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Streambanks: Sediment and Phosphorus Contributions to an Impaired Water Body in Eastern Nebraska

Streambank erosion contributes to sediment and phosphorus loading of water bodies. Few studies have been done in eastern Nebraska to evaluate the extent of that contribution to impaired water bodies, such as in Wagon Train Lake. The pollutant reduction target has not been met even after implementation of BMPs throughout most of the Wagon Train Watershed of 4,000 hectares. The objectives of this research are 1) to quantify sediment and phosphorus loads from streambanks, 2) to examine dominant mechanism(s) of streambank erosion, and 3) to determine site-specific factors controlling bank erosion in the watershed. Data of the stream reach network were generated using GIS-interface of the AnnAGNPS Model and divided by size of drainage which resulted in four strata. From each of the four strata, four stream reaches were selected for detailed streambank observation. Erosion pins were installed in grids with minimum disturbance to the bank. Site-specific factors such as bank angle, vegetation cover, bank height, and other factors were assessed. Results indicate that streambank erosion contributes 2,619 Mg/yr of the estimated 7,205 Mg/yr entering Wagon Train Lake. Current erosion pin data suggest that falling soil crumbs from subaerial processes, often thought of as a preparatory agent, cause a significant portion of the erosion in the Wagon Train Watershed.

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