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USING A TOWN'S GIS PROJECT TO CREATE A DEER-VEHICLE ACCIDENT MANAGEMENT PLAN

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Problem

The Town of Amherst, New York (a bedroom community adjacent to the City of Buffalo), faced high numbers of deer-vehicle accidents (DVAs) on a landscape where sport hunting had been historically prohibited and is currently not allowed. In addition, an attempt at an organized three-year lethal control ("bait and shoot") effort had ended in controversy and a lawsuit that stopped the program. The Town of Amherst needed a fresh approach to its problem of DVAs.

Objective

The project had two objectives: (1) to use data from the town's GIS project to better understand the spatial and temporal patterns of DVAs within the town and (2) to use this analysis to design a Community DVA management plan. By law, such a community plan would need to be passed through the state environmental quality review process.

Funding source

The Town of Amherst contracted with White Water Associates, Inc., for \$60,000 to conduct the study and produce the plan.

Methodology

Georeferenced data available in the existing town GIS project included 10 years of DVA data, land use types, roads and speeds, parks and open land, and multiple years of deer counts by the State Department of Environmental Conservation by designated polygons. Using the Town's GIS project, DVA data were analyzed using the ArcView® density function and a half-mile radius to provide an assessment of accident risk in time and space. DVA "hot spots" (area of high accident density) were defined and examined relative to adjacent established land use activities, proximity of natural areas as potential deer habitat, and recent development of open space that formerly served as deer habitat. Deer population counts were standardized by polygon area and compared among years with particular emphasis on deer populations before and after the three years of lethal control.

Summary of Findings and Applications

"Hot spots" were most likely to occur where two-lane traffic flow interfaced with open land, and also where recent development had likely displaced deer from their suburban habitat of vacant lands or former tree nurseries. In addition, GIS analysis also was able to show a significant effect of the three years of lethal control in reducing extent and intensity of DVAs "hot spots" and in reducing deer population density within the count polygons. These data scientifically justified the inclusion of professional lethal control as an important component of a multi-faceted, adaptive deer vehicle accident management plan.

Implications for Future Research and Management

Municipalities and counties can add DVA data to their existing GIS projects and use these projects to assess and monitor spatial and temporal patterns of DVAs. Such projects, in turn, allow local governments to better target any DVA reduction efforts that might include driver education, signage, fencing, artificial corridors, and lethal control.

Biographical Sketch: Dr. Elizabeth Rogers is a research ecologist for White Water Associates, Inc., an ecological consulting firm in northern Michigan. Dr. Rogers holds a B.S. from Central Michigan University, an M.S. from Southern Oregon State University and a Ph.D. in zoology (ornithology) from Michigan State University. Research interests include riparian ecology, bird communities in managed forests, and the use of scientific tracking to assess mammal communities and document corridors. Dr. Rogers recently completed a two year membership on the National Research Council Committee on the function and management of riparian areas. Current interests focus on ways to use GIS to address wildlife and land use issues.

Web site: www.amherst.ny.us