

Town of North East

Road-Stream Crossing Management Plan



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Table of Contents

Volume I: Introduction and Road-Stream Crossing Inventory

Introduction	3
Partners, Funders and Advisors	5
Executive Summary	6
General Recommendations	9
How Streams Work	13
Road-Stream Crossings: Common Impacts to Streams and Best Management Practices	25
Plan Development Process Summary	40
Resources for Addressing Problem Crossings	43
Conclusion	49
Road-Stream Crossing Inventory	51
Reference Map(s)	53
Interpretive Guide	57
Culvert Prioritization Results	63
Town-Managed Crossings	73
County-Managed Crossings	187
State-Managed Crossings	263
Private and Other Crossings	311

Volume II: Appendices

Appendix A: NAACC Fact Sheet, Instructions, Data Sheet

Appendix B: UConn Data Collection Protocol, Statement of Work

Appendix C: Municipal Prioritization Workshop Proceedings Appendix D: Prioritization Ranking Rubric

Appendix E: 2021 Vulnerable Population Assessment

Appendix F: Ten Mile River Watershed Management Plan's Road-Stream Crossing Projects for the Village of Millerton & Town of North East



Introduction

Partners, Funders and Advisors



I. Executive Summary

The Town of North East has 65 miles of streams and rivers, and 114 miles of roads and other transportation corridors. At every intersection between these two long, linear networks, there is a bridge, culvert, or some other mechanism for carrying the road over the stream. Collectively, these structures are referred to as “road-stream crossings.” Just as roads are designed to accommodate levels and types of traffic and are built to those specifications, streams are also built to function in particular ways, shaping themselves based on their watershed, the climate and other factors. *Road-Stream crossings that change the natural shape of a stream (most commonly because they are undersized and/or misaligned) are more vulnerable to flood damage, require more maintenance, and can also block the movement of fish and wildlife along the stream corridor.*

Because streams and transportation networks are linear systems laid over each other, intersections are common. There are 138 road-stream crossings in the Town of North East alone. This is the case along the Ten Mile River and its tributaries in North East, many of which are home to populations of rare species that indicate healthy, intact cold-water fluvial habitat, such

Proportions of the non-bridge structures for which UConn flood risk analysis was performed ($n = 910$) that fail at the given flood intervals		
Recurrence of Interval Failure	Number of Culverts	Percentage
2-Year	22	2%
5-Year	16	2%
10-Year	25	3%
25-Year	70	8%
50-Year	46	5%
100-Year	57	6%
200-Year	70	8%
Passing	604	66%

as native brook trout (*Salvelinus fontinalis*), burbot (*Lota lota*) and slimy sculpin (*Cottus cognatus*). The results of ongoing research to identify flood risks and habitat barriers at road-stream crossings indicate that a significant proportion of these structures are management issues. Initial results of an ongoing study conducted by the Housatonic Valley Association (HVA) indicate that 55% of the non-bridge road-stream crossings (i.e., culverts) evaluated to date in the Housatonic watershed are considered moderate or worse barriers to fish and

wildlife movement ($n = 1231$). Furthermore, modeling by project partners at the University of Connecticut indicates that approximately 15% of non-bridge structures evaluated fail (i.e., water over the road) in a 25-year recurrence interval flood or smaller ($n = 910$). Given the sheer number of problem structures, a strategic approach to restoring habitat connectivity and reducing flood risk at road-stream crossings is necessary.

In 2015, HVA began a pilot project to develop road-stream management plans in seven towns in Northwest Connecticut (Canaan, Colebrook, Cornwall, Kent, Norfolk, Salisbury, and Sharon), in order to create a framework for strategic management of road-stream crossings. The primary objectives of this work are to help communities identify highest priority replacement projects

HVA'S ROAD-STREAM CROSSING MANAGEMENT PLANNING PROCESS

- 1) **Assessments of all road-stream crossings in Town:** Assessments for fish and wildlife passage (stream habitat continuity) are done using the NAACC protocol. Data collected in the field is uploaded to a regional online database which produces a "passability score" and barrier evaluation, ranking the site's ability to pass fish and wildlife and ranging from 0 (complete/ severe barrier) to 1 (no barrier, full passage).
- 2) **Flood Risk Analysis:** All closed-bottom structures (culverts) are assessed for flood resiliency, through a collaboration with UConn Department of Civil and Environmental Engineering (UConn), using a hydraulic capacity model that predicts failure (water overtopping the road) at various flood frequencies (2-, 10-, 25-, 50-, 100-, 200-year recurrence intervals).
- 3) **Road-Stream Crossing Inventory documents:** Town-wide inventory documents are developed for partner municipalities, containing maps, photos, all data collected in the field, and barrier status for each crossing, as well as the results of UConn's flood-risk analysis.
- 4) **Collaborative prioritization:** Inventory documents are used to guide prioritization workshops for each town, with representatives from the Board of Selectmen, Public Works and Emergency Services as well as other key stakeholders. These meetings allow for a better understanding of distinct flood-risk issues at specific sites in each town, such as frequent flooding or sediment/debris accumulation. Sites that exemplify the intersection of the three target issues, high flood risk, poorly connected habitat, and poor structure condition, were then selected in each town for further project development.
- 5) **Preliminary Design for Replacement (where funding is available) :** Conceptual designs and implementation strategies for the highest priority replacement project in each town are developed in collaboration with a Project Engineer. Replacement projects are designed using the Stream Simulation method, which not only preserves safe roadways and minimizes expenses associated with more frequent repair and replacement, but reconnects critical habitat for ecologically and economically important native species like Eastern Brook Trout.
- 6) **Road-Stream Crossing Management Plans:** All of the above information, along with conclusions and management recommendations, is assembled as Road/Stream Crossing Management Plan document for each partner town. These documents are suitable for official municipal adoption as an annex to local Natural Hazard Mitigation plans.

based on conservation value, flood risk and maintenance need, encourage adoption of culvert design Best Management Practices, and create a new tool for securing financing for replacement projects. This project was expanded in 2017 and 2018 to include towns in New York and Massachusetts.

This document is the product of a collaborative planning process meant to identify the highest priority road-stream crossing replacement projects at town-managed structures in the Town of North East based on flood risk, potential to restore stream habitat connectivity, and maintenance need. Using a town-wide comprehensive Road-Stream Crossing Inventory as the launching point for collaborative prioritization, Town

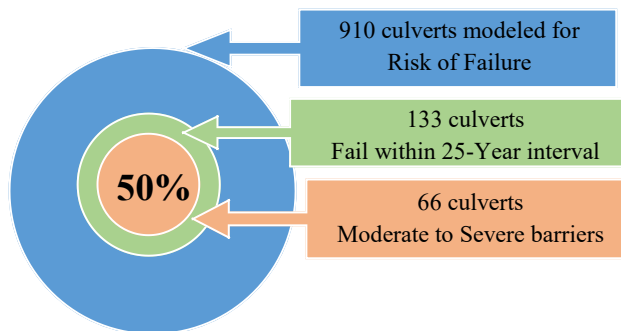
staff and officials in partnership with HVA and other stakeholders worked together to rank structures for replacement. In addition to information collected in the field, the Inventory document includes the results of flood risk modeling conducted by researchers at the University of Connecticut Department of Civil and Environmental Engineering (UConn), and an evaluation of the habitat barrier status of each structure conducted by the North Atlantic Aquatic Connectivity Collaborative (NAACC). Multiple stakeholder workshop meetings combined local knowledge of past flood events, the occurrence of species targeted for conservation (such as Eastern Brook Trout [*Salvelinus fontinalis*]), and structure condition with the results of this modeling to identify replacement projects most likely to achieve multiple benefits.

In addition to prioritizing structures for replacement, this document is also meant to provide information on Best Management/Design Practices for road-stream crossings that can simultaneously reduce flood risk, restore stream habitat connectivity, and reduce long-term infrastructure costs. Structures designed to conserve natural stream shape and function not only allow for the movement of aquatic and terrestrial organisms, but also require less long-term maintenance and are more resilient to large floods. Less maintenance and longer life-span mean that these structures are more cost-effective over the long term.

II. General Recommendations:

Wherever possible, build road-stream crossings that allow for natural stream function upstream, downstream and within the structure.

There is significant overlap between flood risk and habitat barriers at non-bridge road-stream



Proportion of culverts that fail in the 25-year flood interval and are considered moderate or worse barriers to fish and wildlife movement

and processes through a crossing structure accomplish multiple benefits- these structures reduce long-term maintenance costs, risk of failure during large floods, and restore stream habitat connectivity¹. *The Town of North East should build road-stream crossings that conserve stream shape and process across the road elevation to the maximum extent possible with every replacement project, using the principles of Stream Simulation Design.*

crossings; the results of HVA's regional study of the intersection of culvert barrier status and flood risk indicate that 56% of all culverts that fail in the 25-year flood interval or smaller are also considered moderate or worse barriers to fish and wildlife movement based on NAACC evaluation. A growing body of research indicates that design techniques that conserve stream shape



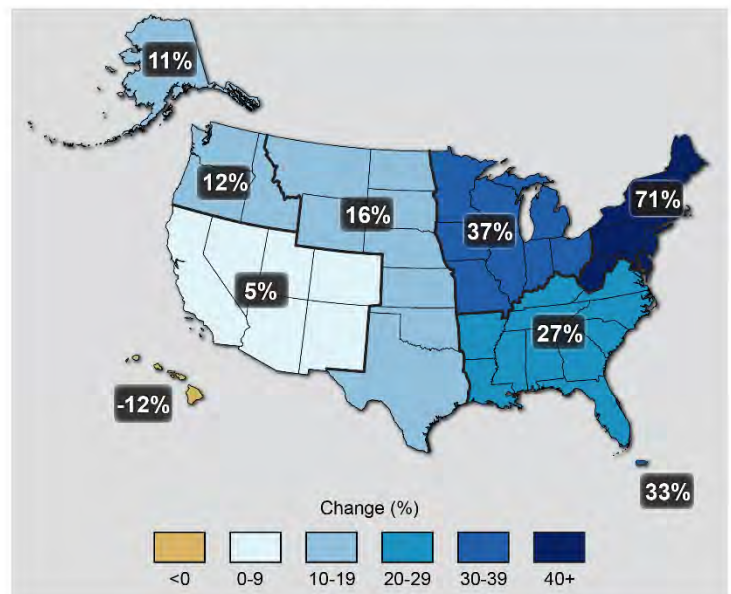
Heavy rain from a thunderstorm, Town of Sharon. Photo source: Litchfield County Times

¹ Stream Simulation Working Group. (2008). *Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings*. San Dimas Technology and Development Center: U.S. Department of Agriculture, Forest Service.
Gillespie, N., et al. (2014). Flood Effects on Road-Stream Crossing Infrastructure: Economic and Ecological Benefits of Stream Simulation Designs. *Fisheries*, 39(2), 62-76.
Levine, J. (2013). *An Economic Analysis of Improved Road-Stream Crossings*. Keene Valley, NY: The Nature Conservancy, Adirondack Chapter.
Massachusetts Division of Fish and Game, Division of Ecological Restoration. (2015). *Economic & Community Benefits from Stream Barrier Removal Projects in Massachusetts*.

Wherever possible, build road-stream crossings to pass the 100-year recurrence interval flood, based on the most up-to-date hydrologic information for the Northeast.

Climate change is increasing occurrences of intense rainfall and extreme precipitation events in northeastern U.S. towns, such as the Town of North East². Road-stream crossings are particularly susceptible to increased flood risk, especially if they were designed using outdated hydrologic information. Many structures in North East were sized using design storms derived from National Weather Service Technical Paper 40 (TP-40)³, which was released in 1961. The most recent NOAA Precipitation Atlas for the Northeastern United States (released in 2016)⁴ shows a roughly 2-inch increase in the amount of rain expected during the 24-hour, 1% annual chance storm from TP-40. This trend is expected to continue as climate change progresses. *Therefore, it is critical that the Town of North East takes advantage of replacement projects to increase hydraulic capacity at road-stream crossings, using the best available hydrologic information.*

Observed Change in Very Heavy Precipitation



The map shows percent increases in the amount of precipitation falling in very heavy events (defined as the heaviest 1% of all daily events) from 1958 to 2012 for each region of the continental United States. The changes shown in this figure are calculated from the beginning and end points of the trends for 1958 to 2012. (Source: Melillo, J.M. et al., Eds., 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment*. U.S. Global Change Research Program, as updated from Karl, T. R., et al. (2009): *Global Climate Change Impacts in the United States*. T.R. Karl, J.T. Melillo, and T.C. Peterson, Eds. Cambridge University Press.)

