as well as the importance value of each species in the study site. Four species considered to be the most dominant in the study site were *I. cylindrica* (55.74%), *P. conjugatum* (22.18%), *E. brownii* (9.37%), and *T. arguens* (8.94%). Others were found in fairly low percentages. As cited by Imbiri, *et al.*, (1998) five dominant species in the natural pasture in Kebar were *I. cylindrica*, *P. conjugatum*, *M. minutiflora*, *C. rotundus*, and *T. procumbens*.

Table 1. Low layer vegetation species found in the upland Kebar grassland.

SPECIES	OCCURRENCE				
	A	B	C	D	E
Grass					
<i>Imperata cylindrica</i> *	+	+	+	+	+
<i>Paspalum conjugatum</i> *	+	+	+	+	+
<i>Eragrostis brownii</i>	-	-	+	+	+
<i>Themeda arguens</i> *	+	+	+	+	+
<i>Melinis minutiflora</i> *	+	+	+	+	+
<i>Setaria geniculata</i>	+	+	-	+	+
<i>Cenchrus ciliaris</i>	+	+	-	+	+
<i>Leersia hexandra</i>	+	+	+	-	+
<i>Cyperus rotundus</i> *	+	+	-	+	-
<i>Indigofera trifoliata</i>	-	+	+	+	+
<i>Tridax procumbens</i>	+	-	-	-	-
Legumes					
<i>Biophytum petersianum</i>	+	+	+	+	+
<i>Crotalaria juncea</i>	+	+	+	-	+
<i>Centrosema plumieri</i>	+	+	-	+	+
<i>Desmodium sp</i>	+	+	-	-	+
<i>Mimosa pudica</i>	+	+	+	+	+

(*) Observed species consumed by the deer

+ Present in the area

- Absent in the area

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