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[An Investigation into the Use of Road Drainage Structures by Wildlife \(Phase-I\)](#)

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Problem

Habitat fragmentation, or the breaking up of one patch of habitat into several smaller patches, by roadways and the consequent effects on the gene pools of wildlife populations is of growing concern to transportation planners, environmental regulators, and the public. Anecdotal observations lead to an assumption that some members of animal populations inhabiting urban, suburban and exurban environments may adapt their behavior to take advantage of movement opportunities provided at strategically located drainage facilities.

Objectives

The purpose of this research project is to evaluate the effectiveness of a variety of drainage structures on a variety of roadway sections to determine if these structures are being used to provide habitat connectivity.

Description

The Maryland State Highway Administration's Drainage Structures Database was used to develop a sample list of drainage structures (240) of varying sizes, materials, and design. Specific task activities included: (1) Characterizing the highway drainage structure in terms of size, length, material and type of structure (pipe, box culvert, bridge, etc.); (2) Providing evidence of wildlife use by documenting direct visual observations, photographs, animal tracks, etc (5 site visits); (3) Determining species composition, frequency of use, direction of travel etc.; (4) Documenting surrounding habitat characteristics at the inlet and outlet ends of the structure including the presence of perennial flow and substrate depositional characteristics within the structure; (5) Determining whether wildlife access to the roadway is limited by the presence of fencing, walls, etc. and assess the maintenance condition of these features; (6) Accessing any available databases that document wildlife mortality in the vicinity of the structure.

The research team placed cameras at a group of 90 drainage structures for a 14-day observation period. At the completion of each period, cameras were retrieved and images were downloaded, analyzed to species, and summarized in an Excel database. After processing, cameras were moved to a succeeding drainage structure group further east in the state for another rotation. One full cycle, which completes monitoring for one seasonal interval for the entire state, requires about 80 days. The research team is currently engaged in the fourth full cycle and plan to execute 5-6 additional full cycles, providing two seasonal (spring, summer, fall, and winter) samplings for each drainage structure over a two-year period (see Phase II).

Results

The first two seasons of data collection was completed in April, 2009. Species found in rough order of frequency of occurrence are: raccoon, Virginia opossum, domestic cat, great blue heron, white-tailed deer, red fox, gray fox, deer or white-footed mice, gray squirrel, domestic dog, woodchuck, beaver, mink, river otter, un-identified mustelid, humans, mallard ducks, wood duck, and eastern snapping turtle.

The preliminary analysis into the relationship of drainage structure use frequency by deer and road kill deer found within one mile of the structure in the past two years (above graph) reveals that there is a possible positive correlation between them. The correlation suggests that drainage structure use by deer does not preclude vehicle collisions, but rather culvert use is high in areas where overall deer activity is high.

Report Information

There is no final report published for the Phase-I study. For more information on the study, please contact Dr. Gates at egates@al.umces.edu or 301-689-7173.