ASSESSING THE POTENTIAL IMPACTS OF CLIMATE CHANGE ON DIPTEROCARPUS SPECIES AND CONSERVATION ADAPTATION IN PENINSULAR THAILAND

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The objectives of this research were to evaluate the consequences of climate change on potential shifts in distribution of Dipterocarpus species, to assess species at risk and to adapt protected area networks to cope with future climate change in Peninsular Thailand. A sub-scene of the predicted climate in 2100 of the Hadley Centre Coupled Model, version 3 (HadCM3), was extracted and calibrated with topographic variables. A machine learning algorithm or Maxent was employed to generate ecological niche models of 31 Dipterocarpus species from eight genera. In addition, a risk assessment matrix and the gravity model & GIS were employed to determine species at risk and priority areas to cope with future climate change, respectively. According to the global climate data, the temperature in Peninsular Thailand will increase from 26.6 °C in 2008 to 28.7 °C in 2100, while the annual precipitation will decrease from 2,253 mm in 2000 to 2,075 mm in 2100. The model predicted that six species have a turnover rate greater than 50 percent of the current distribution range and 13 species will be listed as high to extreme risk species. The studied Dipterocarp species were predicted to assemble in large and contiguous protected areas. However, such concentration areas are likely to decrease from 12.03 percent in 2008 to 9.35 percent in 2100. If the government expands the existing protected areas from 19 percent to 25 percent in priority areas, this conservation effort will significantly mitigate future climate change in the peninsular Thailand.