Always consider potential downstream impacts when right-sizing road-stream crossings

While increasing hydraulic capacity is critical to reducing maintenance costs and flood risk at individual structures, care must be taken to minimize risk to downstream property and infrastructure when doing so. Many undersized structures in road elevations currently serve as de-facto flood storage dams, reducing downstream flood peaks. Note that this is not a good reason to leave undersized structures in place- road elevations are not designed to the same

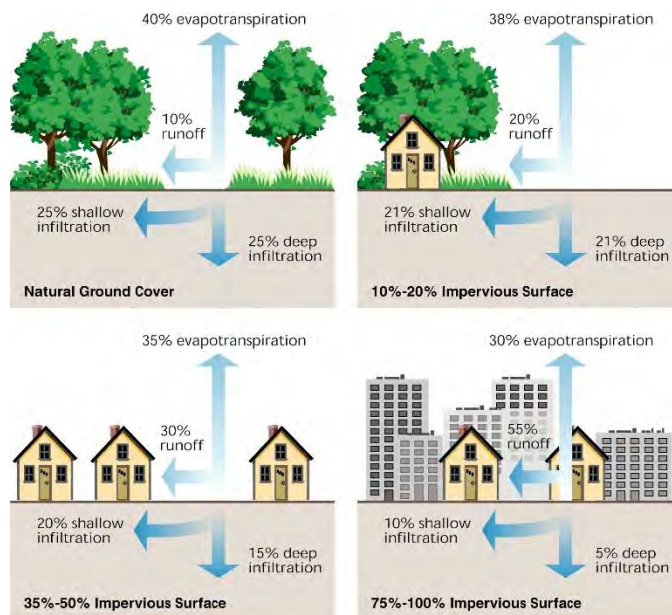
² Spierre, Susan G, and Cameron Wake. (2010). Trends in Extreme Precipitation Events for the Northeastern United States 1948-2007. *Carbon Solutions New England*.

New York State Department of Environmental Conservation. (2015). Observed and Projected Climate Change in New York State: An Overview. <https://doi.org/10.7930/J0Z31WJ2>

³ Hershfield, David M. (1961). *Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years*. Washington D.C.: Engineering Division, Soil Conservation Science, U.S. Department of Agriculture.

⁴ Perica, Sanja, Sandra Pavlovic, Michael St Laurent, Carl Trypaluk, Dale Unruh, Deborah Martin, and Orlan Wilhite. (2015). *Precipitation-Frequency Atlas of the United States: Volume 10 Version 2.0: Northeastern States*. Silver Spring, Maryland: National Oceanic and Atmospheric Administration.

reason to leave undersized structures in place- road elevations are not designed to the same standards as dams, and failures can be catastrophic. *The Town of North East should consider road-stream replacements holistically, with the appropriate amount of analysis to understand potential risk to downstream property and infrastructure.* In some cases, it may be necessary to increase hydraulically capacity starting at a downstream structure in a series and work upstream, or replace multiple structures at once.



Changes in proportion of rainfall that becomes runoff in different IC scenarios (Source: Stream Corridor Restoration: Principles, Processes, and Practices, 10/98, by the Federal Interagency Stream Restoration Working Group (FISRWG))

Consider restoring and protecting natural hydrology upstream of undersized structures through Green Infrastructure/Low Impact Development practices

Impervious surfaces like roofs, roads and parking lots cause runoff to enter the stream channel much faster than undeveloped landscapes, which generally allow water to soak into the ground. This often results in higher peak flows downstream of developed areas, which in turn put more strain on hydraulically inadequate structures. Green Infrastructure practices that capture and infiltrate stormwater runoff before it reaches the stream channel can help reduce flood risk and maintenance costs

at structures downstream of developed areas. These practices can also restore and protect water quality. *The Town of North East should identify hydraulically inadequate structures downstream of areas with existing high concentrations of impervious cover and areas targeted for development, and consider the adoption of Green Infrastructure/LID practices in areas where impervious cover is contributing to higher peak flows.*

Use this document to track ongoing maintenance, replacement projects, and other factors that may change priorities

This document, particularly the Road-Stream Crossing Inventory section, should be updated periodically to reflect changing stream and structure conditions as well as ongoing maintenance and replacement projects. This is important for internal record-keeping and continuity of knowledge between staff, but is also extremely helpful for securing financing for replacement projects. For example, FEMA Hazard Mitigation Assistance through competitive grants or in the wake of the flood for projects like upsizing a road-stream crossing generally require a Cost-Benefit Analysis; having comprehensive records of information such as required maintenance

and associated costs, road closures during floods, and photographic documentation flood damage can be advantageous in this process. *The Town of North East should use this plan as a framework for keeping track of important information related to road-stream crossing management.*

III. How Streams Work

Adapted with permission from “Living in Harmony with Streams: A Citizen’s Handbook to How Streams Work” (2012)⁵

Conserving natural stream processes through a crossing structure reduces flood risk and maintenance costs while maintaining stream habitat connectivity. This section presents general information about watersheds, the structure of streams, and the physical processes at work when water flows across the landscape to help users of this plan understand the elements of a natural stream, and how road-stream crossing design can conserve or change stream shape and behavior.



The Hydrologic Cycle (Source: Stream Corridor Restoration: Principles, Processes, and Practices, 10/98, by the Federal Interagency Stream Restoration Working Group (FISRWG))

Streams are complex systems that do complicated work. In their natural state, streams gather, store, and move water.

However, it is important for

understanding stream processes to realize that streams and rivers are not only moving water.

Streams are also moving sediment and woody debris. The work of streams is the collection and movement of water, sediment and debris from the surrounding landscape.

Streams Come from Watersheds

A watershed is the area of land from which surface and subsurface waters drain to a common receiving body or outlet. A stream is the product of this land, the watershed, which supplies both water and sediment to the stream system. The physical characteristics of a watershed—climate, topography, soils, bedrock, vegetation and land use— affect how water reaches its streams and how those streams behave. These features also influence the potential for soil erosion and the delivery of sediment into the stream channels. A portion of the rain that falls, along with melting

⁵ Friends of the Winooski River, White River Natural Resources Conservation District, Winooski Natural Resources Conservation District. (2010). *Living in Harmony with Streams: A Citizen’s Handbook to How Streams Work*. Retrieved from: <https://winooskiriver.org/images/userfiles/files/Stream%20Guide%201-25-2012%20FINAL.pdf>

snow (precipitation) soaks into the ground and fills depressions. The excess water flows downhill into streams as surface runoff and subsurface flow.

Hydrologic Cycle

The transfer of water from precipitation to surface water and groundwater, to storage and runoff, and eventually back to the atmosphere is an ongoing cycle called the hydrologic cycle. In a climate like the northeastern United States, about 30-34 percent of precipitation runs off into surface waters; about 50 percent is returned to the air by evaporation from land and water and by plants emitting water vapor (transpiration); and about 16-20 percent seeps into the ground and recharges the groundwater supply.

Valley Slope

In hilly or mountainous watersheds such as those in the Northwest Hills, water flows quickly down steep slopes, producing “flashy” streams in which water levels rise rapidly. The steep slopes also facilitate the transport of sediment into the stream. In areas with gentler slopes, the storm flow enters streams over a longer period and will thus have peak flows that are lower.

Soils

Different types of soil absorb water differently. If the soil allows large amounts of rainfall to pass through it or infiltrate into the ground, then less water will run off as storm flow and more will enter the stream later as base flow. Soils with high clay content and frozen soils are less able to absorb water and thus cause more rapid runoff into streams.

Vegetation

Plants play a vital role in moderating the flow of water into streams and protecting against soil erosion. A rainstorm or heavy shower drops millions of tons of water on the land. When soil is exposed, the force of raindrops beats away at the surface, loosening soil particles and moving them downhill. When vegetation is present, leaves and stems intercept and reduce the impact of both falling and running water. This allows the water to either soak into the soil or to safely run off in a controlled manner. Forest soils are particularly porous and absorbent. Some of the water that infiltrates into the soil is drawn up by plant roots and transpired—or given off through the leaves as water vapor. This, in turn, renews the soil’s ability to absorb water.

Land Use

Land use refers to the way that people change the landscape, and encompasses development of towns and cities as well as agriculture, mining, timber harvesting and other activities. Land use changes in the watershed can impact the shape of the receiving stream by leaving soil more vulnerable to erosion. The erosion that occurs increases the amount of sediment delivered to a stream. This changes the pattern of water and disrupts the stream’s natural patterns of movement or equilibrium (to be explained more later on). If a disturbance, whether natural or man-made, is large enough, there can be impacts on the watershed that go beyond the initially affected area. It may take years, decades, or even centuries for a stream to reach a new equilibrium.

The Structures of Streams

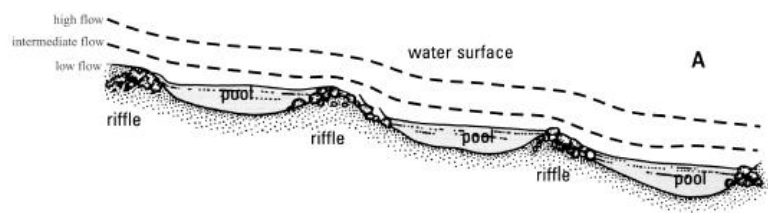
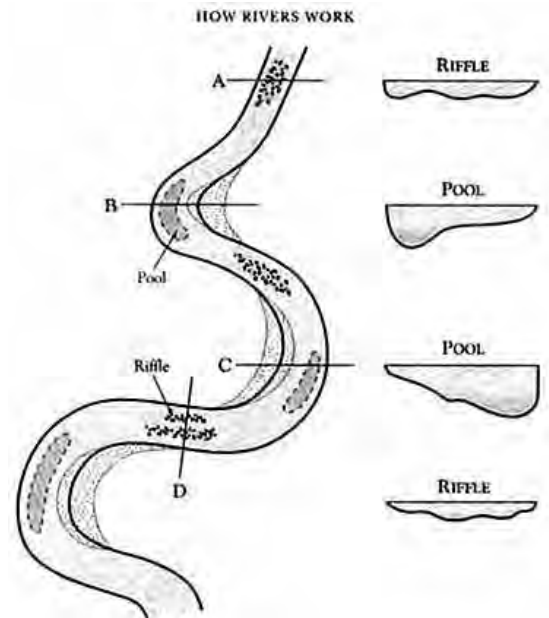
Stream characteristics range from steep, swift-flowing mountain streams to flat, slow-flowing streams. The character of a stream is influenced by the amount of water it carries, the geology and soils it flows through, and the shape and slope of its valley. Each stream channel is formed, maintained, and altered by the stream itself through the processes of erosion and deposition of sediment. If something changes the conditions that have shaped the stream, then its channel will change in response to those different conditions.

Streambed and Channel

The streambed is the foundation of a stream and supports its banks. Streambeds are composed of a variety of materials, ranging in size from bedrock, large boulders, and rocks, to gravel, sand, silt, and clay particles. The scouring and depositing of these materials shape the stream channel and its floodplain. The banks within which low and moderate stream flows occur define a stream's channel. The deepest areas are generally connected, forming a low flow channel. In the unaltered stream, the term "bankfull" is used to describe the state at which the flow of the water completely fills the channel, just before it spills into the floodplain.

The structure of a channel is described by the following:

- Length of meandering or curving (pattern);
- Width and depth of the channel (dimension);
- The degree of slope (profile).



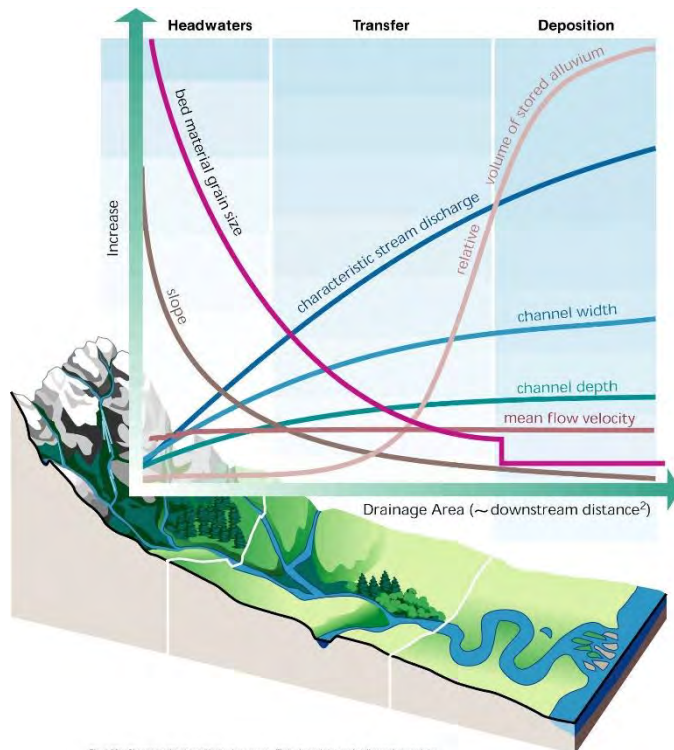
River pattern, dimension and profile

Some channels are relatively stable, while others actively adjust and change their shape. For example, the channel of a stream that is flowing through bedrock will change at a much slower rate (relatively stable) than one flowing through a sandy or highly erodible area (more actively depositing, adjusting or changing shape). Otherwise, adjustments in channel shape usually occur in response to changed conditions, such as increased water flow or a modification made within

the stream channel or to the surrounding landscape. Most natural streams are dynamic; they may move around, and still maintain the same basic dimensions, meander pattern, and slope.

