

Calvin Cole Road Culvert Replacement Project Planning and High Valley View
Project Replacement – Town of Stephentown and Copake



FINAL REPORT

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CALVIN COLE ROAD CULVERT REPLACEMENT PROJECT PLANNING AND HIGH VALLEY VIEW PROJECT REPLACEMENT – TOWN OF STEPHENTOWN AND COPAKE PROJECT

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High Valley View Road Over UNT to Bash Blish Creek, Hudson River Watershed, NY



EXECUTIVE SUMMARY

This project addressed the critical need for infrastructure upgrades and habitat restoration at two road-stream crossings: Calvin Cole Road in Stephentown (NAACC#88744) and High Valley View Road in Copake (NAACC#52936), both located within the Hudson River Estuary watershed. At both sites the crossings were undersized and identified during a previous planning effort with Trout Unlimited (TU), Hudson River Estuary Program (HREP) and the local municipalities and present a dual threat to community safety and ecological health. The culverts were identified as flooding issues and were aquatic barriers to native species such as the Eastern brook trout and American eel. Improving flood resiliency and protecting public safety were top priorities for the affected municipalities, whose limited budgets were often inadequate to address these complex infrastructure issues.

At Calvin Cole Road, the existing 6-ft round metal culvert was only half the size of the 13-ft active stream channel. Hydraulic analysis showed the structure was overtopped at the (50-year) storm event, and frequent flooding was compounded by a "HIGH" wood debris index that caused chronic culvert jams.

At High Valley View Road, the plastic culvert was elevated and undersized, capable of passing only the predicted 0-year flow event. This structure acted as a severe aquatic barrier, fragmenting the stream system and hindering aquatic organisms from moving upstream to high quality coldwater habitat. Brook trout, a conservation species of concern, were documented both upstream and downstream of this barrier during a NYS Department of Environmental Conservation (NYS DEC) survey.

The inadequacy of these structures contributed to habitat fragmentation, reducing opportunities for spawning and survival for migratory fish. This loss of connectivity was

recognized as a critical threat that could lead to local extinctions and reproductive isolation, weakening the overall resilience of the fish population in the stream network.

The primary goal was to install replacement structures that met both hydraulic requirements for climate resilience and ecological standards for aquatic organism passage. Our objectives were to:

1. Removed severe aquatic barriers and reduced habitat fragmentation for species including the brook trout and American eel.
2. Improved stream conditions by creating stable, climate-change resilient stream reaches.
3. Improved town infrastructure, reduced maintenance costs, and ensured long-term flood resiliency.

TU stream designers completed comprehensive surveys and developed final designs in close collaboration with the towns. The proposed structures were designed to accommodate greater than the active channel width.

Final designs were completed for the Calvin Cole Road site and included the replacement with a 19-ft span prefabricated bridge on Redi Rock prefabricated block abutments. This size will accommodate the adjusted flow (100-year event plus climate change factor) with greater than 2-ft freeboard. The project also included six grade control structures to prevent channel bed incision. The Town of Stephentown will complete the construction in-house once additional funding is secured for the project materials.

The existing High Valley View Road structure was replaced with a 14-ft span single radius arch (SRA) on concrete prefabricated abutments. This structure was sized to pass the adjusted storm event. The project included seven rock grade control structures. Subcontractor A & M Excavating was hired for construction, with the Town of Copake assisting with site hauling and traffic control.

Final designs for the Calvin Cole site and final implementation at the High Valley site resulted in significant accomplishments:

- Total reconnection (up and down to Bash Bish) of 2.5 miles of high-quality stream habitat at the High Valley View site, a high-quality brook trout tributary to the Bash Bish and Roeliff Jansen Kill. Final designs for the Calvin Cole site will set the stage for project implementation, which will reconnect additional miles.
- The new structures will eliminate the current flood risks, ensuring flood capacity exceeds climate-adjusted storm events, thereby reducing potential impacts in both Stephentown and Copake.
- Restoration of natural flow and reduction of habitat fragmentation, supporting the long-term sustainability of native trout populations and other aquatic life in the headwaters of the Hudson River watershed

