Results

Biomass

Aboveground biomass did not tend to change with distance to primary forest edge (Fig 1a), despite significant trends with underlying related variables (Fig 1). Median plot wood density tended to increase marginally significantly (p=0.105) with edge distance by 0.00019 per m explaining *~10* % of variance among median distance strata values (Fig 1b), while tissue carbon did not change significantly with distance to forest edge (Fig 1c). Plot stem density also tended to increase significantly (p=0.03) with edge distance but more strongly and non-linearly, by ~17.4 ± 3.4 per m (Fig 1d). At this stage in forest regeneration, canopy light availability did not tend to change with distance from forest edge (Fig 1e). Notably, tree diversity decreased marginally significantly (p=<0.0001) by ~ 1 per g plot wood density, yet only explaining *~4* % of variance (Fig 1f).

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Composition

Overall diversity changed significantly with distance to primary forest edge (Fig 2). Diversity significantly (p=0.003) decreased non-linearly by ~0.5 ± 0 per m as distance to primary forest edge increased, which explained *73*% of variance among distance strata medians (Fig 2a) – while in contrast taxonomic richness increased slightly (p=0.067) and linearly by 0 ± 0 per m and had *16*% variance explained among distance strata (Fig 2b). Community composition and beta diversity also changed significantly (p=0.01) with 11.4% variance among distance strata explained by distance to primary forest edge, and the first two principal components explaining 47% and 23% totaling 70% of variance among calculated plot distances (Fig 2d). Key abundant taxa *Vochysia* and *Ficus* showed different responses – *Vochysia* nearly tended to decrease with distance to primary forest edge (Fig 2e), while *Ficus* decreased marginally significantly (p=0.088) and linearly by -62.6 ± 25.1 per m with *~20*% variance among distance strata explained (Fig 2f).

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Traits

Overall trait regeneration highlighted successional stage associations over primary dispersal mode along distance to primary forest (Fig 3). Taxa associated with both early and late successional stages decreased significantly (p=0.042) and curvi-linearly by ~ -584.9 ± 167.3 kg per m with distance to edge explaining *~14*% variance among distance strata medians (Fig 3a). Dispersal modes did not show consistent trends in biomass with increasing distance to edge (Fig 3b).

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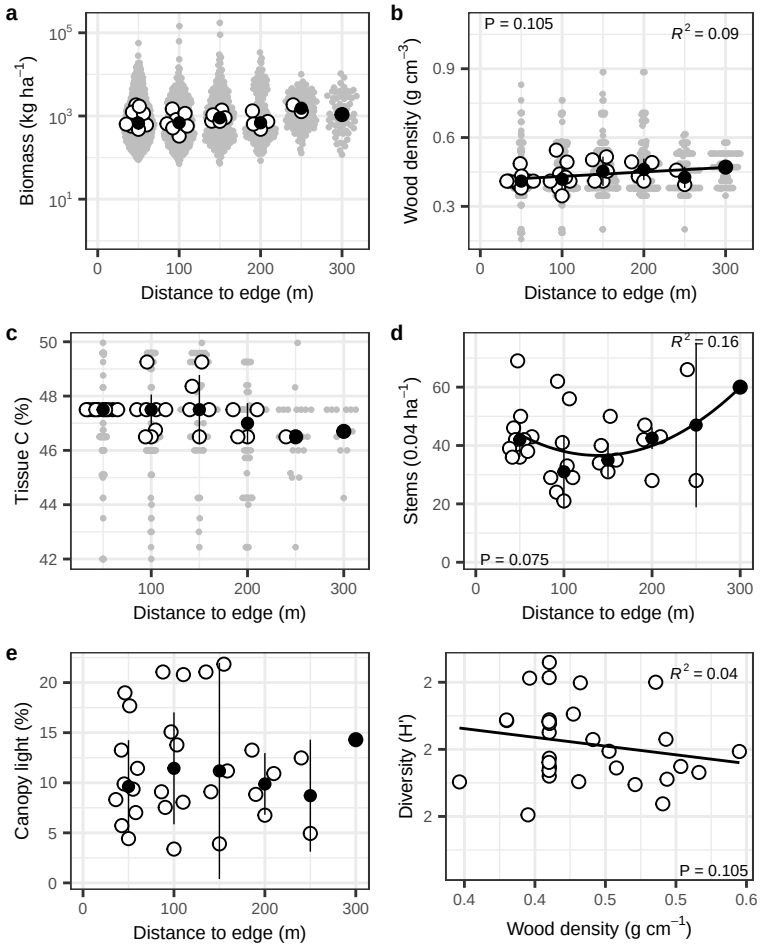

Figure 1: Plot stand properties, namely (a) biomass, (b) wood density, (c) tissue carbon, (d) stem density, (d) canopy light availability, all across distance to primary forest edge gradient, and (e) diversity against wood density. Grey dots show individual tree values, white dots with border show plot medians, black dots show distance strata medians ± 1 absolute deviation, and black lines show linear or non-linear regression through strata medians.

