



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Mapping Secondary Forest Succession with Geographic Information Systems: A Case Study from Bulanıkdere, Kırklareli, Turkey

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Abstract: Developing forest management plans for sustaining the full range of forest values is a challenging task. One of the difficulties in this process is to set and achieve management objectives, and conservation targets. A sustainable forest management concept requires that a target forest structure (the composition and the configuration) be set before developing alternative management actions for the achievement of management objectives and the conservation targets. In this respect, developing and understanding vegetation succession play important roles in setting the target forest conditions. This study was conducted in the Bulanıkdere Forest planning unit (Kırklareli, Turkey) where the biodiversity-integrated multiple-use forest management planning process is conducted as part of the GEF project. The seral stages of secondary forest succession were determined according to Clements's succession theory by using 639 systematically distributed sample plots in the planning unit in 2003. The secondary forest succession was generated and mapped using a geographic information system (GIS) and remote sensing (RS), along with aerial photographs. The paired samples t-test was used to determine whether or not there were significant differences between estimated and calculated succession values. The difference was not statistically significant at a 95% confidence level. The results indicated that the forest has developed towards the climax stage. Around 70.1% of the area is in the competition stage, while the areas in the nudation, migration, and ecesis stages account for about 2.8%. Results show that anthropogenic disturbances and harvesting techniques have been the major causes of the succession. Under a selective harvesting regime, the trees left uncut or damaged would become the main components of the subsequent forest succession. The spatial database offers excellent opportunities to understand the vegetation dynamics and to help the forest manager in deciding future forest conditions for maintaining biodiversity.

Key Words: GIS, remote sensing, forest management planning, secondary forest succession

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