ABSTRACT

In the Sierras Chicas a long land use history has produced major changes on the extent and spatial configuration of the forest. The objective of this study is to quantify the deforestation, to assess the degree of fragmentation and the changes in spatial configuration between 1970 and 1997. I analyzed a representative area of the east slope of the Sierras Chicas located near Córdoba city. I used Geographic Information Systems, aerial photographs and Landsat imagery to develop maps of the forest, urban areas and other vegetation types in 1970, 1987 and 1997. I quantified the extent of these cover types in each year. Landscape ecology-based indexes Ire used to quantify the changes in spatial configuration of the forest. I quantified the number and mean size of patches, fractal dimension and perimeter of patches, mean distance between patches and amount of forest core area. To assess the degree of fragmentation I used the Gisfrag index.. To analyze the relationship betIen deforestation and landforms I divided the area into Sierra (>750m) and Plain (<750m). I also assess the influence of slope, distance to roads and urbanization growth on deforestation rates. Between 1970 and 1997 the forest extent declined from 14800 ha to 9050 ha. The patch number increased from 243 to 517. The mean patch size declined from 60 ha to 18 ha. Fractal dimension, patch perimeter and fragmentation degree increased substantially. Deforestation rates and changes in spatial configuration Were greater in Plain than in Sierra forest. Slope, distance to roads and urban growth are key factors in the deforestation process. Our results indicate that if the present trend continued over time the forest could undergo a dramatic reduce in extent. The original forested landscape would turn into a new landscape dominated by urbanization and grass or bush vegetation types. The forest would remain as isolated small patches with complex shapes located in step slopes and hills surrounded by urbanization or agriculture.

Key words: forest, fragmentation, deforestation, land use, Landsat, aerial photographs, Sierras Chicas, spatial configuration, landscape ecology, indexes, urbanization.