Skinner Creek Conservation Planning Project

PREPARED BY

SENECA CHAPTER OF TROUT UNLIMITED

ACKNOWLEDGEMENTS

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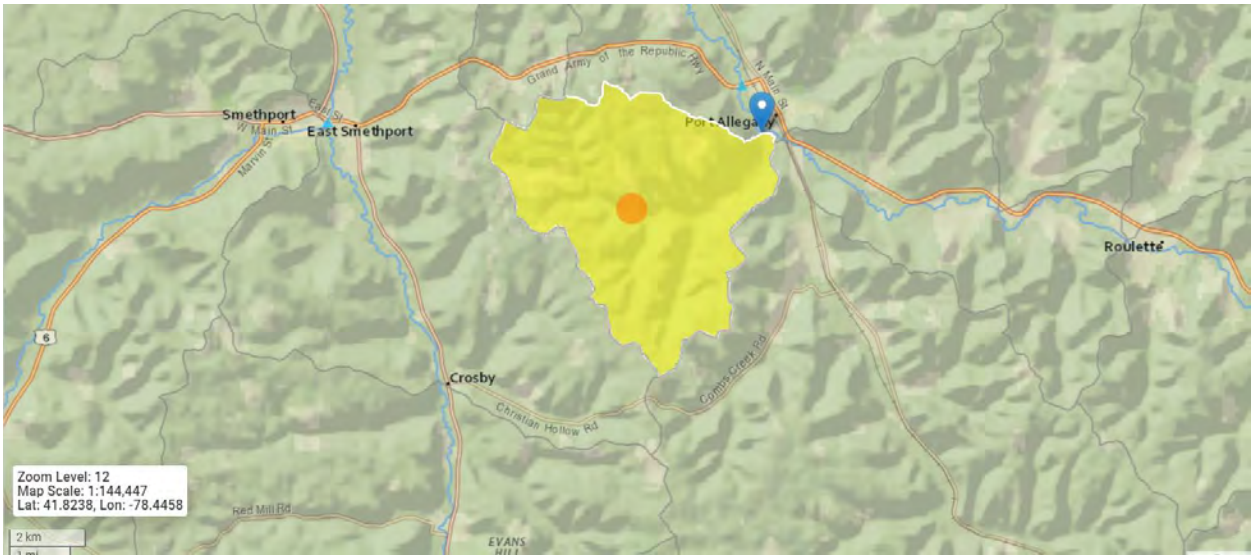
SECTION 1. PURPOSE OF STUDY/WATERSHED BACKGROUND

Skinner Creek is widely used by anglers due to its proximity to Port Allegany and portions of the stream being located on State Game Lands 061. The Seneca Chapter installed streambank stabilization and habitat enhancement structures in the summer of 1984, 2000, and 2002. It is the intent of these efforts to document the current status of the watershed, assess the condition of previous stream work, and determine a path forward to protect, enhance, and restore the Skinner Creek drainage for its various stakeholders.

Figure 1. Skinner Creek Watershed



SECTION 2. EXISTING DATA AND PROJECTS

Skinner Creek is a part of the Upper Allegheny watershed and is currently managed as two sections by the Pennsylvania Fish & Boat Commission. Section 01 extends for a distance of 3.4 km (2.11mi) from the headwaters downstream to Sherwood Hollow. The latest stream examination surveys are as follows: On June 28, 2001 Fisheries Management Area 2 staff conducted a Petersen population estimate on a 302 m site at RM 3.40. Wild Brook Trout biomass was estimated at 26.20 kg/ha and wild Brown Trout biomass was estimated at 7.99 kg/ha. On July 26, 2011 PFBC Habitat Division staff conducted a single pass electrofishing effort on a 305 m site at RM 3.09. Wild Brook Trout biomass was estimated at 3.53 kg/ha and wild Brown Trout biomass was estimated at 23.73 kg/ha. Based on the latest inventory information, Section 01 supports a biomass Class B wild trout population. This section is managed for wild trout and is not stocked by the PFBC.

Section 02 extends for a distance of 4.5 km (2.79 mi) from Sherwood Hollow downstream to the mouth. This section is stocked by the PFBC and allocated 400 trout (280 ST &120 BT) during the preseason stocking period and 300 trout (150 ST & 150 BT) during the in-season stocking period. The latest stream examination surveys are as follows: On June 19, 1996 Fisheries Management Area 2 staff conducted a single pass electrofishing effort on a 222 m site at RM 1.20. wild brook trout biomass was estimated at 0.93 kg/ha. On July 26, 2011 Habitat Division staff conducted a single pass electrofishing effort on a 310 m site at RM 2.92. Wild brook trout biomass was estimated 1.72 kg/ha and wild brown trout biomass was estimated 1.67 kg/ha. The latest inventory information confirms that Section 02 supports a low biomass Class D wild trout population The Biomass Class D rating of wild trout in this section allows it to continue as a viable candidate for continued stocking of hatchery trout and planned to continue stocking in 2017.

