Predicting the impact of climate change on the distribution of flindersia pimenteliana f. muell. in Indonesian Papua and Papua New Guinea

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Abstrak

Population of Flindersia pimenteliana (Maple Silkwood) in Indonesian Papua and Papua New Guinea is severely fragmented and experiencing a continuing decline due to habitat destruction and illegal logging. This species is very susceptible to environmental changes and at greater risk of extinction due to its small and fragmented geographic ranges and low abundance. Using maximum entropy (MaxEnt) method, the present study predicted the impact of climate change on the distribution of the species across its native distribution area. Elevation and 19 bioclimatic variables commonly used in species distribution modeling were used as predictors. Â The prediction model of the current potential distribution identified a total area of 156,214 km2 in Indonesian Papua and Papua New Guinea (18% of total land area) as suitable habitat for F. pimenteliana. Elevation and precipitation of the wettest, coldest and warmest quarters contributed most to the model. Based on the average of HadGEM2-ES and MIROC-ESM models, potential distribution projections under RCP8.5 scenario suggested a habitat gain of 16% for 2050 and 8% for 2070 in the species distribution. Whereas under RCP4.5, an average habitat gain of 7% was predicted for both 2050 and 2070. The newly suitable habitats were predicted to be found mainly in Southern and Western Highland of Papua New Guinea. Protection of these areas from habitat destruction and land use change is needed to assist F. pimenteliana find the most suitable climate for its survival.