

Bachman Run Stream Restoration Projects

NOTE: **Green font** denotes agricultural projects. **Red font** denotes projects prioritized due to severity of bank erosion & sedimentation contributed to the watershed.

Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
Subwatershed 18 - Upper Bachman Run				
1	East Fork Farm adjacent to Philhaven Hospital DS of Butler Rd West Cornwall	1320	Livestock grazing impacts; lack of buffer; unstable E4 channel with low eroding banks	Relocate existing fence a minimum of 15 feet to either side of stream and install two (2) livestock crossings.
2	East Fork Quarry West Cornwall	1980	Channelized, unstable C4 channel with high eroding banks; low baseflow conditions	Restore as stable C4 stream with constructed wetlands to treat agricultural runoff and augment baseflow.
3	Middle Fork Along East side of Rte 241 South Annville	2640	Channel ditched and lacking buffer	Plant a minimum 35 foot riparian buffer.
4	West Fork UPS of Rte 241 and McCurdy Rd South Annville	500	Incised G4 channel with high eroding banks	Restore G4 reach as stable B4 stream.
5	West Fork UPS of Rte 241 and DS of McCurdy Rd South Annville	1810	Unstable B4 and C4 channels with high to moderately high eroding banks, aggraded sections with chute cutoff channels	Restore as stable B4 and C4 streams.
6	West Fork DS of Rte 241 South Annville	700	Channel ditched and lacking buffer	Plant minimum 35 foot riparian buffer.
7	West Fork DS of Graystone Stables South Annville	1650	Unstable B4 and C4 channels with high to moderately high eroding banks, aggraded sections	Restore as stable B4 and C4 streams. Construct a wetland along this reach to treat agricultural runoff.
8	Main Stem Risser Farm South Annville	1320	Unstable B4/G4 channels with high to moderately high eroding banks, lacking buffer	Restore G4 reach as stable B4 stream. Plant a minimum 35 riparian buffer.
9	Main Stem Inman Property UPS of Rte 322 South Annville	1650	Concrete walls and dam; unstable F4/C4 channels with high to mod-high eroding banks, aggraded, lateral and mid-channel bars in lower section.	Remove dam and walls; restore as a stable B4c stream.
Subwatershed 11 - Lower Bachman Run				
10	Main Stem Bachman Property DS of Rte 322 South Annville	660	Livestock grazing impacts; lack of buffer; unstable C4 channel with moderately high eroding banks.	Grade and stabilize banks. Install fencing a minimum of 15 feet to either side of stream and install a livestock crossing.

11	Main Stem Horning Farm UPS of Fontana Rd South Annville	1320	Livestock grazing impacts; lack of buffer; unstable C4 channel with moderately high eroding banks.	Grade and stabilize banks. Install fencing a minimum of 15 feet to either side of stream and install a livestock crossing.
Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
12	Main Stem Gary Horst Farm DS of Fontana Rd South Annville	1320	Livestock grazing impacts; concrete walls along one section; unstable C4 channel with moderately high eroding banks.	Restore as stable C4 stream; Install fencing a minimum of 15 feet to either side of stream and install a livestock crossing.
13	Main Stem Dr. Denalis Property DS of Private Drive South Annville	660	Unstable C4 channel with low to moderate eroding banks, lateral and mid-channel bars.	Restore as stable C4 stream and construct wetland in adjacent floodplain.
14	Main Stem Copenhaver Farm and Resnick Property UPS of Louser Rd South Annville	2376	Channelized C4 with stone walls along both banks.	Remove walls and restore as stable C4 stream and construct wetland in adjacent floodplain.
15	Main Stem Property DS of Louser Rd South Annville	1980	Unstable C4 channel with low to moderate eroding banks, lateral and mid-channel bars.	Restore as stable C4 stream and construct wetland in adjacent floodplain
16	Main Stem Wind Over Grove DS of Quittie Park Road South Annville	1320	Channelized and rip-rapped G4 in upper section; Channel split below ponds; unstable F4 and G4 along lower sections	Remove rip-rap from upper section; restore upper and lower sections as stable B4/B4c streams and construct wetland in adjacent floodplain.
	Total Length	23,206		
	Upper Bachman Run	8,250		
	Lower Bachman Run	3,300		
	Total Length	11,550		

