

# BIG SEWICKLEY CREEK WATERSHED ASSESSMENT, RESTORATION, & PROTECTION PLAN

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# Prepared for:

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# BIG SEWICKLEY CREEK WATERSHED ASSOCIATION

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# BIG SEWICKLEY CREEK WATERSHED ASSOCIATION

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## 1.0 INTRODUCTION

In March of 2006 the Big Sewickley Creek Watershed Association (BSCWA) applied for a Growing Greener grant from the PA Department of Environmental Protection (PaDEP) to conduct a watershed assessment of the Big Sewickley Creek Watershed. In November of 2006, the group was awarded a grant for \$58,537. The BSCWA chose to have the Allegheny County Conservation District (ACCD) serve as the sponsor to administer this grant. In June of 2007 the ACCD contracted with Blazosky Associates, Inc. (BAI) to conduct the assessment and complete the restoration and protection plan.

Over the next 12 months (June 5, 2007 to May 13, 2008), BAI conducted visual assessments of the watershed, walking many streams and their tributaries in the watershed to identify impacts and potential project sites. In addition, macroinvertebrate studies were conducted at nine (9) sites, fish surveys at three (3) sites, and sampling for fecal coliform at twenty-five (25) locations across the watershed (between June 12, 2008 and July 25, 2008) (with additional fecal re-sampling on January 6, 2009 of six (6) sites). Field pH and conductivities were taken at the confluence of most tributaries encountered, as well as other general stream check points. This data is provided within this report and its appendices.

During the visual assessments, BAI scored stream segments using a modified version of the United States Department of Agriculture (USDA) protocol for visual stream assessments (see Attachment E). Stream reaches were scored based on criteria such as: channel condition, stream embeddedness, canopy cover, AMD (if applicable), riparian zone, bank stability, instream fish and macroinvertebrate cover, and water appearance. Photos were taken of nonpoint source pollution impacts as well as areas that had a positive impact on water quality or potential for watershed management options. A global positioning system (GPS) hand-held unit and topographic maps were utilized to field locate areas that had an issue that would be depicted in the final plan report.

Finally, the GPS points were incorporated into an excel spreadsheet which was then used to create data layers for maps that were developed in a Geographic Information System (GIS). The GIS maps included in this report depict many features of the watershed and include the waypoints, scoring, and other information that was taken in the field along with land use information provided from other sources.

## 2.0 WATERSHED BACKGROUND

A watershed is defined by the United States Environmental Protection Agency (EPA) as the area of land where all of the water that is under it or drains off of it goes into the same place.

## 2.1 WATERSHED DESCRIPTION

Encompassing approximately 46 square miles, the watershed extends from the southwestern tip of Cranberry Township, southwest toward the northeastern tips of Leetsdale and Ambridge at the Ohio River. The watershed consists of ten boroughs and townships in three counties, including: Marshall Township, Franklin Park Borough, Bell

Acres Borough, Leet Township, and Leetsdale Borough in Allegheny County; New Sewickley Township, Economy Borough, Harmony Township, and Ambridge Borough in Beaver County; and Cranberry Township in Butler County (- with a very small portion of the watershed in the Borough of Bradford Woods, which is to the east of Marshall Township). Economy Borough and Marshall Township make up the largest land area in the watershed. The watershed is comprised of one main watershed, Big Sewickley Creek, and four smaller subsheds, North Fork Big Sewickley Creek, East Branch Big Sewickley, Cooney Hollow, and Rippling Run.

The main stem of Big Sewickley Creek extends from the headwaters in Marshall to the mouth between Leetsdale and Ambridge. Flowing through 8 municipalities, the Creek creates the border between these municipalities - Economy, Harmony, and Ambridge to the north and Franklin Park, Bell Acres, Leet, and Leetsdale to the south.

The East Branch extends from the headwaters in Marshall, just east of I-79, to the confluence with Big Sewickley Creek in Franklin Park, near the intersection of the 3 municipalities of Franklin Park, Economy, and Marshall. It only flows in these 2 municipalities.

Rippling Run, a tributary to the East Branch, flows solely through Franklin Park. The North Fork extends from headwaters in Economy (tip is in Marshall) to the confluence with Big Sewickley Creek in Economy at the Economy/Bell Acres border. Cooney Hollow flows solely through Economy. The mouth of Cooney Hollow is approximately one half mile east of the North Fork's mouth.

# 2.2 TOPOGRAPHY

Located within the Pittsburgh Low Plateau Section, topography within the watershed consists of smooth to irregular, undulating, topographic land surfaces with narrow and relatively shallow valleys. Topographic relief is low to moderate ranging from over 1200 feet above mean sea level (msl) in the highlands of the watershed to approximately 720 feet msl at the confluence with the Ohio River. The drainage pattern is dendritic. Forces that have shaped topography within this watershed are largely from fluvial erosion and periglacial mass wasting (Pennsylvania Geological Survey, 2000).

# 2.3 BEDROCK

The subsurface geology of the watershed is comprised of Pennsylvania age sedimentary rocks predominantly shale and siltstone, but also containing sandstone. Specifically, the Glenshaw (Pcg) Formation underlies much of the valley floor while the Casselman (Pcc) form the uplands.

# 2.4 HYDROLOGY

A United States Geological Survey (USGS) gauging station exists on the Big Sewickly just east of the borough of Ambridge and records flow draining from the upper 15.6 square miles of the watershed. Based on a 10 year dataset (1968 – 1978) the Big Sewickly had a median discharge of 7.6 cubic feet per second. The  $Q_{7-10}$  (the 7 day, 10 year low flow) was 0.09 cubic feet per second. Base flow (as a percentage of annual recharge) appears to be low with variations over the 10 year period between 4.2 to 13.4

percent. Since there are few withdrawals within the watershed, low base flow conditions may be due to a low groundwater storativity of the fractured bedrock aquifer.

## 2.5 STREAM HEALTH

Big Sewickley Creek and the North Fork of Big Sewickly Creek are designated by PA Code Chapter 93 as Trout Stocked Fisheries (TSF). The streams are designated as "attaining" their designated use for aquatic health. Based on PADEP eFACTS (<u>http://www.ahs2.dep.state.pa.us/eFactsWeb/default.aspx</u>, accessed October 15, 2010), there are no "non-attaining" designations for the Big Sewickley.

The PA Fish and Boat Commission (PFBC) classifies streams that are stocked with trout as Approved Trout Waters (ATW). PFBC has guidelines including water quality for ATW waters. For example, (1) for new waters added to the stocked trout program, water temperatures shall not exceed 24C at any time prior to June 1. (2) The pH at the time of stocking shall not be less than 6.0 for brook trout and brown trout, and not less than 6.5 for rainbow trout. (3) No stream section shall be stocked if pollutants are known to be present at concentrations equal to or greater than the PA Department of Health action limits, or, in the case of a bioaccumulative substance, in a concentration which is harmful to humans (G. Smith, PFBC, October 2010).

# 2.6 ECONOMIC INFLUENCE

The BSCW is comprised of diverse industrial and economic areas. Historically, steel towns were located near the Ohio River (concentrated in Ambridge and Leetsdale), and oil production occurred in Economy Borough and parts of Marshall Township. Historically, oil and gas wells have been concentrated in Economy. Most of the active wells left to date are in Economy, Marshall Township, and Franklin Park. Oil and gas well activity in the watershed is depicted on Figure 6.

Current areas of economic activity include industrial facilities near the Ohio River (Leetsdale Industrial Park, Buncher Commerce Park, Port Ambridge Industrial Park), and commercial/retail (Thorn Hill Industrial Park) located near Marshall/Cranberry Township near I-79. Other growth has occurred in the form of suburban housing developments throughout the upper sections of the watershed.

# 2.7 IMPORTANT WATERSHED FEATURES

# National Heritage Inventory

# (http://www.naturalheritage.state.pa.us/CNAI\_Download.aspx)

The BSCW is identified as an exceptional area of great importance for biological diversity and ecological integrity through the 1994 Natural Heritage Inventory (NHI) of Allegheny County. The Allegheny County NHI identifies and maps Allegheny County's most significant natural areas. The study investigated plant and animal species and communities that are unique or uncommon in Allegheny County; it also explored areas important for general wildlife habitat, education and scientific study.

Designated as the *Big and Little Sewickley Creek Landscape Conservation Area* (LCA), the area is the largest tract of relatively contiguous, undeveloped "green space" in the county, and an area that contains a large Biological Diversity Area, four managed lands, and encompasses a watershed of a High Quality stream. According to the study,

an LCA is defined as a large contiguous area that is important because of its size, open space and habitats, and although including a variety of land uses, has not been heavily disturbed and thus retains much of its natural character. Sites of exceptional county significance merit guick, strong and complete protection.

In addition, the *Cooney Hollow Biological Diversity Area* (BDA) is identified in the 1993 Beaver County NHI. Although small in size, this site is noted as both a high diversity area and a community/ecosystem conservation area. The area is a quality example of a mature Mesic Central Forest community.

## State Game Lands

The watershed also contains the State Game Lands 203, a 1,247 acre managed land. State Game Lands 203 is a largely forested land with patches of cleared land in the form of food plots, clearcuts, and reverting forest, all of which is managed for This property, which is owned and managed by the Pennsylvania Game wildlife. Commission, is situated in the East Branch Big Sewickley Creek valley and in other tributary valleys to the Big Sewickley Creek. The forest here represents some of the most natural land in the area and an important large green space for Allegheny County. All of the forest has been selectively logged more than once, so it does take on the character of a young, early successional forest with scattered mature trees. Since high quality examples of this forest community are fairly uncommon in the county, the Game Commission is encouraged to allow some of this forest to remain undisturbed and mature on its own so that it can be preserved as an example of old growth forest in the future.

(http://www.naturalheritage.state.pa.us/CNAI\_PDFs/Allegheny%20County%20NHI%201 994%20WEB.pdf)

# Blue Heronry

Located within 1/4 mile upstream from the Big Sewickly Creek sewage treatment plant, a heronry was identified (at waypoint BSC-38 on Figure 1). According to (http://en.wikipedia.org/wiki/Great\_Blue\_Heron) great blue herons:

- Usually breed in monospecific colonies, in trees close to lakes or other wetlands; often with other species of herons;
- Maintain Large colonies, ranging between 5-500 nests per colony, with an average of approximately 160 nests per colony; and,
- Build a bulky stick nest, and the female lays three to six pale blue eggs. One brood is raised each year. If the nest is abandoned or destroyed, the female may lay a replacement clutch. Reproduction is negatively affected by human disturbance, particularly during the beginning of nesting. Repeated human intrusion into nesting areas often results in nest failure, with abandonment of eggs or chicks.

Herons choose nesting sites where food will be plentiful onsite or in very close proximity, where they can have a penthouse view so they can watch for predators, and where they won't be disturbed by people. Great Blue Herons are indicators of ecosystem health because they return to the same site each year (Vermont Fish and Wildlife Department 1995). They are linked with and dependent upon habitat quality.

According to the draft 2005 North American Breeding Bird Survey, Great Blue Heron have been increasing in population since studies were first conducted in 1966 and continue to show positive trends (Sauer et al. 2005). The National Audubon Society (2006) estimates the continental North American population at 124,500. Virginia Department of Conservation and Recreation (2006) reports that heron populations are secure globally, but vulnerable due to restricted habitat requirements and disturbance factors.

Great blue herons are on the increase in Pennsylvania and, unknown to many residents, the Pittsburgh area is home to several breeding colonies -- called rookeries or, more specifically, heronries. A State Game Commission survey of wading birds in 2007 showed that heron nests increased by 32 percent since 2002.

According to the PA Game Commission, in the Pittsburgh area, the rookery in Franklin Park increased from 21 to 41 nests, and three new colonies were established: 17 nests appeared on Twelvemile Island, another 9 at Boyce Mayview Park and 17 more in Deer Creek. Since the survey, a single nest has been built in Allegheny Cemetery. Indeed, the fact that these birds have expanded in density and number in recent years may be attributable to the lowering of pollution in rivers, streams, ponds and lakes.

BAI observed the heronry on the main stem of Big Sewickley Creek and observed several herons over the course of the field assessments, including during field checks of debris jam areas in the fall of 2010. This would seem to indicate that the heron population is sustainable in the watershed and that the water quality is on a positive trend.



<u>http://dorisdumrauf.blogspot.com/2008\_03\_01\_archive.html</u> <u>http://www.flickr.com/photos/verikoko/2407013460/</u> <u>http://heronsforever.org/greatblueheron</u> <u>http://www.pittsburghlive.com/x/pittsburghtrib/lifestyles/fitness/s\_633184.html</u>

## Bell Acres Nature Preserve in Bell Acres

Located at the corner of Turkeyfoot Road and Sevin Road, the Bell Acres Nature Preserve (Park) is a non-traditional borough park with over 200 acres which can be used for hiking, birdwatching, etc. The park also contains the Bell Acres Trail, which is <sup>3</sup>/<sub>4</sub> mile long and ends at the Merriman House foundation. The Merriman Family is believed to be the first settlers in the area. There are no facilities located at this park. Bell Acres was very fortunate to have all of this land donated by The Western Pennsylvania Conservancy. This land will remain parkland in perpetuity.

## 3.0 MUNICIPAL INFORMATION

There are parts of twelve different municipalities in three counties in the BSC Watershed. Below is some general information on each of the municipalities that gives some background for the demographics of the watershed community.

## Ambridge Borough

<u>Website</u>: (http://www.ambridgeboro.org) <u>County</u>: Beaver <u>Population</u>: 7,769 <u>Population Density</u>: 5,232.8 per square mile <u>Square Miles</u>: 1.7 (0.2 is water)

<u>Governing Body</u>: Mayor and seven (7) member council

<u>Description</u>: "Ambridge began as a steel town in 1905 and thrived for many years until the steel industry collapsed in the early 1980's. Since then, most of the steel industry has moved away, but industries and small steel fabricating companies still remain. In recent years, the town council and community has initiated a massive brownfields project to replace old dilapidated factories with new residential and commercial use structures. Also, a group of enthusiastic citizens has started the Committee to Clean and Beautify Ambridge. This group of dedicated citizens cleans public areas, plants flowers, and has raised money for a beautiful water feature that was built in a park in the center of town. These are only a small sample of the many projects that have recently been completed, are currently being planned, or are underway".

## Bell Acres Borough

<u>Website</u>: (http://www.bellacresborough.org) Also info from (<u>http://en.wikipedia.org</u>)
<u>County</u>: Allegheny
<u>Population</u>: 1,382
<u>Population Density</u>: 265.3 per square mile
<u>Square Miles</u>: 5.2
<u>Governing Body</u>: Mayor and seven (7) member council
<u>Description</u>: "Bell Acres was settled around 1808. The area was originally established as
Sewickley Township on June 28, 1854. Bell Acres was incorporated as its own borough on
March 14, 1960. The Borough has sustained slow moderate growth with a population of 443
people in 1870 to approximately 1350 at present. The Borough contains is mostly comprised of

single family homes. Bell Acres also has a municipal park located at the corner of Big Sewickley Creek Road and Hitzel Hill Road, and a nature preserve at the corner of Turkeyfoot Road and Sevin Road. The preserve is a non-traditional borough park with over 200 acres which can be used for hiking, birdwatching, etc".

## Cranberry Township

<u>Website</u>: (http://www.twp.cranberry.pa.us) *Also info from* (http://en.wikipedia.org/wiki/Cranberry\_Township,\_Butler\_County,\_Pennsylvania) <u>County</u>: Butler <u>Population</u>: 28,000 <u>Population Density</u>: 1,036.5 per square mile <u>Square Miles</u>: 23.7 <u>Governing Body</u>: Five (5) member Board of Supervisors <u>Description</u>: "Cranberry Township, in the southwestern corner of Butler County, Pennsylvania, was incorporated in 1804. The community's name is derived from the wild cranberries which used to grow in the area. Cranberry Township is a land of rolling hills, which are mostly covered with woodlands. Some of the largest oak trees are between 200 and 250 years old."

"One reason for Cranberry's rapid growth has been its location. Situated at the intersection of I-76 (the Pennsylvania Turnpike) I-79, and Routes 19 and 228, the community is easily accessible from virtually anywhere in the region. In addition, the opening of I-279 in 1989 cut travel time to Pittsburgh to less than half an hour."

"Right now, about 40 percent of Cranberry's land is undeveloped; another 10-15 percent may be ripe for redevelopment. Cranberry Township is one of the fastest-growing areas in the United States in both population and businesses. While many residential communities are being built, even more so are retail stores. One of the busiest business centers is at the Cranberry Mall. Cranberry Township is also home to the Thorn Hill Industrial Park, where many businesses are headquartered."

# Economy Borough

<u>Website</u>: (http://www.economyborough.org) *Also info from: (<u>http://en.wikipedia.org/wiki/Economy, Pennsylvania</u>); (<u>http://www.economyborough.org/EBHistory.pdf</u>) <u>County</u>: Beaver <u>Population</u>: 9,363 <u>Population Density</u>: 1,036.5 per square mile* 

Square Miles: 17.8 (0.1 is water)

Governing Body: Mayor and seven (7) member council

Description: "Economy's history as a community began in 1827 when Economy Township was formed from the southern part of New Sewickley Township. Economy village had been founded by the Harmony Society just two years earlier, and the increase in population within the area warranted the change. Since the Harmonists worked together to develop intensive cultivation and various manufacturing activities on their lands, Economy village would soon have its own township of Harmony, erected from Economy Township in 1851. The balance of Economy Township remained as it had been, a sparsely populated rural community. The area was settled in the 1790's. The area where John Ullrich made his home became known as Wall Rose, a crossroads village remaining today. The discovery of the Economy oil field in the 1890's brought major changes to the township. Wallace City, just north of the township line in New Sewickley, became the center of the booming oil industry. More than one hundred wells were drilled in the field, which extended from the Pfaff farm in Economy north to Big Knob in New Sewickley. The twelve square mile oil field produced as much as 45,000 barrels of oil a day during peak production years. The oil was under great pressure, and many of the wells produced without pumping. The boom brought construction of boarding houses, livery stables, shops and stores, in addition to drilling rigs, tanks and all sorts of shacks and buildings. Some evidence of the oil industry remains in Tevebaugh Hollow. By 1910, the oil boom had reached its peak, and then guickly declined. Economy's population began to increase with the post war period. In the late 1950's, construction began on Northern Lights Shopping Center, the first large shopping center in Beaver County, located in Economy between Conway and Baden. In 1957, in order to preserve the boundaries of the township and to prevent further annexation by surrounding communities, the residents of Economy Township petitioned for borough status.

On January 1, 1958, the new form of government was adopted and Economy became officially known as Economy Borough. The township's primary concern was the building and maintenance of roads."

"In recent years, Economy Borough's growth has been remarkable as rural areas are converted to suburban housing developments. However, the borough has preserved its rural integrity and charm. Three local parks and picnic areas are maintained, and the borough also hosts Old Economy County Park, a large popular recreation area with a swimming pool and abundant summer activities."

## Franklin Park Borough

<u>Website</u>: (http://www.franklinparkborough.us) Also info from (http://en.wikipedia.org/wiki/Franklin\_Park,\_Pennsylvania) County: Allegheny Population: 11,364 Population Density: 836.5 per square mile Square Miles: 13.6 Governing Body: Mayor and seven (7) member council including a junior council member. Description: "Franklin Park is a growing community located northwest of Pittsburgh in the North Hills area of Allegheny County. The Borough has a highly educated workforce, good schools and a superb quality of life. With quick access to the interstate highway system Franklin Park Borough is within easy reach of the region's retail centers, universities, hospitals, cultural and recreational facilities. It also includes the highest point in altitude in Allegheny County, at 846 feet. There are also 4 parks and one nature reserve. Blueberry Hill Park is Franklin Park Borough's premier community park. It is a beautiful 87 acre park nestled in the heart of the borough off of Nicholson Road. Linbrook Park is an 80 acre park located in the western part of Franklin Park Borough off of Big Sewickley Creek Road. More of a natural park, it is a great place to visit since most of the park is not developed. Acorn Park is a 25 acre park located off of McGee Road, most of this park is a natural area having been untouched for over 100 years. Old Orchard Park is a 16 acre neighborhood park located in the southeastern part of Franklin Park Borough off of Rochester Road. This park is currently under development with a one mile walking trail. The Mel Lubert Nature Reserve is a natural area consisting of an 8 acre park located in the northeastern section of Franklin Park Borough off of Wexford Run Road. Currently it remains a natural area with Pine Creek running through it and two retention ponds that host a variety of wildlife species. Future plans are to construct a nature trail through the park."

# Harmony Township

<u>Website</u>: (http://www.harmonytwp.org) *Also info from* (http://en.wikipedia.org/wiki/Harmony\_Township,\_Beaver\_County,\_Pennsylvania) <u>County</u>: Beaver <u>Population</u>: 3,373 <u>Population Density</u>: 1,176.3 per square mile <u>Square Miles</u>: 3.0 (0.2 is water) <u>Governing Body</u>: Five (5) member board of commissioners. <u>Description</u>: "Harmony Township was formed in 1851 from Economy Township, and is comprised of 3.13 square miles and has a population of 5,022 as of 2004. Economically and socially, the township is a sub-center of the Pittsburgh metropolitan area. Major manufacturers located within the township provide raw materials and finished products".

## Leet Township

<u>Website</u>: (http://leettownship.org) *Also (http://en.wikipedia.org/wiki/Leet\_Township,\_Pennsylvania)* <u>County</u>: Allegheny <u>Population</u>: 1,568 <u>Population Density</u>: 983.9 per square mile <u>Square Miles</u>: 1.6 <u>Governing Body</u>: Five (5) Township Commissioners <u>Description</u>: "There are 569 households out of which 36.0% have children under the age of 18 living with them, 67.7% are married couples living together, 8.1% have a female householder with no husband present, and 20.4% are non-families. 17.8% of all households are made up of individuals and 8.1% have someone living alone who is 65 years of age or older. The average

household size is 2.70 and the average family size is 3.08."

A historical account of the flood of September 2004 on Big Sewickley Creek provided by Leet Township emergency management officials: "The night of September 17th was unlike any other time, in our community of Fair Oaks. It compared to the flood of 1936, for those who were around back then and could compare the two. Those of us with experience in Crisis Management had our limits and knowledge tested to the limit. That evening we received over 6 inches of rainfall and a night most of us will never forget".

"The water of Big Sewickley Creek came up so quickly and flowed so rapidly that its path left devastation and shock all along the creek route. Backyard items were floating away; water was taking refuge in basements, crashing through windows and flooding garages. Residents were scrambling and emergency sirens were ringing out in neighborhoods bordering the creek".

"The Fair Oaks Fire Department and Allegheny Emergency Management were receiving never-ending calls for help. Other communities in Beaver County were sending additional help, along with rescue boats and vehicles that could maneuver through the high rising water. The Quaker Valley School District provided safe haven for students who were stranded and supplied buses to transport evacuated residents to the upper Heath South facility located at the top of Camp Meeting Road. The primary focus at this point for me as Emergency Management Coordinator was to set up the Emergency Operations Center, provide safe transportation to those evacuated [with housing assistance from the Heath South staff for those with special needs and the evacuees, the American Red Cross and the Salvation Army for providing food] and prioritize community needs as requests came in from the F.O. Volunteer Fire Department. The Emergency Operations Center was located in the F.O.V.F.D. and a 24-hour a day kitchen was established to feed residents and emergency workers as well as a small medical station for those with light injuries. The kitchen ran from Friday night until Monday evening, providing meals and a warm refuge to those who needed it. Those in the F.O.V.F.D. were heroes as they worked non-stop throughout the day and night. They were victims as well, putting the needs of others ahead of themselves."

"Clean up began, neighbors were helping neighbors, dumpsters were brought in [approximately 46], and the damage assessment was to begin its long and tedious job of contacting insurance agencies, FEMA, local help organizations, and re-formation of family life, as best possible. This cleanup would go on for months".

### Leetsdale Borough

<u>Website</u>: (http://www.leetsdaleboro.net) *Also (<u>http://en.wikipedia.org/wiki/Leetsdale, Pennsylvania</u>) <u>County</u>: Allegheny <u>Population</u>: 1,232 <u>Population Density</u>: 1,246 per square mile <u>Square Miles</u>: 1.1 (0.2 is water)* 

<u>Governing Body</u>: Mayor and seven (7) member council

<u>Description</u>: "Leetsdale is located 12 miles north of Pittsburgh on Route 65, it's the last Allegheny County community along the Ohio River. More than 3,000 people work within the borough. Leetsdale is divided almost evenly by Route 65 and the Norfolk Southern Railroad tracks. The property on the West Side of the tracks is predominately commercial and industrial with the Buncher Commerce Park and Leetsdale Industrial Park accounting for much of the approximately one hundred businesses in the borough. Leetsdale has recently gone through several major changes. An overpass, which eliminated the dangerous at-grade railroad crossing at Ferry Street was constructed, and a new municipal building was completed."

### Marshall Township

<u>Website</u>: (http://www.twp.marshall.pa.us) (<u>http://en.wikipedia.org/wiki/Marshall\_Township, Pennsylvania</u>) County: Allegheny Population: 5,996 Population Density: 384.4 per square mile Square Miles: 15.6 Governing Body: Five (5) member Board of Supervisors Description: "Marshall Township has a rural atmosphere, yet it is situated a short 20-minute drive north of Pittsburgh's business and cultural centers via I-79/279. It is located in the northwest corner of Allegheny County. Marshall is bordered by Cranberry Township to the North, Franklin Park Borough to the South, Pine Township to the East, Economy Borough to the West, and borders Bradford Woods Borough on three sides. Incorporated June 3, 1863, it was named for Thomas Mercer Marshall, a famous trial lawyer who practiced law in Allegheny

County. Two Indian trails, a meteorite, oil wells, and the Harmony Shortline are only a small part of the rich and colorful history. The Indian trails dating from the colonial times wind their way through the area. Marshall Township's Park facilities consist of 116 Acre Knob Hill Park; 8 Acre Warrendale Park; The Sean DeArment Nature Trail; and 2 Mile Thorn Hill Trail with crushed limestone surface suitable for walking, biking, or cross country skiing."

## New Sewickley Township

<u>Website</u>: (http://www.newsewickley.com) <u>County</u>: Beaver <u>Population</u>: 7,076 <u>Population Density</u>: 216.6 per square mile <u>Square Miles</u>: 32.7 Governing Body: Five (5) member Board of Supervisors

Description: "New Sewickley Township is a part of depreciation lands that were set aside by Act of Assembly on March 12, 1783 to be awarded to those men who served in the Revolutionary War. In 1801 the original Sewickley Township was divided and New Sewickley Township was created. At that time, New Sewickley Township was situated in the eastern part of Beaver County and was composed of about 19,279 acres of hilly, but very fertile land. Over the next 28 years, New Sewickley Township was reduced in size by forming Economy Borough, Rochester Township and Pulaski Township. Today, New Sewickley Township is a rural community with a population of approximately 7,076. The Township's skyline is easily recognized from nearly every high point in the county because of Big Knob, a dome-shaped hill nearly 200 feet higher than any of its neighbors. It is recognized as Beaver County's highest point. The Township purchased 80.5 acres from Mr. Rolland Richardson in 1965 for construction of Green Valley Park. In 1982, Mr. Blake Walker donated an additional 8.7 acres. The Park now consists of athletic fields for baseball, softball and soccer, play areas for children and picnic shelters that may be reserved."

# 4.0 FISH AND MACROINVERTEBRATE SURVEYS

A biological assessment was completed by the Western Pennsylvania Conservancy in July of 2008 with assistance from BAI, BSCWA, ACCD, and BCCD (Attachment C). This included a macroinvertebrate and fish survey, as well as water chemistry analysis at each site. The conclusions of the report are summarized below.

Macroinvertebrate surveys were conducted following the benthic macroinvertebrate protocol for single habitat streams, as described in the United States Environmental Protection Agency's (EPA) Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. A sample area consisted of a 100 meter stream reach at sites previously selected by BAI. Two kicks were taken at each sample area using a kick net (500 micron screen). A single kick consisted of substrate disruption in front of the collection net (one square meter) for 60 seconds. Following sample collection, specimens and sediment were transferred from the examined collection net into sample bottles and preserved with 95% alcohol. Preserved samples were delivered to the laboratory for processing and identification. Laboratory procedures followed EPA protocols. Samples were taken at nine sites within the Big Sewickley Creek watershed, site names, and descriptions are included in the individual analysis section of Attachment C (Page 5-20). Macroinvertebrate samples were carefully examined and organisms were separated from the debris in the laboratory. The identified organisms were transferred to collection bottles and preserved with 70% alcohol. Organisms were identified to the family taxonomic level under a dissecting microscope. Quality control procedures included a qualified staff member sorting through a sub-section of the sample to check for missed organisms.

Fish surveys were conducted following the electrofishing protocol for single habitat streams described in *EPA's Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*. A Smith-Root LR-24 Electrofisher electrofishing unit was implemented to temporarily immobilize the fish for the purpose of identification. The sample area consisted of a 200 meter stream reach at sites previously selected by BAI. Following sample collection, fish were identified at the end of the reach or if there was no longer room available in the bucket to continue the collection of specimens, which ever procedure was most appropriate. Specimens were identified by Mr. Gary Smith, Southwest Regional Habitat Biologist for the Pennsylvania Fish and Boat Commission (PAFBC).

Surveys were conducted at three sites within the Big Sewickley Creek watershed, site names and descriptions are included in the individual analysis section of Attachment C. Only one preserved sample was collected, Site 6:NFT2W1, as representatives of the southern redbelly dace (*Phoxinus erythrogaster*). This species is not seen very often in this part of Pennsylvania according to the PAFBC.

The following metrics were used to analyze the macroinvertebrate data for this study: (1) total number of taxa, (2) number of EPT taxa, (3) percent EPT, (4) percent Diptera, (5) Shannon Diversity Index (H), and (6) pollution tolerance index (PTI). Total number of taxa indicates the number of families present in the sample, and number of EPT taxa indicates the number of families (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) present in the sample. Percent EPT to percent Diptera ratio compares the number of mayflies, stoneflies, and caddisflies to the number of true flies (Diptera). Diptera organisms are generally more tolerant of pollution than EPT organisms. An abundance of Diptera organisms indicates poorer water quality.

Diversity indices are mathematical measures of species diversity in a community. The Shannon Diversity Index provides information about species richness and also takes into account the relative abundances of different species. The higher the index value, the more diverse the community. The Pollution Tolerance Index (PTI) is based on the concept of indicator organisms and tolerance levels. Indicator organisms are those organisms sensitive to water quality changes and their presence or absence indicates the condition of the water in which they live. Pollution-intolerant organisms include mayflies, stoneflies, caddisflies, riffle beetles, and water pennies. Pollution-tolerant organisms include tubifex worms, midges, pouch snails, and leeches. Figure 31 includes the macroinvertebrate analysis and is located on page 25.

The Fish Index of Biotic Integrity (FIBI), is an index that measures the health of a stream based on multiple attributes of the resident fish assemblage. Each site was sampled and the score is based on its deviation from reference conditions and classified as "poor," "fair," "good," or "excellent." The FIBI calculates data relating to; (1) Total number of species found, (2) Number of benthic insectivorous species, (3) Number of salmonidae and centrachidae, (4) Proportion of pollution intolerant species, (5) Proportion of pollution tolerant species, (6) Proportion of generalists, (7) Proportion of insectivorous cyprinids, (8) Number of piscivorous species, (9) Number of individuals in the sample, and (10) Proportion of species with disease, excluding blackspot. The total FIBI analysis is included on page 24 of Attachment C. Section two of the FIBI, identifies benthic insectivores, meaning those fish species that are located in the lowest part of the water column and feed exclusively on aquatic insects. Section three refers to the amount of fish species found at the sampled site, such as; trout, salmon, sunfish, bass, and crappies. Section four identifies the percentage of pollution intolerant individuals such as; lamprey, cutlip minnows, southern redbelly dace, hognose suckers, trout, sculpin, and walleye. Section five identifies the percentage of pollution tolerant individuals such as; the american eel, fathead minnows, pickerels, muskellunge, pike, killifish, bluegill, and sunfish. Section six, refers to the percentage of fish species that feed on whatever may be available such as, algae and insects. Section seven identifies those fish that can survive in multiple habitats or will consume multiple food sources. These generalists species include; chubs, shiners, minnows, and daces. Section eight of the FIBI metric aids in calculating the percentage of fish species that primarily feed on other types of fish. And lastly, section ten takes into account the percentage of fish species that had a disease or disfigurement other than blackspot, which is actually a parasitism caused by a turbellarian flatworms.

The review of biological assessment metrics showed the following ranking of the sites from best quality to worst; 6, 4, 1, 7, 8, 2, 5, 9, and 3. Macroinvertebrate sampling conducted at the nine sites within the Big Sewickley watershed resulted in an average Pollution Tolerance Index (PTI) rank of 15.11, which ranks the sites sampled within the watershed as a "fair."

The electrofishing survey of three, of the nine sites, within the Big Sewickley watershed resulted in the identification of 20 different species of fish, with 766 individuals being sampled. Overall, the Fish Index of Biotic Integrity (FIBI) score was a 39, which ranks the watershed as a "good."

The three metrics of assessment resulted in the highest ranking within the watershed for Site 6 (NFT-2W1). This may be due to the heavily vegetated riparian buffer and a reduced residential impact. The other sites may have ranked lower to due to: reduced riparian buffers, roadway runoff, storm water management issues, or residential impacts.

## 5.0 WATER QUALITY

To get a better idea of the water quality of the watershed, BAI performed bacteria sampling at various points on each of the streams. Bacteria was an impact that was identified by the BSCWA at the beginning of the assessment as an issue of concern in the watershed. Biological Sample Results are included in Attachment D and depicted visually on Figure 5. The following sites had elevated levels for fecal coliform:

- BSC08F on Shaffer Road (56,000 colony forming units (cfu)/100 ml.)
- NF05F (34,000)
- BSC04F (4,200)

Bacteria levels in the main stem of Big Sewickley Creek should be improving most recently, since the above samples were taken, because of a recent sanitary line project in Marshall Township. Marshall Township has extended a new sanitary line down Warrendale-Bayne Road to Big Sewickley Creek Road. These construction areas were observed to be completed and recently stabilized with seed and mulch during field checks by BAI in October of 2010.

A previous study on bacteria in the watershed was conducted on the North Fork in March 2003. According to a report titled "*North Fork Big Sewickley Creek Water Quality Study of Bradford Park Area - A Boy Scout Eagle Service Project*", by Chad Kuny, the objective of the project was to investigate the influence of failing septic systems, and to establish a baseline of data for the watershed. He concluded that due to elevated fecal coliform results from the six sample sites septic tanks in the area were most likely failing. In addition, samples were taken near the salt storage depot at the Economy Borough building and elevated chloride levels were noted due to the runoff that was occurring into the stream. A sanitary system upgrade in Economy Borough was constructed since this 2003 report. BAI sample NF05F above was high in cfu. There is a possibility that some of the residents in this area are still not tied in to the sanitary sewer system for Economy Borough. More detailed sampling would need to occur to try to determine more specific causes of these elevated bacteria levels.

Overall, based on BAI field observations and recent developments with municipal sanitary systems, the bacteria levels in the streams of the watershed should be going down. The main impairment to water quality is erosion and sedimentation from development and lack of storm water management.

# 6.0 WATERSHED ISSUES

Out of the 40 sections surveyed, 48% received a good rating, 35% were fair, 10% were excellent, and 7% received a poor rating. An average score of 7.59 (lower end of "good") was calculated for the watershed. This scoring is based on the modified USDA Visual Assessment Protocol that was utilized by BAI to visually assess the streams and surrounding areas of the

watershed. A copy of all of the visual assessment field sheets is provided in Attachment E. This protocol provides a numerical score for 13 different parameters that are indicators of water quality and stream health.

<6.0	Poor
6.1-7.4	Fair
7.5-8.9	Good
>9.0	Excellent



The Big Sewickley Creek Watershed is a mix of rural, old, and new residential, and still has some large areas of undeveloped land. The goal of this project was to assess the watershed and develop recommendations for restoration and protection of the natural resources within the watershed.

The main impacts to the watershed are erosion and sedimentation. This is caused by improper storm water management, stream bank erosion, stream debris jams, stream encroachment, and riparian buffer alterations/degradation. Encroachments by landowners on the streams were evident in all parts of the watershed. Examples of this included filling, dump sites, improper stream crossings, yard waste dumping, utility crossings, and debris jams. Many of these issues were observed in the field and identified on the enclosed maps in this report (see Figure 2). These encroachments cause watercourses to change, bank erosion, sedimentation, and flooding.

Storm water management is an issue in this watershed. Big Sewickley Creek was hit by the floods of September 2004. These events, especially Hurricane Ivan, opened many people's eyes to the importance of floodplain and storm water management. Many areas of the watershed that were affected by Hurricane Ivan were also impacted earlier that summer by heavy thunderstorms. Many storm water outlets and facilities were observed throughout the watershed that seemed to have a negative effect on their receiving streams, whether it is through bank erosion or shear volume of water being released. Some of the larger outlets/outfalls were marked by BAI in the field and are shown as Storm water management issues/facilities on Figure 3.

In addition, current and future land use planning is a significant concern for the many remaining undeveloped land tracts within the watershed. Several large tracts of open space, with high water quality were observed in each sub-watershed. These areas hold an abundance of flora and fauna that are not found in many neighboring areas of southwestern Pennsylvania because of development. These open space areas also act as a natural filter and buffer to development. Therefore, because these areas are essential to maintaining a healthy watershed community, it is important to protect them.

The sections of the report that follow (sections 7.0 to 11.0) describe the findings of the visual assessments that were conducted by BAI on the main stem of Big Sewickley Creek and the major tributaries in the watershed. Stream segments were broken out based on contiguous land use. Each stream segment started at the mouth of the stream and worked upstream until there was a change in land use immediately adjacent to the stream channel. BAI used the USDA Visual Assessment Protocol to assign a numerical score for a possible 13 different parameters including: channel condition, canopy cover, riparian zone, bank stability, abandoned mine drainage, manure presence, sewage, invertebrate habitat, in-stream fish cover, fish barriers, nutrient enrichment, and water appearance. Scores ranged from <6 = Poor; 6.1-7.4 = Fair; 7.5-8.9 = Good; and >9 = Excellent.

## 7.0 BIG SEWICKLEY CREEK STREAM SEGMENT ANALYSES

All of the stream segments/reaches described below have a number that corresponds to the map of the watershed on **Figure 1**.

## BSC-01 through BCS-09 (fair)

Waypoints: BSC1-BSC9 (Reach #1) Segment: Big Sewickley Creek from bridge at entrance to park to mouth at Ohio River. Date of Assessment: 6/5/07

## <u>Sewage impacts</u>

There is a noticeable odor, excess plant growth on the substrate, and siltation.

# Stream bank erosion and siltation

There does not appear to be a lot of bank erosion in this section of the creek. The banks appear moderately stable. There is not a significant problem with sedimentation, but the embeddedness ranges from 20-30% for this section of the creek. This is not uncommon for a flat sloped area of a stream, near the junction with the river where there could be backwaters also. There is sediment build up, creating a sand bar, at the mouth of the creek where it enters the Ohio River (see photo 1).

# <u>Wetlands</u>

There is about 1 acre of wetlands (see photo 2 and Figure 6) located along this area of the Big Sewickley Creek.

#### Invasive Plants

Japanese Knotweed was found growing along this reach of Big Sewickley Creek. This is to be expected because of the close proximity to the railroad lines which have an abundance of this plant.

## Trash and Litter

There is a small amount of trash scattered throughout this section.

## Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.27 out of 10 which means it is in Fair condition, according to the scoring system provided by the USDA visual assessment protocol. There is not a lot of erosion. There is a sewage impact and some trash in this part of the stream.

Algal growth indicates this reach of the stream is high in nutrients. This may be caused by treated effluent from the sewage treatment plant having high levels of nutrients. Effluent from the sewage treatment plant should be monitored to insure that concentrations of nutrients and Total Suspended Solids do not exceed effluent discharge limits.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. Stream channel restoration can reduce the stream bank erosion, reduce sediment deposition in the channel, and reduce the formation of sand bars.

There is a possible stream project opportunity at Plum Street Park (Figure 7). The channel is too wide and shallow and could be restored. Trash and litter in the area needs to properly addressed.



Photo 1: Mouth of Big Sewickley Creek, discharging into the Ohio River. (BSC-01)



Photo 2: Large floodplain wetland upstream from the mouth. (BSC-08)

## BSC-10 through BSC-16 (fair)

Waypoints: BSC10-BSC16 (Reach #2)

Segment: Big Sewickley Creek from bridge at ballpark to concrete storm water pipe in Fair Oaks.

Date of Assessment: 6/5/07

#### Sewage impacts

There is a noticeable odor, excess plant growth on the substrate, and siltation.

#### Stream bank erosion and siltation

There is a severe amount of erosion in this section of the creek. There are undercut banks across from the ballpark and some erosion by 2 storm water outfalls. There is a huge bank erosion area that is 6 feet high and 100 feet long (see photo 1), and a few debris jams that are piling up on concrete structures in the creek (see photo 2). The debris jam at BSC14 has been cleaned out as of 9/24/10. The embeddedness ranges from 30-40% for this section of the creek.

#### Wetlands

There are no wetlands along this area of the creek.

#### Invasive Plants

Japanese Knotweed was found growing along this reach of Big Sewickley Creek.

#### Trash and Litter

There is a small amount of trash scattered throughout this section.

#### Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.36 out of 10 which means it is in Fair condition, according to the scoring system provided by the USDA visual assessment protocol. There is a lot of stream bank erosion in this section of main stem of Big Sewickley Creek.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. Stream channel restoration can reduce the stream bank erosion, reduce sediment deposition in the channel, and reduce the formation of sand bars. The site pictured below at BSC12 would be a good site for a project because of ease of access from the township park.

Algal growth indicates this reach of the stream is high in nutrients. This may be caused by treated effluent from the sewage treatment plant having high levels of nutrients.

There were also some children here at the time of the assessment that can be seen holding a recent catch from a nearby pool in the stream (see photo 3). Trash along the edge of the stream channel in this section should be able to be policed by Leet Township code enforcement.

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Photo 1: A six foot high by 100 foot long section of streambank erosion. (BSC-12)



Photo 2: Debris piling up on concrete in stream. (BSC-14)



Photo 3: Fish caught by children. (BSC-14)

# BSC-17 through BSC-26 (fair)

Waypoints: BSC17-BSC26 (Reach #3) Segment: Big Sewickley Creek main stem above Fair Oaks. Date of Assessment: 6/11/07

## Sewage impacts

There is a noticeable odor, excess plant growth on the substrate, and siltation. There is also a 6-8" metal pipe discharging from the trailer court sewage plant near BSC30 (see photo 1).

## Stream bank erosion and siltation

The banks appear to be moderately stable and there is no reported erosion throughout this section of the stream. There is however a lot of debris that is piling up on concrete structures in the creek bed (see photo 2).

The embeddedness ranges from 30-40% for this section of the creek. This is probably due to several (4) storm water pipes that discharge in this section of the stream.

## <u>Wetlands</u>

There are no wetlands located along this section of Big Sewickley Creek (BSC). *Invasive Plants* 

Japanese Knotweed was found growing along this reach of BSC.

# Trash and Litter

There is a little trash scattered throughout this section.

## Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.27 out of 10 which means it is in Fair condition, according to the scoring system provided by the USDA visual assessment protocol. There are sewage impacts and some trash in this part of the stream.

Algal growth indicates this reach of the stream is high in nutrients. This may be caused by treated effluent from the sewage treatment plant having high levels of nutrients. Effluent from the sewage treatment plant should be monitored to insure that concentrations of nutrients and Total Suspended Solids do not exceed effluent discharge limits.



Photo 1: Sewage plant discharge from trailer court. (BSC-25)



Photo 2: More evidence of debris piling up on concrete in the stream. (BSC-26)

# BSC-27 through BSC-33 (fair)

Waypoints: BSC27-BSC33 (Reach #6) Segment: Big Sewickley Creek running alongside the Big Sewickley Creek road. Date of Assessment: 7/3/07

# <u>Sewage impacts</u>

There is a noticeable odor, excess plant growth, and siltation.

# Stream bank erosion and siltation

There is a bank that is eroded because the opposite side of the creek is a concrete wall which is constricting the creek channel (see photo 1). There is also heavy sediment build up on the right side of the bridge by Zassick's Auto (see photo 2). The embeddedness is around 30% throughout this section of the stream.

# <u>Wetlands</u>

There are no wetlands located in this area of the Big Sewickley Creek.

# Invasive Plants

Japanese Knotweed was found growing in this reach of Big Sewickley Creek.

# Trash and Litter

There are auto parts, plastics, and flood debris littered throughout this section of the creek.

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## Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.73 out of 10 which means it is in Fair condition. There is erosion and sediment buildup in this region of the stream at BSC30.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.



Photo 1: Concrete wall at Ed Wagner Auto Salvage constricting channel. (BSC-30)



Photo 2: Right side of bridge by Zassick's Auto is silted in. (BSC-33)

# BSC-34 through BSC-42 (fair)

Waypoints: BSC34-BSC42 (Reach #8) Segment: BSC just upstream of bridge at white concrete office to Gaydos Lane Bridge. Date of Assessment: 7/3/07

## Sewage impacts

The Hanson-Sewickley Creek Plant is located immediately adjacent to the stream (see photo 1). There is also a sewage treatment plant (see photo 2) located on this section of the stream, and it is discharging liquid with a greenish/black color (see photo 3). There is also a Blue Heron Rookery (heronry) nearby (see photo 4). BAI observed bird droppings and dead fish around the ground which is creating a strong smell.

## Stream bank erosion and siltation

There is no noticeable bank erosion in this area and the banks appear to be stable, with a good riparian zone. The embeddedness is 30%.

#### <u>Wetlands</u>

There are no wetlands located in this stream reach.

## <u>Invasive Plants</u>

Japanese Knotweed was found growing along this stream reach.

#### Trash and Litter

There was some minor trash found in this section of the stream.

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### Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.91 out of 10 which means it is in Fair condition.

Algal growth indicates this reach of the stream is high in nutrients. This may be caused by treated effluent from the sewage treatment plant having high levels of nutrients. Effluent from the sewage treatment plant should be monitored to insure that concentrations of nutrients and Total Suspended Solids do not exceed effluent discharge limits.

There is a white discharge seen coming out of the creek bank (see photo 5). BAI is not sure what was causing this discharge. Often times white discharges are indicative of aluminum in abandoned mine water. Fisherman Kevin Holman is seen showing off his catch of an orange koi (see photo 6). It should be noted that this species is invasive.



Photo 1: Hanson-Sewickley Creek Plant located right up on stream bank. (BSC-34)



Photo 2: Sewage treatment plant. (BSC-36)



Photo 3: Greenish-black discharge from sewage plant. (BSC-36)



Photo 4: Blue heron nests (heronry) located on the south side of Big Sewickley Creek. (BSC-38)



Photo 5: White discharge coming from a flow on the south side of the Creek. (BSC-41)



Photo 6: A local boy catches an orange koi. (BSC-41)

# BSC-43 through BSC-52 (fair)

Waypoints: BSC43-BSC52 (Reach #9) Segment: Big Sewickley Creek from Gaydos Lane Bridge to a floodplain wetland. Date of Assessment: 7/13/07

## <u>Sewage impacts</u>

There is a noticeable odor, excess plant growth and siltation. The sanitary line installation has also caused stream changes and damages (see photo 1).

# Stream bank erosion and siltation

There are a few small bank erosions throughout this section, however there is a seven foot high bank erosion (see photo 4) which created a deep pool with a greenish color. There are also several areas of sediment buildup which have created sand bars (see photos 2&3), which in turn have created debris jams. There is also heavy sedimentation at the mouth of Cooney Hollow where homeowners are encroaching on the creek with cement blocks (see photo 5). In some areas the water is cloudy with a greenish hue and the embeddedness is between 20-30% throughout this section.

## <u>Wetlands</u>

There is a floodplain wetland that is approximately 1,000 feet long by 400 feet wide along this section of the stream at BSC52.

## Invasive Plants

Japanese Knotweed was found growing along this reach of BSC.

## Trash and Litter

There was some trash found along this section of the stream.

#### Conclusions and Recommendations

This section of BSC received a visual assessment score of 6.55 out of 10 which means it is in Fair condition. This section of the stream has a few bank erosion areas, several sand bars, and debris jams.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.



Photo 1: Black pipe with hose coming off of Chem-Dry property. (BSC-46)



Photo 2: Sediment bar built up in middle of stream. (BSC-45)



Photo 3: Large sediment build up and debris jam at a sanitary sewer crossing. (BSC-48)

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Photo 4: Seven foot high bank erosion and a deep greenish colored pool. (BSC-48)



Photo 5: Location of the mouth of Cooney Hollow. Homeowners are encroaching the stream with concrete blocks. (BSC-50)

## BSC-53 through BSC-60 (good)

Waypoints: BSC53-BSC60 (Reach #10) Segment: BSC from debris jam to incoming tributary. Date of Assessment: 7/13/07

#### Sewage impacts

There were no notable sewage discharges but there was an abundance of brown and black algae growing in this section of the stream. This indicates possible nutrient enrichment in the stream.

#### Stream bank erosion and siltation

The banks are stable and there does not appear to be excessive erosion. The embeddedness is from 20-30%.

#### <u>Wetlands</u>

There are no wetlands along this stream reach.

#### Invasive Plants

Japanese Knotweed was found growing along this reach of BSC.

#### Trash and Litter

There was no trash found along this section of the stream.

#### Conclusions and Recommendations

This section of BSC received a visual assessment score of 7.7 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol.

There was an abundance of dark brown and black algae growth in the area where a dam was placed in the stream by the PA Game Commission (see photo 1). The dam is there because that area is protected by the PA Game Commission as a waterfowl preservation area. The dam acts as a fish impasse as fish cannot swim past it to get up or downstream.



Photo 1: Area protected by the PA Game Commission for waterfowl. (BSC-58)

# BSC-61 through BSC-65 (fair)

Waypoints: BSC61-BSC65 (Reach #11) Segment: BSC from wetlands to incoming tributary. Date of Assessment: 7/13/07

## Sewage impacts

There are no sewage treatment plants on this stretch of stream, and no visible impacts.

## Stream bank erosion and siltation

There are a few areas of bank erosion throughout this stream segment. One area is caused by an incoming tributary, while another erosion area is caused by a man-made rock dam (see photo 1). The water in the rock dam is also very cloudy. Further downstream there is also a tree debris jam with brown algae growing on it. The sediment from the erosion is causing the embeddedness to be around 30%.

## <u>Wetlands</u>

There is a small 25 by 25 foot patch of wetlands near the start of this part of the stream at BSC61 (see photo 2).

# Invasive Plants

Japanese Knotweed was found growing along this reach of BSC.

## Trash and Litter

There was no trash found along this section of the stream.
# Conclusions and Recommendations

This section of BSC received a visual assessment score of 7.3 out of 10 which means it is in Fair condition. This section of the stream has some bank erosion, and a man- made rock dam which is causing the water to become murky.

The eroded stream banks could be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.

People should also be discouraged from building rock dams along the stream. These dams slow the water flow causing sediment to build up, creating sand bars and clouding the water.



Photo 1: Man-made rock dam creating bank erosion in the bend on the left. (BSC-64)



Photo 2: Floodplain wetland area. (BSC-61)

# BSC-66 through BSC-70 (good)

Waypoints: BSC66-BSC70 (Reach #12)

Segment: BSC from bridge over Big Sewickley Creek Road to bridge at Warrendale-Bayre Road. Date of Assessment: 7/24/07

# Sewage impacts

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

The bank is eroded in a few areas in this section (see photo 1). A man made rock dam was made (see photo 2) which contributed to sediment buildup due to reduced flow of water (see photo 3). Even with the erosion, the embeddedness is still low at 20%.

# <u>Wetlands</u>

There are no wetlands along this section of the stream.

# Invasive Plants

No invasive plants were found growing along this reach.

# Trash and Litter

There was no trash found along this section of the stream.

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# Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 7.7 out of 10 which means it is in Good condition. This section of the stream has some bank erosion. Marshall Township has completed a new sanitary line installation in this section of stream, as of October 2010. The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.



Photo 1: Bank erosion and massive slope failure in a homeowner's front yard. (BSC-67)



Photo 2: Rock dam contributing to sediment bar problem due to reduced water flow. This has been removed as of 10/05/10 field check (BSC-69).



Photo 3: Large sediment bar built up in middle of stream. (BSC-69)

# BSC-71 through BSC-76 (fair)

Waypoints: BSC71-BSC76 (Reach #13) Segment: BSC from drainage to pond off Markman Road. Date of Assessment: 7/24/07

#### Sewage impacts

There are no visible impacts from sewage on this reach. New sanitary line recently completed in this area.

#### Stream bank erosion and siltation

The bank is eroded in a few areas in this section. There are also some sandbars caused by sediment build up which are created debris jams (see photo 1&2). Even with the erosion problems, the embeddedness is still low at 20%. Some of the debris jams in this area were removed in Fall of 2010 when sanitary line was completed.

#### <u>Wetlands</u>

There is a large floodplain wetland (BSC76) in this section of Big Sewickley Creek. It is approximately 4000 feet long by 500 feet wide. There is a flooded area from the pond above Markman Road upstream (see photo 3).

#### Invasive Plants

No invasive plants were found growing along this reach of BSC.

## Trash and Litter

There was no trash found along this section of the stream.

#### Conclusions and Recommendations

This section of BSC received a visual assessment score of 6.6 out of 10 which means it is in Fair condition, according to the scoring system provided by the USDA visual assessment protocol. This section of the stream has some streambank erosion which is creating sediment islands and debris jams.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. There could be a nice area for a streambank stabilization project at BSC76.

The debris jams along with the on stream pond at Markman Road act as fish barriers, preventing fish to travel past them.



Photo 1: Large sediment buildup in the middle of the stream. (BSC-74)



Photo 2: Debris jam creating a large pool. (BSC-75) This jam has been removed as of 10/05/10 field check.



Photo 3: An on-stream pond and wetland area near Markman Park Road. (BSC-76)

# BSC-77 through BSC-82 (good)

Waypoints: BSC77-BSC82 (Reach #14) Segment: BSC from Sleepy Hollow Lane to Cliff Road Bridge. Date of Assessment: 7/24/07

# Sewage impacts

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

There is no bank erosion in this area; the banks are very stable; and they have a good riparian zone. The embeddedness is low as well at only 20%.

#### <u>Wetlands</u>

There is a large, floodplain wetland (see photo 1, BSC78) along a long section of this stream reach.

# Invasive Plants

No invasive plants were found growing in this reach of Big Sewickley Creek.

# Trash and Litter

There was no trash found in the section of the stream.

#### Conclusions and Recommendations

This section of BSC received a visual assessment score of 8.4 out of 10 which means it is in Good condition. This high ranking shows the value of a preserved riparian zone with no

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encroachment on the stream channel and floodplain. This stream reach would be a tremendous area to construct a regional storm water management facility and/or wetland mitigation bank.



Photo 1: Large grassland floodplain. (BSC-77)



Photo 2: A sinuous channel that would make a good area for wetlands mitigation bank project. (BSC-78)

# BSC-83 through BSC-85 (good)

Waypoints: BSC83-BSC85 (Reach #15) Segment: BSC from road drainage area to Spang Road bridge. Date of Assessment: 7/26/07

# <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

There is no bank erosion in this area, but drainage from the road is causing excess sediment to enter the stream (see photo 1). There are also 3 ATV crossings along the stream which can cause sedimentation while degrading the stream banks and channel. The sediment in the water has created an embeddedness of 20-30%.

#### <u>Wetlands</u>

There are no wetlands in this section of BSC.

#### Invasive Plants

No invasive plants were found growing in this reach of BSC.

#### Trash and Litter

There was no trash found in the section of the stream.

# Conclusions and Recommendations

This stream reach received a visual assessment score of 7.6 out of 10 which means it is in Good condition. This section of the stream has several ATV crossings (BSC83) that have degraded the banks, and also has a small landslide. These erosion problems contribute to the 20-30% embeddedness in the stream channel.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. ATVs should be discouraged from driving through the channel, but this is sometimes difficult to enforce on private property.



Photo 1: Drainage area coming off of road bringing in excess sedimentation. (BSC-84)

# BSC-86 through BSC-97 (good)

Waypoints: BSC86-BSC97 (Reach #16) Segment: BSC from above Spang Road bridge to incoming tributary from the west. Date of Assessment: 7/26/07

# <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

There is no bank erosion but there is a small landslide (see photo 1, BSC87) which has added sediment to the stream. There was a fallen tree that created a debris jam and a small sand bar, which created a deep pool (see photo 2). There is also several trees that were cut down and left by the stream (see photo 3), from nearby construction, which are adding to the debris jams. A homeowner made a dam out of a sheet of metal (see photo 4) which is creating

downstream sedimentation. The excess sediment in the water has created embeddedness ranging from 20-30%.

#### <u>Wetlands</u>

There are no wetlands along this section of Big Sewickley Creek.

#### Invasive Plants

No invasive plants were found growing in this reach of Big Sewickley Creek.

## Trash and Litter

There was no trash found along this section of the stream.

#### Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 8.6 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol. This section of the creek has no bank erosion but there was a landslide causing sediment to enter the stream.

There was a man made dam made from a sheet of metal (see photo 4) that is acting as a fish impasse and causing downstream sedimentation. Downstream there were also a few culverts along the stream, one of which was too small and squeezes the channel (see photo 5), and another allowing a tributary to pass under a road (see photo 6).



Photo 1: Landslide off hill into stream. (BSC-87)



Photo 2: A fallen tree creating a debris jam and deep pool. (BSC-89)



Photo 3: Trees that were cut and left in stream. There is also housing construction uphill. (BSC-91)



Photo 4: Here a homeowner placed a piece of metal in the stream, creating dam, but also a fish impasse and downstream sedimentation. (BSC-92)



Photo 5: Improperly sized culvert squeezing the channel. (BSC-94)



Photo 6: An incoming tributary from across the road. (BSC-96)

# Tributaries to Big Sewickley Creek

(Western Tributaries)

# BSC-T1W1 through BSC-T1W8 (poor)

Waypoints: BSCT1W1-BSCT1W8 (Reach #5) Segment: Tributary that travels from power lines, through trailer park, to BSC. Date of Assessment: 6/21/07

# Sewage Impacts

There are no visible impacts from sewage on this reach.

# Stream Bank Erosion and Siltation

There are several areas of bank erosion and there is also a landslide under the power lines. The stream bank is eroded in areas and the bank is undercut near the trailer park (see photo 1). There is runoff, from a dirt and gravel road, entering the stream causing sedimentation. The landslide at the power lines (see photo 3) is creating heavy sedimentation in the stream, and erosion from the Economy Borough Sanitary line project (staging area) is having an impact on the headwaters of this tributary stream.

The above mentioned erosion and landslides (BSCT1W7) are causing a great deal of sediment to enter the stream. The embeddedness is greater than 40% and the water was very turbid and muddy during the initial site visit (see photo 4).

# <u>Wetlands</u>

There were no wetlands observed on this stream reach.

## Invasive Plants

Japanese Knotweed was found growing on this tributary.

## Trash and Litter

There is dumping between the stream and the road (see photo 2, BSCT1W4).

## Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 5.3 out of 10 which means it is in Poor condition. This section of the tributary has severe bank erosion and there is a lot of sediment entering the stream. There is also an area where people have dumped their bulk trash.

The hill that the power lines are on must also be restored and preventative actions must be taken to stop landslides from happening in the future. The trash needs to be cleaned up, removed, and disposed of properly. Dump sites could be monitored by Economy Borough code enforcement.



Photo 1: Heavy sedimentation and undercut bank on the tributary. (BSC-T1W2)



Photo 2: A dump site indentified along the stream. (BSC-T1W4



Photo 3: A landslide occurring along a power line, dumping sediment into the stream. (BSC-T1W7)



Photo 4: View of the heavily silted stream water below the landslide. (BSC-T1W7)

# BSC-T2W1 through BSC-T2W2 (fair)

Waypoints: BSCT2W1-BSCT2W2 (Reach #4)

Segment: Unnamed tributary that travels through residential area to power lines on top of hill. Date of Assessment: 6/21/07

# Sewage impacts

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

There are a few small areas of minor bank erosion, and the embeddedness is around 30%.

# Wetlands

There were no wetlands observed on this stream reach.

# Invasive Plants

There were no invasive species found growing along this tributary to BSC.

# Trash and Litter

There is no trash along this section of the stream.

# Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 8.6 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol.

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# BSC-T3W1 through BSC-T3W7 (good)

Waypoints: BSCT3W1-BSCT3W7 (Reach #36) Segment: Starts at Zehnder Road and ends at the headwaters. Date of Assessment: 5/13/08

## Sewage Impacts

There are no visible impacts from sewage on this reach.

## Stream Bank Erosion and Siltation

There are a few small areas of bank erosion near Hatton Lane (BSCT3W3). However, most of the streams banks are stable, the embeddedness is below 20%, and upstream there exists a healthy riparian zone (see photo 2). There is also a concrete retaining wall squeezing the tributary between the wall and the road (see photo 1, BSCT3W2).

#### Wetlands

There were no wetlands observed on this stream reach.

## Invasive Plants

Japanese Knotweed was found growing along this tributary.

# Trash and Litter

There is no trash along this section of the stream.

## Conclusions and Recommendations

This tributary of BSC received a visual assessment score of 8.6 out of 10 which means it is in Good condition. This section of the tributary has some bank erosion.

The eroded stream banks at Hatton Lane could be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.



Photo 1: Tributary along Shaffer Road squeezed by the road and a concrete retaining wall. (BSC-T3W2)



Photo 2: Upstream, this tributary has a good riparian zone. (BSC-T3W3)

# BSC-T4W1 through BSC-T4W3 (fair)

Waypoints: BSCT4W1-BSCT4W3 (Reach #40) Segment: Tributary to BSC on Conway-Wallrose Road. Date of Assessment: 5/13/08

## Sewage Impacts

There are no visible impacts from sewage on this reach.

## Stream Bank Erosion and Siltation

There is some bank erosion along the Conway-Wallrose Rd (see photo 1). Throughout the channel there are levels of embeddedness from 20-30%. Excess sedimentation was caused by recent construction near the Economy VFW (see photo 2).

#### <u>Wetlands</u>

There were no wetlands observed on this stream reach.

## Invasive Plants

Japanese Knotweed was found growing along this stream reach.

## Trash and Litter

There was some trash along the road.

## Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 7.3 out of 10 which means it is in Fair condition. This tributary has problems with stream bank erosion, and litter. There is an opportunity to do a small streambank stabilization project with access from the Conway-Wallrose Road, just upstream of the confluence with BSC.



Photo 1: Tributary along Conway-Wallrose Road with some bank erosion near the mouth. (BSC-T4W1)



Photo 2: Culvert across Conway-Wallrose Road, leading to headwaters. Recent construction near the Economy VFW was leading to excess sedimentation in the tributary. (BSC-T4W3) *(Eastern Tributaries)* 

# BSC-T1E1 through BSC-T1E8 (good)

Waypoints: BSCT1E1-BSCT1E8 (Reach #7)

Segment: Tributary of BSC that starts at the intersection of Big Sewickley and Turkeyfoot Roads, and ends at a small tributary flowing in from the north. Date of Assessment: 6/29/07

#### Sewage Impacts

There are no visible impacts from sewage on this reach.

## Stream Bank Erosion and Siltation

There is a small amount of bank erosion occurring across the street from Beadnell Drive (see photo 4, BSCT1E4). Sediment is also flowing into the stream from Beadnell Drive which is a dirt and gravel road (see photo 3). There is also a storm water outlet pipe sticking out of the bank too far, which is causing some erosion (see photo 5).

## <u>Wetlands</u>

There were no wetlands observed on this stream reach.

## Invasive Plants

Japanese Knotweed was found growing in this stream reach.

# Trash and Litter

No trash or litter was found along this stream reach.

## Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 8.6 out of 10 which means it is in Good condition. There is a dirt and gravel road and bank erosion causing sedimentation. There are a few culverts in this section which impede fish passage. An old tank is being used as a driveway culvert (see photo 1, BSCT1E3), and another culvert under Sevin Road is placed too high (see photo 6).

One recommendation for an improvement project would be to improve drainage on Beadnell Drive with cross pipes and even a broad-based dip on this low traffic route. This would break up storm water flows in order to prevent a large flush of water during storm events that has erosive force and deposits road materials and other sediments in the stream channel. Bell Acres Borough could apply for funding from the Allegheny County Conservation District through the dirt & gravel roads improvement program to address this road.



Photo 1: Here, an old tank was improperly used as a driveway culvert on a tributary that runs along Turkeyfoot Road. (BSC-T1E3)



Photo 2: A nice section of this tributary flowing through a wooded area. (BSC-T1E3)



Photo 3: Dirt and gravel from Beadnell Drive is going into the stream. (BSC-T1E4)



Photo 4: Bank erosion occurring across the road from Beadnell Drive. (BSC-T1E4)

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Photo 5: Storm water outfall that is sticking out too far into the stream channel. (BSC-T1E4)



Photo 6: Culvert under Sevin Road at intersection with Turkeyfoot Road placed too high. This creates a passage fish barrier. (BSC-T1E6)

# BSC-T2E1 through BSC-T2E3 (excellent)

Waypoints: BSCT2E1-BSCT2E3 (Reach #38)

Segment: Right Tributary to BSC starting at Camp Meeting Road and ending at the headwaters. Date of Assessment: 5/13/08

#### <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

## Stream bank erosion and siltation

There is no bank erosion and the level of stream embeddedness is under 20%.

## <u>Wetlands</u>

There were no wetlands observed on this stream reach.

## Invasive Plants

Japanese Knotweed was found growing along this stream reach.

## Trash and Litter

There was no trash along this section of the stream.

## Conclusions and Recommendations

This tributary of BSC received a visual assessment score of 9.2 out of 10 which means it is in Excellent condition. This is a very high score for this suburban watershed. This area should be protected.

# BSC-T3E1 through BSC-T3E7 (excellent)

Waypoints: BSCT3E1-BSCT3E6 (Reach #34) Segment: Tributary of BSC that starts in at a fenced pasture and ends at a fork in the stream, and runs through state game lands. Date of Assessment: 5/1/08

#### <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

#### Stream bank erosion and siltation

There is very little to no bank erosion in this section, and the banks are very stable. There is low siltation and the embeddedness is less than 20%.

#### <u>Wetlands</u>

There were no wetlands observed on this stream reach.

#### Invasive Plants

Japanese Knotweed and Skunk Cabbage were found growing in this stream reach.

#### Trash and Litter

No trash or litter was found along this tributary to BSC.

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# Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 9.3 out of 10 which means it is in Excellent condition. There is very little to no erosion or sedimentation. The only problem is a landowner encroachment with a mulch pile in the stream (see photo 1, BSCT3E2) causing some sedimentation in the stream.



Photo 1: Mulch pile and disturbed ground encroaching on tributary off of Markman Park Road. (BSC-T3E2)

# 8.0 <u>EAST BRANCH BIG SEWICKLEY CREEK STREAM SEGMENT ANALYSES</u> <u>EF-01 through EF-07 (good)</u>

Waypoints: EFBSC1-EFBSC7 (Reach #17) Segment: East Fork of the Big Sewickley Creek from the east side of BSC to a bridge. Date of Assessment: 7/13/07 and 7/26/07

# Sewage impacts

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

This section of the stream did not appear to have any erosion and the banks looked stable. There was also a good riparian zone throughout the section. However, some of the section runs though a yard where there is some bank erosion because there is grass cut all the way up to the edge of the creek (see photo 1). The homeowner has also discarded some cut limbs in the creek.

There did not appear to be a lot of sedimentation, the water was very clear, and the embeddedness was low at only 20-30%. The only area with excess sedimentation was at the confluence of Rippling Run where there was a lot of debris and sedimentation (see photo 2).

## <u>Wetlands</u>

There were no wetlands observed on this stream reach.

## Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

# Trash and Litter

There was no trash observed along this section.

## Conclusions and Recommendations

This branch of Big Sewickley Creek received a visual assessment score of 8.2 out of 10 which means it is in Good condition.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. Homeowners should be discouraged to mow grass up to the edge of the creek, and instead told to plant heavier vegetation there to protect the slopes of the creek bank. This is a hard sell for people that are used to keeping their properties neat and trimmed.



Photo 1: Near the mouth of East Branch Big Sewickley Creek, a homeowner has discarded cut limbs in the stream. There is also bank erosion due to the cutting of gas right up to the stream bank. (EF-05)



Photo 2: The confluence of Rippling Run with the East Branch is jammed with debris and excess sedimentation. (EF-06)

# EF-08 through EF-24 (good)

Waypoints: EFBSC8-EFBSC24 (Reach #18)

Segment: East Fork of the BSC from a private bridge through the state game lands to where a tributary enters the creek.

Date of Assessment: 8-14-07 and 8-28-07

#### Sewage impacts

There are no visible impacts from sewage on this reach.

#### Stream bank erosion and siltation

This section of the stream had some bank erosion however the banks were still very stable, and they had a good riparian zone. In the game lands there is some bank degradation where the bank has been trampled due to horse access to the stream (see photo 1). There was bank erosion just below the game lands border (see photo 2). A few other bank erosions occurred where tree jams were blocking the flow of water. One of these tree jams is also creating a sand bar.

The water was still very clear throughout and the embeddedness only ranged from 20-30% in this section of the stream

#### <u>Wetlands</u>

There was a small floodplain and wetlands area in this section of the creek. *Invasive Plants* 

There were no invasive species of plants found growing along this reach of the stream.

#### Trash and Litter

There was no trash spotted on this section.

# Conclusions and Recommendations

This section of the East Fork of Big Sewickley Creek received a visual assessment score of 8.7 out of 10 which means it is in Good condition. This section of the stream has some locations of severe erosion and siltation (EF22).

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. A bank stabilization project could be completed at EF22 with landowner cooperation.

There is also a culvert acting as a fish impasse under the entranceway to the state game lands (see photo 3). In the game lands there are also several small trees with beaver chew marks in them (see photo 4), and just upstream of those trees a small beaver dam can be seen (see photo 5).



Photo 1: This section of streambank has been disturbed due to horse access to the stream. (EF-13)



Photo 2: Bank erosion on a section of the East Fork just upstream of the Gamelands border. (EF-22)



Photo 3: A culvert under a State Gamelands access road acts as a fish impasse. (EF-18)



Photo 4: Sign of beaver activity near the stream. (EF-19)



Photo 5: Upstream from the beaver activity, this small dam was observed. (EF-20)

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# EF-25 through EF-27 (poor)

Waypoints: EFBSC25-EFBSC27 (Reach #19) Segment: East Fork of the BSC from homeowner's yards back into a wooded area. Date of Assessment: 8-28-07

## Sewage impacts

There was a plastic white pipe discharging water into the stream in this section (see photo 1). The water had a white precipitate and a noticeable odor.

## Stream bank erosion and siltation

This section of the stream had some bank erosion. This could be related to the fact that there was grass that was mowed right up to the bank of the stream (see photo 1). The erosion is causing occasional cloudiness in the water and an embeddedness of 20-30%.

## <u>Wetlands</u>

There was a small floodplain wetland approximately 50 feet by 50 feet near this section.

## Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

# Trash and Litter

There was no trash spotted along this section.

## Conclusions and Recommendations

This section of the East Fork received a visual assessment score of 5.2 out of 10 which means it is in Poor condition.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. The landowners in this section could be advised to plant more vegetation around the banks of the creek to create a better riparian zone, and not keep mowed grass running up to the edge of the bank.



Photo 1: A white pipe discharging fluids with white precipitate out of a front yard. (EF-26)

# EF-28 through EF-33 (poor)

Waypoints: EFBSC28-EFBSC33 (Reach #20) Segment: East Fork of the BSC from top of watershed to woods below Interstate 79. Date of Assessment: 8/28/07

# <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

There were several areas of erosion along this section of the creek. There was an old wooden bridge that eroded out and is now causing a debris jam across the channel (see photo 1, EF29). There is also a washed out pipe crossing and a channel coming out from under I-79, which is severely eroded and contributing a high volume of sediment to the stream channel. There are also concrete slabs that were dumped in the creek creating a debris jam at EF31. The excess sediment in the water is causing occasional cloudiness and the embeddedness of the cobbles ranges from 30-40% throughout the section.

# <u>Wetlands</u>

There is a small area of floodplain wetlands in this section of stream.

# Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

## Trash and Litter

There was trash spotted on this section that appeared to be blowing down the hill from I-79.

## Conclusions and Recommendations

This section of the East Fork of BSC received a visual assessment score of 5.6 out of 10 which means it is in Poor condition. This section of the stream has severe erosion and siltation.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. There may be opportunity to partner with the PA Department of Transportation on a project to stabilize the stream channel below the interstate highway.

The trash and litter in the area needs to properly be disposed of. It would be difficult to control the flow of litter from I-79.

There is a good area for a regional storm water basin on-stream immediately below I-79 (EF31). This would help prevent the erosion and sedimentation caused by excessive water runoff from the highway.



Photo 1: A collapsed wooden bridge creating a debris jam. (EF-29)

# Tributaries to the East Branch Big Sewickley Creek

# EF-T1E1 through EF-T1E2 (good)

Waypoints: EFT1E1-EFT1E2 (Reach #39) Segment: Tributary of East Fork that starts off of Hopkins Church Road, and flows behind Linbrook Park until it enters the East Fork. Date of Assessment: 5/13/08

## <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

## Stream bank erosion and siltation

There is little to no bank erosion and the banks appear to be very stable with a good riparian zone that extends two active channel lengths away on each side of the stream. There is also very little siltation with the embeddedness ranging from 20-30% throughout the section.

## <u>Wetlands</u>

There was small area of floodplain wetlands along this section of stream.

## Invasive Plants

Japanese Knotweed and skunk cabbage were found growing along this tributary.

## Trash and Litter

No trash or litter was found along this tributary.

# Conclusions and Recommendations

This tributary of East Fork received a visual assessment score of 8.8 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol.

# EF-T2E1 through EF-T2E6 (excellent)

Waypoints: EFT2E1-EFT2E6 (Reach #35)

Segment: Tributary of East Fork that starts at a small wetlands and ends at the mouth where it enters the main stem of East Fork.

Date of Assessment: 5/8/08

#### Sewage impacts

There are no visible impacts from sewage on this reach, except for some brown algae on the substrate in areas.

#### Stream bank erosion and siltation

There is little to no bank erosion and the banks appear to be very stable with a good riparian zone that extends two active channel lengths away from each side of the stream. There is also very little siltation with the embeddedness ranging from 20-30% throughout the segment.
### <u>Wetlands</u>

There are a few small patches of wetlands (EFT2E2) throughout the beginning of the stream.

#### Invasive Plants

Japanese Knotweed and skunk cabbage grow along this tributary of East Fork.

## Trash and Litter

No trash or litter was found along this tributary of East Fork.

## Conclusions and Recommendations

This tributary of East Fork received a visual assessment score of 9 out of 10 which means it is in excellent condition. There was some brown algae observed in sections of the stream substrate which is usually caused by a high amount of nutrients in the water.

# 9.0 NORTH FORK BIG SEWICKLEY CREEK STREAM SEGMENT ANALYSES

## NF-01 through NF-14 (good)

Waypoints: NFBSC1-NFBSC14 (Reach #21) Segment: Section of the North Fork of the BSC from mouth to debris jam. Date of Assessment: 10/4/07 and 10/9/07

#### Sewage impacts

BAI observed some algal growth throughout this area of the stream that could be indicative of excess nutrients.

#### Stream bank erosion and siltation

This section of the stream had a few areas of stream bank erosion. The banks are stable and there is a good riparian zone, however in some areas near homes there was some bank erosion due to grass being mowed right up to the bank. There were also several debris jams throughout this stretch of stream.

The water in the stream is very clear and the embeddedness is less than 20% for this section of the creek.

# <u>Wetlands</u>

There were no wetland areas observed on this stream reach.

#### Invasive Plants

There were no invasive plants found growing in this reach of the stream.

# Trash and Litter

There was no trash observed in this area of the stream.

#### Conclusions and Recommendations

This section of the North Branch of BSC received a visual assessment score of 8.1 out of 10 which means it is in Good condition. The homeowners along the creek could be informed of planting heavier vegetation closer to the stream bank to prevent further erosion. The

landowners are doing a good job of keeping the area clean and the stream well managed for conservation. There is a wide channel with sand bar areas off to the side, and backchannels cut out from extra flow events. The debris jam at NF06 needs to be pulled out because it is causing severe bank erosion into the edge of Hoenig Road.

# NF-15 through NF-22 (good)

Waypoints: NFBSC15-NFBSC22 (Reach #22)

Segment: Section of the North Fork of the BSC from tributary entering on the left to bridge. Date of Assessment: 10/8/07 and 10/31/07

## Sewage impacts

There are no visible impacts from sewage on this reach.

## Stream bank erosion and siltation

This section of the stream did not have any observed stream bank erosion. The banks are stable and there is a good riparian zone. The water in the stream is clear and the embeddedness is around 20% for this segment of the stream.

## <u>Wetlands</u>

There is a flooded wetland in this section of the stream near the intersection of Hoenig and Conway-Walrose Roads that is approximately 400 feet long by 500 feet wide (NF20).

# Invasive Plants

There were no invasive plants found growing in this reach of the stream.

# Trash and Litter

There was no trash observed in this section of the stream.

# Conclusions and Recommendations

This section of the North Fork received a visual assessment score of 8.1 out of 10 which means it is in Good condition. The landowners in this area are doing a good job of keeping the area clean and the stream well managed for conservation.

# NF-23 through NF-31 (good)

Waypoints: NFBSC23-NFBSC31 (Reach #23) Segment: Section of the North Fork from a large pond with bridge to private home to a bridge over Bradford Park Road. Date of Assessment: 10/31/07

# Sewage impacts

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

There is not that much erosion through this section of the stream. There were several debris/tree jams throughout. The water along this stretch was clear with embeddedness of around 20%.

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## <u>Wetlands</u>

There is a large pond located near private land at the start of this section. Downstream from the pond there were several trees that beavers have started to chew through and there were drag marks to the pond. Deer, ducks, and hawks were also spotted in this area (NF23).

# Invasive Plants

Japanese Knotweed was found growing in this reach of the stream.

#### Trash and Litter

There was no trash observed in this section of the stream.

## Conclusions and Recommendations

This section of the North Fork of Big Sewickley Creek received a visual assessment score of 8.3 out of 10 which means it is in Good condition.

## NF-32 through NF-39 (fair)

Waypoints: NFBSC32-NFBSC39 (Reach #24) Segment: Section of the North Fork from a wetland along sanitary line to a large pond below the Tri-County Soccer field. Date of Assessment: 1/31/08

#### <u>Sewage impacts</u>

There was a black algae growth of the substrate indicating high levels of nutrients in the water.

# Stream bank erosion and siltation

There is not that much erosion here because there are several areas of the stream that have been stabilized by homeowners using concrete blocks to line the banks of the creek (see photo 1, NF37). There are also a few storm water management pond outlets into this area, one of which needs more rock outlet protection (see photo 2). There is a little stream bank erosion near the outlet pipe of the large pond below the Tri-County Soccer facility.

The water along this stretch was occasionally cloudy with embeddedness of around 20%.

# <u>Wetlands</u>

There were no wetland areas observed along this section of the creek.

#### Invasive Plants

Japanese Knotweed was found growing along this reach of the stream.

#### Trash and Litter

There was a glass dump between the large pond and the outlet pipe below the Tri-County Soccer facility.

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# Conclusions and Recommendations

This section of the North Fork of Big Sewickley Creek received a visual assessment score of 6.5 out of 10 which means it is in Fair condition. There were a few areas with erosion and sedimentation problems along this section of the stream.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. The storm water outfall could be stabilized with additional rip-rap rock at NF38 in order to reduce erosion and sedimentation.



Photo 1: An improper attempt at bank stabilization using concrete blocks. (NF-37)



Photo 2: Storm water pond outlet from industrial park above that empties into the North Fork. (NF-38)

# NF-40 through NF-45 (fair)

Waypoints: NFBSC40-NFBSC45 (Reach #25) Segment: Section of the North Fork of the BSC from Lovi Road to below the bridge crossing. Date of Assessment: 1/31/08

#### Sewage impacts

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

On this section of the stream there were a few erosion areas and some sedimentation. There was some erosion downstream of a possible old pond breach which caused some sedimentation in the channel. There is also a road cave-in (see photo 1) which is being washed into the stream when it rains and causing more sedimentation.

This excess sediment is causing occasional cloudiness throughout the stream and embeddedness around 30%.

#### Wetlands

There were several small wetlands and flooded areas in this section of the creek.

#### Invasive Plants

Japanese Knotweed was found growing along this reach of the stream.

# Trash and Litter

There was some yard waste thrown in the stream along with some litter from the road intersection.

## Conclusions and Recommendations

This section of the North Fork received a visual assessment score of 6.2 out of 10 which means it is in Fair condition. There were a few areas with erosion and sedimentation problems in this section of the stream.

The group could work with the local authority responsible for the road at NF40 to get that area stabilized and eliminate that source of sediment to the stream channel.

The trash should be cleaned up and disposed of properly, and homeowners should be discouraged from throwing yard waste into the stream. The yard waste that is in the stream needs to be removed.



Photo 1: Roadside cave-in that is causing excess sedimentation in the stream during rain events. (NF-40)

# Tributaries to North Fork Big Sewickley Creek

# NF-T1W1 through NF-T1W4 (excellent)

Waypoints: NFT1W1-NFT1W4 (Reach #37)

Segment: Tributary to the North Fork of the BSC from headwaters to the North Fork branch.

Date of Assessment: 5/13/08

# <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

There were no reported areas of bank erosion or sedimentation. The banks are very stable and there is a good riparian zone. There were only a few debris jams in this section of the stream. The water is very clear and there was no algae observed on the substrate. The embeddedness was less than 20% throughout this section.

# <u>Wetlands</u>

There were several small wetlands and flooded areas in this section of the stream.

# Invasive Plants

Japanese Knotweed was found growing along this reach of the stream.

# Trash and Litter

There was no trash spotted on this section.

# Conclusions and Recommendations

This tributary of North Fork received a visual assessment score of 9.4 out of 10 which means it is in Excellent condition. There was no reported erosion or sedimentation in this section. This section was fine except for the occasional debris jam.

# NF-T2W1 through NF-T2W15 (fair)

Waypoints: NFT2W1-NFT2W15 (Reach #28)

Segment: Tributary to the North Fork of the BSC from the bridge at the main road to the crossing under the road.

Date of Assessment: 3/24/08

# <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

There were many areas of bank erosion in this section of the stream. Many tributaries enter the stream through this section causing many bank erosion and sedimentation (see photo 1). There is an ATV crossing degrading the stream and causing a sediment deposit (see photo 2). There are a few debris jams throughout the section of the stream. There is also an on-stream pond that is silting-in (see photo 3) because of all of the excess sedimentation.

The siltation is causing the water to be occasionally cloudy with embeddedness between 30-40% throughout this section of stream.

# <u>Wetlands</u>

There were no wetlands observed in this section of the creek.

# Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

# Trash and Litter

There was no trash spotted on this section, but there is silt fence still in place all the way down the stream valley from a sanitary line project which needs to be removed.

# Conclusions and Recommendations

This tributary of the North Fork received a visual assessment score of 6.2 out of 10 which means it is in Fair condition. There are several areas of stream bank erosion, an ATV crossing, and a pond being silted in.

ATVs should be discouraged from driving through the stream channel, but this is difficult to enforce.

The authority responsible for the sanitary line project needs to come back, take out, and collect the remaining silt fence.



Photo 1: At a tributary of the North Fork, this slope failure and bank erosion was observed. (NF-T2W7)

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Photo 2: Another instance of erosion just upstream from a large gully on ATV trail. (NF- T2W8)



Photo 3: A pond along the tributary filled with excess sediment. (NF-T2W14)

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# NF-T3W1 through NF-T3W3 (fair)

Waypoints: NFT3W1-NFT3W3 (Reach #29) Segment: Tributary to the North Fork from bridge to wetland area. Date of Assessment: 2/7/08

## Sewage impacts

There are no visible impacts from sewage on this reach.

## Stream bank erosion and siltation

This section of the stream had very little erosion. The streambanks are stable and there is a good riparian zone. However, there is a stream crossing culvert which is causing erosion and downcutting of the channel at NFT3W2 (see photo 1). There are ATV trails that are degrading the stream channel and banks. There is also a new bridge where mud is flowing into the stream.

The water throughout this section is occasionally cloudy and the embeddedness ranges from 20-30%.

## <u>Wetlands</u>

There is a floodplain wetland in the right-of-way area along the stream channel.

## Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

# Trash and Litter

There was no trash spotted on this section.

# Conclusions and Recommendations

This tributary of the North Fork received a visual assessment score of 6.3 out of 10 which means it is in Fair condition. There is no stream bank erosion reported in this area, but there are ATV crossings and a stream crossing culvert causing erosion and siltation.

ATVs should be discouraged from driving through the stream channel, but his is hard to enforce. The manmade improvements on this private property may be difficult to address because they are located on a small, headwater tributary.



Photo 1: A stream crossing culvert causing down cutting and erosion. (NF-T3W2)

# NF-T4W1 through NF-T4W5 (good)

Waypoints: NFT4W1-NFT4W5 (Reach #27)

Segment: Tributary to the North Fork of the BSC from an erosion and sedimentation basin to the main stream.

Date of Assessment: 2/7/08

# <u>Sewage impacts</u>

There are no visible impacts from sewage on this reach.

# Stream bank erosion and siltation

This section of the stream had very little to almost no erosion. The streambanks are stable and there is a good riparian zone. There are some trees that have fallen over the stream but nothing that has caused significant damage.

The water throughout this section is very clear and the embeddedness ranges from 20-30%.

#### Wetlands

There is a floodplain wetland immediately adjacent to the stream channel.

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## Invasive Plants

There was no invasive species of plants found growing along this reach of the stream.

## Trash and Litter

There was no trash spotted on this section, but there is silt fence still in place all the way down the stream valley which needs to be removed.

#### Conclusions and Recommendations

This tributary of the North Fork received a visual assessment score of 7.9 out of 10 which means it is in Good condition. There is no erosion reported in this section and the stream is in very good condition.

There is an interesting tunnel like structure that was observed in the hillside next to another stream nearby at NFT4W2 that appears to be an old coke oven (see photo 1). Also the silt fence that was left behind by construction needs to be removed.



Photo 1: An interesting structure (possible coke oven) noted alongside another tributary, in the hillside. (NF-T4W2)

# NF-T5W1 through NF-T5W11 (good)

Waypoints: NFT5W1-NFT5W11 (Reach #26) Segment: Tributary to the North Fork of the BSC from the Whispering Pines development to the main stream.

Date of Assessment: 2/7/08

#### Sewage impacts

There are no visible impacts from sewage on this reach.

#### Stream bank erosion and siltation

This section of the stream has several areas where the stream bank has been eroded. One area is quite large where about 30 feet of the stream bank is eroded at NFT5W2. A storm water pipe support has eroded and needs to be fixed or replaced at NFT5W6 (see photo 2). There are several other smaller erosion areas from tributaries entering the stream, and another from an improperly sized pipe that is too small to convey the stream flow at NF-T5W7 (see photo 3).

The erosion is causing the water to be cloudy at times, and there is embeddedness in the stream of around 20-30% for this section.

## Wetlands

There is a large, floodplain wetland near this section of the stream (see photo 1).

## Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

#### Trash and Litter

There was no trash spotted on this section.

# Conclusions and Recommendations

This section of the North Fork of Big Sewickley Creek received a visual assessment score of 7.9 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol. There are several areas of erosion and some sedimentation in this section of the creek.

It is recommended that the storm water infrastructure be replaced/repaired at NFT5W6 and W7 to improve water flow and reduce the causes of sedimentation in the stream channel.



Photo 1: Floodplain wetland area. (NF-T5W3)



Photo 2: A storm water outlet that needs reconstructed. (NF-T5W6)



Photo 3: Severe erosion around concrete pipe that is improperly sized. (NF-T5W7)



Photo 4: E&S Basin in Whispering Pines development. (NF-T5W11)

# 10.0 COONEY HOLLOW STREAM SEGMENT ANALYSIS

Waypoints: CH01-CH03 (Reach #33)

Segment: Section of Cooney Hollow starting at the confluence with BSC and ending at the headwaters.

Date of Assessment: 5/1/08

#### Sewage impacts

There are no visible impacts from sewage on this reach.

#### Stream bank erosion and siltation

This section of the stream did not have many problems with bank erosion. It is a small creek that flows primarily through woods except for a small residential area (see photos 1 & 2). The banks appear to be very stable and there is a good riparian zone throughout the area.

The water is very clear and the embeddedness is less than 20%.

#### <u>Wetlands</u>

No wetlands were observed in this area.

#### Invasive Plants

Japanese Knotweed and Skunk Cabbage are growing along this reach of the stream.

#### Trash and Litter

There was no trash observed along this area of the stream.

#### Conclusions and Recommendations

Cooney Hollow received a visual assessment score of 8.8 out of 10 which means it is in Good condition.

Cooney Hollow runs along Cooney Hollow Road, behind a small development and through a culvert where it enters Big Sewickley Creek. The creek and surrounding area is well maintained by the land owners and the area is forested.



Photo 1: Cooney Hollow flows through the woods except for at the mouth. (CH-01)



Photo 2: Headwater area of Cooney Hollow. (CH-03)

# 11.0 RIPPLING RUN STREAM SEGMENT ANALYSES

# RR-01 through RR-10 (good)

Waypoints: RR1-RR10 (Reach #30)

Segment: Section of Rippling Run starting at a storm water outlet and ending at Sechler's Lake. Date of Assessment: 4/24/08

#### Sewage impacts

There are no visible impacts from sewage on this reach.

## Stream bank erosion and siltation

This section of the stream did not have many problems with bank erosion. There was a small amount of bank erosion at a storm water outlet at RR02. There were a few log jams along this section also.

The water was very clear and the embeddedness was less than 20%.

#### Wetlands

There were a few small wetlands observed in this area (RR06).

## Invasive Plants

Japanese Knotweed and Skunk Cabbage were found growing in this reach of the stream.

## Trash and Litter

There was no trash in this area of the stream.

#### Conclusions and Recommendations

This section of Rippling Run received a visual assessment score of 8.2 out of 10 which means it is in Good condition.

There is a culvert under a homeowner's driveway that looks properly sized for Rippling Run at RR06 (see photo 1), however the inlet side in clogged with debris (see photo 2). Rippling run also flows through Sechler's Lake at RR09 as it makes its way to BSC (see photos 3 & 4). Landowner needs to maintain the inlet side of the stream crossing so as not to cause flooding and downstream erosion.



Photo 1: Culverts under a driveway that seem properly sized on Rippling Run. (RR-06)



Photo 2: However, the inlets to these culverts are jammed with debris. (RR-06)

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Photo 3: Sechlers Lake, which Rippling Run flows through. (RR-09)



Photo 4: Outlet to Sechlers Pond. (RR-09)

# Tributaries to Rippling Run

(Eastern Tributaries)

# RR-11 through RR-13 (good)

Waypoints: RR11-RR13 (Reach #31)

Segment: Section of Rippling Run starting at a homeowner's property and ending at the headwaters.

Date of Assessment: 5/1/08

#### Sewage impacts

There are no visible impacts from sewage on this reach.

#### Stream bank erosion and siltation

This section of the stream did not have any problems with bank erosion. The banks were stable and the area had a good riparian zone. The water was also very clear with an embeddedness of around 20%.

#### Wetlands

There were no observed wetlands in this area.

#### Invasive Plants

There were no invasive species of plants found growing in this reach of the stream.

#### Trash and Litter

There was no trash observed along this stream reach.

#### Conclusions and Recommendations

This section of Rippling Run received a visual assessment score of 8.4 out of 10 which means it is in Good condition. The landowners are doing a good job of keeping the area clean and the stream well managed for conservation.

#### RR-14 through RR-17 (good)

Waypoints: RR14-RR17 (Reach #32) Segment: Tributary to Rippling Run from houses to headwaters at wetlands. Date of Assessment: 5/1/08

#### Sewage impacts

There are no visible impacts from sewage on this reach.

#### Stream bank erosion and siltation

This section of the stream did not have any problems with bank erosion. The banks were observed to be stable and the area had a good riparian zone. The water was also very clear with an embeddedness of less than 20%.

# <u>Wetlands</u>

There were a few wetland areas in this section (RR15). One area that was about half an acre by the road near the top of the stream, and another area about the same size near the confluence with the main stem of Rippling Run.

# Invasive Plants

Skunk Cabbage was found growing in this reach of the stream.

# Trash and Litter

There was no trash observed along this area of the stream.

# Conclusions and Recommendations

This tributary to Rippling Run received a visual assessment score of 8.5 out of 10 which means it is in Good condition. The landowners are doing a good job of keeping the area clean and the stream well managed for conservation.

# 12.0 CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

The Big Sewickley Creek Watershed has many natural resource issues and opportunities. Major areas of concern and/or opportunity are outlined in the Management Recommendations section of the plan in Attachment A. A significant concern to the watershed is unmanaged storm water. Several older neighborhoods built before there were storm water management regulations are located in Leet Township, Franklin Park, Marshall Township, and Economy Borough. Flooding is occurring during severe storms along Big Sewickley Creek in the lower portions of the watershed. It appears to be caused by the cumulative effect of unmanaged flows and improper encroachment into the natural floodplain and floodway of the stream channels.

Storm water management improvements and maintenance should be a high priority for this watershed community. With increased development, streams are heavily impacted, and so are properties along the streams. It is recommended that the BSCWA sponsor a coalition of local and state entities to apply implementation funding to develop a storm water management plan for the Big Sewickley Creek Watershed. The Act 167 program has recently been cut from the state budget and is not likely to be reinstated in the near future. Other possible sources of funding could be EPA, Growing Greener, and PennVEST. Partners on this project would include PaDEP, Allegheny and Beaver Counties, municipalities, and the BSCWA. A plan needs to be developed that will set standards for managing storm water from new development according to the characteristics of the receiving subwatershed. PaDEP's Storm water Best Management Practices manual could be utilized to strengthen this effort. Current management facilities are clearly not doing the job of managing storm water and protecting downstream resources. Developers need to have more options for new innovative management techniques within the local ordinances. These ordinances would be amended based on the findings of a detailed storm water management assessment and plan. Another key component of this management strategy will be the monitoring and maintenance of existing storm water facilities. Other municipalities in the region are checking these facilities and finding that many of them are not constructed to the approved specifications and others are not maintained properly and therefore not functioning as they should. A comprehensive program, watershed-wide, on a municipal level needs to be done first to take inventory of what is out there and what needs to

be repaired, maintained, and/or retrofitted. This would be a great first step toward making progress and improvements for downstream communities in the watershed.

Area landowners need to be educated on the impacts and issues created from encroaching on the floodplains of local streams. These encroachments have caused numerous problem areas throughout the watershed, and especially in the lower portions of the main stem of Big Sewickley Creek. This would be a good project for the watershed association to tackle at a grassroots level in conjunction with the municipal governments within the watershed. Education followed by more strict enforcement of floodplain regulations at the local and state level would make a difference on this issue.

Many stream reaches in the watershed are eroded, entrenched, and braided from different causes. These areas need to be assessed in detail for the causes of impairment and then redesigned to restore them to their most natural course. Many specific reaches that are candidates for natural stream restoration are identified on the attached maps and tables. These types of projects will have lasting, measurable effects on the local communities that are worth the investment. Some open, upstream areas may be appropriate for regional storm water management basins. This management technique has been suggested and implemented in other local watersheds with some success. These facilities would lessen the volume of water being squeezed into the lower section of the watershed during large storm events.

Impacts from sewage was another issue that was investigated at a snapshot level during this assessment. Fecal coliform samples were taken at different locations across the watershed. There were a few samples that were considered high in bacteria counts. One of those areas was on the North Fork of Big Sewickley Creek. This area seems to have some issues with wildcat sewage. Further sampling and investigation needs to be conducted in this subwatershed to hone in on specific problem sources. The other areas of high bacteria levels were on the main stem of BSC. Marshall Township has completed a large sanitary service upgrade project as of October 2010 that has brought service to a long stretch of the upper reaches of BSC. This should have immediate impacts on the water quality in the main stem of BSC. There is also a small trailer park along the main stem that has a package plant treatment system. A check of the compliance of this system is in order along with some other scattered monitoring points downstream of these areas on BSC.

Several natural, open space areas are identified throughout this plan. These areas should be seriously looked at for preservation possibilities. There are several community parks, playgrounds, and ball fields in the different municipalities throughout the watershed. There are some nature park and reserve areas, but there are additional tracts of land that could be set aside for conservation easements. BSCWA could approach the owners of some of these properties to assess their future plans for their properties. A few priority areas should be looked at for preservation. Some of these include the area in and around the Campmeeting Woods BDA and the Bell Acres Nature Preserve; areas contiguous with the PA Gamelands #203; Cooney Hollow; and the western tributaries of the North Fork of Big Sewickley Creek. All of these areas are being pushed by development from the north and east. Some of these areas should be preserved in their natural state, for they act as natural buffers to development and sources of high water quality. This open space planning falls in line with a push for comprehensive land use planning. Both Allegheny and Beaver County have comprehensive plans that echo the aforementioned recommendations.

Overall, the BSCWA has a great opportunity to use this plan to continue their efforts and focus in on a few watershed improvement projects that will have lasting, measurable results on the natural resources of the watershed and the subsequent quality of life of residents and visitors to this watershed.

# 13.0 ACKNOWLEDGEMENTS

This project was completed with the assistance of many organizations and individuals. The funding was provided by the PA Department of Environmental Protection through the Growing Greener program. A significant matching effort was supplied by members of BSCWA, Leet Township, Fern Hollow Nature Center, Western PA Conservancy, Allegheny County Conservation District (ACCD), and Beaver County Conservation District (BCCD). The Allegheny County Conservation District provided a great amount of support during the field assessments with the help of Mr. Rich Kowalski, Watershed Specialist, and during the report phase with Ms. Amy Miller, Watershed Specialist. Ms. Susan Barness, President of BSCWA, was the originator of the project and continued to push to completion. The macroinvertebrate and fish surveys, and watershed monitoring training were conducted by the Western PA Conservancy – Watershed Conservation Program, in coordination with Mr. Gary Smith, Regional Habitat Biologist with the PA Fish and Boat Commission in Somerset, PA. Blazosky Associates, Inc. (BAI) coordinated all of the field assessments and prepared the assessment and restoration plan with the oversight review of aforementioned partners.

ATTACHMENT A: MANAGEMENT RECOMMENDATIONS FOR THE WATERSHED

# Big Sewickley Creek Watershed Management Recommendations

Subwatershed	Areas of Concern & Opportunity	Proposed Projects	GIS/GPS Waypoint(s)	Municipality(s)	Priority Ranking	Cost Estimate
	severe bank erosion 6' high by 100' long	stream bank stabilization	BSC11-12	Leet & Harmony Townships	Н	\$
	Blue Heron Rookery	Conservation easement to protect this area.	BSC38	Bell Acres Borough	Н	\$\$
	sediment build up with backwater pools and debris jam at sanitary crossing. Sanitary line installation has caused stream changes/damage.	natural stream channel restoration	BSC48	Bell Acres & Economy Boroughs	Н	\$
	on-stream wetland and pond	maintain buffer areas around this floodplain/wetland area	BSC76	Marshall Township	Н	\$
	landslide on power line and heavy sedimentation in stream below	slope stabilization, stream channel restoration	BSCT1W7	Economy Borough	Н	\$\$
	small 1 acre wetland	maintain buffer areas around this floodplain/wetland area	BSC 8	Leet Township	Μ	\$
	channel is too wide and straightened in many places	natural channel restoration	BSC20	Bell Acres & Economy Boroughs	М	\$\$
	auto parts, plastics, and flood debris along stream banks	Enforce local ordinances and environmental regulations in order to remove debris from stream	BSC31	Bell Acres Borough	М	\$
	sediment build up in middle of stream, channel too wide.	natural stream channel restoration	BSC45	Bell Acres & Economy Boroughs	М	\$\$
Creek	large floodplain wetland 1000'x400'	maintain buffer areas around this floodplain/wetland area	BSC52	Bell Acres Borough	М	\$
kley (	Abundance of brown/black algae	localized sampling to determine cause of algae	BSC58	Franklin Park Borough	М	\$
Big Sewickley Creek	dam with water fowl sign from PA Game Commission	maintain buffer areas around this floodplain/wetland area	BSC58	Franklin Park Borough	М	\$
iig S	bank erosion/debris jam	stream bank stabilization	BSC68	Marshall Township	М	\$
B	island in middle of stream constricting tributary, and a 6' high bank erosion just	natural stream channel restoration/ stream bank	BSC74	Marshall Township	М	\$\$
	floodplain wetland/sinuous channel	possible mitigation wetland construction area	BSC78	Marshall Township	М	\$\$\$
	dump site along stream	Enforce local ordinances and environmental regulations in order to remove debris from stream channel	BSCT1W4	Economy Borough	М	\$
	erosion and sedimentation from Beadnell Drive (dirt and gravel road)	Improvements to road to reduce volume of water coming down.	BSCT1E4	Bell Acres Borough	М	\$\$
	bank erosion	stream bank stabilization	BSCT3W3	Economy Borough	М	\$
	small 25'x25' wetlands	maintain buffer areas around this floodplain/wetland area	BSC61	Franklin Park Borough	L	\$
	several ATV crossings	Stabilize crossing with waterbars and rock to reduce sediment load	BSC83	Marshall Township	L	\$
	small landslide causing sedimentation and debris jams	slope stabilization, stream channel restoration	BSC87-90	Marshall Township	L	\$
	manmade dam	remove dam, restore channel	BSC92	Marshall Township	L	\$
	road washout at trailer park	stabilized stormwater outlet	BSCT1W1	Economy Borough	L	\$
	homeowner encroachment, mulch pile in stream	education program: brochures, news articles, watershed newsletter, and enforcement	BSCT3E2	Marshall Township	L	\$

# Big Sewickley Creek Watershed Management Recommendations

Subwatershed	Areas of Concern & Opportunity	Proposed Projects	GIS/GPS Waypoint(s)	Municipality(s)	Priority Ranking	Cost Estimate
	severe erosion caused by I-79 runoff	good sight for a regional stormwater basin on-stream below I-79	EFBSC30-31	Marshall Township	н	\$\$\$
East Fork	unstable banks through residential area	homeowner watershed education and small bank protection project	EFBSC25	Marshall Township	М	\$\$
Easi	bank erosion and sand bar	natural channel restoration/ bank stabilization	EFBSC19	Marshall Township (in SGL 203)	L	\$
	beaver dam found in small wetland	maintain buffer areas around this floodplain/wetland area	EFBSC20	Marshall Township (in SGL 203)	L	\$
	Erosion and culvert not large enough to handle flows	replace culvert with larger pipe and repair streambank	NFT5W7	Economy Borough	Н	\$\$
	wetland area 400'X500'	maintain buffer areas around this floodplain/wetland area	NFBSC20	Economy Borough	М	\$
North Fork	severe erosion	check soil types to find explanation for erosion/stream bank stabilization	NFT2W7-8	Economy Borough	М	\$\$
No	possible coke oven on hillside	historical preservation	NFT4W2	Economy Borough	L	\$
	severe erosion	stream bank stabilization	NFT5W2	Economy Borough	L	\$\$
un	Sechlers Lake area	maintain buffer areas around this floodplain/wetland area	RR9	Franklin Park Borough	н	\$\$
Rippling Run	a few small 1/2 acre wetland areas	maintain buffer areas around this floodplain/wetland area	RR15	Franklin Park Borough	Μ	\$
Cooney Hollow	Debris Jam	remove jam and work to maintain riparian areas.	CH2	Economy Borough	Н	\$

# ATTACHMENT B: FIELD ASSESSMENT WAYPOINT DATA

1

									STREAM				WATERSHE		INTERES	ST								
									ENCROACHM NTS (DAMS, RETAINING	-	07000004750	SW	D IMPROVEM ENT		FOR HISTOR OR				NUTRIENT	F1011 IN 1910		INSECT/IN		MANURE EWAGE_ PRESENC
WAYPOINTS	Y		ELEVATION_ FEET DATE	NOTES PH		ECTION REACH D SCOR	E SCORE2	DEBRIS JA	MS ATV IMPACTS BUILDUP)	BANK	EROSION	MANAGEMENT FACILITIES/ISS UES	ROJECT	WETLANDS	SEWAGE CONSER	VA CONDITIO	IPARIAN STAE	BILIT APPEAR	A ENRICHM ENT	BARRIEE M FI	IREA SH EMBEDD IER DNESS	VERTEBR ATE CANOP HABITAT COVER	AMD_IF IF APPLICAB AI	E E_IF PPLICAB APPLICAB E LE
BSC01	40.57376	-80.22758	680 6/5/2007	START	1	6.27	FAIR						_			5 6	7	7	5	7 7	7	6 8	0 5	0
BSC02 BSC03	40.57591 40.57791		692 6/5/2007		630 1 630 1	6.27	FAIR						-			5 5	7	7	5	7 7	7	6 8	0 5	0
BSC03 BSC04	40.57791	-80.22275 -80.22151	691 6/5/2007 714 6/5/2007	WATER CHECK 6.87 STORMWATER DISCHARGE UNDER BEAVER ST. BRIDGE	1	6.27	FAIR					x	-			5 5	7	7	5	7 7	7	6 8	0 5	0
BSC05	40.57981	-80.22046	680 6/5/2007	LOW DAM	1	6.27	FAIR			-			-			5 5	7	7	5	7 7	7	6 8	0 5	0
BSC06 BSC07	40.57935	-80.21887	684 6/5/2007 693 6/5/2007	STORMWATER DISCHARGE (3)-(2) 15" CPP AND (1) 12" CPP 18" CPP STORMWATER DISCHARGE	1	6.27	FAIR				_	x	-			5	7	7	5	7 7	7	6 8	0 5	0
BSC08	40.58204	-80.21833	693 6/5/2007	FLOODPLAIN WETLAND	1	6.27	FAIR						_	x	x	5 5	7	7	5	7 7	7	6 8	0 5	0
BSC09	40.58131		700 6/5/2007	END	1	6.27	FAIR			_			-			5 5	7	7	5	7 7	7	6 8	0 5	0
BSC10 BSC11	40.58108 40.58081	-80.21630	699 6/11/2007 701 6/11/2007	START/BRIDGE AT BALLPARK UNDERCUT BANKS ACROSS FROM BALLFIELD/ALSO (2) STORMWATER OUTFALLS FROM ROAD	2	6.36	FAIR			×	_		× –			7 0	7	7	5	7 7	5	6 8	0 5	0
BSC12	40.58081	-80.21515	702 6/11/2007	6' HIGH BANK EROSION-100' LONG AND SMALL TRIB FROM UNDER ROAD 7.37	620 2	6.36	FAIR			x			x			7 0	7	7	5	7 7	5	6 8	0 5	0
BSC13	40.58276	-80.21208	719 6/11/2007	24" CONCRETE STORMWATER PIPE	2	6.36	FAIR					x	-			7 0	7	7	5	7 7	5	6 8	0 5	0
BSC14 BSC15	40.58383 40.58550	-80.21171 -80.21119	723 6/11/2007 715 6/11/2007	DEBRIS JAM 36° CONCRETE PIPE (LOW FLOW) 7.35	2	6.36	FAIR	x				x	-			7 0	7	7	5	7 7	5	6 8	0 5	0
BSC16	40.58769			END/BEND IN STREAM WITH BACKWATER	2	6.36	FAIR						_			7 0	7	7	5	7 7	5	6 8	0 5	0
BSC17	40.58785	-80.20765	722 6/11/2007	START	3	6.27	FAIR						_			4 7	7	7	4	8 7	5	7 9	0 4	0
BSC18	40.58821	-80.20677		STORMWATER DISCHARGE FROM END OF STREET STORMWATER DISCHARGE FROM END OF STREET (15' SPP)	3	6.27	FAIR				_	x	-			4	7	7	4	8 7	5	7 9	0 4	0
BSC19 BSC20	40.58833		720 6/11/2007 722 6/11/2007		690 3	6.27	FAIR					x	x			4	7	7	4	8 7	5	7 9	0 4	0
BSC21	40.58873	-80.20479	729 6/11/2007		640 3	6.27	FAIR						_			4	7	7	4	8 7	5	7 9	0 4	0
BSC22 BSC23	40.58961 40.59004	-80.20380 -80.20322	729 6/11/2007 729 6/11/2007	15' SCP STORMWATER PIPE 15' SCP STORMWATER PIPE	3	6.27	FAIR				+	x x	-			4	7	7	4	8 7	5	7 9	0 4	0
BSC23 BSC24	40.59004		729 6/11/2007 728 6/11/2007	15 SCF STORRWATER PIPE	3	6.27	FAIR					x	-			4	7	7	4	8 7	5	7 9	0 4	0
BSC25	40.59124	-80.20213	732 6/11/2007	SEWAGE PLANT FROM TRAILER COURT	3	6.27	FAIR						-		x	4	7	7	4	8 7	5	7 9	0 4	0
BSC26 BSC27	40.59140 40.59136	-80.20187 -80.20093	735 6/11/2007	ENDWATER CHECK 7.70 START/BRIDGE AT TRAILER PARK	370 3 e	6.27	FAIR				-		-			4	7	7	4	8 7	5	7 9	0 4	0
BSC28	40.59289	-80.19821	730 6/29/2007		630 6	6.73	FAIR						-			7	8	7	5	8 6	6	8 9	0 5	0
BSC29	40.59387	-80.19727	738 6/29/2007	SPRING FLOW FROM ROAD AT OLD MANHOLE 7.33	680 6	6.73	FAIR						-			7 5	8	7	5	8 6	6	8 9	0 5	0
BSC30 BSC31	40.59506 40.59570	-80.19589 -80.19532	740 6/29/2007 751 6/29/2007	BANK EROSIONCONCRETE WALL CONSTRICTING CHANNEL TRIBUTARY FROM TURKEY FOOT ROAD AT ED WAGNER AUTO SALVAGE	6	6.73	FAIR		X	x	_	<u> </u>	-			7 5	8	7	5	8 6	6	8 9	0 5	0
BSC32	40.59570	-80.19532	646 6/29/2007	12" CONCRETE PIPE WITH TRICKLE FLOW (PINK ALGAE)	6	6.73	FAIR						-		x	7	8	7	5	8 6	6	8 9	0 5	0
BSC33	40.59644	-80.19119	686 6/29/2007	END/BRIDGE OVER BSC BY ZASSICK'S AUTO/RIGHT SIDE OF BRIDGE SILTED IN	6	6.73	FAIR		x				_			7 5	8	7	5	8 6	6	8 9	0 5	0
BSC34	40.59630	-80.19053	779 7/3/2007	START/UPSTREAM OF BRIDGE AT WINE CONCRETE COMPANY	8	6.91	FAIR						-			8 8	8	7	5	6 8	6	8 8	0 4	0
BSC35 BSC36	40.59631 40.59655	-80.18947 -80.18544	770 7/3/2007 770 7/3/2007	HANSON-SEWICKLEY CREEK PLANT 7.54 SEWAGE TREATMENT PLANT/GREEN-BLACK DISCHARGE POINT	670 8 8	6.91	FAIR						-		x	8 8	8	7	5	6 8	6	8 8	0 4	0
BSC37	40.59810	-80.18511	777 7/3/2007	SEWAGE PLANT OUTLET STRUCTURE/CANNOT SEE ENDPIPE	8	6.91	FAIR						-		x	8 8	8	7	5	6 8	6	8 8	0 4	0
BSC38	40.59912 40.60056	-80.18777	788 7/3/2007 784 7/3/2007	HERON ROOKERY NESTS IN TREES	8 650 8	6.91	FAIR					<u> </u>	-		X	8 8	8	7	5	6 8	6	8 8	0 4	0
BSC39 BSC40	40.60111	-80.18726 -80.18510	801 7/3/2007	PRIVATE HOMES/SMALL GREEN PLASTIC PIPES COMING OUT OF BANKS 7.69 4" GREEN PLASTIC PIPE COMING OUT OF BANK/SEWAGE?	8	6.91	FAIR								x	8 8	8	7	5	6 8	6	8 8	0 4	0
BSC41	40.60127	-80.18385			1,110 8		FAIR					<u> </u>	-		x	8 8	8	7	5	6 8	6	8 8	0 4	0
BSC42 BSC43	40.60152	-80.18383	782 7/3/2007 825 7/3/2007	END START/GAYDOS LANE BRIDGE	8	6.91	FAIR				-		-			5 5	5	7	6	6 8	6	8 8	0 4	0
BSC44	40.60460	-80.18421	850 7/3/2007	TRIBUTARY FROM WEST AT INTERSECTION OF BSC ROAD AND SHAFFER ROAD	9	6.55	FAIR						_			5	5	7	6	6 8	7	8 8	0 5	0
BSC45	40.60539	-80.18316	844 7/3/2007	SEDIMENT BUILD-UP IN MIDDLE OF STREAM	9	6.55	FAIR		X		_	<u> </u>	x			5	5	7	6	6 8	7	8 8	0 5	0
BSC46 BSC47	40.60593 40.60810	-80.18186	840 7/3/2007 848 7/3/2007	CHEM-DRY/BLACK PLASTIC PIPES COMING OUT OF BANK CONFLUENCE WITH NORTH FORK (ON MAIN STREAM, PH=7.99, COND=650) 8.21	580 9	6.55	FAIR						-			5 5	5	7	6	6 8	7	8 8	0 5	0
BSC48	40.60852	-80.18026	849 7/3/2007	SEDIMENT BUILD-UP WITH BACK WATER POOLS AND DEBRIS JAM AT SANITARY CROSSING	9	6.55	FAIR	x	x				_			5	5	7	6	6 8	7	8 8	0 5	0
BSC49		-80.17617	854 7/3/2007	SEEP DOWN HILLSIDE FROM OLDER HOUSE	9	6.55	FAIR			-			-			5	5	7	6	6 8	7	8 8	0 5	0
BSC50 BSC51		-80.17188		TRIB COMING IN BY HOUSE/HEAVY SEDIMENTATION DEBRIS JAM	9	6.55	FAIR	x	X		_		-			5 1	5	7	6	6 8	7	8 8	0 5	0
		-80.16856	848 7/3/2007	END/FLOODPLAIN WETLAND	9	6.55							_	x		5	5	7	6	6 8	7	8 8	0 5	0
BSC53		-80.16588	1	START/DEBRIS JAM UNDER ROAD CULVERT/FLOWING 7.00	10	0 7.70		x			-		-			8 9	8	9	5	5 9	7	9 8	0 0	0
BSC54 BSC55	40.60621 40.60785	-80.16541	1	UNDER ROAD CULVER (//FLOWING //.00 DEBRIS JAM	500 10		GOOD	x					-			8 9	8	9	5	5 9	7	9 8	0 0	0
BSC56		-80.15949	862 7/13/2007	INCOMING TRIBUTARY FROM EAST	10	1							-			8 9	8	9	5	5 9	7	9 8	0 0	0
BSC57 BSC58				CULVERT/DRY/FROM BUSINESS?/START OF BEDROCK SECTION DAM WITH WATERFOWL SIGN	10				x		-		-		x	8 9	8	9	5	5 9	7	9 8	0 0	0
BSC59		-80.15297		INCOMING TRIBUTARY FROM WEST	10				^	1	_		-			8 9	8	9	5	5 9	7	9 8	0 0	0
BSC60		-80.15179	863 7/13/2007	END	10						_		_			8 9	8	9	5	5 9	7	9 8	0 0	0
BSC61 BSC62		-80.15182		START/SMALL WETLAND OFF OF STREAM/DRY ERODED BANK/INCOMING TRIBUTARY FROM WEST UP AHEAD-DRY	11		FAIR		x	×	-		-	X		7 9	7	7	7	5 8	7	8 8	0 0	0
		-80.14828			640 11				^		_		-			7 9	7	7	7	5 8	7	8 8	0 0	0
BSC64	40.61298	-80.14634		HOMEOWNER STONE DAM/WATER REALLY BROWN AND CLOUDY	11					x	_		-			7 9	7	7	7	5 8	7	8 8	0 0	0
BSC65 BSC66		-80.14472		ENDINCOMING TRIBUTARY-EAST FORK BSC/REALLY CLOUDY WATER START/BRIDGE OVER BSC ON BSC ROAD 7.64	630 12	1 1.00							-			7 9	7 R	7	6	5 8 5 R	7 8	8 8 9 a	0 0	0
BSC67		-80.14315		BANK EROSION, DEBRIS JAM RECENTLY REMOVED	12	1				x			_			7 9	8	8	6	5 8	8	9 9	0 0	0
BSC68	40.61521	-80.14261	1	BIG DEBRIS JAM	12			x					-			7 9	8	8	6	5 8	8	9 9	0 0	0
BSC69 BSC70		-80.14253		MAN-MADE DAM, DEBRIS JAM END/DRAINAGE COMING FROM WAREENDALE/BAYNE RD. AT BRIDGE	12			x	X	-	-		-			7 9	8	8	6	5 8	8	a a a	0 0	0
BSC70 BSC71		-80.13942				3 6.60							_			6 8	6	8	8	1 7	8	7 7	0 0	0
BSC72	40.62125	-80.13942		TERRA COTTA PIPE (12") AND SMALL DRAINAGEWAY FROM THE ROAD/BANK EROSION	13					x			_			6 8	6	8	8	1 7	8	7 7	0 0	0
BSC73 BSC74		-80.13927 -80.13933		DRAINAGE FROM END OF ROAD/DRIVEWAY ISLAND IN MIDDLE OF STREAM @ CONFLUENCE WITH TRIB.??, 6' HIGH BANK EROSION JUST DOWNSTREAM OF MARKMAN PK. RD.	13	3 6.60 3 6.60	FAIR		x	x			x –			6 8	6	8	8	1 7	8	7 7	0 0	0
BSC75		-80.13933		ISEAND IN MIDDLE OF STREAM & CONFIDENCE WITH TRUE ??, & HIGH BANK EROSION JUST DOWINGTREAM OF WARKWAW PR. RD. SINOUS STREAM SECTION W/DEBRIS JAMS	T	3 6.60		x	^				x			6 8	6	8	8	1 7	8	7 7	0 0	0
BSC76		-80.13967		END/ON-STREAM WETLAND/POND OFF MARKMAN PARK RD. / BAD BANK EROSION BETWEEN ROAD AND WETLAND(7' HIGH) 150' LONG	13		FAIR			x			x	х	x	6 8	6	8	8	1 7	8	7 7	0 0	0
BSC77 BSC78	40.62456	-80.14082	1		530 14 520 14	4 8.40 4 8.40							<b>x</b>	x	x	9 9	9	9	7	9 8 9 8	8	8 8 8 8	0 0	0
BSC79				PCOODE-CHIWWE LEXING/SINGUS CHAINEL (SOOD area for wetland minigation bank) 7.51 DEBRIS JAM ON STREAM CHANNEL	14			x					~ _		^	9	9	9	7	9 8	8	8 8	0 0	0

