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Abstract: This paper deals with a prey–predator model incorporating a prey refuge and harvesting of the predator species. A mathematical analysis shows that prey refuge plays a crucial role for the survival of the species and that the harvesting effort on the predator may be used as a control to prevent the cyclic behaviour of the system. The optimal harvest policy is studied, and the solution is derived in the equilibrium case by using Pontryagin's maximal principle. Some numerical simulations are taken to illustrate the established results.

This paper deals with a qualitative approach with attention to equilibrium values and stability.

Keywords: differential equation, population, model, predator prey model, refuge, hiding, stability