KIMBERLY RUN Watershed

MANAGEMENT PLAN

Process and Criteria for Determining Threats to Watershed Resources for the Somerset County Conservancy

Somerset County, Pennsylvania









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Watershed Group Evaluation

Group Overview

Somerset County Conservancy (SCC) was formed and incorporated in Pennsylvania as a non-profit organization and received their designation as a 501(c)(3) corporation from the Internal Revenue Service in 1994. Originally established to hold ownership of the properties where abandoned mine reclamation projects were being constructed (SCC now holds five properties containing Abandoned Mine Drainage (AMD) treatment systems), the group expanded its involvement in land acquisition to include preservation of unique natural areas. Their guiding principals are to preserve, restore, and improve the natural resources of Somerset County, promote natural resource science and education, and to use their properties for the benefit of the general public.

Over the years, SCC has developed several guiding documents, which include their Bylaws, Project Selection Criteria for Land and Easement Acquisition, and Pre-Acquisition Worksheet for Land and Easement Acquisitions. SCC acquired 260 acres of undeveloped land in 2001 and named it the Kimberly Run Natural Area because the stream flows through the property and is its key feature. Kimberly Run Natural Area is part of both an Important Mammal Area (IMA) and Biological Diversity Area (BDA) as designated by Western Pennsylvania Conservancy (WPC).

Their Five Year Strategic Plan, adopted in March of 2009, states "The Somerset County Natural Heritage Inventory will be the primary document to guide our future preservation actions." The plan also identifies four key goals that are described below:

Administration and Operations –

Improve the management, operations, and organizational structure of the Conservancy. **Communications and Public Affairs -**

Increase public awareness of the Somerset County Conservancy as a valuable community resource and engage more members and the general public in projects and programs involving the organization. **Financial Management** -

Improve the financial condition of the Somerset County Conservancy by 10% per year through a combination of fund raising, financial management and increasing paid membership.

Land Programs -

Improve the Organization's capacity to acquire and manage properties for environmental and public benefit.

SCC is a well functioning and successful organization with a strong and active Board of Directors containing 15 members and has a general membership of approximately 125 members.

WPC met the with SCC Board of Directors in February of 2010 to introduce the assistance program, explain the types of technical assistance available, get a better understanding of the SCC's goals and expectations, and develop initial



contacts. As their application indicated, they specifically requested technical assistance to determine why they seldom observe fish in Kimberly Run within the Kimberly Run Natural Area. The Board indicated there were a few different studies undertaken on Kimberly Run over time and there was a significant amount of previous data collected on the watershed which identified several possible pollution sources. WPC agreed to log all available data into a geographic information system (GIS) along with the data being collected by this effort.

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Hiking trail through Kimberly Run Natural Area

SCC suggested that a technical committee be formed to provide guidance during the implementation of the project and a committee was formed in the following months. Technical committee members include: **Representatives from Somerset County Conservancy –** James Moses, president, and Daniel Seibert, board member and soil scientist; Pennsylvania Department of Environmental Protection – Bureau of Mining and Reclamation, Malcolm Crittendon, watershed manager, and Bureau of Abandoned Mine Reclamation, Richard Beam, geologist; U.S. Office of Surface Mining (OSM) -Brent Means, hydrologist; Somerset County Conservation District (SCCD), - Eric Null, aquatic biologist; Western Pennsylvania Conservancy – Mark Killar, watershed manager. It was agreed that individuals with expertise in other technical fields could also be asked to join the committee or provide input should the need arise.

SCC members asked if WPC could purchase continuous water samplers in order to assess water quality within the stream hour to hour and during seasonal changes. WPC suggested water sampling would be performed and samples could be evaluated at a local lab and that we would look into acquiring a water quality data logger. To be consistent with previous work, WPC agreed to follow the biological protocol previously established for the countywide inventory of watersheds.

WPC has gathered available data from SCC, DEP, OSM, PAFBC and SCCD. We have developed various maps of the watershed and have performed three field investigations to date (Figs. 2 - 4). SCC members and SCCD staff accompanied WPC on a preliminary investigation of the watershed and a follow-up investigation of an area of AMD sources. SCCD also assisted WPC with an aquatic survey within and just above the Natural Area.

Watershed Identification...

