

RESTORATION OF ATMOSPHERIC-RELATED WATER QUALITY IMPACTS IN SCHRADER CREEK

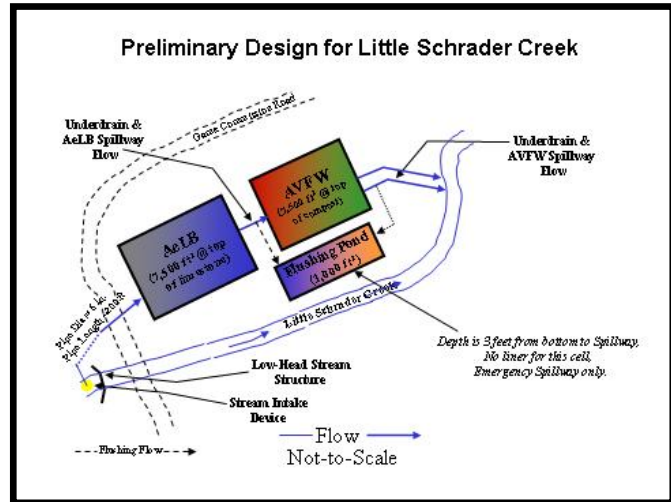
Project Location: Schrader Creek Watershed, Lycoming, Sullivan & Bradford Counties, Pennsylvania

Project Duration: January 2003-May 2005

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Water quality impacts associated with "Acid Rain" are widespread throughout the Appalachian Highlands & other regions of North America. Schrader Creek (EV & HQ Coldwater Fishery) is a predominately forested watershed located in Bradford, Sullivan & Lycoming Counties. Numerous studies by the PFBC and recently by Penn State University indicate the headwaters and tributaries (approximately 25 miles of stream length) of this watershed are episodically & chronically acidified from impacts of longterm atmospheric deposition. All headwater tributaries have baseflow pH less than 6 with many less than 5, which are below the PA Water Quality Standard for pH (6). In addition, these areas contain high dissolved aluminum concentrations (>50 µg/L), known to toxic to aquatic life. Episodic acidification extends into the mainstem of Schrader Creek impacting approximately 10 miles of stream length. These water quality impacts have eliminated the majority of naturally occurring fish and macroinvertebrates in large sections of the stream and its tributaries. In addition, the low buffering capacity in Schrader Creek is insufficient to minimize impacts of downstream-untreated AMD.



Dietz *et al* Consulting is developing designs for four (4) innovative combination aerobic limestone basin (ALB)/ anaerobic vertical flow wetland (AVFW) located in headwater tributary locations. The technologies have been used independently in AMD treatment, but are relatively new to this field of restoration (an approach developed by Jon Dietz, Ph.D.). The combination systems will employ hydraulic designs that will adjust flow (and alkalinity output) with stream flow to restore base and episodic flow water quality. Once installed the projects will remove an average acidity load (as CaCO₃) of 12,000 kg/year and add alkalinity in the amount of 30,000 kg/year for a total acidity reduction (or alkalinity addition) of approximately 42,000 kg/year; the acid load contributed by AMD (prior to treatment) in the watershed is approximately 41,000 kg/year. The systems will restore the water quality to prior existing conditions, which should restore biodiversity in the tributaries and improve the fishery throughout Schrader Creek.

Funding for this design project is from a "Growing Greener" grant cooperatively prepared and submitted by the Schrader Creek Watershed Association & Jon Dietz, Ph.D. (Dietz *et al* Consulting).