							STREAM			v	VATERSHE	:	INTERE	ST										
							ENCROACHME NTS (DAMS, RETAINING				D MPROVEM	1	FOR HISTOR	۲Y							ECT/IN		EWAGE_ PF	ANURE
WAYPOINTS	•		ELEVATION_ FEET	DATE NOTES pH		SECTION _REACH ID SCORE	SCORE2 DEBRIS JAMS ATV IMPACTS BUILDUP)	BANK	EROSION	MANAGEMENT E FACILITIES/ISS F UES S	PROJECT	WETLANDS	OR SEWAGE CONSER IMPACTS TION		RIPARIAN	N STABILIT	APPEARA	NUTRIENT FIS ENRICHM BAI ENT RS	RRIEE M FISH	EMBEDDE AT	RTEBR A E CANOPY A BITAT COVER L	MD_IF IF APPLICAB AP .E LE	F E IPPLICAB AF	PPLICAB
BSC80	t 40.62857	1			73 240	1	GOOD	EROSION	51125	025 3	DITES	WEILANDS	IMPACTS TION	9	9	9 9	9 9	7 9	8	8 8	8 0	<u>- LE</u> 0	0	
BSC81	40.63399	-80.14091	919	7/24/2007 SMALL DRAINAGEWAY INTO STREAM (DRY)			GOOD							9	9	9 9	9	7 9	8	8 8	8 0	0	0	
BSC82	40.63466	-80.14061	918			14 8.40 15 7.60					~			9	9	9 9	9	7 9	8	8 8	8 0	0	0	
BSC83 BSC84	40.63563	-80.13996	921	7/24/2007         START/15' CPP STORMWATER PIPE/ATV CROSSINGS ON CHANNEL           7/24/2007         DRAIN FROM ROAD/SEDIMENTATION		15 7.60 15 7.60	GOOD X GOOD			x	×			8	8	8 9	9	6 8	5	8 7	9 0	0	0	
BSC85	40.64109	-80.13805	971	7/24/2007 END/BRIDGE ON SPANG ROAD		15 7.60	GOOD							8	8	8 9	9	6 8	5	8 7	9 0	0	0	
BSC86	40.64151	-80.13801	985	7/26/2007 START/ON SPANG BRIDGE		16 8.60	GOOD							8	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC87 BSC88	40.64334	-80.13850 -80.13848	1005	7/26/2007 SMALL LANDSLIDE DEBRIS JAM 7/26/2007 INCOMING TRIBUTARY	-	16 8.60 16 8.60	GOOD X X X				x			8	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC89	40.64646	-80.13767	967	7/26/2007 DEBRIS JAM		16 8.60	GOOD X							8	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC90	40.64779	-80.13771	1026	7/26/2007 DEBRIS JAM		16 8.60	GOOD X							8	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC91	40.64860		978	7/26/2007 TREES CUT AND LAYING IN STREAM (HOUSE CONSTRUCTION UP ABVOVE)		16 8.60	GOOD X							8	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC92 BSC93	40.65042	-80.13774	982	7/26/2007 HOMEOWNER METAL DAM 7.2 7/26/2007 STRONG SMELL OF NATURAL GAS	22 450	16 8.60 16 8.60	GOOD X GOOD				x			88	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC94	40.65574	1 1	1004	7/26/2007 CULVERT			GOOD							8	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC95	40.65677	-80.13619	1023	7/26/2007 DRIVEWAY CROSSING/CULVERT		16 8.60	GOOD X							8	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC96	40.65708		1046	7/26/2007 INCOMING TRIBUTARY		16 8.60 16 8.60	GOOD							8	10	9 9	9	9 6	8	8 9	10 0	0	0	
BSC97 BSCT1E1	40.66132 40.59523	-80.13344	770	7/26/2007 END/INCOMING TRIBUTARY 6/29/2007 START/INTERSECTION OF BSC ROAD AND TURKEYFOOT ROAD 7.5	58 770	16 8.60 7 8.60	GOOD							8	9	10 1	9	10 5	6	10 8	10 0	0	0	
BSCT1E2	40.59468	-80.19355	766	6/29/2007 STREAM PIPED UNDER ENTRANCE/PARKKING LOT FOR SEWICKLEY CONSTRUCTION		7 8.60	GOOD							8	9	10 1	10	10 5	6	10 8	10 0	0	0	
BSCT1E3	40.59394	-80.19177	774	6/29/2007 OLD TANK USED FOR DRIVEWAY CROSSING		7 8.60	GOOD X							8	9	10 1	10	10 5	6	10 8	10 0	0	0	
BSCT1E4 BSCT1E5	40.59240 40.59169	-80.18573	822 820	6/29/2007 EROSION/SEDIMENT FROM BEADNELL DRIVE 6/29/2007 SMALL SNAKE/FISH 7.5	54 770	7 8.60 7 8.60	GOOD		x	<u> </u>	х			8	9	10 1	10	10 5	6	10 8	10 0	0	0	
BSCT1E5 BSCT1E6	40.59169	-80.18433	836	0/29/2007 SMALL SMARL/FISH [7.5 6/29/2007 ROAD CROSSING UNDER SEVIN ROAD AT INTERSECTION WITH TURKEYFOOT ROAD AND INTERSECTION OF TRIBUTARY FROM BELL 7.5		7 8.60	GOOD		L					8	9	10 1	10	10 5	6	10 8	10 0	0	0	
BSCT1E7	40.58684	-80.18230	888	6/29/2007 SMALL TRIBUTARY FLOWING IN FROM THE SOUTH 7.6	64 810	7 8.60	GOOD						<u> </u>	8	9	10 1	10	10 5	6	10 8	10 0	0	0	
BSCT1E8	40.58601				61 700		GOOD		x	x				8	9	10 1	10	10 5	6	10 8	10 0	0	0	
BSCT1W1 BSCT1W2	40.59249 40.59484	-80.20132	672 807	6/21/2007         START/ROAD WASHOUT AT TRAILER PARK INTO STREAM           6/21/2007         INTERSECTION OF 2 STREAMS (LEFT BRANCH WATER CHECK)         7.1	10 440	5 5.30 5 5.30	POOR		×	X	x			6	8	4 1	1	9 5	4	3 4	9 0	0	0	
BSCT1W3	40.59569		833	6/21/2007 CROSS PIPE FROM PAVED ROAD AND LOOSE FILL	10 440		POOR			x				6	8	4 1	1	9 5	4	3 4	9 0	0	0	
BSCT1W4	40.59689	-80.20096	872	6/21/2007 DUMP SITE ALONG STREAM 7.3	34 920	5 5.30	POOR X				x			6	8	4 1	1	9 5	4	3 4	9 0	0	0	
BSCT1W5	40.59689	-80.20096			34 920	5 5.30	POOR		-					6	8	4 1	1	9 5	4	3 4	9 0	0	0	
BSCT1W6 BSCT1W7	40.59973	00.10001	957	6/21/2007         SPRING FLOW         7.6           6/21/2007         LANDSLIDE ON POWER LINE/HEAVY SEDIMENTATION IN STREAM BELOW         7.6	60 220	5 5.30 5 5.30	POOR X		×	x	×			6	8	4 1	1	9 5	4	3 4	9 0	0	0	
	40.60378	1		6/21/2007 ENDWASTE AREA CAUSING SEVERE EROSION		5 5.30	POOR	х	x	x	~			6	8	4 1	1	9 5	4	3 4	9 0	0	0	
BSCT2E1	40.60858	-80.15937	879	5/13/2008 START/RIGHT TRIBUTARY OFF BIG SEWICKLEY CREEK/INT AT CAMP MEETING ROAD EXTENSION 7.8	85 370	38 9.20	EXCELLENT							9	10	10 9	9	9 8	9	9 9	10 0	0	0	
BSCT2E2	40.59642		1184	5/13/2008 TRIBUTARY FROM LEFT GOING UPSTREAM		38 9.20	EXCELLENT							9	10	10 9	9	9 8	9	9 9	10 0	0	0	
BSCT2E3 BSCT2W1	40.59512	-80.14790 -80.20324	1133 861	SY13/2008         ENDIFIEADWATERS AT CAMP MEETING ROAD           6/21/2007         START/36' PIPE CROSSING AND SMALL TRIB INTERSECTION         7.5	59 360	38 9.20 4 7.30	FAIR							8	8	7 9	9	9 8	9	9 9 6 7	10 0 9 0	0	0	
BSCT2W2	40.59672	-80.20492	863		74 530	4 7.30	FAIR							8	8	7 9	9	9 5	5	6 7	9 0	0	0	
BSCT3E1	40.62254			5/1/2008 START/TRIBUTARY TO BIG SEWICKLEY CREEK		34 9.30	EXCELLENT							9	10	9 1	10	10 9	9	9 8	10 0	0	0	
BSCT3E2 BSCT3E3	40.62440	-80.13009	951	5/1/2008 LANDOWNER ENCROACHMENT/TRIBUTARY SPLIT 5/1/2008 TRIBUTARY FROM RIGHT GOING UPSTREAM 7.7	70 160	34 9.30	EXCELLENT X				х			9	10	9 1	10	10 9	9	9 8	10 0	0	0	
BSCT3E3	40.62529	-80.12550	1001	5/1/2008 SPLIT IN TRIBUTARY	/0 160	34 9.30 34 9.30	EXCELLENT							9	10	9 1	10	10 9	9	9 8	10 0	0	0	
BSCT3E5	40.63300	-80.11312	1015	5/1/2008 END OF DAY-RIGHT FORK		34 9.30	EXCELLENT							9	10	9 1	10	10 9	9	9 8	10 0	0	0	
BSCT3E6	40.63977		1053	5/1/2008 END OF DAY-LEFT FORK		34 9.30	EXCELLENT							9	10	9 1	10	10 9	9	9 8	10 0	0	0	
BSCT3W1 BSCT3W2	40.60476	-80.18403	849 868	S/13/2008 START/LEFT TRIBUTARY OFF BIG SEWICKLEY CREEK (HEADING UPSTREAM)     8.0     S/13/2008 CONCRETE RETAINING WALL OFF SHAFFER ROAD BEHIND HOMEOWNERS	05 470	36 8.60 36 8.60	GOOD X							88	8	8 1	10	10 6	9	9 9 a a	9 0	0	0	
	40.61013		923	5/13/2008 OFF HATTON LANE, BANK EROSION		36 8.60	GOOD	х			x			8	8	8 1	10	10 6	9	9 9	9 0	0	0	
BSCT3W4	40.61159	-80.19160	946	5/13/2008 TURNS INTO FORESTED/WOODY SECTION, SOME BANK EROSION		36 8.60	GOOD	х						8	8	8 1	10	10 6	9	9 9	9 0	0	0	
		-80.19193		S/13/2008 CULVERT UNDER LAND SECTION			GOOD X							8	8	8 1	10	10 6	9	9 9	9 0	0	0	
	40.61257 40.61934	-80.19310		5/13/2008 CULVERT UNDER ROAD 5/13/2008 END/HEADWATERS, DRY, HOUSING PLAN			GOOD							8	8	8 1	10	10 6	9	9 9	9 0	0	0	
BSCT4W1	40.61090	-80.15444	896			40 7.30	FAIR							6	7	7 ε	в	8 5	7	8 8	9 0	0	0	
BSCT4W2	40.62110			5/13/2008 CHANGE FROM FORESTED SECTION TO HOMEOWNERS/OPEN SECTION			FAIR							6	7	7 8	В	8 5	7	8 8	9 0	0	0	
BSCT4W3 CH01	40.63237	-80.16042			64 1,440 15 330		FAIR GOOD		<u> </u>	X				<u>6</u> 10	7	8 6	9 9	9 R	7	8 8 9 8	9 0	0	0	
CH02	40.61252	1		STARTICUREDENCE AT BIG SEWICKLET CREENCOLVERT UNDER HOMEOWINERS PROPERT FAT CONFLUENCE 6.1 5/1/2008 DEBRIS JAM	1		GOOD X								10	8	9	9 8	8	9 8	9 0	0	0	
CH03	40.62657	-80.17341	1135	5/1/2008 END /HEADWATERS AT 2 ROAD INTERSECTIONS		33 8.80	GOOD							10	10	8 9	9	9 8	8	9 8	9 0	0	0	
EF01	40.61314	-80.14383		7/26/2007 START			GOOD							9	9	8 8	B	8 7	8	8 9	8 0		0	
EF02 EF03	40.61094 40.61019	-80.14077 -80.13943		7/26/2007 DEBRIS AND TREE JAM 7/26/2007 PARK			GOOD X GOOD							9	9	8 8	8 R	8 7	8	8 9	8 0	0	0	
EF04	40.60925	-80.13772		7/26/2007 INCOMING TRIBUTARY (DRY)			GOOD							9	9	8 8	в	8 7	8	8 9	8 0	0	0	
EF05	40.60896	-80.13673	874	7/26/2007 INCOMING TRIBUTARY (DRY)/CUT TREE LIMBS IN STREAM		17 8.20	GOOD X							9	9	8 8	В	8 7	8	8 9	8 0	0	0	
EF06 EF07	40.60740	-80.13348	887	7/26/2007 TRIBUTARY (RIPPLING RUN)		17 8.20 17 8.20	GOOD		+					9	9	8 8	8	8 7	8	8 9	8 0	0	0	
EF07 EF08	40.60743			7/26/2007 ENDIBRIDGE ON BSC ROAD 8/14/2007 START/PRIVATE BRIDGE NEAR INT STATE GAME LANDS ROAD AND BSC ROAD			GOOD		+					9	9 10	9 8	В	8 7	9	8 9	10 0	0	0	
EF09	40.60808	-80.13138		8/14/2007 CONCRETE SLABS FOR STREAMBANK STABILIZATON		18 8.70	GOOD X							9	10	9 8	8	8 7	9	8 9	10 0	0	0	
EF10	40.60857			8/14/2007 METAL LINE (GAS) CROSSING STREAM ABOVE CHANNEL			GOOD			L					10	9 8	В	8 7	9	8 9	10 0	0	0	
EF11	40.60865	-80.13060			A 580		GOOD X								10	9 8	8	8 7	9	8 9	10 0	0	0	
EF12 EF13	40.60986 40.61067	-80.12938 -80.12877		8/14/2007         TREE DOWNDEBRIS JAM           8/14/2007         HORSE ACCESS TO STREAM CHANNEL		18 8.70 18 8.70	GOOD X GOOD X	x						-	10 10	9 8	B	8 7	9	8 9	10 0	0	0	
EF14	40.61128	-80.12780		8/14/2007 TREES DOWN ACROSS STREAM IN TWO PLACES			GOOD X								10	9 8	8	8 7	9	8 9	10 0	0	0	
EF15	40.61253	-80.12713		8/14/2007 STORMWATER RUNOFF FROM INT OF ROADS ABOVE			GOOD		<u> </u>	x				9	10	9 8	В	8 7	9	8 9	10 0	0	0	
EF16 EF17	40.61395	-80.12489	942	8/14/2007 TRIBUTARY FROM WEST NA 8/14/2007 TRIBUTARY FROM EAST	A 950	18 8.70 18 8.70	GOOD							9	10	9 8	в	8 7	9	8 9	10 0	0	0	
EF17 EF18	40.61460	-80.12320	981	8/14/2007 TRIBUTARY FROM EAST 8/14/2007 CMP CULVERT UNDER GAMELANDS ROAD/BLOCKS FISH PASSAGE	-		GOOD X		L					9	10	9 8	8	8 7	9	8 9	10 0	0	0	
EF19	40.61760	-80.11949		8/14/2007 BANK EROSION/TREE JAM/SAND BAR			GOOD X X X	х							10	9 8	в	8 7	9	8 9	10 0	0	0	
EF20	40.61963	-80.11619		8/14/2007 BEAVER DAM (SMALL) ACROSS FROM SHOOTING RANGE		18 8.70	GOOD X			L				9	10	9 8	В	8 7	9	8 9	10 0	0	0	
EF21	40.62512	-80.11038	1041	8/14/2007 END OF DAY		18 8.70	GOOD							9	10	9 8	В	8 7	9	8 9	10 0	0	0	

							STREAM			WATERS	Ξ	INTEREST	r									
							NTS (DAMS, RETAINING			D IMPROVE	M	FOR HISTORY OR							INSECT/IN			MANURE EWAGE_ PRESENC
WAYPOINTS	Y	ELEVATION_ X FEET	DATE NOTES	pH COND	SECTION _REACH ID SCORE	SCORE2 DEBRIS JAMS ATV IMPACT	WALLS, SEDIMENT BA S BUILDUP) ER	NK	STORMWATER EROSION SITES	MANAGEMENT FACILITIES/ISS UES SITES	SEWAGE WETLANDS IMPACTS		A CHANNEL CONDITIO		STABILIT AF	PPEARA EN	JTRIENT FISH IRICHM BARRIEE IT RS	INSTREA M FISH EME COVER DNE	VERTEBR BEDDE ATE ESS HABITAT	CANOPY A	AMD_IF IF APPLICAB AP .E LE	PLICAB
EF22	40.62561	-80.10900 984	8/28/2007 START OF DAY/CULVERT CROSSING FOR GAMELANDS ENTRANCE/DOWNSTREAM BANK EROSION		18 8.70	GOOD		х				_	9	0	8	8	77	9 8	9	10 0	0	0
EF23 EF24	40.62581 40.62541	-80.10750 1019 -80.10620 1019	8/29/2007 TRIB FROM ACROSS ROAD 8/28/2007 END/TRIB FROM ACROSS ROAD	7.69 200 7.03 410	18 8.70 18 8.70	GOOD							9	0	9 8	8	7	9 8	9	10 0	0	0
EF25	40.62529	-80.10612 1017	8/28/2007 START/LANDOWNERS/STREAM FLOWS THROUGH FRONT YARDS/BANK EROSION	1.00 410	19 5.20	POOR		x		x			7	3	1 6	6	9	3 6	5	3 0	5	0
EF26	40.62510	-80.10411 1030	8/28/2007 PRIVATE BRIDGE/PLASTIC, WHITE OUTLET (SEWAGE?)		19 5.20	POOR					X		7		1 6	6	9	3 6	5	3 0	5	0
EF27	40.62489	-80.10372 1028	8/28/2007 ENDIEND OF MOWED AREA, BACK INTO WOODS 8/28/2007 START		19 5.20 20 5.60	POOR							7	3	1 6	6	9	3 6	5	3 0	5	0
EF28 EF29	40.62483	-80.10353 1034 -80.10282 1036	8/28/2007 START 8/28/2007 BRIDGE AND DEBRIS JAM ACROSS CHANNEL		20 5.60 20 5.60	POOR X	x						3		5 7	8	1	4 5	6	9 0	0	0
EF30	40.62462	-80.09880 1058	8/28/2007 WASHED-OUT PIPE CROSSING/SEVERLY ERODED/BY I-79 (Possible SWM facility location)		20 5.60	POOR	x	x	x	<u>x</u> x			3	3	5 7	8	1	4 5	6	9 0	0	0
EF31	40.62392	-80.09790 1056	8/28/2007 CHANNEL COMING UNDER I-79/SEVERE EROSION/DUMPED CONCRETE SLABS		20 5.60	POOR	x	x	x	<u> </u>			3		5 7	8	1	4 5	6	9 0	0	0
EF32	40.62336	-80.09367 1066		7.98 700	20 5.60	POOR							3	3	5 7	8	1	4 5	6	9 0	0	0
EF33 EFT1E1	40.62326	-80.09093 1092 -80.13705 883	8/28/2007         CONFLUENCE OF TRIBUTARIES THAT GO UNDER NEELY SCHOOL ROAD NEAR INT. WITH MINGO ROAD           5/13/2008         START/INTERSECTION AT EAST FORK BIG SEWICKLEY CREEK	7.80 800 7.61 120	1 1 1	GOOD							3 10	0	a 9	9	7	9 8	8	9 0	0	0
EFT1E2	40.59980	-80.14848 939	5/13/2008 END/HEADWATERS/DRY		39 8.80	GOOD							10	0	9 9	9	7	9 8	8	9 0	0	0
EFT2E1	40.61445	-80.12300 925	5/6/2008 START/RIGHT TRIBUTARY OFF EAST FORK (HEADING UPSTREAM) THROUGH GAMELANDS		35 9.00	EXCELLENT							10	0	9 9	7	9	9 8	9	10 0	0	0
EFT2E2 EFT2E3	40.61394	-80.12229 919 -80.11914 1004	5/6/2008 CULVERT/SMALL EARTHEN BRIDGE/SMALL WETLANDS ON RIGHT SIDE OF TRIBUTARY 5/6/2008 TRIBUTARY TO RIGHT HEADING UPSTREAM	8.21 720	35 9.00 35 9.00	EXCELLENT	X				X	_	10	0	9 9	7	9	9 8	9	10 0	0	0
EFT2E4	40.61247	-80.11633 1054	5/6/2008 DEBRIS JAM		35 9.00	EXCELLENT X						_	10	0	9 9	7	9	9 8	9	10 0	0	0
EFT2E5	40.61386	-80.11191 1096	5/6/2008 TRIBUTARY TO RIGHT HEADING UPSTREAM		35 9.00	EXCELLENT							10	0	9 9	7	9	9 8	9	10 0	0	0
EFT2E6	40.61096	-80.10653 1280	5/6/2008 END/MOUTH OF OTHER TRIBUTARY		35 9.00	EXCELLENT							10	0	9 9	7	9	9 8	9	10 0	0	0
NF01 NF02	40.60837	-80.18140 814 -80.18113 830	10/4/2007 START/ALGAE 10/4/2007 CONCRETE DEBRIS	8.01 530	21 8.70 21 8.70	GOOD	v				X	_	9	)   .	3 9	7	9	9 9	9	9 0	0	0
NF02	40.60935	-80.18040 794	10/4/2007 BEDROCK OUTCROP/LOTS OF FISH/ATV XING AROUND BEND		21 8.70	GOOD X							9	, ,	3 9	7	9	9 9	9	9 0	0	0
NF04	40.61275	-80.18280 848	10/4/2007 LOOKING DOWNSTREAM, RIP-RAP CHANNEL/BEDROCK/LOTS OF FISH		21 8.70	GOOD	x						9	)	3 9	7	9	9 9	9	9 0	0	0
NF05	40.61822	-80.18316 822	10/4/2007 DEBRIS JAM		21 8.70	GOOD X						_	9		3 9	7	9	9 9	9	9 0	0	0
NF06	40.61857	-80.18386 847 -80.18396 865	10/4/2007 TREE DOWN IN STREAM 10/4/2007 DEBRIS JAM		21 8.70 21 8.70	GOOD X GOOD X							9		3 9	7	9	9 9	9	9 0	0	0
NF08	40.62128	-80.18422 860	10/4/2007 TRIBUTARY COMING IN FROM WEST	7.92 530	21 8.70	GOOD							9	, ,	3 9	7	9	9 9	9	9 0	0	0
NF09	40.62988	-80.18230 876	10/4/2007 BANK EROSION NEAR HOMES		21 8.70	GOOD		x					9	)	3 9	7	9	9 9	9	9 0	0	0
NF10	40.63041	-80.18252 865	10/4/2007 END OF DAY		21 8.70	GOOD							9		3 9	7	9	9 9	9	9 0	0	0
NF11	40.63110	-80.18220 879	10/8/2007 START OF DAY (CONTINUED)/ERODED BANK/DEBRIS JAM BY HOMES		21 8.70 21 8.70	GOOD X		x				-	9		3 9	7	9	9 9	9	9 0	0	0
NF12 NF13	40.63209	-80.18146 894 -80.18127 869	10/8/2007 DEBRIS JAM 10/8/2007 TRIBUTARY COMING IN FROM WEST/DERIS JAM	7.58 540	21 8.70 21 8.70	GOOD X GOOD X							9		3 9	7	9	9 9	9	9 0	0	0
NF14	40.63326	-80.18068 876	10/8/2007 END/DEBRIS JAM		21 8.70	GOOD X							9	)	3 9	7	9	9 9	9	9 0	0	0
NF15	40.63546	-80.17796 881	10/8/2007 START/TRIBUTARY COMING IN FROM WEST (NEW SECTION DUE TO LESS ALGAE)	7.00 670	22 8.10	GOOD							8	8	3 8	7	9	8 8	8	9 0	0	0
NF16	40.63696	-80.17323 889	10/8/2007 B ROOK/TRIBUTARY COMING IN FROM EAST		22 8.10	GOOD							8	3	3 8	7	9	8 8	8	9 0	0	0
NF17	40.63851	-80.17022 888 -80.16654 726	10/8/2007         END OF DAY/HOMEOWNER BRIDGE           10/31/2007         START OF DAY/SMALL TRIB FROM EAST		22 8.10 22 8.10	GOOD						_	8	3	3 8	7	9	8 8	8	9 0	0	0
NF19	40.63803	-80.16649 731	10/31/2007 SHALE CLIFFS ALONG STREAM		22 8.10	GOOD							8	3	3 8	7	9	8 8	8	9 0	0	0
NF20	40.64030	-80.16616 837	10/31/2007 FLOODPLAIN WETLAND (NEAR INT WITH CONWAY-WALROSE ROAD)		22 8.10	GOOD					x		8	3	3 8	7	9	8 8	8	9 0	0	0
NF21	40.64216	-80.16488 842	10/31/2007 CONFLUENCE WITH TRIBUTARY FROM WEST	7.94 770	1 1	GOOD						_	8	s	3 8	7	9	8 8	8	9 0	0	0
NF22	40.64311 40.64370	-80.16376 876 -80.16278 883	10/31/2007         ENDIBAD BRIDGE (2 SMALL PIPES)           10/31/2007         START/BIG POND WITH BRIDGE TO PRIVATE HOUSE		22 8.10 23 8.30	GOOD	X					_	8	3	3 8	7	9	8 8	8	9 0	0	0
NF24	40.65309	-80.16036 959	10/31/2007 DEBRIS/TREE JAM		23 8.30	GOOD X							7	, ,	9 8	8	7	8 8	9	10 0	0	0
NF25	40.65396	-80.16022 969	10/31/2007 TRIBUTARY COMING IN FROM EAST		23 8.30	GOOD							7	)	9 8	8	7	8 8	9	10 0	0	0
NF26	40.65478	-80.16139 980	10/31/2007 DEBRIS/TREE JAM		23 8.30	GOOD X							7		8	8	7	8 8	9	10 0	0	0
NF27 NF28	40.65631	-80.16187 974 -80.16152 982	10/31/2007 TRIBUTARY COMING IN FROM WEST 10/31/2007 TRIBUTARY COMING IN FROM WEST	7.88 670	23 8.30 23 8.30	GOOD GOOD							7		8	8	7	8 8	9	10 0	0	0
NF29	40.65681	-80.16152 982	10/31/2007 TRIBUTARY COMING IN FROM WEST		23 8.30	GOOD							7	, ,	9 8	8	7	8 8	9	10 0	0	0
NF30	40.65745	-80.15942 1010	10/31/2007 DEBRIS/TREE JAM	1		GOOD X						_	7		9 8	8	7	8 8	9	10 0	0	0
NF31	40.65944	-80.15862 1038	10/31/2007 END/AT BRIDGE OVER BRADFORK PARK ROAD NEAR INT WITH SUMMERFIELD DRIVE		23 8.30	GOOD							7		9 8	8	7	8 8	9	10 0	0	0
NF32 NF33	40.65944	-80.15862 484 -80.15660 499	1/31/2008 START POINT 1/31/2008 CONFLUENCE OF TRIBUTARIES/WETLAND ALONG SEWAGE LINE/MAIN STEM pH=7.62, COND=1380	6.80 1,130	24 6.50 24 6.50	FAIR							6	3   .	7 7	6	5	5 8	7	8 0	0	0
NF34	40.66398	-80.15669 557	1/31/2008 SMALL DEBRIS JAM FROM FIREWOOD FALLING INTO STREAM	6.60 1,130	24 6.50	FAIR X					X		6	,	7 7	6	5	5 8	7	8 0	0	0
NF35	40.66398	-80.15669 581	1/31/2008 18° DIA. SPP OUTLET FROM ROAD DRAINAGE SYSTEM		24 6.50	FAIR				x			6		7 7	6	5	5 8	7	8 0	0	0
NF36	40.67027	-80.15598 974	1/31/2008 CONFLUENCE WITH SMALL TRIBUTARY	8.08 580	24 6.50	FAIR							6		7	6	5	5 8	7	8 0	0	0
NF37 NF38	40.67345	-80.15393 1027 -80.15358 1048	1/31/2008         OLD SCHOOL BANK STABILIZATION (BLOCK WALLS FAILING)           1/31/2008         STORMWATER POND OUTLET FROM INDUSTRIAL PARK		24 6.50 24 6.50	FAIR	X	X		×			6		, ,	6	5	5 8	7	8 0	0	0
NF39	40.67441	-80.15358 1048		7.70 640	24 6.50	FAIR				x		_	6		7 7	6	5	5 8	7	8 0	0	0
NF40	40.67057	-80.14846 1086	1/31/2008 START/INT OF WOODLAND, PLEASANT HILL LOVI, AND GOLDEN GRAVE ROAD	7.80 1,170		FAIR							6	, ,	6 6	6	5	5 6	7	8 0	0	0
NF41	40.67030	-80.14883 1082	1/31/2008 DEBRIS JAM IN CHANNEL (LANDOWNER DUMPED YARD WASTE)		25 6.20	FAIR X							6		3 6	6	5	5 6	7	8 0	0	0
NF42	40.66928	-80.15011 1072 -80.15085 1077	1/3/2008 POSSIBLE OLD POND BREACH, DOWNSTREAM EROSION/SEDIMENTATION		25 6.20	FAIR	x	x				_	6	,	6	6	5	5 6	7	8 0	0	0
NF43 NF44	40.66843	-80.15085 1077 -80.15124 1071	1/31/2008 VERY BLACK STREAM BOTTOM 1/31/2008 CONFLUENCE WITH TRIBUTARY	7.60 950	25 6.20 25 6.20	FAIR					X		6	,	5 6	6	5	5 6	7	8 0	0	0
NF45	40.66422	-80.15473 1051	1/31/2008 END/PLASTIC GEOMEMBRANE BELOW BRIDGE CROSSING		25 6.20	FAIR							6	,	5 6	6	5	5 6	7	8 0	0	0
NFT1W1	40.62802	-80.18319 883	5/13/2008 START/INTERSECTION OF TRIBUTARY AT HOENIG ROAD AND NORTH FORK BSC	7.71 320	37 9.40	EXCELLENT						_	10	0	9 10	9	9	9 9	9	10 0	0	0
NFT1W2	40.62922	-80.18509 901	5/13/2008 DEBRIS JAM		37 9.40	EXCELLENT X EXCELLENT X						_	10	0	9 10	9	9	9 9	9	10 0	0	0
NFT1W3 NFT1W4	40.63506	-80.19138 1045 -80.19472 1089	5/13/2008 DEBRIS JAM 5/13/2008 END/HEADWATER AREA	7.61 260	37 9.40 37 9.40	EXCELLENT X							10	0	, 10 ) 10	9 9	9	9 9	9	10 0 10 0	0	0
NFT2W1	40.63378	-80.18146 875		7.90 350		FAIR							4	)	3 7	8	3	7 5	8	8 0	0	0
NFT2W10	40.64813	-80.18858 972		7.58 360	28 6.20	FAIR				<u> </u>			4		3 7	8	3	7 5	8	8 0	0	0
NFT2W11 NFT2W12	40.65047	-80.18797 988		7.68 180		FAIR X							4		3 7	8	3	7 5	8	8 0	0	0
NFT2W12 NFT2W13	40.65177 40.65506	-80.18848 998 -80.19035 1021	3/24/2008 TRIBUTARY FROM THE EAST 3/24/2008 MAIN STEM WATER QUALITY CHECK	7.76 460 7.78 580		FAIR							4	,	3 7	8	3	7 5	8	8 0	0	0
NFT2W13	40.65531	-80.19047 1018		7.67 840		FAIR				x			4	)	3 7	8	3	7 5	8	8 0	0	0
NFT2W15	40.65911	-80.19238 1049	3/24/2008 END POINT; CROSSING UNDER ROAD NEAR WHERE WE PARKED	7.81 470	1 1	FAIR							4		3 7	8	3	7 5	8	8 0	0	0
NFT2W2	40.63484	-80.18347 542	3/24/2008 DEBRIS JAM IN STREAM		28 6.20	FAIR X							4		3 7	8	3	7 5	8	8 0	0	0
NFT2W3 NFT2W4	40.63690 40.63831	-80.18488 905 -80.18529 910	3/24/2008 STREAM JUMPED BANKS DURING RECENT FLOOD 3/24/2008 SMALL TRIBUTARY FROM EAST	7.81 230	28 6.20 28 6.20	FAIR				<u>x</u>			4		3 7	8	3	7 5	8	8 0	0	0
NF 12W4	190.03031	1 30.10328  910		17.01  230	1=0 [0.2U	p				·				- 1	· /	lα	lo	,  5	0	<u> 0</u>		

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						STREAM ENCROACHME				WATERSHE	E	INTE FOR	REST							
						NTS (DAMS, RETAINING			:w/	IMPROVEN	и	HIST	ORY						INSECT/IN	MANURE SEWAGE PRESENC
ELEVATION		SECTION REACH				WALLS,	BANK	STORMWATER M EROSION F	ANAGEMENT	ENT PROJECT	SEWA	OR CE CONS					ITRIENT FISH INS		VERTEBR	AMD_IF IF E_IF APPLICAB APPLICAB APPLICAB
WAYPOINTS Y X FEET DATE NOTES	pH COND		CORE SCORE	DEBRIS JAI	MS ATV IMPACTS		EROSION		JES	SITES	WETLANDS IMPAC	TSTION		ZONE	r NC	CE EN	IT RS CO	ER DNES	SS HABITAT COVER	LE LE LE
NFT2W5 40.63999 -80.18690 914 3/24/2008 LARGE TRIBUTARY FROM WEST.	7.56 420	28 6	20 FAIR										4	9	3 7	8	3 7	5	8 8	0 0 0
NFT2W6 40.64079 -80.18692 915 3/24/2008 SMALL STREAM FROM HEMLOCKS TO THE EAST	8.06 150	28 6	20 FAIR										4	9	3 7	8	3 7	5	8 8	0 0 0
NFT2W7 40.64114 -80.18707 926 3/24/2008 SEDIMENT DEPOSITS IN CHANNEL @ ATV CROSSING; BANK SLIDE/DEBRIS JAM		28 6	20 FAIR	x	x	х	x	-					4	9	3 7	8	3 7	5	8 8	0 0 0
NFT2W8 40.64503 -80.18676 938 3/24/2008 GULLY EROSION FROM FARM LANE INTO STREAM; LARGE TRIBUTARY FROM EAST	7.82 260	28 6	20 FAIR					x	х	х			4	9	3 7	8	3 7	5	8 8	0 0 0
NFT2W9 40.84665 -80.18874 957 3/24/2008 DEBRIS JAM @ INTERSECTION WITH OLD ROAD		28 6	20 FAIR	x									4	9	3 7	8	3 7	5	8 8	0 0 0
NFT3W1 40.65254 -80.19600 1023 3/24/2008 ATV TRAILS, 3D COURSE, RIGHT OF WAY, NEW BRIDGE WITH MUD PUSHED INTO STREAM		29 6	.30 FAIR		x	х							5	7	7 7	8	6 4	6	6 7	0 0 0
NFT3W2 40.65392 -80.19522 1019 3/24/2008 15" SPP FOR STREAM CROSSING		29 6	.30 FAIR										5	7	7 7	8	6 4	6	6 7	0 0 0
NF3W3 40.65446 -80.19561 1026 3/24/2008 WETLAND AREA; PIPES TO DRAIN WETLAND???		29 6	.30 FAIR								x		X <u>5</u>	7	7 7	8	6 4	6	6 7	0 0 0
NF14W1 40.63771 -80.17316 994 27/2008 START/NEAR MOUTH OF STREAM AT CROSSING UNDER MAIN ROAD	7.80 380	27 7	.90 GOOD										8	8	3 8	7	9 6	8	9 8	0 0 0
NFT4W2 40.63847 -80.17417 1053 2/7/2008 POSSIBLE COKE OVEN IN HILLSIDE ALONG STREAM		27 7	.90 GOOD										X <u>8</u>	8	3 8	7	9 6	8	9 8	0 0
NFT4W3 40.64244 -80.17649 1107 2/7/2008 SMALL TRIBUTARY FROM THE SOUTH	7.93 230	27 7	.90 GOOD										8	8	3 8	7	9 6	8	9 8	0 0 0
NF14W4 40.64423 -80.17617 1133 2/7/2008 FALLEN TREES ACROSS STREAM CHANNEL		27 7	.90 GOOD	x									8	8	8 8	7	9 6	8	9 8	0 0 0
NF14W5 40.64688 -80.17716 1087 2/7/2008 END/SMALL TRIBUTARY FROM THE NORTH	7.66 690	27 7	.90 GOOD										8	8	8 8	7	9 6	8	9 8	0 0 0
NFT5W1 40.64305 -80.16478 939 2/7/2008 START/SMALL CONCRETE STRUCTURE WITH DISCHARGE PIPE NEAR ROAD	7.65 480	26 7	.90 GOOD						x				8	9	7 7	9	8 7	7	8 9	0 0 0
NFT5W10 40.65497 -80.17084 1064 2/7/2008 CONFLUENCE WITH TRIBUTARY FROM THE NORTH	7.56 610	26 7	.90 GOOD										8	9	7 7	9	8 7	7	8 9	0 0 0
NF55W11 40.65856 -80.17337 1008 2/7/2008 END/STORMWATER OUTLET TO STREAM (15' SPP) NEAR CROSSING UNDER ROAD		26 7	.90 GOOD						х				8	9	7 7	9	8 7	7	8 9	0 0 0
NF75W2 40.84527 -80.16793 963 2/7/2008 BANK EROSION ~ 30 LONG		26 7	.90 GOOD				x			х			8	9	7 7	9	8 7	7	8 9	0 0 0
NF75W3 40.64600 -80.16834 971 2/7/2008 SMALL TRIBUTARY FROM HOLLOW/WETLAND/SOME BANK EROSION	7.34 410	26 7	.90 GOOD				x				x		8	9	7 7	9	8 7	7	8 9	0 0
NFT5W4 40.64837 -80.16915 997 2/7/2008 TRIBUTARY FLOWING IN FROM EAST/OPEN FIELD/LAWN AREA	7.49 1,360	26 7	.90 GOOD										8	9	7 7	9	8 7	7	8 9	0 0 0
NF55W5 40.65133 -80.16995 1020 2/7/2008 TRIBUTARY CASCADING DOWN HILL FROM WEST	7.59 60	26 7	.90 GOOD										8	9	7 7	9	8 7	7	8 9	0 0 0
NFT5W6         40.65255         -80.17057         1007         2/7/2008         SMALL TRIBUTARY FLOWING IN FROM THE EAST/BESIDE BIG HOMES	7.53 770	26 7	.90 GOOD										8	9	7 7	9	8 7	7	8 9	0 0 0
NFT5W7 40.65333 -80.17020 1023 2/7/2008 CONFLUENCE WITH TRIBUTARY FROM WEST AND OLD ROAD CROSSING/SEVERE EROSION AROUND 36" CONCRETE PIL	IPE (NOT LARGE ENOUGH FC	26 7	.90 GOOD			x	x						8	9	7 7	9	8 7	7	8 9	0 0 0
NFT5W8 40.65436 -80.17049 1064 2/7/2008 STORMWATER OUTLET		26 7	.90 GOOD						х				8	9	7 7	9	8 7	7	8 9	0 0
NF75W9 40.65456 -80.17059 1065 2/7/2008 ROCK FLOW STRUCTURE(S) IN STREAM BEHIND LOG HOUSE/SMALL TRIBUTARY FROM THE EAST	7.54 580	26 7	.90 GOOD										8	9	7 7	9	8 7	7	8 9	0 0 0
RR01 40.60719 -80.13312 878 4/24/2008 START OF RIPPLING RUN/CONFLUENCE WITH EAST FORK BIG SEWICKLEY CREEK		30 8	20 GOOD										7	8	9 9	9	8 8	8	8 8	0 0 0
R02 40.60532 -80.13203 586 4/24/2008 BANK EROSION/STORMWATER OUTLET		30 8	20 GOOD				x		х				7	8	9 9	9	8 8	8	8 8	0 0 0
RR03 40.60237 -80.13009 706 4/24/2008 PIPE/WATERFALL OUTLET	8.27 500	30 8	20 GOOD						x				7	8	9 9	9	8 8	8	8 8	0 0 0
RR04 40.60188 -80.12963 743 4/24/2008 TRIBUTARY ON LEFT GOING UPSTREAM/DEBRIS JAM	7.93 360	30 8	20 GOOD	x									7	8	9 9	9	8 8	8	8 8	0 0 0
RR05 40.60024 -80.12820 925 4/24/2008 TRIBUTARY ON RIGHT GOING UPSTREAM	8.11 480	30 8	20 GOOD										7	8	9 9	9	8 8	8	8 8	0 0
RR06 40.60014 -80.12773 821 4/24/2008 DEBRIS JAM		30 8	.20 GOOD	x									7	8	9 9	9	8 8	8	8 8	0 0 0
RR07 40.59910 -80.12460 867 4/24/2008 SLIGHT CHANGE IN CHANNEL CONDITIONS/MORE HOMEOWNERS/GRASS UP TO BANKS		30 8	20 GOOD										7	8	9 9	9	8 8	8	8 8	0 0 0
RR08 40.59915 -80.11881 957 4/24/2008 TRIBUTARY ON RIGHT GOING UPSTREAM		30 8	20 GOOD										7	8	9 9	9	8 8	8	8 8	0 0 0
RR09 40.60212 -80.11293 1000 4/24/2008 SECHLERS LAKE POND OUTLET		30 8	20 GOOD						х				7	8	9 9	9	8 8	8	8 8	o o o
RR10 40.60227 -80.10653 1097 4/24/2008 END OF RIPPLING RUN		30 8	20 GOOD										7	8	9 9	9	8 8	8	8 8	0 0 0
RR11 40.59891 -80.11857 962 5/1/2008 START OF 1ST SOUTH TRIBUTARY TO RIPPLING RUN		31 8	.40 GOOD										9	9	3 9	8	8 8	8	8 9	0 0 0
R12 40.59649 -80.11502 1024 5/1/2008 POINT WHERE LAND CHANGES FROM LANDOWNERS TO WOODS		31 8	40 GOOD										9	9	3 9	8	8 8	8	8 9	0 0 0
RR13 40.59163 -80.10851 1216 5/1/2008 END/HEADWATERS AT TOP OF RAVINE		31 8	40 GOOD										9	9	3 9	8	8 8	8	8 9	0 0 0
RR14 40.59974 -80.12813 922 5/1/2008 START OF 2ND SOUTH TRIBUTARY TO RIPPLING RUN		32 8	.50 GOOD										8	8	9 9	9	8 8	9	8 9	0 0 0
R15 40.59744 - 80.12868 953 5/1/2008 HOMEOWNERS BY STREAMYARDS TO STREAM EDGE		32 8	50 GOOD				x			х			8	8	9	9	8 8	9	8 9	0 0 0
R16 40.59195 -80.12576 1026 5/1/2008 END /HEADWATERS OF WEST FORK AT ROAD		32 8	.50 GOOD										8	8	9 9	9	8 8	9	8 9	0 0 0
R17 40.59031 -80.13538 1055 5/1/2008 END /HEADWATERS OF EAST FORK		32 8	50 GOOD										8	8	9 9	9	8 8	9	8 9	0 0 0

ATTACHMENT C: MACROINVERTEBRATE AND FISH SURVEYS



# **Big Sewickley Creek Biological Assessment**

July 24 & 25, 2008

Prepared by: Western Pennsylvania Conservancy Freshwater Conservation Program 246 South Walnut Street Blairsville, PA 15717 (724) 459-0953

Western Pennsylvania Conservancy



# Big Sewickley Creek Biological Assessment

# **Macroinvertebrate and Fish Sampling**

## Macroinvertebrate:

Macroinvertebrate surveys were conducted following the benthic macroinvertebrate protocol for single habitat streams, as described in EPA's Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. A sample area consisted of a 100 meter stream reach at sites previously selected by Blazosky & Associates. Two kicks were taken at each sample area using a kick net (500 micron screen). A single kick consisted of substrate disruption in front of the collection net (one square meter) for 60 seconds. Following sample collection, all specimens and sediment were transferred from the examined collection net into sample bottles and preserved with 95% alcohol. Preserved samples were delivered to the laboratory for processing and identification. Laboratory procedures followed EPA protocols. Samples were taken at nine sites within the Big Sewickley Creek watershed, site names, and descriptions are included in the individual analysis section (Page 5-20). A watershed map highlighting sample sites included with this document (Page 4). Macroinvertebrate samples were carefully examined and organisms were separated from the debris in the laboratory. The identified organisms were transferred to collection bottles and preserved with 70% alcohol. Organisms were identified to the family taxonomic level under a dissecting microscope. Quality control procedures included a qualified staff member sorting through a sub-section of the sample to check for missed organisms.

# Fish:

Fish surveys were conducted following the electrofishing protocol for single habitat streams described in *EPA's Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*. A Smith-Root LR-24 Electrofisher electrofishing unit was implemented to temporarily immobilize the fish for the purpose of identification. The sample area consisted of a 200 meter stream reach at sites previously selected by Blazosky & Associates. Following sample collection, fish were identified at the end of the reach or if there was no longer any room available in the bucket to continue the collection of specimens, which ever procedure was most appropriate. Specimens were identified by Mr. Gary Smith, Southwest Regional Habitat Biologist for the Pennsylvania Fish and Boat Commission. Surveys were conducted at three sites within the Big Sewickley Creek watershed, site names and descriptions are included in the individual analysis section. A watershed map highlighting sample sites follows on page four. Only one preserved sample was collected, Site 6:NFT2W1, as representatives of the southern red-belly dace (*Phoxinus erythrogaster*).

# Sample Period:

Water chemistry analysis, macroinvertebrate collection, and fish surveys were conducted over two days, July 24 and 25, 2008. Follow-up sampling should occur during a similar time of year, as to reproduce the most accurate sample that reflects a similar sample set.

#### **Data Analysis**

In addition to sampling the macroinvertebrates and conducting a fish survey, Western Pennsylvania Conservancy (WPC) also performed water chemistry analysis at all sampled sites. All water quality information can be found in Figure 26 (Page 21).

The following metrics were used to analyze the macroinvertebrate data for this study: (1) total number of taxa, (2) number of EPT taxa, (3) percent EPT, (4) percent Diptera, (5) Shannon Diversity Index (H), and (6) pollution tolerance index (PTI). Total number of taxa indicates the number of families present in the sample, and number of EPT taxa indicates the number of families of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) present in the sample. Percent EPT to percent Diptera ratio compares the number of mayflies, stoneflies, and caddisflies to the number of true flies (Diptera). Diptera organisms are generally more tolerant of pollution than EPT organisms. An abundance of Diptera organisms indicates poorer water quality. Diversity indices are mathematical measures of species diversity in a community. The Shannon Diversity Index provides information about species richness and also takes into account the relative abundances of different species. The higher the index value, the more diverse the community. The Pollution Tolerance Index (PTI) is based on the concept of indicator organisms and tolerance levels. Indicator organisms are those organisms sensitive to water quality changes and their presence or absence indicates the condition of the water in which they live. Pollution-intolerant organisms include mayflies, stoneflies, caddisflies, riffle beetles, and water pennies. Pollution-tolerant organisms include tubifex worms, midges, pouch snails, and leeches. Figure 31 includes all of the macroinvertebrate analysis and is located on page 25.

The Fish Index of Biotic Integrity (FIBI), is an index that measures the health of a stream based on multiple attributes of the resident fish assemblage. Each site was sampled and the score is based on its deviation from reference conditions and classified as "poor," "fair," "good," or "excellent." The FIBI calculates data relating to; (1) Total number of species found, (2) Number of benthic insectivorous species, (3) Number of salmonidae and centrachidae, (4) Proportion of pollution intolerant species, (5) Proportion of pollution tolerant species, (6) Proportion of generalists, (7) Proportion of insectivorous cyprinids, (8) Number of piscivorous species, (9) Number of individuals in the sample, and (10) Proportion of species with disease, excluding blackspot. The total FIBI analysis is included on in Figure 30 (Page 24). Section two of the FIBI, identifies benthic insectivores, meaning those fish species that are located in the lowest part of the water column and feed exclusively on aquatic insects. Section three refers to the amount of fish species found at the sampled site, such as; trout, salmon, sunfish, bass, and crappies. Section four identifies the percentage of pollution intolerant individuals such as; lamprey, cutlip minnows, southern redbelly dace, hognose suckers, trout, sculpin, and walleye. Section five identifies the percentage of pollution tolerant individuals such as; the american eel, fathead minnows, pickerels, muskellunge, pike, killifish, bluegill, and sunfish. Section six, refers to the percentage of fish species that feed on whatever may be available such as, algae and insects. Section seven identifies those fish that can survive in multiple habitats or will consume multiple food sources. These generalists species include; chubs, shiners, minnows, and daces. Section eight of the FIBI metric aids in calculating the percentage of fish species that primarily feed on other types of fish. And lastly, section ten takes into account the percentage of fish species that had a disease or disfigurement other than blackspot, which is actually a parasitism caused by a turbellarian flatworms.


# Big Sewickley Creek Biological Assessment Map

# Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 1: BSC 11-12 GPS: N 40.58128 W 80.21394

Site 1 is located a few blocks south of the Leet Township building and is adjacent to a recreational park. This site was only sampled for macroinvertebrates. The stream is approximately twenty feet in width and the substrate is primarily composed of gravel and sand.

Figure 1 exhibits the water chemistry analysis for this site. Site 1 had one of the four highest pH levels at 8.20 and all other measurable levels were relatively average. The water chemistry analysis summary can be found in Figure 26 (Page 21).



Figure 2 outlines the summary of the biotic metric; the analysis of the macroinvertebrates sampled. The Shannon Diversity Index (H) resulted in a score of 1.58649. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. The Pollution Tolerance Index (PTI) resulted in an "excellent" ranking.

Figure 1

#### Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.20	420	6.92	650	70.9	7	1.07	0.8

Figure 2

	· · · · ·
Richness	13
Evenness (E)	0.6.185
Shannon Diversity (H)	1.58649
Hilsenhoff (B)	4.83
Hilsenhoff Rank	Good
% Ephemeroptera	10.77
% Plecoptera	0
% Trichoptera	35
% EPT	45
% Chironomidae	39
# Intolerant Taxa(0,1,2)	0
PTI	26
PTI Rank	Excellent

# Big Sewickley Creek Biological Assessment (Macroinvertebrates and Fish) Site 2: BSC 13-14 GPS: N 40.58500 W 80.21097





Site 2 is located a few blocks south of the Leet Township building off of Neely Street, bordered by a residential area. This site was sampled for macroinvertebrates and a fish survey was also conducted. The stream is approximately twenty feet in width and the substrate is composed of cobble, gravel, sand, and some exposed bedrock.

Figure 3 (Page7) exhibits the water chemistry analysis. This site resulted in the highest phosphate level. Otherwise, the site ranked relatively average compared to other sites. The water chemistry analysis summary can be found in Figure 26 (Page 21).

The following Figures; 4 (Page 7), 5 and 6 (Page 8) outline summaries of biotic metrics, the analysis of the macroinvertebrates, abundance and the proportion of fish species sampled, and the Fish Index of Biotic Integrity (FIBI).

Figure 4 (Page 7) lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.45596 Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. The Pollution Tolerance Index (PTI) resulted in a "fair" ranking.

Site 2 is the first site where a fish survey was conducted. The data from the survey resulted in the highest count of species, 14 of the 20 species, found at the three sites. This site also resulted in the largest amount of individuals identified (491 of the 766). Thus, Site 2 composed 64% of the total individuals identified in the watershed. Six of the 14 species identified at Site 2 contained five or fewer individuals collected in the sample. This group consisted of 42.8% of all species found on site and 2.8% of all individuals on site. Eight of the 14 species collected included eight or greater individuals collected at Site 2. This group consisted of 57.1% of the species sampled on site and 97.4% of the individuals sampled at Site 2. Figure 5 (Page7) reflects the fish species and their abundance at this site.

It is important to note that some of the fish species were relatively atypical for the watershed. One of these atypical species is the rainbow trout (*Oncorhynchus mykiss*), which its presence would signify a spring stocked hatchery fish. Additionally, four other species that were surveyed in very low quantities and were atypical for this watershed were the; freshwater drum (*Aplodinotus grunniens*), golden redhorse (*Moxostoma erythrurum*), shorthead redhorse (*Moxostoma macrolepidotum*) and the walleye (*Sander vitreus*). The previously listed four species most likely migrated upstream from the nearby Ohio River.

Species that were predominately found at this site Included the central stoneroller (*Campostoma anomalum*) Illustration 1, which composed 40.3% of the individuals found at the site and 198 individuals. The second species was the rainbow darter (*Etheostoma caeruleum*), Illustration 2, which composed 54.17% of the sample and included 68 individuals.

Species composition and abundance is directly impacted by the variation and availability of habitat found at the sample site. The riffle zone found at this location was nearly balanced with the pool zone. The pool zone was also equally divided into a more shallow and a deeper section. This provided habitat niches for the variety of species surveyed. These sites were notably residential and lacked a riparian buffer, but did have tree canopy cover.

This site's FIBI (Fish Index of Biotic Integrity) resulted in a score of 42, which ranks the site as "good." Figure 6 showing this data is listed at the Site 2 summary (Page 8).

) Illustration 1 Central Stoneroller (Campostoma anomalum)



Illustration 2 Rainbow Darter (Etheostoma caeruleum)



Figure 3

#### Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.10	410	8.02	630	70.0	8	1.37	2.2

#### Figure 4

8	i i i i i i i i i i i i i i i i i i i		
Richness	11		
Evenness (E)	0.6072		
Shannon Diversity (H)	1.45596		
Hilsenhoff (B)	4.64		
Hilsenhoff Rank	Good		
% Ephemeroptera	16.66		
% Plecoptera	0		
% Trichoptera	48		
% EPT	65		
% Chironomidae	25		
# Intolerant Taxa(0,1,2)	1		
PTI	12		
PTI Rank	Fair		





Fish Index of Bio	Fish Index of Biotic Integrity (FIBI) for Big Sewickley Creek: BSC 13-14						
	Species Richness & Composition						
1	Total number of species found	5					
2	Number of benthic insectivorous species	5					
3	Number of trout and sunfish species	1					
4	Number of intolerant species	5					
5	Proportion of tolerant individuals	4.48%					
	Trophic Composition						
6	Proportion of generalists	4.48%					
7	Proportion of insectivorous cyprinids	41.95%					
8	Proportion as trout or piscivores	5.49%					
	Fish Abundance & Condition						
9	Number of individuals in the sample	491					
10	Proportion with disease (excluding blackspot)	0					
	Pollution Tolerance Index Results	42 Good					

# Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 3: BSCT1W 4-5 GPS: N 40.59972 W 80.20001

Site 3 is located near a State Game Lands, parallel to a gravel road, and located at a lower elevation from a sewage treatment facility. This site was only sampled for macroinvertebrates. The stream is approximately six feet in width and the substrate is composed of gravel and silt.

Figure 7 exhibits the water chemistry analysis. This site had one of the four highest pH levels at 8.20 and the highest turbidity level. However, this site



also had the lowest recorded water temperature at 65.6 degrees Fahrenheit. It must also be noted that this site was one of three sites with the lowest reading of nitrates. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 8 lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 0.41605. This site scored the lowest on the Shannon Diversity Index, showing this site had the lowest richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "poor" ranking.

#### Figure 7

#### Big Sewickley Creek Watershed: Site Specific Water Quality Data

F	'n	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.	20	460	8.40	720	65.6	31	0.15	0.0

Figure 8

Richness	11
Evenness (E)	0.1735
Shannon Diversity (H)	0.41605
Hilsenhoff (B)	4.00
Hilsenhoff Rank	Very Good
% Ephemeroptera	2.00
% Plecoptera	0
% Trichoptera	2
% EPT	4
% Chironomidae	1
# Intolerant Taxa(0,1,2)	0
PTI	10
PTI Rank	Poor

# *Big Sewickley Creek Biological Assessment (Macroinvertebrates and Fish)* Site 4: BSCT1E 3-4 GPS: N 40.59332 W 80.18881

Site 4 is located on Turkeyfoot Road through the intersection at Wine Concrete Products. The site is composed of a narrow stream with few pools and steep banks. This site was sampled for macroinvertebrates and the where the second fish survey was conducted. The stream is approximately four feet in width and the substrate is composed of cobble and gravel.

Figure 9 (Page11) exhibits the water chemistry analysis. This site demonstrated one of the four highest pH



levels at 8.20. Conversely, this site also resulted in one of the four lowest readings of turbidity. The water chemistry analysis summary can be found in Figure 26 (Page 21).

The following Figures; 10 (Page 11) and 11 and 12 (Page 12) outline summaries of biotic metrics; the analysis of the macroinvertebrates, abundance, and the proportion of fish species sampled, and the Fish Index of Biotic Integrity (FIBI).

Figure 10 (Page 11) lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.45037. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "good" ranking.

The second fish survey conducted at Site 4 resulted in the lowest amount of species found, two of the 20species identified within the watershed. Site 4 resulted in only 10% of total species assemblage found in the watershed. Also, The smallest quantities of individuals were surveyed at this site, which resulted in only 12% of the total sample (92 of the 766).

The only two species that were surveyed at this site were the blacknose dace (*Rhinichthys atratulus*), Illustration 3, and the creek chub (*Semotilus atromaculatus*), Illustration 4. These species were found in nearly equal quantities; creek chub (52.17% of the sample and 48 individuals) and the blacknose dace (47.82% of the sample and 44 individuals). Figure 11 (Page 12) reflects the fish species and their abundance at this site.

This site's habitat was relatively even with shallow riffles, with the exception of two small pools. This site was adjacent to a dirt and gravel road and within a forested area and had ample tree canopy cover.



Illustration 4 Creek Chub (Semotilus atromaculatus)



This site's FIBI (Fish Index of Biotic Integrity) resulted in a score of 28, which ranks the site as "poor." The table showing this data, Figure 12, can be found on (Page 11).

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.20	500	8.01	760	67.8	0	0.25	0.1

Big Sewickley Creek Watershed: Site Specific Water Quality Data

# Figure 10

Big Sewickley Creek Watershed Assessmer	nt: Macroinvertebrate Analysis

Richness	13
Evenness (E)	0.5655
Shannon Diversity (H)	1.45037
Hilsenhoff (B)	4.28
Hilsenhoff Rank	Very Good
% Ephemeroptera	3.65
% Plecoptera	2
% Trichoptera	5
% EPT	11
% Chironomidae	17
# Intolerant Taxa(0,1,2)	1
PTI	18
PTI Rank	Good





# Figure <u>12</u>

Fish Index of	Fish Index of Biotic Integrity (FIBI) for Big Sewickley Creek: BS CT1E 3-4						
	Species Richness & Composition						
1	Total number of species found	1					
2	Number of benthic insectivorous species	1					
3	Number of trout and sunfish species	1					
4	Number of intolerant species	1					
5	Proportion of tolerant individuals	0%					
	Trophic Composition						
6	Proportion of generalists	0%					
7	Proportion of insectivorous cyprinids	52.17%					
8	Proportion as trout or piscivores	0%					
	Fish Abundance & Condition						
9	Number of individuals in the sample	92					
10	Proportion with disease (excluding blackspot)	0					
	Pollution Tolerance Index Results	28 Poor					

## Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 5: BSC 38 GPS: N 40.60052 W 80.18775



Site 5 is located upstream of Hanson and a sewage treatment facility. This site was only sampled for macroinvertebrates. The stream is approximately 35 feet in width and the substrate is composed of cobbles, boulders, and gravel.

Figure 13 (Page 14) exhibits the water chemistry analysis. This site had one of the four highest pH levels at 8.20. Conversely, this site demonstrated the highest dissolved oxygen, one of the four lowest turbidity readings, and one of the three lowest nitrate readings. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 14 (Page14) lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 0.41605. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "fair" ranking. Figure 14 lists details the macroinvertebrate assessment (Page 14).

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.20	410	9.04	630	71.4	0	0.38	0.0

#### **Big Sewickley Creek Watershed: Site Specific Water Quality Data**

### Figure 14

Richness	12
Evenness (E)	0.7
Shannon Diversity (H)	0.41605
Hilsenhoff (B)	4.083
Hilsenhoff Rank	Very Good
% Ephemeroptera	6.00
% Plecoptera	2
% Trichoptera	56
% EPT	64
% Chironomidae	25
# Intolerant Taxa(0,1,2)	3
PTI	15
PTI Rank	Fair

# Big Sewickley Creek Biological Assessment (Macroinvertebrates and Fish)

<u>Site 6: NFT2W1</u> GPS: N 40.63084 W 80.12098





Site 6 is located off the Hoeing Road, through an open grassy field which is adjacent to a home. The stream is narrow and well vegetated. This site was sampled for macroinvertebrates and the third and final fish survey was conducted. The stream is approximately six and a half feet in width and the substrate is composed of gravel and cobble.

Figure 15 (Page16) exhibits the water chemistry analysis. This site demonstrated one of the two lowest pH levels at 7.80, one of the two lowest total dissolved solids (TDS) levels at 320ppm, and did not register any phosphates or nitrates. However, this site also had the lowest dissolved oxygen and the highest water temperature at 74.5 degrees Fahrenheit. Site 6 possessed the best water quality readings overall, of the nine sampled sites in the Big Sewickley Watershed assessment. The water chemistry analysis summary can be found in Figure 26 (Page 21).

The following Figures; 16 (Page 16), 17 and 18(Page 17) outline summaries of biotic metrics; the analysis of the macroinvertebrates, abundance and the proportion of fish species sampled, and the Fish Index of Biotic Integrity (FIBI).

Figure 16 (Page16) lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 2.07291. This site scored the highest on the Shannon Diversity Index, showing this site had the highest richness and relative abundance of macroinvertebrates. Pollution Tolerance Index (PTI) resulted in a "good" ranking.

