Public Abstract

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Title:LANDSCAPE ANALYSIS USING A GIS METHODOLOGY FOR THE EVALUATION AND PREDICTION OF RELATIONSHIPS OF AMPHIBIAN HEALTH IN MISSOURI WETLANDS

A new methodology to quantify wetland health is developed using landscape characteristics for 49 wetlands in northern Missouri and relating them to wetland health. Wetland health was defined in this project as the presence of sensitive or rare amphibian species, such as tiger salamanders or northern crayfish frogs, which are very sensitive to habitat disturbance. Crops, forest, grass, herbs, length of stream, length of roads, change in elevation between wetland and nearest drainage channel, and length of flowpath from wetland to stream are landscape characteristics considered because they are assumed to affect wetland habitat for amphibians. A commercial geographic information system (GIS) ArcGIS 9.2 was used to quantify the landscape characteristics. Two types of wetlands were identified: non-pairs and pairs. Non-pair wetlands were defined as those wetlands in which the 600 m buffer zone and beyond did not overlap with the buffer zones of other wetlands. A pair wetland was defined as one in which the concentric rings of the buffer zones overlapped with the concentric rings of another wetland. Multiple linear regression analyses were performed, at different spatial scales, to test the relationship between wetland health and landscape variables. It was found that proximity to roads negatively affect wetland health up to a distance of 900 meters, while crops can have a negative effect up to a distance up to 2100 meters.