Applications of Aerial Photogrammetry and GIS Techniques on Mapping the Forest Types and Terrain Characteristics of the Alishan Natural Reserve Area[*)]

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Abstract

The Alishan natural reserve area, abbreviated as ANRA, locates in the middle-southern part of Taiwan. It has been choosing to be the study site for implementing serial remote sensing researches that focus on the long-term development monitoring of forest reserve area. This study is an essential one of the serial researches. It aims to mapping the distribution of vegetation types to supporting the research needs of remote sensing. After review the relative literatures and onsite checking survey, we made a photo interpretation key for mapping the forest types of ANRA. A digital elevation model of ANRA was also produced in this study by the means of digital photogrammetry for applying to analyze the terrain of the study site.

The results show that the mean of the elevation and slope of ANRA is 2,110 meters and 23.4 degrees respectively, and there are about 50% of the site area whose slope is greater than the slope mean of the site. The terrain relief of ANRA goes up from the lower northwest to the higher southeast and covers with many folds around the whole site. The dominant species of ANRA are *Chamaechyparis spp.*, *Tsuga chinensis*, *Pinus spp.*, *Cryptomeria japonica* and *Taiwania cryptomerioides*, and other hardwood species. All of these species are mainly distributed in mixed types and rarely existed in pure types. There are 16 forest types that could be interpreted from the aerial photographs. And among all of the forest types, the HP (Hinoki-Pinus), HPH (Hinoki-Pinus-Hardwood), HTP (Hinoki-Tsuga-Pinus), and HTPH (Hinoki-Tsuga-Pinus-Hardwood) are the superior ones and they inhabit totally more than 92% of the site area. The richness of forest types (RFT) of the ANRA is significantly different at varying situations of the elevation, aspect and slope factors.

Key words: Aerial photogrammetry, GIS, Alishan natural reserve area (ANRA), Forest type, Terrain analysis.

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