

A GIS-based multi-criteria decision making approach to forest conservation planning at a landscape scale: a case study in the Kinabalu area, Sabah, Malaysia

Abstract

This paper presents a geographic information system (GIS)-based multi-criteria decision making approach for forest conservation planning at a landscape scale. This approach enables decision makers to evaluate the relative priorities of conserving forest areas based on a set of preferences, criteria and indicators for the area. Compromise programming techniques are used to integrate the forest conservation priority maps of decision groups where a separation distance is calculated. A clustering analysis was applied to identify potential conservation areas as the basis of delineating potential new protected areas. The study was conducted in the Kinabalu area, Sabah, Malaysia where two polygons neighboring the Kinabalu Park were delineated. A group of 11 polygons totaling 2050 ha has also been detected in the western part of Kinabalu Park. The study recommends the inclusion of a forest polygon (359 ha) neighboring Kinabalu Park and another (4361 ha) to the west of the park as new protected areas. A green corridor linking the potential new protected areas and Kinabalu Park should also be constructed to facilitate animal movement and interaction. This study reveals that riparian vegetation is an important aspect to forest conservation and the legislation to protect riparian zones should be strengthened.