2019 Final Report

Project Title: Bowman Creek Eastern Brook Trout Habitat Restoration, Former Mountain Springs Lake Bottom, South Branch Bowman Creek, Fairmount Township, Luzerne County, PA

Date Prepared: March 30, 2020

Submitted By: Luzerne Conservation District
John Levitsky, Watershed Specialist
Luzerne Conservation District
325 Smith Pond Road
Shavertown, PA 18708
570-674-7991 extension 5
john@luzcd.org

Project Location: South Branch Bowman Creek, Former Mountain Springs Lake, Luzerne County, PA
Latitude: 41.339264^{o}N, Longitude -76.226286^{o}W to Latitude 41.338399^{o}N, Longitude -76.234060^{o}W

Project Overview:
The Pennsylvania Fish and Boat Commission removed an aging former ice dam in August 2017 that impounded the Mountain Springs Lake that was used for a recreational fishery. The impoundment was beyond repair and was an impedance to aquatic life traversing the South Branch Bowman Creek. Wild, naturally reproducing Eastern brook trout continue to spawn and use upstream and downstream areas of the watershed surrounding the drained Lake. The removal of the impoundment allowed the Luzerne Conservation District (LCD) to pursue a recommendation by the Stanley Cooper Chapter of Trout Unlimited board member, Dr. Joseph Simmons to restore the riparian areas along the former lake bottom. Stanley Cooper Chapter of Trout Unlimited has adopted the Bowman Creek Watershed as their focus waters for many years and were an integral part of this project. The LCD designed the species of trees and shrubs to be planted and assessed the number of each species based on soil analysis and hydrologic review of the riparian corridor along South Branch Bowman Creek. A total of 2,300 Lineal Feet of South Branch Bowman Creek was planted with trees and shrubs including an approximate 35 feet buffer along both banks that required 2000 trees and shrubs. The goals were to accelerate riparian growth to reduce sunlight impacts to the coldwater eastern brook trout habitat, improve streambank stability and restore leaf litter to the stream for macroinvertebrate habitat. Additional concerns for Eastern brook trout were identified historically by the LCD since approximately the year 2000 due to the poor levels of alkalinity and acid deposition impacts within the headwaters of the Bowman Creek Watershed. Part of the request for funding included Limestone sand applications to improve water quality on the former Lake bottom.

Accomplishments to date:
EBTJV funds were made available on September 19, 2018 to the LCD, the grant administrator. Planning began for a Spring 2019 planting of trees and shrubs as the first growing season began with the gradual draining of soils from the former Lake bottom. Seven separate spring seeps were identified when the Lake bottom drained and created a high percentage of the streambank to be a hydric soil condition. Tree and shrub species selection shifted to varying wetness hydrophytic species to accomplish survival of the wet conditions with 70% varying wetland species. Approximately 30% of the trees and shrubs were upland to wetland border species. An additional 150 green cuttings were installed from nearby cuttings. Tree and shrub species selection included only native species present within the watershed basin. This

approach minimizes losses that will not adapt to surroundings or introduction of species that are not present within the watershed boundary that may become invasive later.

During the ordering of trees and shrubs, the Chesapeake Bay Foundation, Keystone 10 Million Trees initiative offered to supply the project. The offer was taken for species planned for the location. Specialized species not available through CBF were ordered with the EBTJV funds.
The grant value was estimated by the LCD during the impoundment removal and assumptions were made for seeding herbaceous species and a plan to install staked coir logs on eroding bends of stream were expected. Due to a natural seed bed occurring in the former Lake bottom germinating in the first growing season of 2018, no herbaceous seeding was needed or used. The installation of coir logs was avoided due to extreme conditions with saturated organic soils making it nearly impossible to install by hand or with heavy equipment. It was decided that the use of heavy equipment in the mucky substrate would accomplish more damage than the restoration it would complete.

Limestone sand applications were applied over 5 locations where spring waters flow from extremely rocky soils outside of the former Lake bottom. The locations will gradually improve alkalinity of the spring flows without loss of the limestone sand to high water events from stream flows. It is anticipated that the limestone will last for long periods of time in improving the pH of the spring waters flowing to the South Branch Bowman Creek. This improvement will be measured over time to evaluate the long term positive impacts from water quality measurements. Placing of limestone sand in the former Lake substrate was not possible due to extreme mud conditions and placing of limestone would be considered as fill in an existing wetland system. Therefore the limestone was placed in upland surroundings outside of the former Lake bottom to infiltrate to the groundwater flows. This fulfills the pH adjustment requirement of the proposed Brook trout improvements for South Branch Bowman Creek. Water quality sampling will continue to evaluate the effectiveness of the treatment. Future electroshock surveys will look for brook trout in comparison to the baseline survey conducted on July 22, 2019.

Figure 1 Volunteers planting April 27, 2019, South Branch Bowman Creek.

Figure 2 Volunteers planting April 28, 2019, South Branch Bowman Creek.

Figure 3 View of former Lake bottom along South Branch Bowman Creek July 22, 2019.

Figure 4 Limestone applications outside of former Lake bottom to increase spring seep pH levels.

Figure 5 PA Fish and Boat Commission limestone application assistance November 18-19, 2019.

Figure 6 Electroshock sampling of South Branch Bowman Creek in project area July 22, 2019.

Figure 7 Showing varying age classes from July 22, 2019 sampling.

Figure 8 Tree and shrub growth establishing riparian zones as substrate is purged of sediment.