Beck Creek Stream Restoration Projects

Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
1	UPS of Mine Rd West Cornwall	330	Incised G4 channel with high eroding banks migrating upstream through old breached dam	Remove dam and restore G4 reach as stable B2 stream.
2	Gretna Glen Camp UPS of lake West Cornwall	5000	Unstable B4, C4, F4, G4, F4 and C4 channel sections with high eroding banks along upper and middle sections, aggradation and bank erosion along lower section	Restore as stable B4 and C4 streams.
3	Gretna Glen Camp DS of lake West Cornwall	1980	Unstable G1 and C4 channel sections with very high eroding banks along upper section, aggradation, avulsions, and cut-off channels along middle and lower sections	Restore as stable B1/B2 and C4 streams.
4	Henry Farm DS of Camp West Cornwall	850	Livestock grazing impacts; lack of buffer; unstable E4 channel with low eroding banks.	Install fencing a minimum of 15 feet to either side of stream and install a livestock crossing.
5	Weaver Farm DS of Starner Rd and Ups of Rte 322 West Cornwall	2310	Livestock grazing impacts; lack of buffer; unstable C4 channel with moderately high eroding banks.	Grade and stabilize banks; Install fencing a minimum of 15 feet to either side of stream and install two (2) livestock crossings.
6	Weaver Farm DS of Rte 322 West Cornwall	1320	Livestock grazing impacts; lack of buffer; unstable E4 channel with low eroding banks.	Install fencing a minimum of 15 feet to either side of stream and install two (2) livestock crossings.
7	Property West of Spangler Rd UPS of Flutterby Farm West Cornwall	990	Rip-rapped C4 channel with high W/D ration and sedimentation	Remove rip-rap and restore as stable C4 stream.
8	Flutterby Farm And Radio Station Property West Cornwall	1860	Unstable C4 channel sections with moderately high eroding banks, lacking buffer in lawn area.	Restore as stable C4 stream. 35 foot riparian buffer along upper section. Create wetland system in old field area.
9	Boyd Property UPS of Colebrook Rd North Cornwall	1300	Unstable E4 channel with moderate to moderately high eroding banks, lacking a buffer.	Restore as stable E4 stream. Plant a minimum 35 foot riparian buffer.
10	Eckenrode Property UPS of Colebrook Rd North Cornwall	700	Channelized, unstable C4 channel with moderate eroding banks, lacking a buffer, poorly constructed pond diversion.	Restore as stable C4 stream; plant a minimum 35 foot riparian buffer; modify pond diversion.
11	Bomberger Property	1980	Livestock grazing impacts; unstable C4 channel with moderately high eroding banks;	Restore as stable C4 stream; Install fencing a minimum of 15 feet to either side of stream;

Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
	Meadow Wood Farms DS of Colebrook Rd North Cornwall		heavy sedimentation and aggradation; poorly constructed pond diversion	install a livestock crossing; modify pond diversion.
12	Property on Private Drive east of Forney Rd North Cornwall	500	Stream fenced but livestock watering access and crossing causing erosion and sedimentation problems.	Modify fencing configuration to reduce impacts.
13	Nolt Farm UPS of Royal Rd North Cornwall	600	Row crops planted to stream edge, no buffer.	Plant a minimum 35 foot riparian buffer
14	Nolt Farm UPS of Royal Rd North Cornwall	1650	Livestock grazing impacts; unstable C4 channel with moderate eroding banks and heavy sedimentation; bank revetment composed of concrete, cinder blocks and asphalt.	Remove concrete, cinder blocks and asphalt revetment; restore as stable C4 stream; install fencing a minimum of 15 feet to either side of stream; install a livestock crossing;
15	Royal Oaks Golf Course North Cornwall	3630	No buffers; tees and greens with retaining walls immediately adjacent to stream; heavy accumulations of grass clippings in channel; poorly constructed pond diversion.	Relocate channel sections away from existing tees and greens; create wetlands; plant a minimum 35 foot riparian buffer of grasses/low growing shrubs; modify maintenance practices to minimize impacts to water quality; modify pond diversion.
16	Lebanon Country Club North Cornwall	1650	No buffers; tees and greens immediately adjacent to stream; poorly constructed pond diversion.	Relocate channel sections away from existing tees and greens; plant a minimum 35 foot riparian buffer of grasses and low growing shrubs; modify pond diversion.
17	Robert Copenhaver Farm DS of Reist Rd North Cornwall	1320	Stream fenced but crossing constructed with poor configuration such that fencing is ineffective; livestock grazing impacts; unstable C4 channel – banks completely trampled; heavy sedimentation and aggradation.	Install two (2) new crossings with modified configuration to eliminate impacts.
18	Ed Copenhaver Farm UPS of Bricker Rd North Cornwall	990	Stream fenced but livestock watering access and crossing causing erosion and sedimentation problems.	Install two (2) new crossings with modified configuration and materials to eliminate impacts.
19	Ron Copenhaver Farm DS of Bricker Rd South Annville	1590	Unstable C4 channels in upper and lower sections, low to moderate eroding banks, heavy sedimentation and aggradation; poorly designed and constructed fish habitat structures causing instability in middle E4 section	Remove fish habitat structures and restore as stable E4 throughout. Create large floodplain wetland system to treat agricultural and golf course runoff.
	Total Length	30,550		
	Recommended Length	19,570		

Buckholder Run and Gingrich Run Stream Restoration Projects

Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
1	Buckholder Run Grubb Farm DS of Rte 322 South Annville	1650	Channel ditched; incised with high eroding banks, unstable G4; no buffer	Restore channel as a stable E4 stream with adjacent floodplain wetlands.
1	Gingrich Run Funk Farm UPS of Rte 322 South Annville	660	Livestock grazing impacts; lack of buffer; unstable C4 channel with high eroding banks	Grade and stabilize banks; Install fencing a minimum of 15 feet either side of stream and install livestock crossing
2	Gingrich Run UPS of Rte 322 Brough Property DS of Rte 322 and UPS of Meadow Lane South Annville	1485	Junk cars, trucks and buses stacked along top of banks and along floodplain; unstable C4 channel with high eroding banks, debris jams, mid channel bars	Acquire property; remove junk vehicles; restore as stable C4 stream and create wetland system in adjacent floodplain to treat agricultural runoff and wastewater discharges from Thousand Trails Campground.
3	Gingrich Run Smith Property DS of Meadow Lane South Annville	2310	Unstable C6 channel with moderately high eroding banks, debris jams, lateral and mid channel bars, heavy sedimentation	Restore as stable C6 stream and create wetlands in adjacent floodplain.
4	Gingrich Run Oberholtzer Farm South Annville	1650	Livestock grazing impacts; lack of buffer; unstable E6 and E4 channels with moderately high eroding banks	Grade and stabilize banks; Install fencing a minimum of 15 feet either side of stream and install two (2) livestock crossing
5	Gingrich Run MacDonald Farm DS of Long Meadow Rd and UPS of Killinger Creek South Annville	2400	Stream fenced but fencing ineffective; livestock grazing impacts; lack of buffer; unstable B4/B4c channels with moderately high eroding banks	Grade and stabilize banks; remove existing fencing and install higher quality fencing same location as old fencing and install two (2) livestock crossings
	Total Length	10,155		
	Recommended Length	6,360		