Meanders

The processes of erosion and deposition serve to lengthen a channel through a curving process known as “meandering.” Almost all streams naturally meander. Curves slow down the water and absorb energy, which helps reduce the potential for erosion. The velocity of a stream is greatest on the outside of a bend. The increased force of this water frequently results in erosion along this bank and a short distance downstream from the bend. On the inside of the bend, the stream



How Slope Affects a Stream's Ability to Meander: The channel and behavior of a stream can vary considerably along its length. Mountain headwater streams flow swiftly down steep slopes. At lower elevations, the slope is generally gentler and the stream is more likely to meander (form curves) across its valley. (Source: Stream Corridor Restoration: Principles, Processes, and Practices, 10/98, by the Federal Interagency Stream Restoration Working Group (FISRWG))

term to describe material that ranges in size from silt to sand to gravel to boulders. In flatter sections, the water will move more slowly, allowing finer sediment to deposit, referred to as “deposition.” The stream adjusts to the slope of the valley through this process of erosion and deposition.

Pools, Steps, and Riffles

Streams alternate between concentrated (convergent) flows and flows which are more spread out (divergent). Convergent flows are deeper, faster and more erosive. Pools are deeper areas that are scoured out during flood events. Sediments that are eroded from a pool will fall to the bottom of

velocity decreases, which results in the dropping out or deposition of sediment, usually sand and gravel, along this bank. Looking at the long-term history of a valley over hundreds or thousands of years, the stream moves back and forth across the valley bottom. This side-to-side or lateral migration of the channel, along with down-cutting that occurred in a stable, predictable way, actually formed the valleys we see today.

Slope

The slope is the change in elevation or steepness of a streambed. The slope of the streambed contributes to how fast the water moves and, therefore, determines how much sediment of what size the water can carry. The steeper the slope, the faster the water moves and the more sediment bedload (i.e. sediments, silt, sand, gravel, boulders, and organic materials) can be moved through the channel. The term sediment is a general

the stream when flows are shallower and slower, with less energy to move the sediment, forming a riffle. This alternating between bed erosion and deposition creates up and down “bed forms” that dissipate the energy of a flood and help maintain channel stability. In steeper streams, high-energy flows scour pools and move larger sediments, such as cobbles and boulders, downstream to form rocky steps rather than riffles. Streams are often classified or named from the type of bed forms they have, for example riffle-pool or step-pool streams.

Stream Reach

A reach is a segment of a stream with similar physical characteristics throughout its length. These characteristics are related to the stream’s structure and other physical processes such as valley slope and bed material. In Vermont, reaches vary greatly in length, from hundreds of yards to a few miles.

On the surface, streams appear to serve a simple function: to move water from one place to another. In reality, streams carry much more than just water; they also move materials like rocks and sand, woody debris, fish and wildlife, and—of course—paddlers. This section provides some basic background information on stream structure and function in order to better understand the issues associated with road-stream crossings and what we can do to remediate and/or prevent them.

Riparian Area/Riparian Buffer/Riparian Zone

These terms can refer to a number of things depending on the context in which they are used.

Generally, they refer to the land immediately adjacent to a stream that includes vegetation, wildlife, and other natural features. Derived from the Latin word *ripa* meaning streambank, this area is where the water is separated or buffered from adjacent land uses. Once established, the plant roots in the buffer help stabilize the bank and the tree canopy provides shading to cool water temperatures. The buffer allows vegetation to filter sediments and excess nutrients. The term “riparian” may also be applied legally to define the rights of landowners along a stream.



Water on the broad floodplain of the East Branch Delaware River near Margaretville, NY. Photo courtesy of Delaware County Soil and Water Conservation District

Floodplain

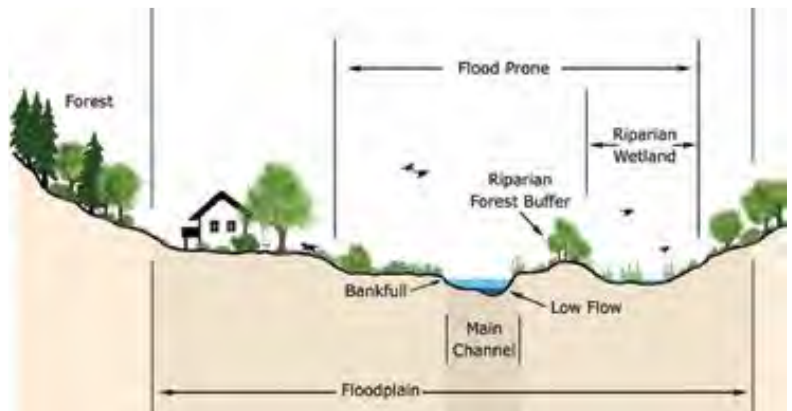
Floodplains are essential to the health of river systems. They are generally flat areas of land adjacent to the stream. These areas are constructed of material deposited by the stream, separated from the channel by a stream bank, and subject to flooding. Floodplains provide a place for water to go when it cannot be contained in the channel, such as during spring thaw or heavy precipitation.

A floodplain is formed by a stream that is eroding and depositing sediment. Over time, the stream channel moves or meanders across the floodplain. In turn, this causes erosion in some places and deposition of materials in other places. When water fans out across the floodplain, the speed of the water is decreased, thereby decreasing and dissipating the energy of the stream. This relieves pressure on stream banks and offers a place for the water to flow temporarily. The outcome is a reduction of the amount of flooding and erosion downstream. If no human development is located in the floodplain, then this area can perform its natural functions of storing and conveying floodwater and dissipating excess energy.

Vegetation also slows the water's velocity, and the roots hold soil in its place, reducing erosion. A stream that is no longer able to overflow onto its floodplain is often a stream with erosion problems.

Stream Corridor

Stream corridors are comprised of the channel, floodplains, and adjacent lands. They provide an area within which the channel can meander or curve so that sediments and the energy of flowing water are distributed more evenly—the condition of dynamic equilibrium. These are complex ecosystems that provide an avenue for wildlife movement and other important natural processes.



Cross Section Image of a Stream Corridor

How Streams Work

In the process of moving water and sediment downhill, a stream dissipates energy. This process results in the formation of a stream channel. The natural stability and balance in a river system depend on its ability to build and access a floodplain and create meanders and bed forms. These structures help evenly distribute a stream's energy and sediment load. The next few sections describe the physics of the energy flow of streams and how stream channels are constantly adjusting to keep their energy in a state of balance.

Streams start in headwater areas where there is tremendous potential energy because of generally steep slopes. The energy that develops in these headwater areas is used by the stream in the following ways:

Kinetic Energy

As the water begins flowing downhill, potential energy is converted to the energy of movement or motion—kinetic energy. This energy is what powers mills and hydroelectricity, or simply moves a boat downstream.

Friction

Up to 95 percent of a stream's energy is dissipated through friction with its bed, banks, and floodplain. Woody debris and vegetation in the channel and on the floodplain also break the water flow and increase roughness or friction. In addition, streams expend energy flowing around their curves (meandering).

Stream Flow

The amount of water carried by a stream can vary from none, in the case of streams that are dry during part of the year (ephemeral streams) to extreme flood conditions. Precipitation reaches the stream by two different pathways that affect the quantity, quality, and timing of stream flow: infiltration into the ground where it contributes to groundwater flow or “base flow;” and water that flows across the surface of the land, referred to as surface runoff or “storm flow.” Stream flow at any one time consists of water from one or both sources.

Base Flow

Rainwater and snowmelt that soak into the ground recharge the groundwater. This water moves slowly through the soil and bedrock before eventually reaching the surface water. This regular, continuous discharge of groundwater that provides a steady supply of water to many streams and rivers is called base flow. Enormous amounts of water move slowly through the soil, creating the base flow in streams from rainwater that fell days, weeks, months, or even years before. Base flow enables many streams to flow year-round, even when there has been no recent rainfall. The amount of base flow varies with groundwater levels, so some streams have continuous flow during part of the year but dry up during dry periods and droughts.

Storm Flow

Some of the rainfall and snowmelt within a watershed flows quickly into the stream by moving over the land surface or through near-surface soil. This water is the main component of high stream flows during rainy weather and spring snow melt. This is called storm flow. Each stream has developed in response to the amount of water it carries and the way that water moves through the channel. The volume and timing of runoff into a stream is called its hydrology.

This is dependent on precipitation patterns and watershed characteristics. The flow processes within a stream channel are called hydraulics and are influenced by the characteristics of the channel. These characteristics include the stream's slope, the shape of the cross section of the

channel, and roughness. Roughness is caused by the water coming in contact with sediments and vegetation, which causes friction, slowing the flow of water.

Sediment Transport

Stream energy not used by kinetic motion and friction is available for transporting sediment. The sediment in the channel comes from the surrounding landscape and erosion of the bed and banks.

A stream develops over time to handle a certain sediment load, which it transports and deposits in a fairly predictable pattern. Streams are constantly balancing the energy they have by meandering (curving), transporting, and depositing their load of sediments. This means that some erosion is natural and a normal function of how streams work.

When the energy or sediment inputs are changed, the energy balance is altered and the system must adjust. If a stream is slowed down, backed up, or spread out, it may lose the energy needed to transport its sediment load and sediments will deposit or drop out of the stream flow (deposition). Conversely, if the stream becomes steeper or is deepened and has more energy than is needed to transport the available sediment it will obtain additional sediment by eroding its bed or banks.

If the amount of sediment entering a stream increases, but there is no corresponding increase in water flow and energy to move the sediment, the sediment will deposit. This occurs at the tail end of a large flood, as it did in Tropical Storm Irene. Flows begin receding, along with the energy to move all the sediment that has entered the channels from numerous hillslope failures. Conversely, if the sediment flow decreases significantly (e.g., when it becomes trapped behind a dam), but the flow and energy are not also decreased, this excess energy works on the bed and banks, increasing erosion.

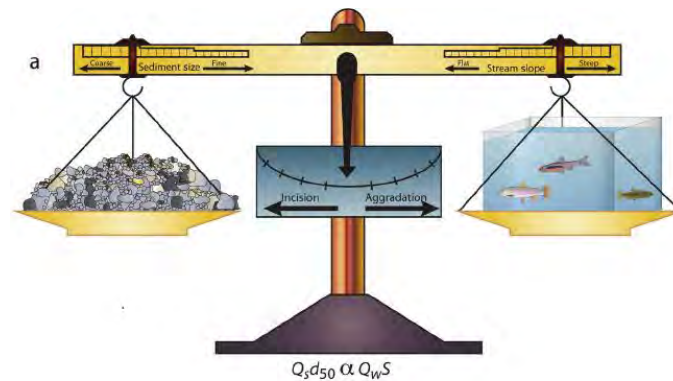
Dynamic Equilibrium

Despite frequent change, streams exhibit a dynamic form of stability. Streams are changing but generally in a slow and predictable manner. As long as the conditions that influence the stream's energy are relatively constant, then the stream for the most part stays in equilibrium. This process of establishing and maintaining a balanced condition is called dynamic equilibrium. In other words, the stream is moving and changing, but generally maintains its dimensions, pattern, and profile without dramatic changes in the pattern of its erosion and deposition processes.

When a natural stream achieves an equilibrium depth and slope, the shape of its channel is maintained by the following channel slope and channel roughness and/or resistance characteristics:

- The coarseness of the sediments in its bed; and/or
- The soil cohesiveness and soil binding properties of vegetative root systems on its banks.

The following diagram⁶ illustrates the relationship between the water in a stream and the system's ability to transport sediment:



The relationship is shown as a balancing scale, with sediment load on one weighing pan and stream flow on the other. The hook holding the sediment pan slides along the horizontal arm to reflect adjustments according to sediment size. The hook holding the stream flow side adjusts to reflect changes in stream slope. Adjustments and changes in a stream system occur when there is an imbalance in the system's energy. When any one or more of the variables change, the system is no longer in balance.

When a stream is free to make adjustments, then one or more of the other variables in the system is likely to change until equilibrium is restored.

The diagram indicates how the variables will change. For example, if the slope increases (gets more steep), then the size of sediments being moved will get bigger. The process can take place suddenly during one storm event or it may occur gradually over hundreds or thousands of years.

The physical laws which govern the evolution of stream channels dictate that, in time and left in their natural state with no human development or interaction, rivers will self-adjust (erode and deposit) to an equilibrium condition. When these conditions are achieved across an entire watershed, they are associated with minimal erosion, storage of organic material and nutrients throughout the watershed, and aquatic and streamside (riparian) habitat diversity.

How Channels Change their Shape

Streams in dynamic equilibrium are considered to be stable. This is because they generally maintain consistency with respect to channel dimensions, pattern, and profile as presented earlier. Streams in (dynamic) equilibrium erode their banks, migrate over time across their floodplains, and experience small-scale adjustments in the formation of their channel. These

⁶ Image from Lane's Balance of Sediment Supply & Sediment Size with Slope & Discharge: Lane, E.W. (1955). The Importance of Fluvial Morphology in Hydraulic Engineering. In Proceedings of the American Society of Civil Engineers 81(745): 1-17. Retrieved from: Using Beaver Dams to Restore Incised Stream Ecosystems - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Lanes-balance-a-describes-how-changes-in-sediment-load-sediment-size-slope-and_fig1_261215514 [accessed 30 Nov, 2018]

conditions change over time (are dynamic) based on water and sediment inputs that are driven by natural flood events. This evolution of channel form often takes place over decades or even generations.