In December of 2016, The Seneca Chapter voted Adopt Skinner Creek in an effort organized by PATU to oppose the stocking of hatchery reared brook trout and brown trout in streams that supported native brook trout and wild brown trout populations. For 2017, PFBC agreed to stock only rainbow trout. There was sufficient water quality and pH to allow rainbows to be stocked and this approach would take some pressure off the native brook trout and naturalized brown trout. Based on discussion, PFBC may be hold off on resurveying Sec 01 for the possibility of a Class A population for a few more years.

Water Quality

Field data was collected May 19, 2010 and April 11, 2013 on the water quality of each site (Table 1). Station number 20130411-1230-JPG had some boulders, mostly cobble and gravel. There were large amounts of sand due to an upstream beaver pond.

Table 1. Field data on water quality of station locations 2010 and 2013 PA DEP NW Regional Office

Station Number (SN)	Temp (ºC)	DO (mg/l)	pH	Cond. (µS/cm)	Alkalinity (mg/l)	Water appearance/ Odor Comments
20100519-1115-JCB	9.9	n/a	6.80	50.7	8	Waterflow moderate, potential low
20130411-1230-JPG	5.9	n/a	6.85	32.3	4	Odorless, turbid from recent heavy rainfall, not impaired
20130411-1130-JCB	6.1	n/a	6.71	27.2	4	Clear, odorless, not impaired

Macroinvertebrates

All field data and previous kick screens were conducted in 2010 and 2013. 6-kick ICE data were found for Skinner Creek and Paul Brook.

Habitat

Habitat scores were calculated for each of the sampling locations in 2010 and 2013 (Table 2). Evaluations included a mostly open riparian zone with limited areas of small trees and shrubs. There was heavy pastoral and agricultural use. Good habitat for brown trout with long riffles to deep holes was noted. Station number 20130411-1130-JCB had a good riparian zone upstream of the several camps located near the mouth of Paul Brook. Banks were mostly stable. Substrate was mostly cobble and gravel with small amounts of boulders and sand. Riffles were long, indicating a good brook trout stream.

Table 2. Flowing waterbody field data form station number descriptions 2010 and 2013

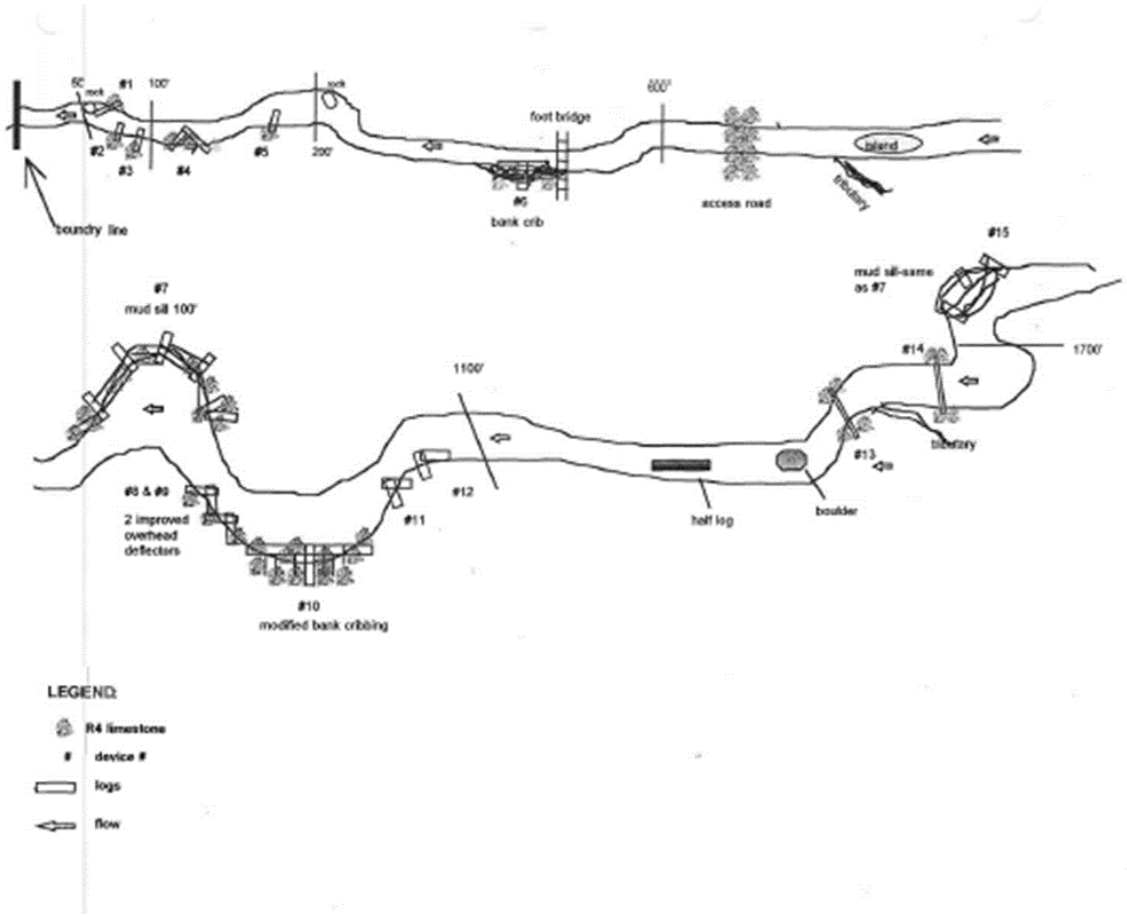
Station Number (SN)	Date and Time	Waterbody Name	Location	Land Use	IBI Score	Total Habitat Score
20100519-1115-JCB	05/19/2010 1115	Skinner Creek	Skinner Creek at probabilistic sampling station (Port Allegany Quad)	Extensively forested within SGC Fully shaded	94.3	214 Optimal
20130411-1230-JPG	04/11/2013 1230	Skinner Creek	Flows East into the Allegheny River. Sampled ~250m downstream of large beaver pond complex	Forested tributaries, heavy agricultural use in valley around stream, pastures with mowed fields. Partly shaded	83.5, Special conditions: high water	188 Optimal
20130411-1130-JCB	04/11/2013 1130	Paul Brook	Sampled just upstream from road crossing	Mostly forested, camps with mowed yards surrounding. Mostly shaded	86.8	200 Optimal