Killinger Creek Stream Restoration Projects

Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
Subwatershed 5 - Upper Killinger Creek				
1	UPS of Rte 322 and Rte 117 South Annville	700	Livestock grazing impacts; lack of buffer; unstable E4 channel with low eroding banks	Install fencing a minimum of 15 feet to either side of stream and install livestock crossing.
2	UPS of Rte 322 and DS of Rte 117 South Annville/South Londonderry	620	Livestock grazing impacts; lack of buffer; unstable C4 channel with high eroding banks	Grade and stabilize banks; Install fencing a minimum of 15 feet either side of stream and install livestock crossing
W-1	UPS of Brandt Road South Annville/South Londonderry	1200	Agricultural Runoff, wastewater discharge, low baseflow	Acquire property and create wetlands system to treat agricultural runoff and wastewater discharges from S. Londonderry WWTP and augment baseflow
Subwatershed 4 - Middle Killinger Creek				
3	MacDonald Farm South Annville/South Londonderry/North Londonderry	2640	Livestock grazing impacts; lack of buffer; unstable C4 channel with moderately high eroding banks	Grade and stabilize banks; Install fencing a minimum of 15 feet and install two (2) livestock crossings. Create wetlands to treat agricultural runoff and wastewater discharges from Palm City WWTP
4	Buck Farm South Annville/North Londonderry	2310	Livestock grazing impacts; lack of buffer; unstable C4 channel with moderately high eroding banks	Grade and stabilize banks; Install fencing a minimum of 15 feet either side of stream and install two (2) livestock crossings
5	Musser Farm South Annville/North Londonderry	990	Livestock grazing impacts; lack of buffer; unstable C4 channel with moderately high eroding banks	Grade and stabilize banks; Install fencing a minimum of 15 feet either side of stream and install livestock crossing
6	Kreider Farm UPS of Killinger Rd. South Annville/North Londonderry	1650	Livestock grazing impacts; lack of buffer; unstable C4 channel with moderately high eroding banks	Grade and stabilize banks; Install fencing a minimum of 15 feet either side of stream and install two (2) livestock crossings
7	Kreider Farm DS of Killinger Rd. South Annville/North Londonderry	330	Livestock grazing impacts; lack of buffer; unstable E4 channel with low eroding banks	Install fencing a minimum of 15 feet to either side of stream and install livestock crossing.
8	UPS of Rte 422 South Annville/North Londonderry	2970	Stream channel is concrete flume	Remove concrete flume; restore channel as stable E4 stream; plant riparian buffer

Subwatershed 3 – Lower Killinger Creek				
9	DS of Rte 422 North Annville/North Londonderry	2310	Stream channel is concrete flume	Remove concrete flume; restore channel as stable E4 stream and create wetland system in adjacent floodplain to provide water quality and habitat.
10	Quarry North Annville/North Londonderry	990	Bank erosion and sedimentation along sections of tributary; unmanaged runoff from facility contributing to turbidity and sedimentation problems along main stem Quittapahilla Creek	Stabilize eroding banks on quarry property; work with Quarry Mgmt and PADEP to develop and implement water quality management plans for controlling runoff from facility
	Total Length	16,710		
	Recommended Length			
	Upper Killinger Creek	1,320		
	Middle Killinger Creek	7,920		
	Lower Killinger Creek	0		
	Recommended Total Length	9,240		