Substantial changes in channel form are reactions to large-scale events such as major floods and human activities that take place in the stream corridor- like road crossings- and across the landscape. The following terminology is generally used to describe these adjustments to the formation of a stream channel.

Degradation, Incising, Scouring Down

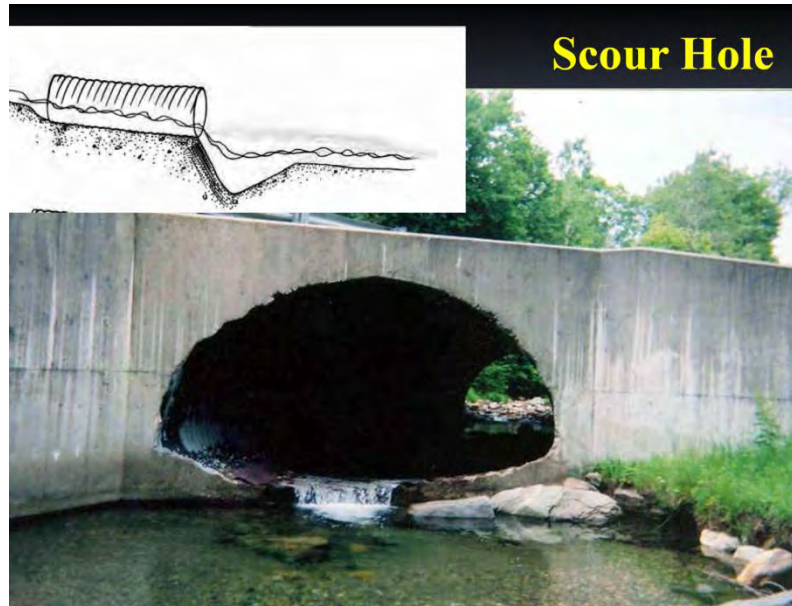
All of these terms refer to situations when a stream has more energy than needed to move available sediment. In these cases, it will acquire additional sediment by eroding its bed or banks. Degradation is common at the downstream end of undersized culverts.

Degradation is most visible in actively eroding banks or headcuts. A headcut is a small waterfall, often resulting from the deepening of a channel

caused by dredging, excavation, or increased stream erosive power downstream of a natural or anthropogenic constriction. In the case of a “scour hole” below an undersized culvert, the degradation is generally confined to one spot as the culvert invert serves as grade control. This can lead to very wide, deep holes that undermine adjacent stream banks and “perched” culverts that block the movement of fish and wildlife upstream. In situations where a headcut is uncontrolled, the headcut and associated erosion will migrate upstream until it is stabilized.

Aggradation and Lateral (Width) Adjustments

When a stream does not have enough energy to transport its sediment load, it will **deposit sediments in its channel** through a process called “aggrading.” As the streambed rises, the water spreads out, eroding laterally (lateral width adjustments), and thus widening the channel. Disequilibrium and channel evolution occur when moderate to major vertical adjustments have been set in motion. Aggradation is common upstream of road-stream crossings that constrict the natural stream channel, and can lead to erosion of adjacent stream banks as well as reduced hydraulic capacity as sediment and debris block the inlet of the crossing.



Scour hole downstream of an undersized culvert. Photo/diagram credit: UMASS River and Stream Continuity Program

The rate of change in a stream channel, often referred to as the stream's "sensitivity," is a function of the erodibility of the bed and bank materials, the supply of sediments, and the frequency of flooding. A gravelly stream bed with non-cohesive banks in a flashy watershed may evolve in a much shorter time frame than a stream in clayey soils where flooding has not occurred very often.

Describing Channel "Conditions"

A stream reach is a section of stream with similar physical characteristics. The condition of stream reaches can vary from one that is in dynamic equilibrium to one where its channel structure has begun to evolve, adjust, or be "in adjustment." The Vermont Rivers Program describes three benchmarks along the gradient of physical condition. The following terminology and photographs describe these different conditions.

Reference Condition

Reference condition refers to a stream reach that is in or near dynamic equilibrium. That means it is maintaining its channel dimensions and watershed functions within the range of natural variability and is providing high quality aquatic and riparian habitats. Such conditions can typically be found in headwater sections of streams, where human influence is limited. When designing a road-stream crossing structure, it is instructive to identify and measure the closest nearby reference reach, and use that to develop specifications for rebuilding the stream channel through the crossing structure.

An understanding of the reference (natural) or stable condition provides a way of measuring if conditions are different from a stream's natural characteristics. A change or departure from the reference condition can be measured by various degrees of change as described below. This is often referred to as "degree of departure." (This is not so different from a physician judging one's health by reference to the characteristics of a healthy person.)

Undersized or misaligned structures can cause streams to become unstable upstream and downstream of a road-stream crossing. Knowledge of which stage of stream adjustment a particular stream reach may be in is critical for anticipating future conflicts with human infrastructure and in designing any restoration or protection strategies.

In Adjustment

The "in adjustment" condition refers to a stream reach where the channel structures and stream processes have deviated from the expected natural conditions. These unstable stream segments haven't evolved into a completely new stream type. However, the aquatic and riparian habitats of such a reach are in "fair" condition as they lack certain streambed features, cover types, and connections with related habitats (connectivity). Reaches that are in adjustment are poised for additional adjustments. When floods occur, major adjustments will take the channel either toward or further away from equilibrium or reference conditions. Further departures may even

change the stream channel to a different type—that is, develop different structures and exhibit different processes.

Poor Condition

A stream reach in poor condition is said to be in “disequilibrium” or exhibiting a departure from its stream type. Such a stream reach is experiencing adjustments to a much greater degree and rate beyond the expected natural conditions of a reach in fair condition.

This means the reach is exhibiting a new stream type. For example, a reach that may have alternated between deposition and erosion (riffle and pool) has become completely erosional or completely depositional. In poor condition streams, habitat features may be disturbed beyond the range of some species’ adaptability. Such a reach is expected to continue to undergo major adjustments until it evolves back to the reference stream condition or a new equilibrium.

IV. Road-Stream Crossings: Common Impacts to Streams and Best Management Practices

If not designed to mimic the natural stream channel, road-stream crossings can disrupt stream equilibrium and pose risks for human safety and ecological integrity. Below are some common impacts associated with road-stream crossings and how they relate to stream structure and function:



Undersized Crossings

A crossing that is too small relative to its bankfull width can lead to faster flows, which in turn can cause erosion at the inlet and outlet (see Outlet Drops and Scour & Erosion below). Undersized crossings are often accompanied by outlet drops and/or scour pools that result from excess flows.



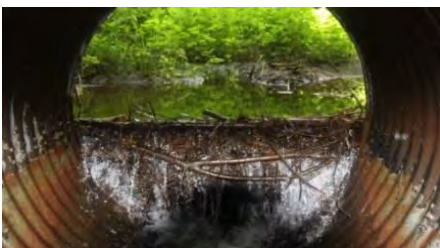
Outlet Drops/Perched Culverts

Crossings that are undersized may have large drops at the outlet, which are called outlet drops or perched culverts. Such drops can be caused by erosion/scouring of the downstream stream bed



Shallow Crossings

Crossings that are undersized or improperly aligned can lead to high flows and erosion that can lead to the water inside the structure being too shallow. Inadequate depths can pose a barrier to fish passage. They also usually lack a substrate that matches stream bed. These crossings can be impassable or even dry for long periods of time.



Clogged Crossings

Undersized crossings are more likely to clog with debris. Beaver activity can exacerbate this problem. If not maintained, a clogged crossing will become impassable to fish for as long as the clog is present. Clogged inlets can also cause

upstream ponding and/or flooding, and the formation of inlet drops.

Ponding



Ponding is the backup of water upstream of an undersized crossing. Typically, the ponded water upstream becomes stagnant, leading to increased temperatures, lower oxygen levels, and poor fish habitat. Ponding can lead to stream bank and road erosion, damage of surrounding property, and creation of wetland ecosystems. It may occur seasonally due to high waters/flooding, or year-round due to induced effects such as clogging.

Misaligned Crossings



A crossing whose inlet is skewed in relation to the stream is considered misaligned. Misaligned crossings can result from improper installation (e.g. installing a pipe perpendicular to the road, even though the stream approaches at an angle). Misaligned crossings have a higher probability of clogging, scouring or eroding, and producing ponding.

Scour and Erosion



Scour and erosion goes hand-and-hand with high flow and ponding, and is a consequence of all crossing insufficiencies besides shallow crossings. Scour pools often form at the downstream end of perched crossings, leading to the undercutting of the crossings, or in a worse case, the road. Eroded stream banks occur both upstream and downstream of the crossing. Lastly, scouring of natural substrate within the crossing degrades passage and natural habitat for aquatic and terrestrial life.



Lack of Substrate

It is recommended that metal, smooth, and unnatural materials, such as concrete, not be used when constructing a culvert. Many aquatic organisms maneuver through the stream by gripping or latching onto rocks. When implementing a substrate through a culvert one must match that of the natural stream. By doing so the natural conditions are maintained, stream continuity remains uninterrupted, and scour is avoided.

Aging Infrastructure

Many of the issues described above are associated with aging infrastructure. According to the National Bridge Inventory Database, of the 2,500 documented bridges in New York, at least 60% were built before 1970.⁷ Although many have been repaired or reconstructed since then, this figure does give a sense of scale to the issues of aging infrastructure—and it does not include culverts.

Each of the above impacts above can contribute to increased flood risk and maintenance costs and reduce the ability of fish and wildlife to move through a crossing.



Undersized culverts, which constrict flow, are almost irresistible to beavers. Source: www.martinezbeavers.org/wordpress

Beaver Activity

The North American beaver population was hunted nearly to extinction by the early 1900s because beaver pelts were so valuable. Today beavers are ubiquitous and the dams they build create issues for road-stream crossing management in many towns. Beavers instinctively build dams in locations where they hear running water, making culverts prime locations. Small culvert pipes are much easier for a beaver to dam up than a wider structure or a bridge. **Therefore, the ideal way to address beaver issues is to install larger culverts and bridges, which will reduce maintenance costs associated with beaver dams**

⁷ U.S. Department of Transportation Federal Highway Administration. National Bridge Inventory Database. Updated annually with data from the Federal Highway Administration. Data retrieved from: <http://nationalbridges.com/index.php>

and clogged culverts.⁸ In cases where culvert replacement is not feasible, the United States Forest Service (USFS) has reviewed several other options and are already commonly used in the Northeast:

Devices to keep beavers from damming the culvert

- Culvert Fences: A box around the culvert inlet that is embedded in the sediment and rises a couple of feet above the water's surface. This is USFS's most commonly used beaver control method, however ***it is not recommended***, as the fencing results in reduced fish and aquatic organism passage, increased maintenance, and ice damage.



Culvert fences are the most commonly used beaver device by the Forest Service, however they may block fish passage. USFS concludes that the best solution is culvert replacement. Source: www.beaversolutions.com

Devices to reduce water speed

- Corrugated or perforated tubing: A tube used to transport water through the culvert and dam in such a way that wholly or partially eliminates the cues that tell beavers to build. Respondents have reported a decrease in maintenance by using this device, though others were not successful.
- Clemson beaver pond levelers: Similar to the corrugated or perforated tubing; the perforations slow the flow of water, which helps reduce the sound of flowing that prompts beavers to build dams. This type of device has been used successfully.

Trapping/Shooting

- Trapping: Trapping beavers requires many considerations, including—but not limited to—animal behavior, site access, skills of the trapper, non-target animals, cost, and state/federal regulations.
- Shooting: Check with local authorities.

Repellants

- Not effective in reducing culvert problems, but can be used to protect riparian areas by making plants less attractive to beavers. Repellants that were tested included various deer repellents, hot sauce, textural repellents (like paint with sand), and using beaver odors to trick other beavers into thinking that an area is occupied. The effectiveness of repellents depends on many factors, including the size of the area to be protected and competition with other animals.

⁸ USDA Forest Service. (2005). *How to Keep Beavers from Plugging Culverts*. Retrieved from: <https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf05772830/pdf05772830dpi300.pdf>

While the USFS report provides an overview of several options that are available to protect culverts from beaver dams, the best solution is to ***redesign and replace culverts*** that beavers have dammed. ***Right-sized culverts help prevent beavers from building dams.*** Reducing beaver dams is an added benefit of replacing culverts with Stream Simulation Design, which is explained in the next section.

Road-Stream Crossing Best Management Practices

State and federal agencies have developed design practices that allow for both fish and wildlife passage and better flood resiliency. The USFS provides the most comprehensive road-stream crossing design protocol geared towards aquatic organism passage known as Stream Simulation Design (SSD)⁹. Each state generally has their own guidelines or standards regarding culverts and bridges. These state recommendations usually incorporate many of the same principles found in SSD.

⁹ Stream Simulation Working Group. (2008). *Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings*. San Dimas Technology and Development Center: U.S. Department of Agriculture, Forest Service.

