



Paulins Kill “Pearly” Mussels

Project Report for 2019

Community Scientist Snorkel Surveys

Overview

The Paulins Kill is the largest New Jersey tributary draining to the Wild & Scenic Delaware River, and maintains both high water quality and remarkable biological diversity. In 2018, an extraordinary ecological experiment began on the Paulins Kill when a large team of partners (led by The Nature Conservancy, the State of New Jersey, and American Rivers) removed the first and largest blockage to this river’s free flowing status by taking down the Columbia Lake dam. Migratory fish have already begun to return to the Paulins Kill in the first year after removal, and broader improvements to both water quality and ecological integrity are anticipated in the years to come.



The diverse and relatively strong populations of freshwater “pearly” mussels in the Paulins Kill distinguish this river among the many Delaware River tributaries, with the Paulins Kill among a short list of streams with existing populations of both state and federally “endangered” species. One of the anticipated restoration benefits from the Columbia Lake dam removal is the potential for continued strengthening of the mussel community using natural instead of artificial propagation, particularly for those species who have the ability to use migratory fish (e.g., American Eel, American Shad) as hosts to complete their life cycle.

In order to document this potential restoration benefit, baseline surveys are needed to establish the population status at the beginning of this restoration effort. Detailed and robust surveys were last conducted in 2007 by a team of USGS mussel biologists using snorkel surveys for the Paulins Kill mainstem above Columbia Lake. In an effort to update these older surveys, the Delaware Riverkeeper Network trained a team of volunteer Community Scientists using the same techniques as the 2007 surveys, and then together conducted semi-quantitative surveys of 11 reaches of the Paulins Kill across nearly 1 km of stream reach in August and September 2019.

In the 2019 Community Scientist surveys, over 1000 mussels were counted by the survey team on five survey dates, with an overall density of nearly 50 mussels per survey hour. Individual survey reaches varied from one to the next, and mussel populations were patchy within reaches both laterally and longitudinally. Mussel counts therefore varied from around 10 mussels per hour to nearly 200 mussels per hour across the survey reaches. These patterns of density and variability closely matched the original 2007 USGS surveys, and these two survey efforts now serve as the foundation upon which to evaluate long-term trends in mussel density and recovery following dam removal.



Project Milestones & Statistics

- 5 surveys of freshwater mussels by a team of volunteer Community Scientists partnering with DRN staff (Erik Silldorff, PhD [Restoration Director] & Faith Zerbe [Director of Monitoring]) in August & September 2019
- Training provided to 15 volunteers, including fundamental biology of mussels, status and conservation of mussels, and snorkel survey techniques (over 30 hrs of training)
- Survey teams ranged from a high school student to young professionals to retired community members
- Snorkel surveys across 1 km of the Paulins Kill in 11 survey reaches, from Lambert Rd down to Vail Rd in Blirstown Township
- Over 1000 mussels counted and documented in the Paulins Kill survey area, with an overall average density of 50 mussels per survey hour
- Total volunteer hours exceeding 80 hours of service time

Next Steps

These Community Scientist baseline surveys serve as one of two key components for documenting the long-term trajectory of freshwater mussels in the Paulins Kill. Future surveys by teams of Community Scientists will be needed for these same survey reaches at regular intervals, perhaps every 2 to 5 years, to quantify the numbers and distribution of freshwater mussels in the years following the Columbia Lake dam removal and the return of migratory fish to the Paulins Kill. Some volunteers have already expressed interest in joining us for future surveys and asked to be contacted again in 2020 or 2021. Not only has this training helped to lay the foundation for the long-term monitoring of these mussel populations, but it has also provided experiential learning opportunities for local residents that greatly enhanced their recreational enjoyment and appreciation of the Wild & Scenic River resources.

Additional quantitative mussel surveys are also needed to document the current and future size distribution of freshwater mussels in order to document the status and recovery of reproduction for these mussel populations above the former Columbia Lake. DRN and its partners will be seeking funding to support this additional element of mussel restoration work.



This project is supported by grants from the Lower Delaware Wild & Scenic Committee, with support from the National Park Service (www.lowerdelawarewildandscenic.org), and from the National Park Foundation, with support from the Coca-Cola Foundation.