Snitz Creek Stream Restoration Projects

Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
Subwatersheds 20 and 21 - Upper Snitz Creek – East Fork and Middle Fork				
1	East Fork Anthracite Rd to Rte 419 Cornwall	1000	Short G4 section migrating upstream through stable B4. Reaches UPS and DS stable.	Restore G4 section as stable B4 stream; Excavate adjacent floodplain along Willow Rd to create intermittently flooded wetland system.
2	East Fork Rte 419 to Culvert St. Cornwall	2310	Unstable B4, F4, C4, D4, F4, and B4 channels with high eroding banks along upper section, aggradation and bank erosion along middle and lower sections.	Restore as stable B4 and C4 streams. Modify opening at old roadbed in middle of project area to detain storm flows in floodplain UPS; excavate adjacent floodplain upstream of old roadbed to create intermittently flooded wetland system.
3	East Fork Culvert St to Cornwall Rd Cornwall	1290	Unstable C4 and F4 channel sections with active headcuts and high eroding banks throughout and aggradation along lower section	Restore as stable C4 and B4c streams. Create wetlands in adjacent floodplain.
4	East Fork Cornwall Rd to confluence with main stem Snitz Cornwall	1980	Stone walls along both banks upper section; unstable F4 channel in upper and middle sections with high eroding banks throughout; channelized B4/G4 in lower section	Remove stone walls and restore as stable B4c stream throughout.
5	Middle Fork Burd Coleman Village Cornwall	300	Gullies eroding in headwaters along railroad	Repair gullies.
6	Middle Fork Alden St to Rte 419 Cornwall	400	Unstable C4 channel sections with low to moderately high eroding banks, lacking buffer in park area.	Restore as stable C4 stream. Plant a minimum 35 foot riparian buffer.
7	Middle Fork Cornwall Ctr near Old School Cornwall	1650	Unstable C4 channel with debris jams, aggradation, and high eroding banks throughout.	Restore as stable C4 stream.
8	Middle Fork Farm adjacent to North Cornwall Rd Cornwall	2310	Livestock grazing impacts; unstable C4/F4 channel with moderately high to high eroding banks; heavy sedimentation and aggradation; dam in lower section	Remove dam; restore as stable C4 and B2 streams; install fencing a minimum of 15 feet to either side of stream; install two (2) livestock crossings
9	Middle Fork DS of North Cornwall Rd Cornwall	1650	Unstable G4 channel with moderately high to high eroding banks, bank revetment composed	Remove cinder blocks and rip-rap revetment; restore as stable B4 stream. Plant a minimum 15 foot riparian buffer along yards.

			of cinder blocks and rip-rap; lacking a buffer in lawn areas.	
10	Middle Fork and main stem Snitz confluence UPS of Rte 72 Cornwall	700	Unstable G4 channel with moderately high eroding banks, bank revetment composed of rip-rap; lacking a buffer in lawn area.	Remove rip-rap revetment; restore as stable B4 stream. Plant a minimum 15 foot riparian buffer along yard.
Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
Subwatershed 14 - Upper Snitz Creek – West Fork				
11	West Fork Burd Coleman Village Cornwall	3960	Unstable B4, C4, and G4 channels with active headcuts, high eroding banks, heavy sedimentation and aggradation throughout; breached dam in upper section	Remove breached dam; restore as stable B4 and C4 streams.
12	West Fork UPS of Alden Lane Cornwall	1980	Unstable C4 channel with moderate to moderately high eroding banks and heavy sedimentation throughout; gully erosion in adjacent fields; pond diversion.	Restore as stable C4 stream; repair gullies; evaluate impact of pond diversion. Evaluate potential for creating wetland system UPS of Alden Lane.
13	West Fork Quentin Riding Club DS of Rte 419 West Cornwall	1320	Altered C4/B4c channel with no buffer	Restore as stable B4c; plant a minimum 15 foot riparian buffer.
14	West Fork Adjacent to Fairview Estates Cornwall	850	Unstable F4 and B4 channels in lower section with high eroding banks and heavy sedimentation.	Restore as stable B4c and B4 stream.
15	West Fork Farm along Rte 72 Cornwall	1980	Stream ditched and lacking a buffer	Plant a minimum 35 foot riparian buffer along fields.
16	Main Stem Snitz DS of Rte 72 West Cornwall	1320	Unstable F4 channel with high to very high eroding banks and heavy sedimentation.	Restore as stable B4c stream.
Subwatershed 14 - Lower Snitz Creek				
17	Main Stem Snitz Royer Farm DS of Rocherty Rd North Cornwall	2310	Stream fenced and recovering from livestock impacts; heavy sedimentation observed.	Reevaluate recovery process to determine if intervention necessary.
18	Main Stem Snitz Property at rear of Quentin Circle Shopping Center North Cornwall	1320	Unstable C4 channel with debris jams, moderate eroding banks, and heavy sedimentation; small dam on stream for diversion to off-line ponds.	Remove dam; restore as stable B2 stream with modified diversion to supply ponds.
19	Main Stem Snitz Spitler Farm UPS of Colebrook Rd North Cornwall	660	Unstable C4 channel with debris jams, moderate eroding banks, and heavy sedimentation;	Restore as stable C4 stream

