A Tree related Microhabitat (TreM) is a distinct, well-delineated morphological singularity occurring on living or standing dead trees, that constitutes a crucial substrate or life site for species. TreMs are widely recognized as key features for biodiversity. The current TreM typology identifies 47 TreM types according to both to their morphology and associated taxa. These TreMs have been pooled into 15 groups then seven forms, in order to provide a range of accuracy and speed of use for different typology users. Thus, forest managers may use the form level during tree marking to ensure a TreM diversity at the stand scale while researchers should use the type level for recording TreMs in biodiversity assessment. Another approach to simplifying TreM recording in routine management job may be to use co-occurrence pattern to reduce the number of TreMs to be observed. From a large international TreM database, we evaluated both the significance and the magnitude of TreM co-occurrence on living trees for 11 TreM groups. We highlighted 33 non-random and positive co-occurrences for broadleaves while only nine for conifers. Bark loss, Rot-hole, Crack and Polypore showed the highest number of positive co-occurrences with the other TreMs for broadleaves (N=8) while bark loss (N=4) did for conifers. We found negative co-occurrences only for conifers: Exposed Heartwood with Dendrotelm and Sap run. Among a set of three variables tested for their positive contribution to significant co-occurrences, dbh was the most consistent.

The influence of riparian forests on surface water: a case in Southern Atlantic Forest biome, Parana, Brazil

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The stream water quality depends on the presence of riparian forest which acts as a filter to protect surface waters in watersheds. We have worked with 1,300 water samples and according with the following parameters: turbidity, color, pH, conductivity, dissolved solids, alkalinity, nitrate, chloride. Samples were collected in 33 field experiments over six contiguous hydrographic basins. These basins are located in the Southern Atlantic Forest biome, Humid Subtropical Climate of Altitude, ecosystem of Mixed Ombrophilous Forest, Parana, Brazil. The land use map and stream conflict map were drawn. The stream conflict map was drawn taking into account the fluvial PPAs (permanent preservation areas). This study has found 5 main land use typologies: natural forest, forestry, buildings, agriculture and pasture. Conflicts of PPAs were defined when natural riparian forest was absent and replaced by another typology, considering a 5-meter strip along the stream's banks, in compliance with the Brazilian law applied to this local situation. Multiple correlation analyses were performed taking into account water quality parameters, conflict over fluvial disputes, and land use. Our conclusion is that amount all streams studied, 51% of them, contain with the Brazilian law concerning fluvial PPAs. The water quality changes according to different seasons and also with the conflicts of fluvial PPAs in some typologies (agriculture, buildings and pasture). However, changes in water quality have not being found when taking to account different land uses, as well as precipitation events. This work confirms the close connection between occupation of riparian areas and surface water quality.

An assessment of the anthropic activities effects on canopy layer attributes in subtropical Atlantic Rainforest

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Subtropical forests are predominantly composed of second-growth remnants as a result of degradation processes caused by human-driven disturbances. We aimed to investigate the effects of anthropic disturbances on forest attributes of the canopy layer (DBH ≥ 10 cm), namely: aboveground biomass, rarefied species richness, and proportion of individuals of pioneer and threatened species. The study was carried out in the Brazilian subtropical Evergreen Rainforest and data from 186 systematically distributed 0.4 ha sample plots were used. The effects of anthropic disturbances on the forest attributes were modeled through ordinary least squares (OLS) and geographically weighted regression (GWR) models. Yet, a path analysis was applied to investigate if topographic heterogeneity (TH; standard deviation of altitude) influences indirectly the forest attributes via anthropic disturbances. The GWR models outperformed the OLS models in predicting the proportion of individuals of pioneer and threatened species. We showed that anthropic disturbances at different spatial scales – landscape, forest patch, and sample plot – may affect the forest attributes. Agriculture area was related to stands with greater biomass in landscapes with large forest remnants, while pasture area was related to stands with lesser species diversity and more exposed to proliferation of pioneer species. We identified stands with great proportion of threatened species exposed to risk factors, such as long road networks and selective logging. TH showed to limit the expansion of pasture areas over the landscape, affecting indirectly the species richness. Evidences were found regarding biotic homogenization and variation in forest productivity resulting from forest fragmentation and edge effects.

Human-induced edge influence on vegetation in boreonemoral forests

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During the last centuries European forest landscape has changed from mostly natural conditions of forest growth to the dominance of production forests. For forest management, it is important to understand the predictable influences on set-asides adjacent to post-harvesting areas. We studied temporal response on vegetation in black alder (Alnus glutinosa) swamp woods in boreonemoral forests in terms of the influence of edge after post-harvesting in adjacent forest stands. Forest edges have been well studied in nemoral and tropical forests, but less is known about the vegetation response toward human-induced edges in boreonemoral and boreal forests. We surveyed data on forest vegetation at black alder swamp woods adjacent to edges in a different age chronosequence (<10, 20-40 and ≥ 41 years post harvesting) was used to test how dynamics of edge effects changes during the time. We tested this by setting permanent sample plots from forest stand edge to interior, then vegetation survey at set distances from stand edge. The main results showed that even more than 41 years after harvesting the magnitude of edge influence persists on the herbaceous layer and rare epiphytic lichen species. This result highlights the need to consider edge effects in sustainable forest principles for set-asides where nature conservation has been prioritized.

A Belize forest landscape and its management

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Permanent forest sample plots provide information on landscape patterns in space and time of tree composition, growth, and population and community dynamics. We present a 25-year study of trees ≥ 10 cm DBH in four 1-ha plots in old-growth, subtropical moist forest in Northwest Belize (Rio Bravo Conservation and Management Area, managed by Programme for Belize). The four plots are in *upland mesic* forest, *upland dry* forest, *palm/hardwood* forest,