

SUNFISH POND ACIDIC DEPOSITION REMEDIATION

Project Location: Schrader Creek Watershed, Sunfish Pond County Park, Bradford County, Pennsylvania

Project Duration: October 2001-May 2003

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Sunfish Pond is a 20 acre lake contained within the Sunfish Pond County Park, an important recreational resource in Bradford County. Sunfish Pond is fed by shallow springs that have become acidic due to atmospheric deposition. In 1994 a major fish kill in the pond resulted in the PA Fish Commission removing the pond from its stocking list, which had impacted the recreational uses of the Park. In response the SCWA initiated annual costly, labor intensive and at time dangerous (hazardous roads, thin ice and etc.) liming of Sunfish Pond. County officials were considering prohibiting the liming due to safety & liability concerns.

A study was conducted to determine the sources of acidic water contributing to the Sunfish Pond acidification. A major acidic water spring source was identified. The spring characteristics are pH = 4.6, Al > 100 $\mu\text{g/L}$ and Conductivity = 25 μS , which are the result of longterm acidic deposition in the source area. The pH and aluminum levels in this water are toxic to aquatic life.



Designs were developed for an aerobic limestone basin (ALB) to provide longterm (> 25 years) and continuous treatment of the source water. The designs were based on a Maximum Alkalinity Estimation Model (MAEM) and an alkalinity kinetic model (AKM) developed by Jon Dietz for acidic type waters. The 6,000 ft^2 system was constructed in the fall of 2002 at a cost of approximately \$50,000. A unique and innovative hydraulic design was employed to improve water contact in the ALB. In addition, the design included burial of the system to accommodate multiple recreational uses of the open area adjacent to a number of campsites.

Performance of the ALB over the past 2 years has been exceptional. The acidic source water is treated to a pH > 7 with alkalinities between 30 and 40 mg/L at flows well in excess of 200 gpm. Sunfish Pond has not been limed since the ALB was installed and water quality has been maintained throughout the year with a pH > 6.5 and alkalinity greater than 5 mg/L. This water quality is more than adequate to sustain a trout and recreational fishery in Sunfish Pond.