

A Multi-Vector Rabies Model

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Abstract

Recently, the number of rabies cases in raccoon dogs (*Nyctereutes procyonoides*) has increased in European countries. However, most rabies models concentrate only on the red fox (*Vulpes vulpes*). In order to incorporate both of these species, a two-vector model for the spread of rabies is created. First, a model with only red foxes is developed based on recent literature. This base model is then expanded to include an independent model for the raccoon dog. Once both models are producing desired results, the interaction between these species is added to produce the final model. The two-vector model results in the formation of patterns observed in nature. This includes multiple waves of infection along with spontaneous appearances of rabies. These results are explained in different ways than previous models through the interaction of species and the hibernation of raccoon dogs.