The data from the Site 6 survey resulted in the neither the highest nor the lowest count of species for the three fish survey sites. This site yielded 11 of the 20 species found in the watershed. Site 6 composed 23.89% of total sampled individuals (183 of the 766). Five of the 14 species identified included five or less individuals collected in the sample, 25% of the total species found, and 1.8% of all the individuals surveyed. Six of the 14 species identified comprised six or greater individuals collected, 22% of all of the species sampled, and 22% of all the individuals surveyed. Figure 17 on (Page 17) reflects the fish species and their abundance at this site.

Chart 1 Pennsylvania Range of the Southern Redbelly Dace

It is important to note that one atypical fish species, the southern redbelly dace (*Phoxinus erythrogaster*), was identified at this site, Illustration 5. This is an atypical sampling since this species is found in low levels of abundance throughout the state. The southern redbelly dace is a temperate freshwater fish found in spring-fed headwater creeks. Southern redbelly daces are found throughout North America, but are found in isolated communities in Pennsylvania, see Chart 1. Current records show southern redbelly daces occurring in three Pennsylvania counties.

This species is listed as threatened, through the Pennsylvania Natural Heritage Index and is considered "Critically Imperiled" on a national level. A sample specimen was collected by Mr. Gary Smith as a representative species.

The species that were predominately found at this site were the creek chub (*Semotilus atromaculatus*), see Illustration 4 (Page 10), which composed 22.9% of the individuals found at the site and 42 individuals. The second species was the mottled sculpin (*Cottus bairdi*), Illustration 5. Mottled sculpins composed 51.36% of the sample and contained individuals and generated 74.3% of the total sample.

The habitat at this site was composed primarily riffle zones and a few pools. This site had a well defined riparian vegetated buffer next to an open grassy field adjacent to a home. However, this site was located downstream of a housing development. This site's FIBI (Fish Index of Biotic Integrity) resulted in a score of 35, which ranks the site as "fair." The Figure showing this data can be found on page 16.

Illustration 6 Mottled Sculpin (Cottus bairdi)



#### Figure 15

### Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	(	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
7.80		320	6.82	480	74.5	16	0	0.0

#### Figure 16

	<i></i>
Richness	17
Evenness (E)	0.7316
Shannon Diversity (H)	2.07291
Hilsenhoff (B)	3.73
Hilsenhoff Rank	Very Good
% Ephemeroptera	18.00
% Plecoptera	23
% Trichoptera	19
% EPT	60
% Chironomidae	27
# Intolerant Taxa(0,1,2)	4
PTI	18
PTI Rank	Good





Illustration 5 Southern Redbelly Dace (Phoxinus erythrogaster) Photo: WPC Field Survey





Fish Index of	Fish Index of Biotic Integrity (FIBI) for Big Sewickley Creek: NFT2W 1							
	Species Richness & Composition							
1	Total number of species found	3						
2	Number of benthic insectivorous species	5						
3	Number of trout and sunfish species	1						
4	Number of intolerant species	5						
5	Proportion of tolerant individuals	3.82%						
	Trophic Composition							
6	Proportion of generalists	3.82%						
7	Proportion of insectivorous cyprinids	24.59%						
8	Proportion as trout or piscivores	0%						
	Fish Abundance & Condition							
9	Number of individuals in the sample	183						
10	Proportion with disease (excluding blackspot)	0						
	Pollution Tolerance Index Results	35 Fair						

# Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 7: BSCT3E3 GPS: N 40.62559 W 80.10851

Site 7 is located north off Markman Park Road and was accessed through trails within a State Game Land. This site was only sampled for macroinvertebrates. The stream is approximately ten feet in width and the substrate is composed of silt and gravel.

Figure 19 exhibits the water chemistry analysis. This site had the lowest level of conductivity and one of the four lowest levels of turbidity. The water chemistry analysis summary can be found in Figure 26 (Page 21).



Figure 20 lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.92131. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "fair" ranking.

Figure 19

#### Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.00	400	8.10	610	66.4	0	0.04	0.9

Figure 20

Richness	20
Evenness (E)	0.6414
Shannon Diversity (H)	1.92131
Hilsenhoff (B)	5.00
Hilsenhoff Rank	Good
% Ephemeroptera	1.33
% Plecoptera	1
% Trichoptera	7
% EPT	9
% Chironomidae	18
# Intolerant Taxa(0,1,2)	3
PTI	17
PTI Rank	Fair

# Big Sewickley Creek Biological Assessment (Macroinvertebrates) Site 8: EF 29-30 GPS: N 40.62559 W 80.10851



Site 8 is located adjacent to a State Game Land's access area and is parallel to Interstate 79. This site was only sampled for macroinvertebrates. The stream is approximately eight feet in width and the substrate is composed of cobble, gravel, and silt.

Figure 21 exhibits the water chemistry analysis. This site had one of the two lowest pH levels of 7.80. Conversely, this site also has the highest levels of; total dissolved solids, conductivity, and nitrates. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 22 lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.14577. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a ranking of "fair."

#### Figure 21

#### Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
7.80	690	7.95	1090	71.0	7	0.12	3.3

Figure 22

	1.2001 0111 01 00 01 000 1 21101 9 8
Richness	14
Evenness (E)	0.4342
Shannon Diversity (H)	1.14577
Hilsenhoff (B)	5.56
Hilsenhoff Rank	Fair
% Ephemeroptera	2
% Plecoptera	0
% Trichoptera	15
% EPT	17
% Chironomidae	71
# Intolerant Taxa(0,1,2)	1
PTI	17
PTI Rank	Fair

# Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 9: BSC 70 GPS: N 40.63406 W 80.18188



Site 9 is located prior to the bridge on Warrendale-Bayne Road, through an open weedy field. The stream consisted of mostly riffles and some pools, adjacent to a few residences. This site was only sampled for macroinvertebrates. The stream is approximately eight feet in width and the substrate is composed of gravel and silt.

Figure 23 exhibits the water chemistry analysis. This site had one of the two lowest recorded levels for total dissolved solids (TDS) and one of the four lowest turbidity levels. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 24 lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.57764. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "fair" ranking.

Figure 23

#### Big Sewickley Creek Watershed: Site Specific Water Quality Data

	Ph	TDS	DO (ma/L)	Conductivity (uS)	Temp	Turbidity	Phos (Ma/L)	Nitra
_	rn	(ppm)	DO (mg/L)	Conductivity (uS)	( <b>F</b> )	(Fau)	(Mg/L)	(Mg/L)
	7.90	320	8.26	490	67.4	0	0.03	1.7

Figure 24

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Richness	10
Evenness (E)	0.6852
Shannon Diversity (H)	1.57764
Hilsenhoff (B)	5.41
Hilsenhoff Rank	Good
% Ephemeroptera	0.66
% Plecoptera	0
% Trichoptera	26
% EPT	27
% Chironomidae	45
# Intolerant Taxa(0,1,2)	1
PTI	11
PTI Rank	Fair

# **Big Sewickley Creek Biological Assessment**

# **Conclusion**

The review of all biological assessment metrics showed the following ranking of the sites; 6, 4, 1, 7, 8, 2, 5, 9, and 3. The adjacent chart outlines the preceding ranking.

Macroinvertebrate sampling conducted at all nine sites within the Big Sewickley watershed resulted in an average Pollution Tolerance Index (PTI) rank of 15.11, which ranks the sites sampled within the watershed as a "fair."

The electrofishing survey of three, of the nine sites, within the Big Sewickley watershed resulted in the identification of 20 separate species of fish, with 766 individuals being sampled. Overall, the



Fish Index of Biotic Integrity (FIBI) score is a 39, which ranks the watershed as a "good." Figure 30 lists all FIBI data pertaining to the three sample sites (Page 24).

The water chemistry analysis showed a somewhat similar ranking as the biological assessment ranking as; Site 6, 5, 9, 7, 3, 4, 1, 2, and 8.

Big S	Big Sewickley Creek Watershed Assessment: Water Chemistry Analysis									
Site #	Site ID	Ph	TDS (ppm)	DO (mg/L)	Conduct (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)	
1	BSC11- 12	8.2	420	6.92	650	70.9	7	1.07	0.8	
2	BSC 13-14	8.1	410	8.02	630	70.0	8	1.37	2.2	
3	BSCT1W 4-5	8.2	460	8.4	720	65.6	31	0.15	0	
4	BSCT1E 3-4	8.2	500	8.01	760	67.8	0	0.25	0.1	
5	<b>BSC 38</b>	8.2	410	9.04	630	71.4	0	0.38	0	
6	NFT2W1	7.8	320	6.82	480	74.5	16	0.00	0	
7	BSCT3E3	8.0	400	8.1	610	66.4	0	0.04	0.9	
8	EF 29-30	7.8	690	7.95	1090	71.0	7	0.12	3.3	
9	<b>BSC 70</b>	7.9	320	8.26	490	67.4	0	0.03	1.7	

Figure 26

All three metrics of assessment resulted in the highest ranking within the watershed for Site 6 NFT2W1. This may be due to the heavily vegetated riparian buffer and a reduced residential impact. The other sites may have ranked lower to due to; reduced riparian buffers, roadway runoff, stormwater management issues, or residential impacts.



Big Sewickley Watershed: Majority (87%) of Fish Species Surveye	Big	Sewickley	Watershed:	Majority (87%	6) of Fish S	Species Surveyed
---	-----	-----------	------------	---------------	--------------	------------------

Fish Species	Percentage Composition
Central Stoneroller (Catostomus anomalum)	27%
Mottled Sculpin (Cottus bairdi)	18%
Creek Chub (Semotilus atromaculatus)	12%
Rainbow Darter (Etheostoma caeruleum)	9%
Blacknose Dace (Rhinichthys atratulus)	7%
Green-Sided Darter (Etheostoma blennioides)	7%
Northern Hognose Sucker (Hypentelium nigicans)	7%

Species	Scientific Name	Total Found					
Blacknose Dace	Rhinichthys atratulus	55					
Bluntnose Minnow	Pimephales notatus	2					
Central Stoneroller	Campostoma anomalum	203					
Creek Chub	Semotilus atromaculatus	90					
Freshwater Drum	Aplodinotus grunniens	1					
Golden Redhorse	Moxostoma erythrurum	4					
Green-Sided Darter	Etheostoma blennioides	56					
Johnny Darter	Etheostoma nigrum	2					
Logperch	Percina caprodes	1					
Longnose Dace	Rhinichthys cataractae	9					
Mottled Sculpin	Cottus bairdi	140					
Northern Hognose Sucker	Hypentelium nigricans	57					
Rainbow Darter	Etheostoma caeruleum	68					
Rainbow Trout	Oncorhynchus mykiss	3					
Red-Sided Dace	Clintostomus elongatus	3					
Shorthead Redhorse	Moxostoma macrolepidotum	4					
Silverjaw Minnow	Ericymba buccata	1					
Small Mouth Bass	Micropterus dolomieui	22					
Southern Redbelly Dace	Phoxinus erythrogaster	15					
Walleye	Sander vitreus	1					
White Sucker	Catostomus commersoni	29					
Total Individuals Iden	Total Individuals Identified During Survey						

# Total Fish Species Surveyed at 3 Sites in Big Sewickley Creek Watershed

FIBI Data: Individual Sites & Big Sewickley Creek Total Data

	Site 1 BSC13-14	Site2 BSCT 1E 3-4	Site 3 NFT 2W1	BS WS Total
Species Richness & Composition				
Total number of species found	5	1	3	5
Number of benthic insectivorous species	5	1	5	5
Number of trout and sunfish species	1	1	1	1
Number of intolerant species	5	1	5	5
Proportion of tolerant individuals	5	5	5	5
Trophic Composition				
Proportion of generalists	5	5	5	5
Proportion of insectivorous cyprinids	3	5	3	0
Proportion as trout or piscivores	3	1	1	3
Fish Abundance & Condition				
Number of individuals in the sample	5	3	3	5
Proportion with disease (excluding blackspot)	5	5	5	5
IBI Score	42	28	35	39
	Good	Poor	Fair	Good

# Condition Categories for FIBI Classifications

Excellent	45-50	Comparable to the best situations with minimal human disturbance; all regionally
		expected species for the habitat and the stream size; most intolerant forms are present
		and there is a balanced trophic structure
Good	37-44	Species richness below expectation, especially due to the loss of some tolerant species;
		some species present with less than optimal abundances or size distributions; trophic
		structure show some signs of stress (increasing frequency of generalists and tolerant species
Fair	29-36	Signs of additional deterioration include fewer species, loss of most tolerant species,
		highly skewed trophic structure (high frequency of generalists and tolerant species);
		older age classes of trout and/or top carnivores may be rare
Poor	10-28	Low species richness, dominated by generalists and tolerant species, few (if any) trout or
		top carnivores, individuals may show signs of disease or parasites and the site may
		have an overall low abundance of fish.

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis										
Site ID	Richness	Evenness (E)	Shannon Diversity (H)	% EPT	PTI	PTI Rank				
BSC11- 12	12	0.6221	1.5459	46	26	Excellent				
BSC 13-14	10	0.6141	1.4141	66	12	Fair				
BSCT1W 4-5	9	0.1626	0.3572	4	10	Poor				
BSCT1E 3-4	12	0.5766	1.4328	11	18	Good				
<b>BSC 38</b>	12	0.7000	1.7396	64	15	Fair				
NFT2W1	15	0.7536	2.0408	61	18	Good				
BSCT3E3	17	0.6164	1.7463	12	17	Fair				
EF 29-30	13	0.4395	1.1271	17	17	Fair				
<b>BSC 70</b>	10	0.6852	1.5776	27	11	Poor				

Big Sewickley Creek Watershed Assessment: Site Locations and Descriptions

DI	g Sewickley Cre	ek Watershed As	ssessment: 5	ne Location	s and Description	0115	
						Average	
						Stream	
		Site			Substrate	Channel	
	SITE ID	Description	GPS (N)	GPS (W)	Туре	Width	Site Comments
				````	~ ~		Sewer lines running
							parallel to the stream
							bank. Little riparian
							buffer. Mostly a
		Adjacent to a					residential area. Primarily
		recreational					a riffle zone little to no
1	BSC11- 12	park, high banks	40.58128	80.21394	Gravel & Sand	20'	pools.
-	bberr 12	park, ingli balks	40.30120	00.21374	Graver & Salid	20	Some riparian buffering,
							primarily a residential
		Near the Leet			Cobble, gravel,		area. 2-3 very deep pools
		Township			some exposed		
2	BSC 13-14	-	40.58500	80.21097	bedrock	20'	followed by a section of riffles.
4	DSC 13-14	building.	40.30300	00.21097	Deurock	20	Near the right-of-way of a
		Parallel to					
							sewage distribution
		narrow gravel					facility, located above the
		road, tributary					site. Very narrow stream.
1	DCCT1W 4 F	to Big	40 50072	80 20001	Crowal & Cili	C	Near State Game Lands.
3	BSCT1W 4-5	Sewickley	40.59972	80.20001	Gravel & Silt	6'	Noticeable erosion.
		Right turn onto					
		Turkey foot Rd,					
		below Beadnit					Highly eroded left stream
		Rd intersection					bank. Deep channel. 1-2
		at Wine			~		small pools. Some
		Concrete			Cobble &		exposed bedrock in a few
4	BSCT1E 3-4	products.	40.59332	80.18881	Gravel	4'	locations.
							Brown algae over large
		Upstream of					percentage of stream
		Hanson & of the					bottom. Relatively
		Sewage			Cobble &		shallow stream with
5	BSC 38	Treatment Plant	40.60052	80.18775	Boulders	35'	pockets of pools.
							Narrow stream pear a
							Narrow stream near a
		Some					home. Well vegetated
6	NETOW1		10 62 001	<u>80 12009</u>	Cilt & Cabble	6 51	buffer. Primarily riffles,
6	NFT2W1	residences.	40.63.084	80.12098	Silt & Cobble	6.5'	with a few pools.
							Accessed through multiple
							trails in State Game
							Lands. Narrow headwater
7	BSCT3E3	Just below I-79	40.62559	80.10851	Silt & Gravel	10'	stream.
<u> </u>	2201020			00110001	Shi te Giurei	- •	
							Located outside housing
							developments in a State
		150' prior to					Game Lands. Near a road
8	EF 29-30	Markman Road	40.62277	80.13931	Cobble	8'	with a riparian buffer.
							Through overgrown
							roadside area of teasel &
							thistle. Near a home on
							right stream bank. Some
		Warrendale-					exposed bedrock
9	<b>BSC 70</b>	Bayne Road	40.63406	80.18188	Gravel & Silt	8'	downstream.
	25010	Duyne Roud	10.05100	00.10100	Sharer & Shit	5	do misticulli.

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# ATTACHMENT D: BACTERIA SAMPLING

#### BIG SEWICKLEY CREEK WATERSHED ASSESSMENT, RESTORATION AND PROTECTION PLAN

<u>Attachment D</u> Bacteria Sampling

	<u> </u>			Fiel	d Test Results	1		Lab Test Results <sup>2</sup>
Sample ID	Sample Date	Sample Time	рН	Conductivity (µS/cm)	Temperature (°C)	Dissolved Oxygen	Salinity	Bacteria
BSC01F	6/12/2008	10:30	7.73	550	22.11	7.17	0.26	580
BSC02F	6/12/2008	10:55	7.70	531	22.56	6.80	0.26	3,600
BSC03F	6/12/2008	11:09	7.70	525	19.39	7.70	0.26	63
BSC04F	6/12/2008	11:25	7.64	470	23.47	6.98	0.23	4,200
BSC05F	6/12/2008	11:35	7.51	462	21.14	7.07	0.22	320
BSC06F	6/12/2008	11:45	7.40	587	20.73	8.50	0.28	350
BSC07F	6/12/2008	12:00	7.65	517	21.10	9.20	0.25	622
BSC08F	6/12/2008	12:10	7.55	635	19.50	6.70	0.31	56,000
NF01F	6/12/2008	13:55	7.67	477	23.10	7.98	0.23	108
CH01F	6/12/2008	13:45	7.57	507	20.20	8.02	0.25	36
BSC09F	6/12/2008	13:30	7.51	622	20.10	8.72	0.30	72
EF01F	6/12/2008	13:25	7.55	475	21.10	9.41	0.23	440

<u> </u>				Fiel	d Test Results	1		Lab Test Results <sup>2</sup>
Sample ID	Sample Date	Sample Time	рН	Conductivity (µS/cm)	Temperature (°C)	Dissolved Oxygen	Salinity	Bacteria
NF01AF	6/18/2008	12:00	7.37	553	23.24	4.71	NR	1,216
NF02F	6/18/2008	12:05	7.57	167	21.48	4.80	NR	240
NF03F	6/18/2008	12:10	7.30	372	20.74	4.87	NR	540
NF04F	6/18/2008	12:20	7.27	394	20.46	4.32	NR	63
NF05F	6/18/2008	12:25	7.47	613	16.53	5.44	NR	34,000
BSCT2F	6/18/2008	12:45	7.58	571	15.98	5.67	NR	240
BSC88F	6/18/2008	13:15	7.60	336	15.32	5.74	NR	490
BSC82F	6/18/2008	13:25	7.21	318	17.95	4.96	NR	400
EF01AF	6/18/2008	13:35	7.46	382	17.93	5.19	NR	380
EF28F	6/18/2008	13:45	7.26	608	17.42	5.34	NR	1,153
EF07F	6/18/2008	13:55	7.35	537	15.68	5.43	NR	540
RR01F	6/18/2008	14:00	7.37	557	16.73	5.01	NR	320
RR11F	6/18/2008	14:05	7.39	640	16.49	5.04	NR	2,200
BSC02F	1/6/2009	10:23	8.30	692	0.30		298.00	189
BSC04F	1/6/2009	10:35	8.16	699	0.40		297.00	198
BSC08F	1/6/2009	10:45	8.40	825	0.90		357.00	72
SHAF1F	1/6/2009	10:54	8.26	804	1.60		352.00	560
RR11F	1/6/2009	11:45	8.17	953	0.60		417.00	76,000
NF05F	1/6/2009	12:00	8.52	903	0.60		386.00	99

\* Total <sup>1</sup> measured in mg/L <sup>2</sup> measured in CFU/100 mL Fecal Coliform Bacteria samples analyzed by Environmental Service Laboratories, Inc. of Indiana, PA ND = Non Detect; TNTC = Too Numerous To Count

# ATTACHMENT E: VISUAL ASSESSMENT FIELD SHEETS

# **Big Sewickley Creek Watershed Visual Assessment**

Evaluator	s' Name	S										Dat	e:			
Sub-Wate	rshed		Stream Section Name							ne						
Stream Name Reference Section																
Weather C	Condition	ns To	day						_ Pas	t 2-5	Days					
Active Ch	annel W	idth:	feet													
				LA		JSE W	VITHIN	N DRA	INAG	iE (%)	):					
Grazing Pa	asture			(	Grass	sy Fiel	d					Ro	w Cr	ops		
Forest					Resid	lential						Ind	ustria	al		
Commerci	al				Abano	doned	l Mine	Lands	6			Oth	ner			
	-i		i-			1		ATE (	%):			i				
Boulder			Cobble				avel			Si					lud	
	DESCR	IBE T	HE LAND	US	E OF	THE	AREA	THA	T THE	STR	EAM	FLO	WS 1	HRO	JGH:	
					G	PS PC	DINTS	6 / PHO	отоѕ	:						
Waypoint	Photo	Des	cription												pН	Cond.
-			-													
																_
																_
																_
																-
																_
																-
																+

Invasive plants present: Yes / No	Japanese Knotweed Garlic mustard Purple loosestrife Other
Trash / Litter: Yes / No	
Floodplain wetlands: Yes / No	If so, approximate size: Length / Width feet
Flooded areas: Yes / No (Wetland	or other)
Notes:	

Parameter	Score	Explanation of Score Given
Channel condition		
Riparian zone		
Bank stability		
Water appearance		
Nutrient enrichment		
Fish barriers		
In-stream fish cover		
Embeddedness		
Invertebrate habitat		
Canopy Cover		
AMD (if applicable)		
Sewage (if applicable)		
Manure presence (if applicable)		
TOTAL SCORE (Add all scores and divide by number of scores given)		< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

# **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition										
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	with signifi of channel Any dikes set back to	eration, but cant recovery and banks. or levies are provide an adequate	the reach and/or ch Excess <b>a</b> braided c	nannel; <50% of with riprap annelization. <b>ggradation</b> ; hannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.					
10 9 8	7 6	5 4	3	2	1					

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

**Keys:** look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

	_	Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	5 4	3 2	1

**Keys:** Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability										
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).								
10 9 8	7 6 5 4	3 2	1								

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		Wa	ater Ap	pearance		
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasiona objects vis 1.5 to 3 ft; slightly gre sheen on	ible at de may hav en color	epth ve ; no oil	Considerable cl most of time; ok visible to depth ft; slow sections appear pea-gre rocks or subme objects covered heavy green or green film. Or Moderate odor ammonia or roth	ojects 0.5 to 1.5 s may en; bottom rged I with olive-	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	7 6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

Nutrient Enrichment								
Clear water along entire reach; diverse aquatic plant community <b>little algal</b> growth present.	Fairly clear or slightly greenish water along entire reach; <b>moderate</b> <b>algal growth</b> on stream substrates.	Greenish water along entire reach; <b>abundant</b> <b>algal growth</b> , especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.					
10 9 8	7 6 5 4	3 2	1					

**Keys:** Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

	Fish Barriers								
No barriers		witho	ement v	ater inhibit vithin the	Drop stru culverts, diversior drop) wit reach.	dams or is (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

	Instream Fish Cover								
>7 cover t available	types		7 cover lable	types	4 to 5 co available	over types	2 to 3 co available		None to 1 cover type available
10 9 8 7 6 5 4 3 2 1						1			

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

# Stream Section Name: \_\_\_\_\_

Date: \_\_\_\_\_

	Embeddedness							
Gravel or cobble particles are <20% embedded.	Gravel particle 30% e	es are 2	20 to	Gravel or particles 40% emb	are 30 to	Gravel or particles embedde	are >40%	Completely embedded.
10 9	8	7	6	5	4	3	2	1

**Keys**: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.							
10 9 8	7 6 5 4	3 2	1							

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Canopy Cover Key: This pertains to waterways where channel is 50 feet wide or less. Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>	20 to 50% shaded.	<20% of water surface in reach shaded.						
10 9 8	7 6 5 4	3 2	1						

	Abandoned Mine Drainage (if applicable)								
(Intentionally blank)		f iron staining. Or iron precipitate.	muddy or	0	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.				
	5	4	3	2	1				

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

	Sewage (if applicable)								
(Intentionally blank)		odor, excess h and siltation.	Noticeable plant growt	odor, excess h.	Visible pipe with effluent, heavy odor.				
			ŀ	And					
				ble pipe and m substrate.					
	5	4	3	2	1				

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)						
(Intentionally blank)	ntionally blank) Evidence of livestock access to riparian zone.		nure in e storage ed on the	Extensive amount of manure on banks or in stream. Or		
				Untreated human waste discharge pipes present.		
	5 4	3	2	1		

# **NOTES**

Big Sewickley Creek Watershed Visual Assessment								
Evaluators' Name	sDate: DATSCStream Section NameBSCS	29/0	7					
Sub-Watershed	UNT to BSC Stream Section Name BSCT1E	L → 8						
	<pre></pre>							
Weather Conditions Today partly sunny, ~75°F Past 2-5 Days scattered T-storms								
Active Channel Width: feet								
LAND USE WITHIN DRAINAGE (%):								
Grazing Pasture	Grassy Field Row Crops							
Forest	Residential Industrial							
Commercial	Abandoned Mine Lands Other							
	SUBSTRATE (%):							
Boulder	Cobble Gravel Silt Mi							
DESCR	IBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROU	GH:						
· · · · · · · · · · · · · · · · · · ·	•							
· · · · · · · · · · · · · · · · · · ·	•							
	GPS POINTS / PHOTOS:							
Waypoint Photo	Description	pН	Cond.					
BSCT1E1 1	int. of BSC Rd. and Turtay Foot Rd.	7.58	770					
T1E2	strong ninger under entrare / working lot for Soundelay Count							
T1E3 Q 3	old tark used for dribeway X-ing							
T1E4 4-6	nice shot upstream in woods. erorian/sedm. from Bendvell Drive.							
7	s.w. outlet pipe sticking out too far.							
TLES	small snake - fish	7.54	770					
T1E6 8-9	road X-Ing under Sevin Rd. @ int. w/ Turky fact Rd.							
and the second s		7.59	660					
<u>T1E7</u>		7.64	810					
T.1 E8	11 11 11 11 11 the north K crossian from storm outlet	7.61	700					
	K Cristian (the start out of the							
			-					
	· · · · · · · · · · · · · · · · · · ·							
	· · ·		-					

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Invasive plants present: Yes / No	🗖 Japanese Knotweed 🗇 Garlic mustard 🗇 Purple loosestrife 🗇 Other
Trash / Litter: Yes / No	
Floodplain wetlands: Yes / No	If so, approximate size: Length / Width feet
Flooded areas: Yes / No (Wetland	l or other)
Notes:	

Big Sewickley Creek Visual Assessment

Stream Section Name: \_\_\_\_ Date: \_\_\_

BCSTIEI-8 6129/07

Parameter	Score	Explanation of Score Given
Channel condition	8	Some culverts
Riparian zone	9	By Road but few houses
Bank stability	10	Lots of vegetation
Water appearance	10	Clear
Nutrient enrichment	10	Little to no algare
Fish barriers	5	Culverts above channel impedies fish passage Overhead vege but not many pools or large rocks
In-stream fish cover	6	Overhead regi but not many pools or large rocks
Embeddedness	0	
Invertebrate habitat	\$	
Canopy Cover	10	
AMD (if applicable)	N/A	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	86/10 <u>8.40</u>	< $6.0$ = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT
Stream Section Name: Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	· · ·					C	hanne	el Conditi	ion	
structo evider Cuttin	al channel; no ures, dikes. N nce of down- g or excessiv l cutting.	lo		chan with of ch Any set b acce	signific annel dikes c ack to	eration, cant rec and bai or levies provide in adeq	overy nks. are	the reach and/or ch Excess a braided c	hannel; <50% of n with riprap nannelization. a <b>ggradation</b> ; channel. Dikes or estrict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	18	$\mathcal{V}$	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions. Culverts

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	1

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		W	ater Ap	pearance	· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasion objects v 1.5 to 3 ft slightly gi sheen on	isible at c t; may ha reen colo	lepth ve r; no oil	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive- green film. Or	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
				Moderate odor of ammonia or rotten eggs.	Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	76	5	4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichmen	t	
reac com	ar water alon h; diverse ac munity little wth present.	uatic plant algal	gree enti alga	ly clear enish wa re react al grow strates.	ater alo n; mode	ng erate	algal grow	vater along h; abundant /th, especially mer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10/)	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fi	sh Barriers			
No barriers.		witho			culve diver	structures, erts, dams or sions (<1ft within the n.	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	(5	) 4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

						Instream F	ish Cov	er		
>7 cover types available		o 7 cov ailable	er ty	pes		4 to 5 cove available	er types	2 to 3 co available	ver types	None to 1 cover type available
10 9	8	X	$\mathcal{V}$	6	$\sum$	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble riffles, undercut (banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

٤.,

Stream Section Name: Date:

65CTIET - 8 6129/07

		Embeddedness		
Gravel or cobble particles are <20% embsdded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
(10) 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

			_		Insec	t/invertel	orate Ha	bitat	
availab stage to coloniz	t 5 types o le. Habitat o allow full ation (woo s not fresh	is at a insect dy debris	Sor exis tree hab	ne pote sts, suc s, whic itat, bu	s of hal ntial ha h as ov h will p t have r e strean	ibitat erhanging rovide not yet	The sub disturbe removed velocitie	pes of habitat. strate is often d, covered, or d by high stream s and scour or by nt deposition.	None to 1 type of habitat.
10	9	(8)	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble) boulders, coarse gravel, other:

	-	Key: Th	is perta	ains to	water	Canopy ways whe Coldwate	ere channe	el is 50 feet wi	de or less.
shaded 3 miles	>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			in rea	led in r Or ach, bu to 3 m			% shaded.	<20% of water surface in reach shaded.
10)	0 9 8 7 6 5 4							2	1

	Abandoned Mine Dra	ainage (if applicable)	
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
······································	5 4	3 2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Big Sewickley Creek Visual Assessment Stream Section Name: <u>BSCNE1 - 8</u> Date: <u>U79/07</u>

	Ś	iewage (if a	applicable)		
(Intentionally blank)	Noticeable odo plant growth ar		Noticeable of plant growth	odor, excess ı.	Visible pipe with effluent, heavy odor.
			A	nd	
			Questionabl		
	5	4	3	2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure Pi	esence (if application	able)	
(Intentionally blank)	Evidence of livestoc access to riparian z	one. stream or v	I manure in waste storage ocated on the	Extensive amount of manure on banks or in stream. Or
·				Untreated human waste discharge pipes present.
	5 4	3	2	1

### **NOTES**

Stroom N	ershed <u>70</u>	Supellin.	Stream Section Reference Section	Name		·	<u> </u>
			<u>'s Rain/SWN</u> Past			0'S RA	<u> </u>
	hannel Width					/ u	
		•					
Grazing F	Paeturo		AND USE WITHIN DRAINAGE	= (%): 5	Row Cro		1
Forest	431010	95	Residential		Industria		
Commerc	ial		Abandoned Mine Lands		Other		
			SUBSTRATE (%):				
Boulder			40 Gravel 30	Silt	10	Mud	10
			SE OF THE AREA THAT THE	STREAM F	LOWS T	HROUGH:	
<u> </u>	hough a	ameland.	à	<u></u>			
			GPS POINTS / PHOTOS:				
Waypoint		escription	·····	·····	·····	pH	Cond.
T3E1 98		Start	ano suis act in as of the		- 9-9724 A		
99		iome or uner	encroachment /spli	race i	actional	11 17.7	/ /60
101		Split in th	Bet in the transmitter of	<u>2010 - U</u>	PARTIN	· · · · · · · · · · · · · · · · · · ·	1/60
102		nd at day	- right for K				
NE61013	$ $ $ $ $\epsilon$	nd 89 dat	- PARY fork				
*		{ <i>a</i>	'				
199		JAMAONDONNES	enemachinant - Mul	No mile	in stor	am	
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Stream	Section	Name
		Date:

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Parameter	Score		olanation of Score Given
Channel condition	9		
Riparian zone	10		
Bank stability	9		
Water appearance	10		
Nutrient enrichment	10		
Fish barriers	9		
In-stream fish cover	9		
Embeddedness	9		
Invertebrate habitat	C		
Canopy Cover	10		
AMD (if applicable)	NA		
Sewage (if applicable)	NA		
Manure presence (if applicable)	NA		·
TOTAL SCORE (Add all scores and divide by number of scores given)	9.3	< 6.0 6.1 – 7.4 7.5 – 8.9 > 9.0	= POOR = FAIR = GOOD = EXCELLENT

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

		Chanr	el Conditio	n	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	with signif of channe Any dikes set back to	teration, but icant recovery and banks. or levies are provide an adequate	the reach w and/or char Excess <b>ag</b> braided cha	nnelization.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 (9/ 8	7 6	5 4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone										
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetal extends half of active channel width on each side.		rd of less than a third of the annel active channel width						
	If less than one width, covers entire flood plain.		Filtering func moderately compromised	Or						
(10) 9	8 7 6	5 4	3	2 1						

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability									
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).						
10 (9/ 8	7 6 5 4	3 2	1						

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

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	N	later Ap	pearance	
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally clou objects visible at 1.5 to 3 ft; may ha slightly green colo sheen on water s	depth ave or; no oil	Considerable cloudine most of time; objects visible to depth 0.5 to ft; slow sections may appear pea-green; bot rocks or submerged objects covered with heavy green or olive- green film. Or Moderate odor of ammonia or rotten egg	appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or
$\frown$				pollutants.
(10) 9 8	7 6 5	4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient l	Enrichmer	nt	
Clear wa reach; di commun growth	iverse ad ity <b>little</b>	quatic plant algal	gree entir alga	ly clear enish w re react al grow strates.	ater alo n; mod th on s	ong erate	entire rea	water along ch; abundant wth, especially rmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10)	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

			,		Fish	Barriers	•		
No barriers.	``	with			Drop struculverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversions drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 ( 9	Ĵ	8	7	6	5	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

1				-	Instream	Fish Cov	er		······································
>7 cover t available	types		7 cover lable	types	4 to 5 co available		2 to 3 co available	ver types	None to 1 cover type available
10	(9)	8	7	6	5 ·	4	3	2	1

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name:
		Date:

					Embec	Idedness				
Gravel or o particles an embedded	re <20%	partic	el or co les are embed	20 to	Gravel or particles 40% emb	are 30 to	Gravel o particles embedde	are >40%	Completely embedded.	
10	(9)	8	7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded:

						Insec	t/invertel	orate Habi	tat	
At least available stage to coloniza and logs fallen).	e. Habita allow fu tion (wo	it is II ins ody	at a sect	Som exist trees habil	e pote s, such s, whicl at, but	s of hab ntial ha n as ove n will pr have n stream	bitat erhanging ovide ot yet	The subst disturbed, removed t velocities	es of habitat. rate is often covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	(	8,	7	6	5	4	3	2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Key: Th	is pertains to		Canopy ways whe Coldwate	ere channel is	s 50 feet wid	de or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% sha >75% in re upstream 2 shaded.	Or ach, bui	t	20 to 50% s	shaded.	<20% of water surface in reach shaded.
10/ 9 8	7 6	5	4	3	2	1

	Aband	oned Mine Dr	ainage (if ap	olicable)	
(Intentionally blank)		f iron staining. Or iron precipitate.	Iron precipit muddy oran appearance	ge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
, <u>, , , , , , , , , , , , , , , , , , </u>	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name:
		Date:

Sewage (if applicable)							
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.				
		And					
		Questionable pipe and black stream substrate.					
	5 4	3 2	1				

Mark discharge(s) on map and/or with GPS unit.

	Manure Pre	sence (if applicat	ole)	Manure Presence (if applicable)								
(Intentionally blank)	Evidence of livestock access to riparian zoi		iste storage	Extensive amount of manure on banks or in stream. Or								
•				Untreated human waste discharge pipes present.								
	5 4	3	2	1								

### <u>NOTES</u>

Date: <u>5-/3-08</u> me
6): Row Crops 20 Industrial Other 11t 20 Mud 5 REAM FLOWS THROUGH: PH Con
6): Row Crops 20 Industrial Other 11t 20 Mud 5 REAM FLOWS THROUGH: PH Con
6): Row Crops 20 Industrial Other 11t 20 Mud 5 REAM FLOWS THROUGH: PH Con
Row Crops       /o     Industrial       Other     0       ilt     /o     Mud       SEAM FLOWS THROUGH:     0
Row Crops       /o     Industrial       Other     0       ilt     /o     Mud       SEAM FLOWS THROUGH:     0
Industrial       Other       Other       Ilt     /o       Mud     5       REAM FLOWS THROUGH:       pH
Other
ilt /o Mud 5 REAM FLOWS THROUGH:
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REAM FLOWS THROUGH:
pH Con
7.85 370
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Stream	Section	Name:	
		Date:	

Parameter	Score		planation c Given		re
Channel condition	9				
Riparian zone	. 10 .				
Bank stability	10				
Water appearance	9.				
Nutrient enrichment	9				
Fish barriers	8				
In-stream fish cover	9				
Embeddedness	9				
Invertebrate habitat	9				
Canopy Cover	/0			-	
AMD (if applicable)	NA				
Sewage (if applicable)	MA				
Manure presence (if applicable)	NA	-			
TOTAL SCORE (Add all scores and divide by number of scores given)	012/10 - 	< 6.0 6.1 – 7.4 7.5 – 8.9 > 9.0	= POOR = FAIR = GOOD = EXCELLENT		

Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Channe	I Condition	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting. Structure at INT OB	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess <i>aggradation</i> ; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 (9) 8	7 6 5 4	3 2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

	-	Riparian	Zone	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.		Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
(10) 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability											
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).									
10 / _ 98	7 6 5 4	3 2	1									

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream	Section	Name:
		Date:

	V	Vater Ap	opearance		· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally clou objects visible at 1.5 to 3 ft; may ha slightly green cold sheen on water s	depth ave or; no oil	most of time visible to de ft; slow sect appear pea- rocks or sub objects cove heavy green green film.	pth 0.5 to 1.5 ions may green; bottom merged ared with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			Moderate od ammonia or		Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichme	ent	
reach; c	liverse nity lit	long entire e aquatic plant tle algal ent.	gree enti alga	ly clear enish wa re react al grow strates.	ater alo n; mode th on s	ng erate	entire re algal gro	n water along ach; abundant owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	(9)	) 8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

		Fish Barriers		
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	(8) 7 6	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

				•	Instream	Fish Cov	er		
>7 cover types available		6 to 7 avail	7 cover able	types	4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10 (9	$\overline{b}$	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

### Stream Section Name:

Date:

	•			Embec	Idedness				
Gravel o particles embedde	are <20%	Gravel or co particles are 30% embed	e 20 to	Gravel o particles 40% eml	are 30 to	Gravel or particles embedde	are >40%	Completely embedded.	
10	(9)	8 7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	_				Insec	t/inverte	brate Habi	tat	
available stage to	). Hab allow tion (v	es of habitat itat is at a full insect voody debris eshly	Som exist trees habit	e pote s, suc s, whic at, but	s of hab intial ha h as ove h will pr t have n stream	bitat erhanging rovide not yet	The substr disturbed, removed b	es of habitat. rate is often covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

		Key: Th	iis pert	ains to	o water	ways <b>w</b> h	y Cover ere channel ter fishery	is 50 feet wi	de or less.
shaded	generally	ream 2 to	>75% upstr	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>				shaded.	<20% of water surface in reach shaded.
10)	9	8	7	6	5	4	3	2	1 .

· ·	Aband	oned Mine Dr	ainage (if ap	plicable)	
(Intentionally blank)		f iron staining. Or iron precipitate.	Iron precipi muddy orar appearance	nge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
· · · · · · · · · · · · · · · · · · ·	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

#### Stream Section Name: Date:

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		Sewage (if	applicable	<del>)</del> )		
(Intentionally blank)		odor, excess th and siltation.	Noticeabl	le odor, excess wth.	Visible pipe with effluent, heavy odor.	
				And		
				able pipe and eam substrate.		
	5	4	3	2	1	

Mark discharge(s) on map and/or with GPS unit.

	Manu	ire Presen	ce (if appl	icable)	
(Intentionally blank)	Evidence of liv access to ripa		stream o	nal manure in or waste storage located on the in.	Extensive amount of manure on banks or in stream. Or
•					Untreated human waste discharge pipes present.
	5	4	3	2	1

### <u>NOTES</u>

	1 1 1 1		BSC on	Strea	m Sectio	n Name			
Stream N	ame(	mway.	Mallinge PC	L Refere	ence Sect	ion			
Weather	Conditions <sup>-</sup>	Today			Pas	st 2-5 Days	\$		
Active Cl	annel Widtl	n: <u>3. 5</u> fee	t						
		······································		MITUIN			<u> </u>		
Grazing P	asture		LAND USE		DRAINAG	<u>→                                    </u>	Row Cro	<u></u>	
Forest	asture		Residentia			<u> </u>	Industria	·	
Commerc	ial		Abandone		ands		Other	•	
			sl	JBSTRA	TE (%):			<u> </u>	
Boulder		Cobble	G	iravel		Silt	1	Mud	
			OUSE OF THE						
βY			PD WPPE						
			DRIVE WALL	1 NWEY	2_SECH	on Goer	<u>&gt; 148 00</u>	GH (N	()
<u>A[4-8]</u>	MT MON	16			PHOTOS	······································			
Waypoint	Photo De	escription		-011137	FHOTOS	); 			
WI/M			11/ A9	. OIC	ANVING	1123121	A DA HELEN	<u>pH</u>	<u>с</u> 69 4
W2/8 .			2013 FOr					- D24-17 - 11	
143763			U.E.A.GUNTE				<u>Culver</u>	- 1.4	4 10
<u>*** / / / </u>			1-W 12 12.						
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POND PEPAVING - OPENS DUG OUT TRENCH BY VEN

Stream	Section	Name:
		Date:

**Explanation of Score** Parameter Score Given **Channel condition** ( 
ho7 **Riparian** zone 1 **Bank stability** Water appearance S E Nutrient enrichment **Fish barriers** C In-stream fish cover 1 **Embeddedness** 8 8 Invertebrate habitat 9 **Canopy Cover** AMD MA (if applicable) Sewage NA (if applicable) Manure presence (if applicable) 13/10 2 TOTAL SCORE < 6.0 = POOR 6.1 - 7.4 = FAIR (Add all scores and divide by 7.3 7.5 - 8.9= GOOD number of scores given) > 9.0 = EXCELLENT

Stream Section Name:

Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					С	hanne	el Conditio	n	
structures evidence	· excessive	0	chan with of ch Any set b acce	signific annel a dikes o ack to	f past eration, ant rec and bar r levies provide n adeq	overy nks. s are	the reach w and/or cha Excess <b>ag</b> braided ch	nnelization.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	8	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

**Keys:** look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 (7) 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		Wa	ter Ap	pearance		
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasiona objects vis 1.5 to 3 ft; slightly gre sheen on v	ible at de may hav en color;	e no oil	Considerable most of time; visible to dep ft; slow section appear pea-g rocks or subm objects cover heavy green green film.	objects th 0.5 to 1.5 ons may preen; bottom nerged red with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
				Moderate odd	or of	Or
				ammonia or r	otten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 9 (8)	7 6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

						Nu	trient	Enrichme	nt	
reach; comm	water along diverse aq unity little a h present.	uatic algal		gree entii alga	ly clear enish wa e reach I grow strates.	ater alo n; <b>mod</b>	ng erate	entire rea	water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	)	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers			
No barriers.		witho			Drop stru culverts, diversior drop) wit reach.	dams or is (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

				Instream	Fish Cov	ver		
>7 cover types available		7 cover l lable	types	4 to 5 co available		2 to 3 co available	ver types	None to 1 cover type available
10 9	8	(7)	6	5	4	3	2	1
	avai 8		6	available 5	4	available 3	2	available

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Embeddedness Gravel or cobble Gravel or cobble Gravel or cobble Gravel or cobble Completely particles are <20% particles are 30 to particles are 20 to particles are >40% embedded. embedded. 30% embedded. 40% embedded. embedded. 9 2 10 7 6 5 4 3 1 (8)

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	t/inverte	brate Habi	tat	
availab stage to coloniza	t 5 types of le. Habitat i o allow full i ation (wood s not freshl	s at a nsect ly debris	Som exis tree habi	ne pote ts, sucl s, whic tat, bul	s of hat ntial ha h as ov h will pi t have r e strean	bitat erhanging rovide not yet	The subst disturbed, removed t velocities	es of habitat. rate is often covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	8 /	7	6	5	4	3	2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

		Key: Th	is per	tains to	water	Canopy ways whe Coldwate	ere channel i	s 50 feet wi	de or less.
shaded	generally	ream 2 to	>75	% in re ream 2	ded in r Or ach, bu to 3 m		20 to 50%	shaded.	<20% of water surface in reach shaded.
10	(9)/	8	7	6	5_	4	3	2	1

	Abandor	ned Mine Dr	ainage (i	f applicable	ə)	
(Intentionally blank)	Evidence of ir	Or		ecipitate visibl orange ance.	le, Heavy iron precip noticeable kill zo Or White/bluish-whit precipitate visible egg smell.	ne.
	5	4	3		2 1	

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name:
		<b>FA</b> 4

#### Date:

Sewage (if applicable)						
(Intentionally blank)		odor, excess th and siltation.	Noticeabl plant grou	e odor, excess wth.	Visible pipe with effluent, heavy odor.	
:				And		
				able pipe and eam substrate.		
	5	4	3	2	1	

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)						
(Intentionally blank)	Evidence of line access to ripa			waste storage ocated on the	Extensive amount of manure on banks or in stream. Or	
					Untreated human waste discharge pipes present.	
	5	4	3	2	1	

## **NOTES**

Evaluators' Names	145,5A	· · · · · · · · · · · · · · · · · · ·	_ Date:	13-08	·
		Section Name			
Stream Name hilt	tib of BSC Referen	ce Section			
Weather Conditions T	oday <u>70's Sunny</u>	Past 2-5 Davs	40'S R	ain	
Active Channel Width	: <u>2-4</u> feet				
	LAND USE WITHIN D	RAINAGE (%):	<u> </u>		
Grazing Pasture	Grassy Field		Row Crops		
Forest	56 Residential	50	Industrial		
Commercial	Abandoned Mine Lar		Other	<u> </u>	
	SUBSTRATE				
Boulder 195	Cobble /5 Gravel	7 <u>5</u> Silt	<u> </u>	lud	
•	THE LAND USE OF THE AREA TH	•			
HEADWATCK-S )	THET AT ZEHNDER RD.1	DRY) +LOWS	TROVGH DET	<u>ET FI</u>	REST
BURDAN LAST 12	MILE THROUGH HOMEOWN	UPES FRONT VA	MALL FORESIG	<u>ED 560</u>	
	GPS POINTS / P				
Naypoint Photo Des	scription			Hq	Cond
NI 1,2 S	art look Vistream thin Astr			8.05	<u> </u>
12 3 Co	nercte retaining world (sanitan	1 Swer mancover	on sharp	<u> </u>	<u> </u>
N3 4 He	Atton Lave - bank erosion, pi Gront ward	i of Strain the	ough h.o.		<u> </u>
N.4 5 TI	und into woody section .	Some bank cross	οn.	<u> </u>	<u> </u>
1566	ulvert under land secti	on			
N 6 7 C	ulvert under mad			ļ	
<u>~ 7. – 14</u> e	adwaters, Dry, housing plan	not trajler Lou	<u></u>		
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		· · ·			
ivasive plants present	: Yes/ No 🛛 🖈 Japanese Knotwee	ed 🗖 Garlic mustard	i 🗇 Purple loos	estrife 🗅	J Óthei
rash / Litter: Yes / No			· •		
•	es / No if so, approximate size	Length (Mi	dth feet		
•	<u> </u>		uur 168t		
~·	Wetland or other)				
otes: Chromis	Very clear, little si	It has 1 1		<u>0</u> ,	0.4

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Stream	Section	Name:	
		Date:	

Parameter	Score	Explanation of Score Given
Channel condition	1 9	
Riparian zone	8.	
Bank stability	. 8 .	
Water appearance	10	
Nutrient enrichment	10	
Fish barriers	6	
In-stream fish cover	19	
Embeddedness	9	
Invertebrate habitat	9	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	\$29/10 <u>8.49</u>	< $6.0$ = POOR 6.1 - 7.4 = FAIR (7.5 - 8.9) = GOOD > $9.0$ = EXCELLENT

Stream Section Name:

Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition									
structu eviden Cutting	al channel; n ires, dikes. h ice of down- g or excessiv cutting.	10	cha with of cl Any set l acce	lence c nnel alt signific hannel dikes c back to ess to a d plain.	eration cant rec and ba or levie provide in adeq	overy nks. s are e	the reach and/or ch Excess ag braided cl	nannel; <50% of with riprap annelization. ggradation; nannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	.9	(8)	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone					
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.	
10 9	8) 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability							
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).					
10 9 (8)	7 6 5 4	3 2	1					

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream	Section	Name
		Date:

	Water	Appearance	· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no c sheen on water surface.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
	•	Moderate odor of	Or
$\frown$		ammonia or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10) 9 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

Nutrient Enrichment					
Clear water along entire reach; diverse aquatic plant community little algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrates.	Greenish water along entire reach; <b>abundant</b> <b>algal growth</b> , especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.		
10/ 9 8	7 6 5 4	3 2	1		

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

						Fish	Barrier	5			
No barriers.	withd	ional v Irawal ement n.	s in	hibit		Drop str culverts, diversion drop) wil reach.	dams or າs (<1ft		Drop stru culverts, d diversions drop) with reach.	lams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8	7	(	6	)	5	4		3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

Instream Fish Cover									
>7 cover types available	3	6 to avail	7 cover able	types	4 to 5 co available		2 to 3 co available	ver types	None to 1 cover type available
10	9)	8	7	6	5 ·	4	3	2	1

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name:
		Data

		Embeddedness		
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 (9)	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	Insect/inverte	orate Habitat	
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 (9) 8	7 6 5 4	3 2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Key: Th	is pertain	s to wate	ways wh	by Cover here channel i ter fishery	s 50 feet wi	de or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	>75% ir	haded in Or reach, bu n 2 to 3 m	ut .	20 to 50% s	shaded.	<20% of water surface in reach shaded.
10 (9) 8	7 6	<u> </u>	4	3	2	1

	Abanc	loned Mine Di	rainage (if ap	plicable)	
(Intentionally blank)		of iron staining. Or iron precipitate.	muddy orai	•	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
······································	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name:
		Date:

		Sewage (if	applicable	)		
(Intentionally blank)		odor, excess n and siltation.	Noticeable plant grow	e odor, excess vth.	Visible pipe with effluent, heavy odor.	
				And		
				able pipe and am substrate.	· · · · · · · · · · · · · · · · · · ·	
	5	4	3	2	1	

Mark discharge(s) on map and/or with GPS unit.

	Manure Pr	esence (if appli	cable)	
(Intentionally blank)	Evidence of livestock access to riparian zo	ne. stream o	al manure in r waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
•				Untreated human waste discharge pipes present.
	5 4	3	2	1

### **NOTES**

### **Big Sewickley Creek Watershed Visual Assessment**

Evaluators' Names_	}	CS/CB	Date:	06/21/07
Sub-Watershed	BSC	Stream Section Name	BSCT 2W	$1 \rightarrow 2$
Stream Name		Reference Section	— <u> </u>	
Weather Conditions	TodayMistly si	wmy, breeky Past 2-5 Da	ays <u>Scalt</u>	red rain shares
	Land	l use within drainage (%):		
Our trans Darations		Tiold of last	David	

ĺ	Grazing Pasture		Grassy Field Ctr	retary	20	Row Cro	ps	
ĺ	Forest	70	Residential		10	Industria	·	
. [	Commercial		Abandoned Mine	Lands	<u> </u>	Other		
ĵ			Substra	te (%):		-		
	Boulder	Cobble	40 Gravel	50	Silt	10	Mud	

Active Channel Width: 1.5 meters

Floodplain wetlands: Yes / No Approximate size: Length / Width (feet or meters)

Flooded areas? (Wetland or other)

pH \_\_\_\_\_ Conductivity \_\_\_\_

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH: Type of forest, farmland, residential, and/or commercial: Itures on hill types, Steep, Fure-ked slopes, Pover-line cutting thru.

	GPS Waypoints														
	Latitude	Longitude	Photo # s	Description											
Start															
End															
Other															
BECTZW	1 36	" Q pipe X.	ing a sm	11 trib. int. (ett= 7.59 cond. = 360)											
T'2W2		small trib. f	im wart	pH=7.74/cond.=530)											
	·	·													

	Photographs	
Photo #	Description	
		· · · · · · · · · · · · · · · · · · ·

Discharges										
Size	Туре	Waypoint	Photo #							

Invasive plants present? 
I Japanese Knotweed 
Garlic mustard 
Purple loosestrife 
Other

		<u> </u>			
Trash /	Litter?	not	really	· · · · · · · · · · · · · · · · · · ·	

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Stream Section Name:  $BSCT2W1 \rightarrow 2$ Date: 06/21/07

Parameter	Score	Explanation of Score Given
Channel condition	Ø	
Riparian zone	8	would be 10, but laver section of channel runs thru a few yards.
Bank stability	E	
Water appearance	Ø	
Nutrient enrichment	1	
Fish barriers	5	culvert @ Taw1 (not necessary, old logging X-ing 77)
In-stream fish cover	5	·····
Embeddedness	G	
Invertebrate habitat	Ð	
Canopy Cover	9	
AMD (if applicable)		
Sewage (if applicable)		
Manure presence (if applicable)	A <sup>\\</sup>	
TOTAL SCORE (Add all scores and divide by number of scores given)	7.3	< 6.0 = POO $6.1 - 7.4 = FA^{+}$ 7.5 - 8.9 = GOC > 9.0 = EXCELLE1

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Stream Section Name: Date:

	T2W1	7	2
06/21/07	06	121/0	07

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	· · ·				C	hann	el Conditio	on	
structu evider Cuttin	al channel; n ures, dikes. nce of down- g or excessi cutting.	No	cha with of c Any set acc	i signifi hannel dikes back to	eration cant rec and bai or levies provide an adeq	covery nks. s are e	the reach and/or cha Excess ag braided ch	annel; <50% of with riprap annelization. Igradation; annel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	(8)	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 (	(8) 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

				Banl	<b>Stability</b>	/		· · · · · · · · · · · · · · · · · · ·		
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	ele pla ero bar is p tha	vation in; less ding su nks in c protecte	than 3 Irface a outside d by ro d to the	e flood 3% of area of bends	banks ma typically occurs 1 less freque bends ar (overhan at top of mature tr stream at	ely unstab ay be low, are high (f year out c uently); ou e actively ging vege bank, som ees falling nnually, so ures appa	but looding of 5, or itside eroding tation ie into ome	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).		
10 9 8	7	6	5	4	3		2 1			

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream Section Name:  $\underline{-7} \& 1^{-2}$ Date:  $\underline{-06} [2]$ 

		Water Ap	pearance		· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally c objects visible 1.5 to 3 ft; may slightly green c sheen on wate	at depth / have color; no oil	rocks or subr objects cover heavy green green film.	objects oth 0.5 to 1.5 ons may preen; bottom nerged red with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
		-	Moderate odo ammonia or r		Or Strong odor of chemicals, oil, sewage, other pollutants.
10 ((9)) 8	7 6 8	5 4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient Enrichment												
reach; c							entire rea	n water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.				
10	(9	) 8	7	6	5	4	3	2	1				

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

	Fish Barriers												
withdrawals inhibit d movement within the d reach. d				ulve: livers	structures, rts, dams or sions (<1ft within the	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.					
10	9	8	7	6	Ť.	5	) 4	3	2	1			

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

	Instream Fish Cover											
>7 cover available					5 cover types able	2 to 3 co available	~ .	None to 1 cover type available				
10	9	8	7	6	(	5	) 4	3	2	1		

Cover types: Logs/large woody debris, deep pools, overharging vegetation, boulders/cobble; (iffles) undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream Section Name: \_ \_ \_ \_ \_ \_ \_ \_ Date:

<u>T2W1 72</u>

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						Embec	Idedness			·	
Gravel or particles embedde	are <20%	partic	el or cob les are 2 embedde	0 to	L.	Gravel or particles 40% emt	are 30 to	Gravel or particles embedde	are >40%	Completely embedded.	
10	9	8	7	6		5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	Insect/invertebrate Habitat										
availab stage to coloniz	t 5 types ( le. Habita o allow fu ation (woo s not fres	t is at a I insect ody debris	Sor exis tree hab	ne pote sts, suc s, whic itat, bu	s of hal ential ha h as ov h will p t have r e strean	abitat erhanging rovide not yet	The subs disturbed removed velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type o habitat.	f	
10	9	8	7	6	5	4	3	2	1		

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble) boulders, coarse)gravel, other:

Key: Th	is pertains to	water	Canopy ways whe Coldwate	re channel	is 50 feet wic	le or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shad >75% in rea upstream 2 t shaded.	Or ch, bu	ŧ	20 to 50%	shaded.	<20% of water surface in reach shaded.
10 (9/ 8	7 6	5	4	3	2	1

	Abandoned Mine D	rainage (if applica	ible)	
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate	Iron precipitate v muddy orange appearance.	isible,	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotte
	5 4	3	2	egg smell.