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1. PROJECT SYNOPSIS

The project addressed the critical need to resolve persistent threats to public safety and ecological health posed by failing infrastructure at two key road-stream crossings: Calvin Cole Road in Stephentown and High Valley View Road in Copake. The urgency for this work stemmed from the fact that both sites suffered from undersized culverts that caused chronic local flooding and severe habitat fragmentation. This fragmentation impeded the survival and spawning of native and conservation species, notably the Eastern brook trout and American eel. Since municipal budgets were often inadequate to fund such complex, climate-resilient upgrades, this project was essential to protect communities and vulnerable ecosystems.

GOALS AND OBJECTIVES

The primary goal was to install replacement structures that met both hydraulic requirements for climate resilience and ecological standards for aquatic organism passage. Key objectives achieved or initiated included:

1. Removed severe aquatic barriers and reduced habitat fragmentation.
2. Improved town infrastructure to reduce maintenance costs and ensure long-term flood resiliency.
3. Improved stream conditions by creating stable, climate-change resilient reaches.

APPROACHES AND ACTIONS

TU stream designers played a central role, completing comprehensive surveys and developing final designs that ensured the new structures accommodated greater than the active channel width.

- Calvin Cole Road Status (Stephentown): Final designs and permits were completed for replacement with a 19-ft span ADM bridge, sized to pass the adjusted flow (100-year event plus climate change factor). Six rock grade control structures were included, and the Town of Stephentown will complete the construction in-house.
- High Valley View Road Accomplishment (Copake): The existing culvert was replaced with a 14-ft span SRA sized to pass the adjusted storm event. A & M Excavating was hired as the subcontractor, with the Town of Copake assisting with site logistics. Seven rock grade control structures were included to stabilize the stream bed.

TIMETABLE AND RESULTS

The project completed during the grant funding timeline resulted in significant accomplishments, with the High Valley View Road site fully implemented and its final

design complete, and the Calvin Cole Road site's final designs complete, setting the stage for future implementation.

- The completed High Valley View project reconnected miles of high-quality stream habitat. The final designs for the Calvin Cole site will set the stage to reconnect additional miles.
- The new or designed structures will ensure flood capacity exceeds climate-adjusted storm events, mitigating future risks and supporting the long-term sustainability of native trout populations.

2. TASKS COMPLETED

Task 1. Calvin Cole - Coordinate Project Kick-off Meeting

Reviewed existing final designs for sites and identify all pertinent information needed to complete project objectives. Review field work and deliverable schedule with partners. Coordinate site work and access needs with Stephentown Highway Department and landowners. Schedule site visits with project stakeholders, identify any regulatory issues and the process for addressing them.

Task 2. High Valley View - Geotechnical Survey

Scheduled geotechnical survey of project site prior to project implementation and review results prior to project construction phase.

Task 3. Calvin Cole and High Valley View - Environmental Permitting

Prepared applications for all environmental permits required by local, state and federal agencies, including all required project and natural resource information for submittal by municipal partners to the permitting authorities.

Task 4. High Valley View - Project Construction

Followed project design objectives through the construction phase of the High Valley View Road culvert replacement project. Trout Unlimited to hire subcontractors to complete construction of the project. TU will provide onsite construction management.

Task 5. Quarterly Reports

Prepared and submit brief quarterly reports 10 days after the end of each calendar quarter (by April 10 for January-March, by July 10 for April-June, by October 10 for July-September, and by January 10 for October-December).

Task 6. Final Report

Prepare and submit final project report to funder.

3. METHODOLOGY

TU stream designers completed a survey and design for the projects working closely with the towns to select a structure that can accommodate greater than 1.25 times the active channel and still be easily installed with town resources.

At the Calvin Cole site, the proposed replacement structure is a prefabricated ADM bridge on prefabricated Redi Rock block abutments. The ADM bridge is 19 ft span x 30 ft length. TU restoration design team also proposes 6 rock grade control structures to be installed throughout the project reach to prevent channel bed incision, protect the abutments and maintain stream bed elevation. The team has updated the material costs to reflect current pricing. The town has the necessary experience, staff and equipment to complete project construction in-house, which reduces the cost and timeline for the project. Permit documents for the project have been completed and are in the hands of the town ready for submittal once next phase of the project is funded.