Aquatic Resource Values, Current Conditions and Threats

a. Compilation of Existing Data - Aquatic Resource Data i. Stream Designations

1. The Pennsylvania DEP Chapter 93 designates Kimberly Run's protected use as Cold Water Fishes (CWF) – Maintenance or propagation, or both, of fish species including the family Salmonidae and additional flora and fauna which are indigenous to a cold water habitat. It is identified in the State Water Plan as part of watershed 19 F, which is part of the Monongahela River and part of Coxes Creek, which drains to the Casselman River.

ii. Natural Heritage Inventory

The Somerset County Natural Heritage Inventory (NHI) was completed in January of 2006 under the direction of Western Pennsylvania Conservancy in cooperation with the PA Department of Conservation and Natural Resources (DCNR) and many others who share interest in the natural resources of Somerset County. The Inventory focuses on identifying and mapping the most significant living ecological resources in order to draw attention to their importance, protect their existence, and enhance their populations through conservation whenever possible. Selection and delineation of these areas of importance are based on criteria such as the existence of habitat for plants and animals of special concern, the existence of ecologically significant natural communities, and the size and landscape context of a site (PNHP 2006).

Threatened and Endangered Species

1. Kimberly Run Natural Area, owned by the Somerset County Conservancy, is the core for this Biological Diversity Area (BDA) that contains stream bank and alluvial floodplain habitats occupied by two plant species of special concern, Appalachian blue violet and stiff cowbane; in addition to an animal species of concern. The supporting landscape of this BDA is the immediate watershed surrounding this section of Kimberly Run. Dominant canopy species are eastern hemlock, black birch, red maple, eastern white pine, yellow birch, black cherry, black gum, red oak, white oak, witch hazel, and hawthorn. Herbs include starflower, woodsorrel, partridgeberry, skunk cabbage, marsh blue violet, buttercup, sessileleaved bellwort, Canada mayflower, spike-rush, New York fern, soft rush, goldenrod, deer-tongue grass, and sphagnum. Open, stream bank habitat along Kimberly Run provides habitat for Appalachian blue violet, a regionally endemic species to Maryland, North Carolina, West Virginia, and Pennsylvania that is considered globally vulnerable despite the fact that it is abundant at some locations. The violet is listed as imperiled in the state though it is likely that many new occurrences will be discovered since it is believed by several botanists that the species is often overlooked and more common than initially thought (Grund, pers.comm. 2004). Habitats for the Appalachian blue violet include rich moist woods, mountain coves, stream banks, pastures, and mowed areas such as lawns in rural areas. Stiff cowbane, a globally secure but state imperiled species, was found in a graminoid wetland within

the Natural Area. This species is found throughout the eastern U.S., except for New England, and in the Midwest where it occupies a variety of wetland habitats including swamps, bogs, sedge meadows, sandy shores, wet soils along streams, fens, wet prairies, moist bluffs, and abandoned railroad beds. Core habitats of this BDA are contained within Kimberly Run Important Mammal Area (IMA) (PNHP 2006).



Threats and Stresses

Species of special concern are under no imminent threat given that core habitats at this site are protected as part of the Kimberly Run Natural Area. However, the Pennsylvania Turnpike runs through the northern portion of the supporting landscape of this BDA and non-point source pollution associated with roads and automobiles (deicing salts, heavy metals, petroleum hydrocarbons, etc.) have the potential to significantly impact the stream. Road construction may also impact the hydrology and/or the physical nature of wetland areas within the site. (PNHP 2006)

Recommendations

Remaining forest cover in the immediate watershed surrounding Kimberly Run should be left intact be cause alterations in light levels and temperature could alter the hydrology of the site. Penn DOT workers involved in roadside maintenance should be informed of the presence of these rare species and a buffer between the turnpike and BDA should be maintained. This BDA is partially contained within Kimberly Run IMA and a description and conservation concerns regarding mammals at the site are given below (PNHP 2006).

2. Spanning 3,558 acres, Kimberly Run Important Mammal Area (IMA) is located near the junction of I-70 (PA Turnpike) and SR 219 and includes Kimberly Run Natural Area and State Game Land #50, as well as large contiguous forest tracts and an extensive wetland complex to the southeast of Kimberly Run Natural Area. A 2.5-acre sphagnum bog, older growth eastern and white pine woodlands (not logged since 1800s), oak, maple and beech woodlands, fallow fields, and rocky steam-side habitats are found within this IMA. Bobcat and black bear sightings are known to occur in the area. There has been one confirmed sighting (and several un confirmed reports) of the Pennsylvania endangered fisher, Some stretches of Kimberly Run within SGL 50 may contain suitable habitat for southern water shrews that occur in other drainages of the Casselman River. (PNHP 2006).