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

#### 

# Big Sewickley Creek Visual Assessment Stream Section Name: \_\_\_\_\_\_ Date: \_\_\_\_\_

T2W1 - 2 06/21/07

	Sewage (i	f applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth. And	Visible pipe with effluent, heavy odor.
. · · ·		Questionable pipe and black stream substrate.	
,	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure Presence (if applicable)									
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure stream or waste sto structure located or flood plain.	orage	Extensive amount of manure on banks or in stream. Or						
				Untreated human waste discharge pipes present.						
· · · · · · · · · · · · · · · · · · ·	5 4	3	2	1						

### **NOTES**

valuators' Names		2B/1ES	Date:06/21/0	2
ub-Watershed	BSC	St	ream Section Name $BSCT1W1 \rightarrow 8$	?
ream Name	1 W to 1	BSC Re	ference Section	
eather Conditions To	day5u	my ~ 8	"F Past 2-5 Days rain tresday r	vizht-
			in drainage (%):	
razing Pasture		Grassy Field	Row Crops	
rest	~~~~	Residential	20 Industrial	
mmercial	~~~~	Abandoned Min		15
		Subot	/Lintr rate (%):	
Boulder C	Cobble	Gravel		
ctive Channel Width:	a a			ليسبب
		numriusate at-	a longth (Midth (Gettermine))	
•			e: Length / Width (feet or meters)	
oded areas? (Wetlan	nd or other)			
Conducti	vity			•
			E STREAM FLOWS THROUGH:	
pe of forest, farmland, r	residential, and	l/or commercia	11 1 - Charles I at hading of an low	shell
Steep, wooded s	Topes, res	idential cr	" top of hill and at bottom of water	
				ş,
Trailer park re	ar confluenc	e cf unt	and Big Sewickley Creek.	
Trailer park re	ar confluenc	e cf unt	and Big Sewickley Creek.	
Trailer park re	ar centlerene		and Big Sewickley Creek.	
Trailer park re	ar confluenc Longitude		and Big Sewickley Creek.	
Latitude		GPS W	and Big Sewickley Creek. aypoints	
Latitude art d		GPS Wa Photo # s	aypoints Description	
Latitude art d her BSCT1W1		GPS W	ad Big Sewickley Creek. aypoints Description road warhout @ frailer park into stre	
Latitude art d ner $\beta SC T 1 W 1$ T 1 W 2		GPS Wather Photo # s $\frac{1 - R}{4}$	ad Big Sewickley Creek. aypoints Description road warhout @ frailer park into stre int. of 2 streams left brack pH =	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Latitude rt i er $\&SCT1 \\ W1$ $T1 \\ W2$ W3		GPS Wa Photo # s	and Big Sewickley Creek. aypoints Description road warhout @ frailer part into stre int. of 2 streams left brack pH = Crot pipe from 1 cond =	
Latitude art d ner $\beta SCT1 W I$ TIW2 W3 W4	Longitude	GPS Wa Photo # s 1 - 2 4 6 7 dump si	and Big Sewickley Creek. aypoints Description road warhout @ freiler park into stre int. of 2 streams left brach pH = Croop pipe from Cond = pared road and loose (right brach pH = 7 c alog stream. Fill. Cond = 3	210 440 151
Latitude Int 1 1 1 1 1 1 1 1	Longitude strems ver	GPS Wa Photo # s 1 - 2 4 6 7 dump si 4 road X-1m	and Big Sewickley Creek. appoints Description road warhout @ frailer part into stree int. of 2 streams left brack pH = crot pipe from cond = pared road and loose (right brack pH = 7 e alog stream. Fill. (pH = 7.34/cond = 920)	210 440 151
Latitude Latitude d d d d d d d d	Longitude strems ren ztrems ren ztrems ren	GPS Wa Photo # s 1 - 2 4 6 7 dump si 4 road X-1m	and Big Sewickley Creek. appoints Description road warhout @ frailer part into stree int. of 2 streams left brack pH = crot pipe from cond = pared road and loose (right brack pH = 7 e alog stream. Fill. (pH = 7.34/cond = 920)	210 440 151
Latitude d d d TIW2 W3 W4 15 int. $F$ smull 16 spring flaw (pt)	Longitude strems ver t 7.60 / cmd = Description	GPS Wa Photo # s 1 - 2 4 6 7 dump si + road X-1 220) Photos	ad Big Sewickley Creek. appoints Description road warhout @ frailer part into stree int. of 2 streams left brach pH = cror pipe from cond = pared road and loose (right brach pH = 7 c alog stream. Fill. (pH = 7.84/cond = 920) graphs	210 440 151
Latitude d d er BSCT1W1 TTW2 W3 W4 W5 int. A smull U6 spring flaw (pt)	Longitude strems ver 17.60 / cont = vescription runoff from	GPS Wa Photo # s 1-2 4 6 7 dump sil + road X-1m 220) Photog D/6- road c	and Big Sewickley Creek. appoints Description road warhout @ frailer part into stre int. ef 2 streams left brach pH = cror pipe from cond = pared road and loose (right brach pH = 7 cond = pared road and loose (right brach pH = 7 cond = 3 (pH = 7.84/cond = 920) graphs Lum anto pared road.	210 440 151
Latitude Int 1 1 1 1 1 1 1 1	Longitude strems ven 17.60/cml= Description runoff from heavy sed m	GPS Wa Photo # s 1-2 4 6 7 dump si 4 road X-1m 220) Photos D/6- road C 2 or durde	and Big Sewickley Creek. appoints Description road warhout @ freiter park into stre int. ef 2 streams left brach pH = croop pipe from cond = pared road and loose (right brach pH = 7 cond = pared road and loose (right brach pH = 7 cond = 3 (pH = 7.34/cond = 920) graphs lum anto pared road · rout backs on trib ·	210 440 151
Latitude art d her $\beta$ SCT1 W I CT1 W 2 	Longitude strems re- t=7.60/cad= Description runoff from heavy sed m Land stide o	GPS Wa Photo # s 1-2 4 6 7 dump si 4 road X-1 220) Photog D/6-, road C 20 0/6-, road C 1 220 or 10 0 0 0 0 0 0 0 0 0 0 0 0 0	and Big Sewickley Creek. appoints Description road warhout @ frailer part into stree int. of 2 streams left brach pH = cror pipe from cond = pared road and loose (right brach pH = 7 cond = pared road and loose (right brach pH = 7 cond = 3 (pH = 7.84/cond = 920) graphs lung ento pared road . rout backs on trib. c.	210 440 151
Latitude art d her $\beta$ SCT1 W I CT1 W 2 W 4 N 5 int. $\beta$ smult N 6 spring $\beta$ law (et oto # E	Longitude strems re- t=7.60/cad= Description runoff from heavy sed m Land stide o	GPS Wa Photo # s 1-2 4 G 7 dump si 4 roud X-1m R20) Photog D/G. roud C 220 Photog D/G. roud C 220 Photog	and Big Sewickley Creek. appoints Description road warhout @ freiter part into stree int. of 2 streams left bruch pH = croor pipe from cond = pared road and loose (right bruch pH = 7 cond = 10000 (right bruch pH = 7 cond = 3 (pH = 7.84/cond = 920) graphs lum ato pared road . rout backs on trib. c.	
Latitude It Latitude It Latitude It TIW2 W3 W4 I5 int. $F$ smult I6 spring $Flaw$ (et I6 I0 I0	Longitude strems ver 17.60 / cad = vescription runoff from heavy sed m heavy sed m heavy sed m heavy sed m heavy sed m	GPS Wi Photo # s	and Big Sewickley Creek. appoints Description road warhout @ frailer part into stree int. ef 2 streams left brach pH = cror pipe from cond = pared road and loose (right brach pH = 7 c alog stream. fill. cond = 3 (pH = 7.84/cond = 920) graphs lung ento pared road . rout backs on trib. c. sedimitation in streen below. arges -7 Economy Boro Southry line.	
Latitude rt i ier $\beta SCT1W1$ T1W2 W3 W4 $15$ int. $\beta$ smult 16 spring flaw (pt) $16 \pm 10$ 10	Longitude strems re- t=7.60/cad= Description runoff from heavy sed m heavy sed m heavy sed m heavy sed m	GPS Wi Photo # s 1-2 4 6 7 dump si 4 road X-1 220) Photog D/6-, road C 220) Photog D/6-, road C 220, and under power lin -> beavy	and Big Sewickley Creek. appoints Description road warhout @ freiter part into stree int. of 2 streams left bruch pH = croor pipe from cond = pared road and loose (right bruch pH = 7 cond = 10000 (right bruch pH = 7 cond = 3 (pH = 7.84/cond = 920) graphs lum ato pared road . rout backs on trib. c.	
Latitude T I $er$ $\beta SC T 1 W I$ T 1 W 2 3 3 3 4 3 5 15 int. $d$ smult 16 spring $Flaw$ (et 10 10 10 10	Longitude strems ver 17.60 / cad = vescription runoff from heavy sed m heavy sed m heavy sed m heavy sed m heavy sed m	GPS Wi Photo # s	and Big Sewickley Creek. appoints Description road warhout @ frailer part into stree int. ef 2 streams left brach pH = cror pipe from cond = pared road and loose (right brach pH = 7 c alog stream. fill. cond = 3 (pH = 7.84/cond = 920) graphs lung ento pared road . rout backs on trib. c. sedimitation in streen below. arges -7 Economy Boro Southry line.	
Latitude Int d her $\beta$ SC T1 W I -T1 W 2 W 3 W 4 J5 int. A smult 16 spring flaw (et 10 10 10 10	Longitude strems ver 17.60 / cad = vescription runoff from heavy sed m heavy sed m heavy sed m heavy sed m heavy sed m	GPS Wi Photo # s	and Big Sewickley Creek. appoints Description road warhout @ frailer part into stree int. ef 2 streams left brach pH = cror pipe from cond = pared road and loose (right brach pH = 7 c alog stream. fill. cond = 3 (pH = 7.84/cond = 920) graphs lung ento pared road . rout backs on trib. c. sedimitation in streen below. arges -7 Economy Boro Southry line.	
Latitude rt i er $BSCTIWI$ TIW2 W3 N4 15 int. $P$ smult 15 int. $P$ smult 16 spring $Plan$ (et to #. [] 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	Longitude strems ven strems ven 17.60 / cont = vescription runoff From Londs fide on power ling conving sero Type evos	GPS Wa Photo # s	and Big Sewickley Creek. aypoints Proad work out @ frailer part into stree int. of 2 streams left brack pH = cror pipe from cond = prod road and loose fright brack pH = 7 e along stream. Fill. (pH = 7.84/cond = 920) graphs lump ento pared road · rent backs on trib · .e. sedimetation in streen below · arges - Economy Boro sanitry line . Waypoint Photo #	
Latitude rt er BSCTIWI TIW2 w3 w4 15 int. A small 16 spring Flaw (eth 16 to #. 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	Longitude strems ven strems ven 17.60 / cont = vescription runoff From Londs fide on power ling conving sero Type evos	GPS Wa Photo # s	and Big Sewickley Creek. appoints Description road warhout @ frailer part into stree int. ef 2 streams left brach pH = cror pipe from cond = pared road and loose (right brach pH = 7 c alog stream. fill. cond = 3 (pH = 7.84/cond = 920) graphs lung ento pared road . rout backs on trib. c. sedimitation in streen below. arges -7 Economy Boro Southry line.	

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Big Sewickley Creek Watershed Visual Assessment										
Evaluators' Names		CB/ITS			Date:	06/21/	07			
Sub-Watershed	BSC	Stream S	ection	ı Name <u> </u>	BSCT1	$w \rightarrow 1 \rightarrow 1$	8			
Stream Name UNT 1 W to BSC Reference Section										
Weather Conditions Today <u>Suny</u> ~ 80°F Past 2-5 Days <u>rain tresday night</u>										
Land use within drainage (%):										
Grazing Pasture	Grassy Field			Row Cro	ps					
Forest	65	Residential		20	Industria					
Commercial	L	Abandoned Mine Lands		Other P	ower Line/sa					
	Substrate (%):									
Boulder	Cobble	Gravel		Silt		Mud				
Active Channel Width:	<u>2</u> meters	i .								
Floodplain wetlands:	Yes(No)	Approximate size: Leng	th	/ Width _	(fee	t or meters)				
Flooded areas? (Wetla	and or other)									
pH Conduct	livity					•	,			
DESCRIBE THE LAND Type of forest, farmland, Steep, wooded Truiler perk n	residential, a		of h	ill and	at both	in cfw	tersted.			

		•	GPS Wa	aypoints
	Latitude	Longitude	Photo # s	Description
Start				
End				
Other (	ISCTIWI		1-2	road warhout a finile park into stream
BSCTIW	2		4	int. of 2 streams left brach pH = 7.10
T1W3			6	crorpipe from and = 440
T1W4		-	7	pared road and loose fright branch pH = 7.51
				e alug stream. Fill. Cond = 310
T1W5	int. of sme	ull streams new	w road X-ing	(pH=7.34/cond=920).
TING	spring flow (	eH = 7.60 /cont =	220 Photog	raphs
Photo #		Description		
3		runoff From	p/6 rond c	luna anto paved road.
5		heavy sed m	r, and unde,	reat backs on trib.
8-10		lardslide a	n powerlin	е.
			۱ 	

T1W7	fandslide o	n pava	line ->	heavy	sedimentat	in insti	rem belaw.		
T.1 W 8	wark area	Couving			narges 🥣	Economy	Bora Sonitary	lino.	
Size		Туре	erosion.		Waypoint		Photo #		

Invasive plants present? 
Japanese Knotweed 
Garlic mustard 
Purple loosestrife 
Other

dumping between stream channel road @ w.p. V and Trash / Litter?\_ Yer T1W4
. · ·

Stream Section Name: \_\_\_\_\_\_\_\_

tion Name:	BSCT11	<u>N 1</u>
Date:	06/2	110

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Parameter	Score	Explanation of Score Given
Channel condition	G	
Riparian zone	8	
Bank stability	E	
Water appearance	1	cloudy/turbed from springs picking up silt from landslide site.
Nutrient enrichment	9	
Fish barriers	5	
In-stream fish cover	म	
Embeddedness	3	clay/silt Freshly deposited from siter in upper watersted.
Invertebrate habitat	Image: Second se	
Canopy Cover	1	
AMD (if applicable)	Alva 🗖	
Sewage (if applicable)		
Manure presence (if applicable)		
TOTAL SCORE (Add all scores and divide by number of scores given)	5.3	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream Section Name: Date:

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

				С	hanne	el Conditio	n ,	
Natural channel; r structures, dikes. evidence of down Cutting or excessi lateral cutting.	No	chan with of ch Any set b	nel a signif anne dikes ack to ss to	of past lteration icant red and ba or levie o provide an adeq	covery nks. s are	the reach v and/or cha Excess <i>ag</i> braided ch	annel; <50% of with riprap nnelization. gradation; annel. Dikes or irict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9	8	7 (	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

				Rij	oarian Zo	ne		
Natural Vegetation extends at least two active channel widths on each side	o ext	tural veg ends on annel wic ch side. Or	e active Ith on			extends	vegetation a third of ve channel each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	wid	ess than ith, cove od plain.				Filtering moderat compror		Lack of regeneration. Or Filtering function severely compromised.
10 9	8	7	6	5	4	3	2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

						Bank	<b>Stability</b>	У	
elevation plain; 3 eroding banks i protector	are stable on of activ 33% or mo 3 surface a n outside ed by root to the bas on.	e flood re of irea of bends is s that	elev plai eroo ban is pi that	vation o n; less ding su ks in ou rotected	<i>r</i> stable of active than 33 rface ar utside b d by roc l to the ion.	flood % of ea of ends ots	banks m typically occurs 1 less freq bends ar (overhan at top of mature tr stream a	tely unstable; nay be low, but are high (floodir l year out of 5, o quently); outside re actively erodir nging vegetation bank, some rees falling into annually, some lures apparent).	r inside edges of bends are actively eroding as well as outside bends (overhangir vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope
10	9	8	7	6	5	(4	3	2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		W	later Ap	pearance		· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasion objects vi 1.5 to 3 ft slightly gru sheen on	sible at c ; may ha een colo	depth ive or; no oll	Considerable clor most of time; obje visible to depth 0 ft; slow sections r appear pea-greer rocks or submerg objects covered v heavy green or ol green film. Or Moderate odor of ammonia or rotter	ects .5 to 1.5 may n; bottom jed with live-	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	7 6	5	4	3	2	

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichmei	nt	· · ·
reach;	diverse inity litt	ong entire aquatic plant le algal nt.	grea   enti   alga	ly clear enish w re reacl al grow strates.	ater alo h; mod th on s	ong erate	entire rea algal gro	water along ich; abundant wth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	(9	8	7	. 6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fi	sh Barriers			
No barriers.	withd	ment v	ater inhibit vithin the	c d d	ulve iver:	structures, rts, dams or sions (<1ft within the t.	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	 8	7	6	1	5)	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

4 to 5 cove available		2 to 3 cov available	er types	None to 1 cover type available
5	(4)	3	2	1
	1	4 to 5 cover types available 5 4		

Cover types: Logs/large woody debris, deep pools, overhanning vegeration, boulders/cobble, riffles) undercutbanks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

T1W1-38 6/21/07

					Embec	Idedness	·			
Gravel or co particles are embedded.		partic	el or co cles arc embec	e 20 to	Gravel of particles 40% emi	are 30 to		cie	or cobble s are >40% ded.	Completely embedded.
10	9	8	7	6	5	4	$\left( \begin{array}{c} 3 \end{array} \right)$	$\mathcal{Y}$	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insect	/inve	rtebrate Hab	oitat	
availat stage t coloniz	gs not fres	t is at a l insect ody debris	Som exist trees habit	e pote s, such s, which tat, but	s of habi ntial hab n as ove n will pro have no stream	oitat rhang ovide ot yet	The subs ng disturbed removed velocities	bes of habitat. Strate is often I, covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	8.	7	6	5	(4)	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

Key:	his pertains	to water	Canopy ways who Coldwate	ere channe	el is 50 feet wi	de or less.		
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% sh >75% in r upstream shaded.	Οr each, bι	ıt		% shaded.	<20% of water surface in reach shaded.		
10 (9/8	7 6	5	4	3	2	1		

Abandoned Mine Drainage (if applicable)												
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.									
· · · · · · · · · · · · · · · · · · ·	5 4	3 2	11									

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

#### and the state of

#### **Big Sewickley Creek Visual Assessment**

Stream Section Name: Date: T1 u

Sewage (if applicable) Noticeable odor, excess Noticeable odor, excess Visible pipe with effluent, (Intentionally blank) plant growth and siltation. plant growth. heavy odor. And Questionable pipe and black stream substrate. 5 4 3 2 1

Mark discharge(s) on map and/or with GPS unit.

	Manure Presence (if applicable)											
(Intentionally blank)	Evidence of livestock access to riparian zone.		manure in /aste storage cated on the	Extensive amount of manure on banks or in stream. Or								
				Untreated human waste discharge pipes present.								
	5 4	3	2	1								

## **NOTES**

Big Sewick	ley Creek Watershed V	/isual A	ssessn	nent	
Evaluators' Names <u>FS/St</u>	1		⊳ Date:	1-26-07	)
Sub-Watershed	Stream Section Reference Sect	n Name	BSC 81	0-97	
Stream Name	Reference Sect	ion	<u>~</u>	·····	
	90° Cloudy Pas				
Active Channel Width: <u>20</u> fe		st 2-5 Days			
	<u></u>				
	LAND USE WITHIN DRAINAG	SE (%):			
Grazing Pasture	Grassy Field	2.0	Row Crop	)S	
Forest <u>《C</u> Commercial	Abandoned Mine Lands		Industrial Other	······	
	SUBSTRATE (%):	<u></u>			
Boulder Cobble	Gravel	Silt		Mud	
	D USE OF THE AREA THAT THE	STREAM	FLOWS TH		·····
				····	
			······		
	GPS POINTS / PHOTOS	); 	<u> </u>		0
Waypoint Photo Description BSL 86 1 Start at			···	рН	Cond.
PECRO 7-2 Shall for	ou bilge slite, debes son				
BLABB 34 Droning	The (lit?)				
BSCB1 5 Debis 10	n				
BSEQO (a) Debris	Tems				
BSC91 8 Trus ('0 BSC91 9 m	dec to pose lossine	ten			
BSC92 9 Manuale	Dom			7.22	450
BSC93 Strong St BSC94 p Culurd	ell a gas		· · · · · · · · · · · · · · · · · · ·		
BSC94 10 Column					
BSC95 Priver	Tip Crossily/culvert				
BSC96 11 Throng		2010-2			
- BX97 - theory	3 Rab from W (not 10 d	on topo j			
		<u></u>	· · · · ·		
			<u> </u>		
					<u> </u>
	······				
Invasive plants present: Yes / I	Jo 🗇 🗇 Japanese Knotweed 🗇 G	arlic musta	rd 🗇 Purple	loosestrife 🗆	J Öther
Trash / Litter: Yes / No_/					
Floodplain wetlands: Yes / No		th / W	/idth	feet	
Flooded areas: Yes (No) (Wetla	nd or other)				

Notes: Some backwater Channels

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Stream	Section	Name:
		Date:

Parameter	Score	Explanation of Score Given
Channel condition	8	Culverts under a few driveways one homeowner had own "dam"
Riparian zone	10	
Bank stability	9	
Water appearance	9	Pools looked "bluish"
Nutrient enrichment	9	
Fish barriers	6	I dam / pretty Shallow throut
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	<i>[]</i>	Lots trues!
AMD (if applicable)		
Sewage (if applicable)		
Manure presence (if applicable)		
TOTAL SCORE (Add all scores and divide by number of scores given)	810/10 <u>8.4</u>	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

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Stream Section Name: Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Channel Condition													
structu eviden Cutting	il channel; r ires, dikes. ce of down g or excessi cutting.	No -	<u> </u>	chan with of ch Any o set b acce	signific annel a dikes c ack to	f past eration, cant rec and bai provide provide n adeq	overy nks. ; are ;	the reach and/or cha Excess <b>a</b> <u>c</u> braided ch	annel; <50% of with riprap annelization. ggradation; nannel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.				
10	9	8	)	7	6	5	4	3	2	1				

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

	Riparian Zone													
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or										
$\bigcirc$	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.										
10/) 9	8 7 6	5 4	3 2	1										

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability												
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).										
10 (9) 8	7 6 5 4	3 2	1										

**Ceys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and roding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable anks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream	Section	Name:
		Date:

	Water Appearance													
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasiona objects vis 1.5 to 3 ft; slightly gre sheen on v	ible at d may ha en colo	lepth ve r; no oil	most of tir visible to o ft; slow se appear pe rocks or s objects co	able cloudiness me; objects depth 0.5 to 1.5 ections may ea-green; bottom ubmerged overed with en or olive- Or	appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating								
				Moderate		Or								
				ammonia	or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.								
10 (9) 8	7 6	5	4	3	2	1								

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient Enrichment													
reach; c	diverse nity lit	long entire e aquatic plant tle algal ent.	gree enti alga	ly clear enish wa re reach al grow strates.	ater alc n; mod	ong erate	entire read	water along ch; abundant wth, especially rmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.					
10	( 9	8	7	6	5	4	2	1						

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

						Fis	h Bai	riers			
No barriers.		vithd	onal w rawals ement v n.	inhib		Drop s culver divers drop) v reach.	ts, dan ions (< within t	ns or 1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft f drop) within the reach.
10 9	8	3	7	6	7	5		4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

					Instream	Fish Cov	/er		
>7 cover available		- 1	o 7 covel ailable	r types	4 to 5 co available		2 to 3 co available	ver types	None to 1 cover type available
10	9	(8)	7	6	<b>5</b>	4	3	2	1

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name
		Deter

Date:

					Embe	ddedness				
Gravel or cobble particles are <20 embedded.	)%   p	particle	or cob es are : mbedd	20 to	Gravel o particles 40% em	are 30 to	Gravel o particles embedde	are >40%	Comple embedd	
10 9	1	<b>3)</b> /	7	6	5	4	3	2		1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	t/invertet	orate Habi	itat	
available. stage to a	, Hab allow ion (v	es of habitat itat is at a full insect voody debris reshly	Son exis tree hab	4 types ne pote sts, sucl s, whic itat, but ered the	ntial ha n as ove h will pr have n	bitat erhanging ovide ot yet	The subst disturbed, removed l velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	19.	8	7	6	5	4	3	2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

		Key: Th	is perta	ains to	water	ways who	/ Cover ere channel er fishery	is 50 feet wid	de or less.	
shaded	generally	ream 2 to	>75%	5 in rea eam 2	led in r Or ach, bu to 3 m		20 to 50%	shaded.	<20% of water surface in reach shaded.	
10)	9	8	7	6	5	4	3	2	1	

	Abando	ned Mine Dr	ainage (if ap	olicable)	· · · · · · · · · · · · · · · · · · ·
(Intentionally blank)	Evidence of i Noticeable irc	ron staining. Or on precipitate.	Iron precipit muddy oran appearance	ge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

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	Sewage (if	applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
		And	
	•	Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure	Presen	ce (if applic	able)	
(Intentionally blank)	Evidence of lives access to riparia		stream or	al manure in waste storage ocated on the	Extensive amount of manure on banks or in stream. Or
· .					Untreated human waste discharge pipes present.
	5	4	3	2	1

## **NOTES**

	ʻs' Namo	€S	,	K	S, CB			Date:	C	7/20	1/07
Sub-Wate	ershed _		<u>Bsc</u>		<u>5 сВ</u> Stream	Name	BSC	83-	-) \	·5~	
Stream Na	ame		BSC		Referen	ce Sectio	on				
Weather C	Conditio	ns Tod	ay	Varth	1 Sway ~77	<u>P</u> Past	2-5 Days	50	cttered	she	iver)
Active Ch				1	,,,		. •				
							. (9/ ).	<u></u>			<u> </u>
Grazing Pa	eture		<u> </u>		USE WITHIN DF		: (%): 5	Row C	Tops		
Forest			80		lential		15	Industr			
Commercia	al			Aban	doned Mine Lan	ds		Other			
					SUBSTRATE	(%):		\	Bed	vock	•
Boulder	<u> </u>		obble	10	┉┶┉┉╴┈╸┷┉┉╴┈╸┷╻┉┉	10	Silt/Mal		t		70
	DESCR	IBE TH	E LAND L	JSE OF	THE AREA TH	AT THE S	STREAM F	LOWS	THRO	UGH:	
	<u></u>		<u>·</u>	<u>_</u>	·	<u>.</u>					
· · · ·			<u></u>		······································			<u> </u>		~	
<u></u>				G	PS POINTS / PH	IOTOS:					
Naypoint	Photo	Descri					· · · · · · · · · · · · · · · · · · ·		-~	pH	Cond
. 84	_23_	Dra	in from	<u>rea</u>	d - sedi	mitat	ian	·· <del>··</del> ····			
-82-		Dri	idge or	<u>&gt; &gt; p =</u>	g Rd	ent of	Jectio	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		<u> </u>	
83	.21_	15"	CPP 5	.w. pir	C - ATV )	<-inst	on cha	vel			
	22	vi	in ups	freen	@ small	riffler	across-	bedrec			
							4	<u>substr</u>	ate	[	
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BSC 83 -> 85 7/24/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	Gabian wall @ house w/ ATVs
Water appearance	9	
Nutrient enrichment	6	heavy algae on bedrock substate
Fish barriers	8	
In-stream fish cover	5	bedrock
Embeddedness	8	
Invertebrate habitat	7	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	۲/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	7.6	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream Section Name: \_\_\_\_ Date:

#### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					С	hann	el Conditi	on	
structu eviden Cutting	al channel; r ires, dikes. ice of down- g or excessi cutting.	No	chai with of cl Any set I acce	signific hannel dikes o back to	eration, cant rec and bai or levies provide an adeq	overy nks. s are	the reach and/or ch Excess a braided c	nannel; <50% of with riprap annelization. g <b>gradation</b> ; hannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	(8)	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

			-	Rip	oarian Zo	ne		
Natural Vegetation extends at least tw active channel widths on each sid	o ex ch e. ea	atural veg ktends one nannel wid ach side. Or	e active th on			extends the active width on	/egetation a third of e channel each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.					Filtering moderate comprom	ely	Lack of regeneration. Or Filtering function severely compromised.
10 9	8	7	6	5	4	3	2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream	Section	Name:
		Date:

BSC	83	4	<u> </u>
7	124	10	7

	Wa	ter Ap	pearance	. m	
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy objects visible at de 1.5 to 3 ft; may have slightly green color; sheen on water sur	epth e no oil	Considerable c most of time; ol visible to depth ft; slow sections appear pea-gre rocks or subme objects covered heavy green or green film. Or	bjects 0.5 to 1.5 s may en; bottom rged I with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			Moderate odor ammonia or roti		Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nut	trient	Enrichme	nt	
reach; commu	vater along diverse ac unity little 1 present.	luatic plant algal	gree entir alga	nish w e reac	or sligh ater alo h; mode rth on sl	ng erate	entire rea algal gro	water along ach; <b>abundant</b> wth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	<b>Barriers</b>			
No barriers	<b>3.</b>	witi	vemen	water Is inhibit t within the	culverts diversio	ructures, s, dams or ons (<1ft ithin the	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

					In	strea	m Fish Cov	er		
>7 cover available		1	7 cover lable	types		4 to 5 d availaț	cover types Ne	2 to 3 co available	over types	None to 1 cover type available
10	9	8	7	6	(	5 /	. 4	3	2	1
			£20.00		<u> </u>		•	•		• • • • • • • • • • • • • • • • • • • •

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, tiffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

BJC 83 7 85 7/24/07

					Embe	ddedness			
Gravel or cobble particles are <20% embedded.	p	artic	l or co es are mbed	e 20 to		or cobble are 30 to bedded.	Gravel of particles embedde	are >40%	Completely embedded.
10 9	8		7	6	5	4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	t/invertel	orate Habi	tat	
availab stage to coloniz	t 5 types o le. Habita o allow fu ation (woo is not fres	t is at a I insect ody debris	Son exis tree hab	4 types ne pote its, such s, whic itat, but ered the	ntial ha h as ov h will pi have r	bitat erhanging rovide not yet	The subst disturbed, removed b	es of habitat. rate is often covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	8 (	7)	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

		Key: Th	is perta	ains to	water	ways <b>w</b> h	y Cover ere channel er fishery	is 50 feet wi	de or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.> 50%>75% i upstrea shaded.				in rea eam 2	Or ach, bu		20 to 50%	shaded.	<20% of water surface in reach shaded.
10	(9)	8	7	6	5	4	3	2	1

	Abandoned Mine Drainage (if applicable)										
(Intentionally blank)		f iron staining. Or iron precipitate.	Iron precipi muddy orar appearance	ige	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.						
	5	4	3	2	1						

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

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Stream Section Name: <u>BSC 83 7 85</u> Date: <u>7/24/07</u>

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Sewage (if applicable)									
(Intentionally blank)	Noticeable odor, excess plant growth and siltation		Visible pipe with effluent, heavy odor.						
· · ·		And							
		Questionable pipe and black stream substrate.							
	5 4	3 2	1						

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)								
(Intentionally blank)	Evidence of livesto access to riparian	zone.	Occasional n stream or wa structure loca flood plain.	ste storage	Extensive amount of manure on banks or in stream. Or			
· .					Untreated human waste discharge pipes present.			
	5 4	4	3	2	1			

**NOTES** 

Sub-Watershed	es	KS CB	_ Date:0	7/24	107	
	ßsC	Stream Secti	on Name	BSC 83 -	→ 83	. **** }
Stream Name	BSC	Reference Sec	ction			
		Partly Sunny, ~77 F P	ast 2-5 Davs	scattered	sha	~~)~
		and read the second sec				
Active Channel V	Vidth: <u>~ 7</u> leet	· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·
		LAND USE WITHIN DRAINA	GE (%):			
Grazing Pasture		Grassy Field	5	Row Crops		
Forest	80	Residential	15	Industrial		
Commercial		Abandoned Mine Lands		Other		······································
		SUBSTRATE (%):			lvoc K	
Boulder	Cobble	0 Gravel 10				70
DESC	RIBE THE LAND U	SE OF THE AREA THAT TH	IE STREAM	FLOWS THRO	UGH:	
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				
· · · ·		· · ·				
<u> </u>						<u></u>
		GPS POINTS / PHOTO	S:			
Waypoint   Photo	Description		-		рН	Cond.
84 23	Drain fram	read - sediment	ation			
83	Bridge or	Sping Rd end	of secti	war	· ·	
83 21	15" CPP 5.	W. pipe - ATV X-in	gs on ch	ane -	-	
22	view ups	tream C small riffi	or across	substrate_	- <u> </u>	
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Stream	Section	Name:	
		Date:	

BSC 83 -> 85 7/24/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	Gabian wall @ howe w/ ATVS
Water appearance	9	
Nutrient enrichment	6	heavy algae on bedrock substate
Fish barriers	8	
In-stream fish cover	5	bedrock
Embeddedness	8	
Invertebrate habitat	7	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	A/4	
TOTAL SCORE (Add all scores and divide by number of scores given)	7.6	< 6.0 = POOR 6.1 - 7.4 = EAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream	Section	Name:
		Date:

#### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Channe	I Condition	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess <i>aggradation</i> ; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 (8)	7 6 5 4	3 2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

BS	С	8	3 -3	>	85
	7	12	4/	0	7

		V	Vater Ap	pearance		· · ·		
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	objects 1.5 to 3 slightly g	nally clou visible at ft; may ha green colo n water s	depth ave or; no oil	most of time visible to de ft; slow secti appear pea- rocks or sub objects cove heavy green green film.	pth 0.5 to 1.5 ions may green; bottom merged ared with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.		
				Moderate od		Or		
				ammonia or	rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.		
10 (9) 8	7 6	5 5	4	3	2	1		

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

			-		Nu	trient	Enrichmer	nt	
reach; commu	vater alon diverse ad inity little i present.	quatic plant algal	gree entir alga	nish w e reac	r or slig vater alc h; mod vth on s	ong erate	entire rea	water along ch; abundant wth, especially rmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	(6)	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers			
No barrie	rs.	with			Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

				• •	Ins	strea	m Fish Cov	er		
>7 cover typ available	oes	6 to avail	7 cover able	types		l to 5 vailai	cover types ple	2 to 3 co available	ver types	None to 1 cover type available
10	9	8	7	6	17	5 /	• 4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, (iffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name
		Date:

BJC 83 7 85 7/24/07

				Embed	ddedness				
Gravel or cobble particles are <20% embedded.	6   p	Gravel or co particles are 0% embed	e 20 to	Gravel o particles 40% eml	are 30 to	Gravel o particles embedde	are >40%	Completely embedded.	
10 9	8	1) 7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	t/invertel	orate Hab	itat	
availab stage to coloniz	t 5 types o le. Habita o allow ful ation (woo gs not fres	t is at a l insect ody debri	Son exis s tree hab	4 type: ne pote its, sucl s, whic itat, but ared the	ntial ha n as ov h will pi : have r	bitat erhanging rovide not yet	The subs disturbed removed velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	8	(7)	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobple) boulders, coarse gravel, other:

		Key:	This per	tains to	o water	ways wh	y Cover ere channel i ter fishery	s 50 feet wi	de or less.	
shaded	d and u s gener	r surface ostream 2 f ally well	o >75 ups	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>				20 to 50% shaded. <20% of wate reach shaded		
10	(9	8	7	6	5	4	3	2	1	

	Aband	oned Mine D	rainage (if aj	pplicable)	
(Intentionally blank)		f iron staining. Or iron precipitate.	muddy ora	•	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

. . .

Stream Section Name: <u>B5C 83 - 7 85</u> Date: <u>7/24/07</u>

	Sewage (if applicable)						
(Intentionally blank)	Noticeable od plant growth a		plant grow	e odor, excess /th. And	Visible pipe with effluent, heavy odor.		
				ible pipe and am substrate.			
	5	4	3	2	1		

Mark discharge(s) on map and/or with GPS unit.

	Manure Presen	ce (if applicable)	·····
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or
· .			Untreated human waste discharge pipes present.
	5 4	3 2	1

## <u>NOTES</u>

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ub-Watershed	·····	RK, KS, CB	<u> </u>	Date:	07/24/	107-
	ßsc	Stream Secti	on Name	BSC. 7	-> 76	
		Reference Sec		-		
		sumy ~77 F P				
		$\frac{1}{1}$	ast 2-5 Days _	8 calle	<u>ra onm</u>	-rj
ctive Channel Wic	th: 🔨 🛧 feet					
		LAND USE WITHIN DRAINA	GE (%):			• • • • • • • • • • • • • • • • • • •
razing Pasture		Grassy Field	10	Row Crop	S	
orest	80	Residential	10	Industrial		
ommercial		Abandoned Mine Lands		Other		
	_	SUBSTRATE (%):			Bedrock	
Boulder D	Cobble	20 Gravel 10	Silt/mu	20	Mud	40
DESCRIE	E THE LAND L	JSE OF THE AREA THAT TH	IE STREÀM F	LOWS TH	ROUGH:	
	•					
		· · ·			<del></del>	
·						
	····	GPS POINTS / PHOTO	S:			
aypoint Photo [	Description				<u> </u>	Con
₹	drainagen	vay from opp. alde			7.57	63
F3	Toma - co	otta pipe (12" Of and	1 smald		Váj	<u> </u>
	bank ei	rosion - view dawns		road		
23 11		e from and of read		1021		┼──
74 12	island		n & conpl.		2	- <u> </u>
13	G h	igh back crossion,	just d.s. a	F Marka	nen PK. Rd	
75 14	Sinua		w/ debris			
7-6 15	on - she	can wetland poind		spann		
1			p w/	<u>e Rd.</u>		
<u>16 /00</u> \$	bad bank	certific betw. road	d and we	<u>lad</u>		<u> </u>
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		· · · · · · · · · · · · · · · · · · ·				
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·····				P.74 W		
				•		
	ent: Yes (No)	□ Japanese Knotweed □ G	Garlic mustard	D Purple I	oosestrife [	

Stream	Section	Name
		Date:

»: <u>BSC 7(→76</u> <u>7/24/07</u>

Parameter	Score	Explanation of Score Given
Channel condition	6	
Riparian zone	8	
Bank stability	6	
Water appearance	8	
Nutrient enrichment	8	
Fish barriers	1	On-streen pand @ Markenan Parke Rd.
In-stream fish cover	7	
Embeddedness	8	
Invertebrate habitat	7	
Canopy Cover	7	
AMD (if applicable)	NA	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	r/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.6	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream Section Name: \_\_\_\_\_\_BSC 7 Date: \_\_\_\_\_7/

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	<u>hann</u>	el Conditio	n	
structu eviden	I channel; no res, dikes. N ce of down- or excessiv cutting.	lo	char with of ch Any set b acce	inel ali signifi annel dikes ack to	of past teration, cant rec and bai or levies provide an adeq	overy nks. s are e	the reach v and/or cha Excess <i>ag</i> braided ch	annel; <50% of with riprap nnelization. <b>gradation</b> ; annel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	8	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

**Keys:** look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	channel width on	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or
				Filtering function severely compromised.
10 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 (6/54	32	1

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

BSCZ	1 >>	76
<u>60</u>	·/24	07

		Water Ap	pearance		
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally o objects visible 1.5 to 3 ft; may slightly green sheen on wate	at depth y have color; no oil	Considerable of most of time; of visible to depth ft; slow section appear pea-gro rocks or submo objects covere heavy green o green film.	objects n 0.5 to 1.5 ns may een; bottom erged ed with r olive-	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			Moderate odor ammonia or ro		Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 (8)	7 6	5 4	3	2	. 1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient Enrichment										
reach; commu	vater along diverse aq unity little n present.	juatic plant algal	gree entii alga	ly clear enish wa e reach I growt strates.	ater alo n; <b>mod</b> e	ong erate	entire rea	a water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.		
10	9		7	6	5	4	3	2	1		

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

	Fish Barriers												
No barrier	S.	with			Drop stru culverts, diversion drop) wit reach.	dams or is (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop s culvert diversi drop) v reach.	s, dan ons (> vithin t	ns or 1ft		
10	9	8	7	6	5	4	3	2		(1)	)		

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover										
>7 cover types available		7 cover able	types	4 to 5 co available		2 to 3 co available	ver types	None to 1 cover type available		
10 9	8	(7)	6	5	4	3	2	1		

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, (iffles) undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream Section Name: Date: BSC 71 + 76 7/24/07

					Embec	Idedness				
Gravel or o particles a embedded	re <20%	partic	el or co cles are embed	20 to	Gravel or particles 40% emb	are 30 to	Gravel or particles embedde	are >40%	Completely embedded.	
10	9	8	7	6	5	4	3	2	1	

**Keys**: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	t/invertel	orate Habi	tat	
availabl stage to coloniza	5 types o le. Habitat allow ful ation (woo s not fresl	is at a insect dy debris	Som exist trees habi	ie pote is, sucl s, whic tat, but	s of hab ntial ha h as ove h will pr t have n stream	bitat erhanging ovide ot yet	The substi disturbed, removed b	es of habitat. rate is often covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	8 -	7/	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse) gravel, other:

Key: Tł	nis per	tains to	o waten	Canopy ways whe Coldwate	ere channel i	s 50 feet wid	de or less.
<ul> <li>&gt;75% of water surface shaded and upstream 2 to 3 miles generally well shaded.</li> <li>&gt;50% shad</li> <li>&gt;75% in reaupstream 2 shaded.</li> </ul>				t	20 to 50%	shaded.	<20% of water surface in reach shaded.
10 9 8	[7]	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)		iron staining. Or ron precipitate.	Iron precipi muddy orar appearance	nge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.				
· · · · · · · · · · · · · · · · · · ·	5	4	3	2	1				

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.



Stream Section Name: \_\_\_\_ Date: \_\_\_\_

ßs	C	71	4	- 7	26
	7	12	Y/	0	Ŧ

		Sewage (if a	applicable)		
(Intentionally blank)	Noticeable od plant growth a	•	plant growt	odor, excess h. And	Visible pipe with effluent, heavy odor.
			Questionab black stream	le pipe and m substrate.	
	5	4	3	2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)									
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure in stream or waste storage structure located on the flood plain.							
			Untreated human waste discharge pipes present.						
	5 4	3 2	1						

# **NOTES**

	Bi	g S	ewickle	ey Cro	eek W	atershe	d Vi	sual A	ssessr	nent	ł	
Evaluato	rs' Name	es		RK.	KS	CB	•		Date:	7./:	24/0	7-
Sub-Wate	ershed _		3 ig Scui	deley i	Crrek_	<u>С</u> В Stream Se	ection N	Name	BSC G	$\sim$	70	
Stream N	ame		BSC	·	H	Reference	Section	n			-	
Weather	Conditio	ns To	oday	Jum	W ~	77'F	_ Past 2	2-5 Days	569	ifered s	have	5 75°1
			~ <u>%</u> feel		те ,			•				. avg
				LAND	USE WI	THIN DRA	INAGE	(%):				
Grazing P	asture				ssy Field			10	Row Cro	· · · ·		
Forest			70		idential			20	Industria	1		
Commerc	al			Aba		Mine Lands			Other			
	- <u>r</u>			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		STRATE (%		011/		<u>Bed</u>	<u>ndc</u>	
Boulder	10		Cobble		Grav	¥		Silt/Mud			<u> </u>	20
						REA THAT	THE S	TREAM F	LOWS T	HROUG	H:	
Are	<u>q</u> alan	9	Varendal	<u>e – D</u> e	yre Ko	<u>.</u>						
							· · · · · · · · · · · · · · · · · · ·					
					GPS POI	NTS / PHO	TOS:					
Waypoint	Photo	Des	cription					<u></u>	. • <sup>ا</sup> نت <del>بر ایک دی</del>	q	H	Cond.
66	1			ren k	350 0	n Bigse	w. Cr	. Rd.			.64	630
67	2-3					is jan			moved		•	
68	4		big de		ian_			1		•		
69	5-6	n(0	minma			lebris_	jum.	1				
70	<u>+</u>	1 emp	draina	<u>ye co</u>	<u>ining f</u>			ale = B	ayne K	d /		
i						<u> </u>	ridge?	) ena	2101 50	CFID		
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						<u></u>	··			•		
Invasive p Trash / Lit	ter: Yes	/ No		V	rone_	Knotweed					itrife 🗆	I Other
Floodplair Flooded a			No. Constanting		••	nate size:	-			feet		
			- (									
Notes:												

Stream Section Name: Date:

BSC 66-70 7/24/07

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	9	
Bank stability	- 8	۰ ۲
Water appearance	8	
Nutrient enrichment	6	algae on rocks in substrate
Fish barriers	5	man-made dans on-stream
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	9	•
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	N/A	•
TOTAL SCORE (Add all scores and divide by number of scores given)	7.7	< $6.0$ = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > $9.0$ = EXCELLENT

Stream	Section	Name:
		Data

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

				C	hann	el Conditio	on	
Natural channe structures, dike evidence of do Cutting or exce lateral cutting.	es, No wn-	char with of ch Any set b acce	ence o nnel alte signific annel : dikes c back to ess to a l plain.	eration ant rec and ba or levies provide	covery nks. s are ə	the reach and/or ch Excess ag braided cl	nannel; <50% of with riprap annelization. ggradation; nannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9	8	(7)	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
- Contraction of the second	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	·
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		Water A	ppearance		
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	1.5 to 3 ft; r slightly gree	ble at depth	most of tim visible to de ft; slow sec	epth 0.5 to 1.5 tions may I-green; bottom bmerged ered with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			Moderate o ammonia o	dor of r rotten eggs.	Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 (8)	76	5 4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichme	nt	
reach; commu	water along diverse ac unity little h present.	juatic plant algal	gree entir alga	y clear nish wa e reach I growt strates.	ater alo i; mod	ong erate	entire rea algal gro	water along ach; <b>abundant</b> wth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	6)	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fi	sh B	arriers			
No barrie	ers.	with			cuive diver	erts, da sions ) withi	•	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	2	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

			Instream	n Fish Cov	/er		
		types			1		None to 1 cover type available
(8)	7	6	5 4		3	2	1
		6 to 7 cover available (8) 7	6 to 7 cover types available 8 7 6	6 to 7 cover types 4 to 5 co	6 to 7 cover types 4 to 5 cover types		6 to 7 cover types 4 to 5 cover types 2 to 3 cover types

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, rffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name:
		Date:

<u>35666-70</u> 7124107

					Embec	Idedness			
Gravel or particles a embeddec	re <20%	parti	vel or co cles are embed	20 to	Gravel or particles 40% emt	are 30 to	Gravel of particles embedde	are >40%	Completely embedded.
10	9 (	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

		Insect/inve	rtebrate Habi	tat	
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	trees, whicl	ntial habitat n as overhangi n will provide have not yet	The subst disturbed, removed t velocities	es of habitat. rate is often covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10 (9/8	76	5 4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, under out banks, cobble, boulders, coarse gravel, other:

		Key: Th	nis pert	ains to	water	ways wh	<mark>y Cover</mark> ere channel i er fishery	is 50 feet wi	de or less.
shaded	d and up s genera	surface stream 2 to lly well	>75%	% in rea ream 2	ded in r Or ach, bu to 3 m		20 to 50%	shaded.	<20% of water surface in reach shaded.
10	(9)	8	7	6	5	4	3	2	1

	Aband	oned Mine Dr	ainage (if ap	plicable)	
(Intentionally blank)		f iron staining. Or iron precipitate.	Iron precipit muddy oran appearance	ge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name
		Date:

BSC	66 - 70	
7	124/07	_
	£ 1	-

·	Sewa	ge (if applicable)	
(Intentionally blank)	Noticeable odor, exc plant growth and silt		Visible pipe with effluent, heavy odor.
		Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure Presen	ce (if applicable)	
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or
			Untreated human waste discharge pipes present.
	5 4	3 2	1

# <u>NOTES</u>

Evaluators' Name	s	1-13-0	7
Sub-Watershed		BSC	65
Stream Name $\overline{\hat{T}}$	Reference Section		
Neather Conditio	ns Today 80'S , Dry Sunny Past 2-5 Days Same		
ctive Channel W	idth: 25 feet		<u>.</u>
			<u> </u>
Proving Docture	LAND USE WITHIN DRAINAGE (%):		
Brazing Pasture	Grassy Field 20 Row Crops	······································	
commercial	<u>(00</u> Residential <u>10</u> Industrial 10 Abandoned Mine Lands Other		
Fadrock 20	SUBSTRATE (%):	<b>_</b>	
Boulder /0	Cobble 20 Gravel 20 Silt 20	Mud	10
DESCR	BE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THR	. اجسن المست	<u></u>
······································		· · · · · · · · · · · · · · · · · · ·	
	GPS POINTS / PHOTOS:		
/aypoint Photo	Description	pН	Cond
546 126	start / welland		
-1# <b>]</b>	Braca Book / Incoming this from west north up	p ahrad	
F662 #-B	Riproplastike on bonde retuid have		
63 49	These Itim (ulgae-bounsh)	1.55	640
5664 410	Vom / brally Clady Uptar		
	Incoming this (Bost Brk) Buld section - really cloudy		<u> </u>
<u>-</u>			
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1 1	· · · · · · · · · · · · · · · · · · ·		· .

		n see	- A strength
Floodplain wetlands: 🏹 🔊 No	If so, approximate size:	Length $\underline{\mathcal{L}^{S}}$ / Width	<u>_25</u> feet
Flooded areas: Yes /(No)(Wetland	or other)	·	

Notes:
Big Sewickley Creek Visual Assessment Stream Section Name: <u>BSC 61-65</u> Date: \_\_\_\_\_

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	9	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	7.	
Fish barriers	5	
In-stream fish cover	8	
Embeddedness	7	
Invertebrate habitat	8	
Canopy Cover	\$	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	73/10 7.3	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream Section Name: BSC 61-65

Date:

## Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	hanne	el Conditio	n	
Natural c structure evidence Cutting o lateral cu	s, dikes. of down r excessi	No -	cha with of c Any set acc	dence o innel alt signific hannel dikes o back to ess to a d plain.	eration, cant rec and bai or levies provide n adeq	overy nks. s are	the reach v and/or cha Excess <i>ag</i> braided ch	annel; <50% of with riprap nnelization. gradation; annel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	8	(7)	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
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	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	· .
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	· 1

Keys: All outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

					W	ater Ap	pearance	e	· · · · · · · · · · · · · · · · · · ·
colored depth 3 slightly sheen c noticeal	ear, or cle ; objects v to 6 ft (le colored); on surface ble film or ged objec	ss if no oil ; no 1	obje 1.5 sligi	ects vis to 3 ft; ntly gre	ally cloud sible at c may ha een colo water su	lepth ve r; no oil	most of ti visible to ft; slow se appear pe rocks or s objects co heavy gre green film Moderate	Or	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8,	(7)	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient Enrichment										
reach; commu	water alon diverse ad unity little n present.	quatic plant algal	gre ent alg	rly clear enish wa ire reach al grown strates.	ater alo i; mod	ong erate	entire re algal gr	h water al ach; <b>abu</b> o <b>wth</b> , esp ⁄armer mo	ndant becially	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.	
10	9	8	(7)	6	5	4	3		2	1	

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		with				•	Drop structures, diversion drop) with reach.	dams or s (>1ft	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

					Instream	Fish Cov	er		
>7 cover available	· · ·	1	7 cover lable	types	4 to 5 co available		2 to 3 co available	ver types	None to 1 cover type available
10	9	85	7_	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:

BSC 61-65

Stream Section Name: BSC 61-65 Date:

	Embeddedness								
Gravel or particles a embedded	re <20%	partic	cles	cobble are 20 to edded	particle	or cobble s are 30 to nbedded.	Gravel of particles embedde	are >40%	Completely embedded.
10	9	8	7 7	56	5	4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

	Insect/invertebrate Habitat											
At least 5 types of hab available. Habitat is at stage to allow full inse colonization (woody de and logs not freshly fallen).	ta ict	Some p exists, trees, v habitat,	ypes of hat ootential ha such as ove vhich will pr , but have n I the stream	bitat erhanging ovide ot yet	The subst disturbed, removed t velocities	es of habitat. rate is often covered, or by high stream and scour or by deposition.	None to 1 type of habitat.					
10 9 8		7	6 5	4	3	2	1					

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

Key: Thi	Canopy C is pertains to waterways where Coldwater	e channel is 50 feet wide	or less.			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>	20 to 50% shaded. <a></a> 20% of water surface i reach shaded.				
10 9 (8)	7 6 5 4	3 2	1			

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.						
	5 4	3 2	1						

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.



Stream Section Name: \_\_\_\_\_\_BSC\_161-65\_\_\_\_\_ Date: \_\_\_\_\_\_

		Sewage (if	applicable)		· · · · · · · · · · · · · · · · · · ·
(Intentionally blank)	Noticeable c plant growth	odor, excess and siltation.	plant grow	odor, excess th. And	Visible pipe with effluent, heavy odor.
				ble pipe and im substrate.	· ·
	5	4	3	2	1

Mark discharge(s) on map and/or with GPS unit.

	Manu	re Presen	ce (if applic	cable)	·
(Intentionally blank)	Evidence of liv access to ripar		stream or	al manure in waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
					Untreated human waste discharge pipes present.
	5	4	3	2	1

# **NOTES**

Evaluators	s' Names	KS/SA	}	<u> </u>		_ Date: 7/	13/07	7					
				Date: <u>7/13/07</u> Stream Section Name <u>BSC 53 - BSC-60</u>									
		SC	Refer										
Weather C	ondition	e Today 80	s, Dry, Su	nnl Pas	t 2.5 Dave	Same							
			an man an	ring ras	1 2-0 Day:	<u>scurre</u>	<u></u>						
Active Cha	annei wid	1th: 30 feet	<u>.</u>										
			LAND USE WITHIN	DRAINAG	E (%):								
Grazing Pa	sture		Grassy Field		20	Row Crops							
Forest		60	Residential		10	Industrial							
Commercia		10	Abandoned Mine L		<u> </u>	Other							
	cx 20		SUBSTRA			r	<b>_</b>						
Boulder	3010		20 Gravel	30	Silt	10	Mud [	10					
l 	DESCRIE	BE THE LAND U	SE OF THE AREA 1	HAT THE	STREAM	FLOWS THR	OUGH:						
		<u> </u>					_ <u></u>						
	· ·		······································			·····							
		· · · · ·	GPS POINTS /	PHOTOS									
Waypoint   I	Photo I	Description		1110100.			Hq	Cond					
35653			- labors liam			<del></del>							
35554		Under past a					10	500					
and the second s		Pebos Jan	/	// ·····		······							
5	#5	Theory Th						<b> </b>					
BECSI BECCA	184	- Convert 6 Den: Late	from winder ??	Vrz 12	start of	bedrocksic	<b>b</b>	<u> </u>					
85654	115	Theoming h		estrand	h PA	Game		<u> </u>					
84.60	· ·	Fad point		<u> </u>	(	onnussion	$\sim$						
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			<u>·</u>										
						····	-						
		• <u>-</u>											
	<u></u>	~											
ivasive pla	nts prese	ent:(Yes) No	X Japanese Knotw	veed 🗖 Ga	rlic mustai	rd 🗇 Purple lo	osestrife [	10					
rash / Litter	r:Yes//	Ø	. <u></u>				<u> </u>						
	<b>.</b>		so, approximate si		13.0	r Iui							

Flooded areas: Yes / No (Wetland or other)

Notes:

Big Sewickley Creek Visual Assessment Stream Section Name: <u>bsc 53-60</u> Date:

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	9	
Bank stability	8	
Water appearance	9	
Nutrient enrichment	5	No notable schage / pipes but lots of brown/black algre
Fish barriers	5	0 /0 /0
In-stream fish cover	q	
Embeddedness	7	
Invertebrate habitat	9	
Canopy Cover	8	· · ·
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	7.7	< $6.0 = POOR$ 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > $9.0 = EXCELLENT$

Stream Section Name:

BSC 53-60

#### Date:

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	hanne	el Conditi	on		
structo evider Cuttin	al channel; ures, dikes. nce of down g or excess cutting.	No -	cha with of c Any set l	lence of nnel alte signific hannel a dikes o back to ass to a d plain.	eration ant rec and ba r levies provide	covery nks. s are	the reach and/or ch Excess a braided c	nannel; <50% of with riprap annelization. ggradation; hannel. Dikes or strict flood plain	Channel is a downcutting >50% of the riprap or cha Dikes or leve access to the	or widening. reach with nnelization. es prevent
10	9	(8)	7	6	5	4	3	2		1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function
				severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability										
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).								
10 9 8	7 6 5 4	3 2	· 1								

Keys: All outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream Section Name: <u>BSC 53-60</u> Date:

		W	ater A	opearanc	e	· ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasion objects vis 1.5 to 3 ft slightly gra sheen on	sible at o may ha sen colo	depth ive ir; no oil	most of ti visible to ft; slow se appear pe rocks or s objects ce	able cloudiness me; objects depth 0.5 to 1.5 ections may ea-green; bottom submerged overed with een or olive- n. Or	Very turbld or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
				Moderate	odor of	Or
2	· · ·			ammonia	or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient Enrichment												
reach; c commu	ater along diverse ac nity little present.	juatic plant algal	gree enti alga	ly clear enish wa re reach I grow strates.	ater alo a; mode	erate	entire rea	h water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.				
10	9	8	7	6	(5)	4	3	2	1				

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

	Fish Barriers													
No barriers.		with			c d d	ulv ive	p structures, verts, dams or ersions (<1ft p) within the sh.	culverts diversio	ructures, , dams or ns (>1ft ithin 1 mile of	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.				
10	9	8	7	6		(5	) 4	3	2	1				

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

	Instream Fish Cover													
<ul> <li>&gt;7 cover types</li> <li>available</li> <li>by available</li> <li>cover types</li> </ul>					types	4 to 5 co available	ver types	2 to 3 co available		None to 1 cover type available				
10	(9)		8	7	6	5	4	3	2	1				

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffies, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:

Stream Section Name: <u>BSC 53-60</u> Date:

Date:

	Embeddedness													
Gravel or cob particles are < embedded.	partic	el or co les are embedo	20 to	Gravel o particles 40% em	are 30 to	Gravel or particles embedde	are >40%	Completely embedded.						
10	9	8	(2)	6	5	4	3	2	1					

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat												
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.									
10 (9) 8	7 6 5 4	3 2	1									

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

Key: Th	is pertains to waterways w	py Cover here channel is 50 feet w ater fishery	ride or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poor shaded.</li> </ul>	20 to 50% shaded. rly	<20% of water surface in reach shaded.
10 9 (8)	7 6 5 4	3 2	1

	Abandoned Mine Dra	inage (if applicable)	
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.



Sewage (if applicable)										
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth. And	Visible pipe with effluent heavy odor.							
		Questionable pipe and black stream substrate.								
	5 4	3 2	1							

Mark discharge(s) on map and/or with GPS unit.