20	Main Stem Snitz Zimmerman Property DS of Colebrook Rd North Cornwall	1500	Unstable E4 and C4 channels with debris jams, moderate to moderately high eroding banks, and heavy sedimentation	Restore as stable E4 and C4 streams.
21	Main Stem Snitz Creekside Subdivision UPS and DS of Creekside Drive North Cornwall	3000	Unstable C4 channels with high W/D ratio, moderate to moderately high eroding banks, heavy sedimentation, and aggradation throughout; no buffers.	Restore as stable C4 stream; plant a minimum 35 foot riparian buffer along both sides of stream through subdivision. Create wetlands in adjacent floodplain.
Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
23	Main Stem Snitz Property DS of Oak St North Cornwall	1980	Unstable C4 channels with moderate to moderately high eroding banks, and heavy sedimentation; poorly constructed pond diversions.	Restore as stable C4 stream; modify pond diversions.
24	Main Stem Snitz Hershey Property - Horse Farm UPS of Dairy Rd North Cornwall	1300	Livestock grazing impacts; unstable C4 channels with high W/D ratio, moderate to moderately high eroding banks, and heavy sedimentation	Restore as stable C4 stream; install fencing a minimum of 15 feet to either side of stream and install a livestock crossing.
	Total Length	37,670		
Recommended Length				
Upper Snitz Creek, East Fork & Middle Fork		10,610		
Upper Snitz Creek, West Fork		8,110		
Lower Snitz Creek		11,170		
Total Recommended Length		29,890		

Main Stem Quittapahilla Creek Stream Restoration Projects

Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
Subwatershed 12 – Upper Quittapahilla Creek Mainstem				
1	UPS of 22 nd Street (Reach 1)	1450	Unstable C4/F4 channel with moderately high to high bank erosion, debris jams, aggradation (lateral and mid-channel bars); failing storm drain outfalls.	Alt 1 – Construct a stormwater wetland basin immediately upstream of 22 nd St to provide peak attenuation and water quality management. Alt 2 – Remove debris jams, stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat. Both alternatives require repair of storm drain outfalls.
2	22 nd St – Chestnut St (Reach 2)	850	Unstable C4 channel in lower section with moderate bank erosion. Backwater created by undersized bridge opening at Chestnut St causing aggradation (lateral and mid-channel bars).	Raise road and replace bridge with larger bridge span. Stabilize banks and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
3	Chestnut St – Reigle Auto Upholstery (Reach 3)	1640	Unstable C4 channel with moderate to moderately high bank erosion throughout.	Alt 1 – Construct a stormwater wetland basin to provide peak attenuation and water quality management. Alt 2 – Stabilize banks and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
4	Snitz Creek – Elizabeth St (Reaches 7 and 8)	1475	Unstable C4 with incising streambed, mod high to high bank erosion in upper and lower sections, heavy sedimentation, aggradation, numerous tires along middle section	Install grade control structures at DS end of upper section and raise streambed, stabilize banks, narrow channel in middle section by constructing toe benches along channel margins, and install structures throughout (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.

5	Elizabeth St – Bedrock Step UPS of Garfield St (Reach 9)	1400	Unstable C4 with moderately high to high bank erosion throughout, heavy sedimentation and aggradation; minimal to no buffer along both banks in middle and lower sections.	Stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat. Plant a minimum 20 foot buffer along the right bank and 35 feet along the left bank.
Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
6	Garfield St – Bedrock Ledge (Reach 11)	1060	Unstable C4 with moderately high to high bank erosion throughout; minimal to no buffer along right bank in upper and middle sections and left bank in lower section.	Stabilize banks and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat. Plant a minimum 25 foot buffer along the right bank and 35 feet along the left bank.
7	Bedrock Ledge – UPS of Split channel at Mill St (Reach 12)	800	Localized bank erosion and minimal to no buffer along left bank in upper and middle sections.	Stabilize banks and plant a minimum 35 foot buffer along the left bank.
8	UPS of Cleona Blvd – Drop at Footbridge (Reach 14)	1500	Unstable C4 with high bank erosion throughout; heavy sedimentation, aggradation; and minimal to no buffer along both banks	Stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat. Plant a minimum 20 foot buffer along the right bank and 35 feet along the left bank.
9	Drop at Footbridge – Beck Creek (Reach 15)	2150	Unstable C4 with moderate bank erosion upper and lower sections, debris jams, heavy sedimentation, aggradation; and minimal to no buffer along the right bank in the upper section both banks in the lower section.	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat. Plant a minimum 35 buffer along both banks.
10	Beck Creek – Meander at Walnut St (Reaches 16 and 17)	1950	Unstable C4 with moderate to moderately high bank erosion; debris jams, heavy sedimentation, aggradation (lateral bars) throughout.	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
11	Meander at Walnut St – Meander DS of Willow St (Reach 18)	1200	Unstable C4 in upper section with high bank and slope erosion; aggradation, cutoff channel, and failing storm drain outfalls. Minimal to no buffer along right bank in middle section.	Stabilize banks and slopes, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat;