Figure 2. Flowing waterbody field data location sites

Historic Habitat Restoration by Seneca TU

Seneca TU started habitat restoration on Skinner Creek in 1984 with a grant in the amount of $14,530 from Trout Unlimited's Embrace A Stream Program (Figure 3 and shown on map on Figure 6). The Chapter continued habitat restoration efforts through 2002 and received funding from the Community Foundation and obtained a Growing Greener Grant in 2000. Much of this work has since been destroyed by beaver activity and dams on State Game Lands 61.

Figure 3. Historic habitat restoration design from 1980's



SECTION 3. WATERSHED ASSESSMENT

Methods

Water Quality

To assess the water quality of Skinner Creek, field data was collected and recorded by Heather McKean of Seneca Trout Unlimited at each of the four station sites SN1, SN2, SN3, and SN4. Temperature (°C), dissolved oxygen (mg/l), pH, conductivity (µS/cm), alkalinity (mg/l), water appearance and odor were collected.

Macroinvertebrates

Seneca Trout Unlimited used D-frame sampling method, similar to DEP's ICE collection protocol to conduct 6-kick macroinvertebrate sampling. Macros were then identified and

classified to genus level and the number of macroinvertebrates from each of the four station sites compared to help determine stream health.

Habitat

Water Quality Network Habitat Assessments were completed at four locations on May 9, 2019 to examine the habitat parameters by Heather McKean of Seneca Trout Unlimited. All locations were in McKean County, Liberty Township, Port Allegany. Table 3 shows the descriptions of each location and land use.

Table 3. Flowing waterbody field data form station number descriptions 2019

Station Number (SN)	**Waterbody Name**	**Location**	**Land Use**
SN1	Skinner Creek	Just upstream of bridge at Combs Creek Rd- Gordon Neal property	40% old fields 10% forest 30% pasture Canopy cover partially shaded
SN2	Skinner Creek	Skinner at SGL, pull off below beaver dams	Forested tributaries, heavy agricultural use in valley, pastures, and mowed fields. Canopy cover partially shaded
SN3	Skinner Creek	Goochee property upstream of confluence with Bemis	Mostly forested- Old fish hatchery upstream
SN4	Bemis Hollow	Bemis Hollow- Goochee property	90% old fields 10% Pasture Mostly forested, some agriculture up stream