	Manı	ure Presen	ce (if appli	cable)	·
(intentionally blank)	Evidence of li access to ripa		stream or	al manure in r waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
			· ]		Untreated human waste discharge pipes present.
	5	4	3	2	1

# **NOTES**

Evaluator	s' Nam	es	<u>S</u> A	_ Date:	07/03	5/07		
Sub-Wate	rshed _	Bs	<u>C</u> .	Stream Sectio	n Name	<u>BSC43</u>	$\rightarrow 5$	12
Stream Na	ame	BS	<u>(                                    </u>	Reference Sect	ion	- <u></u>		<u>_</u>
Weather (	Conditio	ons Today	sunny	~ 80°F Pas	st 2-5 Days	M05	ly su	<u>my_</u>
Active Ch	annel V	Vidth: 15 feet					•	
			LAND US	E WITHIN DRAINAG	E (%):		· · · · · · · · · · · · · · · · · · ·	<del></del>
Grazing Pa	asture		Grassy			Row Crops		^.
Forest		70	Residen	itial	20	Industrial		
Commerci	al	5		ned Mine Lands		Other (read	<u>.s-)  </u>	
				SUBSTRATE (%):	<u> </u>		dark_	
Boulder	5			Gravel 30		35 4		<u> </u>
				HE AREA THAT THE	·			
tewsm	all C Function	<u>stopes</u> .	ablishmet	-, then mostly	<u>privek</u>	hear summ	ded b	<b>У</b>
	<u>, -icj /icj</u>	<u>steps</u>						
			GPS	POINTS / PHOTOS				
Waypoint	Photo	Description			·····		pН	Conc
43		start pol	nt (c) G	-aydos Lane brie	dge	10. P1		
44				int. of BSC R. up in middle				
46	2	Chen Di	V - b	lack plastic pi	pes			╆────
47	3	conflu		h Nork Fork	·		8.21	
4	<u>4</u> 11	<u> </u>		(abare	<u>cafl.</u> BSC	C main ston	7.99	650
48		Jean.	buike up	ian @ sanitar				<u> </u> -
	5	bank 1	retion	with deep hol	e a surg	·		<b> </b>
	G	shot u	p @ S	1 commer /sty.				
49	_ <u>+</u>	<u> </u>	dum hill	side from blau	have.	All a tation	┟────	
51	9	Deb	rib cani	h ry nave-	- NOUVY S	edimetatia		<u> </u>
52		Flourt	~	Hard   end put	nt.			[
		•						<b> </b>
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	<u>}</u>						<b> </b>	
	_ <u></u> _		7				<u> </u>	<del></del>
Invasive pla	ants pre	esent:(Yes) No		nese Knotweed 🗖 Ga	arlic mustar	d 🗇 Purple loos	sestrife [	J Other
Trash / Litte	er:(Yes)	No <u>ver</u>	y little	·				
Floodplain	wetland		T C	oximate size: Lengt	h <u>l,000</u> /W	idth <u>400</u> feet		
_		s / No(Wetland)						
						hages / dam		<u> </u>

Big Sewickley Creek Visual AssessmentStream Section Name: $\beta 5C - (3 - 3)$ Date:-7/3/07

Parameter	Score	Explanation of Score Given
Channel condition	5	
Riparian zone	7	
Bank stability	5	
Water appearance	7	
Nutrient enrichment	6-	
Fish barriers	G	
In-stream fish cover	8	
Embeddedness	7	- -
Invertebrate habitat	8	
Canopy Cover	8	
AMD (if applicable)	NA	
Sewage (if applicable)	5	
Manure presence (if applicable)	n/n	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.55	<6.0 = POQR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					· (	Chann	el Conditi	on	
structu evider Cutting	al channel; ures, dikes. nce of down g or excess cutting.	No ŀ-	cha with of c Any set l acce	lence c nnel alt signific hannel dikes c back to ass to a f plain.	eration cant re and ba pr levie provid an ade	n, but covery anks. es are le quate	the reach and/or ch Excess ag braided cl	nannel; <50% of with riprap annelization. ggradation; nannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	8	7	6	(5)	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 (7) 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability												
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).										
10 9 8	7 6 (5) 4	3 2	. 1										

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

				W	ater A	opearanc	e	
Very clear, or cle colored; objects depth 3 to 6 ft (le slightly colored); sheen on surface noticeable film or submerged object rocks.	visible at ess if no oil e; no n	ob 1.5 slig	jects vi 5 to 3 ft ghtly gr	ally clou isible at c ; may ha een colo water st	depth ive ir; no oll	most of t visible to ft; slow s appear p rocks or s objects c	rable cloudiness ime; objects depth 0.5 to 1.5 ections may ea-green; bottom submerged overed with een or olive- n. Or	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
		6			•	Moderate   ammonia	e odor of or rotten eggs.	Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

·	Nutrient Enrichment												
reach; commu	vater along diverse ac inity little i present.	iuatic plant algal	green entire	ish w reac grow	r or sligl ater alc h; mod /th on s	ong erate	entire re algal gro	n water along ach; <b>abundant</b> o <b>wth</b> , especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.				
10	9	8	7 (	6)	5	4	3	2	1				

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

	·				~~	Fish	Barriers			
No barrie	parriers. Seasonal water withdrawals inhibit movement within the reach.		Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.			
10	9	8	7	6		5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

					Instrean	n <mark>Fish</mark> Cov	er		
>7 cover typ available	Des	1	o 7 covel ailable	types	4 to 5 co available	over types	2 to 3 co available	ver types	None to 1 cover type available
10	9	(8)	) 7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffies, undercit banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

BSC 43 + 52 7/3/07

			_		Embed	dedness			
Gravel or particles a embeddec	re <20%	Gravel particle 30% ei	es ar	e 20 to	Gravel o particles 40% eml	are 30 to	Gravel or particles embedde	are >40%	Completely embedded.
10	9	8 (	7/	6	5	4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	t/inverte	brate Hab	oitat		
availab stage t coloniz	it 5 types ble. Habita o allow fu ation (wo js not fres	it is at a Il insect ody debri	Som exists trees habit	e pote s, sucl , whic at, but	s of hat ntial ha h as ov h will pr have n strean	bitat erhanging ovide not yet	The subs disturbed removed velocities	bes of habitat. Strate is often I, covered, or by high strean and scour or deposition.	1	be of
10	9	(8)	7	6	5	4	3	2	1	

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobbile, boulders, doarse gravel, other:

Key	This pertains	to wate	ways wh	y Cover ere channel i er fishery	is 50 feet wid	de or less.
>75% of water surface shaded and upstream 3 miles generally well shaded.	to >75% in r	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly</li> </ul>			shaded.	<20% of water surface in reach shaded.
10 9 8	7 6	5	4	3	2	1

· · · · · · · · · · · · · · · · · · ·	Abando	oned Mine Dra	ainage (if ap	plicable)	·
(Intentionally blank)		iron staining. Or ron precipitate.	Iron precipi muddy orar appearance	ige	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
······································	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream Section Name: Date:

BSC	43	952
	7/3	107

		Sewage (if	applicable)		· · · · · · · · · · · · · · · · · · ·
(Intentionally blank)		e odor, excess /th and siltation.	plant grow	e odor, excess th. And	Visible pipe with effluent, heavy odor.
				ble pipe and am substrate.	
	5)	4	3	2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure Presence (if applicable)								
(Intentionally blank)	Evidence of livestock access to riparian zone	Occasional manur stream or waste st structure located of flood plain.	torage	Extensive amount of manure on banks or in stream. Or					
				Untreated human waste discharge pipes present.					
	5 4	3	2	1					

## **NOTES**

wildlife :

blue horans, bird w/ nort in bank, fish, cray fish

Evaluators' Names	5	A/CB		_Date:	07/03/	07
		Stream Section			1 1	
		Reference Secti		•		
Weather Conditions T	odav Sahi	<u> </u>	t 2-5 Davs			
Active Channel Width:	*		,			
						<u> </u>
Crazing Decture		USE WITHIN DRAINAG	E (%):	Davy Ore		
Grazing Pasture	· · · · · · · · · · · · · · · · · · ·	ssy Field idential	15	Row Cro	<u> </u>	15
Commercial		ndoned Mine Lands	92	Other		
		SUBSTRATE (%):		<u>, I · · ·</u> _	bednetx	<u> </u>
Boulder 195	Cobble 25	Gravel	Silt/mu	20	Mad	50
DESCRIBE '	THE LAND USE O	F THE AREA THAT THE	STREAM	FLOWS T	HROUGH:	
·····	· · · · · · · · · · · · · · · · · · ·	······································				
		• 				
k lot of algan				····.		
		GPS POINTS / PHOTOS				
	scription	F bridge @ Wine C	in to of	<u><u><u></u></u></u>	pH	Con
35 1 4	ansm - Semichter	Creek plant	MATE UL	<u></u>	7.54	67
3	shot upstream	alma Hanra pro	perty			
36 3-45	sewage treatm	at plant, green/b	uck dis.	<u>chase po</u>	int	
6-7 BI	ve heren walki	ng upstream	1			
	Wige plant ant	ef structure → con' - crap, dead fi	<u>t see en </u>	t or pipe		
39 12	private hover	. Small arren pla	stir oid	er coniu	art 7,69	935
13 +	ire bank sta	small green pla bilization				
40	4" O gren pl	astic pipe - sewage	. 7			
41 15 U	iew dawnstree	in the the	1-2		7.54	
16-17	the Human w/	e out of streamberrage Fish	14/1 <sup></sup>	<u>_</u>	<u> </u>	1110
				······································		
						ļ
	<u> </u>					
	<u></u>				· · · ·	<del> </del> .
				· · · · · · · · · · · · · · · · · · ·		<u> </u>
	· · ·	· · · · · · · · · · · · · · · · · · ·				<u> </u>
nunctus planta procesi		∕ Iapanese Knotweed 🗖 Ga	orlia muetar	rd 🗖 Durol	o loosostrifo	
			ano musidi	սեւտին		
Frash / Litter: Yes) No					<b>A A</b>	
		approximate size: Lengt			teet	
Flooded areas: Yes / N	o (Wetland or othe	er)				
		· / ····				

Big Sewickley Creek Visual AssessmentStream Section Name: $\beta SC 34 - 42$ Date:-7/3/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	
Water appearance	7	
Nutrient enrichment	5	
Fish barriers	6	
In-stream fish cover	8	
Embeddedness	6	
Invertebrate habitat	8	
Canopy Cover	8	
AMD (if applicable)	N/A	
Sewage (if applicable)	4	· ·
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	6,91	< $6.0 = POOR$ 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > $9.0 = EXCELLENT$

Stream Section Name:  $\beta s c 34 \rightarrow 42$ Date: 7/3/07

## **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	hann	el Conditio	on	
structu eviden Cutting	al channel; ares, dikes, ace of down g or excess cutting.	No 1-	cha with of c Any set l acce	signific hannel dikes back to	eration, cant rec and bar or levies provide an adequ	overy nks. are	the reach and/or cha Excess ag braided ch	annel; <50% of with riprap annelization. I <b>gradation</b> ; annel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	(8)	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 (	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	· · · · · · · · · · · · · · · · · · ·
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	<u> </u>

Keys: All outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream Section Name: <u>B5C</u> Date:

			W	ater Ap	pearance		
Very clear, or clear but tea colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	obje 1.5 sligt	cts vis to 3 ft; ntly gre	illy cloud ible at c may ha en colo water su	depth ive pr; no oil	most of tin visible to o ft; slow se appear pe rocks or su objects co	vered with en or olive-	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
	1				Moderate ammonia d	odor of or rotten eggs.	Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	(7)	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	Itrient	Enrichme	ent	
reach; commu	vater alon diverse ac inity little present.	uatic plant algal	greer entire algal	e reach	ater al i; moo th on s	ong <b>lerate</b> stream	entire rea	n water along ach; abundant owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	6	(5/	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers			
No barrie	rs.	with	_		Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	(6)	5	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

		•			Instream	n Fish Cov	/er				
>7 cover ty available	ypes	6 to avail	7 cover able	types	4 to 5 co available	over types e	2 to 3 co available	over types	None avail	e to 1 cov able	ver type
10	9		7	6	5	4	3	2		1	
		$- \bigcirc -$			2		$\sim$		()	$\bigcirc$	5

Cover types: Logs/large woody) debris, deep hools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

34-742 - 713107

						Embe	ddedness		······	
Gravel or cobble particles are <20 embedded	%	partic	el or cob les are 2 embedd	20 to	I	oarticles	r cobble are 30 to bedded.	Gravel o particles embedde	are >40%	Completely embedded.
10 9		8	7	6 /		5	4	3	2	1

**Keys:** Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

				Insec	:t/inverte	brate Hab	itat	
availab stage to coloniz	t 5 types o le. Habita o allow ful ation (woo is not fres	it is at a Il insect ody debris	exists, si trees, wł	otential ha uch as ov nich will p out have i	abitat erhanging rovide not yet	The subs disturbed removed velocities	es of habitat, trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	$\left( 8 \right)$	7 6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

		Key: T	his per	tains to	water	ways <mark>wh</mark>	y Cover ere channe er fishery	l is 50 feet wid	de or less.
>75% of w shaded an 3 miles ger shaded.	d upst	ream 2 to	> >75		Or ach, bu			% shaded.	<20% of water surface in reach shaded.
10	9	[8]	7	6	5	4	3	2	1

· · · · · · · · · · · · · · · · · · ·	Abandon	ed Mine Dr	ainage (if app	olicable)	
(Intentionally blank)	Evidence of irc C Noticeable iror	ir .	Iron precipit muddy oran appearance	ge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.



		Sewage (if a	applicable)		· · · · · · · · · · · · · · · · · · ·
(Intentionally blank)		odor, excess th and siltation.	Noticeable plant growth	odor, excess h.	Visible pipe with effluent, heavy odor.
·			A	nd	
		$(\tilde{a})$	Questionab black strear		
	5	(4)	3	2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure	Presen	ce (if appli	cable)	4
(Intentionally blank)	Evidence of lives access to riparia		stream o	nal manure in r waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
					Untreated human waste discharge pipes present.
	5	4	3	2	1

# **NOTES**

·	Big	Sewickley	y Creek Watershed V	isual Assessmer	nt	
Evaluators	s' Names		SA/CB	Date:0	3/29/0	»7
Sub-Wate	rshed	BSC	<u>SACB</u> Stream Section	Name	\$ 33	
Stream Na	ame	BSC	Reference Secti	on		
Weather C	ondition	s Today	Reference SectionReference SectionReference Section	t 2-5 Days scattered	T-sto	1rms
Active Cha	annel Wic	dth: <u>32+5</u> feet	,			
			LAND USE WITHIN DRAINAG	E (%):		
Grazing Pa	asture		Grassy Field	Row Crops		
Forest		60	Residential	Industrial	- +	30
Commercia		<u> </u>	Abandoned Mine Lands	Other (vua		10
Deulden		Cabble	SUBSTRATE (%):		edrick	11011
Boulder		╾╺┶╴╼╴╼╴╼╴┥╴╼	30 Gravel 15	╾╼╼┶╼┶╸┉╴┷╺┷		<u>45 9-</u>
			USE OF THE AREA THAT THE	STREAM FLOWS THRO	UGH:	
<u> </u>	Alog_t	rg Sewickly	Crick Rd.			
			GPS POINTS / PHOTOS:			
Waypoint	Photo	Description			рН	Cond.
27		view upritre	en frie bridge			
28	<b>b</b>	act. chane	1 width regularent	<u> </u>	7.23	630
_ <u>a</u> ¶	2	spring Fla	w from road @ old ma	nhale	7.33	689
30	3-4	bank ero	ision / concrete wall cons	triction channel		<b>†</b>
	5	tributary	from Turtey Fost Rd.	@ Ed Wayner Auto S	in vage.	
32	G	12" 0 0	oncrete pipe w/ tridle fl	w (pink algae)		
3	7	bridge over	- BSC by Zassicks Auto			<b></b>
			(right J	ide of bridge silked-	<u>≒++</u>	<b>├</b> ──── <b>│</b> .
		<u>an 14an 14an 14an 14an 14an 14a</u>				+
					<u></u>	
		<u></u>	<u></u>			<u> </u>
		\. \. \		<u></u>		<b>  </b>
		<u></u>			1	+
						<u> </u>
					<del></del>	ا <del>د د د د</del>
			🖬 Japanese Knotweed 🗆 G		ວsestrife ໃ	☐ Other
Trash / Lit	ter, Yes	No aut	ro parts, plastic, floo	d debris		
Floodplain	n wetland	s: Yes (No)	If so, approximate size: Leng	th / Width fee		
-		s / No (Wetland		······································		
Notes:	Ξ.A.	· ,	т. (1997) К. (1997) К. (1997)			-
	,	. 4	f and a second se	_		

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Notes:	
INVIGO.	



Big Sewickley Creek Visual Assessment Stream Section Name: \_\_\_\_\_ Date: \_\_\_\_\_

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	5	
Bank stability	8	
Water appearance	7	
Nutrient enrichment	5	
Fish barriers	8	
In-stream fish cover	6	
Embeddedness	6	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NIA	
Sewage (if applicable)	5	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	<u>(e.73</u>	< $6.0 = POOR$ 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > $9.0 = EXCELLENT$

• · · · · · ·

Stream Section Name: Date:

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Channel Condition											
struct evide Cuttin	al channel; i ures, dikes. nce of down g or excess l cutting.	No -	cha with of cl Any set l acce	lence c nnel alt signific hannel dikes c back to ass to a plain.	eration cant rec and ba or levies provide	covery nks. s are	the reach and/or ch Excess a braided c	nannel; <50% of with riprap annelization. ggradation; hannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.			
10	9	8	(7)	6	5	4	3	2	1			

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

	Riparian Zone									
Natural Vegetation extends at least tw active channel widths on each sid	channel width on	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or						
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.						
10 9	8 7 6	(5/4	3 2	1						

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	<u> </u>

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream Section Name: \_\_\_\_\_ Date: \_\_\_

6/29/07

Embeddedness													
Gravel or o particles an embedded	∙e <20%	parti	el or cobb cles are 2 embedde	0 to	}	part	içle	or cobble s are 30 to nbedded.	Grave partic embe	es are	bble >40%	Completely embedded.	
10	9	8	7	6		15	JY	4	3		2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	Insect/invertebrate Habitat										
availab stage to coloniza	t 5 types o le. Habita o allow ful ation (woo s not fres	t is at a l insect ody debr		Some p exists, s trees, w habitat,	pes of hal otential has such as ov hich will p but have i the strear	abitat erhanging rovide not yet	The subs disturbed removed velocities	bes of habitat. strate is often I, covered, or by high stream s and scour or by t deposition.	None to 1 type of habitat.		
10	9	8/		7 6	5 5	4	3	2	1		

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, coloble, boulders, coarse gravel, other:

		Key: Th	is pertaiı	ns to w	ater	Canopy ways whe Coldwate	re chanı	nel is 50 feet wi	de or less.	
>75% o shaded 3 miles shaded.	and up genera	stream 2 to	> 50% shaded in reach.					0% shaded.	<20% of water surface in reach shaded.	
10	(9)	8	7	7 6 5 4				2	1	

	Abando	ned Mine Dra	ainage (if ap	plicable)	
(Intentionally blank)		iron staining. Or on precipitate.	Iron precipi muddy orar appearance	ige	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

#### sa tina s

## Big Sewickley Creek Visual Assessment

## Stream Section Name:

Date:

6/29/07

Sewage (if applicable)								
(Intentionally blank)		ceable odor, excess t growth and siltation.	Noticeabl plant grov	e odor, excess vth.	Visible pipe with effluen heavy odor.			
			1	And				
		2		able pipe and am <u>subs</u> trate.				
	5	./ 4	3	2	1			

Mark discharge(s) on map and/or with GPS unit.

	Manure Pres	sence (if applic	able)	
(Intentionally blank)	Evidence of livestock access to riparian zon	e. stream or v	l manure in waste storage ocated on the	Extensive amount of manure on banks or in stream. Or
· ·		•		Untreated human waste discharge pipes present.
	5 4	3	2	1

# **NOTES**

## **Big Sewickley Creek Watershed Visual Assessment**

	06/11/07
Sub-WatershedBSC Stream Section NameBS	$C17 \rightarrow BSC26$
Stream Name B S C Reference Section	
Weather Conditions Today $\underline{Jumy} \sim 80^{\circ}F$ Past 2-5 Days $\underline{\gamma}$	ain Friday p.M.
Land use within drainage (%):	
Grazing Pasture Grassy Field Row	Crops
Forest Residential Indus	strial
Commercial Abandoned Mine Lands Other	
Substrate (%):	
Boulder Cobble Gravel Silt	Mud
Active Channel Width: meters	
Floodplain wetlands: Yes / No Approximate size: Length / Width	(feet or meters)
Flooded areas? (Wetland or other)         pH <u>8.34</u> Conductivity <u>640</u>	· · · · ·

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH: Type of forest, farmland, residential, and/or commercial:

		· · · · · · · · · · · · · · · · · · ·	GPS W	aypoints
	Latitude	Longitude	Photo # s	Description
Start	BSC17/N 40.580	107 W 080.	20989	start point
End				
Other	BSC18			S.W. dischage from end of storet
	BSC 19			11 11 (15" @ SPP)
	BSC20		#9	dischage from 3' & pipe pite 7.37
	BSC 21	-	10-11	pH = 8.34/cond = 640 curd = 690
	BSC 22			S.W. pipe - 15" ØSCP Flaw = 5gpm
	B5C 23			5.W. 11/2 - 11 11
	BSC 24		Photo	graphs
Photo #		Description		
12		new. privat	- bridge	under const. below Benkey's
			V	

Discharges									
Size	Туре	Waypoint	Photo #	ŧ					
6-8" Neta	sewaye p	Int Fran BSC 2	5 13						
	1	miler court							
pH= 7,7 / [cond = 370	Stream	B5C 2	r = 14						

Invasive plants present? D Japanese Knotweed D Garlic mustard D Purple loosestrife D Other

Trash / Litter? very little

.

Stream Section Name: \_\_\_\_\_ Date: \_\_\_\_

BSC 17 -> 26

Parameter	Score	Explanation of Score Given
Channel condition	4	too wide / straightered in sections
Riparian zone	7	ł
Bank stability	7	
Water appearance	7	
Nutrient enrichment		
Fish barriers	8	
In-stream fish cover	Ŧ	
Embeddedness	5	
Invertebrate habitat	7	
Canopy Cover	9	
AMD (if applicable)	<b>n</b> Ma	
Sewage (if applicable)	9	
Manure presence (if applicable)	nia 🗖	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.27	<pre>&lt; 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD &gt; 9.0 = EXCELLENT</pre>

Stream Section Name: \_ \_ \_ \_ \_ \_ \_ Date:

BS	C	7.	~>	26	
	66	/11	/ĉ	7	

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					(	hann	el Conditio	n	
structu eviden Cutting	I channel; r res, dikes. ce of down or excessi cutting.	No -	char with of cł Any set t	lence o nnel alti signific nannel dikes o back to back to ass to a l plain.	eration ant re- and ba or levie provid	covery anks. es are le	the reach and/or cha Excess <i>ag</i> braided ch	annel; <50% of with riprap innelization. g <b>radation</b> ; annel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	8	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration.
	width, covers entire flood plain.		moderately compromised.	Filtering function severely compromised.
10 9	8 ( (7) / 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

				Bank	Stability	/		· · · · · · · · · · · · · · · · · · ·
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	ele pla ero ba is tha	oderately evation of ain; less t oding sur nks in ou protected at extend w elevatio	active han 33 face ar tside b by roc to the	flood % of ea of ends ots	Moderate banks ma typically a occurs 1 less frequ bends are (overhan at top of I mature tr stream ar slope faile	ay be low are high ( year out o uently); ou e actively ging vege bank, son rees falling nnually, s	, but flooding of 5, or utside eroding etation ne g into ome	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	5	4	3	·	2	11		

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		Water Ap	pearance		· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally clo objects visible a 1.5 to 3 ft; may h slightly green co sheen on water	t depth nave lor; no oil	most of tim visible to d ft; slow sec	epth 0.5 to 1.5 ctions may a-green; bottom lbmerged vered with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			Moderate o	odor of	Or
			ammonia o	r rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8 (	7 6 5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nut	rient E	Enrichme	nt	
reach; commu	vater alon diverse ad unity little n present	quatic plant algal	gree entir alga	nish wa e reach	or sligh ater aloi ; <b>mode</b> :h on st	ng erate	entire rea algal gro	n water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	6	5	(4)	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers			
No barriers		witho			Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	(8/	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

					Instream	n Fish Cov	er		
>7 cover typ available	Des		7 cove	r types	4 to 5 cc available	over types	2 to 3 co available		None to 1 cover type available
10	9	8	(7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, (iffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_

Stream Section Name: Date:  $\frac{BSC}{06}\frac{17}{1107} \rightarrow 26$ 

					l	Emb	oeddedness				
Gravel or particles embedde	are <20%	parti	el or co cles are embed	20 to	p	articl	l or cobble es are 30 to mbedded.	Gravel o particles embeddo	are >40%	Completely embedded.	
10	9	8	7	6	0	5	) 4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	t/invertel	orate Habi	itat	
availab stage to coloniza	t 5 types o le. Habita o allow ful ation (woo s not fresl	t is at a l insect ody debris	Som exist trees habi	ie pote ls, suc s, whic tat, bui	s of hab ntial ha h as ove h will pr t have n e strean	bitat erhanging ovide iot yet	The subst disturbed, removed l velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	8 (	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Key: Th	is pertains	to water	ways wh	<mark>y Cover</mark> ere channel i er fishery	s 50 feet wid	de or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% sh >75% in r upstream shaded.	Or each, bu	ıt	20 to 50%	shaded.	<20% of water surface in reach shaded.
10 9 8	7 6	7 6 5 4			2	1 1

	Abandor	ned Mine D	rainage (if ap	plicable)	
(Intentionally blank)	Evidence of in	Or .	Iron precipi muddy orar appearance	nge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

BSC	17-	+ 26
01	i   ii ]	07

· · · · · · · · · · · · · · · · · · ·	Sewage (if a	applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
•		And	
		Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure Presence (if applicable)									
(Intentionally blank)	Evidence of lives access to riparia		stream or	al manure in waste storage located on the n.	Extensive amount of manure on banks or in stream. Or					
					Untreated human waste discharge pipes present.					
	5	4	3	2	1					

# **NOTES**

# **Big Sewickley Creek Watershed Visual Assessment**

Evaluators' Names	CB	145				_ Date:	06/11/0	7	
Sub-Watershed	BSC	$BSC$ Stream Section Name $BSC / 0 \rightarrow BSC / 6$							
Stream Name <u>B_5_C</u> Reference Section									
Weather Conditions Today <u>mostly sunny</u> , ~ 80°F Past 2-5 Days <u>Mostly sunny</u> , Min on 6/									
		Land	use within	drainage	(%):				
Grazing Pasture	1	Grassy	Field		T	Row Cro	ps		
Forest	25	Reside	ntial		45	Industrial	ĺ	25	
Commercial	5	Abando	oned Mine L	ands		Other			
			Substrat	e (%):					
Boulder	Cobble	\$ 25	Gravel	25	Silt	25	Mud		
Active Channel Width	: meter	s					Bedrock	25	
Floodplain wetlands:	Yes (No	Approxi	mate size:	Length	/ Width	(fee	et or meters)		
Flooded areas? (Wet	land or other)	<del>6</del>							
pH Conductivity									
DESCRIBE THE LAND Type of forest, farmland residen tia	, residential,	and/or co	mmercial:	STREAM	FLOWS TH	IROUGH:			

	GPS Waypoints									
	Latitude	Longitude	Photo # s	Description						
Start 🚯	5C10			Bridge @ ballparts						
End B.	rc16			bend in stream w/ backwater						
Other										
BECIL			1	underent bunks across from ball field.						
				also (2) s.w. utfalls from road.						
BSCIL		· ·	3	6' high bank crossion / ~ 100' long &						
				small trib. From under road / plf= 7.37						
BSC13			4 2	4" & convete pipe s.w. 1 cond = 620						
			Photo	graphs						
Photo #		Description								
\$2		undreant o	mks @ bsc	dead sucker / ~ 20 suction inother						
BSCIY		debris jan								
BSCIS		36" concre	te vipe (1.	w flow / pH = 7.35 / card = 730)						
5-	- 8		ids							

		Discharges		
Size	Туре	Waypoint	Photo #	

Invasive plants present? I Japanese Knotweed I Garlic mustard I Purple loosestrife I Other

Strear	n Sectio	n Name:
		Data

BSC 10 - 7 16 06/11/07

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	6	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	5	
Fish barriers	7	
In-stream fish cover	7	
Embeddedness	5	· · ·
Invertebrate habitat	۵	
Canopy Cover	8	
AMD (if applicable)		no dischages visible
Sewage (if applicable)	5	<u>algae</u> on substrate
Manure presence (if applicable)		
TOTAL SCORE (Add all scores and divide by number of scores given)	6.36	<pre>&lt; 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD &gt; 9.0 = EXCELLENT</pre>
Stream Section Name:

Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Cha	nnel Conditio	n	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, bu with significant recove of channel and banks Any dikes or levies ar set back to provide access to an adequat	the reach we and/or chai . Excess age braided chai levees rest	nnelization.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	- / <del></del>	4 3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

			Ripa	arian Zo	ne		
Natural Vegetation extends at least two active channel widths on each side	Natural vegeta extends one ac channel width each side. Or If less than one width, covers e flood plain.	ctive on e	Natural ve extends h active cha width on e side.	alf of the nnel	extends a the active width on	e channel each side. Or unction ly	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 (	6 /	5	4	3	2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	· · · · · · · · · · · · · · · · · · ·
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

			ator An	pearance	•
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	objects v	ally cloue isible at c t; may ha reen colo	dy; tepth ve r; no oil	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive- green film. Or	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			-	Moderate odor of ammonia or rotten eggs.	Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8 (	7/6	5	4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	ıtrient	Enrichme	nt	
reach; comm	water alon; ; diverse ac nunity little th present.	quatic plant algal	gree entir alga	y clear nish wa e reach I growl trates.	ater al ; moc th on s	ong Ierate	entire re algal gro	n water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers			
No barriers	<b>.</b>	with	ement	vater s inhibit within the	Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	(7/	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

					Instream	Fish Cov	ər		
>7 cover type: available	S	1	7 cover	types	4 to 5 co available	ver types	2 to 3 co available		None to 1 cover type available
10	9	8	(7/	6	5	4	3	2	1
		100			2	~	)	AN TOWNARD AND A DECIMANO	

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_

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					Em	beddedness	3			
Gravel or o particles a embedded	re <20%	partic	el or co cles are embedo	20 to	parti	el or cobble cles are 30 to embedded.	Gravel of particles embedde	are >40%	Completely embedded.	
10	9	8	7	6	(5	/ 4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insect	t/invertet	orate Habit	at		
available stage to colonizat	At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen)			ie pote ts, sucl s, whic tat, bul	s of hab ntial hal n as ove h will pro have n stream	oitat erhanging ovide ot yet	The substr disturbed, removed b	s of habitat. ate is often covered, or y high stream and scour or by leposition.	None to 1 type of habitat.	
10	9	8	7 (	6	) 5	4	3	2	1	

-		Key: Th	nis pert	ains to	water	ways wh	y Cover ere channel er fishery	is 50 feet wid	de or less.
>75% of wat shaded and 3 miles gene shaded.	upstre	eam 2 to	>75%	% in rea ream 2	ded in r Or ach, bu to 3 m		20 to 50%	shaded.	<20% of water surface in reach shaded.
10 9		(8)	7	6	5	4	3	2	1

	Abandoned Mine I	Drainage (if app	olicable)	
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate	Iron precipita muddy orang appearance.	ge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

06,

	Sewage (if a	applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
۰.		And	
	5	Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)									
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure in stream or waste stora structure located on th flood plain.	ge manure on banks or in						
			Untreated human waste discharge pipes present.						
	5 4	3 2	1						

## **NOTES**

- fawn

- Cody and Jake Bluming w/ Fish (shepshead)

Evaluators' Names Sub-Watershedß	ca /	ks			Deter	/	nr. Lar	1.5
Evaluators Names		100		<u>_</u>	_ Date:	<u>L</u>	10/00	107
Sub-Watershed <u>B</u>	ing Semicheley	<u>Unin</u> Str	ream Section	Name	<u>BSC 1</u>	->	BS'C 🜌	19
Stream Name	11	Ref	erence Section	on				
Stream Name Weather Conditions T	oday <u>light</u>	scattered rai	<u>^ ^ @</u> Past	2-5 Days	<u>, a</u>	ind	walk s	hervers
		Land use with	in drainage ('	%):				
Grazing Pasture		Brassy Field			Row (	Crops		
Forest		Residential		10	Indus	trial		65
Commercial	20 A	bandoned Mine	e Lands		Other			
		Substr	rate (%):					<u></u>
Boulder 5				Silt	25		Mud	
Active Channel Width			нс	c \$				
Floodplain wetlands:	(Yes) Ap	proximate size	e:Length	/ Width		(feet or	r meters	$)^{-lai}$
Flooded areas? (Wet								
pH Conduc	ctivity							
Type of forest, farmland								
- Industrial au - Industrial au - thin strip of BSC7 - 18" (	rund K.R. trac f forest along	lts dwn to stran Ischige / B	chio Rive 15C8 - Flu		vetlad	(ph	uto - HF	(2)
- Industrial au - Thin strip o BSC 7 - 18 <sup>41</sup> (	rund K.R. trac f forest along CPP S.W. d	lts- dwn to stran is-chuge / B GPS W	Ohio Rive	sdytown v		~	uto = HF	(2)
- Industrial au - Thin strip o BSC 7 - 18" ( Latitude	rund K.R. trac f forest along	Its- dwn to stran Is-chige / B GPSW Photo#s	chio Rive 15C8 - Flu	sdytown v	vefland Descript	~	uto == HF	[2]
- Industrial au - Thin strip or BSC 7 - 18 <sup>41</sup> C Latitude Start BSC	rund K.R. trac f forest along CPP S.W. d	lts- dwn to stran is-chuge / B GPS W	ohio Rive 15C8 - Fla aypoints	sdjelovin v	Descript	ion		· · · · · · · · · · · · · · · · · · ·
- Industrial au - Industrial au - Thin strip of BSC - 18'' ( Latitude Start $BSC$ End $BSC$ (9)	rund K.R. trac f forest along CPP S.W. d	Its durn to stran irchage / B GPSW Photo#s	ohio Rive 15C8 - Flo aypoints Bridge	sdølmin v I over str	Descript	ion F entr	rice to 1	ParK.
- Industrial au - Thin strip of BSC 7 - 18 <sup>41</sup> C Latitude Start BSC	rund K.R. trac f forest along CPP S.W. d	Its- dwn to stran Is-chige / B GPSW Photo#s	b Chio Rive SSC 8 - Flu aypoints Bridge View dawn	over str	Descript com a under	ion F entr	rice to 1	ParK.
- Industrial au - Industrial au - Thin strip of $BSC - 18^{41}$ ( Latitude Start BSC End BSC (9) Other BSC 2	rund K.R. trac f forest along CPP S.W. d	Its durn to stran irchage / B GPSW Photo#s	bridge bridge view days	sdiplain v aver str rhan u 4 / card.	Descript em a under = 63	ion F entr	rice to 1	ParK.
- Industrial au - Thin strip of $BSC 7 - 18^{41}$ ( Latitude Start $BSC$ End $BSC$ (9) Other $BSC$ 2 BSC 3	rund K.R. trac f forest along CPP S.W. d	Its dwn to stran irchige / B GPSW Photo#s 1,2, G	b Chio Rive SFC 8 - Flo aypoints Bridge View dawn (pH = 6.5" off = 6.87	over str rhan u 1 / cand. 1 / cond =	Descript cum a under = G3 G30	ion t entr old R o)	reto 1 .R. tre	Park . ·Hes
- Industrial au - Industrial au - Thin strip of $BSC - 18^{41}$ ( Latitude Start $BSC$ End $BSC$ (9) Other $BSC$ BSC 3 BSC 4	rund K.R. trac f forest along CPP S.W. d	Its durn to stran irchage / B GPSW Photo#s	chio Rive SFC 8 = F(J) aypoints Bridge View day, (pH = 6.87) Sformwater	over str phan u f / cond = dischag	Descript cum a under = G3 G30	ion t entr old R o)	reto 1 .R. tre	Park . ·Hes
- Industrial au - Thin strip of $BSC 7 - 18^{41}$ ( Latitude Start $BSC$ End $BSC$ (9) Other $BSC$ BSC 3 BSC 4	rund K.R. trac f forest along CPP S.W. d	Its durn to stran is charge / B GPS W Photo # s 1,2, G 8	bridge bridge view dawn (pH = 6.57 pH = 6.87 stornwater low dan	over str phan u f / cond = dischag	Descript em a under = 63 630 c unde	ion f cntr old R o n Ber	me to 1 .R. trey wer St.	Park. ·Hes bridge
- Industrial au - Industrial au - Thin strip of BSC 7 - $18^{41}$ ( Latitude Start BSC End BSC (9) Other BSC 2 BSC 3 BSC 4 BSC 5	rund K.R. trac f forest along CPP S.W. d	Its dwn to stran irchige / B GPS W Photo # s I, 2, G G 9	bridge bridge view dawn (pH = 6.54 pH = 6.87 stornwater low dan	over str rhan U 1 / cond. 1 / cond. 1 / cond. 1	Descript em a under = 63 630 c unde	ion f cntr old R o n Ber	reto 1 .R. tre	Park. ·Hes bridge
- Industrial au - Industrial au - Thin strip of $BSC 7 - 18^{41}$ ( Latitude Start $BSC$ End $BSC$ (9) Other $BSC$ BSC 3 BSC 3 BSC 4 $BSC 5^{-}$	Description	Its dwn to stran irchyc / B GPS W Photo # s 1,2, G 9 9 Photo	b Chio Rive SSC8 - Flo aypoints Bridge View dawn (pH = 6.87 Stornwalm Low dan S.W. d ographs	uditan u aver str rhan U 1 / cond = - dischag 1 ischager	Descript eun a under = 63 630 c unde (30) a	ion f cntr old R o n Ber	me to 1 .R. trey wer St.	Park. ·Hes bridge
- Industrial au - Thin strip of $BSC 7 - 18^{41}$ ( Latitude Start $BSC 9$ Other $BSC 9$ Other $BSC 9$ BSC 3 BSC 3 BSC 4 BSC 5 BSC 6 Photo # 1, 2 3 - 4	Description	Its durn to stran irchige / B GPS W Photo # s 1,2, 6 6 9 9 9 Photo BSC @ can	Aridge Bridge View dawn (pH = 6.5" I w dan S.w. d ographs Pluance w	uditan u aver str rhan U 1 / cond = - dischag 1 ischager	Descript eun a under = 63 630 c unde (30) a	ion f cntr old R o n Ber	me to 1 .R. trey wer St.	Park. ·Hes bridge
- Industrial au - Industrial au - Thin strip of BSC 7 - $18^{41}$ ( Latitude Start BSC End BSC (9) Other BSC 2 BSC 3 BSC 3 BSC 4 BSC 5 BSC 5 BSC 6 Photo # 1, 2 3 - 4	Description	Its durn to stran irchige / B GPS W Photo # s 1,2, G G 9 9 9 Photo BSC @ can site on eas	Aridge SFC 8 - Flu aypoints Bridge View dawn (FH = G.S. PH = G.S. PH = G.S. PH = G.S. PH = G.S. A Stormwater I w dan S.W. d ographs Pluence w t side off	over str over str rhan U I cond = I cond = I cond = I cond = I cond = Ohio Ri BSC.	Descript eun a under = 63 630 c unde (30) a	ion f cntr old R o n Ber	me to 1 .R. trey wer St.	Park. ·Hes bridge
- Industrial au - Industrial au - Thin strip of BSC 7 - $18^{41}$ ( Latitude Start BSC End BSC (9) Other BSC 2 BSC 3 BSC 3 BSC 4 BSC 5 BSC 5 BSC 6 Photo # 1, 2 3 - 4	Description	Its dwn to stran irchige / B GPSW Photo#s 1,2, 6 6 9 9 9 Photo BSC @ can site on eas m of Nurfill	Aridge SFC 8 - Flu aypoints Bridge View days (pH = 6.87 PH = 6.87 Storwalm Low day S.W. d ographs Albunce with t side off K Son Korn K.	over str rhan U 1 / cond = - dischag 1 ischagw Ohio Ri BSC. 1. Turtle	Descript eun a under = 63 630 c unde (30) á	ion f cntr old R o n Ber	me to 1 .R. trey wer St.	Park. ·Hes bridge
- Industrial au - Industrial au - Thin strip of BSC 7 - 18 4 ( Latitude Start $BSC$ End $BSC$ BSC 3 BSC 3 BSC 3 BSC 3 BSC 5 BSC 5 BSC 6 Photo # 1, 2, 3 - 4 S 7- 8	Description Mouth of Branfield S.W. dirch	Its durn to stran irchage / B GPS W Photo # s 1,2, 6 6 9 9 9 Photo BSC @ can site on eas n of Nurfoll age under E	Aridge Bridge View durn (pH = 6.54 off = 6.54 off = 6.54 stormwater I w dan S.W. d ographs Alvence with side off r Sonkern R. Berner St. k	Unio Ri Obio Ri BSC. I. Turtle	Descript eun a under = 63 630 c unde (30) a iver	ion t entr old R o) r Ber c 15" c	we to 1 .R. two wer St.	Park . Hes bridge 1 10" Cr
- Industrial au - Industrial au - Thin strip of BSC 7 - $18^{41}$ ( Latitude Start BSC End BSC (9) Other BSC 2 BSC 3 BSC 3 BSC 4 BSC 5 BSC 5 BSC 6 Photo # 1, 2 3 - 4 S 7- 8	Description Mouth of Unw uportrea	Its durn to stran ischinge / B GPS W Photo # s 1,2, 6 9 9 9 Photo BSC @ can site on eas n of Nurfoll age under E node dan a	Aridge SFC 8 - Flo aypoints Bridge View dawn (pH = G.S. pH = G.S. pH = G.S. pH = G.S. pH = G.S. And S.W. d ographs Albume with t side off t side t side off t side off t side off t	Unit of the content o	Descript eun a under = 63 630 c unde (30) a iver	ion t entr old R o) r Ber c 15" c	we to 1 .R. two wer St.	Park. ·Hes bridge
- Industrial au - Industrial au - thin strip of BSC 7 - 18 <sup>41</sup> ( Latitude Start $BSC$ End $BSC$ (9) Other $BSC$ BSC 3 BSC 3 BSC 4 BSC 5 BSC 5 BSC 5 BSC 6 Photo # 1, 2, 3 - 4 5 <sup>41</sup> 7- 8 9 (1-2 <sup>4</sup> hg	Description Mouth of Branfield S.W. dirch	Its durn to stran ischinge / B GPS W Photo # s 1,2, 6 9 9 9 Photo BSC @ can site on eas n of Nurfoll age under E node dan a	Aridose Alver Aridose Alver Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose Aridose	Unit of the content o	Descript eun a under = 63 630 e unde (30) o iver tver	ion t entr old R o) n Bea t 15" c built	we to 1 .R. trev wer St. CPP and . by flo	Park . Hes bridge 1 10" Cr
- Indurtial au - Indurtial au - Thin strip of BSC 7- $18^{41}$ ( Latitude Start BSC End BSC (9) Other BSC 2 BSC 3 BSC 3 BSC 3 BSC 5 BSC 5 BSC 5 Photo # 1, 2, 3-4 5 7- 8	Description Mouth of Branfield S.W. dirch Description Mouth of Branfield S.W. dirch	Its dur to stran irchige / B GPS W Photo # s 1,2, 6 6 9 9 9 9 Photo BSC @ can site on eas n of NurFoll age under E node dan au	Aridge Bridge View durn (pH = 6.5" off = 6.87 Stormwalm I w dan S.W. d ographs Alvence with side off som Kern R. Bernor St. & cross stream Marges Phot	Unit of the content o	Descript eun a under = 63 630 e unde (30) o iver tver	ion t entr old R o) r Ber c 15" c	we to 1 .R. trev wer St. CPP and . by flo	ParK . +les bridge 1 10" CN
- Indurtvial au - Indurtvial au - Thin strip of BSC 7 - $18^{41}$ ( Latitude Start BSC End BSC (9) Other BSC 2 BSC 3 BSC 3 BSC 4 BSC 5 BSC 5 BSC 5 BSC 6 Photo # 1, 2, 3 - 4 5 9 (1-2 <sup>4</sup> hg	Description Mouth of Brimfield : Vine upotrea S.W. dirch	Its durn to stran ischinge / B GPS W Photo # s 1,2, 6 9 9 9 Photo BSC @ can site on eas n of Nurfoll age under E node dan a	Aridge Bridge View dawn (pH = G.S. PH = G.S. PH = G.S. PH = G.S. PH = G.S. PH = G.S. PH = G.S. Annual S.W. d Degraphs Albume with Second St. & Cross stream Harges Phot Waypoint Gik wall	over sty over sty rhean U f / cond = f cond = f cond = dischages Ohio Ri BSC. 1. Turtle n (looler os	Descript enn a under = 63 630 c unde (30) a iver to be	ion t entr old R o) n Bea t 15" c built	we to 1 .R. trev wer St. CPP and . by flo	Par-K . ·+les bridge 1_ 10" CN

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High an lot of both sides

Stream	Section	Name
		Date:

 $\begin{array}{c} \text{He:} \quad \underline{BSC \ 1 \rightarrow 9} \\ \hline 06 \ | as \ | 07 \end{array}$ 

Parameter	Score	Explanation of Score Given
Channel condition	5	
Riparian zone	5	
Bank stability	7	
Water appearance	7	,
Nutrient enrichment	5	
Fish barriers	7	
In-stream fish cover	7	
Embeddedness	7	
Invertebrate habitat	3	
Canopy Cover	ß	
AMD (if applicable)	A ~ 🗖	
Sewage (if applicable)	5	
Manure presence (if applicable)	<b>□</b> ~/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.27	<pre>&lt; 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD &gt; 9.0 = EXCELLENT</pre>

Stream Section Name: Date:

BSC.	1 ->	. 9	
06	105	107	

## **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition											
Natural channe structures, dike evidence of do Cutting or exce lateral cutting.	es. No own- essive	cha with of c Any set	lence of nnel alte signific hannel a dikes o back to ess to a d plain.	eration ant rec and ba r levie provid n adec	covery inks. s are e	the reach and/or cha Excess ag braided ch	annel; <50% of with riprap annelization. ggradation; nannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.			
10 9	8	7	6	(5)	4	3	2	1			

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	(5) 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	· · · · · · · · · · · · · · · · · · ·
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	(7) 6 5 4	3 2	1

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

1

BSC 1		9	
01	6/05	10	7

		Water Ap	pearance		
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally clo objects visible a 1.5 to 3 ft; may f slightly green co sheen on water	t depth have blor; no oil	Considerable of most of time; o visible to depth ft; slow section appear pea-gree rocks or subme objects covered heavy green or green film.	bjects a 0.5 to 1.5 is may een; bottom erged d with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			Moderate odor ammonia or ro		Or Strong odor of chemicals, oil, sewage, other
10 9 8	(7) 6 5	4	3	2	pollutants. 1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

Nutrient Enrichment										
reach; c commu	vater along diverse aq nity little present.	uatic plant algai	greer entire algal	v clear hish wa e reach growt trates.	ater alo ; mod th on s	ong	entire re algal gro	n water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.	
10	9	8	7	6	(5)	) 4	3	2	11	

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish E	Barriers			
No barrie	ers.	witho			Drop struc culverts, c diversions drop) with reach.	lams or s (<1ft	Drop stru culverts, diversions drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	(7)	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

		 			Instrean	n Fish Cov	er		
>7 cover types available		' cov able	-	/pes	4 to 5 co availabl	over types e	2 to 3 co available	••	None to 1 cover type available
10 9	8	 (7	$\mathcal{T}$	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, (iffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name:	
		Date:	

BSC 1→9 06/05/07

				Embe	ddedness			
Gravel or cobble particles are <20 embedded.	1 1	les ar	obble e 20 to dded.	particles	or cobble s are 30 to bedded.	Gravel o particles embedde	are >40%	Completely embedded.
10 9	8	[7]	6	5	4	3	2	1

**Keys**: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	t/invertel	orate Habi	tat	
availab stage to coloniz	t 5 types c le. Habita o allow ful ation (woo is not fres	t is at a l insect ody debris	Som exist trees habi	e pote s, suc s, whic lat, bu	s of hab ential ha h as ove h will pr t have n e stream	bitat erhanging ovide ot yet	The subst disturbed, removed I velocities	es of habitat. rate is often covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	8	7	6 /	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, obbie, boulders, coarse gravel, other:

		Key: Tł	nis per	tains to		ways wh	<b>y Cover</b> ere channel i er fishery	is 50 feet wid	te or less.
shaded	of water sur and upstre generally v	eam 2 to	>75	% in re tream 2	ded in r Or ach, bu to 3 m		20 to 50%	shaded.	<20% of water surface in reach shaded.
10	9	(8)	7	6	5	4	3	2	1

	Aband	oned Mine Dr	ainage (if ap	plicable)	
(Intentionally blank)		f iron staining. Or iron precipitate.	Iron precip muddy ora appearanc	÷	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name:	heroar
		Date:	

BSC 1 → 9 06/05/07

Sewage (if applicable)							
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.				
·		And					
	$\sim$	Questionable pipe and black stream substrate.					
	(5) 4	3 2	1				

Mark discharge(s) on map and/or with GPS unit.

	Manure Presence (if applicable)							
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or					
			Untreated human waste discharge pipes present.					
	5 4	3 2	1					

## **NOTES**

- A WCP Wald Clars processing, company located near north of BSC i Chio River
- possible stream project @ Plum St. Pat
   → channel too wide./shallow

# **Big Sewickley Creek Watershed Visual Assessment**

· •

	Hollow Stream	Section	n Name			
Stream Name	Hallow Reference	e Secti	ion	· · · · · · · · · · · · · ·		
Weather Conditions Today		Pas	t 2-5 Days	- la 0'S	Pa	in
Active Channel Width:	<u>/</u>	_		0		
	LAND USE WITHIN DR	AINAG	E (%):			
Grazing Pasture	Grassy Field			Row Crops		
Forest 9	<u></u>		5	Industrial		
Commercial	Abandoned Mine Land		<u> </u>	Other		
	SUBSTRATE					
Boulder Cobb	IE 50 Gravel AND USE OF THE AREA THA	40	Silt	<del>╕╼╻╱╕╶╻╶╻╶╻┥╻╕</del> ╌		<del></del>
						· · · ·
15 all forested	in the "hollow" o	ung-	~ <u>~ ~ noi</u>	Mes on or	hers	ide
D D DOVICES NOTION 1	$\underline{\Lambda a}$					
<u></u>	GPS POINTS / PH	OTOS:		<del>?</del>	•	
Waypoint Photo Descriptio	<u>n.</u>	N.	·		pH	Cond.
4101 Star		) Ci	uverts (	altomosticor	8.15	330
1102 Debr	sjam		<u> </u>			
1103 Ene	d (1 p.tream)				 	<u> </u>
	7. Stream			·		<u> </u>
	D stream			·		<u> </u>
3 Stant	07 C.H.					
<u> </u>	0					ļ
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		· 				
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	· · · · · · · · · · · · · · · · · · ·					
	· · · · · · · · · · · · · · · · · · ·					
		<u></u>	<del></del>			
vasive plants present: Yes /	No Dapanese Knotweed	🗇 Gar	lic mustard	D Purple loose		
ash / Litter: Yes //No				······	(	7,66A
	) If so, approximate size:	Length	/ Wid	th feet		-
		<b>U</b>		· · = - • ,		
ooded areas: Yes No (Wet						
otes: Follows C.H. R.	d. Lillie Developme	nt	Isai	is our h	there	- gard
it meets B.S.(	You as W			Socard Contraction		
IT METS BUIL	rai					

Stream Section Name: Date:

\_\_\_\_\_

Parameter	Score	Explanation of Score Given
Channel condition	/ð	
Riparian zone	10	
Bank stability	8.	
Water appearance	9	
Nutrient enrichment	Q	
Fish barriers	8	
In-stream fish cover	8	
Embeddedness	9.	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NK	
<b>FOTAL SCORE</b> Add all scores and divide by umber of scores given)	0. ° <	< $6.0$ = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > $9.0$ = EXCELLENT

Stream Section Name: Date:

## Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

		<u>C</u>	hann	el Conditio	<u>n</u>	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	channe with sig of char Any dik set bac	ice of past alteration gnificant rec nel and bat kes or levies k to provide to an adeq lain.	overy nks. s are	the reach w and/or char Excess agg braided cha	nnelization.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10/ 9 8	7	6 5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

· · · · ·		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
/10/ 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability								
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).						
10 9 (8)	7 6 5 4	3 2	<u> </u>						

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

#### Stream Section Name: Date:

		Water	Appearance	•	· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	1.5 to 3 ft; i slightly gree	ble at depth	most of tir visible to o ft; slow se appear pe rocks or si objects co	vered with en or olive-	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
	•		Moderate	odor of	Or
			ammonia o	or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6	5 4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

Nutrient Enrichment								
Clear water along entire reach; diverse aquatic plant community little algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrates.	Greenish water along entire reach; abundant algal growth, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.					
10 / 9/ 8	7 6 5 4	3 2	1					

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers										
No barriers.		wit mo	easonal w hdrawals ovement v ach.		Drop stru culverts, diversior drop) wit reach.	dams or ns (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structur culverts, dam diversions (> drop) within t reach.	ns or 1ft
10 9	- (	8/	7	6	5	4	3	2	1	•

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

				Instream	Fish Cov	/er		
>7 cover types	6 to avail	7 cover able	· types	4 to 5 co available	* 1	2 to 3 co available	ver types	None to 1 cover type available
10	8)	7	6	5	4	3	2	1

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name:
		Date:

		Embeddedness	·	
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 (9)	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded:

						Insec	ct/inverte	brate Hab	itat	
availat stage t coloniz	at 5 types o ble. Habita to allow ful cation (woo gs not fresl	t is at a l insect ody det	a t	Som exist trées habit	e pote s, suci , whic at, but	s of hal Intial ha h as ov h will pi t have r o strean	ibitat erhanging rovide not yet	The subs disturbed removed velocities	es of habitat. strate is often l, covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9	(8)	).	7	6	5	4	3	2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Key:	Canopy This pertains to waterways wher Coldwater	e channel is 50 feet wi	de or less.
>75% of water surface shaded and upstream 2 t 3 miles generally well shaded.	<ul> <li>&gt; 50% shaded in reach.</li> <li>Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>	20 to 50% shaded.	<20% of water surface in reach shaded.
10 (9) 8	7 6 5 4	32	1 .

	Abandoned I	Mine Drainage (if a	pplicable)	· ·
(Intentionally blank)	Evidence of iron st Or Noticeable iron pre	muddy or	÷	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

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### Stream Section Name: Date:

· · · · · · · · · · · · · · · · · · ·	Sewage (if	applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
· .		And	
		Questionable pipe and black stream substrate.	· · ·
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

	Manu	re Presen	ce (if appli	cable)	
(Intentionally blank)	Evidence of liv access to ripa		stream or	al manure in waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
· .					Untreated human waste discharge pipes present.
	5	4	3	2	1

**NOTES** 

Evaluator	s' Names	Ks/sA Dat	te: <u>(5-7-08)</u>
Sub-Wate	ershed	Stream Section Name	
Stream N	ame Tn	Stream Section Name S + S East For K Reference Section	· · · · · · · · · · · · · · · · · · ·
Weather (	Condition	s Today 70'S SWARY Past 2-5 Days	Same
		Ith: <u>5</u> feet	
Outer in a D		LAND USE WITHIN DRAINAGE (%): Grassy Field Ro	w Crops
Grazing P Forest	asture		dustrial
Commerci	al		her
		SUBSTRATE (%):	
Boulder		Cobble Gravel Silt	Mud
	DESCRI	E THE LAND USE OF THE AREA THAT THE STREAM FLO	WS THROUGH:
	THER ALL	SH GAME LANDS, A ENDS AT WEXFORD E	XIT OFF PT. 79
	· · · · · · · · · · · · · · · · · · ·		- Contract
		GPS POINTS / PHOTOS:	·
Waypoint	Photo	Description	pH Cond
<u>NEL</u>	an a	Start Culvert / small wetlands on east side	8.21 720
1 2	the second se	This to malt aire upstreem	
1 4		This to nake asine upstraam	
1.5		Tub to nght	
V C		End/monoth	
11 <b>18</b> 19		/	
·			
		Start Aubvert under emhankment	
	<u> あ </u>	The to rate going upstream	
	- 4	Debis, am	
	5	Inp to nalt	
	16	top of trib	
	1	· v	

Floodplain wetlands	: Yes/No	If so, approximate s	size: Length	. / Width	_feet - Sonne Sa
Flooded areas: (Yes)	/No (Wetlan	d or other)	hackwale	<u>Curras</u>	Wetlan
Notes: Lots of					arcas
J. J	y	0			

Parameter	Score		planation of Score Given
Channel condition	10		
Riparian zone	10		
Bank stability	9		
Water appearance	9		
Nutrient enrichment	7		······································
Fish barriers	9		
In-stream fish cover	9		
Embeddedness	8		
Invertebrate habitat	9		
Canopy Cover	10		
AMD (if applicable)	NA		
Sewage (if applicable)	MA		
Manure presence (if applicable)	NA		
TOTAL SCORE (Add all scores and divide by number of scores given)	$\frac{q_{0}}{q_{0}}$	< 6.0 6.1 – 7.4 7.5 – 8.9 > 9.0	= POOR = FAIR = GOOD = EXCELLENT

Stream	Section	Name:
--------	---------	-------

Date:

## Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Channe	I Condition	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess <i>aggradation</i> ; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10) / 9 8	7 6 5 4	3 2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

	-	Riparian Zo	one	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one	Natural vegetation extends half of the active channel width on each side.	extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
/ 10 / 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

-	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
<u>10 (9) 8</u>	7 6 5 4	3 2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

	Water A	opearance	
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive- green film. Or	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
		Moderate odor of	Or
		ammonia or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient Enrichment									
reach; comm	water along diverse ac unity little h present.	juatic plant algal	gre enti alg	rly clear enish wa ire reach al grow strates.	ater alo n; <b>mod</b> e	ng erate	entire rea algal gro	water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brow water along entire reach severe algal blooms create thick algal mats stream.	ļ,
10	9	8 (	7/	6	5	4	3	2	1	

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

		· · · · · ·		Fish	Barriers								
wit		Seasonal water withdrawals inhibit movement within the		culverts,	Drop structures, culverts, dams or		ictures, dams or	1 -	culverts, dams or				
$\sim$	reac		vitnin-the-	drop) wit	diversions (<1ft drop) within the		drop) within the		• •		s (>1ft hin 1 mile of	diversions (>1ft drop) within the reach.	
10 (9)	8	7	6	5	4	reach.	2	1					

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

				Instream	Fish Cov	er		
>7 cover types available		7 cover lable	types	4 to 5 cov available		2 to 3 co available	ver types	None to 1 cover type available
10 (9)	8	7	6	<b>5</b> '	4	3	2	1

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

#### Stream Section Name: Date:

					Embec	Idedness		·		
Gravel or c particles ar embedded	e <20%	part	vel or co icles are 6 embed	e 20 to	Gravel or particles 40% emb	are 30 to	Gravel o particles embedde	are >40%	Completely embedded.	
10	9 (	8	7	6	5	4	3	2	1	

**Keys**: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	Insect/inverteb	rate Habitat	· · · · · · · · · · · · · · · · · · ·
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 (9) 8	7 6 5 4	3 2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Key: Thi	Canopy s pertains to waterways wher Coldwater	e c <mark>hannel is 50 feet w</mark>	ide or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>	20 to 50% shaded.	<20% of water surface in reach shaded.
10/ 9 8	7 6 5 4	3 2	1

	Abando	oned Mine Dr	ainage (if ap	oplicable)	
(Intentionally blank)		f iron staining. Or iron precipitate.	Iron precip muddy ora appearanc	-	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
· · · · · · · · · · · · · · · · · · ·	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name:
		Date:

Sewage (if applicable)								
(Intentionally blank)	Noticeable od plant growth a		Noticeable plant grow	e odor, excess /th.	Visible pipe with effluent, heavy odor.			
				And				
				ble pipe and am substrate.	· · · · · ·			
	5	4	3	2	1			

Mark discharge(s) on map and/or with GPS unit.