Tributary of Kimberly Run

Conservation Concerns

Kimberly Run Natural Area is dedicated to wildlife habitat, environmental education and open space preservation. A draft resource management plan for the Natural Area has been developed and goals have been identified. Preliminary recommendations for the IMA are to continue efforts to reduce abandoned mine drainage into Kimberly Run, continue conversion of fallow fields to natural grasslands, and to consider moving this IMA to provisional status, with possible restoration to full status pending mammal survey information. Mammal surveys, with special efforts to determine whether southern water shrews occur in the area, should be conducted (PNHP 2006).



American Chestnut Tree within the Natural Area

General Recommendations for conservation lands:

- Consider conservation initiatives for Natural Heritage Areas (NHA) on private land through: conservation easements; lease and management agreements; land acquisition; fee simple acquisition; unrestricted donations; local zoning ordinances
- Prepare management plans that address species of special concern and natural communities
- Protect bodies of water
- Provide for buffers around NHAs
- Reduce fragmentation of surrounding landscape
- Encourage the formation of grassroots organizations
- Manage for invasive species
- Incorporate County NHI information into planning efforts (PNHP 2006)

iii. Additional Existing Data

1. Pennsylvania Fish and Boat Commission (PFBC) manages Kimberly Run for Cold Water Fishes as two sections, with section one being from the

headwaters to a point 362 meters upstream of Route 219, which is just downstream of the boundary of the Kimberly Run Natural Area. Section Two is from the site just below the SCC property to the mouth of the stream. It is managed by PFBC for catchable trout.

The most recent study (2004) indicated in-stream habitat in the optimal range. Both upper and lower sites are affected by AMD. However, the AMD is either buffered by active treatment, is net alkaline or nearly so, or if acidic, is of a small enough flow to prevent significant reductions in aquatic life. PFBC performed two electro-shocking surveys, one in the upper reach of Section Two near SCC property and another at the lower reach, nearer to the mouth. No macroinvertebrate sampling was performed. The survey showed six species of fish at the upper site, including trout, sculpins, chubs, and suckers, and site two had seven species, including trout, dace, bluegill, chubs, suckers, and an abundance of mottled sculpin. Fish habitat, size, and social data in dicated the stream should be managed at "Optimum Yield II Suburban Option given it's location near the town of Somerset and its 39% public ownership (PA Fish and Boat Commission: Kimberly Run (819F) Section 02 Management Report)."

2. DEP also provided a significant amount of historical data on Kimberly Run. Two National Pollutant Discharge Elimination System (NPDES) permits were issued for the landfill area in the headwaters. One is through the Bureau of Water Quality Management for the landfill's effluent. The second one is issued by the DEP Bureau of Mining and Reclamation for an AMD that is being treated under a coal mining permit, which was located on the site prior to the landfill. In addition, DEP's Bureau of Abandoned Mine Reclamation (BAMR) provided additional water quality, and biologic data from assessment work they performed on Kimberly Run several years ago. A map of all the DEP sampling locations was provided along with all water monitoring available for the watershed.

3. The OSM National Mine Map Repository provided historic deep mine maps of the known abandoned mines within a two-mile radius of Kimberly Run. Although the maps indicated very old deep mines were within the area, the maps are poorly referenced to easily identifiable surface features, noting only old property boundaries that existed at the turn of the 20th century. Without the ability to accurately locate them, they were of little value.

4. NRCS PL-566 - SCC had been involved in some previous studies on the watershed through the NRCS in an effort to get the watershed designated under the Watershed Protection and Flood Prevention Program - PL-566 program.

The law authorizes the U.S. Secretary of Agriculture to cooperate with state and local officials in carrying out works of improvement for soil conservation and other improvements. It provides for technical and financial assistance through the USDA to local organizations representing the people living in small watersheds. PL-566 requires the development of a physically, environmentally, socially, and economically sound plan of improvements scheduled for implementation over a scheduled period of years. If a watershed can meet the criteria of the program, it allows for a 50% cost-share for projects related to eight specific purposes, including: flood prevention, agricultural phases of conservation, development, utilization, and disposal of water (agricultural water management), fish and wildlife development, recreational development, ground water recharge, water quality management, conservation and proper utilization of land, and municipal and industrial water supply.