At the High Valley View site in the town of Copake, the replacement structure was a SRA on concrete abutments. The SRA is 14 ft span x 7 ft 3 in x 40 ft length. TU restoration design team also proposed and installed 7 rock grade control structures to prevent channel bed incision, protect the abutments and maintain stream bed elevation. TU hired local contractors for the construction work. The town helped with traffic control and site hauling.

4. DELIVERABLES COMPLETED

1. Removed severe barrier for aquatic organisms and reduce habitat fragmentation for brook trout and American eel.
2. Complete final designs and permitting of Calvin Cole Road Project to set the stage to reconnect 3.54 miles upstream (NYS StreamStats) and 1.68 miles downstream to confluence with Black River. There are no known barriers between this site and the confluence with Kinderhook Creek (NAACC surveys complete for the town 2022).
3. Complete replacement of High Valley View Road culvert to reconnect 2.18 miles upstream (NYS StreamStats) and 0.32 miles downstream to confluence the Bash Bish. There are no known barriers between this site and the confluence with Roeliff Jansen Kill (NAACC surveys complete for the town 2019).
4. Improve stream conditions by creating a stable stream reach that is climate change resilient.
5. Improve town infrastructure to reduce maintenance costs and ensure flood resiliency.
6. Minimize project construction footprint, maintain mature vegetation and expand riparian restoration upstream and downstream of the site.

5. CONCLUSIONS

The success of this two-site project was underpinned by vital public-private collaboration, particularly the close partnership between TU, HREP and the local municipalities, the Town of Stephentown and the Town of Copake. This collaborative approach, which maximized local resources—such as the Town of Stephentown committing to in-house construction and the Town of Copake providing site support for the subcontractor, A & M Excavating—allowed the project to efficiently pursue dual objectives. TU's mission-focused work yielded significant results for aquatic conservation and community safety by reconnecting miles of high-quality habitat for native brook trout and other aquatic life. Furthermore, by finalizing the climate-resilient designs for Calvin Cole Road, the project set the stage to reconnect additional miles, ensuring that both communities are equipped with structures that eliminate flood risks and guarantee the long-term ecological integrity and resilience of headwaters of the Hudson River watershed.

KEY LESSONS LEARNED

The project provided crucial lessons in resilient infrastructure delivery and municipal partnerships:

- The "HIGH" wood debris index at Calvin Cole Road underscored the necessity of integrating debris passage into the initial design phase, necessitating the use of a wide-span bridge (19-ft) and upstream grade control to maintain hydraulic capacity and reduce maintenance demands.
- Success was demonstrated by utilizing distinct partnership models and leveraging the Town of Stephentown's in-house labor for cost savings at one site and hiring a specialized subcontractor (A & M Excavating) supported by the Town of Copake at the other. This flexibility proved essential for efficient project execution tailored to local capacity.
- By setting the design goal at the active channel, the structures successfully met the adjusted permit requirement for climate resiliency while simultaneously achieving optimal aquatic passage, validating the multi-objective approach for securing diverse funding opportunities.

FUTURE WORK AND ALIGNMENT WITH WATER PROGRAM PRIORITIES

Future work will focus on monitoring and replicating this successful approach to align with regional water program priorities:

- Post-implementation monitoring will continue at the newly constructed High Valley View site to verify the efficiency of fish passage, sediment transport, and habitat stabilization, providing data critical for water quality management programs.

- Case Study Replication and Training: The finalized -ft bridge design for Calvin Cole Road and the completed SRA installation at High Valley View will be used as regional case studies. This dissemination of best practices will support the implementation of resilient infrastructure upgrades throughout the Hudson River watershed, aiding other municipalities struggling with similar flood and fragmentation issues.
- Expanding the systematic NAACC survey methodology that initially identified these high-priority sites is proposed to develop a comprehensive, regional barrier removal plan, thereby supporting long-term, large-scale stream health and climate adaptation initiatives.