Fishery Surveys

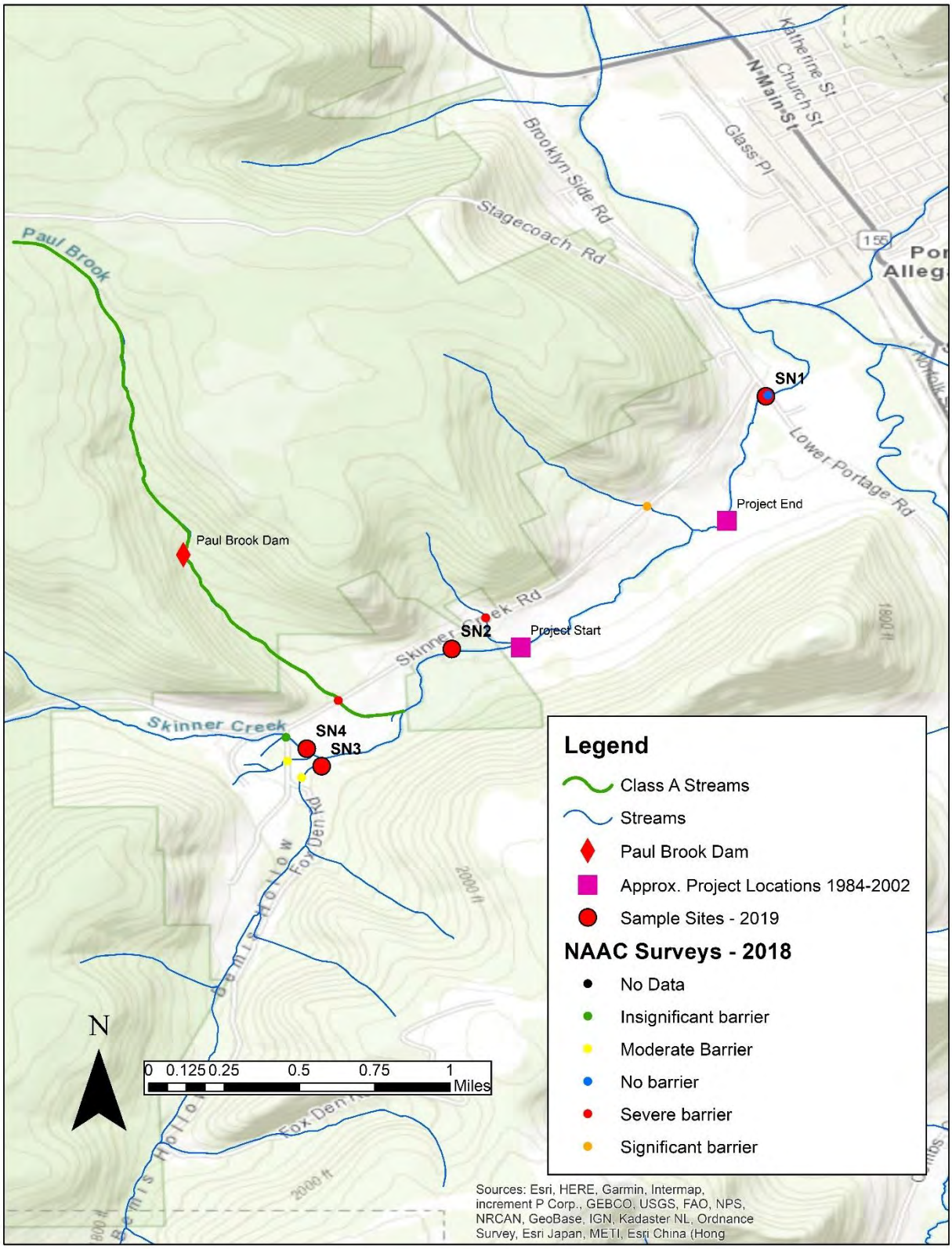
100-meter presence/absence fish surveys were completed at two different sites on Skinner Creek using backpack aquashock (Figures 4 & 5) on October 3, 2019 by NW Regional DEP Biologists. Each site consisted of one pass with two netters and two probes (200 Volts, 8.0 amps).

Figures 4 & 5. DEP Aquashock fish surveying

Culverts

On July 20, 2018 surveys utilizing the North Atlantic Aquatic Connectivity Collaborative (NAACC) protocol were conducted in Port Allegany at seven different locations to evaluate barriers, culverts and water connectivity for Skinner Creek. Figure 6 shows all sites of Skinner Creek where surveys were taken.

Figure 6. 2019 Watershed Assessment Map



Results/Discussion

Water Quality

Field data was collected May 9, 2019 on the water quality at each site (Table 4 Temperatures ranges from 11.5 ºC to 12.0 ºC. Dissolved oxygen ranged from 8.89mg/l to 9.11mg/l.). pH was only collected for SC1 due to equipment failure. Conductivity ranged from 42.7µS/cm to 50.9µS/cm. Alkalinity ranged from 4mg/l to 6mg/l. Water appearance and odor were also noted as being clear and odorless for all four sites.

Table 4. Field data on water quality of station locations 2019

Station Number (SN)	**Time**	**Temp (ºC)**	**DO (mg/l)**	**pH**	**Cond. (µS/cm)**	**Alkalinity (mg/l)**	**Bottle Notes**	**Water appearance/ Odor Comments**
SN1	1300	11.6	8.89	6.67	42.9	6	n/a	Clear, odorless
SN2	1530	12.0	9.06	n/a	50.9	6	pH meter not working properly	Clear, odorless
SN3	1400	11.7	8.96	n/a	42.7	6	pH meter not working properly	Some orange sludge from ditch- clear H_2O, odorless
SN4	1430	11.5	9.11	n/a	48.4	4	pH meter not working properly	Clear, odorless

Macroinvertebrates

Most abundant orders from each station were Ephermeroptera, Trichoptera, and Diptera. Having many macroinvertebrates present are signs that the stream is in good health. Tables 12-15 show data collected from the 6-kick macroinvertebrate sampling from each station site. Together there are thirty-seven different genera of macroinvertebrate found within Skinner Creek. Total specimens collected from each site ranged from 266 to 322.

