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WHETHER TO CUT OR NOT? A MULTIVARIATE ECOLOGICAL INDICATORS SYSTEM OF SAIHANBA FOREST INCLUDING CARBON SEQUESTRATION

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Abstract

In this study, we established a comprehensive ecological value (CEV) index simulation model of Saihanba forest' North China larch from four aspects: water index, soil index, carbon sequestration index, and air index, to study the dynamic changes of the CEV index. It provides theoretical references and case analyses for formulating forest management measures to improve the CEV of forests. The results showed that the CEV index of intermediate cuttings in 150 years was better than that of non-cuttings when the carbon sequestration index weight was more considerable. Its CEV index reached USD 4.42×10^{10} , about 1.72 times that of the non-cutting strip. The dynamic change of the carbon sequestration index showed that the intermediate cuttings and forest products production were measured to improve carbon sequestration. The simulated annealing algorithm is used to solve the harvest density (%) and cutting time (y) under the CEV index simulation model based on the ecological data of Saihanba to maximize the CEV index. The results showed that 74.58 % as harvest intensity and 23.44 as cutting time were the most suitable forest management measures for Saihanba larch. Under this model, the water and soil index maintain the growth trend, and the carbon sequestration and air index break through the limits of the growth curve. It provides ideas for future data management of forest management measures.

Key words: carbon sequestration, ecological value, forest management, intermediate cuttings

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