

Rubber Plantations and Bird Communities in Xishuangbanna, Yunnan, China

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ABSTRACT

The tropical forests of southern Yunnan province, China, are rapidly being converted to rubber plantations. The biodiversity effects of this conversion appear to be severe, although there are as yet few studies published on alternatives to the rubber monoculture. In this study I conducted censuses of the bird communities in seven plots in Xishuangbanna Prefecture, over a range of cropping intensities from rubber monoculture through mixed plantations, to old secondary and remnant primary forest. I related the bird diversity at each site to the vegetative structure of the plots and found strong positive relations ($R^2 > 0.8$) between bird species richness and foliage density, representation of different foliage height layers, and the amount of midstorey present. These preliminary results suggest that foliage complexity can have a positive effect on bird diversity in rubber plantations.



OBJECTIVES

- To see the effects that cultivating rubber has on bird communities in Xishuangbanna prefecture, south Yunnan province
- To determine whether intercropping rubber with other species can reduce those effects

TREATMENTS



Rubber Monoculture



Rubber with Tea



Rubber with Tea and Citrus



Rubber with Bamboo



Rubber with Secondary Forest



Natural Regrowth Secondary Forest



Primary Forest

METHODS - VEGETATION ANALYSIS

- Four 20m transects (N,S,E,W)
- Points at 4m intervals (5 per transect)
- Foliage Layers (0.5,1,2,3,4,6,8,10,12,15,>15m)
- Canopy closure (densiometer)
- Canopy height
- Ground cover

METHODS - BIRD COMMUNITIES

- Fixed-radius point count
- 20m circle around center point
- Record all individuals with the height at which the bird was observed

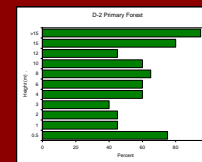
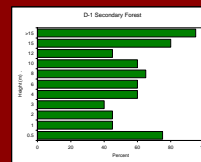
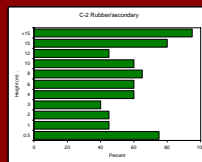
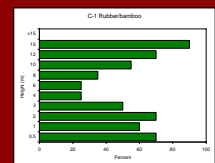
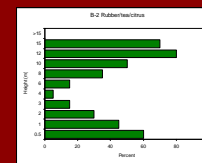
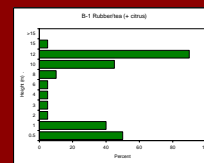
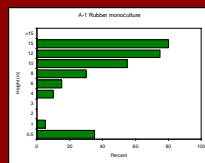
Example data sheet

	0 - 5 minutes		5 - 10 minutes		10 - 15 minutes	
	<10 m	10-20m	<10 m	10-20m	<10 m	10-20m
1	<2m					2-3m
2				12m		
3		6m				

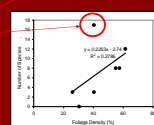
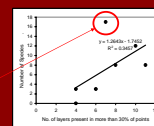
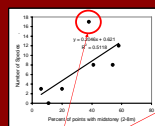
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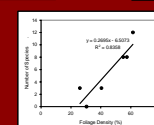
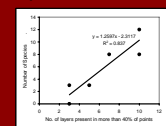
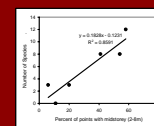
FOLIAGE HEIGHT PROFILES



Best Predictors



Excluding Primary Forest



Primary Forest

CONCLUSIONS

- Need more data (replicates if possible)
- Bird diversity increases with vegetative complexity in artificial and secondary forests
- Bird diversity in primary forest is higher than in the other forest types
- Plant community has an effect?
- Taller canopy has an effect?
- Biodiversity consequences of conversion to monoculture rubber are very severe