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NWRC Spotlight - Why Modeling is Useful in Wildlife Damage Management

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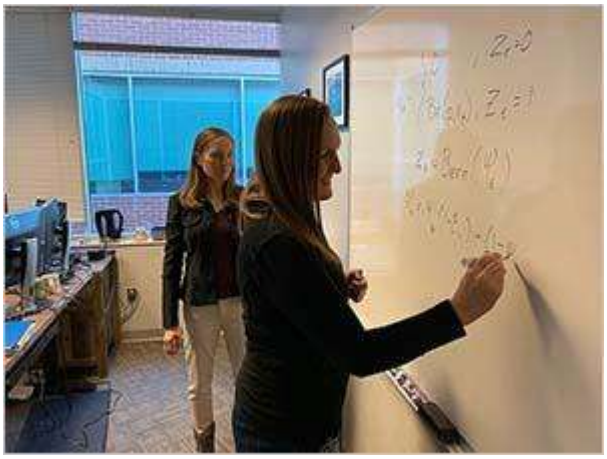

NWRC researchers use models to better understand complex systems.

Modeling can be intimidating with its complex concepts, technical terms, and mathematical methods. It can be difficult to wrap your head around. But modeling is a very useful tool, providing information that is difficult or too expensive to gather by other means.

A model is anything that represents something. People use models all the time whether they realize it or not. When a trapper determines the best place to set a trap, that is a mental model based on their knowledge and experience. Scientists use mathematical models to help them, and others assimilate information and

predict an outcome. Models can be thought of as thinking tools, to help form explanations and anticipate consequences.

At NWRC, researchers use all sorts of models to help understand complex systems. They answer questions like: How does disease spread through a wildlife population? How might wildlife damage to crops affect the regional economy? Which management method is more cost effective? Which data should be collected to best inform management decisions?

NWRC researchers Drs. Kim Pepin and Amy Davis are no strangers to modeling. Much of their research is devoted to teasing answers from complex data sets and ecological systems using a variety of modeling techniques.

“One of our recent projects looked at feral swine and their visitation and use of agricultural crops and natural resources,” states Pepin. “We combined movement data from more than 300 collared feral swine from 24 different studies with data from USDA annual crop records to learn about pig preferences.”

Predicting how the availability of crops and natural forage (i.e., grasses, acorns, bulbs, mushrooms, and animal matter) might influence whether a pig visits a crop field helps managers develop efficient control and damage assessment tools and strategies.

“Our findings can be used by wildlife managers, landowners, and others to target specific crops where swine are more likely to be active. For instance, the data show that swine strongly prefer peach and cotton crops, but not soybeans in South Carolina relative to the crops’ overall availability in the state,” continues Pepin.

Eventually, the methodology used to predict visitation and preferences could be paired with other data to calculate damage rates per individual feral swine, and subsequently predict damage levels from population estimates—all useful information for building support for feral swine damage management.

Currently, Davis helps the National Rabies Management Program with evaluating program objectives and improving efficiency.

“We worked with Wildlife Services rabies experts and others to evaluate the effectiveness of different rabies surveillance strategies to ensure sufficient allocation of the program’s resources. This involved statistical analysis of the program’s

surveillance data using an ecological model," notes Davis.

The model estimates and maps occurrence patterns over space and time—in this case, the occurrence of rabies. This collaborative approach helped inform oral rabies vaccine (ORV) zone placement in Ohio, West Virginia, and Pennsylvania. It also contributed to management decisions in New York, Vermont, and New Hampshire to move the ORV zone 20 miles south of the Quebec border.

"These targeted approaches are helping to improve WS' efforts on the ground," states Davis.

For more information, please contact NWRC@usda.gov.

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