

WHAT SECONDARY FORESTS CAN TELL US ABOUT OUR FUTURE

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Where we sampled

We collected data from primary and secondary forests of ages 15, 30-40, 50-70, and 70+ years

METHODS

Data were collected from transects made of 3 10x10 meter plots

what was measured?

In each plot, a square meter quadrat was thrown randomly 3 times to measure several characteristics.

Quadrat measurements:

Percent plant cover Ecomorph richness

Understory plant abundance

Other measurements:

Soil characteristics (probe) Leaf litter depth (cm)

Above-ground biomass (measured by DBH >10cm) Canopy Cover



Densiometer reading for canopy measurements

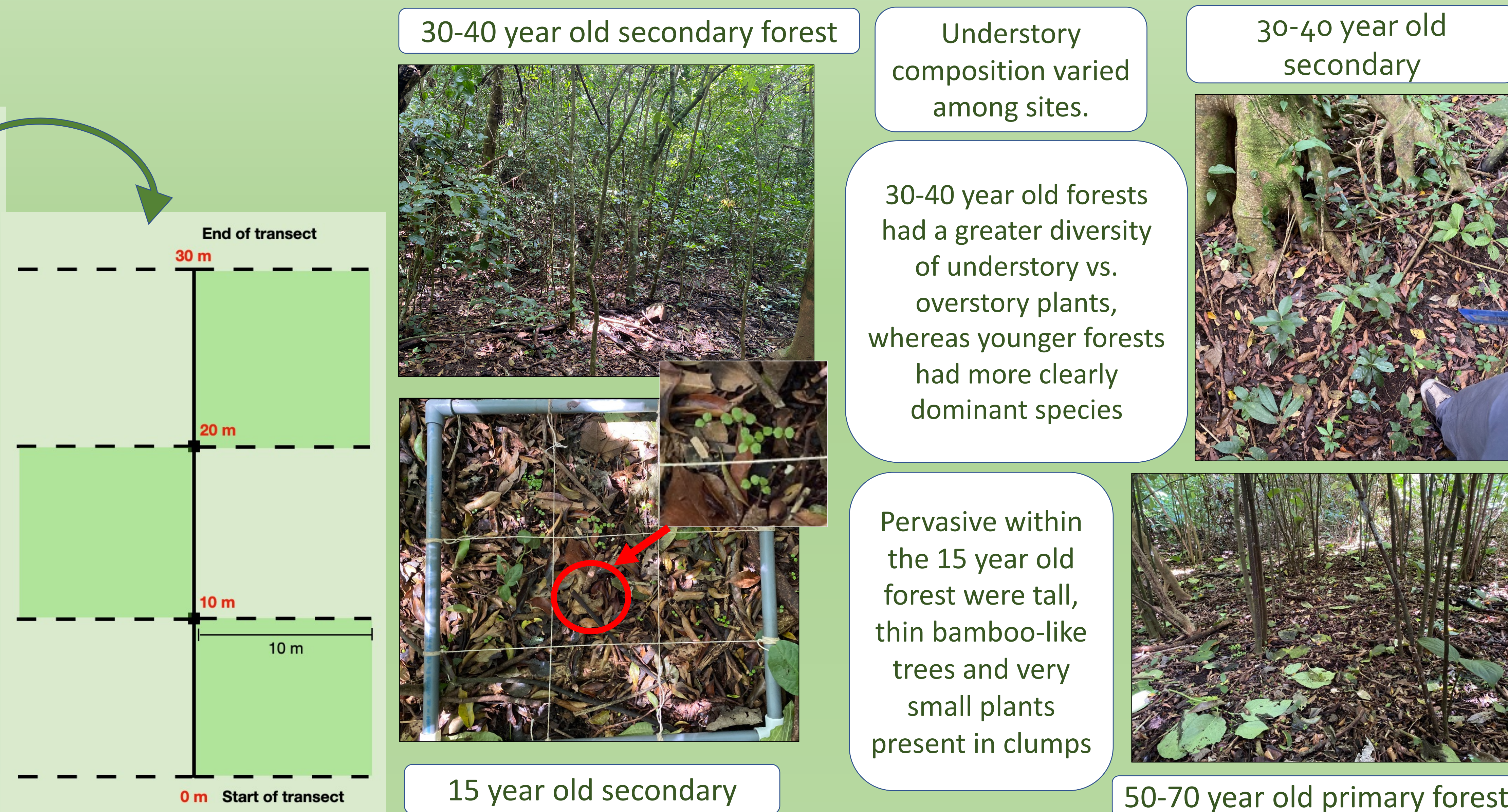


Quadrat thrown in (a.) 30-40 secondary and (b.) 70+ primary

INTRODUCTION

Increasing rates of deforestation and destruction of primary forests have prompted a focus on the ecological importance of secondary forests amid emerging regeneration efforts. Secondary forests provide essential ecosystem services, such as sequestering CO₂ and fostering diverse niches, but the extent of their role is still being studied. In the tropics, secondary forests cover 70% of the entire forested area and, thus, are more common than primary forests (Pain et al. 2020).