				repair of storm drain outfalls; plant minimum 20 foot buffer along right bank.
12	End of Bedrock-Boulder Meander DS of Spruce St – Old Dam in Quittie Park (Reach 21)	1600	Localized bank erosion.	Stabilize banks and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
13	Old Dam in Quittie Park – SD Channel along Bachman Rd (Reach 22)	1150	Unstable C4 with moderate to moderately high bank erosion in lower section; heavy sedimentation, aggradation (lateral and mid-channel bars) throughout.	Stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
14	UPS of Rte 934 – Meander at King St (Reach 23 lower section and 24)	2100	Unstable C4 moderately high to high bank erosion, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout; minimal to no buffer along right bank.	Stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat; plant minimum 20 foot buffer along right bank.
15	Meander at King St – Split channel DS of Old Mill Dam (Reaches 25, 26 and upper 27)	3675	Unstable C4/F4 with high to very high bank erosion, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout; minimal to no buffer along right bank in upper section.	Stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat; Construct single channel DS of old mill dam; plant minimum 35 foot buffer along right bank in upper section.
Subwatersheds 1, 2 and 3 – Lower Quittapahilla Creek Mainstem				
16	Rte 422 – Concrete Flume DS of WWTP (Reach 28)	2150	Unstable C4 with low to moderate bank erosion, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout.	Narrow channel by constructing toe benches along channel margins; install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
17	Concrete Flumes DS of WWTP	2550 and 3275	Concrete flumes conveying Quittapahilla Creek are devoid of habitat and aquatic organisms. Secondary flume is deteriorated with broken sections of concrete and gaps allowing storm flow erode the soil base and causing further damage.	Remove both flumes and reconstruct a natural channel along this section of the creek. Construct a large floodplain wetland system to provide flood storage, water quality and habitat. At a minimum the damaged flume should be repaired.
18	End of Concrete Flume – Clear Spring Rd	2000	Unstable C4 with moderately high to high bank erosion, debris jams, heavy	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along

	(Reach 29)		sedimentation, aggradation (lateral and mid-channel bars) throughout.	channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
19	Clear Spring Rd – Syner Road (Reaches 30 and 31)	2700	Unstable C4 with moderate to moderately high bank erosion, numerous large debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout.	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks..
Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
20	Syner Rd – Killinger Creek (Reaches 32 and 33)	2200	Unstable C4 with moderately high to high bank erosion, debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout.	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
21	Killinger Creek – School Creek (Reaches 34 and 35)	3250	Unstable C4 with high to very high bank erosion, debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout.	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, remove rip-rap in fishing club and install structures (e.g., log vanes or log-boulder J-Hooks) to divert flow away from banks and create habitat.
22	School Creek – Old Mill Race at Forge Farm (Reaches 36 - 38)	5300	Unstable B4c/C4 with high to very high bank erosion, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout; islands immediately DS of Palmyra-Bellegrave Bridge.	Remove islands DS of Palmyra-Bellegrave Bridge; stabilize banks, narrow channel by constructing toe benches along channel margins, install structures (e.g., log vanes or log-boulder J-Hooks) to divert flow away from banks and create habitat.
23	Old Mill Race at Forge Farm – Unnamed Tributary (Reaches 39 and 40)	3210	Unstable C4 with moderate to moderately high bank erosion in upper section, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout.	Stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat.
24	Unnamed Tributary – Syner Rd (Reaches 41 and 42)	2425	Unstable C4/B4c with high to very high bank erosion in upper section, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout.	Stabilize banks, narrow channel by constructing toe benches along channel margins, and install structures (e.g., log vanes, rock vanes, or log-boulder J-Hooks) to divert flow away from banks and create habitat; plant trees along right floodplain.