Table 5. SN1 macroinvertebrate sampling

Skinner Creek 20190509-1300-STU @ Combs Creek Bridge		
Family	**Genus**	**# Counted**
Order		
Ephemeroptera		
Isonychiidae	Isonychia	38
Ephemerellidae	Attenella	13
Ephemerellidae	Ephemerella	33
Heptageniidae	Heptagenia/Maccaffertium	74
Hepageniidae	Leucrocuta	21
Baetidae	Acentrella	19
Baetidae	Heterocloeon	56
Plecoptera		
Perlodidae	Isoperla	7
Perlidae	Agnetina	3
Trichoptera		
Philopotamidae	Chimarra	5
Apataniidae	Apatania	5
Rhyacophilidae	Rhyacophila	2
Glossosomatidae	Glossosoma	11
Hydropsychidae	Hydropsyche	2
Odonata		
Cordulegastridae	Cordulegaster	1
Megaloptera		
Corydalidae	Nigronia	2
Diptera		
Chironomidae	Chironomus	7
Pediciidae	Dicranota	4
Simuliidae	Simulium/ Prosimulium	2
Ceratopogonidae	Probezzia	1
Oligochaeta		
Naididae	Tubificoides	13
Coleoptera		
Psephenidae	Psephenus	3
Total Specimens: 322		

Table 6. SN2 macroinvertebrate sampling

Skinner Creek 20190509-1530-STU SGL Site		
Family	**Genus**	**# Counted**
Order		
Ephemeroptera		
Isonychiidae	Isonychia	32
Ephemerellidae	Ephemerella	42
Heptageniidae	Heptagenia/Maccaffertium	75
Baetidae	Heterocloeon	64
Plecoptera		
Perlidae	Neoperia	1
Perlodidae	Isoperla	9
Pteronarcyidae	Pteronarcys	1
Perlidae	Agnetina	7
Trichoptera		
Philopotamidae	Chimarra	8
Apataniidae	Apatania	4
Glossosomatidae	Glossosoma	5
Hydropsychidae	Hydropsyche	16
Hydropsychidae	Diplectrona	4
Rhyacophilidae	Rhyacophila	5
Psychomyiidae	Lype	1
Megaloptera		
Corydalidae	Nigronia	4
Diptera		
Chironomidae	Chironomus	3
Ceratopogonidae	Probezzia	1
Athericidae	Atherix	4
Tipulidae	Tipula	4
Limoniidae	Hexatoma	3
Simuliidae	Simulium/ Prosimulium	2
Coleoptera		
Psephenidae	Psephenus	4
Oligochaeta		
Naididae	Tubificoides	6
Total Specimens: 305		

Table 7. SN3 macroinvertebrate sampling

Skinner Creek 20190509-1400-STU Upstream of Bemis		
Family	**Genus**	**# Counted**
Order		
Ephemeroptera		
Ephemerellidae	Attenella	51
Isonychidae	Isonychia	2
Ephemerellidae	Ephemerella	36
Heptageniidae	Heptagenia/Maccaffertium	53
Heptageniidae	Leucrocuta	3
Baetidae	Acentrella	6
Baetidae	Heterocloeon	62
Plecoptera		
Leuctridae	Leuctra	1
Perlodidae	Isoperla	8
Perlidae	Agnetina	11
Trichoptera		
Hydropsychidae	Arctopsyche	4
Apataniidae	Apatania	6
Rhyacophilidae	Rhyacophila	2
Glossosomatidae	Glossosoma	2
Diptera		
Tipulidae	Tipula	2
Simuliidae	Simulium/ Prosimulium	3
Limoniidae	Hexatoma	10
Athericidae	Atherix	1
Decapoda		
Parastacidae	Astacopsis	1
Oligochaeta		
Naididae	Tubificoides	2
Total Specimens: 266		

Table 8. SN4 macroinvertebrate sampling

Skinner Creek 20190509-1400-STU Upstream of Bemis		
Family	**Genus**	**# Counted**
Order		
Ephemeroptera		
Ephemerellidae	Attenella	55
Isonychidae	Isonychia	2
Ephemerellidae	Ephemerella	27
Heptageniidae	Heptagenia/Maccaffertium	49
Baetidae	Acentrella	4
Baetidae	Heterocloeon	38
Plecoptera		
Pteronarcyidae	Pteronarcys	3
Leuctridae	Leuctra	1
Perlodidae	Isoperla	13
Perlidae	Agnetina	10
Trichoptera		
Hydropsychidae	Diplectrona	6
Hydropsychidae	Hydropsyche	5
Brachycentrus	Brachycentridae	3
Philopotamidae	Chimarra	1
Apataniidae	Apatania	4
Rhyacophilidae	Rhyacophila	3
Glossosomatidae	Glossosoma	4
Megaloptera		
Corydalidae	Nigronia	1
Coleoptera		
Psephenide	Psephenus	2
Diptera		
Tipulidae	Tipula	2
Simuliidae	Simulium/ Prosimulium	3
Muscidae	Musca	2
Chironomidae	Chironomus	4
Limoniidae	Antocha	4
Limoniidae	Hexatoma	6
Chironomidae	Diamesa	16