Stream Simulation Design (SSD)

When a crossing must be replaced or repaired the current best practice is to follow SSD. The premise of SSD is to replicate natural channel dimensions and characteristics that are observed upstream through a crossing structure. This design allows wildlife movement and natural processes to continue as if the structure was not there at all. Components of SSD allow for a dynamic channel that can adjust during high water periods and allow proper hydraulic capacity as well as passage of varying sized debris. Barriers to wildlife passage are eliminated so that all organisms at every stage of life can move freely through the crossing. To achieve the goal of maintaining healthy ecological connectivity as well as safe transportation networks, crossings should be designed with the three SSD guiding principles in mind:

- **The design should fit both the stream and the road, not just the road.**
- **Minimum intervention in stream process results in the least risk of failure.**
- **Crossings should present no greater challenge to organism movement than the stream being crossed.**

Specific components of SSD that follow these principles include:

- **Structure width** is equivalent to or exceeds the bankfull width of the natural channel.
- **Structure substrate** should have similar mobility and stability properties to that of the natural bed material of the stream channel.
- Provide **sufficient hydraulic capacity and passage of debris** during a 100-year flood.
- Provide adequate space between 100-year flood water level and top of the structure utilizing a head-water-to-depth ratio less than .8, allowing **room for debris to pass without clogging the structure.**
- The stream within the structure should have the **capability to adjust dimensions** in response to a wide range of floods and sediment or wood inputs without compromising the movement needs of aquatic organisms or the hydraulic capacity of the structure.

RECURRENCE INTERVALS

A flood recurrence interval, also known as a return period, is how we statistically describe a storm event based on historical observations. Recurrence intervals are generally identified as the -year flood (e.g. 100-year flood). However, this can be somewhat misleading. A 100-year flood, for example, would represent a storm with a 1% chance of happening on any given year, not a storm that only happens once in 100-years. Theoretically a 100-year storm could happen multiple times in one year. These statistical benchmarks will be changing as the intensity and frequency of our storms increase due to global climate change.

Although SSD structures may have a higher initial cost, they may save significantly more money in the long run.¹⁰ Long-term maintenance and replacement costs of both the structure and road must be assessed when planning a crossing, as well as costs associated with destruction of property, the disruption of transportation, emergency response, commerce, and tourism. Costs from these factors can dramatically overshadow those of constructing an improved structure.

New York Stream Crossing Guidelines

The New York State Department of Environmental Conservation (NYS DEC) developed some basic guidelines for replacing road-stream crossings to avoid stream fragmentation.^{11,12} These guidelines are for people involved in designing and constructing road-stream crossings who want to protect and restore stream continuity.

The goal of these guidelines is to maintain natural conditions that don't restrict fish and wildlife passage through the stream, noting that "additional engineering design may be necessary to ensure structural integrity and appropriate hydraulic capacity."

Stream crossing designs that preserve natural stream conditions while marrying the needs of fish/wildlife with human transportation. Fish and wildlife in this case include invertebrates, fish, amphibians, reptiles and mammals, and they move on a daily and seasonal basis. The necessary reasons for moving upstream and downstream include: accessing coldwater habitats, feeding areas, and breeding/spawning/nursery areas, as well as the need for natural dispersal to maintain genetic diversity. Additional considerations include the impact of improperly designed crossings on adjacent riparian habitats.

Common road-stream crossing problems include undersized, shallow and perched crossings, and double (as opposed to single) culverts. Consequences of poor crossings include low flows, unnatural bed materials, scouring and erosion, high flows, clogging, and ponding. All of these consequences can degrade in-stream and riparian habitats and restrict fish and wildlife movement through a crossing.

Solving the aforementioned issues requires the proper sizing, placement and installation of road-stream crossings. Crossings should be:

¹⁰ Levine, J. (2013). *An Economic Analysis of Improved Road-Stream Crossings*. Keene Valley, NY: The Nature Conservancy, Adirondack Chapter.

Long, J. (2010). *The Economics of Culvert Replacement, Fish Passage in Eastern Maine* (p. 5). Natural Resource Conservation Services.

¹¹ New York State Department of Environmental Conservation. (ND) *Stream Crossings: Guidelines and Best Management Practices*. Retrieved from <http://www.dec.ny.gov/permits/49066.html>

¹² NYSDEC. (2011). *Stream Crossings*. Retrieved from: http://www.dec.ny.gov/docs/permits_ej_operations_pdf/streamcrossing.pdf

- Large enough to accommodate fish, wildlife, and floods without changing the natural flow regime
- Open-bottomed or embedded into the stream bottom to maintain natural substrate and water depth

The NYS DEC also provides some basic stream crossing standards to support practical, effective and long-term solutions for protecting and restoring stream continuity. Ideal crossings are “invisible” to fish and wildlife. Bridges, open-bottom arches/culverts with sufficient span, and embedded box/pipe culverts with sufficient span are typically the best approaches. Below is a summary of the NYS DEC crossing standards:

Types of Crossings

- Structures should be placed in straight, unobstructed, well-defined stream reaches, and in straight, flat areas where streambed/bank characteristics can be easily replicated. Avoid wetlands when possible. Preferred crossing types, in descending order of preference, are:
 - Open-bottom arches (typically installed on concrete footings)
 - Box culverts (typically pre-cast concrete)
 - Arch or elliptical/squash culverts (metal, concrete, or plastic)
 - Circular culverts (metal, concrete or plastic)
- If a box or pipe culvert must be used, it should be:
 - Embedded to at least 20% of the culvert height on the downstream side
 - Used only on streams with slopes no steeper than 3% grade
 - Installed level

Capacity/Size

- Structure width should be 1.25 times the normal width of the streambed, and the capacity should accommodate high flows.

Length and Side Slopes

- Road and shoulder widths should be the minimum size necessary, and side slopes should be as steep as possible without compromising the structure and to minimize the length of the structure. A side slope grade of 2:1 is typically the steepest grade that can be vegetated.

Width

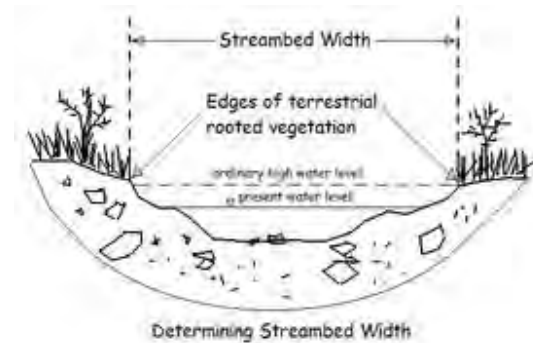
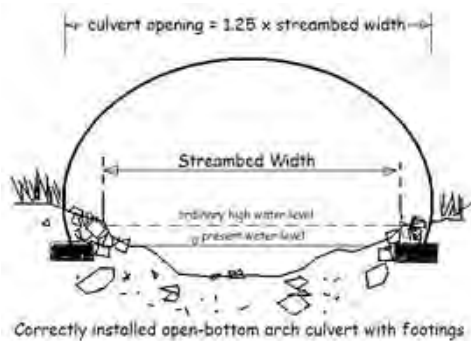
- The crossing opening, regardless of shape, should be at least 1.25 times the width of the stream channel bed, as measured from bank to bank at the ordinary high water level or edges of terrestrial, rooted vegetation

Depth and Velocity

- These should both match the natural stream channel during low flows

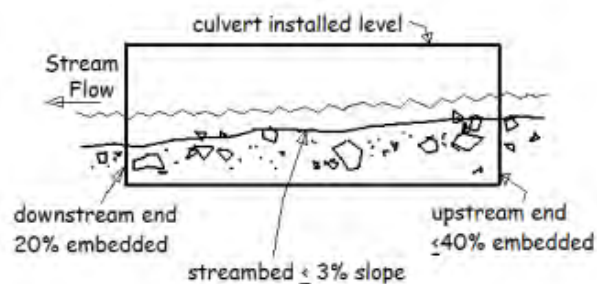
Substrate

- Use natural substrate inside the crossing to match the rest of the stream channel. Substrate should resist displacement during floods



Installation

- Install culverts “in the dry” (may require piping, pumping, and/or use of cofferdams; duration of dewatering should be minimized).
- Closed-bottom culverts should have a streambed slope of less than 3% and the culvert should be installed level with at least 20% of the vertical rise embedded at the downstream invert.



Erosion Control

- Use rip rap as headwall protection to prevent scouring
- Control erosion and sediment with silt fencing, straw bales, etc. parallel to the stream (include these in projects plans)
- Minimize streambed and bank disturbance, and restore bed and bank to pre-construction conditions after crossing is installed.

Timing

- Instream work should generally occur during low flow conditions between June and September in order to minimize water quality and fisheries impacts. Contact the regional DEC office in the county of the project for more details.

Maintenance

- Crossings should be maintained—e.g. checked for structural deficiencies including undermining and debris buildup—at least once a year before high spring flows.

Permitting

- A NYS DEC permit is necessary for construction in:
 - All streams with water quality classifications of AA (drinking water), A (drinking water) or B (swimming and contact recreation), or C (fisheries and non-contact recreation), as well as those with a standard of (T), indicating that a stream supports a trout population, or (TS), for trout spawning (ECL Article 15-0501),
 - All navigable waters (ECL Article 15-0505),
 - NYS DEC regulated freshwater wetlands outside of the Adirondack Park (wetlands inside the Park are regulated by the Adirondack Park Agency; ECL Article 24).

Other potential permitting agencies include the Adirondack Park Agency and the U.S. Army Corps of Engineers. Contact the appropriate regional DEC Environmental Permits office, depending on which county the project is in. Other permits and approvals may also be necessary from other agencies, county or town government, etc.

Flood Risk Guidelines

In June 2018, the NYS DEC released the *New York State Flood Risk Management Guidance for Implementation of the Community Risk and Resiliency Act*¹³ for a public review period. The document was developed under the Community Risk and Resiliency Act (CRRRA) and is intended to mitigate future physical climate risk related to sea-level rise, storm surges, and flooding in New York. Applicants for projects involving new or replacement structures on roadways crossing inland streams, should demonstrate consideration of the higher of the following flood-risk management guidelines as part of a comprehensive risk-management approach¹⁴:

*Critical*¹⁵ Bridges

- The vertical flood elevation and corresponding flows that result from increasing current, relevant peak flows, e.g., Q₅₀, to account for projected peak flows for the full, expected

¹³ New York State Department of Environmental Conservation. (2018). *New York State Flood Risk Management Guidance for Implementation of the Community Risk and Resiliency Act*. Retrieved from https://www.dec.ny.gov/docs/administration_pdf/nysfrm.pdf

¹⁴ All the listed guidelines are for structures in nontidal areas. Structures in tidal areas should incorporate a range of sea-level rise projects, including the highest project.

¹⁵ Critical transportation infrastructure includes structures to which any of the following apply:

- 1) Transportation asset provides sole access to any of the following facilities and practical detour routes are not available in case of loss or closure of the asset: facilities designed for bulk storage of chemicals,

service life of the infrastructure, and adding at least two feet of bridge freeboard. An additional foot of bridge freeboard should be considered for critical bridges. The projected Q_{100} flow should pass below the lowest chord without going into pressure flow.

Non-critical bridges

- The vertical flood elevation and corresponding flows that result from increasing current, relevant peak flows, e.g., Q_{50} , to account for projected peak flows for the full, expected service life of the infrastructure, and adding two feet of bridge freeboard. The projected Q_{100} flow should pass below the lowest chord without going into pressure flow.

Culverts on Critical Roadways

- The vertical flood elevation and corresponding flows that result from increasing current, relevant peak flows, e.g., Q_{50} , to account for projected peak flows for the full, expected service life of the infrastructure, and that allow the culvert to fully pass the design flood without increasing headwater and that provide at least two feet of roadway freeboard above the projected Q_{100} flood. An additional foot of roadway freeboard should be considered for culverts on critical roadways.
- The vertical flood elevation and corresponding flows resulting from the 0.2-percent annual chance flood.

Culverts on Non-Critical Roadways

- The vertical flood elevation and corresponding flows that result from increasing current, relevant peak flows, e.g., Q_{50} , to account for projected peak flows for the full, expected service life of the culvert, and that provide at least two feet of roadway freeboard above the projected checkflow.

Green Stormwater Infrastructure

With the rapid increase of impervious surfaces through urbanized areas, the implementation of green infrastructure can play a vital role in reducing flood risk to road-stream crossings. Green infrastructure practices can include; rain gardens, rooftop disconnects, bio-retention areas and basins, vegetated swales, pervious surfaces, rain cisterns and green roofs. All these techniques are geared towards the common goal of reducing stormwater runoff and allowing precipitation to recharge groundwater storage naturally. These techniques work best when installed in heavily developed areas where impervious cover is high and the density of road-stream crossings is great. During heavy precipitation events the peak high water will become lower and sustain for a greater duration due to these practices. This will benefit road-stream crossings and the infrastructure/people that live around them by minimizing the flood risk and possible costly

hospitals/rest homes/correctional facilities/dormitories/patient care facilities, major power generation, transmission or substation facilities, major communications centers, major emergency service facilities.

- 2) Transportation asset is part of a designated evacuation route.