Although and application was filed and approved by USDA and preliminary work begun, the initial work

showed that a positive cost/benefits analysis was not likely to be met. Therefore, further study was curtailed and eventually all the data gathered by NRCS was discarded. No data gathered during the application process could be located.

iv. Aquatic Community Classification

1. The East Branch of Coxes Creek, into which Kimberly Run flows, is classified as an Ohio Coldwater Community for fish, with representative species being brook trout and mottled sculpin. Kimberly Run is not listed at all in the classifications for macroinvertebrates.

v. Potential Pollution Sources

1. The primary potential point source pollution of Kimberly Run is the Mostoller Landfill located in the headwaters area just west of Route 31 (Fig. 5). The landfill operates under DEP solid waste and NPDES permits. Water quality is monitored for numerous organic and inorganic compounds under their permit and is strictly regulated. In addition, there are two AMDs emanating from the landfill property, one under permit and one abandoned. The permitted discharge is regulated by the DEP mining program and is being treated chemically to meet water quality standards under mining regulations. The AMD is treated passively but is not under a regulated permit, so although it receives some treatment, it does not always meet mining water quality standards.

2. In addition to the AMDs located on the landfill property, there is also another permitted mine discharge being chemically treated located on an unnamed tributary to Kimberly Run which enters upstream of the SCC property. Like the permitted discharge on the landfill, it is required to meet permit standards. Although all these permitted discharges presently meet their permit standards, there is always a potential for them to be released into the stream untreated so therefore they remain a threat to the stream.

3. Nonpoint source pollution (NPS) is a constant threat to Kimberly Run. One of the primary sources of this threat is the Pennsylvania Turnpike, which traverses the watershed. In the early 1990's a fish kill occurred on Kimberly Run, and although the cause was never pinpointed, the turnpike was one of the primary suspected sources. The most consistent pollution source is salt, which is often applied in large quantities during the winter months. Because of the proximity of the stream, runoff from the turnpike enters the stream unabated. In addition, any number of spills or releases of toxic pollution from vehicular traffic could occur along the turnpike at any time.

Runoff from agricultural areas in the headwaters area above the Natural Area property is another potential source of nonpoint source pollution.

4. AMD has been a consistent problem for Kimberly Run year round and looks to remain so for well into the future. Although surface mining appears to be the primary disturbance causing AMD, polluted groundwater also appears to be affecting the stream, especially within the central portion of the watershed near the Kimberly Run Natural Area.

The primary focus of this planning effort is to better define the pollution loading entering the stream from AMD and to discern whether the turnpike or landfill are also affecting the stream. A chemical and biological monitoring program was implemented and will continue until low water levels return in 2011 (Fig. 6 and Fig. 7).

vi. Land Cover-Related Metrics

1. Data available from the Pennsylvania Spatial Data Access (PASDA) was used to analyze land use within the Kimberly Run watershed. Primary land use in the watershed is forest (57%) followed by farmland (29%), developed land (8%), and barren lands (5%). (Figure 3)

vii. Active River Area Analysis

1. WPC staff reviewed several portions of the Active River Analysis document that The Nature Conservancy (TNC) released in July 2010. Based on the small scale nature of this project (only one watershed) versus the multi-state geographic extent of the active river area analysis, we feel that this project doesn't benefit from a detailed analysis utilizing the program.

b. Major Threat Identification

In addition to the threats identified by the Natural Heritage Inventory, other major threats include:

- Possible spills of toxic materials being transported on the Pennsylvania Turnpike
- Runoff resulting from the application of salt on the turnpike and Route 31 during snow and ice events
- Release of toxic effluent from the Mostoller Landfill
- Release of untreated AMD from two permitted chemical treatment plants
- Release of toxic levels of pollutants from AMD sources being treated under DEP regulated permits.
- AMD from various unregulated discharges and ground water sources throughout the upper and middle watershed
- Sediment from the spoil area of the active underground coal mine located east of Route 31
- Sediment from agricultural areas upstream of the Natural Area property

c. Completed Assessments or Conservation Plans

i. Presently the most information and data collected for Kimberly Run has been done by the state agencies (DEP and the PFBC) in cooperation with the Somerset County Conservancy and the Somerset County
Conservation District. These studies focus on water quality and in-stream biologic sampling and associated habitats at the sampling sites. No visual assessment of the entire watershed has been performed. Somerset
County Conservation District also completed the Somerset County Benthic Entomological Survey, a standardized database of benthic macroinvertebrate sampling of all Somerset County's major watersheds. Kimberly Run was not sampled. Coxes Creek was sampled well downstream from the mouth of Kimberly Run so the results cannot be directly related to conditions within the watershed.

ii. In 2000, the Chestnut Ridge Chapter of Trout Unlimited finalized the Middle Youghiogheny River Corridor River Conservation Plan. Although the plan focused mostly on the river corridor and streams directly entering the river between Confluence and Connellsville, addressing issues on all the tributaries affecting the Middle Youghiogheny River, including the Casselman River and its tributaries, was part of the recommendations developed. Establishing water quality monitoring programs, cleaning up AMD, and enhancing recreational opportunities were all listed as priority management options and would be directly applicable to Kimberly Run.

iii. The Casselman River Watershed Major Nonpoint Pollution Assessment and Restoration Plan identified the main AMD pollution sources affecting the river. This study identified Kimberly Run as a pollution source. Initial water quality monitoring was performed on AMD sources and stream locations. The water quality monitoring results are included in the historic monitoring data collected during this project.

iv. WPC is presently completing the Casselman River Watershed Recreation and Trail Guide. Since the guide identifies areas for recreational opportunities, improving water quality in Kimberly Run and thereby improving fishing and enhancing other recreational values further downstream, such as on Coxes Creek and the Casselman River, would be compatible with the plan.

d. Data Analysis and Map Production

All data gathered from various sources was compiled and placed into a common file to be reviewed by the technical advisory committee. Additional monitoring data is presently being gathered. Monitoring information was placed on GIS and maps generated to identify all monitoring locations. Additional maps identifying topography, impaired streams, point source pollution, and land use were also created.

e. Identification of Remaining Data Gaps

Numerous efforts have been initiated within Kimberly Run to characterize its ecological resources, water quality, and the effects of known pollution sources on the biota of the stream. The Natural Heritage Inventory identified key species of special concern, the threats and stresses affecting them, and made recommendations to conserve their habitat and support their survival. Local efforts have primarily been focused on the water quality of the stream and several studies of various sorts have attempted to characterize the chemistry of AMD sources and associated effects on in-stream water quality and macroinvertebrates

Several theories have been proposed for why there appears to be few fish ever observed in the stream, including sedimentation, salt, AMD, and toxic chemical compounds created from the combination of all the various pollution sources entering the stream. But because it would be very difficult and expensive to chemically test the water for all possible compounds, the technical advisory committee decided to install some in-stream continuous data loggers in key locations within the watershed to determine if any unobserved fluctuations in water quality are occurring. This will require monitoring over an extended period, which began in November, 2011. Although this monitoring will test for several basic water quality parameters, it will not test for any chemical compounds that might be created through a combination of pollution sources entering the stream. Such testing is beyond the scope of this project.

AMD entering the stream as base flow has also been identified as a threat to the health of the stream. Stream chemistry monitoring that would include in-stream flow measurements and calculating in-stream pollution loads as it approaches the Natural Area property would be required to determine if such conditions are present and should be performed.

Macroinvertebrate sampling can be used to help identify pollution sources. Certain species of macroinvertebrates are affected by different pollution sources and can be used to help identify the types of pollution entering the stream. Some macroinvertebrate sampling was performed by DEP in 2003 and can be used as historic data. Another macroinvertebrate sampling was performed in the October 2010 at three locations on the main stem of the stream, including two within the Natural Area property. As of this report, the findings have not been finalized but will be part of a future update. Macroinvertebrate sampling should be conducted on a regular basis in order to establish long-term trends in water quality conditions.



