ASSESSING THE EFFECTIVENESS OF RESIDENT WATER QUALITY IMPROVEMENT PRACTICE ADOPTION ON NON-POINT SOURCE POLLUTION ACROSS URBAN-TO-RURAL LANDSCAPES IN NW INDIANA

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Effective control of nonpoint source (NPS) pollution is critical for both long-term health of freshwater ecosystems. Previous research has focused primarily on the implementation of best management practices (BMPs) to reduce NPS pollution from agricultural or urban land uses. However, there is a critical need to incorporate landowner willingness to adopt BMPs to more accurately quantify the cumulative water quality improvement potential at the watershed scale. This project sent out 2866 surveys to ascertain the background knowledge and likely adoption levels of various BMP types by residents within the East Branch—Little Calumet River and Trail Creek watersheds in Northwest Indiana. The survey divided the population into 5 resident groups including urban, suburban, rural residential, row crop agricultural, and pastural. Loads of nitrogen (N), phosphorus (P), and sediment generated from these resident groups were quanitied with the Generalized Watershed Loading Function – Enhanced (GWLF-E) hydrologic model under BMP implementation scenarios guided by the survey responses. Results show that row crop agirculture and urban land uses generate the greatest amount of N (54-75%) and sediment (37-62%) in these watersheds, respectively. Cover crops were the greatest reducer of watershed N (14.4-20.6%) and TP (6.0-15.9%) under full implemenation. However, application to the likely adoption level (27.8%) of cover crops generated only 6.5-9.3% of N and 2.7-7.1% P reduction. Porous pavement was the most effective sediment reducing practice (12.0-12.7%), but the low level of likely adoption (3.7%) allowed only 0.4-0.5% reduction of watershed sediment. Resident group area, loading rates, background knowledge levels, and location within the watershed are shown to be important considerations for BMP selection and education efforts by watershed managers to improve water quality.