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Optimal impulsive harvesting policy for single population. (English) Zbl 1011.92052
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Summary: We establish the exploitation of an impulsive harvesting single autonomous population model by the logistic equation. By some special methods, we analyse the impulsive harvesting population equation and obtain existence, an explicit expression and global attractiveness of impulsive periodic solutions for constant yield harvest and proportional harvest. Then, we choose the maximum sustainable yield as the management objective, and investigate the optimal impulsive harvesting policies, respectively. The optimal harvest effort that maximizes the sustainable yield per unit time, and the corresponding optimal population levels are determined. At last, we point out that the continuous harvesting policy is superior to the impulsive harvesting policy; however, the latter is more beneficial in realistic operations.

MSC:

- 92D40 Ecology
- 91B76 Environmental economics (natural resource models, harvesting, pollution, etc.)
- 49N90 Applications of optimal control and differential games
- 34C25 Periodic solutions to ordinary differential equations
- 34C60 Qualitative investigation and simulation of ordinary differential equation models

Cited in **1** Review
Cited in **72** Documents

Keywords:

logistic equation; impulsive differential equation; impulsive periodic solution; global attractivity; optimal impulsive harvesting policy

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