	Manur	e Presenc	e (if applic	cable)	
(Intentionally blank)	Evidence of live access to riparia		stream or	al manure in waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
· .					Untreated human waste discharge pipes present.
	5	4	3	2	1

## <u>NOTES</u>

Evaluators' Names Sub-Watershed	in In 18851	Streem Cesti				3
Stream Name <u>Bunic</u>	id Liphanil Pa.	Stream Sectio	on Name			
Weather Conditions T	aday This Su	<u>keterence Sec</u>	tion	1.000		
Weather Conditions T	- 2 ( ) 2 30	<u>In q</u> Pa	st 2-5 Days	<u> </u>	<u>rainy</u>	
Active Channel Width	: <u></u> teet KLA-IIY	Shallow				•
	LAND U	JSE WITHIN DRAINAG	GE (%):	<u> </u>		
Grazing Pasture		y Field		Row Cr	ops	
Forest Commercial	100 Reside	ential Joned Mine Lands	-	Industria	al	
		SUBSTRATE (%):		Other		
Boulder 5	Cobble 10	Gravel 70	Silt	10	Minal	<b>A</b> 10 <b>4</b>
		THE AREA THAT THE		10 FLOWS T		5
<u>ALL FORESTE</u>	D. HEHOWATER	25 OF& HOPKIN	1 S ( 41)0	CH DE	Et ALAC	50
EAST FORK AT	LINBRODK PAR		<u> </u>		TILOW	, 10
· · · · · · · · · · · · · · · · · · ·						
Waypoint Photo Des	GF	PS POINTS / PHOTOS	;			
1 1 S Plis S	THR-T/INT @ E	TRee			pH	Cond
1.6 16 . 2/16 E	ND / headwarters	_Dry			7.6	120
		· ·		• ····•		
11 - T	ib 1001Gine A stream	on behind linbru	ok park			
	0	<u></u>	· · · · · · · · · · · · · · · · · · ·			
					·	
			. <u></u>			
		· · · · · · · · · · · · · · · · · · ·			······	
			1.51			
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			······································			
			. <u> </u>			
I I						
				· · · · · · · · · · · · · · · · · · ·		
nvasive plants present	Yes / No /i lan	anese Knotwood 🗖 📿	arlio musta-			
nvasive plants present:	(es) No 🗇 Japa	anese Knotweed 🗖 Ga	arlic must <b>a</b> rd	d 🗖 Purple	e loosestrife [	Other
「rash / Litter: Yes / No _	)				S	D Other
nvasive plants present: Frash / Litter: Yes / No Floodplain wetlands: Ye Flooded areas: Yes / No	es)/No If so, app	roximate size: Lengt	h /Wi	dth	S	D Other

Stream Section Name: \_\_\_\_\_ Date: \_\_\_\_\_

Parameter	Score	Explanation o Given	f Score
Channel condition	18		
Riparian zone	10		
Bank stability	9		
Water appearance	<u> </u>		
Nutrient enrichment	9		
Fish barriers	7	2	
In-stream fish cover	9		
Embeddedness	8		
Invertebrate habitat	8		
Canopy Cover	9		
AMD (if applicable)	NA		
Sewage (if applicable)	N'A		
Manure presence (if applicable)	NA		. •
TOTAL SCORE (Add all scores and divide by number of scores given)	88/102 8.8	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT	

Stream Section Name: \_\_\_\_\_ Date: \_\_\_\_\_

## **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

		Chann	el Conditio	n	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of channel alter with significa of channel al Any dikes or set back to p access to an flood plain.	ation, but nt recovery nd banks. levies are rovide	the reach w and/or char Excess <b>ag</b> braided cha	nnelization.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10/ 9 8	7 6	5 4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

				Ri	parian Zo	ne			
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or					Natural vegetation extends a third of the active channel width on each side. Or		Natural vegetation less than a third of the active channel width on each side. Or	
	If less width, flood p	covers	ne s entire	2		Filtering moderate compron	ely	Lack of regeneration. Or Filtering function severely compromised.	
(10) 9	8	7	6	5	4	3	2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability									
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope fallures apparent).						
10 / 9 / 8	7 6 5 4	3 2	1						

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Stream	Section	Name:
		Date:

				W	ater Ap	pearance		
colored; depth 3 slightly o sheen o noticeat	ar, or clear but t objects visible a to 6 ft (less if colored); no oil n surface; no ole film on ged objects or	at obje 1.5 slig	casional ects visi to 3 ft; i htly grea en on w	ble at d may ha en colo	lepth ve r; no oil	most of time visible to de ft; slow sect appear pea- rocks or sub objects cove heavy green green film.	pth 0.5 to 1.5 ions may green; bottom omerged ared with a or olive- Or lor of	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	(9) 8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

		Nut	trient	Enrichmen	t	
Clear water along entire reach; diverse aquatic plant community little algal growth present.	Fairly clear greenish wa entire reach algal grown substrates.	ater alo i; mode	ng erate	entire read algal grov	water along ch; abundant vth, especially mer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10 / 9 / 8	7 6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish I	Barriers			
No barriers.		withc			Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	1	8	(7)	6	5	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

					Instream	Fish Cov	er		
>7 cover types available		6 to 7 avail	7 cover able	types	4 to 5 co available	ver types	2 to 3 cov available	/er types	None to 1 cover type available
10 ( 9	1	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

					Embec	Idedness				
Gravel or particles a embedde	are <20%	parti	vel or co cles are embed	20 to	Gravel or particles 40% emt	are 30 to	Gravel or particles embedde	are >40%	Completely embedded.	
10	9	/8)	7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	Insect/inver	ebrate Habitat	
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhangin trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8)	7 6 5 4	3 2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

			Key: Th	is peri	tains to	waten	ways wh	y Cover here channe ter fishery	l is 50 feet wic	le or less.
>75% o shaded 3 miles shaded	and gene	upstr	eam 2 to	>75		Or ach, bu			% shaded.	<20% of water surface in reach shaded.
10	(9	)	8	7	6	5	4	3	2	1

	Aband	oned Mine Dr	ainage (i	f applicat	ole)	
(Intentionally blank)		of iron staining. Or iron precipitate.		ecipitate vis orange ance.	ible,	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	•	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

# Stream Section Name: \_\_\_\_\_ Date: \_\_\_\_\_

		Sewage (if a	applicable)		
(intentionally blank)		odor, excess th and siltation.	plant grow	e odor, excess ⁄th. And	Visible pipe with effluent, heavy odor.
				ble pipe and am substrate.	
<u> </u>	5	4	3	2	1

## Mark discharge(s) on map and/or with GPS unit.

	Manur	e Presen	ce (if applie	cable)	·····
(Intentionally blank)	Evidence of live access to riparia		stream or	al manure in waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
					Untreated human waste discharge pipes present.
	5	4	3	2	1

## **NOTES**

Cirk W. / /		ek Watershed		<b>_</b>	,	1
Evaluators' Names_ Sub-Watershed Stream Name	E. Branch BS.C	Stream Section		Date:	<u>    8/28</u>	107-
Stream Name	11	Reference O	n Name	EBB.	<u>sc'zy</u> .	- <u>2</u> _32
Weather Conditions	Today Suna V		lion			
Stream Name Weather Conditions Active Channel Width	l: feet	00_FPa:	st 2-5 Day	s	the su	
		_				1-
Grazing Pasture	LANDU	SE WITHIN DRAINAG	E (%):			
orest	Olassy	Field	_ ( <i>1</i> 0).	Bang		
Commercial			2000	Row Crops	;	1
÷		ned Mine Lands		Other		<u> </u>
Boulder		SUBSTRATE (%):				<u> </u>
			Silt	40	Mud	
woods below	HE LAND USE OF TH	CAREA THAT THE	STREAM	LOWS THR	 0UGH•	
	<u></u>	, new and do	l herid	ntial down	eles (	
		very top ,	E He u	interfed.	ugart.	12_
aypoint Photo Desc	GPS	POINTS / PHOTOS:				
<u> ハヴ                                   </u>	ahaott					
29 6 n	TART of new sec	tion			рН	Cond
30 7-09	cidge and debris varied - ant pipe	jan across d	nannel			ļ
	E passible SWM	- A Ing / Schere	y erad	ed	+	┟────
10-14103	Chamel coming u	- Fit Within	sight c	f T-79	+	<u> </u>
· )			en everiu	slabit.		<u>~</u>
3 14 cmF	+ check @ road	crowing.	Canca pe	slabit.	13 00	$\square$
	Verce of tribs the	At go Under	7.80/9	00 -> trik	7.78	706
		Neely Rd.	7.731/1	10 7 t-ib. U	From your	<u>m Rol.</u>
15 Stin	sewer covered b				6 m 47	d
	Sewer Covered b	y debrit caur	q evosin	damelia	hingo	
					<u> </u>	
						·
				<u>-</u>		
/e plants present: Ye	s/No Jananaca	Knohu		<u> </u>	<u></u>	
Litter: Yes/ No	Fran T-29	Garlic m	iustard 🗇 I	Purple looses	trife 🗖 🗅	ther
lain wetlands; Yes)/ N d areas: Yes / No (We		·	·			u 101 -
d areas: Yes/No (We Guid area fr.	it so, approxim	ate size: Length	/ Width	fact		<b>—</b> —
	Stland or other)			1661		

Stream Section Name:	
Date:	

Ē	BB.					35
	8	12	2/	6	1	

	Parameter	Scor	re l	Explanation of Score Given
	Channel condition	3		
	Riparian zone	8		
	Bank stability	5		
ľ	Water appearance	7		
	Nutrient enrichment	8		
F	Fish barriers	1		pipe X-ing @ w.p. 30
	n-stream fish cover	4		
E	mbeddedness	5		
Ir	nvertebrate habitat	6		
С	anopy Cover	9		
	MD (if applicable)	MA		
[	ewage (if applicable)	MA		
Ma	anure presence (if applicable)	NA		
(Add	DTAL SCORE d all scores and divide by ber of scores given)	5.6	< 6.0 6.1 – 7.4 7.5 – 8.9 > 9.0	= POOB = FAIR = GOOD = EXCELLENT

Stream	Section	Name
		Date:

Eb	65(	12	Y -9	<u>3)</u> (
	8	28	107	

## Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	Channe	el Co	onditi	ion		
structur evidenc	channel; no es, dikes. No e of down- or excessive cutting.		char with of cł Any set b acce	ence c nel alt signific nannel dikes c back to ess to a l plain.	eration cant re- and ba or levie provid in adec	covery inks. is are e	the and Ex bra	reach d/or ch cess a ided c ees re	hannel; « n with ripi nanneliza aggradat channel. I estrict floc	rap tion. <b>ion</b> ; Dikes or	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	0 9 8 7 6 5 4 (3) 2					2	1				

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

	· · · · · · · · · · · · · · · · · · ·	Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 9	(8) 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability										
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately s elevation of plain; less th eroding surfa banks in out is protected that extend t flow elevatio	active floo an 33% c ace area side bend by roots o the bas	bd banks m f typically of occurs 1 s less freq bends ar e- (overhan at top of mature to stream a	ely unstable; ay be low, but are high (floodin year out of 5, or uently); outside re actively erodin nging vegetation bank, some rees falling into unnually, some lures apparent).	inside edges of bends are actively eroding as well as						
10 9 8	7 6	(5)	4 3	2	1						

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

	Wat	er App	bearance		
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at dep 1.5 to 3 ft; may have slightly green color; r sheen on water surfa	oth no oil ace.	Considerabl most of time visible to dep ft; slow secti appear pea-g rocks or sub objects cove heavy green green film.	pth 0.5 to 1.5 ons may green; bottom merged red with or olive- Dr or of	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals,
	$\sim$				oil, sewage, other pollutants.
10 9 8	7) 6 5	4	3	2	4

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient	Enrichment	
Clear water along entire reach; diverse aquatic plat community little algal growth present.	Fairly clear or slightly	Greenish water along entire reach; abundant algal growth, especially	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10 9 (8)	7 6 5 4	3 2	4

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

				Fish	Barriers		· · · · · · · · · · · · · · · · · · ·			
No barriers.	with			Drop stru culverts, diversior drop) wit reach.	dams or is (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop s culvert diversid drop) w reach.	s, dan ons (>	ns or 1ft
<u> 10                                   </u>	8	7	6	5	4	3	2	10001.	$\left(\frac{1}{4}\right)$	

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

					Instream F	ish Cov	/er		
>7 cover types 6 to 7 cover types available available		4 to 5 cove available	4 to 5 cover types 2 to 3 cover types None to 1 co						
10 9 8 7 6				5	(4)	3	2	available	
								L	

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:

Stream	Section	Name
		Date:

EBBSC 28-735 08/28/07

					En	nbeddedi	iess			
Gravel or cob particles are < embedded.		partic	el or col les are embedo	20 to	part	/el or cobb icles are 30 Pembedde	) to	Gravel or particles embedde	are >40%	Completely embedded.
10	9	8	7	6	( 5	1	4 <sup>.</sup>	3	2	1

**Keys:** Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

						Insec	:t/inverte	brate Habit	at	
10 9 8 7 (6 <sup>-</sup> ) 5 4 3 2 1	availab stage to coloniza	le. Habita o allow ful ation (wo	t is at a Il insect ody debris	Son exis tree hab	ne pote ts, suc s, whic itat, bu	ential ha h as ov h will pi t have r	ibitat erhanging rovide not yet	The substr disturbed, removed b velocities a	ate is often covered, or y high stream and scour or by	
	10	9	8	7	( 6'	) 5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse graval, other:

		Key: Th	is perta	ains to	water	ways wh	y Cover ere channel er fishery	is 50 feet wid	de or less	3.
>75% of shaded a 3 miles g shaded.	and up	stream 2 to	>75% upstre	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>			20 to 50%	shaded.		of water surface in shaded.
10	(9)	8	7	6	5	4	3	2		1 .

· · · · · · · · · · · · · · · · · · ·	Abando	ned Mine Di	ainage (if ap	plicable)	
(Intentionally blank)		iron staining. Or on precipitate.	muddy orai	•	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name
		Date:

	Sewage (	f applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
		And	
		Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

· · · · · · · · · · · · · · · · · · ·	Manure Prese	nce (if applicable)	
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or
· .			Untreated human waste discharge pipes present.
	5 4	3 2	1

## **NOTES**

•						Watershed V				
Evaluator	s' Name	5			SA/C	B		Date:0	8/28/	v7
Sub-Wate	rshed		Eart	Br.	BSC	Stream Sectio	on Name	EBBSC	25 ->	<u>17</u>
Stream Na				11		Reference Sec	tion			
Weather C	Condition	ıs To	day		sunny,	~ 80°FPa	st 2-5 Days	Most	y sunn	<u>у</u>
Active Ch					· · ·				/	/
Active on										
				L		WITHIN DRAINA		<b>D</b>		
Grazing Pa	asture				Grassy Fi		<b>10</b> <b>10</b> <b>10</b>			t
Forest			<u>6</u> 98	10	Residentia	al ed Mine Lands	<b>920</b> AU	Other		
Commerci	al					BSTRATE (%):	<u>l</u>	<u>j otnor</u>		
	-1	<u> </u>	Cabbla	<u> </u>	G		Silt		Mud	
Boulder			Cobble		I	AREA THAT TH	<u></u>		l.	
										I to Dd
	Gasry	<u>, †</u>	ield / I	lan	1 artss	by two priv	ate resto	$\frac{1}{10}$	ng U-cm	ICAF KU
								····		`
		<u> </u>			GPS F	POINTS / PHOTO	S:			
Waypoint	Photo	Des	cription						рН	Cond.
25	2-3	51	ART /	Hor	H LANDON	WER /HOMES	Bank 6	notion		
26	4-5	p	Ivate	brid	lye / pl	artic, while o	utlet (sen	rage 7.		
27			<u>ENÓ /</u>	en	<u>d of mow</u>	id area back	; into wood	s on both sid	er	· ·
						• •				
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	<u> </u>					-			<u> </u>	<u>_</u>
Invasive p	olants pr	esen	t: Yes/	No	🗖 Japar	nese Knotweed 🗖	Garlic musta	ard 🗖 Purple lo	osestrife	e 🗖 Other
Trash / Li			<b>`</b>							
			<u> </u>		lfeo annr	oximate size: Ler	nath 50 /1	Vidth <i>S´D</i> fe	et	
Floodplai		~	_			JAIIII ALG JILG, LCI	igui <u>o -</u> / V			
Flooded a	areas: Y	es / N	lo (Wetl	and	or other) _	<u></u>				<b>·</b>
Notes:	Spole	w/	landon	мr	of scen	nd have. H	e said t	hat the s	frem	lenar its
	banks	- 'F	ngventi	ly	in thir	aron, and i	+ seens	to hypen	Mi/t	often sinc
	pe	+ w	whip	put	in new	arm, and i steen seve	r on the	roads.		

Stream Section Name:  $EBBJC 25 \rightarrow 27$ Date:  $\frac{8/28/07}{}$ 

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	3	grass movied up to edge of stream
Bank stability	4	
Water appearance	6	
Nutrient enrichment	6	-
Fish barriers	9	
In-stream fish cover	З	
Embeddedness	6	
Invertebrate habitat	5	
Canopy Cover	3	
AMD (if applicable)	Аlч	
Sewage (if applicable)	5	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	<u>(5.2)</u>	< $6.0$ = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > $9.0$ = EXCELLENT
#### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Channe	I Condition	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past' channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate	Altered channel; <50% of the reach with riprap and/or channelization. Excess <i>aggradation</i> ; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	10 od plain.	3 2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side.	Natural vegetation extends half of the active channel width on each	Natural vegetatión extends a third of the active channel width on each side.	Natural vegetation less than a third of the active channel width on each side.
Widths on edon older	Or	side.	Or	Or
	If less than one width, covers entire		Filtering function moderately	Lack of regeneration. Or
	flood plain.		compromised.	Filtering function severely compromised.
10 9	8 7 6	5 4	(3) 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	E	Bank	Stability		
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; elevation of active f plain; less than 33% eroding surface are banks in outside be is protected by root that extend to the b flow elevation.	lood % of ea of ends is	Moderately un banks may be typically are h occurs 1 year less frequent bends are ac (overhanging at top of bank mature trees stream annua slope failures	e low, but high (flooding rout of 5, or y); outside tively eroding vegetation k, some falling into ally, some	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 (	4)	3	2	1

Keys: All outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

	Water Ap	pearance	
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive- green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	7 (6) 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

				Nu	trient	Enrichmer	nt		
Clear water along reach; diverse ac community little growth present.	juatic plant algal	greei entiro alga	nish w e reac	<sup>·</sup> or sligl /ater alc h; mod /th on s	ong erate	entire rea algal gro	water along ich; <b>abunda</b> r wth, especia armer months	nt water Illy sever	green, gray or brown · along entire reach; ·e algal blooms ·e thick algal mats in m.
10 9	8	7	6	5	4	3	. 2		1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

			- ····································	Fish I	Barriers			· · · · · · · · · · · · · · · · · · ·
No barriers.	withd	ement w	ater inhibit vithin the	Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 (9)	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

				Instream	Fish Cov	er		
>7 cover types		7 cover ilable	types	4 to 5 cov available	••	2 to 3 co avaitable	ver types	None to 1 cover type available
available	0	7	6	5	4	(3)	2	1
10 9 ·	0							$\bigcirc$

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, liffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

		Embeddedness		
particles are <20%	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
embedded.	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	li li	isec	t/inverteb	rate Habi	itat	
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly	3 to 4 types of Some potent exists, such a trees, which habitat, but h	of hal ial ha as ov will p ave I	pitat. abitat rovide not yet	1 to 2 type The subs disturbed removed velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
fallen).	entered the s	<u>area</u> r	YI.	200111011	2	1
10 9 8	7 6	5	/_4	<u> </u>	<b>_</b>	

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Key: Thi	<b>Canopy</b> s pertains to waterways <b>wher</b> Coldwater	e channel is 50 feet w	
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly</li> </ul>	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	shaded. 7 6 5 4	(3) 2	1

	Abandoned Mine Dra	inage (if applicable)	
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

		Sewage (if a	applicable)		
(Intentionally blank)	Noticeable o plant growth		Noticeable plant growt	odor, excess h.	Visible pipe with effluent, heavy odor.
			Δ	\nd	
			Questionab	le pipe and n substrate.	
	(5)	4	3	2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure Pres	ence (if applicable)		
(Intentionally blank)	Evidence of livestock access to riparian zone	Occasional man stream or waste structure located flood plain.	storage	Extensive amount of manure on banks or in stream. Or
•				Untreated human waste discharge pipes present.
	5 4	3	2	1

**NOTES** 

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Evaluator	rs' Name	s5A/CBDate:	08	*/14	107
Sub-Wate	ershed	s <u><math>5A/CB</math></u> Date: <u>Eart Branch B5(</u> Stream Section Name <u>EFB</u> .	568-	9 200	24
Stream N	ame —	Reference Section	,		
Weather (	 Conditio	ns Today Sunny ~ 75° F Past 2-5 Days	eary van	lart	Th.
Active Ch	annel W	/idth: <u>6-8</u> feet	_/		
				,	
		LAND USE WITHIN DRAINAGE (%):		T	
Grazing P	asture		Crops striat		
Forest Commerci	al	90         Residential         10         Indus           Abandoned Mine Lands         Other			
Commerci		SUBSTRATE (%):	Bedn	 .k	
Boulder	5	Cobble gravel 20 Silt/Ser 25			20
	<u> </u>	IBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS			· · · · · · · · · · · · · · · · · · ·
5.		relady, Rente 79, Georelady Rd., shouting ray			
			<del></del>		
		· · · · · · · · · · · · · · · · · · ·		····	
		GPS POINTS / PHOTOS:			
Waypoint	Photo	Description		pH	Cond.
EF8(i)	1	concrete slabs streamback stabilization			
10	ן ג	retal line (ans?) crissing stream in air			
<u> </u>		retal line (gas?) crissing stream in air small trib coming in from the eart			580
12	3	tree down deprif 1999	<u> </u>		
13	4	horse access to stream channel. Trees down across stream in two (2) place			
15		stormwater runoff from int. of roads at	Dave .		
16		trib. From wert * main Fork in tribs. (similar flows) * main ster	strum Ch	ch -	950
17				tribe	5 910
18	67 8	Gar Liner (metal) crist-crossing stream chan CMP culturet under genelandraccess road	nnel.	Cilan	1.5476.60
	749	wetland plant (~ 5' tall)	(pixia)	TUMP	/
0	10	trees chewed by bearer, near gos pin	peline.		
19	<b>A</b>	trees chewed by beater, near gos pill bank erosion fore jan / sand bar.	·		
20					
20	<b>1</b> 4	beaver dan? across from shrotig rage. Frisbre on stick.	<u> </u>		
	6	concrete cylinder wird for back stab	ilization		
_4		(END of Day 78/14 culout cristing for Genelade entrant - d.s. ero	<u>k.</u>		
<u></u>	<u> </u>	THE fun across the wind	<u>s in</u>	 1.67	200
nvasive p	lants pre	esent: Yes (No) 🗇 Japanese Knotweed 🗇 Garlic mustard 🗇 Pe			
Frash / Lit	ter: Yes	1000 not much, few tirer year parking as	reg in	top of	rectio
Floodnlair	wetland	ds: Yes No If so, approximate size: Length / Width	feet (	btw	16-17
- popool		es) No (Wetland or other)floud plain		2 <b></b>	•
Notes:	1 - 0	end of section / trib. from across the road -			
્  સે `	1 - C	in a section trib, from across per road .		4	

•

Parameter	Score	Explanation of Score Given
Channel condition	9	
Riparian zone	10	
Bank stability	9	
Water appearance	. 8	
Nutrient enrichment	8	
Fish barriers	7	
In-stream fish cover	9	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	10	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	( <del>87)</del>	< 6.0 = POOR 6.1 - 7.4 = EAIR 7.5 - 8.9 = GOOD + > 9.0 = EXCELLENT

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Str	eam	Section	Name
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Date:

#### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

				С	hann	el Conditio	n	•
Natural cha structures, evidence of Cutting or e lateral cuttin	chai with of cl Any set l acce	nnel all signifi nannel dikes back to	of past teration, cant rec and bai or levies provide an adeq	overy nks. s are	the reach and/or cha Excess ag braided ch	annel; <50% of with riprap annelization. I <b>gradation</b> ; annel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.	
10 (	9 8	7	<u>6</u>	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
(10) 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation. 10 9 8 7 6 5 4		Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 (9) 8	7 6 5 4	3 2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

			۷	Nater Ap	pearance		
colored; depth 3 slightly o sheen o noticeab	ar, or clear but tea- objects visible at to 6 ft (less if colored); no oil n surface; no sle film on ged objects or	objects 1.5 to 3 slightly	onally clo visible at s ft; may h green col on water s	depth ave lor; no oil	most of time visible to de ft; slow sect appear pea rocks or sul objects cove heavy green green film.	opth 0.5 to 1.5 tions may -green; bottom omerged ered with n or olive-	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other
	$ \longrightarrow  $						pollutants.
10	9 \8/	7 (	65	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient l	Enrichme	nt	
reach; commu	vater along diverse ac inity little i present.	uatic plar algal	nt gree enti alga	ly clear enish w re reacl al grow strates.	ater alo n; mod th on s	ong erate	entire re algal gro	n water along ach; abundant owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	(8)	7	6	5	4	3	2	1 .

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers			· · · · · · · · · · · · · · · · · · ·
No barriers.		witho	ement	vater s inhibit within the	Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	(7)	6	5	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

		-			Instream	Fish Cov	er		·····
>7 cover typ available	bes		7 cover lable	types	4 to 5 co available	• •	2 to 3 co available		None to 1 cover type available
10 (	9)	9) 8 7 6		6 5 4 3			2	1	
								~	<u> </u>

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, iffies, undercut banks, thick root mats, dense macrophyte beds, isolated/packwater pools, other:\_\_\_\_\_

Stream Section Name: <u>EFBJC</u> Date: <u>P/14</u>

EFBSC 8-7204 8/14/07 18/28

		-			Embe	ddedness				
Gravel or o particles an embedded	re <20%	par	avel or co ticles are % embed	20 to	Gravel o particles 40% em	are 30 to	Gravel of particles embedde	are >40%	Completely embedded.	
10	9	8	7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

			Insec	t/invertel	orate Hab	itat	
available. Ha	v full insect (woody debris	Some p exists, s trees, w habitat,	ypes of hab otential ha such as ove /hich will pr but have n the stream	bitat erhanging ovide ot yet	The subs disturbed removed velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10 (9	8	7 0	6 5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

		Key: Ti	nis per	tains to	o water	ways wh	y Cover ere channel er fishery	is 50 feet wi	de or less.
sha 3 m	% of water s ded and upst iles generally ded.	ream 2 to	>75 upsl	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>			20 to 50%	shaded.	<20% of water surface in reach shaded.
10	) 9	8	7	6	5	4	3	2	1

	Aband	oned Mine D	rainage (if ap	oplicable)	
(Intentionally blank)		of iron staining. Or iron precipitate.	muddy ora	•	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

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Stream Section Name: EFBJC = 9 204Date: 8 / 14/07 = 8/28

	Sewage (if applicable)								
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.						
		And							
		Questionable pipe and black stream substrate.							
	5 4	3 2	1						

Mark discharge(s) on map and/or with GPS unit.

	Manure Presence (if applicable)									
(Intentionally blank)	Evidence of livestoc access to riparian zo	one. stream or v	l manure in waste storage ocated on the	Extensive amount of manure on banks or in stream. Or						
•			· •,	Untreated human waste discharge pipes present.						
	5 4	3	2	1						

