

1086-34-83

Xueying Wang* (xueying@math.tamu.edu), Department of Mathematics, Texas A&M University, College Station, TX 77840, and **Jay R. Walton, Rana D. Parshad, Katie Storey** and **May Boggess**. *Analysis of the Trojan Y-Chromosome eradication strategy for an invasive species.*

The Trojan Y-Chromosome (TYC) strategy has been proposed to eliminate invasive alien species. In this work, we analyze the dynamical system model of the TYC strategy, with the aim of studying the viability of the TYC eradication and control strategy of an invasive species. In particular, because the constant introduction of sex-reversed trojan females for all time is not possible in practice, there arises the question: What happens if this injection is stopped after some time? Can the invasive species recover? To answer that question, we perform a rigorous bifurcation analysis and study the basin of attraction of the recovery state and the extinction state in both the full model and a certain reduced model. In particular, we find a theoretical condition for the eradication strategy to work. Additionally, an Allee effect and a Turing instability are also studied in this work. Our results show that: (1) with the inclusion of an Allee effect, the number of the invasive females is not required to be very low when the introduction of the sex-reversed trojan females is stopped, and the remaining Trojan Y-chromosome population is sufficient to induce extinction of the invasive females; (2) incorporating diffusive spatial spread does not produce a Turing instability. (Received July 09, 2012)