Stakeholders Meeting

Initially, WPC met with the SCC Board of Directors to review their application for technical assistance and further determine their needs and expectations. Because this project had very specific goals which focused on better understanding the effects of pollution on Kimberly Run within the Natural Area, we met again with the board of directors, the technical advisory committee, and cooperating organizations to discuss the technical aspects of gathering additional data. The group suggested that additional threats to the watershed may be identified by studying fluctuations in water chemistry, composition of sediment samples, and biologic sampling. A monitoring program was then developed and a schedule for implementation set.

Biological Monitoring of Kimberly Run

Watershed

Management Plan Developed

a. Threat Identification

The primary 'target' was identified as Kimberly Run and its aquatic life as it flows through the SCC Natural Area. Direct threats were identified as the transportation infrastructure, primarily the Pennsylvania Turnpike and State Route 31 as they traverse the watershed (Route 219 is also located in the watershed but it is downstream of the Natural Area property). Toxic spills and salt runoff were the primary indirect threats.



Route 31 in the headwaters of Kimberly Run

AMD from a number of sources was indicated as a direct threat because of the known impacts on the stream, while the permitted mine sites were viewed as indirect threats related to the previous mining because of the possibility of untreated acid mine drainage reaching the stream should an active treatment system fail. A specific threat from mining was identified as the permitted AMD treatment system located on the Mostoller Landfill. Presently, the effluent from the system is 11 pH , which is outside the usual mining effluent limits of 7 to 9 pH. The high pH indicates the water is being over treated and may be one of the causes for the unnaturally high alkalinity and conductivity of the stream. Another source of mining threats was identified as the underground mining operation located in the headwaters on the eastern side of the watershed, just west of Route 31. Recently the mine has asked to increase its discharge of treated water from .61 million gallons per day to 2.0 million gallons per day. In addition, very large piles of unvegetated soil and rock are located at the site and the threat of sedimentation and runoff from this mine spoil is of concern.

Another indirect threat was the Mostoller landfill because of the possibility of untreated effluent being released into the watershed, though there was no indication that any had ever occurred.

i. Feasibility of Success by Group - SCC is a well-functioning nonprofit organization that has successfully completed both land conservation and AMD remediation projects. Their board of directors is well-informed and contains members with a broad array of interests that are highly knowledgeable about the issues facing Kimberly Run. SCC will certainly be able to successfully complete this project and meet the goals of their Five Year Strategic Plan.

ii. Overall Impact on the Watershed - The water quality problems affecting Kimberly Run are similar to other areas in Somerset County where such issues have successfully been addressed. The pollution problems on Kimberly Run are primarily located upstream of the Natural Area so addressing those impacts should improve the water quality throughout the remainder of the watershed. Knowledge gained here could successfully be transferred to other watersheds in the county.

iii. Available Funding - There are several sources of funding which could be applied to the Kimberly Run projects. Most AMD remediation will likely be funded primarily from either state or federal grant programs. State funding includes Growing Greener, 319 Nonpoint Source Program, and Abandoned Mine Reclamation Fund grants administered by DEP BAMR. Federal sources could include funding from OSM, EPA, and U.S. Fish and Wildlife Service. In addition to state and federal sources, private foundation grants have played a key role in sustaining nonprofit organizations involved in watershed restoration projects. Examples such as the Foundation for Pennsylvania Watersheds, the Richard King Mellon Foundation, and the Colcom Foundation, are significant regional supporters of environmental initiatives. Nonprofit groups have also received funding from private sources such as local businesses and individuals. In addition, in-kind services are often provided by local businesses and governments.

 iv. Available Partners - Numerous partners are involved with this project and others could be called upon to support the effort. To date, the Somerset County Conservation District, Natural Resources Conservation Service, Pennsylvania Department of Environmental Protection, and Office of Surface Mining have been actively involved in the project.

v. Impact on Regional Conservation - This project is specific to the Kimberly Run watershed. However, information gathered from the study of the stream will become part of the more regional Somerset County Benthic Survey and will meet the management recommendations identified in the Middle Youghiogheny River Corridor River Conservation Plan. The data will also be compatible with the goals of the Casselman River Watershed Major Nonpoint Pollution Assessment and will help address water quality issues in Coxes Creek, the receiving stream.

b. Strategies to Address Threats

Threats to Kimberly Run from the transportation infrastructure within the watershed will take cooperation

from both PennDOT and the Pennsylvania Turnpike Commission in order to address the threats from salt and toxic spills. If a toxic spill would occur on the Turnpike it is highly unlikely that the materials could be kept from entering the stream if the spill occurs east of Route 219. For such toxic spills, the best approach might be to protect the downstream waters such as the Casselman River or lower Coxes Creek because the effects on Kimberly Run would be practically instantaneous. SCC may be able to work cooperatively with the Turnpike Commission and PennDOT to minimize the amount of salt that is applied during winter weather. The practical aspects of keeping road conditions safe during the winter will likely limit how much salt can be prevented from entering the stream. Perhaps some type of detention basin could be developed to capture the runoff from the turnpike where it is closest to the stream. In addition, wider buffer zones along the stream may be able to reduce direct impacts.

