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*A stage-structured mathematical model for fish stock with harvesting*

We propose a mathematical model for a single species fish stock with three stages structure: juveniles, small adults and large adults with two harvesting strategies for mature classes, maturity and size selectivities. The purpose of the work is to investigate the dynamical behavior of the model and discuss the effect of harvesting. We identify the adult reproduction number  $\mathcal{R}_A$  for the model; obtain the local and global stability of the trivial equilibrium when  $\mathcal{R}_A < 1$ ; discuss the population persistence and existence of a unique positive equilibrium when  $\mathcal{R}_A > 1$ . Numerical simulations are provided to investigate the influence of harvesting functions, discuss the optimal harvesting rates and explore the effect of periodic coefficients on the dynamical system.