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Lakmali Pradeepa Weerasena* (lakmali-weerasena@utc.edu), 615 McCallie Avenue, Chattanooga, TN 37403. *A multi-objective mathematical model for optimal design of a compact-connected nature reserve system.*

Conservation biologists and wildlife managers are challenged with designing protected reserves for biodiversity conservation. In this study, we present a multi-objective mathematical model to obtain a compact shape for the reserve system. The model aims to include direct connections between reserve sites to increase the likelihood of species persistence while maintaining a compact shape for the reserve system. For the proposed model, we introduce two conflicting objective functions that allow us to utilize the true purpose of multi-objective mathematical techniques and enhance the decision-making process with a trade-off analysis. We used synthetic reserve systems to demonstrate the working of the proposed model. An empirical application to a data set shows that the model produces quite impressive designs. (Received August 19, 2020)