Decapoda		
Parastacidae	Astacopsis	1
Oligochaeta		
Naididae	Tubificoides	8
Total Specimens: 277		

Habitat

Habitat assessment scores for the four station sites of Skinner Creek are shown in Table 9 for each parameter. It was noted SN2 habitat had some boulders, mostly cobble and gravel, and lots of sand from upstream beaver ponds. SN3 had channelization from the pond which borders the stream and an old hatchery located upstream. IBI scores for all locations were not calculated. Overall habitat scores for Skinner Creek ranged from suboptimal to optimal with water appearance being clear and odorless. Invasive knotweed was also seen along banks of Skinner Creek (Figures 6 & 7).

Table 9. Habitat assessment scores for the Skinner Creek.

Parameter	**SN1**	**SN2**	**SN3**	**SN4**
Instream Cover (Fish)*	8	18	15	16
Epifaunal Substrate*	17	17	17	20
Embeddedness*	12	11	15	15
Velocity/ Depth Regimes	16	18	16	19
Channel Alteration	14	14	15	15
Sediment Deposition*	10	11	15	15
Frequency of Riffles	17	16	18	19
Channel Flow Status	18	19	19	19
Condition of Banks	12	15	14	15
Bank Vegetative Protection	12	18	14	15
Grazing or other Disruptive Pressure	15	13	10	15
Riparian Vegetative Zone Width	10	12	10	15
Total Score	161	182	178	198

Optimal
Suboptimal
Marginal
Poor

*Scores in the “marginal” (6-10) or “poor” (0-5) categories for these parameters are of greater concern than for those of the other parameters due to their ability to influence instream benthic macroinvertebrate habitat.

Figures 7-9. Invasive knotweed was noted in riparian areas near SN1

Fishery Surveys

From field data collected, 413 fish were counted in total from the two sites, with twenty-five species in total recorded (Table 11) with help from the NW Regional DEP Office. Relative abundance was recorded together from both sites, most fish collected being a common species for Skinner Creek. The most abundant fish encountered were Blacknose Dace, Common Shiner, and Mottled Sculpin. An American brook lamprey was also collected while surveying

Figures 10-12. Native brook trout and young of year brown trout

Table 10. Fish surveying site locations and stream data

Site ID	Description	Start-End time (military)	Mean Site Width (M)	Mean Site Length (M)	Water Clarity
210191003-1030-JPG (SN1)	Lower Station- just upstream of Combs Ck. Rd. crossing	1035- 1215	4.8 m	105 m	10 (clear)
210191003-1230-JPG (SN2)	~1.3 miles up of Combs Ck. Rd. crossing, near SGL Parking (upper station)	1240-1320	4.1 m	101 m	n/a

Table 11. Fish species and relative abundance from 10/03/2019 fish surveys

Species (length> 25mm)	Field Count for Site 210191003-1030-JPG (SC1)	Field Count for Site 210191003-1230-JPG (SC2)	Relative Abundance
Brook Trout (96,220.72,90,81)	0	5	Present
Brown Trout (98)	0	1	Rare
Blacknose Dace	59	81	Abundant
Longnose Dace	1	1	Present
Redside Dace	22	1	Common
Common Shiner	41	10	Abundant
Creek Chub	3	4	Present
Fantail Darter	12	7	Common
Mottled Sculpin	14	20	Abundant
American Brook Lamprey	24	4	Common
White Sucker	13	2	Common
Northern Hogsucker	16	2	Common
Rock Bass	1	1	Present
Rainbow Darter	2	0	Present
Johnny Darter	12	0	Common
Greenside Darter	4	0	Present
Blackside Darter	13	0	Common
Trout Perch	13	0	Common
River Chub	2	0	Present
Rosyface Shiner	2	0	Present
Bluntnose Minnow	10	0	Common
Central Stoneroller	7	0	Present
Tonguetied Minnow	1	0	Rare
Pumpkinseed	1	0	Rare
Silver Redhorse	1	0	Rare
Total # of Fish	274	139	

RELATIVE ABUNDANCE

< 2 =RARE

2-8 = PRESENT

9-33 = COMMON

>33 = ABUNDANT

Figure 13. Adult American brook lamprey found while surveying

Culverts

The seven locations in Table 1 were chosen for NAACC surveys to assess the culverts and how much of an effect they had on the stream's connectivity. Culverts were evaluated along Skinner Creek. Evaluations ranged from no barriers to severe barriers which could hinder aquatic organism passage.

