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Acid Mine Drainage: A Farewell to Recreational Fishing

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Growing up near the small town of Tamaqua in Schuylkill County, I can tell you it is impossible not to recognize and appreciate the history of coal mining in the area; this practice basically defines our region of Pennsylvania.

Yet, anyone who has driven through our wooded valleys can tell you it is also impossible to ignore the streams and pools of water which possess that distinct orange tint, characteristic of the ever-looming, rarely discussed acid mine drainage (referred to as AMD). With the growing conversation about environmental concerns across the country, the time has come to evaluate the environmental implications and relationship between the mining industry and the increasingly noticeable impact on our water resources.

To begin, it is crucial to assess the process and causes behind AMD to understand exactly how more than 138 kilometers of the upper main stem and West Branch of the Schuylkill River—to name some regions—have become compromised by AMD and why water sources have earned the label “mining’s most common casualty.”

AMD stems from a series of chemical reactions where water interacts with abandoned or active coal mining sites: as the water moves across old mine structures, it can interact with pyritic material and oxygen, forming iron hydroxide and sulfuric acid. This ultimately means that pH levels of streams will drop (to less than 5.0 on a scale of 0-14) and the amount of dissolved metals and sediment will increase. Mining practices are altering the chemical composition of various water supplies—making the water more acidic—leading to adverse side effects that spell consequence for the future of water quality throughout the area.

So why should our community care? Why should individuals care? Why should we modify the original mining practices that put our towns on the map? To simply answer these overarching questions, the environmental health implications of an issue like this extend beyond the discoloration of streams you pass every day on your way to work. The scope of AMD encompasses all aspects of the living and nonliving factors in our water. Not only does AMD compromise the safety of groundwater drinking sources and limit the opportunity for various outdoor activity use, but it also causes the deterioration of fish species that are often treasured for recreational purposes.

There is no doubt that Schuylkill County is home to a healthy population of fishermen, many who value the activity as a family tradition or as a way to enjoy the outdoors. If the effects of AMD are not curbed, we may begin to see degraded fish populations sooner rather than later. In these populations, the previously mentioned acidity and metal concentration in streams can actually lead to a higher mortality rate, a decreased ability to grow and reproduce, and even the relocation of certain species that are sensitive to changing conditions. Specifically, this acidity, as evidenced by pH levels, can change how penetrable fish gills are in water, in turn, affecting how well they function.

While the impacts of AMD extend throughout the region, Mill Creek and the West Branch Schuylkill River specifically demonstrate consistencies between the condition of fish and high amounts of AMD; these sections are characterized by the smallest populations of fish, in terms of numerical amounts, as well as the smallest level of species diversity. This correlation indicates that mining activities are inadvertently targeting species whose availability was once ensured.

So what can be done to reverse this problem, or to at least revitalize the health of our streams? Since the history of coal mining in this area is so prosperous and many residents likely have coal dust running through their veins, it would be ignorant to believe that any and all mining practices can be eliminated. Often times, it its difficult or unrealistic to curb acid mine drainage because technology is very expensive or inadequate. However, with that being said, it is crucial to consider methods of preventing any future damage, while also attempting to remediate past contamination. There is some hope, particularly through systems such as wetlands, which eliminate specific substances in the water, or limestone diversion wells, which counteract the polluting chemicals.

The best mechanism for fixing this issue is to maintain a level or awareness, spreading knowledge about the health and prosperity of our streams.

If we, as a population, hope to enjoy the benefits of fishing as a pastime for years to come, it is our job to evaluate the current situation, and remain educated about what is occurring in various ecosystems throughout our community. Examining AMD in relation to its impact on aquatic life is the only way to preserve these populations. If not, the next time you go fishing, there may not be any fish to catch.