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Adapative Management of Protected Areas under Land Use and Climate Changes in Thailand

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The objectives of this research were to assess the potential impacts of future land use and climate change scenarios on mammal distributions in northern Thailand and to priority new protected areas to minimize the predicted impacts. Occurrence data of 17 selected mammals were obtained from a nationwide inventory during 2004-2006. Current and predicted future bioclimatic variables in 2050 were extracted from global datasets. In addition, the maximum entropy model (MaxEnt) was used to generate suitable habitats. In addition, the vulnerability matrix and the gravity model were employed to define risk species and additional protected areas, respectively. The results revealed that future climatic conditions would favor species inhabiting dense habitats. However, most species were predicted to lose suitable habitat if the remaining forest cover declines from the current level of 57% to 50% in 2050. When land use and climate changes were combined, the predicted impacts were more severe. Most species would lose suitable habitats and the average shift in distribution was greater than 40%. Centers of current mammal richness and in the future were predicted in large and contiguous protected forests but the percentage of moderate-very high concentrations would decrease marginally in the future. By increasing additional protected areas of 1,861 km2 from the current plan (from 31.4% to 32.5%) in the vulnerable areas, the predicted impacts on mammal distributions will be significantly decreased. This research demonstrates that spatially explicit models and protected areas are effective means to contribute to conservation planning at current and future dynamic threats.