**NOTES** 

a the first state of the second state of the s	KS/SA	Stream St	ection Name E	_Date:	BSE	EFBSC
Sub-Watershed	TEARY R	SC Reference	Section			
		<u> </u>	Dest 2 5 Days			
Veather Conditions 1	oday		_ Past 2-0 Days	·		
Active Channel Width	1: <u>70</u> feet					
		LAND USE WITHIN DRA	INAGE (%):			
		Grassy Field		Row Crops		
Brazing Pasture		Residential		Industrial		
Forest Commercial		Abandoned Mine Land	3	Other	· .	
	<u>l</u>	SUBSTRATE (	%):			
Boulder	Cobble	Gravel	Silt		lud	
DESCRIBE	THELANDL	JSE OF THE AREA THA	THE STREAM	FLOWS THRO	UGH:	
		· · · · · · · · · · · · · · · · · · ·				
<u> </u>		east side BSC) GPS POINTS / PH				
FBSCI S	tart (on	GPS POINTS / PH	OTOS:			
Naypoint Photo De	escription				pH	Cond.
F135C412 12	Debor th	ee Jam				
-FBSC \$3.3	Pork		<u> </u>			
	Dicony T	bb (Pag). Nb (Dag) Thee lin				
5 13 14	Premer I		<u>185</u>		•	
10 15	This Chipple	to KUNGED				
	Marpaure 1	brages				
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			<u></u>	<u> </u>	1	
	`````					
<u></u>						
		☐ Japanese Knotwee				

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Notes:

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Parameter	Score	Explanation of Score Given
Channel condition	\$ 9	
Riparian zone	89	
Bank stability	7,8	
Water appearance	Ś	
Nutrient enrichment	8	
Fish barriers	. 7	
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	8	
AMD (if applicable)	NA	
Sewage (if applicable)	NĄ	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	82/10 8.2	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

			С	hanne	el Conditio	n	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	chan with of ch Any set b acce	signific annel dikes c ack to	eration, cant rec and bai or levies provide n adeq	overy nks. s are	the reach and/or cha Excess ag braided ch	annel; <50% of with riprap annelization. Igradation; aannel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 (9) 8	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

**Keys:** look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

·····		Ri	barian Zo	ne		
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side.			extends a the active		Natural vegetation less than a third of the active channel width on each side.
	Or	side.		1	Or	Or
-	If less than one width, covers entir flood plain.	e		Filtering f moderate comprom	ly	Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5	4	3	2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

		Bank	Stability		· · · · · · · · · · · · · · · · · · ·
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately s elevation of a plain; less tha eroding surfa banks in outs is protected k that extend to flow elevation	active flood an 33% of ice area of ide bends by roots o the base-	occurs 1 ye less frequer bends are a (overhangin at top of bar mature tree stream annu	be low, but high (flooding ar out of 5, or htly); outside actively eroding by vegetation nk, some s falling into	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6	5 4	3	2	· 1

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		W	ater Ap	pearance		
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasiona objects vis 1.5 to 3 ft; slightly gre sheen on v	ible at c may ha en colo	lepth ive ir; no oil	most of tim visible to d ft; slow sec appear pea rocks or su objects cov heavy gree green film. Moderate o	epth 0.5 to 1.5 stions may a-green; bottom bmerged vered with en or olive- Or	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	76	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichme	<u>nt</u>	
reach; c commu	ater along liverse ac nity little present.	juatic plant algal	gree entii alga	ly clear enish w re react al grow strates.	ater alc n; mod	ong erate	entire rea algal gro	i water along ach; ab <b>undan</b> o <b>wth</b> , especial armer months.	lly severe algal blooms
10	9	(8)	7	6	5	4	3	2	· 1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers										
No barriers.	with	ement	vater s inhibit within the	Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversions drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.		
10 9	8	77	6	5	4	3	2	1		

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

Instream Fish Cover									
>7 cover types		o 7 cover ailable	types	4 to 5 co available	ver types	2 to 3 co available	ver types	None to 1 cover type available	
available	8	) 7	6	5	4	3	2	1	

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffies, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

р

# Stream Section Name:

					Embe	ddedness			
Gravel of particles embedde	are <20%	part	vel or co icles are s embed	20 to	particles	or cobble s are 30 to nbedded.	Gravel o particles embedde	are >40%	Completely embedded.
10	9 /	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat										
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.							
10 (9) 8	7 6 5 4	3 2	1							

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

Key: Th	is pertains to	water	ways wh	/ Cover ere channel is er fishery	s 50 feet wid	de or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% sha >75% in re upstream 2 shaded.	Or ach, bu	t	20 to 50% s	shaded.	<20% of water surface in reach shaded.
10 9 8 7 6 5 4				3	2	1

	Abandoned Mine Dra	ainage (if applicable)	
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Date:

• :

#### Stream Section Name: \_\_\_\_\_ Date: \_\_\_\_\_

	Se	wage (if a	applicable)		
(Intentionally blank)	Noticeable odor, plant growth and		Noticeable of plant growth. An		Visible pipe with effluent, heavy odor.
			Questionable black stream		
	5	4	3	2	11

Mark discharge(s) on map and/or with GPS unit.

	Manure Presence (if applicable)									
(Intentionally blank)	Evidence of livestock access to riparian zon		e storage	Extensive amount of manure on banks or in stream. Or						
				Untreated human waste discharge pipes present.						
	5 4	3	2	1						

## **NOTES**

	g Sewickley Creek Watershed Visual Assessmen		****
Evaluators' Nam	$Parte: \frac{CB}{Date: \frac{D2}{Date: D2}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}$	0710	08
	<u>NFBSC</u> Stream Section Name <u>NF 46-9</u>		
Stream Name	UNT to NEBSC Reference Section		
	ons Today scattered light snow ~35° F Past 2-5 Days rain s	new	
Active Channel	/idth: <u>~4_</u> feet		
	LAND USE WITHIN DRAINAGE (%):		·····
Grazing Pasture	Grassy Field V 10 Row Crops		
Forest Commercial	V     75     Residential     V     15     Industrial       Abandoned Mine Lands     Other		<del></del>
	SUBSTRATE (%): Cobble 40 Gravel 40 Silt 20 M		
Boulder	Cobble 40 Gravel 40 Silt 20 M		
Mostly to	rented area with home on hillsider above the strum	valle	Y
<u>Seven</u>	ne running up strim valley. Abundant wildlife	Sign	
Includ	gps points / photos:		
Waypoint Photo	Description	рН	Conc
INFY6	Near conflorence on main stem	7.65	
11	Small concrete stimuture w/ dischase pipe new road		
2 NF 47 2	bank erision (~301 long)	-11 2//	
3 NF-48 3	small trip. from Kollow/ willard (some bank erosian) big with and in Flood plain on posted ground	7.34	470
4 NE49 5		7.49	1366
5 NESO 6	Trip concerding dues hill from the wort	7.59	60
PNFSI	small trib. Fluwing in from east, beside by homes	7.53	770
7 1 NF52 8	small trib. Flowing in from cast, beside by homes swM outlet pipe (~ 18" SPP) road confluence w/ trib. from west and old Mar. X-ing	~~	
7 NF52 8	Sever evosich around 36" concrete pipe	7.58	210
	(not lage crough fin	stran 4	(m)
8 NF 53 9	S.W.M. auflet		<u></u>
9 NF 54 10	rock flue structure (o) in stream behind log house		
	Small trib. from Part	7.54	580
NF 55 11		7.56	.610
11 NF 56 12	SWM outlet to stream (15" SPP) near X-ing under He E.S. barin at cul-de-sac in "whispering Pins"	1401	<del></del>
13	View upstran between Ess. baring development		
	Gard road		
<u> </u>			
Invasive plants pr	esent: Yes (No) 🗇 Japanese Knotweed 🗇 Garlic mustard 🗇 Purple loose	estrife 🗆	l Othei
Trash / Litter: Yes			
		<u></u>	
Floodplain wetlan			
Flooded areas: Ye	s/No (Wetland or other) large wetlind		
Notes:			

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Stream Section Name: NF 46 - 56Date: 02/07/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	9	
Bank stability	7	١
Water appearance	7	
Nutrient enrichment	9	
Fish barriers	8	
In-stream fish cover	7	
Embeddedness	7.	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	79 ÷ 10	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream Section Name:  $\frac{NF 46 - 356}{Date: 02/63/08}$ 

#### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	hann	el Conditi	on			
structo evider Cutting	al channel; ures, dikes nce of dow g or exces cutting.	. No n-	cha with of c Any set acc	signifi hannel dikes back to ess to a	teration cant red and ba or levie provide an adec	overy nks. s are	the reach and/or ch Excess a braided cl	nannel; <50% of with riprap annelization. ggradation; hannel. Dikes or strict flood plain	down >50% riprap Dikes	nel is actively cutting or widening of the reach with or channelization or levees prevent as to the flood plain	l İ
	flood plain.										
10	9	(8)	7	6	5	4	3	2		1	

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability									
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).						
10 9 8	7 6 5 4	3 2	11						

Keys: All outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

NF	40	, -9	S	-6
0	21	107	10	8
	-1		t T	

	Water Ap	pearance	· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive- green film. Or	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
	· ·	Moderate odor of	Or
		ammonia or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8 (	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

Nutrient Enrichment									
reach; c commu	ater along liverse aq nity little a present.	uatic plant algal	gree enti alga	ly clear enish wa re reach al grow strates.	ater alc n; mod	ong erate	entire re algal gro	n water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	(9)	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barrier	s.	with			Drop stru culverts, diversior drop) wit reach.	dams or is (<1ft	diversion	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	/ 8 /	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

Instream Fish Cover									
>7 cover available	types		7 covel able	types	4 to 5 co available		2 to 3 co available	over types e	None to 1 cover type available
10 9 8 (7) 6 5 4 3 2 1					1				

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, (riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream Section Name: <u>NF 46</u> Date: <u>02/0</u>

Embeddedness									
Gravel or cobt particles are ≺ embedded.		Grave particl 30% e	es a	re 20 to	Gravel o particles 40% em	are 30 to		or cobble s are >40% ed.	Completely embedded.
10 9	)	8 (	7	6	5	4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded:

		orate Habitat	
At least 5 types of habit available. Habitat is at a stage to allow full insect colonization (woody deb and logs not freshly fallen).	Some potential habitat exists, such as overhanging	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 (8)	7 6 5 4	3 2	1

Cover types: Fine woody debris, subme ged logs, leaf packs, under out banks, cobble) boulders, coarse) gravel, other: \_\_\_

		Key: Th	is pertain	s to water	rways wh	y Cover ere channel er fishery	is 50 feet wid	le or less.
<ul> <li>&gt;75% of water surface shaded and upstream 2 to 3 miles generally well shaded.</li> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly shaded.</li> </ul>					20 to 50%	shaded.	<20% of water surface in reach shaded.	
10	( 9 /	8	7 6	5	4	3	2	1

· · · · · · · · · · · · · · · · · · ·	Aband	oned Mine D	rainage (if ap	plicable)	1
(Intentionally blank) $\mathcal{V}$		of iron staining. Or Iron precipitate	muddy ora	-	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
······································	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name:
		Date:

NF 46 -9 56 02/07/08

· ·	Sewage (	f applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
NIA		And	
		Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)											
(Intentionally blank) いん	Evidence of live access to ripar		stream or	al manure in waste storage located on the n.	Extensive amount of manure on banks or in stream. Or						
· .					Untreated human waste discharge pipes present.						
	5	4	3	2	1						

### **NOTES**

# Big Sewickley Creek Watershed Visual Assessment

巨川

Ø

Evaluators' Nam	es	KS / CB		Date:	02/07/08
		1	m Section Name		· /
			ence Section	-	
			Thow Past 2-5 Days		
		T COUL SCHIMA	Past 2-5 Days	<u>N</u>	- Shaw
Active Channel V					
		LAND USE WITHIN	DRAINAGE (%):		
Grazing Pasture		Grassy Field	10	Row Crops	
Forest	V 80	Residential	<u> </u>	Industrial	
Commercial		Abandoned Mine L		Other	
Boulder	Cobble	SUBSTRA		20	Mud
f			HAT THE STREAM		·····
			from pend on		
			honlock treve a		
New Sewa	ye line install	ed durn stress	r valley.		
		GPS POINTS /	7		, <u> </u>
Waypoint Photo	Description				pH Con
WEAVES7 14		ib. from north		······································	7.66 69
MNE58 16		un stream val		<u></u>	
MNP59 16	Small that	trom Saeth			7.93 23
W>NF60 18	Cotre ove	n? in hillsi	de alora stra	·~~)	
NNFG1	Near Mo	with of stream	de along stra C X-ing und	in main R.	or 7.80 380
		<u></u>			
	· · · · · · · · · · · · · · · · · · ·				
	······································	·		<u> </u>	
			······	·	·
	·	······································			
			·····	· · · · · · · · · · · · · · · · · · ·	
			·····		
		· · · ·			
Invasive plants pr	esent: Yes No	Japanese Knotw	/eed 🗇 Garlic mustar	d 🗆 Purple lo	osestrife 🗆 Othe
Trash / Litter: Yes	(No)				
Floodplain wetlan	ds (Yes)/No If	so, approximate si	ze: Length/ W	idth fee	ət
	A DECK	other) imm	diately adjoired	to stran	n and sewer
· · ·			•		
Notes: - Silt	force still	in place all	the way dow		1
			in any now	+1 Strem	Vally nord
Hen	locks / femr	an hill sider			rymm

NF 57 - 76 | 02/07/08

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	
Water appearance	8	
Nutrient enrichment	7	
Fish barriers	9	
In-stream fish cover	6	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	8	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	79 ÷ 10	< 6.0 = POOR 6.1 - 7.4 = EAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

#### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

-				C	hann	el Conditio	on			
Natural channel; no structures, dikes. N evidence of down- Cutting or excessive lateral cutting.	0	chai with of cl Any set t acce	signifi nannei dikes back to	teration cant rec and bai or levies provide an adeq	overy nks. s are	the reach and/or cha Excess ag braided ch	annel; <50% of with riprap annelization. Igradation; nannel. Dikes or trict flood plain	downo >50% riprap Dikes	nel is actively outting or wide of the reach w or channelizat or levees prev to the flood p	ith ion. ent
10 9 (	8)	7	6	5	4	3	2	-	1	

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 (	8 / 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability												
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends protected by roots that extend to the base-flow elevation.	l elev plai eroo is ban is p that	derately vation o n; less ding su ks in ou rotected extend elevati	f active than 33 rface a utside t d by roe l to the	e flood 3% of rea of bends ots	Moderate banks ma typically a occurs 1 less frequ bends are (overhang at top of t mature tro stream ar slope failu	ay be low are high ( year out lently); o e actively ging vege gank, sor ees falling nnually, s	y, but (flooding of 5, or utside v eroding etation ne g into come	inside edges of bends are actively eroding as well as					
10 9 (8)	5	4	3		2	1							

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

NF 57-761
02/07/08

	Water	Appearance	· · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no sheen on water surface		appearance most of the time; objects visible to depth <0.5 ft; slow moving
	· ·	Moderate odor of	Or Strong odor of chamicala
		ammonia or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 9 (8)	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichme	nt	
reach; commu	vater alon diverse ac inity little i present.	quatic plant algal	ent ent alg	rly clear enish w ire reacl al grow ostrates.	ater alc n; mod th on s	ong erate	entire rea	water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers			
No barriers.	$\sim$	with			Drop stru culverts, diversion drop) wit reach.	dams or is (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9 /	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

				Instream	Fish Cov	er		
>7 cover types 6 to 7 cover types available available		types	4 to 5 co available		2 to 3 cover types available		None to 1 cover type available	
10 9	8	7	(6)	5	4	3 2		1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream Section Name:

Date: 02

		-	· · ·		Embe	ddedness			
Gravel or c particles ar embedded	e <20%	pa	avel or co rticles are %_embed	20 to	Gravel o particles 40% em	are 30 to		or cobble are >40% ed.	Completely embedded.
10	9 (	8)	7	6	5	4	3	. 2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	Insect/inverteb	rate Habitat	
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	trees, which will provide habitat, but have not yet	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 (9) 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobbe, boulders, coarse gravel, other:

	Key: TI	nis perta	ains to	water	ways wh	y Cover iere channe ter fishery	l is 50 feet wi	de or less.
>75% of water s shaded and ups 3 miles generall shaded.	tream 2 to	>75%	<ul> <li>&gt; 50% shaded in reach. Or</li> <li>&gt;75% in reach, but upstream 2 to 3 miles poorly</li> </ul>				% shaded.	<20% of water surface in reach shaded.
10 9	(8)	7	7 6 5 4			3	2	1.

	Aband	oned Mine D	rainage (if a	pplicable)	
(Intentionally blank)		f iron staining. Or iron precipitate	muddy ora	•	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white
	5	4	3	2	precipitate visible, rotten egg smell. 1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name
		Date:

· · · · · · · · · · · · · · · · · · ·	Sewage (if	applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
NA		And	
1- ( <i>i</i>		Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

	Ma	nure Presen	ce (if applic	cable)	
(Intentionally blank) N/A	1	cess to riparian zone. 🛛 🛛 strea		al manure in waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
				-	Untreated human waste discharge pipes present.
	5	4	3	2	1

### **NOTES**

Evaluato	rs' Name	98	<u> </u>	B/KS			_ Date:	03	24/0
Sub-Wate	ershed _	NF	656	Stre	am Sectio	n Name	NF	77 -	79
Weather	Conditio	UNT to Nons Today	ustly su	mny ~ 4	<u>o°F</u> Pas	st 2-5 Days	sliy	ht sn	$m, \sim$
		/idth: fee		,					, '
			LAND	USE WITHIN		GE (%):		<u></u>	
Grazing P	asture	15		sy Field			Row Cro	ps	-
Forest		80		lential		5%	Industria	al	
Commerc	ial		Aban	doned Mine			Other		
Boulder	10	Cobble	30	SUBSTR/ Gravel		Silt	15	Mud	115
Douldei		IBE THE LAND						<u></u>	
		· · · · · · · · · · · · · · · · · · ·		· · · · · ·	·				·
							· · · · · · · · · · · · · · · · · · ·		
Waypoint	Photo	Description	G	PS POINTS	PHOTOS	•		n	H Co
NF77			-i(r . 3	D Course	, right	- of - wi	iv wu	,	
			-		bridge	e with	mud pur	nd into	stream
NF 78	12	15"0 5	<u>ipp for</u>	stream	X-ing	· • ·	•		
NF 79	13	iretland	area	piper	to drain	wetlan	17		
		·	/	· /	<u> </u>				
						,	<u></u>		
· · · ·			<u> </u>				· · · · · · · · · · · · · · · · · · ·		
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	<u>+</u>	<u> </u>				<u></u>			
			<u> </u>						
			·				·····		~

Floodplai	tter: Yes /No n wetlands: /	(es) No II	f so, approxi	imate size: Len	gth / Widi	th feet	
				Right - of.			
Notes:	<u> </u>			part this s	1	<u>.</u> .	

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08

Parameter	Score	Explanation of Score Given
Channel condition	5	
Riparian zone	7	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	8	
Fish barriers	6	
In-stream fish cover	4	
Embeddedness	6	
Invertebrate habitat	6	
Canopy Cover	7	
AMD (if applicable)	w/a	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	$63 \div 10$ $6.3$	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream Section Name: Date:

#### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition										
structe evider Cuttin	al channel; n ures, dikes. I nce of down- g or excessiv l cutting.	No	cha with of c Any set l	lence o nnel alt signific hannel dikes o back to bas to a bas to a d plain.	eratior cant re and ba or levie provid n adeo	covery anks. s are e	the reach and/or ch Excess au braided cl	nannel; <50% c with riprap annelization. ggradation; nannel. Dikes c strict flood plair	downcut >50% of riprap or Dikes or	is actively ting or widening. the reach with channelization. levees prevent o the flood plain.
10	9	8	7	6	(5)	4	3	2		1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends haif of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 (7) 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	(7) 6 5 4	3 2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

	Water Ap	pearance	· ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive- green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil accurace other
ł			oil, sewage, other pollutants.
10 9 8	7) 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

				Nu	trient	Enrichmen	t	
Clear water along entire reach; diverse aquatic plant community little algal growth present. Fairly clear or slightly greenish water along entire reach; modera algal growth on stre substrates.		ong erate	entire read algal grov	water along ch; <b>abundant</b> wth, especially mer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.			
10 9 8	)	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

			· ·			Fish	Barriers			
No barrie	ers.	with	sonal wa drawals i ement w h.	inhib		Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	diversio	ructures, s, dams or ons (>1ft ithin 1 mile o	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	1	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

				•	Instream F	ish Cov	/er		
>7 cover available		1	7 cover lable	types	4 to 5 cove available	r types	2 to 3 cov available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream Section Name: \_ Date: NF 77 7 79 03/24/08

					 Embeo	dedness		-		
Gravel or	re <20%	partic	el or cob dès are 2 embedd	20 to	Gravel o particles 40% emi	are 30 to	Gravel o particles embedd	are >40%	Completely embedded.	
10	9	8	7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded:

				Insec	:t/inverte	brate Hab	itat	
At least 5 types available. Habit stage to allow fu colonization (wo and logs not fre fallen).	at is at a Ill insect ody debris	Some exists, trees, habita	pote suc whic t, bu	s of hat ntial ha h as ov h will pi t have r e strean	ibitat erhanging rovide not yet	The subs disturbed removed velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10 9	8	7 (	6/	5	4	3	2	1

Cover types: Fine woody debris, submarged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

•		Key: Th	is pe	rtains to	o water	ways wh	/ Cover ere channel i er fishery	is 50 feet wi	de or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.		>75 ups	0% sha % in re tream 2 ded.	Or ach, bu		20 to 50%	shaded.	<20% of water surface in reach shaded.	
10	9	8	<u>[7]</u>	6	5	4	3	2	1

	Aband	oned Mine D	rainage (if a	oplicable)	
(Intentionally blank) $\mathcal{N}$		of Iron staining. Or Iron precipitate	muddy ora	÷	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name
		Date:

: <u>NF7</u> 03

	Sewage	e (if applicable)	
(Intentionally blank)	Noticeable odor, exce plant growth and siltat		Visible pipe with effluent, heavy odor.
		And	
MA		Questionable pipe and	
		black stream substrate.	
	5 4	3 2	1 .

Mark discharge(s) on map and/or with GPS unit.

······································	Manure F	Presence (if ap	plicable)	
(Intentionally blank) [♪] /}	Evidence of livesto access to riparian	zone. stream	ional manure in n or waste storage ire located on the lain.	Extensive amount of manure on banks or in stream. Or
• (77				Untreated human waste discharge pipes present.
······································	5 4	3	2	1

**NOTES** 

	es $CB/KS$ Date: 03		
Sub-Watershed	NFB5C Stream Section Name <u>NF62</u>	» 7	6
	UNT to NFBSC Reference Section		
Weather Conditi	on's Today	hav	
Active Channel \		-	
			<b></b>
	LAND USE WITHIN DRAINAGE (%):		
Grazing Pasture Forest	IO     Grassy Field     Row Crops       W/ 75     Residential     Industrial		<u> </u>
Commercial	Abandoned Mine Lands Other		•
	SUBSTRATE (%):	1	
Boulder  P		ud	10
	RIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROU		
	GPS POINTS / PHOTOS:		
Waypoint Photo		рН	Cond
NF 62 1	start; bridge @ Main road	7.90	350
NF 63 1	stream instream everent flood.	<u> </u>	
NF 65	Small trib. from cast	7.81	230
NF 66 3	Large task from the west.	7.56	420
	she at small waterfall		- 24
NFG7	SMALL Stream from homlockes to the Cast.	8.06	150
NF68	Bank slide / debris jam.		
VF 69 7	/ Gully erosion from farm lanc into stream		
	Sharpe true, from cast	7.82	260
NF 70 8	Depuis jam at intersection of old road.	here an / <sup>20</sup> 5	<b>3</b> 2 3 4
<u>NF 7</u>	Major Trib. From He west small trib From eart / debits jam	7.58 7.68	1000
NF72	small trib Form eart / debits jam	7.76	460
NF74	Main stem water quality cleck	7.78	
NF75 9	small trib. below pond. / pend silting in.	7.67	840
	old farm mindmill.	1 101	1,000,00
UF 76	Endpoint; X-ig under road near where we perfor	7.8	470
	mud purched into stream		
4F-78-12-	15" O SPP for Xing		
VF 79-13-	wetland boul area top of sub watersbed.		
• •	resent: Yes (No) 🛛 Japanese Knotweed 🗖 Garlic mustard 🗖 Purple loos	sestrife [	□ Other
<b>rash / Litter</b> : Ye	s/No not much, some near top of section where		
	ids: Yes / No If so, approximate size: Length / Width feet		
•	es / No (Wetland or other)		
	e Auth, readr to core back and collect all of t		

í

Stream	Section	Name
		Date:

: <u>NF-62-976</u> <u>03/24/08</u>

Parameter	Score	Explanation of Score Given
Channel condition	4	
Riparian zone	9	
Bank stability	3	
Water appearance	7	
Nutrient enrichment	8	
Fish barriers	3	
In-stream fish cover	7	
Embeddedness	5	
Invertebrate habitat	8	
Canopy Cover	8	
AMD (if applicable)	Alu	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	62710 6.2	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT
### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	hanne	el Conditio	n	
structu eviden Cutting	Il channel; no ires, dikes. No ice of down- g or excessive cutting.	C	chai with of cl Any set l acce	signifi nannel dikes back to	eration, cant rec and bar or levies provide	overy iks. are	the reach and/or cha Excess ag braided ch	annel; <50% of with riprap annelization. Ig <b>radation</b> ; annel. Dikes or trict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	8	7	6	5	(4)	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	(3) 2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

	Water Ap	pearance	· · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive- green film. Or	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
		Moderate odor of	Or
	$\frown$	ammonia or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

						Nu	trient	Enrichme	nt	
reach; commu	vater along diverse aq unity little a n present.	uatic p algal		gree entir alga	ly clear enish wa e reach il grow strates.	ater alc n; mod	ong erate	entire rea algal gro	water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9		,	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers				
No barrie	rs.	with			Drop stru culverts, diversion drop) wit reach.	dams or is (<1ft	cul div drc	lver /ersi	structures, ts, dams or ions (>1ft within 1 mile of	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4		3	) 2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

				•	Instream	Fish Cov	'er		
>7 cover ty available	pes	6 to avail		r types	4 to 5 co available	ver types	2 to 3 co available	ver types	None to 1 cover type available
10	9	8	(7)	) 6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, diffes, undercuty banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name
		Date:

NF 62 776 03/24/08

					Emb	eddedness			
Gravel or o particles a embedded	re <20%	Grave partic 30% e	les are	e 20 to	particle	or cobbie s are 30 to nbedded.	Gravel o particles embedde	are >40%	Completely embedded.
10	9	8	7	6		4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	· . · ·					Insec	t/inverte	brate Hak	oitat	
availat stage t coloniz	at 5 types of ble. Habitat to allow full tation (wood gs not freshi	is at a insec ly del	a t	Som exist trees habil	e pote s, sucl s, whic at, but	s of hat ntial ha n as ov h will p have r strean	bitat erhanging rovide not yet	The subs disturbed removed velocities	bes of habitat. strate is often d, covered, or by high stream s and scour or by t deposition.	None to 1 type of habitat.
10	9	(8)	/	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

Key: T	his pertains to v	Canopy vaterways whe Coldwate	ere channel is 50	feet wie	de or less.	
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	>75% in reac	Or	20 to 50% shad	ed.	<20% of water surface in reach shaded.	
10 9 (/ 8)	7 6	5 4	3	2	1	

	Abando	oned Mine D	rainage (if a	pplicable)	
(Intentionally blank) NA		iron staining. Or ron precipitate.	muddy ora	•	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

**,** , (

Stream Section Name: Date:

NF 62 -> 76 Œ 02

Sewage (if applicable)									
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.						
NA		And							
N/A		Questionable pipe and black stream substrate.							
	5 4	3 2	1						

Mark discharge(s) on map and/or with GPS unit.

	Manure Pres	ence (if applicab	le)	
(Intentionally blank) レート	Evidence of livestock access to riparian zone	e. Occasional m stream or was structure loca flood plain.	ste storage	Extensive amount of manure on banks or in stream. Or
V				Untreated human waste discharge pipes present.
	5 4	3	2	1

## **NOTES**

	rs' Name	s <u>Ks/SA</u> Da	te: <u>6</u>	5-13-08	<u> </u>
Sub-Wat	ershed _	Stream Section Name			•
Stream N	lame <u>İcf</u>	this to North Fork_ Reference Section		· _ · · ·	
Weather	Conditio	ns Today 70's Sunny Past 2-5 Days 6	<u>e0's</u>	rain	
Active C	hannel W	idth: <u>1-3</u> feet			
	<u></u>	LAND USE WITHIN DRAINAGE (%):		· · · · · · · · · · · · · · · · · · ·	
Grazing F	asture		w Cro	ps	
Forest		9.5 Residential 5 Ind	lustrial		
Commerc	ial	Abandoned Mine Lands Oth	ner	·	
 		SUBSTRATE (%):	·		
Boulder	5		<u> </u>	Mud	5
<u>_</u>		BE THE LAND USE OF THE AREA THAT THE STREAM FLO			
<u> </u>	foreste	d. Where it mosts NFBSC there is one homeon & through field where they 've planted trees	wher	goes L	<u>ind</u>
Horn	<u>ig Rd</u>	1 through field where they 've planted trees			
	· ·	GPS POINTS / PHOTOS;			
Waypoint	Photo	Description		pH	
WI 8	1	INT OF THIS & NORTH FORK		7.71	3.
W29		Debn's Jam			
W3/0 W4/1	23	Debuis dam		····	15
<u>y</u> , 177	243	Headworter area		7.61	21
				<u>·</u> .	
					- <u> </u>
					<u> </u>
					<u> </u>
			<u> </u>		
				· ·	
	· · ·		·		·
					┣
	4				<u> </u>

ΝI	otes:	
1 4	<b>ULC</b> 3.	

Stream is very clear, no algar

Stream Section Name: Date:

Parameter	Score	Explanation of Score Given
Channel condition	10	
Riparian zone	/0	
Bank stability	9.	
Water appearance	10	
Nutrient enrichment	9	
Fish barriers	9	
In-stream fish cover	9	
Embeddedness	2	
Invertebrate habitat	9	
Canopy Cover	/0	
AMD (if applicable)	NA	
Sewage (if applicable)	NH	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	0,4/10 9,4	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

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Date:

### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Channe	el Condition	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess <i>aggradation</i> ; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 4	3 2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Rip	barian Zor	10		
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one action channel width on each side. Or If less than one width, covers ent flood plain.	ve extends active ch width on side.		Natural ve extends a the active width on e C Filtering fu moderatel compromit	third of channel each side. Dr Inction y	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
(10) 9	8 7 6	5	4	3	2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

· · · · · · · · · · · · · · · · · · ·	Bank Stability											
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).									
0 (9) 8 7 6 5 4 3 2 1												

**Keys**: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		Water Ap	pearance	≥	
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally objects visible 1.5 to 3 ft; ma slightly green sheen on wate	e at depth y have color; no oil	most of ti visible to ft; slow se appear pe rocks or s objects co	able cloudiness me; objects depth 0.5 to 1.5 ections may ea-green; bottom ubmerged overed with een or olive-	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
<b>1</b>			Moderate		Or
			ammonia	or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10) 9 8	7 6	5 4	3	· 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient Enrichment												
reach; c	fiverse nity lit	long entire e aquatic plant tle algal ent.	gree enti alga	ly clear enish w re reacl al grow strates.	ater ald h; mod th on s	ong erate	entire realized algal gro	n water along ach; <b>abundant</b> owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algai blooms create thick algai mats in stream.				
10	(9)	8	7	6	5	4	3	2	1				

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

		· · · ·		Fish I	Barriers			
No barriers.	wit		Contraction of the second second second second second second second second second second second second second s	Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 (9)	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

					Instream	Fish Cov	er		
>7 cover types available		6 to avail	7 cover able	types	4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10 (9	$\lambda$	8	7	6	5	4	3	2	1

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name:
		Date:

	•		Embec	Idedness				
Gravel or cobble particles are <20% embedded.	Gravel or particles a 30% emb	are 20 to	Gravel or particles 40% emb	are 30 to	Gravel o particles embedde	are >40%	Completely embedded.	
10 (9)	8 7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffies & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					Insec	:t/inverte	brate Hab	oitat	
available stage to	e. Habi allow t tion (w	s of habitat itat is at a full insect voody debris eshly	Som exist trees habit	e pote s, suc , whic at, bu	s of hal intial ha h as ov h will pi t have r e strean	ıbitat erhanging rovide not yet	The subs disturbed removed velocities	bes of habitat. strate is often d, covered, or by high stream s and scour or by t deposition.	None to 1 type of habitat.
10	(9)	8	7	6	5	4	3	2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

		Key: Th	is per	tains to	o water	ways wh	y Cover ere channel er fishery	is 50 feet wi	de or less.
>75% of shaded 3 miles shaded.	and upsi generally	ream 2 to	>75	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly				shaded.	<20% of water surface in reach shaded.
10)	9	8	7	6	5	4	3	2	1

	Aband	oned Mine Dr	ainage (if ap	olicable)	
(Intentionally blank)		f iron staining. Or iron precipitate.	Iron precipit muddy oran appearance	ge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
· · · · · · · · · · · · · · · · · · ·	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name:
		Date:

· · · · · · · · · · · · · · · · · · ·		Sewage (if	applicable)		
(Intentionally blank)	Noticeable o plant growth	dor, excess and siltation.	Noticeable	odor, excess	Visible pipe with effluent, heavy odor.
•			4	And	
				ole pipe and m substrate.	
	5	4	3	2	1

Mark discharge(s) on map and/or with GPS unit.

	Man	ure Presen	ce (if applic	able)	
(Intentionally blank)	Evidence of access to rip		stream or v	I manure in waste storage ocated on the	Extensive amount of manure on banks or in stream. Or
· .					Untreated human waste discharge pipes present.
	5	4	3	2	1

# <u>NOTES</u>

Evaluators' Na	mesDate:	01/31	108
	I NFBSC Stream Section Name バF	40 - 4	<u>۶-</u>
	NFBSC Reference Section		
	tions Today <u>overcast ~ 25°F</u> Past 2-5 Days <u>sca</u>	Hered vain	Long
	Width: <u>3-4</u> feet	• <b></b> _	7
		• =	·
	LAND USE WITHIN DRAINAGE (%):		
Brazing Pasture	Grassy Field V 10 Row Cro V 65 Residential V 15 Industrial		
Forest Commercial	10 Abandoned Mine Lands Other		, . <b></b> _,
	SUBSTRATE (%):	<u>_</u>	
Boulder	Cobble 25 Gravel 40 Silt 25	Mud	10
	CRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS TH		10
	eridutial wooded lots. Commercial part at top a		h./
<b>I</b>	contact to the competial part of top of	F WARTS	<u>YA</u>
	GPS POINTS / PHOTOS:		
Vaypoint Phot	Description	pH	Con
NF 40 P		r Rd	
16	le arein wider Lovi Rd	7.80	117
	17 debris jam in channel (landomer dwaped yard was	<u>h</u>	
NF42 16	18 possible dd pond breach, downstrean crosion/ 19 very black strean bottom, sewage?	sed ipintatio	μ
JE44 18	20 confluence with tributative	7,60	950
VE45 M			
* World	in from top of sub-water hed down.		<u> </u>
			***
			·
		·	<u> </u>
<u>-</u>			

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invasive plants plesent. Tes / I		se Motweed D Game mustard D T alple loosestime D G	110
Trash / Litter: (Yes) No	yard warte,	, litter from road intersection	
$\mathbf{i}$		imate size: Length / Width feet	
Flooded areas: Yes / No (Wetla	nd or other)		
Notes:			



Ø

Parameter	Score	Explanation of Score Given
Channel condition	6	
Riparian zone	7	
Bank stability	6	
Water appearance	6	
Nutrient enrichment	6	
Fish barriers	5	
In-stream fish cover	5	
Embeddedness	6	
Invertebrate habitat	7	
Canopy Cover	8	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	62 ÷ 10 <u>6.2</u>	< $6.0 = POOR$ 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > $9.0 = EXCELLENT$

Stream Section Name: Date:

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

•					С	hann	el Conditio	on	
structu eviden	I channel; n res, dikes. I ce of down- or excessiv cutting.	10	chann with si of cha Any di set ba	iel al ignifi innei ikes ick to s to	of past teration cant rec and ba or levies provide an adeq	overy nks. s are	the reach and/or ch Excess ag braided cl	nannel; <50% of with riprap annelization. ggradation; nannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	8	7 (	6)	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 (7) 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	······································			Bank	<b>Stability</b>	/		
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	eleva plain; erodi banks is pro	ition less ng su s in c tecte	ly stable of active than 33 urface a butside l ad by ro d to the tion.	e flood 3% of rea of bends ots	banks ma typically occurs 1 less frequ bends an (overhan at top of l mature tr stream ar	ely unstable ay be low, I are high (flo year out of uently); out e actively e ging vegeta bank, some ees falling i nnually, sor ures appare	but 5, or side roding ation into ne	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 (	6	) 5	4	3	<u> </u>	2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

			······		W	ater A	opearanc	e	-	
colored; depth 3 slightly c sheen of noticeab	ear, or clea objects v to 6 ft (les colored); r n surface; le film on jed object	ss if no oil ; no	obje 1.5 t sligh	cts vi o 3 fi tly gi	ally cloud isible at c ; may ha een colo water su	lepth ve r; no oil	most of t visible to ft; slow s appear p rocks or objects o	rable clou lime; object o depth 0.8 sections m bea-green submerge sovered wi een or oliv n. Or	cts 5 to 1.5 nay ; bottom ed ith	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			· ·				Moderate	e odor of		Or
				$\bigcirc$	<b>\</b>		ammonia	or rotten	eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3		2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichme	Int	
reach; commu	water alon diverse ac unity little n present.	uatic plant algal	gree entire alga	hish w Ə reac	r or sligi /ater alc h; mod /th on s	ong erate	entire re algal gro	n water along ach; abundant owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	(6)	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

		, ·			F	Fis	sh Barriers				
No barriers.	with			( . (	ulu dive	vei ers p)	structures, rts, dams or sions (<1ft within the	Drop : culver divers drop) reach.	ts, dai ions ( within	ms or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	 8	7	6	1	5	5)	4	3		2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

		·		•	Instre	am Fish Cov	er		
>7 cover available		6 to avail	7 cover lable	types	4 to 5 avails	cover types	2 to 3 co available		None to 1 cover type available
10	9	8	7	6	(5)	4	3	2	1
				6	- \ /	· · · · · · ·			

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, underout banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name:
		Date:

,					Embe	ddedness					
Gravel or particles a embedde	are <20%	partic	el or cob les are 2 embedd	20 to	Gravel o particles 40% em	are 30 to	Gravel o particles embedde	are >40%	Complete embedde	•	
10	10 9 8 7 (6) 5 4 3 2 1										

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded:

					Insec	t/invertel	orate Hab	itat	
availat stage t coloniz	js not fres	t is at a I insect ody debris	Sor exis trée hab	4 types ne pote sts, such s, which itat, but ered the	ntial ha n as ov n will pi have r	bitat erhanging rovide iot yet	The subs disturbed removed velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10	9 8 (7) 6 5 4						3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

•	Key:	This pe	tains to	water	ways wh	y Cover lere channel ter fishery	is 50 feet wie	de or less.
>75% of wate shaded and u 3 miles genera shaded.	ostream 2 t	o >75 ups	0% sha % in rea tream 2 ded.	Or ach, bu		20 to 50%	6 shaded.	<20% of water surface in reach shaded.
10 9	(8)	7	6	5	4	3	2	1

-	Aband	oned Mine Dr	ainage (if ap	plicable)	
(Intentionally blank)		of iron staining. Or iron precipitate.	muddy orai	-	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

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· ·	Sewage (if applicable)										
(intentionally blank)	Noticeable odor plant growth an	-	plant growth	odor, excess i. nd	Visible pipe with heavy odor.	n effluent,					
			Questionabl black stream		· .						
	5	4	3	2	1						

Mark discharge(s) on map and/or with GPS unit.

	Manure	Presence	(if applical	ole)	
(Intentionally blank)	Evidence of liveste access to riparian		Occasional r stream or wa structure loca flood plain.	aste storage	Extensive amount of manure on banks or in stream. Or
•					Untreated human waste discharge pipes present.
	5	4	3	2	1

<u>NOTES</u>

Evaluators' Name	esCB/K5Date://	31/08
	NFBSC Stream Section Name NFBSC 32 -	
Stream Name	NF BSC Reference Section	
Veather Conditio	ns Today over cart, ~25°F Past 2-5 Days 5 callered rain	Isnaw
Active Channel W		
	LAND USE WITHIN DRAINAGE (%):	<u> </u>
Brazing Pasture	Grassy Field V/ 15 Row Crops	
orest	√ 5 <sup>-</sup> Ø Residential V 15 <sup>-</sup> Industrial	
ommercial	20 Abandoned Mine Lands Other	
	SUBSTRATE (%):	
Boulder	Cobble 40 Gravel 40 Silt 20 M	ud
DESCR	IBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROU	GH:
Buck you	- of residutial, laye wooded lots. Then Hill Ind.	Ports at
to o it	waterbod with two lose SWM baring p had waters, A	treas alus
Streen cha	ninel were cleared for service liner (Economy Bord) that were p	put in 3-4
	GPS POINTS / PHOTOS:	year sigo,
/aypoint Photo	Description	pH Cond.
32	start print	
33 1	Confluence of tribs. / wetland along sewage line This.	
34 2	Small debris jam from Firewood falling into stream	7.62 1380
35	18" O SPP outlet from road draining system	
36 14	Confluence with small trib.	8.08 580
1015	pipe / drive way X - ing (~ 4 of Hen in His strike	<u>4)</u>
06	ruff drain entran distingutor	
	7-8 "Old school" bank stabilization (block walls failing	<u></u>
38 09	S.W.M. pard article from Ind. Park	· /
10	- spill way mide rock - water in prod	
11-12	huge bude rabs	
39 140		
		·
		7.70 640
·····		
3	residutial bart stabilization.	
<b>.</b>		
asive plants pre-	sent: Yes / No 👘 🗇 Japanese Knotweed 🗇 Garlic mustard 🗇 Purple loose	strife 🗖 Other -

Flooded areas: Yes / No (Wetland or other)

Notes:

Big Sewickley Creek Visual AssessmentStream Section Name: $NF 32 \rightarrow 39$ Date: $ol / 31/ \delta B$ 

Parameter	Score	Explanation of Score Given
Channel condition	6	
Riparian zone	6	sewer line installation
Bank stability	7	
Water appearance	7	
Nutrient enrichment	6	'Black' growth on rocks on substrate
Fish barriers	5	multiple driveway crossings near NF36
In-stream fish cover	5	
Embeddedness	8	
Invertebrate habitat	7	
Canopy Cover	8	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	65 ÷ 10 = <u>6.5</u>	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

1/31/08 NF 32739

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

				C	hanne	el Conditi	on		
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.		chanr with s of cha Any d set ba	nel a igni inne ikes ick t s to	of past literation, ficant rec and bar or levies o provide an adequ	overy nks. are	the reach and/or ch Excess au braided cl	nannel; <50% of with riprap annelization. g <b>gradation</b> ; nannel. Dikes or strict flood plain	>50% of t riprap or o Dikes or le	s actively ng or widening. he reach with hannelization. evees prevent the flood plain.
10 9	8	7	6/	5	4	3	2	· ·	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

**Keys:** look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian 2	lone	
Natural Vegetation extends at least two active channel widths on each side	channel width on	Natural vegetation extends half of the active channel width on each side.		Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 (6)	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

						Ban	<u>&lt; Stability</u>		
elevation plain; 3 eroding banks i protect	are stable on of activ 3% or mo surface a n outside ed by root to the bas on.	e flood ore of area of bends is is that	ele pla ero bar is p tha	derately vation o in; less ding su hks in ou rotected t extend v elevati	f active than 3 rface a utside l d by ro l to the	e flood 3% of irea of bends ots	banks ma typically a occurs 1 y less frequ bends are (overhang at top of b mature tre stream an	ly unstable; ay be low, but are high (flooding year out of 5, or iently); outside a actively eroding ging vegetation pank, some ees falling into inually, some ires apparent).	inside edges of bends are actively eroding as well as
10	9	8	(7)	6	5	4	3	2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

•

				Water	Appeara	nce		•
	ed); no oil rface; no m on	object 1.5 to slightly	lonally cl s visible 3 ft; may green c on watei	at depth have olor; no	oil ft; slov e. appea rocks object	derable clo of time; obje to depth 0 v sections r r pea-greer or submerg s covered v green or ol film. Or	ects .5 to 1.5 nay n; bottom red vith	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
					Moder	ate odor of		Or
					ammo	nia or rotter	n eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 9	8 (	7)	6 5	4	3		2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichmen	it	
reach; commι	vater alon diverse a inity little n present	quatic plant algal	gree entire alga	nish v Freac	r or slig vater alc h; mod vth on s	ong erate	entire read algal grov	water along ch; abundant wth, especially mer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					F	ish Barriers			
No barriers.		with	ementv	ater inhibit vithin the	culve dive	o structures, erts, dams or rsions (<1ft ) within the b.	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	) 4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

					In	stre	am Fish Cov	er		
>7 cover available			7 cover lable	types		4 to { ayafa	i cover types ≹ple	2 to 3 co available	~ • •	None to 1 cover type available
10	9	8	7	6	(	5	/ 4	3	2	1
· · ·						$\nabla$				$\sim$

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, liffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream Section Name: \_\_\_\_\_NF 32

Date: 01/3

					Embeo	dedness			
Gravel or particles a embedded	are <20%	par	avel or c ticles ar % embed	e 20 to	Gravel o particles 40% emi	are 30 to	1	or cobble are >40% ed.	Completely embedded.
10	9	8/	7	6	5	4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded:

			Insect/inverte	brate Habit	at		
At least 5 types of ha available. Habitat is stage to allow full ins colonization (woody and logs not freshly fallen).	at a sect	exists, such trees, which	ntial habitat n as overhanging h will provide have not yet	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.	
10 9	8 (	7) 6	5 4	3	2	1	
10 9 Cover types: Fine w gravel, other:	8 ( oqdy c	7 6 lebr)s, subm	5_4_ erged logs, leaf p	3 Bagks, under	2	le, boulders, coari	

	ł	Key: Th	nis pert	ains to	water	ways wh	y Cover ere channe er fishery	l is 50 feet wi	de or less.
shaded and upstream 2 to 3 miles generally well shaded.				% in rea	ded in r Or ach, bu to 3 m			% shaded.	<20% of water surface in reach shaded.
10 9 (8) 7 6 5 4						3	_ 2	1 .	

	Aband	oned Mine Dr	ainage (if ap	plicable)	· · · ·
(Intentionally blank) $w/A$		f iron staining. Or iron precipitate.	Iron precipi muddy oral appearance	•	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

	Sewage (if applicable)									
(Intentionally blank)	Noticeable odor, excess plant growth and slitation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.							
N/A		And								
10/11		Questionable pipe and black stream substrate.								
	5 4	3 2	1							

Mark discharge(s) on map and/or with GPS unit.

· · · · · · · · · · · · · · · · · · ·	Man	ure Presen	ce (if appl	icable)	
(Intentionally blank)	Evidence of access to rip		stream o	nal manure in or waste storage e located on the in.	Extensive amount of manure on banks or in stream. Or
•					Untreated human waste discharge pipes present.
	5	4	3	2	1

<u>NOTES</u>

Evaluators' Names	;	CBSA		_ Date:	10/31/	of
Sub-Watershed	NGK F	<u>/&lt; BSC</u> Stream Se	ction Name	NEBSC	23 -	<u>&gt;3 </u>
Stream Name		Reference S	Section			
Weather Condition	s Today	Sunny briezy~65	Past 2-5 Days	<u>S'yn</u>	ny ~s	T°E a
Active Channel Wi						
					<u> </u>	
Grazing Pasture	<u> </u>	LAND USE WITHIN DRAI	NAGE (%):	Row Crop	<u> </u>	
Forest	50	Residential	40	Industrial	<u> </u>	
Commercial		Abandoned Mine Lands		Other		
		SUBSTRATE (%	):			
Boulder	Cobble	Gravel	Silt		Mud	
		SE OF THE AREA THAT			-	
This stream	n section r	uns through forested	array that	are bour	by st	variely
populyted	residuatial a	rear with large lot	sizer and	<u>la lot</u>	<u>cf gri</u>	<u>n spall</u>
		GPS POINTS / PHOT	<u></u>		· · · ·	
Waypoint Photo	Description				Ha	Conc
23 4	start : bi	id pand w/ bridge to	private hu	N		
5-7	Deavers	( chewred trees and "	drag path to	pond)		
29	trib. fn	thre jan				
24	debrir	Thee jam		····		
27	trib.	from the left			7.88	670
28	trib 4	- 11 11 11 . 				
20	<u> </u>			·····	·····	
31	Erd	of section @ brie	due over	Bradford P.	nk Rd.	
				er int. w	┞_ <u> </u>	
8	cover st	not downstream	> vond		•	
			······································			
					_·	ļ
		ndi - 67				
				_ <u></u>		
				· · · ·		
			<u></u>			
	·					
<u> </u>	$\sim$			·····	<u> </u>	<u></u>
nvasive plants pres	ent: Yes (No <sup>*</sup> )	□ Japanese Knotweed □	J Garlic mustar	d 🗖 Purple I	oosestrife l	🗇 Othei
rash / Litter: Yes (	No			<u></u>		<u></u>
•		so, approximate size: Le	ength / Wi	idth fe	et	. –
looded areas (Yes)	$\sim$ /					
Acces	deer be	caver evidence, 1	oge hawk	or owl !		
Line	allords and	Lordonner ha Managed Fo	ve tart st	rean bot	Hum cl	tan 6
			· · · · · · ·	· · · ·	-	

Stream Section Name:  $NFBSC 23 \rightarrow 31$ Date: 10 |31| / 07

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	9	
Bank stability	9	
Water appearance	8	
Nutrient enrichment	8	
Fish barriers	7	
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	10	
AMD (if applicable)	NA	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	8.3	< 6.0 = POOR 6.1 - 7.4 = EAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream Section Name: Date:

#### **Scoring Descriptions**

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

	Chann	el Condition	
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate fisod plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess <b>aggradation</b> ; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	(7) 6 5 4	3 2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

······································		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank	Stability	
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 (9/ 8	7 6 5 4	3 2	1

Keys: All outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		 		Wa	ater Ar	pearance		· · · · · · · · · · · · · · · · · · ·
Very clear, or clear colored; objects vi depth 3 to 6 ft (les slightly colored); n sheen on surface; noticeable film on submerged objects rocks.	sible s if o oil no	objec 1.5 to slight	ts visit 3 ft; n ly gree	ly cloud ole at d nay hav en color ater sui	epth /e ; no oil	most of tim visible to d ft; slow sec	epth 0.5 to 1.5 ctions may a-green; bottom ibmerged vered with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
		•				Moderate o	odor of	Or
	$\sim$					ammonia o	r rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient l	Enrichmer	nt	
reach; commu	water alon diverse a unity little h present	quatic plant algal	gree entii alga	ly clear enish wa e reach I grow strates.	ater alc n; mod	ong erate	entire rea	water along ch; abundant wth, especially rmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	(8)	7	6	5	4	3	2	1 .

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

, 			·		Fish	Barriers			
No barriers		witho	ement	vater s inhibit within the	Drop stru culverts, diversion drop) with reach.	dams or s (<1ft	Drop stru culverts, diversion drop) with reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8 (	(7)	6	5	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

<u>, www. , , , , , , , , , , , , , , , , ,</u>				-	Instream	Fish Cov	er	······································	· · ·
>7 cover types available			7 cover lable	types .	4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10 9	- (	8	) 7	6	5	4	3	2	1
		/		-					

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, (ffles) undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name
		Dato.

NFBSC 23 → 3 | 10/31/07

			-		Embe	ddedness		·	
Gravel or particles a embedder	are <20%	pai	avel or co rticles are % embec	e 20 to	Gravel o particles 40% em	are 30 to	Gravel o particles embedd	are >40%	Completely embedded.
10	9 (	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

					nsec	t/invertel	orate Hab	oitat	· · · · · · · · · · · · · · · · · · ·
available stage to	ə, Hab allow tion (w	s of habitat itat is at a full insect /oody debris eshly	Some exists trées, habita	types of potent , such a which at, but h ed the s	ial ha as ove will pr ave n	bitat erhanging rovide lot yet	The subs disturbed removed velocities	bes of habitat. Strate is often d, covered, or by high stream s and scour or by t deposition.	None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debis, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse) gravel, other:

Key: Th	ls pertains	to water	ways wh	y Cover ere channel ter fishery	is 50 feet wi	de or less.	
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% sh >75% in upstream shaded.	Or reach, bu	ıt	20 to 50%	shaded.	<20% of water surface in reach shaded.	
10 / 9 8	7 6	5	4	3	2	1 .	

· · · · · · · · · · · · · · · · · · ·	Aband	oned Mine Di	ainage (if ap	plicable)	
(Intentionally blank)	Evidence of	of iron staining. Or	Iron precipit muddy oran		Heavy iron precipitate, noticeable kill zone.
· • • • •	Noticeable	iron precipitate.	appearance	l <b>.</b> ,	Or
N/A		• •			White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream Section Name:  $NFBSC 23 \rightarrow 3$ Date: 10/3(/07)

· ·	Sewage (if	applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
		And	
N/A		Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

	Manu	re Presen	ce (if applic	cable)	· · · · · · · · · · · · · · · · · · ·
(Intentionally blank) $N/A$	Evidence of liv access to ripa		stream or	al manure in waste storage located on the n.	Extensive amount of manure on banks or in stream. Or
•			_		Untreated human waste discharge pipes present.
	5	4	3	2	1

## **NOTES**

Big Sewickley Creek Watershed V    Evaluators' Names  KS /SA / CB    Sub-Watershed  Stream Section    Stream Name  NORTH  FORK    Reference Sect  Weather Conditions Today  70'S (LOUDY    Pase  Active Channel Width:  20 feet    LAND USE WITHIN DRAINAGE    Grazing Pasture  Grassy Field    Forest  70  Residential    Commercial  Abandoned Mine Lands    SUBSTRATE (%):  SUBSTRATE (%):	n Name ion st 2-5 Days E (%): [0 2 0 Silt ] STREAM I	Date: 10- NF 650 S'ani S	8-07 \$ - 15-> ny, ~ 5 Brdrock Mart	22
Sub-Watershed Stream Section    Stream Name  NORTH  FORK  Reference Sect    Weather Conditions Today  70'S  (LOUDY  Pase    Active Channel Width:  20  feet  Image: Stream Section    Grazing Pasture  Grassy Field  Grassy Field    Forest  70  Residential    Commercial  Abandoned Mine Lands	n Name ion st 2-5 Days E (%): [0 2 0 Silt ] STREAM I	NF 65 C S'ani S'ani Industrial Other FLOWS THR	Brdrock	22 5-5-°F 0
Sub-Watershed Stream Section    Stream Name  NORTH  FORK  Reference Sect    Weather Conditions Today  70'S  (LOUDY  Pase    Active Channel Width:  20  feet  Image: Stream Section    Grazing Pasture  Grassy Field  Grassy Field    Forest  70  Residential    Commercial  Abandoned Mine Lands	n Name ion st 2-5 Days E (%): [0 2 0 Silt ] STREAM I	NF 65 C S'ani S'ani Industrial Other FLOWS THR	Brdrock	22 5-5-°F 0
Stream Name  NORTH  FORE  Reference Sect    Weather Conditions Today  70'S  (1000)  Pase    Active Channel Width:  20  feet  Include   ion st 2-5 Days E (%): 10 20 Silt STREAM I	Sand Row Crops Industrial Other FLOWS THR	ny,~s Bedrock	s-y-°F e	
Active Channel Width:  10 feet    LAND USE WITHIN DRAINAG    Grazing Pasture  Grassy Field    Forest  70  Residential    Commercial  Abandoned Mine Lands	E (%): 10 20 Silt STREAM I	Row Crops Industrial Other (Composition) FLOWS THR	Bedrock Mart	
Active Channel Width:  10 feet    LAND USE WITHIN DRAINAG    Grazing Pasture  Grassy Field    Forest  70  Residential    Commercial  Abandoned Mine Lands	E (%): 10 20 Silt STREAM I	Row Crops Industrial Other (Composition) FLOWS THR	Bedrock Mart	
Grazing PastureGrassy FieldForest7-0ResidentialCommercialAbandoned Mine Lands	SIIt	Industrial Other I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Bedrock Mart	
Forest 7-0 Residential Commercial Abandoned Mine Lands	Silt STREAM I	Industrial Other I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Bedrock Mart	
Commercial Abandoned Mine Lands	Silt STREAM I	Other	-Merti-	
	STREAM	15 FLOWS THR	-Merti-	- VO
SUBSTRATE (%):	STREAM	FLOWS THR	-Merti-	<u>– 110</u>
	STREAM	FLOWS THR	<u> </u>	$\mu n$
Boulder Cobble 25 Gravel 20			LOUGH:	<u> </u>
DESCRIBE THE LAND USE OF THE AREA THAT THE	er/acna			
sparsely residential with large lot size hillsides.		<u>90 , 54</u>	ep, wa	<u>rch d</u>
GPS POINTS / PHOTOS	•		<u></u>	
Vaypoint Photo Description			pН	Cond.
VFBSC 15 START / TRIB ON LEFT (NEW SECT	DUE TO	LESSALGA	<u>e) 7.0</u>	6.70
FBSC 16 13 BROOK THE ON PIGHT	^ ,u==		`	
PBSC17 END OF DAY/HOMEOWNER BRIDG	<u>7-E.</u>			
1 shot upstragen				
18 small trib. from the right				
19 2 shale cliffs along stream				
20 Floodplain wetland (near int. w 21 Conflorace w/ trib, fran, le			7.94	770
22 3 bod bridge (2 small piper)	FT WIFT	- 17 <sub>1817 11</sub>		+ rc
				1
	<u></u>		_	
	410 = M4 - 0			<b></b>
				───
			-	<u> </u>
				·
		<u> </u>		<u> </u>
	· ·			<u> </u>
				<del> </del>
				<u></u>
nvasive plants present: Yes(No) 🛛 🗇 Japanese Knotweed 🗆 G	arlic mustar	d 🗖 Purple lo	oosestrife (	∃ Other
rash / Litter: Yes / No very little		·		

Floodplain wetlands:(	Yes	No If	so, ap	proximate	e size:	Length 40	00/Width	5 0D feet	
Flooded areas: Yes /	NO (1	Netland or	other)						

.

Notes:

Stream Section Name:  $NFBSC | 5 \rightarrow 2\lambda$ Date:  $10/8 \neq 10/31/07$ 

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	- 8	
Water appearance	8	
Nutrient enrichment	7	
Fish barriers	9	
In-stream fish cover	8	· · · · · ·
Embeddedness	8	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	· · ·
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	8.1	< 6.0 = POOR 6.1 - 7.4 = EAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream Section Name: Date: NFBSC 15 → 22 10/8 10/31/07

### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	hann	el Conditio	on	
structu eviden Cutting	I channel; r res, dikes. ce of down- j or excessi cutting.	No	cha with of cl Any set l acce	signific nannel dikes c back to	eration, cant rec and bar or levies provide n adeq	overy nks. are	the reach and/or cha Excess ag braided ch	annel; <50% of with riprap annelization. ggradation; nannel. Dikes or strict flood plain	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	(8)	7	6	5	4	3	2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like <u>down cutting</u>, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

			Rip	arian Zo	ne		
Natural Vegetation extends at least two active channel widths on each side.	extends channe each si If less t width, c	Or han one covers entire			extends the active width on Filtering moderate	e channel each side. Or function ely	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or
	flood pl				comprom	nsea.	Filtering function severely compromised.
10 9	8/	76	5	4	3	2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

					Bank	Stability			
Banks are stable; a elevation of active t plain; 33% or more eroding surface are banks in outside be protected by roots t extend to the base- elevation.	flood of ea of ends is that	eleva plain erod bank is pr that	ation o i; less f ing sur is in ou otected	r stable f active than 33 fface ar itside b d by roo l to the ion.	flood % of ea of ends ots	Moderate banks ma typically a occurs 1 less frequ bends are (overhang at top of t mature tre stream ar slope failu	ay be low, are high (f year out c uently); ou e actively ging vege pank, som ees falling nnually, so	but looding of 5, or itside eroding tation ne i into ome	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (	8 /	7	6	5	4	3		2	1

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

	Wat	er Ap	pearance		•
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at dep 1.5 to 3 ft; may have slightly green color; i sheen on water surfa	oth no oil	Considerable clo most of time; ob visible to depth ( ft; slow sections appear pea-gree rocks or submer objects covered heavy green or o green film.	jects 0.5 to 1.5 may en; bottom ged with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			Moderate odor o ammonia or rotte	-	Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 (8/	7 6 5	4	3.	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

					Nu	trient	Enrichme	ent		
reach; comm	water alon diverse a unity little h present	quatic plant algal	gre ent alg	rly clear enish wa ire reach al grow ostrates.	ater alc n; mod th on s	ong erate	entire realised algal gro	n water along ach; <b>abunda</b> owth, espec armer month	ant ially	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8 (	7)	6	5	4	3		2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

				Fish	Barriers			
No barriers.	with			Drop structures, diversion drop) wit reach.	dams or is (<1ft	Drop stru culverts, diversion drop) wit reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 (9)	8	7	6	5	4	3	2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

				Instream	n Fish Cov	'er		
>7 cover types available		7 cover ilable	types	4 to 5 co available	over types	2 to 3 co available	over types	None to 1 cover type available
10 9	(8)	) 7	6	5	4	3	2	1
			-					

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble riffles, undercut banks,)thick root mats, dense macrophyte beds, isolated/backwater pools, other:

NFBSC 15 - 22 10/8 10/31/07

	Embeddedness									
Gravel or o particles a embeddeo	re <20%	pai	avel or co ticles are % embed	20 to	Gravel o particles 40% em	are 30 to	Gravel o particles embedde	are >40%	Completely embedded.	
10	9	8	/ 7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

			Insect/inver	tebrate Habi	itat	
At least 5 type available. Hab stage to allow colonization (v and logs not fr fallen).	itat is at a full insect /oody debris	exists, sucl trees, whic	ntial habitat n as overhangir h will provide : have not yet	The subs disturbed removed velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10 9		7 6	5 4	3	2	1

Cover types: Fine woody debris, submerged logs, lea(packs, undercut banks, cobble, boulders, coarse) gravel, other:

Key: Th	is pertains to wa	Canopy terways whe Coldwater	re channel is	50 feet wid	le or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded Or >75% in reach, upstream 2 to 3 shaded.	but	20 to 50% sh	naded.	<20% of water surface in reach shaded.
10 (9) 8	7 6 5	5 4	3 .	2	1

	Abandon	ed Mine Dra	inage (if applic	able)	
(Intentionally blank)	Evidence of irc C Noticeable iror	)r	Iron precipitate muddy orange appearance.	visible,	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
·····	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream Section Name:  $\frac{NFBSC}{Date}$ :  $\frac{10/8}{10/31/07}$ 

	Sewage (if a	applicable)	
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.
$\left( A \right) \left( A \right)$		And	
NA		Questionable pipe and black stream substrate.	
	5 4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

	Manure Prese	nce (if applicable)	
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional manure in stream or waste storage structure located on the flood plain.	stream. Or
			Untreated human waste discharge pipes present.

## **NOTES**

—	KS SA		•	_ Date:	10-4-0	78
Sub-Watershed		Stream S	Section Name			4018
tream Name 74	SEWICH	NORTH FORReference	e Section			, et
eather Conditions	Todav SC	15	Past 2-5 Days	SAM	e DR	
tive Channel Widtl	n: 35 feet					/
		· · · · · · · · · · · · · · · · · · ·				
		LAND USE WITHIN DRA				
razing Pasture	1-1-0	Grassy Field Residential	20	Row Cro		
ommercial	<u>  (00</u>	Abandoned Mine Land		Other		
3ED LOCK/	· <u></u>	SUBSTRATE (		1	······································	L
oulder 15	Cobble	0 20 Gravel 50	· · · · · · · · · · · · · · · · · · ·	10	Mud	5
DESCRIBE	THE LAND U	SE OF THE AREA THA	T THE STREAM	FLOWS TH	ROUGH:	
3 <sub>4</sub>	•	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			
		`		<b>.</b> ,		
· · · · · · · · · · · · · · · · · · ·	······································					
aypoint Photo De	escription	GPS POINTS / PHO	5105:			Cond.
	TART / All	iae "			pH 8.0]	530
BSC 02 1 (	oncrete the	bris				1972
	Bedneck Out		ish lanund			
		tream - wiprap ch	annol/bedneck	1 lots fit	sh	
×	<u>Kbris Jam</u> Tree down					
	Debris Jan			·······		
B5(08 5 1		across Hoenig Rd.			7.90	130
		n near houses	•	,	·	
L'and a state of the second se	ND 10/4/07	Finded Benk 11	Vhuc land	by hous		
<u>BSC12 /1 /</u>	ART (Con't) Le bris Jan	Ended Bank /1	JUP IS CALL	DY NOU		
35c13 Th	b on left	/ Debn's Jam			7.58	540
150 111 10/ 100	xbris Ji	MA	March Columny Columns			
1-1-T - Le - L	15 PA left	1	2		7.0	670
1)-15 Tr					1	
1)-15- Tr	DOL BUSCO	to on right	alson A	·····		
0-15 Tr	tel Builly	(hance gotter chi	elisig			·
0-15 Tr	10 Port	In manual and have	elisary)		·····	· · · · · · · · · · · · · · · · · · ·
0-15 Tr	nd Buile	In manual and have	elsarg)			
0-15 Tr	rd / Budg	In market a hore	elisary)			

 $\mathcal{A}^{\mathcal{I}}(X)$ 

Parameter	Score	Explanation of Score Given
Channel condition	9	
Riparian zone	9	
Bank stability	.8	
Water appearance	9	
Nutrient enrichment	7	Algae but NO scover odors, not many Nomus along stretch
Fish barriers	9	)
In-stream fish cover	9	
Embeddedness	9	· ·
Invertebrate habitat	9	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	87	< $6.0$ = POOR 6.1 - 7.4 = EAIR 7.5 - 8.9 = GOOD $8_{}7$ + 9.0 = EXCELLENT
č,

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition										
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of pa channel alterat with significant of channel and Any dikes or le set back to pro access to an a flood plain.	ion, but recovery banks. vles are vide	the reach w and/or char Excess age braided char	nnelization.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.					
10 (9) 8	7 6	5 4	3	2	1					

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or	Natural vegetation less than a third of the active channel width on each side. Or
	If less than one width, covers entire flood plain.		Filtering function moderately compromised.	Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability									
Banks are stable; at elevation of active floo plain; 33% or more of eroding surface area o banks in outside bends protected by roots that extend to the base-flov elevation.	d el pl f er s is ba is v th	oderately evation of ain; less t oding sur inks in ou protected at extend w elevati	f active han 33 face ar itside b I by roo to the	flood % of ea of ends ots	banks ma typically a occurs 1 y less frequ bends are (overhang at top of b mature tre stream an	ly unstable; ny be low, but are high (flood year out of 5, iently); outside actively eroc ging vegetatio pank, some ees falling into inually, some ares apparent	ling some strai or inside edg actively en ding outside be vegetation bank, num o trees fallin annually, r	banks may be pically are high; ight reaches and es of bends are oding as well as ends (overhanging at top of bare herous mature g into stream humerous slope parent).		
10 9 (8	) 7	6	5	4	3	2		1		

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

	Wate	er Appeara	nce	· · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at dep 1.5 to 3 ft; may have slightly green color; n sheen on water surfa	th most visible no oil ft; slov ce. appea rocks object	Iderable cloudiness of time; objects to depth 0.5 to 1.5 w sections may ar pea-green; bottom or submerged to covered with green or olive- film. Or	Very turbld or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
	- -		rate odor of nia or rotten eggs.	Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5	4 3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

Nutrient Enrichment									
reach; commι	water alon diverse ac unity little n present.	luatic plant algal	gre enti alga	rly clear enish wa ire reach al growl strates.	ater alo i; mod	ng erate	entire re algal gr	h water along ach; <b>abundant</b> owth, especially varmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10	9	8	7)	6	5	4	3	. 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

		Fish Barriers		
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 (9)	8 7 6	5 4	3 2	1

**Keys:** You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

Instream Fish Cover										
>7 cover types available		7 cover ilable	types	4 to 5 co available	ver types	2 to 3 co available	ver types	None to 1 cover type available		
10 (9)	8	7	6	5	4	3	2	1		

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:

Embeddedness										
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.						
10 (9)	8 7 6	5 4	3 2	1						

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat											
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.								
10 (9) 8	7 6 5 4	3 2	1								

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Key:	This pertains	to water	ways wh	y Cover ere channel i er fishery	s 50 feet wid	de or less.
>75% of water surface shaded and upstream 2 3 miles generally well shaded.	> 50% sh >75% in r upstream shaded.	Οr each, bι	ıt	20 to 50%	shaded.	<20% of water surface in reach shaded.
10 (9) 8	7 6	5	4	3	2	1

	Abandoned Mine Dra	ainage (if applicable)	
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

# 

	Sewage (if applicable)									
(Intentionally blank)	Noticeable c plant growth	dor, excess and siltation.	plant growt	odor, excess h. \nd	Visible pipe with effluent heavy odor.	1				
				ble pipe and m substrate.						
	5	4	3	2	1					

Mark discharge(s) on map and/or with GPS unit.

	Manure Presence (if applicable)												
(Intentionally blank)	Evidence of livesto access to riparian	zone. str	casional manu eam or waste s ucture located od plain.	storage	Extensive amount of manure on banks or in stream. Or								
					Untreated human waste discharge pipes present.								
	5 4	4	3	2	1								

## **NOTES**

Evaluators' Names <u>LS/SA</u> Sub-Watershed <u>South trib 2 to RR</u> Stream Section N Stream Name <u>Rippling Run</u> Reference Section Weather Conditions Today <u>70'S Rain/Sun</u> Past 2		ssessmer		
Sub-Watershed South trib 2 to RR Stream Section N	<u> </u>	Date: <u>5-</u>	1-08	<u>-</u>
	Name			
Stream Name <u>Rippling Run</u> Reference Section	n			
Weather Conditions Today 70'S Rain / Sun Past 2	2-5 Days	60'5	Pair	<u></u>
Active Channel Width: <u>3-4</u> feet				
	/0/ \.			
LAND USE WITHIN DRAINAGE ( Grazing Pasture /0 Grassy Field	(%):	Row Crops		r <u> </u>
	15	Industrial		
Commercial Abandoned Mine Lands		Other	·	
/s SUBSTRATE (%):		· ·		
	Silt			5
DESCRIBE THE LAND USE OF THE AREA THAT THE ST	TREAM F	LOWS THRO	UGH:	
MOSTLY FORESTED, A FEW HOMES/PASTURES				····
GPS POINTS / PHOTOS:	<u></u>	<u></u>	· ·	
Vaypoint Photo Description	·		pH	Cond.
4.14 Start				
P.J.15 Homeowners by stram	<u> </u>	n	<u> </u>	
PPB16 End @ Road d 1 End 100King upstream headwallist	1 RR trit	vasdream		
2 Wetlands @ same spot			<u>├</u> ────	·
Conservation area (a) top			<b>├</b>	l
RR17 End of other tribs		- <u> </u>	·	┨╼────
				· · · · · · · · · · · · · · · · · · ·
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Stream	Section	Name:
		Data

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	G.	
Water appearance	9	
Nutrient enrichment	9	
Fish barriers	8	
In-stream fish cover	C d	
Embeddedness	q.	
Invertebrate habitat	9	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	. NR	
TOTAL SCORE (Add all scores and divide by number of scores given)	<u> </u>	< 6.0 = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

); ;

Stream Section Name:

Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					C	hann	<u>el Condi</u>	tion			
struct evidei Cuttin	al channel; ures, dikes. nce of down g or excess l cutting.	No -	cha with of c Any set	nnel al signifi hannel dikes back to	of past teration cant rec and ba or levies provide an adeq	overy nks. s are	the read and/or of Excess braided	channel; <50% o ch with riprap channelization. aggradation; channel. Dikes o estrict flood plain	downa >50% riprap r Dikes	nel is activ cutting or v of the rea or channe or levees s to the flo	widening. ich with elization. prevent
10	9	(8)	7	6	5	4	3	2		1	

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

· · · · · · · · · · · · · · · · · · ·		Riparian Zo	one	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.		Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	(8) 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

	Bank Stability													
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).											
10 (9) 8	7 6 5 4	3 2	1											

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		Wate	r Appearar	100	· · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	objects vi 1.5 to 3 ft slightly gr	ally cloudy; sible at dept ; may have een color; no water surfac	h most o visible o oil ft; slow appear rocks o objects heavy g green ft	terable cloudiness f time; objects to depth 0.5 to 1.5 v sections may pea-green; bottom or submerged covered with green or olive- ilm. Or te odor of ia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	76	5 4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

	Nutrient Enrichment														
	diverse nity litt		gree enti alga	ly clear enish wa re react al grow strates.	ater alc n; mod	ong erate	entire rea	h water along ach; abundant owth, especially armer months.	Pea green, gray or brown water along entire reach; severe algai blooms create thick algal mats in stream.						
10	(9)	8	7	6	5	4	3	2	1						

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

					Fish	Barriers			
No barrier	5.	with	-		Drop stru culverts, diversion drop) with reach.	dams or is (<1ft	Drop stru culverts, diversion drop) wit reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	(8)	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

	Instream Fish Cover													
>7 cover types available	>7 cover types 6 to 7 cover types available available						2 to 3 co available		None to 1 cover type available					
10 9	)	8)	7	6	5	4	3	2	1					

**Cover types:** Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream Section Name: Date:

Embeddedness										
Gravel or c particles ar embedded.	e <20%	partic	el or co les are embed	20 to	Gravel o particles 40% eml	are 30 to	1	or cobble are >40% ed.	Completely embedded.	
10	(9)	8	7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded:

	Insect/invertebrate Habitat									
availat stage t coloniz	at 5 types of ble. Habitat i o allow full i cation (wood gs not freshly	s at nsec y de	a :t	Som exist trées habit	ie pote is, suc s, whic tat, bu	es of hat ential ha h as ov h will pi t have n e stream	bitat erhanging ovide iot yet	The sub disturbe removed velocitie	pes of habitat. strate is often d, covered, or d by high stream s and scour or by at deposition.	None to 1 type of habitat.
10	9	8	).	7	6	5	4	3	2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

· ·			(ey: Th	is per	iains to	o water	ways wh	y Cover ere channel er fishery	is 50 feet wid	de or less.	
>75% o shaded 3 miles shaded.	and gene	upstrea	m 2 to	>759	% in re ream 2	ded in r Or ach, bu to 3 m			20 to 50% shaded. <20% of water sur reach shaded.		
10	(9	)	8	7	6	5	4	3	2	1	

	Abandoned Mine Drainage (if applicable)										
(Intentionally blank)		of iron staining. Or e iron precipitate.	Iron preci muddy on appearan	•	Heavy iron precipitate, noticeable kill zone, Or White/bluish-white precipitate visible, rotten egg smell.						
	5	4	3	2	1						

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.



Stream	Section	Name:
		Date:

Sewage (if applicable)										
(Intentionally blank)		odor, excess h and siltation.	Noticeable o		Visible pipe with heavy odor.	h effluent,				
			Ar	nd		•				
			Questionable black stream							
	. 5	4	3	2	1					

Mark discharge(s) on map and/or with GPS unit.

·	Manure Presence (if applicable)										
(Intentionally blank)	Evidence of l access to rip		stream or	al manure in waste storage ocated on the	Extensive amount of manure on banks or in stream. Or						
• .					Untreated human waste discharge pipes present.						
	5	4	3	2	1						

**NOTES** 

Ctroom Nome Lit TV	B South - RR.	Rotaranca Sacti	nn			
Weather Conditions To	day <u>70's k</u>	ain/Shn_Pas	t 2-5 Days	_ 100'5	Rain	
Active Channel Width:		1				
	LAND USE	WITHIN DRAINAG	E (%):	· <u>-</u> · · · · · · · · · · · · · · · · · · ·		
Grazing Pasture	Grassy F			Row Crops	3	
Forest	75 Residenti		25	Industrial		
Commercial		ed Mine Lands		Other		
		JBSTRATE (%):		•		
		iravel 25	Silt	10	Mud	_5
DESCRIBE T	HE LAND USE OF THE	AREA THAT THE	STREAM I	FLOWS THE	ROUGH:	
· · · · · · · · · · · · · · · · · · ·						
· · · · ·	·					
	GPS I	POINTS / PHOTOS:				
	pription				pH	C
RER 577-1- 5774					_	
$\frac{n}{2}$ Hr	monner > Woods	(ravine)				
3 Photo (En	oss Road Supstree	Vine hlad	<u>warrs</u>	,		_
	oss road -7 upstite	m 10~ 710p	•		-	
3	p of this looking of NO withall pipe as	1 Jan m Stram	Cheadwat	(VS)		
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Notes:

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\_\_ Stream Section Name: \_\_ Date:

\_\_\_\_\_

Parameter	Score	Explanation of Score Given
Channel condition	9	
Riparian zone	9	
Bank stability	d'	
Water appearance	9	
Nutrient enrichment	8	
Fish barriers	8	
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	8.4	< $6.0$ = POOR 6.1 - 7.4 = FAIR 7.5 - 8.9 = GOOD > 9.0 = EXCELLENT

Stream	Section	Name:
		Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

-				С	hann	el Condi	tion		
Natural channel; n structures, dikes. N evidence of down- Cutting or excessiv lateral cutting.	10	char with of cl Any set t acce	signific nannel dikes c ack to	of past eration cant rec and bai or levies provide in adeq	overy nks. are	the read and/or of Excess braided	channel; <50% of ch with riprap channelization. aggradation; channel. Dikes of restrict flood plain	downcuttir >50% of th riprap or c Dikes or le	actively ng or widening. he reach with hannelization. wees prevent he flood plain.
10 (9)	8	7	6 6	5	4	3	2		1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

		Riparian Zo	ne	
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration.
	width, covers entire flood plain.		moderately compromised.	Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability										
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; a elevation of active fl plain; less than 33% eroding surface area banks in outside ber is protected by roots that extend to the ba flow elevation.	ood of a of nds	Moderately un banks may be typically are hi occurs 1 year less frequently bends are acti (overhanging at top of bank, mature trees fa stream annual slope failures a	low, but igh (flooding out of 5, or /); outside vely eroding vegetation some alling into ly, some	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).					
10 9 (8)	7 6 5	4	3	2	1					

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

		Water A	ppearance		*
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.		ole at depth	appear pea-g rocks or subr objects cover heavy green green film.	objects oth 0.5 to 1.5 ons may green; bottom nerged red with	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright- green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface.
			Moderate odd	or of	Or
$\bigcirc$			ammonia or r	otten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 /9 / 8 /	7 6	5 4	3	2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

Nutrient Enrichment										
Clear water along entire reach; diverse aquatic plant community little algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrates.	Greenish water along entire reach; abundant algal growth, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.							
10 9 (8)	7 6 5 4	3 2	1							

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		wit mc	asonal w hdrawals ovement v ich.	inhibit		•	diversior	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	(	8/	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

Instream Fish Cover									
>7 cover available	types		to 7 covei /ailable	types	4 to 5 co available	ver types	2 to 3 co available		None to 1 cover type available
10	9	8	) 7	6	<b>5</b> '	4	3	2	1

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name:
		<b>—</b> 1.

Date:

				Embe	ddedness		4	·····
Gravel or cobble particles are <20% embedded.	p	ravel or c articles ar 2% embe	e 20 to	Gravel o particles 40% em	are 30 to	1 .	or cobble s are >40% led.	Completely embedded.
10 9	8	] 7	6	5	4	3	. 2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded.

	Insect/invertek	orate Habitat	
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 (8)	7 6 5 4	3 2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: \_\_\_\_\_

Кеу: Т	nis pertains t	o water	ways wh	y Cover iere channel i ter fishery	s 50 feet wi	de or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% sha >75% in re upstream 2 shaded.	Or ach, bu	t	20 to 50%	shaded.	<20% of water surface in reach shaded.
10 (9) 8	7 6	5	4	3	2	1

· · · · · · · · · · · · · · · · · · ·	Abanc	loned Mine Dr	ainage (if app	olicable)	· · · ·
(Intentionally blank)	i i i i i i i i i i i i i i i i i i i	of iron staining. Or iron precipitate.	Iron precipit muddy oran appearance	ge	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

Stream	Section	Name:
		Date:

Sewage (if applicable)									
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.	Noticeable odor, excess plant growth.	Visible pipe with effluent, heavy odor.						
•		And							
		Questionable pipe and black stream substrate.							
	5 4	3 2	1						

Mark discharge(s) on map and/or with GPS unit.

	Manure Prese	nce (if applicable	)	
(Intentionally blank)	Evidence of livestock access to riparian zone.	Occasional ma stream or waste structure locate flood plain.	e storage	Extensive amount of manure on banks or in stream. Or
•				Untreated human waste discharge pipes present.
	5 4	3	2	1

## **NOTES**

	rs' Name	s <u>KS/SA</u>			_ Date:	4-64-6	0
Sub-Wat	ershed _	Sippling Run no Today 75° Sunn	Stream Section	Name			
Stream N	lame 🔟	ipplina Run	_ Reference Section	on			
Veather	Conditio	ns Today 75° Sunn	<u>~/</u> Past	2-5 Days	<u>    Sam</u>	e	
ctive Cl	nannel W	idth: <u>25</u> feet					
	•	LAND USE	WITHIN DRAINAGE	E (%):	<u></u>		
Grazing F	asture	Grassy Fie		10	Row Cro		
orest		<u>60</u> Residentia		30	Industria	<u></u>	
Commerc	ial		d Mine Lands		Other		
<u> </u>			BSTRATE (%):	0.11			
Boulder		Cobble 60 G		Silt	20	Mud	15
<u> </u>		BE THE LAND USE OF THE			······································		
STRE TRO.	AM FI	ONS ADJACENT TO U	VEXFORD-DAY	NE KOT	112, 1100	STLY F	LOWS
De NOIS	enec	THEN HEADS AWAY F	DAM RAAT	N MKO	<u>007 700</u> 27 (1710	THE P	TEOWNER JANE
INUTE	<u>-1107</u>	GPC D	OINTS / PHOTOS:		HCH St		<u>- "LT" KC</u>
/aypoint	Photo	Description				Ha	Cond.
RF1		Start	*			рп	
RP2		Bank Children _ <					
REJ	9	Pipe I WARRAN OK	11.0-1			8,	27 500
	~					· .	
<u></u>	4	11		, <u>.</u>			
KLU	<u> </u>	This as left daine he Trib as half Pind 4	MITTERN / DC	Dag J.	<u>am_</u>	-7.6	13360
<u> KK5</u>			÷ 7 7		trib	-> 8.1	11 480
KF-6	8	Jam )		(> 177)		l	_ <b>_</b>
		Cheverd V drivenia.	PY JAW (	(2477)			
	10	other side of cueve: Take	<u>/  </u>				
	- <u>10</u> 	Take			······································		
	12	Culvert out of lake					
	13	Down stream Loom lake			·		
			to the end 7 C	hannel 3	" wide ho	measurers, c	avan at
RR7	1			<u>^</u>			<u>, , , , , , , , , , , , , , , , , , , </u>
RR7		Ainchannel				· .	· ·
	·	Ainchannith All Wooks [ Marsund	/1000ing at sta	1+ (fr.	auklin nu	(rsende)	
Fork		Ainchannel	/lagging at sta	17 (fr.	anklin nu	irsen()	
Fork RR8		Ainchannel	/lagging at sta	.7+ (fr.	anklin n	irseny)	
Fork RR8 RR9		All Woods [ Mursung	/lagging at sta	.1+ (fr.	anklin nu	irsen,)	
Fork RR8		All Woods / Mursung This on right	/lagging_at sta	.(+ (fv,	anklin nu	lrsen(;)	

Floodplain wetlands: Yes No It so, approximate size. Length \_\_\_\_\_\_

Notes:

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Stream	Section	Name:
		Date:

**Explanation of Score** Given **Parameter** Score Channel condition 8 **Riparian** zone 9 **Bank stability** 9 Water appearance 9 Nutrient enrichment J **Fish barriers** In-stream fish cover 8 Embeddedness 8 Invertebrate habitat **Canopy Cover** AMD NA (if applicable) Sewage NA (if applicable) Manure presence NA (if applicable) 82/10 TOTAL SCORE < 6.0 = POOR 6.1 - 7.4= FAIR (Add all scores and divide by 8.2 7.5-8.9-= GOOD number of scores given) > 9.0 = EXCELLENT

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Stream Section Name:

Date:

#### Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

					0	hann	el Condit	ion			
structu evider Cutting	al channel; ures, dikes. nce of down g or excess cutting.	No -	cha with of c Any set	idence o annel alt h signific channel y dikes c back to cess to a pd plain.	eration ant rec and ba or levie provid	covery nks. s are e	the react and/or cl Excess a braided o	channel; <50% of h with riprap hannelization. aggradation; channel. Dikes or estrict flood plain	downcu >50% o riprap o Dikes o	el is active otting or w f the read r channel r levees p to the floo	idening. h with ization. prevent
10	9	8	7	6	5	4	3	2		1	

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

	Riparian Zone								
Natural Vegetation extends at least two active channel widths on each side	channel wic	e active	Natural veg extends ha active chan width on ea side.	lf of the nel	extends the activ	vegetation a third of e channel each side. Or	Natural vegetation less than a third of the active channel width on each side. Or		
	If less than width, cover flood plain.				Filtering moderat compron	ely	Lack of regeneration. Or Filtering function severely compromised.		
10 9	(8) 7	6	5	4	3	2	1		

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

· · · · · · · · · · · · · · · · · · ·	Bank Stability										
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base- flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).								
10 (9) 8	7 6 5 4	3 2	1								

**Keys:** <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

	V	Vater Ap	pearance	· · · · · · · · · · · · · · · · · · ·
Very clear, or clear but tea- colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally clou objects visible at 1.5 to 3 ft; may h slightly green col sheen on water s	depth ave or; no oil	Considerable cloudiness most of time; objects visible to depth 0.5 to 1. ft; slow sections may appear pea-green; botto rocks or submerged objects covered with heavy green or olive- green film. Or	appearance most of the time; objects visible to depth <0.5 ft; slow moving
			Moderate odor of	Or
			ammonia or rotten eggs.	Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5	4	3 2	1

Keys: Remember to look at the water, not the substrate. Dip a clear glass jar in water and observe the clarity.

Nutrient Enrichment										
Clear water along entire reach; diverse aquatic plant community little algal growth present.	Fairly clear or a greenish water entire reach; m algal growth o substrates.	r along noderate	algal grow	vater along h; abundant rth, especially mer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.					
10 (9) 8	76	54	3	2	1					

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

	Fish Barriers									
No barriers.		wit mo	asonal w hdrawals ovement v ach.		Drop stru culverts, diversion drop) with reach.	dams or is (<1ft	Drop stru culverts, diversion drop) wit reach.	dams or	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.	
10	9 /	8)	7	6	5	4	3	2	1	

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

Instream Fish Cover										
>7 cover available			7 cover lable	types	4 to 5 co availabi	over types e	2 to 3 co available	ver types	None to 1 cover type available	
10	9	(8)	7	6	5	4	3	2	1	

**Cover types**: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:\_\_\_\_\_

Stream	Section	Name
		<b>—</b> 17

Date:

Embeddedness									
Gravel or cobble particles are <20% embedded.	p	ravel or articles a 0%_emb	are 20 to	Gravel o particles 40% em	are 30 to	Gravel o particles embedd	are >40%	Completely embedded.	
10 9	(8	7	6	5	4	3	2	1	

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in riffles & runs. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3<sup>rd</sup> of the way by sediment then it is 30% embedded:

					Insec	t/inverte	orate Hab	itat	
At least 5 types of available. Habita stage to allow ful colonization (woo and logs not fres fallen).	t is at a l insec ody de	a t	Son exis trée habi	ne pote ts, sucl s, whic tat, but	s of hat ntial ha h as ov h will pi have r strean	bitat erhanging ovide ot yet	The subs disturbed removed velocities	es of habitat. trate is often , covered, or by high stream and scour or by deposition.	None to 1 type of habitat.
10 9	8	).	7	6	5	4	3	2	1

**Cover types:** Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other:

Key: Th	is pertains to w	Canopy aterways whe Coldwate	ere channel is	50 feet wid	de or less.
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded C >75% in reach upstream 2 to shaded.	Dr 1, but	20 to 50% shaded.		<20% of water surface in reach shaded.
10 9 (8)	7 6	5 4	3	2	1

· · ·	Aband	oned Mine D	rainage (if ap	plicable)	
(Intentionally blank)		f iron staining. Or iron precipitate.	muddy oral	÷	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5	4	3	2	1

If AMD is found, complete AMD site diagram and mark discharge point on map, and/or with GPS unit.

. . .

#### Stream Section Name: \_ Date:

		Sewage (if a	applicable)		
(Intentionally blank)		Noticeable odor, excess plant growth and siltation.		odor, excess th. And	Visible pipe with effluent, heavy odor.
				ble pipe and m substrate.	
	5	4	3	2	1

Mark discharge(s) on map and/or with GPS unit.

	Manu	re Presen	ce (if applic	able)		
(Intentionally blank)		Evidence of livestock access to riparian zone.		al manure in waste storage ocated on the	Extensive amount of manure on banks or in stream. Or	
					Untreated human waste discharge pipes present.	
	5	4	3	2	1	

**NOTES** 

## ATTACHMENT F: GIS MAP REFERENCES SUMMARY

#### Attachment F GIS Reference Summary

Мар	Shapefiles/Layers	Source	Description
Stream Score Assessment	PAMAP Tile Index - South 2006	PAMAP Program, Bureau of Topographic and Geologic Survey, PA Department of Conservation and Natural Resources	PAMAP 10,000 feet x 10,000 feet tile index covering counties in the southern State Plane zone of Pennsylvania. This version has been updated to include additional tiles within a 5000 feet buffer of the Pennsylvania border An encroactiment Coaction is a Dep primary facility type
Areas Of Encroachment & Bank Erosion	Encroachment Locations	Pennsylvania Department of Environmental Protection	related to the Water Resources Management Water Obstructions Program. There are many sub-facility types relating to Encroachment Locations, ranging from Boat Launch Ramps to Dredging to Wetland Impact. These sub- facilities may pertain
Stormwater Management & Land Use	Erosion & Sediment Control Facilities	Pennsylvania Department of Environmental Protection	An Erosion and Sediment Control Facility is a DEP primary facility type related to the Water Pollution Control program
	PAMAP Program Land Cover for Pennsylvania, 2005	The Pennsylvania State University	State wide land cover will provide a reference for current land use status in the state;The coding is based on the Anderson Land Use/Land Cover system
Oil And Gas Wells	Encroachment Locations for Oil & Gas	Pennsylvania Department of Environmental Protection	An Encroachment Location for Oil & Gas is a DEP primary facility type related to the Oil and Gas Program. The sub- facilities that fall under Oil and Gas Encroachment also exist under Encroachment Locations
	National Wetlands Inventory - Pennsylvania	U.S. Fish and Wildlife Service PA Game Commission	This data set represents the extent, approximate location and type of wetlands and deepwater habitats in the conterminous United States PA State Game Land Boundaries
Natural Areas	State Game Lands Floodplains of Pennsylvania NHI (Natural Heritage Inventory)	Office of Remote Sensing for Earth Resources, Penn State University Western Pennsylvania Conservancy	Floodplain boundaries state wide Natural Heritage Inventories, prepared by the Western Pennsylvania Conservancy
	Trout Stocked Streams Watershed Boundaries (ERRI	PA Fish and Boat Commission	This layer contains flowing waters from the Pennsylvania Fish and Boat Commission Fisheries Resource Database that were stocked with trout in 2008
	- Small Watersheds	Environmental Resources Research Institute	Boundaries of 9,895 watersheds in Pennsylvania indicated in the Pennsylvania gazeteer of streams.
General (multiple mans)	State Roads	Pennsylvania Department of Transportation, Bureau of Planning and Research, Geographic Information Division	State-owned and maintained public roads within Pennsylvania as extracted from the PENNDOT Roadway Management System (RMS). Includes fields describing pavement type, traffic volumes and other information as detailed below
(multiple maps)	Municipalities	Pennsylvania Department of Transportation Pennsylvania Department of	Boundaries of municipalities within Pennsylvania as delineated for the PennDOT Type 10 general highway maps.
	Counties Streams	Transportation Environmental Resources Research Institute	Boundaries of counties within Pennsylvania The connected network of streams and waterways of Pennsylvania are indicated as single lines in this coverage.

Other shapefiles or layers were based on waypoints taken during field surveys conducted in watershed.

ATTACHMENT G: MEDIA: NEWS REPORTS & WATERSHED ARTICLES



Bob Donaldson/Post-Gazette

Blue Heron returned to their nests for another season in the trees above Big Sewickley Creek in Bell Acres in April 2004. Collecting old bird nests without the proper permit is illegal.

#### Craig Barras

From:suzybeezy@comcast.netSent:Monday, June 04, 2007 12:13 PMTo:Craig BarrasSubject:Sewickley Herald Article

Forwarding this article for inclusion with our study.

Susan Barness

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#### Property still in danger of falling into creek

Adam Brandolph Staff Writer Thursday, May 31, 2007

A broken wire fence and cracked concrete slabs are all that separates Elizabeth Zedak's home in Bell Acres from a 30-foot cliff into the Big Sewickley Creek.

Zedak, who lives in the home with her daughter Jenni and Anthony Caracci, be-lieves the creek is causing the hillside to slowly erode, sliding their home closer to the cliff.

"The creek is causing the house to move," Zedak said. "The creek is the reason my house is falling."

A Network of People Committed to You. Last Friday, Zedak invited members of the Pennsylvania Department of Environmen-tal Protection to investigate the property.

She hopes they'll be able to offer assistance in finding a solution.

DEP officials have visited her home on many occasions over the last several years.

"They've been out here before and every single time they're here, they don't say anything except that it's my issue," she said.

State officials offered her information on stabilizing the hillside before, but Zedak says she doesn't have

money to pay for permits let alone construction costs.

"I don't have money to be fixing this problem," she said.



"It would cost almost \$4,000 just for permits. I don't have that kind of money just sitting around."

In a letter dated February 2004, Joseph Capasso of the DEP told the Zedak's that the "team again confirmed that the problem appears to be erosion of the upper embankment rather than the top or the area immediately adjacent to the stream."

Zedak doesn't believe that conclusion.

"They (the DEP) keep telling me it's my problem," she said. "It's not rain run-off that's causing this problem."

The creek does have its upsides, though.

"The creek offers so much nature here," she said.

"It's like Raccoon [Creek State] Park. With the deer and the fish all around the creek, it's so nice to be near."

But it's the fish in the creek that are partly to blame for her troubles.

Even though government officials have told her before to dump soil along the hillside, Zedak risks being fined by state fish and game officials.

"We've been told to dump dirt down the hill by some officials," she said. "If we do that, we'll get fined."

Her situation worsened after the remnants of Hurri-cane Ivan swept through the area.

"After Ivan," she said, "waters were very high. It looked like a river running through here."

Ivan relocated the creek nearly 30 feet closer to her home, she said, placing it directly at the bottom of the hill.

"When Ivan moved the creek, our problem got worse," Zedak said.

"Ivan did so much damage in a little amount of time."

State Rep. Sean Ramaley, who also visited the Zedak property last Friday, said he would like to do whatever he can to help.

"Finding a way to stabilize Mrs. Zedak's home is important," he said.

"She's obviously very worried about her property."

Though Zedak knows her life may be in danger should another leftover hurricane or heavy rainfall come through the valley, she doesn't want to move.

"This is my house," she said.

"It may not be much but it's my house. I love it."

FIGURES



















	BSCT Tributaries to Big Sewickley Cre	ek
	CH Cooney Hollow	
	EF East Branch Big Sewickly Creek	
$\sim$	EFT Tributaries to East Branch Big S	ewickly Creek
	NF North Fork Big Sewickley Creek	
	NFT Tributaries to North Fork Big Ser	wickley Creek
	RR Rippling Run	
Butler Beaver	The numbers increase from the mouth of the segment H For Tributaries: First No. (1, 2, 3, etc.) refers to the tributary Direction of Tributary (E or W) refers to East or West sid Second No. (1, 2, 3, etc.) is waypoint indentification	0.1
Cooney Hollow East Branch Rippling Rem Allegheny	BIG SEWICKLEY CREEK WATERSHED Allegheny, Beaver, and Butler Counties, Pennsylvania WATERSHED MANAGEMENT RECOMMENDATIONS	2010
	ASSOCIATES - INC. BALANCED ENVIRONMENTAL SOLUTIONS Pittsburgh, PA, Telephone: 724/733-2060; State College, PA, Telephone: 814/238-2060	Map 7 of 7