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Graeme Caughley proposed in 1976 a predator-prey differential equation model for elephant-tree dynamics which hypothesized an outcome of stable limit cycles. Duffy et al investigated Caughley's model and discovered that stable limit cycles were unlikely when using realistic values of the parameters.

Our modifications to Caughley's model include the effects of harvesting and stocking on both species' density for elephants and trees. Both harvesting and stocking are assumed to occur at rates proportional to the density size. In this way, the model can now account for elephant poaching or restocking, as well as harvesting or planting of trees.

With these modifications to Caughley's model, not only are limit cycles improbable, but coexistence between elephant and trees is unlikely as well for the realistic parameter values offered by Duffy et al. The best hope for coexistence in the system with harvesting and stocking is in the scenario of planting trees when the elephant decay rate outweighs their stocking rate. Then elephants and trees are successful at coexistence. (Received September 02, 2020)