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**MATHEMATICAL AND BIOLOGICAL CONSEQUENCES OF
AGGREGATIVE BEHAVIOR NEAR HABITAT BOUNDARIES**

ROBERT STEPHEN CANTRELL

In this talk we consider the effects of nonlinear boundary conditions on a diffusive logistic equation in a bounded domain. The equation arises as a model for a population that grows logistically inside a focal patch of habitat and crosses the boundary at a rate that depends on the population density. Specifically, the rate at which the population crosses the boundary is assumed to decrease as the density of the population increases. The model is motivated by empirical work on the Glanville fritillary butterfly. In the first part of this talk we establish that for some ranges of parameters the model can support an Allee effect at the scale of the habitat patch. In the second we explore the local and global bifurcation structure of the problem. This work is joint with Chris Cosner and Salome Martinez.

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