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## ECOLOGICAL RESEARCH PROGRAM

### RESTORED STREAMS ENHANCE ABILITY TO REMOVE NITROGEN

#### Issue:

Excess nitrogen from fertilizer, septic tanks, animal feedlots, and runoff from pavement can threaten human and aquatic ecosystem health. Degraded ecosystems like those impacted by urbanization have reduced ability to process and remove excess nitrogen from the environment. Restoring ecological condition of streams may be a cost-effective, sustainable means to reduce nitrogen pollution in watersheds.

#### Science Objective:

Scientists at the U.S. Environmental Protection Agency's Office of Research and Development evaluated the effects of stream restoration on nitrogen removal capacity at an urban stream undergoing intensive restoration in Towson, Md.

Restoration of the stream was completed in 2005 using various techniques that reshaped the stream banks and channel,

reconstructed natural stream features, and re-established riparian plants. Research began before restoration and continued afterwards to determine the effects of restoration practices on nitrogen removal.

Scientists found restored streams more effectively removed nitrate nitrogen than unrestored streams. The total amount of nitrogen removed in restored streams can be significant and may help to reduce the total nitrogen load reaching water bodies of concern like the Chesapeake Bay.

#### Application and Impact:

The research represents one of the most intensive efforts to date to quantify the effects of stream restoration on nitrogen processing in urban streams. Municipal natural resource agencies such as Baltimore County have used this information to help develop regional stream restoration strategies to improve ecosystem

health and water quality. This research also has contributed to efforts by EPA's Chesapeake Bay Program to model the effects of stream restoration on Bay ecosystem health. Results of this ongoing research effort on stream restoration continue to be used to develop regional and national approaches to implementing and prioritizing stream restoration to manage nitrogen in watersheds.

#### REFERENCES:

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