Control of point source pollution from the Mostoller Landfill and from the permitted mining sites depends on the continued proper functioning and monitoring of the permitted discharges. DEP regularly monitors and inspects the sites and should be notified if any issues resulting from the permitted discharges are identified.

Untreated AMD is the most obvious pollution source affecting the stream and three primary areas have been identified that should be addressed. One major issue associated with all three discharge areas is that they are adjacent to the stream and could be hydraulically connected to the stream. There are also wetlands associated with each discharge. The most upstream area is located east of Menser Road and within a wetland area adjacent to the stream and is identified as AMD01. The discharge pH is near neutral and usually contains more alkalinity than acidity. Because the iron levels averaging 21 mg/L it cannot be considered as truly net alkaline and would probably be best treated using an ALD, prior to settling the iron in a pond/wetland configuration. Because the discharge occurs within a large wetland area and is in the floodway, permitting will be a major issue and might include wetland mitigation requirements. There is

very little gradient in the area as well so oxygenation of the discharge water will be an issue. AMD02 is located west of Menser Road and is again adjacent to the stream. Its water quality is similar to AMD01 but with an average of 16 mg/L of iron, elevated manganese, and twice the sulfates at about 200 mg/L. It would also likely benefit from an ALD treatment. It is confined by the stream location and little treatment area is available adjacent to the discharge. AMD04 is also located west of Menser Road and is adjacent to an abandoned house that has collapsed. The flow of this discharge is very difficult to measure and numerous other areas around the site are flowing apparent AMD. There is no single discharge point to the stream where total flow can be measured accurately. This discharge zone is net acidic and would also benefit from and ALD if the source could be isolated. Another discharge identified in this area is AMD03 and is a piped discharged flowing directly into the stream. It is an acidic discharge and enters Kimberly Run just upstream of the AMD04 area. The source of this discharge is unclear and is lower in iron than the other discharges at an average of 9 mg/L. All of these discharges appear to be good candidates for an ALD treatment system. All are very near the stream and may be directly entering the stream as base flow. Any attempt to treat the discharges will likely require some type of barrier to cut off underground flow to the stream, such as a slurry wall/curtain. All are located in wetlands and successful treatment will depend on the ability to gain the appropriate permits.

Sediment appears to be a major source of stream impairment. Some agricultural areas upstream of the Natural Area and likely sources of sediment and could benefit from larger vegetative buffers adjacent to the stream. Most do appear to be employing some best management practices to reduce sediment runoff from fields. One area on an unnamed tributary along Wills Church Road could benefit from stream bank fencing in addition to riparian buffers. Another source of sediment could be the large spoil area of the underground mine located north of Route 31. Very large piles of soil and rock are unvegetated and likely produce sediment during rain events. SCC should work with DEP to reduce the likelihood of sediment entering the stream from the soil piles and other unvegetated areas on the mine site.

c. Desired Outcomes

The overall primary desired outcome of this effort is a reduction of pollution sources and increase of fish and macroinvertebrate diversity and population numbers within Kimberly Run. As part of that goal, SCC hopes to specifically identify the leading cause of the impairments. In addition, SCC hopes to acquire or protect key land parcels adjacent to the present Natural Area property to improve the natural diversity of plants and animals within the greater watershed. Through these actions they hope to further engage the community to support the overall goal of environmental restoration and conservation.

