Letters

Drugs, trees, tourism, sharks

More turtles mean more sharks

There is, in mathematics, a system of differential equations called the predator-prey equations. (See, for example, chapter 12 of "Differential Equations, Dynamical Systems, and Linear Algebra," by Morris Hirsch and Steven Smale.)

These equations determine a mathematical model for the variation in time of the population of a predator-prey pair (for example tiger sharks and sea turtles). The model predicts that the population of both predator and prey will vary periodically in time.

It is unclear how accurate the model is when applied to the populations of tiger sharks and sea turtles. There is little precise information available about the population of either species.

But windsurfers in Kailua believe that there has been a recent (over the past five or 10 years) increase in the sea turtle population and I have read in various places that the population of tiger sharks is increasing.

The frightening thing is that the model predicts that the tiger shark population will continue to increase until the sea turtle population stabilizes and even will continue to increase for a while as the sea turtle population decreases.

If the prey-predator model is applicable here we may be in for a further increase in the tiger shark population and a consequent increase in the frequency of shark attacks on surfers.

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