Analisis model predator-prey dengan pengaruh allee effect pada populasi prey dan pemanenan pada kedua populasi = Analysis model of predator-prey with allee effect on prey population and harvesting in both population

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Abstrak

ABSTRACT
Skripsi ini membahas model predator-prey dengan Allee effect pada populasi prey dan pemanenan pada kedua populasi. Allee effect adalah situasi ketika pertumbuhan populasi pada populasi berkepadatan rendah berkurang ketika ukuran populasi nya berada dibawah koefisien Allee. Intervensi pemanenan ilegal pada populasi predator dan prey diperhitungkan ke dalam model bersama dengan persaingan internal pada populasi predator. Analisis matematika digunakan untuk menemukan titik ekuilibrium. Stabilitas lokal untuk titik-titik ekuilibrium kepunahan dan koeksistensi dianalisis menggunakan metode linearisasi dengan matriks Jacobian. Analisa bidang fase juga diberikan untuk memberikan interpretasi yang lebih baik untuk hasil sebelumnya. Beberapa simulasi numerik diberikan untuk menunjukkan bagaimana intervensi pemanenan dapat menyebabkan kepunahan pada kedua populasi ketika tidak terkontrol.
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ABSTRACT
This thesis discussed predator prey model with Allee effect on prey population and harvesting in both populations. Allee effect is a situation for a small population when the population growth is reduced when it is under overcrowding. Intervention of illegal harvesting in both predator and prey population included into the model along with internal competition of predator population. Mathematical analysis to find the equilibrium points conducted analytically. Local stability for the extinction and coexistence equilibrium points are analyze using the linearization method with the Jacobian matrix. Phase portrait analysis also given to give a better interpretation for the previous result. Some numerical simulation are given to show how harvesting intervention can lead into an extinction of both population when it is uncontrolled. This thesis discussed predator prey model with Allee effect on prey population and harvesting in both populations. Allee effect is a situation for a small population when the population growth is reduced when it is under overcrowding. Intervention of illegal harvesting in both predator and prey population included into the model along with internal competition of predator population. Mathematical analysis to find the equilibrium points conducted analytically. Local stability for the extinction and coexistence equilibrium points are analyze using the linearization method with the Jacobian matrix. Phase portrait analysis also given to give a better interpretation for the previous result. Some numerical simulation are given to show how harvesting intervention can lead into an extinction of both population when it is uncontrolled.