Systematic Monitoring of Maling Bamboo Experimental Plots in Neora Valley National Park

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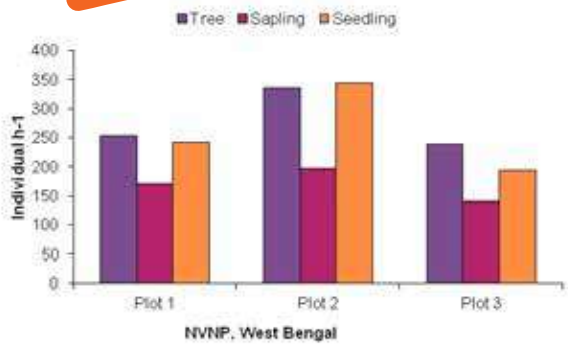
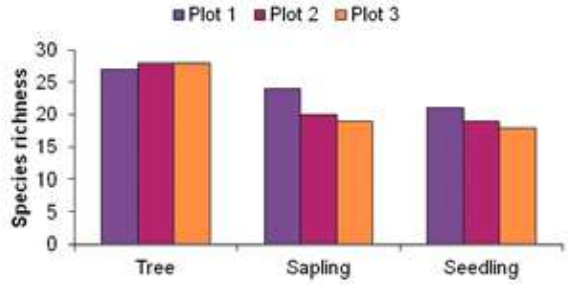
The Neora Valley National Park (NVNP) is one of the key protected areas in the KL-India and transboundary in nature. Considered as one of the most pristine ecosystems, the NVNP is an important National Park due to wide altitudinal variations, intact primary forests and also being part of the ecological tri-junction with Sikkim and Western Bhutan. The NVNP, initially established with 88 km^2, was further extended with an area of 159.78 km^2 in 2017. With a wide range of environmental gradients (183 m – 3,200 m), the park has diverse ecosystems and rich biodiversity. The lush and luxurious forests found in the NVNP is an important catchment for water supply to 50,000 people living in Kalimpong downstream. The NVNP is also an important habitat for *Red Panda*, Gaur, and even the Royal Bengal Tiger. However, periodic studies looking for seasonal and temporal changes on biodiversity crucial for management interventions of the park are yet to be established. Moreover, the increasing invasion by native Maling bamboo *(Yushania maling)*, is arresting regeneration of the climax species and changing the ecosystem and biodiversity of the National Park. Directorate of Forests, North Wing, Government of West Bengal, has established experimental plots with different treatments in the Park for understanding the response and managing Maling Bamboo.

We studied regeneration pattern of three experimental plots (each of 1ha area) to observe status of planted seedlings (i) wild saplings (ii) nursery saplings planted, and to study the effect of such exercise on biodiversity of the NVNP-PA, with special reference to exotic invasive species and the baseline data was collected. Preliminary data shows the decline in the recruitment of the seedlings into the saplings in all three plots, although these plots have shown a fair regeneration status, the maximum tree, sapling and seedling density (336, 198, 344 ind ha-1) were recorded for plot 2 and minimum (238, 141, 194 ind ha-1) was recorded for Plot 3, respectively. Maximum tree species were recorded from plot 3 and plot 2 (24 species in each). The maximum basal area was recorded for Plot 2 tree (31.46 m^{2}ha^{-1}) and seedling layer (0.03 m^{2}ha^{-1}), however, in sapling layer the maximum basal area (0.65 m^{2}ha^{-1}) was recorded for plot 1. Soil analysis of these plots reveals that the range of moisture





Tree, Sapling and Seedling Density in Three Different Maling (Bamboo) Plots in NVNP; Fig. 3: Species Richness in Three Different Maling (Bamboo) Plots in NVNP

content (range 39.6-60.8%) was and the highest in plot 1. The bulk density ranged from 0.47-0.93 g/cm3, and the highest bulk density was recorded in plot 2. Similarly, the phosphorus content ranged between 0.05 and 0.10% in the sampled plots, and the maximum content of phosphorus was recorded from plot 3. To understand the consequences of the invasion of Maling Bamboo and decline in recruitment from seedlings to sapling there is a need to establish long-term monitoring plots and study the ecological changes in Maling Bamboo and Non-Maling Bamboo sites.