

Impact of Anoxic Limestone Drain Treatment of Acid Mine Drainage in Bilger Run, PA

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Abstract

The Bilger Run wetland, located near Curwensville, Clearfield County, Pennsylvania was severely impacted by acid mine drainage due to years of extensive coal and clay mining operations. From October 2004 until September 2005, The Western Pennsylvania Conservancy tested the water quality of Bilger Run. Measured pH values ranged from 3.1 to 5.6, with an average value of 3.95. Conductivity levels ranged from 1080 to 1390 micro-Siemens per centimeter ($\mu\text{s}/\text{cm}$), with an average conductivity of 1114 $\mu\text{s}/\text{cm}$. In the fall of 2007, Hedin Environmental began the development and implementation of an anoxic limestone drain. Completed in early 2008, the passive treatment system was intended to improve the water quality of Bilger Run. From June 2008 to May 2009, we monitored pH and conductivity on a four acre portion of the wetland to determine the impact of the treatment system on the water quality. Results indicate that the water quality has slowly, but steadily improved since the implementation of the treatment system. After treatment, the pH increased from a low of 4.1 in September 2008 to a high of 5.7 in April 2009, with an average pH of 4.67. Treatment also lowered the average conductivity to 470 $\mu\text{s}/\text{cm}$, and values ranged from a high of 480 $\mu\text{s}/\text{cm}$ in July 2008 to a low of 294 $\mu\text{s}/\text{cm}$ in March 2009. There was also a spatial variation in pH and conductivity values related to the distance from the treatment point. In June 2008 and July 2008, 20-minute point counts were conducted at four locations to determine total number of bird species per location. The median pH at each point count location was compared with the results of the bird surveys to determine if water quality impacted the number of bird species. Preliminary results indicate that there may be an association between water quality and number of bird species; however, more research is needed to confirm these results due to the small sample size.

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