INTERMODULAR DESCRIPTION SHEET:	UMAP Unit 776
TITLE:	Small Mammal Dispersion

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MATHEMATICAL FIELD: Differential equations

APPLICATION FIELD: Biology, ecology

TARGET AUDIENCE: Students in a course in differential equations

ABSTRACT: This module introduces students to the social fence hypothesis explaining small mammal migration between adjacent land areas. Students are shown how the hypothesis is formulated in the population ecology literature as a pair of autonomous differential equations, and then they are directed toward a modified version of the standard formulation leading to increased realism. The modified version is solved qualitatively with phase diagrams for a range of ecological circumstances. Students also gain experience working with the numerical phase-plane plotter Dynasys, which can be downloaded from the World Wide Web. The social fence hypothesis is presented within the real-world context of controlling beaver-related damage in a given area by trapping.

PREREQUISITES: Introduction to ordinary differential equations covering phase-plane solutions.