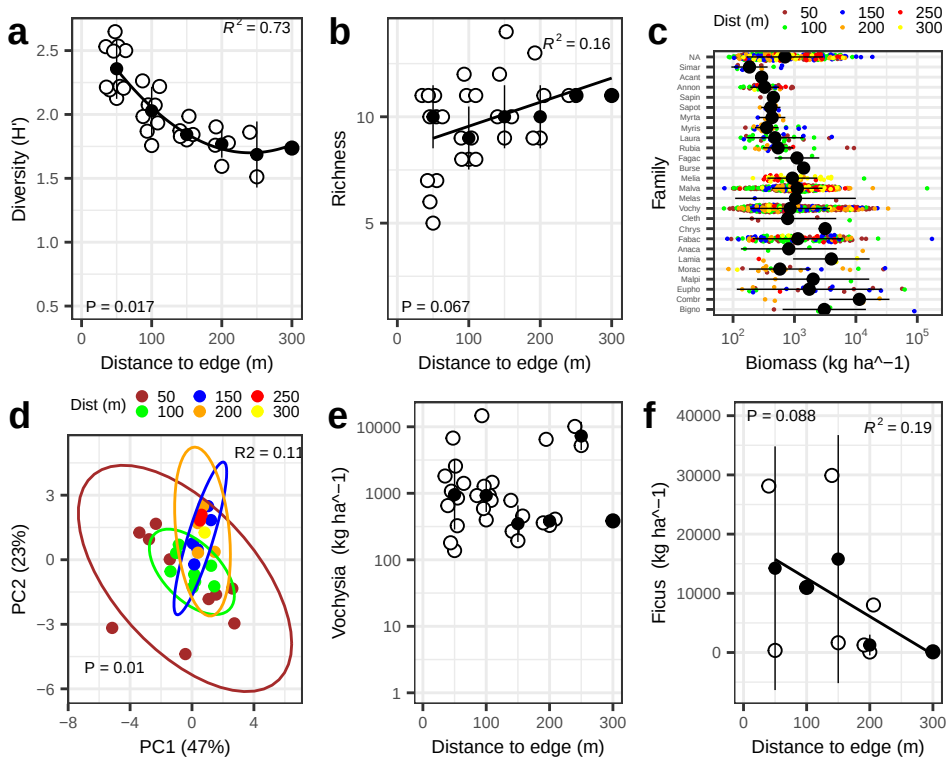

Figure 2: Taxonomic composition measures including (a) diversity, (b) richness, (c) overall biomass, (d) beta diversity, and (e,f) biomass of key taxa. White and colored dots with border show plot medians, black dots show distance strata medians ± 1 absolute deviation, and black lines show linear or non-linear regression through strata medians.

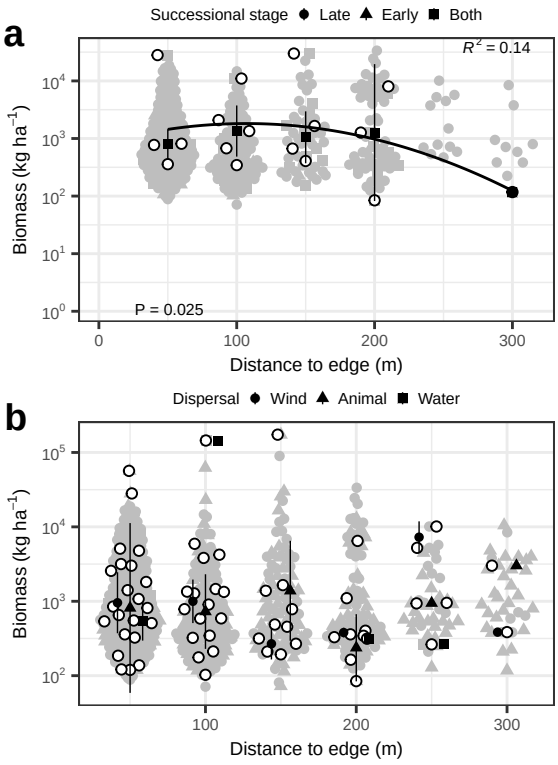

Figure 3: Functional regeneration based on taxa associations with (a) successional stages and (b) primary dispersal mode. Grey dots show individual tree values, white dots with border show plot medians, black dots show distance strata medians ± 1 absolute deviation, and black lines show linear or non-linear regression through strata medians.