IDENTIFICATION OF HUON TREE KANGAROO (*DENDROLAGUS*

MATSCHIEI) HABITAT IN PAPUA NEW GUINEA THROUGH INTEGRATION

OF REMOTE SENSING AND FIELD OBSERVATIONS

BY

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ABSTRACT

The Huon Tree Kangaroo (*Dendrolagus Matschiei*) is endemic to the montane forests of the Huon Peninsula in Papua New Guinea. *D. matschiei* is threatened by increasing hunting pressure and by the expansion of subsistence agriculture associated with rising human populations, which leads to loss of forest habitat. The Tree Kangaroo Conservation Program (TKCP) began in 1996 as a study of *D. matschiei* and has expanded into a community-based effort to preserve montane forest habitat on the Huon Peninsula. Although the TKCP has produced impressive results, the remote location, lack of transportation infrastructure, and limited financial resources have prevented a regional assessment of tree kangaroo habitat. To address this issue, I integrated multiple sources of spatial data to identify potential *D. matschiei* habitat in the region. There were three primary objectives to my research: (1) examine the relationship between tree kangaroo presence, vegetation, and landform based on data collected at two field transect sites; (2) produce a current and accurate land-cover map for the region from Landsat-7 Enhanced Thematic Mapper Plus (ETM+) imagery; (3) develop a map which predicts the suitability of habitat for *D. matschiei* throughout the region. I used contingency tables, principal coordinates analysis (PCoA), and logistic regression to examine the relationship between the dependent variable tree kangaroo presence, and independent variables describing vegetation and landform at the two transect sites (Dendawang and Sibidak). A logistic regression model ($R^2 = 0.05$, $p = 0.038$) of vegetation factors at the Dendawang site indicated significant relationships with the presence of the subcanopy tree *Astronidium sp.* ($B = 0.817$, $p = 0.015$) and undisturbed canopy surface ($B = -0.593$, $p = 0.039$). Also, a logistic regression model

($R^2 = 0.012$, $p = 0.048$) of PCoA components for the Dendawang site indicated a significant relationship ($B = 5.427$, $p = 0.035$) with an association of vine species found at the edges of disturbed areas. A logistic regression model ($R^2 = 0.112$, $p = 0.018$) of vegetation factors at the Sibidak site indicated a significant relationship with the presence of the subcanopy tree *Pandanus sp.* ($B = -1.888$, $p = 0.017$). I also created a regional land-cover map through classification of Landsat-7 ETM+ imagery which identifies forested areas. I integrated this land-cover classification with species information from existing literature and regional population and land-use data using a Geographic Information System (GIS). I then used GIS modeling to develop a regional map predicting the suitability of montane forest habitat for *D. matschiei* as good (29.6%), marginal (50.7%), or poor (19.7%). My results will be used to identify priority areas for conservation, assisting in the protection of habitat for this culturally and ecologically important species.