Survey ID	**Crossing Code**	**Last Updated**	**Town**	**Stream**	**Road**	**Evaluation**	**Culvert**
61830	xy4178452778307548	07/20/2018	Port Allegany, PA	Skinner Creek	Prvt	Moderate barrier	1
61833	xy4178531678308232	07/20/2018	Port Allegany, PA	UNT to Skinner	Bemis Road	Moderate barrier	1
61834	xy4178645778308300	07/20/2018	Port Allegany, PA	Skinner Creek	Bemis Road	Insignificant barrier	1
61835	xy4178823078305783	07/20/2018	Port Allegany, PA	Paul Brook	Skinner Creek Road	Severe barrier	2
61838	xy4180288778285156	07/20/2018	Port Allegany, PA	Skinner Creek	Combs Creek Road	No barrier	1
61840	xy4179754978290946	07/20/2018	Port Allegany, PA	UNT Skinner Creek	Skinner Creek Road	Significant barrier	1
61841	xy4179115078300952	07/20/2018	Port Allegany, PA	UNT Skinner Creek	Skinner Creek Road	Severe barrier	1

SECTION 4. Threats and Opportunities

There are numerous threats to the Skinner Creek watershed, but an equal or greater number of opportunities that will be discussed in this section. This list should be reexamined and updated periodically as coldwater conservation practices are implemented.

Threats

Sedimentation was noted as a problem in the watershed based on habitat assessments that were completed during this study. Some of the sediment can be attributed to past resource extraction activities such as logging, and gas well development. These activities take place throughout the watershed and are sources of erosion, mainly from improperly constructed and poorly maintained access roads that collect runoff and funnel it to streams. Aside from access roads, other roadways, particularly dirt and gravel roads, can contribute sediment and other pollutants to streams.

Another threat to the Skinner Creek is past and present agricultural practices. Pastures and crop fields located along the stream increase exposure to sunlight, warming the water and making it harder for trout and other coldwater species to survive. It also creates more erosion as the roots of streamside vegetation are important for holding soil in place. Development in the floodplain of streams also leads to increased flooding and property damage.

Undersized and improperly installed culverts create additional threats to the Skinner Creek watershed. Failing and undersized culverts create flooding hazards, especially in areas of the watershed where homes and businesses are located in the floodplain. Another threat posed by these culverts is to aquatic ecosystems. Undersized or improperly installed culverts can create physical barriers that prevent fish and other organisms from moving freely throughout the watershed to feed, reproduce, and escape warm temperatures, pollution, and other threats.

Opportunities

Many restoration and conservation opportunities exist in the Skinner Creek watershed. One of the easiest things that can be done to help protect and preserve the coldwater resources of the Skinner Creek watershed is to collect additional data where necessary. As mentioned above, Section 1 and 2 have already been added to the PFBC's list of naturally reproducing (wild trout) waters, Paul Brook has been designated as Class A trout water. Such designations automatically help protect these streams as any wetlands surrounding wild trout waters are designated as exceptional value (EV) and all Class A streams are upgraded to high quality (HQ) status by the DEP. As restoration efforts continue and additional water quality improvements are made throughout the watershed, attempts should be made to continue monitoring biological recovery, especially macroinvertebrates and wild trout populations.

One of the most visible problems facing the watershed is the lack of streambank fencing and riparian areas in agricultural fields. Streamside (riparian) restoration can be accomplished by limiting mowing and grazing, and planting trees and other vegetation along the stream corridor to create a natural buffer that cools water temperatures, stabilizes streambanks, filters pollution, and provides food and habitat for aquatic and terrestrial species. These buffer zones can be designed to meet the needs of the landowner and can include native trees, shrubs, and grasses, fruiting trees and bushes, or other suitable vegetation. A good place to start when looking for additional

information on streamside buffers is the DCNR's website: http://www.dcnr.pa.gov/Conservation/Water/RiparianBuffers/Pages/default.aspx. In addition, conservation easements are another potential tool for the protection of forested habitat that contributes to the coldwater resources in the watershed. There are numerous land conservancies in the area that could be contacted to assist in identifying critical habitat and engaging landowners to enhance and protect those areas.

Culvert replacement projects provide another opportunity in the watershed to increase flood resiliency, reduce maintenance costs, and open additional habitat for trout and other aquatic species. Properly sized and installed culverts have been shown to reduce flooding impacts while reducing long-term maintenance costs as they allow flood waters and accompanying debris to pass under roadways rather than creating areas where debris jams can exacerbate flooding issues. This also means that municipal and state road crews will spend less time and money maintaining and repairing clogged and/or damaged culverts. In recent years, there has been increased interest federally and statewide in projects that provide for aquatic organism passage while also helping to increase flood resiliency.

While overall stream habitat within the Skinner Creek watershed is mostly intact, there are areas of the watershed where the opportunity exists to complete habitat and/or streambank stabilization projects. Sampling sites SN1 and SN2 are areas where bank erosion was noted during this assessment, but other areas exist throughout the watershed. Instream habitat restoration projects not only provide cover and habitat for fish and other aquatic species, but can also reduce erosion. Habitat restoration is accomplished by constructing PFBC-approved structures in the stream that are designed to work with the stream hydrology to protect banks and provide pools and overhanging cover for trout and other species. Examples of these structures can be found on the PFBC website at: http://www.fishandboat.com/Resource/Habitat/Pages/default.aspx.