d. Success Measurements

Success can be measured in many ways. For Kimberly Run as it flows through the Natural Area, monitoring changes in water quality, habitat conditions, macroinvertebrates, and fish populations will be the primary measurements of success. In order to quantify improvements, monitoring should be done in a consistent manner. Because the biologic monitoring protocol used in this plan is consistent with that of the Somerset County Benthic Entomological Survey, direct comparisons to other watersheds within the county can be made. The protocol is quantitative and therefore improvements can be statistically analyzed. Water quality can most easily be measured in reduced pollution load, such as reductions in acidity or metals. For other goals a variety of measures of success could be utilized. For land conservation activities, total number of additional acres placed under permanent protection could be a measurement. Or perhaps, the number of land parcels protected. Other related measurements could be restoration projects completed, length of stream bank protected or improved, pounds of sediment prevented from entering the stream, or number of critical habitats protected. SCC will need to develop a list of success measurements for the individual goals they establish and then monitor progress through a quantifiable measurement tool.



Implementation

Implementation of restoration projects will depend on the findings of the ongoing studies being performed under the guidance of this technical assistance grant, which should be completed in 2011. Although threats and strategies have been identified, implementation of those strategies will depend on many factors, including landowner cooperation, regulatory considerations, funding availability, organizational support, and many others. Several possible restoration ideas have been proposed and more will be considered as data is collected and evaluated.

Recommendations

Monitoring – Part of the technical assistance SCC requested was to further investigate the water quality within Kimberly Run and evaluate whether there were unknown factors affecting the stream, such as combinations of different chemicals combining from various pollution sources to produce either toxic substances or short-term spikes in water quality conditions that would kill aquatic life. Upon investigation, very high levels of conductivity and alkalinity were measured within the stream. It also appears that hidden sources of AMD may be entering the stream through groundwater (base flow) sources. The physical nature of the stream above the Natural Area and through its upstream portion is conducive to causing sediment to settle out in the stream. It is clear the stream has incised several feet and is constricted within its channel, causing higher velocities to flow within the channel during storms. Such incision, likely caused by all the land use changes that have occurred over time

upstream of the Natural Area, indicates the stream has become unstable and is adjusting to again find equilibrium. Under these conditions the banks tend to erode more readily on the outside of bends and deposit the material in the stream bed, which affects the macroinvertebrates. Other sources of sediment, such as the deep mine and the upstream agricultural areas, add to the problem.

A water quality monitoring program was initiated, which includes the use of continuous data loggers, to better determine what the water quality in the stream is like over time. This monitoring should continue through at least one low flow/high flow yearly cycle in order to evaluate whether conditions arise that may be detrimental to aquatic life. Recently, the underground coal mine has applied for a permit to increase its permitted discharge to an unnamed tributary of Kimberly Run by over three fold to 2.0 MGD. Such a significant



Recommendations (continued)

change should be monitored for possible negative effects to the receiving stream.

AMD - If the study finds that AMD is the primary source of impairment, it is likely significant funding sources will be required to begin the design and permitting process and then construction. It is likely for at least some of the discharges, treatment options will require work to be performed in existing wetland areas. Most of the areas are already impacted by AMD so construction activities may be eligible for waivers to wetland impacts under what is called a 'Waiver 16'. This waiver allows impacts to wetlands with water quality characterized as mine drainage with little or no mitigation for impacts. There will likely be long-term monitoring requirements associated with the waiver and may include some mitigation. However, based on a prior precedence, the treatment wetland could possibly serve as the mitigation wetland. A key part of any new AMD project is a requirement for long-term operation and maintenance. SCC will either be required to assume operation and maintenance responsibility or identify an entity that will be responsible for continued upkeep. Because SCC has considerable experience with planning, implementing, and managing AMD treatment projects, they are very capable of implementing recommended treatment options.

Streamside Buffers – As mentioned earlier, there are agriculture areas upstream of the Natural Area property that would benefit from increasing the width of streamside buffers in order to reduce sediment pollution. Landowners of the affected properties should be contacted to determine if they would work with SCC to install appropriate best management practices.



Plan Evaluation & Evolution

This plan must be viewed as a living document and once the plan is implemented it should be monitored to see whether the outcomes are what were expected and adjustments made if necessary. This project will be generating monitoring data, both chemical and biological, that should be reviewed with regularity. Based on that data, the plan should be reviewed and updated to meet changing needs.

Överview







Land Use



Impaired Streams



Existing DEP Permit Locations



Chemical Monitoring Points



Biological Monitoring Points





KIMBERLY RUN WATERSHED

Somerset County, Pennsylvania





Bayer Center for Nonprofit Management