6. REFERENCES

Gosset, C., Rives, J. and Labonne, J. (2006), Effect of habitat fragmentation on spawning migration of brown trout (*Salmo trutta* L.). *Ecology of Freshwater Fish*, 15: 247–254. doi: 10.1111/j.1600-0633.2006.00144.x

Letcher B.H., K.H. Nislow, J.A. Coombs, M.J. O'Donnell, T.L. Dubreuil. 2007. Population response to habitat fragmentation in a stream-dwelling brook trout population. *PLoS ONE* 2(11):e1139. doi:10.1371/journal.pone.0001139.

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7. APPENDICES



Trout Unlimited & Partners Announce Exciting Improvement for Wild Trout in Columbia County



Project: High Valley Culvert Replacement

Watershed: Unnamed Tributary to the Bash Bish Brook

Location: Town of Copake (Columbia County)

Goal: RECONNECT 2 MILES OF WILD TROUT WATER + INCREASE FLOOD CAPACITY

The Eastern brook trout, New York's state freshwater fish, is native to thousands of small streams across the northeastern United States. Brook trout, like other aquatic species, need to move freely through the stream to feed, grow and spawn. However, culverts at road stream crossings can create barriers that fragment critical habitat, which threatens their long-term sustainability.

The Town of Copake and Trout Unlimited recently partnered on a road-stream crossing management plan to identify and prioritize culverts that are barriers to aquatic organisms, a flooding issue or a maintenance issue for the town, leading to the replacement of an undersized culvert on Valley View Road. This new culvert reconnects two miles of previously fragmented habitat and is larger in size to handle increasingly high rain events. Town of Copake Highway Supervisor, Bill Gregory, was initially hesitant about the project's complexity, but now champions the partnership. *"I had some hesitancy about the added complexity of this project presented by TU,"* Gregory said. *"However, what resulted was a great opportunity to see our highway guys working in partnership with A&M Construction and TU."*

EASTERN BROOK TROUT

"THE CANARY IN THE COAL MINE"
NEW YORK'S STATE FISH AND A RESIDENT
OF ONLY THE COLDEST, CLEANEST
WATERS. THEIR PRESENCE IS A FINE
INDICATOR OF WATER QUALITY.



BEFORE

THIS CULVERT PIPE WAS A SIGNIFICANT
BARRIER TO FISH MIGRATION AND A MAJOR
CHALLENGE DURING HIGH WATER CONDITIONS.

AUGUST 2025

WILD TIGER TROUT

A VERY UNIQUE SIGN OF A HEALTHY WILD TROUT NURSERY STREAM WAS FOUND IN THE FORM OF A RARE HYBRID BROOK/BROWN TROUT REFERRED TO AS THE "TIGER TROUT."



AFTER

THE NEW HIGH VALLEY STRUCTURE OFFERS A NATURAL STREAM BOTTOM, IMPROVED PASSAGE FOR TROUT, AND INCREASED CAPACITY FOR HIGH WATER. WITH THE HELP OF SOME RAIN, THIS PROJECT SITE WILL FILL IN BEAUTIFULLY.

During construction, Jeremiah Stone of Trout Unlimited, safely relocated brook and wild brown trout from the work area. In addition to these species, Stone discovered two rare tiger trout. *"Tiger trout are the sterile offspring of a male brook trout and a female brown trout"* explained Stone, a project coordinator with Trout Unlimited and a passionate wildlife enthusiast. *"Finding these rare fish highlights the importance of streams like Bash Bish, where wild brown and brook trout share spawning habitat in the fall."* We would like to thank the local residents and elected officials of the Town of Copake for their patience and professionalism. We look forward to collaborating in the future on more exciting opportunities to improve aquatic passage for the wild trout of Columbia County

For more information or questions please email Northeast Conservation staff at Trout Unlimited at northeastconservation@tu.org

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THANK YOU!



Department of
Environmental
Conservation