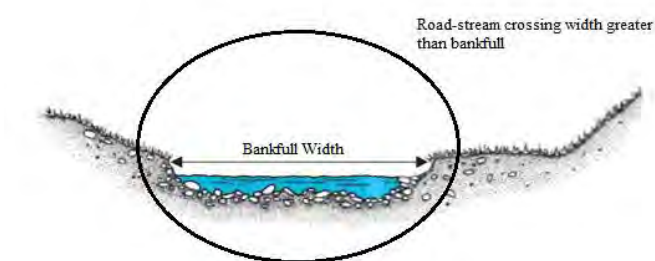
damage that could occur. By funding green infrastructure projects, money will be saved in the way of damaged crossings, infrastructure and personal injury that could all result from a failed and/or flooded road-stream crossing.

Relationship between flood resilience and habitat continuity at road-stream crossings

A road-stream crossing deemed impassable to aquatic and terrestrial life is also likely to be at risk during flood events. When faced with excessive flows barrier structures may constrict and back up water, cause the stream to avulse (abandon the stream channel and create a new channel), and/or fail; potentially causing damage to the road-stream crossing, associated roadbed, and neighboring property. Conversely, the characteristics which make a structure passable to fish and wildlife also make it resilient to floods.



Road failure at a 3-m culvert placed within a 6-m bankfull width stream, GMNF



Barrier road-stream crossings are often undersized for the streams they are designed to pass. The U.S. Forest Service's Stream Simulation Design protocol recommends that the minimum width of a culvert should be at least the bankfull width of the reference stream channel¹⁶. In New York, the NYS DEC

recommends that structures are at least 1.25 times the bankfull width of a natural reach in the stream. In Connecticut, the Department of Energy and Environmental Protection recommends that culvert width should span at least 1.2 times the bankfull width of the stream¹⁷ and neighboring Massachusetts recommends the same minimum dimension in its River and Stream Crossing Standards¹⁸. This recommended structure width, along with other Stream Simulation

¹⁶ Stream Simulation Working Group. (2008). *Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings*. San Dimas Technology and Development Center: U.S. Department of Agriculture, Forest Service, page 3-2.

¹⁷ Connecticut Department of Environmental Protection Inland Fisheries Division. (2008). *Stream Crossing Guidelines*. Retrieved from: <https://www.ct.gov/deep/lib/deep/fishing/restoration/StreamCrossingGuidelines.pdf>

¹⁸ River & Stream Continuity Partnership. (2012). *Massachusetts River & Stream Crossing Standards*, pg.10.

Design principles, will generally allow for the conveyance of flood-level flows, natural sediment transport patterns, and the passage of fish and wildlife.

During storm events floodwaters may exceed the hydraulic capacity of undersized culverts causing the stream to overtop the structure. This is especially true if wood and debris accumulations clog the inlet of the culvert, reducing its capacity to convey flows and sediment. Many times this debris is not much larger than the diameter of the culvert and often not exceeding the bankfull width of the stream channel. These issues related to inlet clogging during high flows can be resolved by utilizing design principles mentioned above. Stream simulation channels, like that of a natural stream channel, are able to adjust dimensions through substrate movement and accommodate a wide range of flows as well as sediment and debris inputs. This process is able to happen while allowing for the movement of fish and wildlife. Many hydraulically designed structures are unable to handle the amount of water and debris during larger storms in addition to acting as barriers to aquatic organisms.

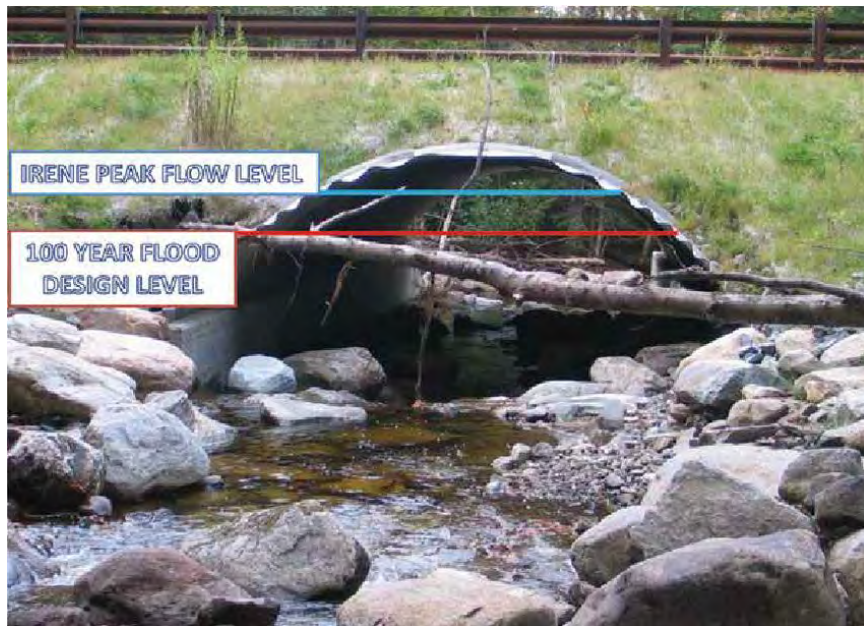
In the summer of 2011 Tropical Storm Irene dramatically impacted our region, rising rivers to record levels and causing considerable infrastructure damage across the northeast. The upper White River watershed of Vermont was hit particularly hard during the storm. The White River is Vermont's fourth largest subbasin and a major tributary to the Connecticut River. Between 2004 and 2007 the Vermont Fish and Wildlife Department assessed road-stream crossings throughout the state. Only 5% of these structures allowed for full passage of aquatic organisms and nearly 91% of structures significantly constricted the natural stream channel (a structure width to bankfull width ratio of less than 0.75). Of the 43 culverts surveyed in the upper White River watershed 15 failed during Irene¹⁹. All of these structures provided either reduced or no aquatic organism passage (AOP) and had culvert widths less than bankfull (an average culvert width-bankfull ratio of 0.54).

Nearby, in the Green Mountain National Forest, two Stream Simulation Design crossings had been installed before the 2011 storm. These culverts not only provided fish and wildlife passage, but survived Tropical Storm Irene and needed no follow-up maintenance. The previous structures at these sites were identified by U.S. Forest Service staff as barriers to eastern brook trout and other aquatic organisms. The hydraulically designed structures were also flagged as risks for debris accumulation and potential failure during flood events. The survival of the replacement structures designed for fish and wildlife passage highlights the dual benefit of stream simulation principles as compared to that of the traditional hydraulic design approach. In short, road-stream crossings built with the intention of restoring stream connectivity also provide flood resiliency.

¹⁹ Gillespie, N., Unthank, A., Campbell, L., Anderson, P., Gubernick, R., Weinhold, M., ... Kirn, R. (2014). Flood Effects on Road-Stream Crossing Infrastructure: Economic and Ecological Benefits of Stream Simulation Designs. *Fisheries*, 39(2), 62–76.



Double-barrel hydraulically designed culvert on Jenny Coolidge Brook, Green Mountain National Forest, VT

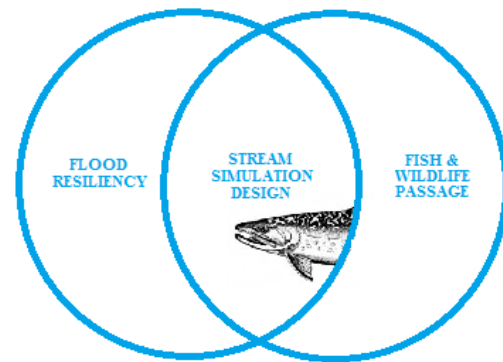


Replacement open bottom arch structure utilizing Stream Simulation Design after Tropical Storm Irene. Notice that there was no damage to the structure or road caused by the storm.

There are many other examples of AOP structures proving their flood resilience throughout the region. In the summer of 2003 a double box culvert catastrophically failed on Bronson Brook, a tributary of the Westfield River in Worthington, MA. This undersized crossing (structure-to-bankfull ratio of 0.67) was previously identified as a barrier to fish and wildlife. After its failure the culvert was replaced with an arch design that allowed for the movement of eastern Brook

Trout and other species. This replacement structure and adjacent roadway has survived several major storms without damage, including Irene²⁰.

In 2014 the United States Geological Survey conducted a hydraulic assessment of existing culverts with alternative stream crossing designs in Massachusetts. These alternative structures were designed with Aquatic Organism Passage (AOP) in mind and followed many of the Stream Simulation Design principles. Of the seven sites assessed five of the existing structures were modelled to fail during the 50-year flood interval. None of the structures incorporating AOP design principles failed at that interval. On the extreme end, all existing structures failed during the 500-year flood, while only two of the AOP crossings failed to withstand those floodwaters²¹.



There is a strong correlation emerging between road-stream crossings that allow for fish and wildlife passage and greatly improved flood resiliency. The many considerations of Stream Simulation Design allow for rivers and streams to behave and respond through a structure as if it were not there; in turn reducing the damage caused during flood events and the maintenance needed after a storm.

²⁰ Gillespie, N., Unthank, A., Campbell, L., Anderson, P., Gubernick, R., Weinhold, M., ... Kirn, R. (2014). Flood Effects on Road-Stream Crossing Infrastructure: Economic and Ecological Benefits of Stream Simulation Designs. *Fisheries*, 39(2), 62-76.

²¹ Zarriello, P. J., & Barbaro, J. R. (2014). *Hydraulic Assessment of Existing and Alternative Stream Crossings Providing Fish and Wildlife Passage at Seven Sites in Massachusetts* (Scientific Investigations Report 2014-4146). U.S. Department of the Interior, U.S. Geological Survey.

V. Plan Development Process Summary

Field Assessments

The first step in developing a town-scale road stream crossing management plan is a comprehensive field assessment of all bridges and culverts in town. These stream crossing surveys entail collecting information about the stream channel and the crossing structure itself, which later help determine if crossings are barriers to fish and wildlife. Road-stream crossings were evaluated using the protocol developed by the North Atlantic Aquatic Connectivity

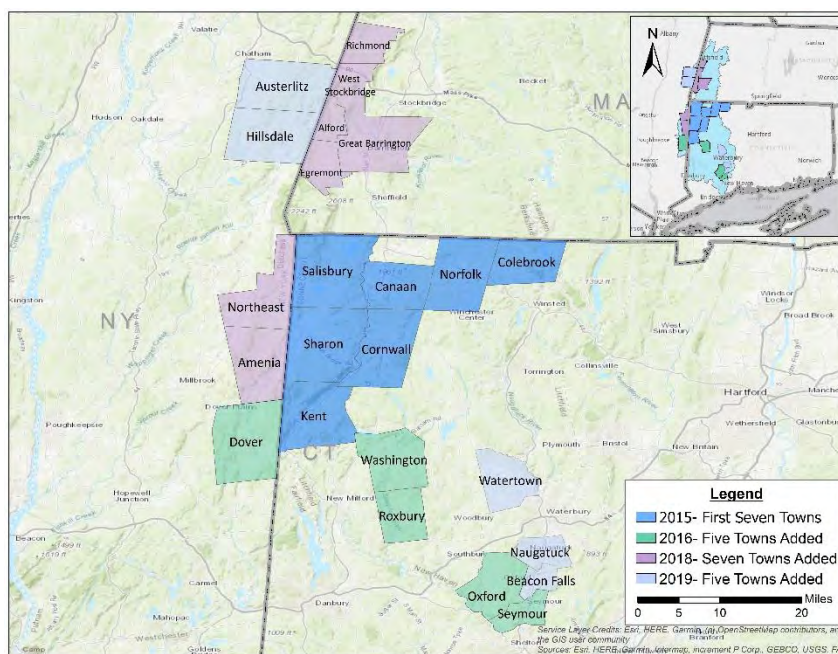
Collaborative (NAACC); a

partnership of universities, conservation organizations, and state and federal agencies focused on improving aquatic connectivity across a region spanning West Virginia to Maine.²² Materials related to data collection using the NAACC protocol are included in Appendix A.

Following collection, this information is logged into a region-wide database (www.streamcontinuity.org/cdb2). After being input each crossing is assigned an “aquatic score” ranging from 0 (worst rating) to 1. This number is essentially a ranking on how well the crossing performs related to aquatic habitat continuity. Each crossing is also assigned a “terrestrial passability score” which represents the structure’s suitability for passage of terrestrial organisms that may use streams and their banks as travel corridors.

Flood Risk Modeling

This study included an analysis of flood risk at all non-bridge structures (i.e., culverts) in the Town of North East. Using a surface water runoff model developed by Dr. Emmanouil Anagnostou and Dr. Xinyi Shen at the University of Connecticut’s Civil and Environmental



Current HVA Road-Stream Crossing Management Plans project towns

²² NAACC (North Atlantic Aquatic Connectivity Collaborative). 2014. <https://www.streamcontinuity.org/> (Accessed April 2018).

Engineering Department (UConn)²³ in combination with HVA's field data, this analysis predicts when a culvert will fail (indicated by water overtopping the road) during floods of different magnitudes. UConn's runoff model provides peak flows for the 2-, 5-, 10-, 25-, 50-, and 100-year flood events at each culvert, which are then combined with HVA's field data in a hydraulic model. The hydraulic model is used to determine stage height for each peak flow; this is then compared with road fill height to determine pass/fail. Protocols for field data collection and a description of UConn's methods are included as Appendix B.