This study was conducted in a tropical premontane wet forests. Samples were from four sites: three in primary forest and four in secondary forest. The primary forest sites were 70+ years old; one secondary forest site was 15 years old, and the others were between 50 and 70 years old. The area of primary forest is decreasing worldwide and being replaced with secondary forest (McNamara et al. 2012).



30-40 year old secondary forest

Understory composition varied among sites.

30-40 year old forests had a greater diversity of understory vs. overstory plants, whereas younger forests had more clearly dominant species

30-40 year old secondary

Pervasive within the 15 year old forest were tall, thin bamboo-like trees and very small plants present in clumps

15 year old secondary

50-70 year old primary forest

DISCUSSION

Soil characteristics, canopy cover, and leaf litter all yielded **similar mean values** across age classes and forest type.

No correlation was found between forest age and percent plant cover, but the mean secondary forest was twice that of primary.

AGB of both primary and secondary were similar with no specific trend besides **an increase in AGB with age in secondary forest.**

So what?

An estimated 250-300 million hectares of land globally are undergoing a shift in cultivation and most of it is secondary forest in various stages of regrowth (Mertz et al. 2021). With a changing climate and primary forests being converted into secondary at the rate we see today, it is becoming increasingly important to understand the process of regeneration and how it may affect biodiversity, ecosystem services, etc.

ACKNOWLEDGEMENTS

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RESULTS

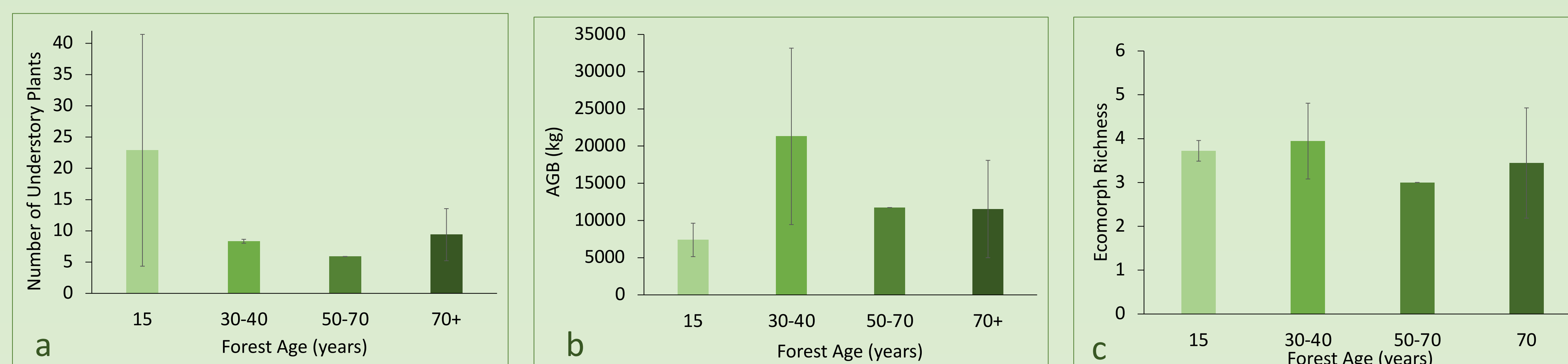


Figure 1. The average number of (a) Understory plants, (b) above-ground biomass, and (c) ecomorph diversity per age class. (d) the relationship between number of understory plants by forest age.

Table 1. Abiotic variables and plant cover (%) by forest age class.

Forest Age (years)	Canopy Cover (%)	Plant Cover (%)	Soil pH	Soil Moisture (%)	Leaf Litter (cm)
15	90.39 ± 1.35	17.36 ± 11.96	6.73 ± 0.079	72.67 ± 4.87	2.17 ± 0.46
30-40	86.10 ± 1.92	19.67 ± 1.57	6.46 ± 0.16	71.78 ± 0.79	1.37 ± 0.85
50-70	19.33 ± 0	6.62 ± 0	74.22 ± 0	2.89 ± 0	
70+	88.6 ± 0.55	25.27 ± 8.86	6.89 ± 0.11	60.89 ± 4.87	1.05 ± 0.21