25	Syner Rd – Bedrock Section DS of Powerlines on Blauch Farm (Reaches 43 and 44)	2450	Unstable B4c/C4 with moderate to moderately high bank erosion in the lower section, debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout; minimal to no buffer along right bank in middle and lower sections.	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, install structures (e.g., log vanes or log-boulder J-Hooks) to divert flow away from banks and create habitat; relocate fence a minimum of 25 feet from top of bank and plant buffer with trees and shrubs.
Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
26	Bedrock Section DS of Powerlines on Blauch Farm – Riffle UPS of wetland swale that drains pond in left floodplain (Reaches 45 and 46)	2625	Unstable C4 with moderate to moderately high bank erosion, debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, install structures (e.g., log vanes or log-boulder J-Hooks) to divert flow away from banks and create habitat.
27	Riffle UPS of wetland swale that drains pond in left floodplain – Riffle at Beach Area (Reaches 47 and 48)	3150	Unstable C4 with moderate to moderately high bank erosion, numerous debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, install structures (e.g., log vanes or log-boulder J-Hooks) to divert flow away from banks and create habitat.
28	Riffle at Beach Area – Valley Glen Rd (Reaches 49 and 50)	1800	Unstable C4 with moderate bank erosion, numerous debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout	Remove debris jams; stabilize banks, narrow channel by constructing toe benches, install structures (e.g., log vanes or log-boulder J-Hooks) to divert flow away from banks and create habitat.
29	Valley Glen Rd – Swatara Creek (Reaches 51 and 52)	1950	Unstable C4/F4 with moderate to high bank erosion, numerous debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) throughout	Remove debris jams; stabilize banks, narrow channel by constructing toe benches along channel margins, install structures (e.g., log vanes or log-boulder J-Hooks) to divert flow away from banks and create habitat.
	Total Length	61,760		
	Recommended Length	61,760		

Unnamed Tributary Stream Restoration Projects

Project ID	Location	Length (feet)	Existing Problems	Proposed Solutions
1	Struphar Farm DS of Rte 934	600	Livestock grazing impacts; lack of buffer; unstable F4 channel with moderately high to high eroding banks	Restore as stable B4c stream; install fencing a minimum of 15 feet to either side of stream and install a livestock crossing.
2	Bomgardner Farm DS of Rte 934	2970	Unstable C4 channel with debris jams, high eroding banks, aggradation and gully erosion in headwaters.	Restore as stable C4 stream; repair headwater gullies.
3	Wagner Property UPS of Palmyra Bellegrove Rd	300	Unstable F4/B4 with moderately eroding banks throughout; no buffer	Restore as stable B4c streams; plant a minimum 15 foot riparian buffer along both sides of stream across yard.
4	Gingrich Orchard UPS of Palmyra Bellegrove Rd	1155	Unstable F4, G4 and B4 channel sections with high eroding banks throughout and aggradation in lower section; junk scattered along upper section below pond; no buffer in upper section	Remove junk from upper section; restore as stable B4c and B4 streams; plant a minimum 15 foot riparian buffer along both sides of stream across yard below pond.
5	Meyer Farm DS of Palmyra Bellegrove Rd	4290	Stream fenced but livestock still grazing riparian area; livestock grazing impacts; unstable C4 and E4 channels with debris jams, low to moderately high eroding banks throughout, aggradation and bank erosion along middle and lower sections.	Restore as stable E4 and C4 streams. Reconfigure fencing and crossings to limit livestock access to stream and riparian area.
	Total Length	9,315		
	Recommended Length	9,015		