

Securing habitats and populations of endangered species through countermeasures of invasive plant problems in Mt. Rungwe Nature Forest Reserve, Tanzania



ACTIVITIES COMPLETED

A: RESTORATION OF INVADED AREAS BY PLANTING NATIVE PLANT SPECIES

We planted tree seedlings in areas affected by IAPs and those degraded by human activities. The planting was done in collaboration with local people adjacent to MRNFR. Also, local people were given tree seedlings to plant on their farms and/or areas, which would provide them with fuelwood and building materials in the future. In addition, people were trained on how to prepare tree nurseries, plant trees and how to monitor their growth. The purpose of this activity was to maintain forest ecosystem structure and support the survival of CPR and other species.





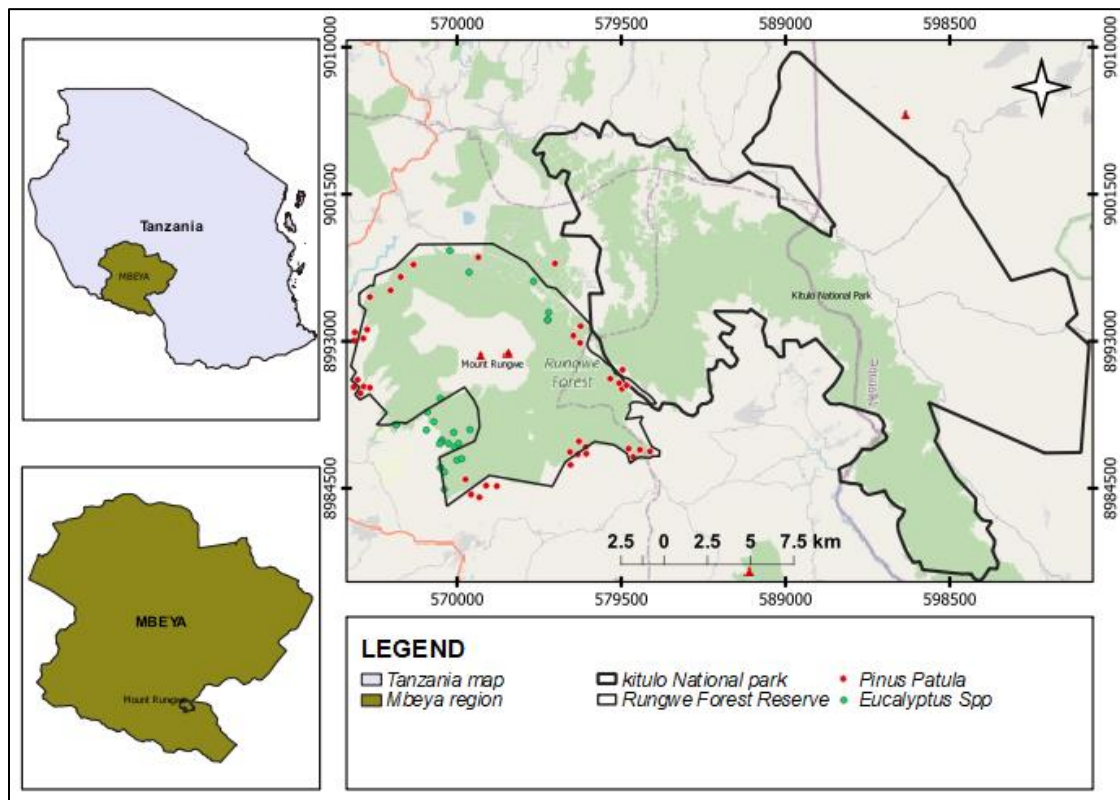
Figure 1. Different tree seedlings planted

B: ABUNDANCE, SPREAD, AND IMPACT OF IAPs ON NATIVE PLANTS AND CPR IN MRNFR

A detailed field survey in MRNFR was conducted to establish the IAPs' abundance, spread, and impact on native plant species richness, diversity, and composition. The GPS coordinates of IAP occurrences were recorded and used to map the current invasion of IAPs (e.g., *P. patula*, *E. saligina*, *L. camara*, *A. conyzoides*, and *Cypress sp.*) and predict their potential spread in MRNFR using ArcGIS. Their impact on native plant species richness, diversity, and composition was assessed along 50 transects of 500 m and 20 m apart in MRNFR. Along each transect, 25 plots (400 m²) were established in which the IAPs and native plants' abundance or cover will be estimated using the ACFOR scale. Where A = abundant, C = common, F = frequent, O = occasional, and R = rare. The species of native plants in each plot were identified. The diversity indices were calculated and compared with those of uninvaded plots. The result provided insight on the overall MRNFR's ecological integrity and the impact of IAPs on CPR. Overall, the findings revealed that *P. patula* and *Eucalyptus spp.* had a significant negative impact on native vegetation cover, with grasses, shrubs, and herbs being less abundant in areas invaded by these species

compared to non-invaded plots. Agricultural expansion, fuelwood extraction, and grazing were identified as key drivers of forest cover loss. Additionally, plantations around MRNFR contributed to the invasion and spread of *P. patula* and *Eucalyptus* spp. The study underscores the urgent need for management strategies to curb the spread of invasive alien plants, prevent forest cover loss, and protect endangered species in MRNFR from human-induced changes. It also emphasizes the importance of developing community-based forest management and increasing public awareness to achieve a balance between nature conservation and sustainable livelihoods.

The manuscript for these results was submitted to Heliyon Journal and is currently under review. One of the maps in the manuscript showing the distribution of the common invasive tree is shown here below.



ACKNOLWEGEMENT

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