Road-Stream Crossing Inventory documents

A comprehensive Road-Stream Crossing Inventory document was then created that includes the following information: 1) Field data collected during NAACC assessments including physical measurements, photos etc., 2) Barrier status/Aquatic Organism Passage (AOP) information from NAACC, and 3) Risk-of-Failure modeling conducted by our partners at UConn. The Town of North East's Road-Stream Crossing Inventory is included in this document in Volume 1.

Replacement Project Prioritization

Road-Stream Crossing Inventory documents were then used as the basis for a replacement project prioritization developed in collaboration with each community based on: 1) Conservation value, particularly for cold-water habitat; 2) Flood risk (understood through UConn's modeling and local knowledge of past flood events), and; 3) Condition/management priority (understood through local knowledge and NAACC assessments).

Municipal Prioritization Workshops

HVA distributed copies of the Road-Stream Crossing Inventory document to key decision makers in each town. This generally included the First Selectman and Public Works Director. These individuals were encouraged to share the documents with other key figures for comment.

HVA then held workshop meetings with each town, which included at minimum representatives from the Board of Selectmen, Public Works/Highway and Emergency Services. These meetings were guided by the following questions, developed by HVA to gather local knowledge about flood risk and maintenance need:

- Which structures regularly flood the road?
- Has water over the road or other crossing failure blocked access for Town residents to essential services, such as Fire/EMS? If not, are you aware of any crossings where failure would block access for essential services?
- Which structures require regular sediment, debris and/or ice removal?
- Are you aware of structures that are in poor condition and need to be repaired or replaced?

²³ Shen, X., & Anagnostou, E. N. (2017). A framework to improve hyper-resolution hydrological simulation in snow-affected regions. *Journal of Hydrology*, 552, 1–12.

The goal of these workshops was to identify 5-10 high priority replacement projects. The best projects were those that were prioritized based on barrier status to fish and wildlife movement, were identified as flood risks by UConn modeling and local knowledge, and were identified as needing to be replaced in the near future by the town.

Materials related to the Town of North East Municipal Prioritization Workshop are included as Appendix C.

Continuous Ranking

Finally, a ranking system was developed to rank potential replacement projects at all non-bridge structures in each town. This method was developed by Trout Unlimited and modified by HVA for this project. Ranked metrics included: Barrier Significance class, Hydraulic Capacity, Geomorphic Compatibility, Crossing Condition, Critical Linkages (when available)²⁴, and Town Priority. More details on the Continuous Ranking rubric are included as Appendix D.

²⁴ Critical Linkages Project. (2013). Conservation and Assessment Priority System. University of Massachusetts. Amherst, MA.

VI. Resources for Addressing Problem Crossings

This project identifies crossings that are both barriers to fish passage, are in poor condition, *and* pose a risk of flooding. With all of this information in hand, backed up by regional data, towns seeking funding to implement new designs can access funding sources that may not otherwise be available. Below is an overview of some existing programs that can help fund construction projects that address flood risk and/or habitat connectivity issues.

New York Grant Programs

Bridge New York Program

- Overview: This program provides assistance for local governments to rehabilitate and replace bridges and culverts statewide. The program is administered by the NYS Department of Transportation. The program emphasizes projects that address poor structural conditions; mitigate weight restrictions or long detours; facilitate economic development or increase competitiveness; and/or reduce the risk of flooding
- Award Size: \$100,000 to \$1 million
- Who is Eligible: Municipalities that can administer state funding
- Application Period:
- Website: <https://www.dot.ny.gov/divisions/engineering/structures/bridgeny>

Hudson River Estuary Program

- Overview: The New York State Department of Environmental Conservation provides funding through the Hudson River Estuary Program to implement priorities outlined in the Hudson River Estuary Action Agenda aimed at conserving or improving clean water; fish, wildlife and their habitats; waterway access; the resiliency of communities; and river scenery. These opportunities are announced as Hudson River Estuary Grants Program Request for Applications (RFAs) or as New England Interstate Water Pollution Control Commission Request for Proposals (RFPs).
- Average Award Size: \$10,000 to \$750,000 over two years
- Who is Eligible: Governmental entities, municipalities, and quasi-governmental entities (a local public authority or public benefit corporation, a county, city, town, village, or Indian tribe or nation residing within New York State, municipal corporations, soil and water conservation districts, school districts, community colleges, or any combination thereof), and not-for-profit corporations with a 501(c)(3) designation. Projects eligible for state assistance must be located within the Estuary Watershed Boundary (see website for details)
- Application Period:
- Website: <http://www.dec.ny.gov/lands/5091.html>

New York Climate Smart Communities Grant Program

- Overview: The Climate Smart Communities Grant Program is a competitive 50/50 matching grant program for municipalities. It was established in 2016 under Article 54, Title 15 of Environmental Conservation Law, an excerpt of which is below. The program funds climate change adaptation and mitigation projects and includes support for projects that are part of a strategy to become a Certified Climate Smart Community
- Award size: Up to \$200,000 for Implementation projects (adaptation and non-power mitigation) and up to \$100,000 for Certification projects (assessments and planning activities)
- Who is eligible: Any county, city, town, borough, village in the state of New York
- Application period: Due in July
- Website: http://www.dec.ny.gov/docs/administration_pdf/cscgrantsgeneral.pdf

Local Waterfront Revitalization Program

- Overview: Funding to advance the preparation or implementation of strategies for community and waterfront revitalization through the following grant categories:
 - Preparing or Updating a Local Waterfront Revitalization Program (LWRP)
 - Preparing an LWRP Component, including a Watershed Management Plan
 - Updating an LWRP to Mitigate Future Physical Climate Risks
 - Implementing a Local Waterfront Revitalization Program or a completed LWRP Component
- Award size: Variable, up to \$2 million
- Who is eligible: Villages, towns, or cities and counties (with the consent and on behalf of one or more villages, towns, or cities) which are located along New York's coasts or inland waterways as designated pursuant to Executive Law, Article 42.
- Application period: Due in July
- Website: https://www.dos.ny.gov/opd/grantOpportunities/epf_lwrpGrants.html

National Grant Programs

National Fish and Wildlife Foundation's (NFWF) Bring Back the Natives grant program

- Overview: The Bring Back the Natives program invests in conservation activities that restore, protect and enhance native populations of sensitive or listed fish species across the United States, especially in areas on or adjacent to federal agency lands. The program emphasizes coordination between private landowners and federal agencies, tribes, corporations, and states to improve the ecosystem functions and health of watersheds. The end result is conservation of aquatic ecosystems, increase of in-stream flows, and partnerships that benefit native fish species throughout the United States. Priority habitats/species include native fish of the eastern U.S. rivers, including resilient populations of eastern brook trout. One of the priority activities targeted by this program

is *restoring connectivity*, i.e., the removal of culverts and passage barriers or flow restoration to connect fish to key spawning, rearing and refuge habitats.

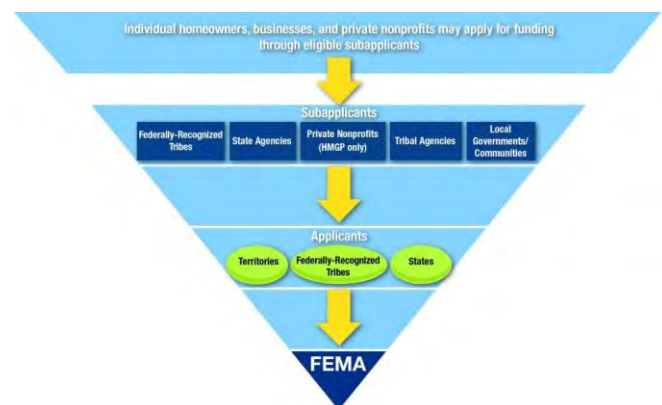
- Average award size: \$50,000 to \$100,000 (1:1 match requirement)
- Who is eligible: Local, state, federal, and tribal governments and agencies (e.g., townships, cities, boroughs), special districts (e.g., conservation districts, planning districts, utility districts), non-profit 501(c) organizations, schools and universities.
- Application period: Pre-proposal due date is mid-July; full proposal due date is early September
- Website: <http://www.nfwf.org/bbn/Pages/home.aspx>

FEMA Hazard Mitigation Grant Program (HMGP)

- Overview: The purpose of HMGP is to help communities implement hazard mitigation measures following a Presidential Major Disaster Declaration in the areas of the state, tribe, or territory requested by the Governor or Tribal Executive. The key purpose of this grant program is to enact mitigation measures that reduce the risk of loss of life and property from future disasters.
- Average award size: Amount available is dependent on the disaster; FEMA can fund up to 75% of the eligible costs of each project. (25% match requirement which include a combination of cash and in-kind sources)
- Who is eligible: Individuals, businesses and private nonprofits via local governments
- Application period: Dependent on the disaster
- Website: <https://www.fema.gov/hazard-mitigation-grant-program>

FEMA Flood Mitigation Assistance (FMA) Program

- Overview: Provides funding to States, Territories, federally-recognized tribes and local communities for projects and planning that reduces or eliminates long-term risk of flood damage to structures insured under the NFIP. FMA funding is also available for management costs. FEMA requires state, tribal, and local governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for HMA mitigation projects.
- Who is eligible: Generally, local communities will sponsor applications on behalf of homeowners and then submit the applications to their State. All FMA grant applications must be submitted to FEMA by a State, U.S. Territory, or federally-recognized tribe.
- Application Period: Generally, October to January



- Website: <https://www.fema.gov/flood-mitigation-assistance-grant-program>

NOAA Community-based Restoration Program Funding

- Overview: NOAA's Restoration Center recognizes that habitat protection and restoration are essential elements of a strategy for sustainable commercial and recreational fisheries. Investing in habitat restoration projects leads to real, lasting differences for communities, businesses, and the environment. The Community-based Restoration Program supports restoration projects that use a habitat-based approach to rebuild productive and sustainable fisheries, contribute to the recovery and conservation of protected resources, promote healthy ecosystems, and yield community and economic benefits. Restoration includes activities that return degraded or altered marine, estuarine, coastal, and freshwater, migratory fish habitats to functioning conditions, and techniques that return NOAA trust species to their historic habitats.
- Award Size: \$75,000 to \$3 million (1:1 match encouraged)
- Who is Eligible: Eligible applicants are institutions of higher education, non-profit organizations, for profit organizations, foreign public entities and foreign organizations, and state, local and Indian tribal governments.
- Application Period: Pre-proposals due in January, Full proposals due in April
- Website: <https://www.fisheries.noaa.gov/grant/coastal-and-marine-habitat-restoration-grants>

Patagonia World Trout Initiative

- Overview: The World Trout Initiative funds only groups and efforts working to restore and protect wild, self-sustainable trout, salmon and other fish species within their native range. We believe that the best way to accomplish this over the long term is by ensuring that populations have high-quality habitats and adequate stream flows, can migrate between habitats without human intervention, are not negatively impacted by hatchery and aquaculture operations, have protection from harmful non-native species and disease, and are not overharvested. We look for innovative groups that produce measurable results and work on long-term solutions to root causes of the problem. Proposed projects should be quantifiable, with specific goals, objectives and action plans, and should include measures for evaluating success. Funding priorities applicable to road-stream crossings include projects that restore native river habitats, ensure in-stream flows that mimic natural stream flows, and provide unassisted fish passage (without human intervention) to and from historically accessible habitats; we give priority to long-term, low-maintenance and natural channel solutions
- Award Size: \$5,000-\$15,000
- Application Period: Generally, accepts application throughout the fiscal year (May 1 to April 30)
- Website: <http://www.patagonia.com/world-trout-initiative.html>

Trout Unlimited Embrace-a-Stream Matching Grant Program

- Overview: Embrace A Stream (EAS) is a matching grant program administered by TU that awards funds to TU chapters and councils for coldwater fisheries conservation. Project priorities include those that help restore stream habitat, improve fish passage, and protect water quality.
- Average award size: Approximately \$4,200
- Application Period: Contact your regional EAS representative with intent to submit a proposal by April 15; Initial drafts of proposals due May 15; Final applications due July 1
- Website: www.tu.org/conservation/watershed-restoration-home-rivers-initiative/embrace-a-stream

Capital Planning for Infrastructure Resilience

Capital planning can help link a town's budget with its long-term improvement goals, leading to programs that prioritize projects and optimize financing. Capital planning happens at both the state and local level, and is an important tool for financing priority road-stream crossing replacement projects that will improve infrastructure resiliency. The road-stream crossing inventory provided here, in conjunction with local and state information, provides critical information for Public Works Departments and Boards of Selectmen to identify road-stream crossings to include in capital planning efforts.

Other state agencies and programs provide helpful guidelines for capital planning related to road-stream crossing replacements and flood resiliency. The Flood Ready Vermont program²⁵, for example, provides key content for helping municipalities update their municipal, capital, hazard mitigation, and emergency operations plans with an eye for flood resiliency.²⁶ The U.S. Federal Emergency Management Agency (FEMA) also provides helpful resources for integrating flood resiliency into local planning efforts, including not just capital planning, but also general planning, zoning ordinances, economic development strategies, and much more.²⁷ Federal regulations require that local hazard mitigation plans describe how localities will integrate the plan's requirements into other planning mechanisms. Doing so for capital planning can help leverage funds to ensure that public money for capital improvements are consistent with hazard mitigation goals.