Another way to help prevent stormwater runoff, decrease erosion and sedimentation issues, and protect water quality is by working with municipal and state officials to ensure they are using best management practices for transportation projects and maintenance. One way they can do this is through the Dirt, Gravel and Low Volume Road Program administered by the county conservation district. This program helps municipalities to receive the training and funding they need to complete projects that will improve travel conditions while also protecting local waterways. More information about this program can be found at: https://www.dirtandgravel.psu.edu/.

Finally, community planning provides another opportunity for protecting coldwater resources in the Skinner Creek watershed. Municipalities within the watershed can assist with stream conservation by forming watershed committees; passing ordinances that reduce stream encroachment, stormwater runoff, and flooding; adopting environmentally sensitive maintenance practices for roadways and stream crossings; and working with community members to seek funding for and implement projects that will benefit stream health.

SECTION 5. CONSERVATION & PROTECTION STRATEGIES

Based on the threats and opportunities in Section 4 above, there are numerous conservation and protection strategies that can be taken by watershed stakeholders within the Skinner Creek

watershed. This is not an exhaustive list, but should serve as a starting point. This section should be periodically updated as projects are implemented and stream conditions change.

Strategy 1: Riparian Restoration and Streambank Fencing – There are numerous areas along Skinner Creek's Section 2 that could benefit from riparian buffer plantings and reforestation. Streambank fencing in several areas could expedite reforestation efforts.

Strategy 2: Culvert Replacement Projects – Several culverts in the Skinner Creek watershed have been identified as being partial or complete barriers to aquatic organism passage. Replacement of these culverts should be prioritized based on water quality and the presence of wild trout populations, particularly Class A stream segments. Of particular importance is the removal of the old water reservoir dam on Paul Brook. The project partners should seek funding to replace these culverts, which will reconnect important coldwater habitat while also increasing flood resiliency for the local community.

Strategy 3: Habitat and Bank Stabilization Projects – Efforts should continue to identify additional areas in need of bank stabilization and/or instream habitat projects. There are many areas along Section 2 of Skinner Creek that are eroding and in need of stabilization. The project partners should assist with implementation and post-construction monitoring of this project and identify other areas of the watershed in need of habitat restoration.

Strategy 4: Dirt, Gravel, and Low Volume Road Projects – There are several dirt and gravel roads within the Skinner Creek watershed that are contributing polluted runoff to the stream. The project partners should work with the McKean County Conservation District to identify projects that could be funded through the Dirt, Gravel, and Low Volume Road Program that would benefit water quality and coldwater habitat in the watershed. Areas that were identified during this study include Bemis Road, private access roads and State Game Lands #61 access roads.

Strategy 7: Community Planning – Many of the issues facing the Skinner Creek watershed were created because development occurred in the watershed before community planning became the norm. Watershed stakeholders should work with the McKean County Planning Department, local municipalities, businesses, and landowners to make sure that future development will not have detrimental effects on the stream. Activities may include developing planning documents such as master site plans, stormwater management plans, revitalization plans, and ordinances related to flooding and stream conservation, and limiting future development that would encroach on the stream corridor.

Strategy 8: Recreation and Tourism Promotion – Part of getting people to care about local waterways is to get them out in the watersheds enjoying them. This can be accomplished by promoting all the great outdoor recreation opportunities that have been identified in the watershed. Efforts should be made to work with recreation and tourism promotion agencies such Allegheny National Forest Vacation Bureau, Class A fishing opportunities, geocaches and other activities available in the watershed.

Strategy 9: Outreach and Stewardship – Another strategy for conserving the coldwater resources in Skinner Creek is through public outreach and stewardship activities. Community members agree that clean water is an important natural resource, but they sometimes struggle to identify actions and activities that they can do to help protect local streams. Efforts should be made to develop education and outreach materials, events, and activities that will empower residents to become watershed stewards. This could include things like litter cleanups, stream monitoring, citizen science projects, tree plantings, brochures, rain barrel workshops, buffer trainings, social media outreach, activities at local fairs and festivals, and many other projects and activities depending on the need.

SECTION 6. BUILDING COMMUNITY AWARENESS

There are many ways in which the project partners can build community awareness. These include: promotion of Upper Allegheny Watershed Association meetings; community outreach projects such as those mentioned in Strategy 9 above; press releases to local media outlets regarding conservation projects; a state of the watershed report to be distributed periodically as an update on restoration and conservation efforts; an increased social media presence for the Seneca TU; engagement of local students in research and monitoring projects; and engagement of local schools, libraries, etc. in the Trout in the Classroom Program. It may be helpful to develop a communication/strategic plan for Seneca TU and Upper Allegheny Watershed Association to help formalize community outreach and activities.

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