²⁵ Flood Ready Vermont. More information at:

http://floodready.vermont.gov/update_plans/municipal_plan/capital_program

²⁶ Flood Ready Vermont. "Update Your Plans". Retrieved from: http://floodready.vermont.gov/update_plans

²⁷ FEMA. *Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials*. (2013). https://www.fema.gov/media-library-data/20130726-1908-25045-0016/integrating_hazmit.pdf

Federal, State, Regional Technical Assistance and Important Contacts

Technical assistance is a key element for successful road-stream crossing surveys and replacement efforts. Various agencies and individuals have provided key insight for this project, and others are available to help take this information to the next level. Below is an overview of the federal, state, and regional groups available for technical assistance related to road-stream crossing projects:

Federal



State



**New York State
Department of
Transportation**

Regional



VII. Conclusion

In a time of environmental reform, most New York residents support the notion that we must protect our natural ecosystem while adapting to an increasing population and growing economy. As motorized transportation becomes more and more necessary we must not let it get in the way of protecting habitat and wildlife adjacent to our roadways. With the growing infrastructure it is imperative that scientists, engineers, and construction professionals work together to create design standards that benefit the environment as well as the cost of production.

The recent programs brought about by the North Atlantic Aquatic Connectivity Collaborative (NAACC) and UConn aim to make stream crossings more sustainable to both the structure itself and the environment it encompasses. Although the means of stream crossing construction and conservation of habitat and wildlife have drastically improved over the years, there is still room for advancement. This starts with the education of the public about what they can do to reduce their impact and increase their awareness on this issue.

This document is intended for such that. Establishing awareness about stream crossings and river continuity, along with the introduction of new standards and best management practices allow town and state agencies to exercise their role in conserving and recovering stream continuity throughout New York.

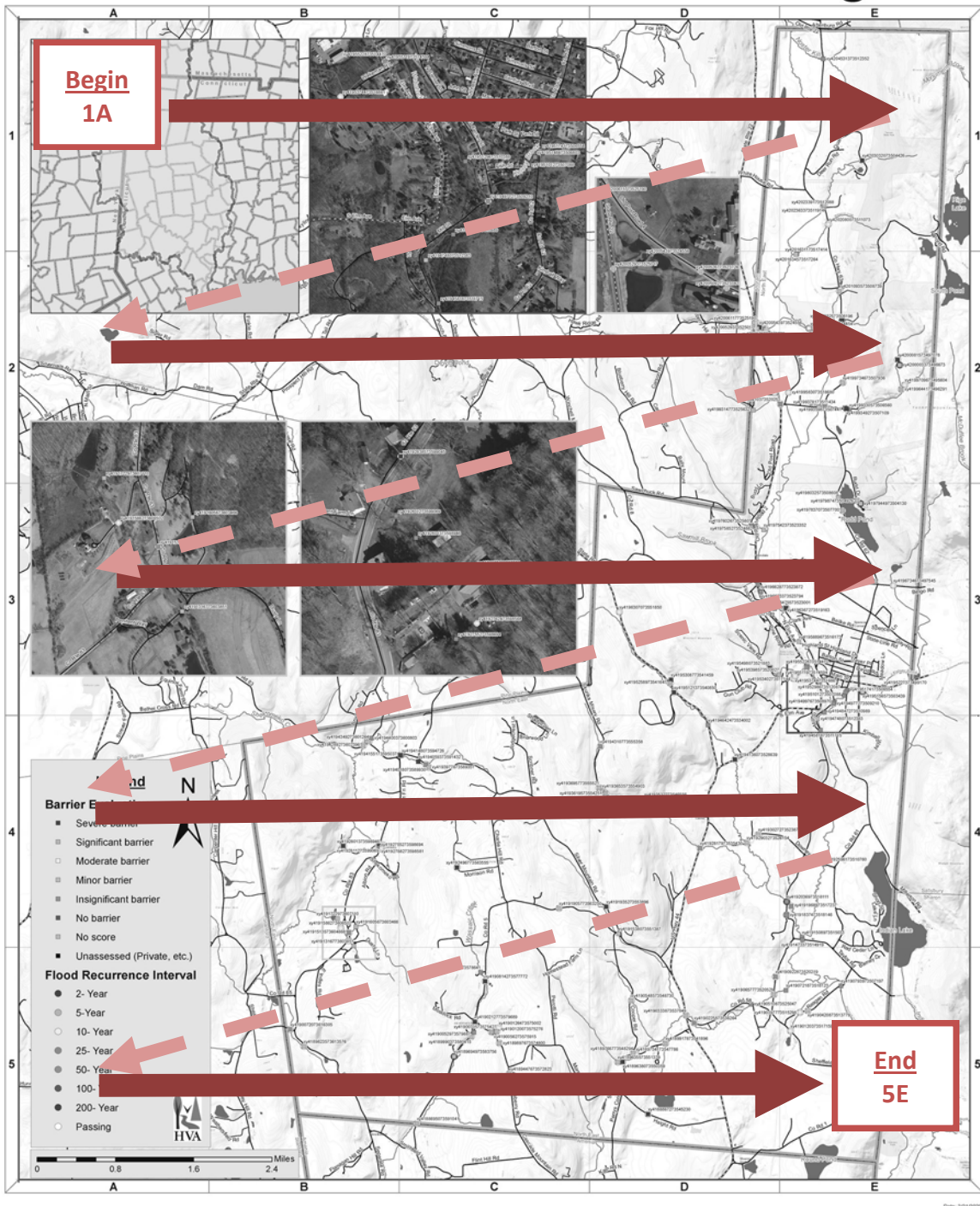
Road-Stream Crossing Inventory

Reference Map(s)

A Note on Organization

In each section of the Inventory (i.e. Town, County, State, Private/Other), crossings are organized based on their location on the Reference Map. Each section begins with crossings in 1A, and ends with 5E. See diagram below:

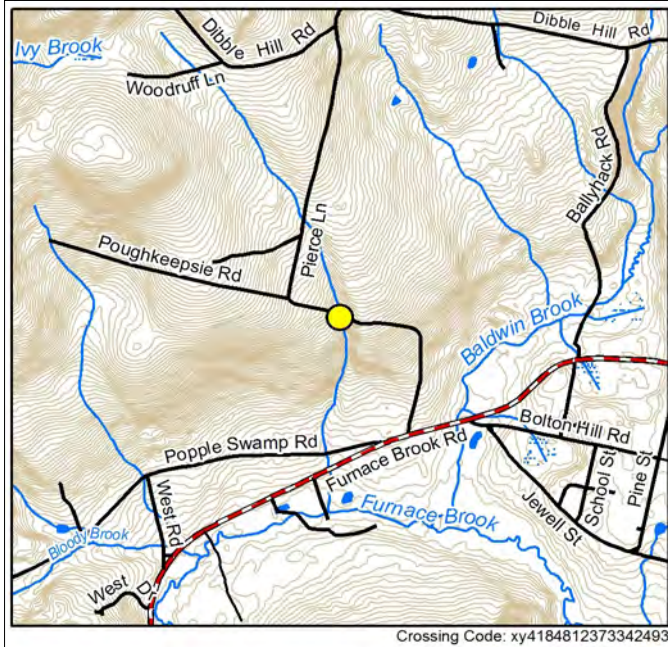
North East Road-Stream Crossings



Interpretive Guide

Road: Pierce Lane

Stream: Unnamed



Results

Barrier Evaluation: Severe barrier
Aquatic Organism Passage Score:
Habitat Restoration Rank: Ranked
Town Comments on Condition/Maintenance:
TBD
Overall Ranking: x out of x town structures

Location

Coordinates: 41.84828, -73.34254
Location Description: Telephone pole 4886-4887
Date Observed: 2015-07-30
Crossing Code: xy4184812373342493

Stream and Crossing

Upstream



Crossing Characteristics

Crossing Type: Culvert
Number of structures/cells: 1
Condition: OK
Constriction: Severe
Alignment: Flow-Aligned
Internal Features/Structures: None

Downstream



Stream Characteristics

Scour Pool: Large
Bankfull Width (feet): 12
Water Depth/Velocity Matches Stream: Yes/Yes
Structure Substrate Type: Cobble
Structure Substrate Matches Stream? Comparable

Crossing Comments: Old stonewall/dam impounding channel upstream.

ROAD: The road that the crossing is on.

STREAM: The waterway that passes through the crossing.

RESULTS

Barrier Evaluation: A description of how severe of a barrier the crossing is to fish and wildlife passage.

Aquatic Organism Passability Score: A score representing how easily an aquatic organism could pass through the structure (0=unpassable, 1= easily passable)

Habitat Restoration Rank: Developed by trout and conservation experts at a meeting hosted by HVA in July 2016.

Condition/Maintenance: Information about scheduled maintenance or replacement, *to be determined at Prioritization Meeting*

Overall Ranking: How the crossing stacks up against other town-managed structures for replacement prioritization based on its potential to reconnect habitat and its risk of failure in the event of a flood. To be determined.

LOCATION

Coordinates: GPS coordinates taken in the field.

Location Description: A brief description of landmarks or other identifying features to help locate the crossing.

Date Observed: The date the crossing was assessed for habitat continuity (format: YYYY-MM-DD).

Crossing Code: A unique 16-digit identification code assigned to each crossing based on its coordinates.

PHOTOS: Photos taken of the stream above and below the crossing.

STREAM CHARACTERISTICS

Scour Pool: The size of the pool (if there is one) at the crossing outlet. A scour pool is considered "Large" if it is twice the width and/or the depth of an average-sized pool in the stream.

Bankfull Width: This is the average width of the stream channel above which any additional water would spill out into the flood plain (for details, see the NAACC protocol). This value helps determine the Crossing Span.

Water Depth/Velocity Matches Stream: A comparison of the water depth/velocity inside of the structure with the stream channel away from the influence of the crossing.

Substrate Matches Stream: A comparison of the substrate inside the structure and the substrate in the stream channel.

Substrate Type: The dominant substrate type inside of the structure.

Substrate Coverage: The extent of the substrate inside the crossing structure as a continuous layer across the entire bottom of the structure.

CROSSING CHARACTERISTICS:

Crossing Type: This refers to the type of crossing it is, i.e. culvert, bridge, etc.

Number of structures/cells: The number of individual culverts or bridge cells that make up the crossing. Structures are numbered by looking at the inlet and counting from left to right.

Condition: The overall state of the crossing from a structural perspective, i.e. how likely it is to collapse.

Constriction: How far the crossing spans across the stream, and whether or not it constricts the stream flow.

Alignment: The crossing can be flow-aligned or skewed. A crossing is "Skewed" if the stream enters it a 45° angle or more.

Internal Features/Structures: Internal structures like baffles and weirs are listed here.

Crossing Comments: Any additional comments pertaining to the crossing or its surroundings. Additional photos are included

STRUCTURE NUMBER: This refers to the order crossings are listed in the Inventory document and can be used to look up certain structures

MAP KEY: Code to find the crossing on the Index Maps. “N” & “S”= “North” & “South”, followed by the column and row num-

ROAD

Road Photo: Taken of the road surface above the crossing structure.

Road Type/Surface: A description of the type of road and the number of lanes, where applicable.

Road Fill Height: The height (in feet) from the top of the culvert inlet to the surface of the road.

Road Ownership: The entity (town, state, private homeowner, etc.) in charge of road maintenance

Return Interval Chart: Expresses the results of flood risk modeling performed by UCONN based on historical and field data.

-**Return Interval:** A return interval of 2 years means that the river has a 1 in 2 (or 50%) chance of reaching a certain peak flow in that time frame. Likewise, a return interval of 5 years means the river has a 1 in 5 (or 20%) chance of reaching the peak flow, and so on.

-**Peak Flow:** The highest velocity at which the water is predicted to move through the crossing at a given return interval. It is expressed in cubic feet per second (cfs).

-**Road Height:** The height at which water from the stream would overtop the road.

-**Stage Height:** The maximum height that water is predicted to get in each return interval

INLET

Inlet Photo: A photo taken looking at the inlet of the crossing.

Inlet Shape: The shape of the inlet. In the UMASS protocol, this is referred to as the “Upstream/Downstream Crossing Type.”

Inlet Type: The style of the inlet that influences how water enters the inlet (e.g. headwall, wingwalls, etc.).

Inlet Grade: Where the inlet is located in relation to the stream bottom (e.g. at stream grade, perched, etc.). For UMASS assessments, this information was only collected if the inlet was perched, in which case the height of the perch is also recorded.

OUTLET

Outlet Photo: A photo taken looking at the outlet of the crossing.

Outlet Shape: The shape of the outlet. In the UMASS protocol, this is referred to as the “Upstream/Downstream Crossing Type.”

Outlet Drop/Grade: Whether or not an outlet drop is present (UMASS) or the grade in relation to the stream bottom (NAACC).

Drop to Stream Surface/Bottom: The distance (in feet) from the bottom of the structure to the surface of the water, and from the bottom of the structure to the stream bottom. This is particularly applicable to crossings that have an outlet drop.

ADDITIONAL STRUCTURE INFORMATION

Material: The type of material the structure is made out of, e.g. concrete, plastic, stone, etc.

Length (feet): To the nearest foot, measure of the length of the structure at its top.

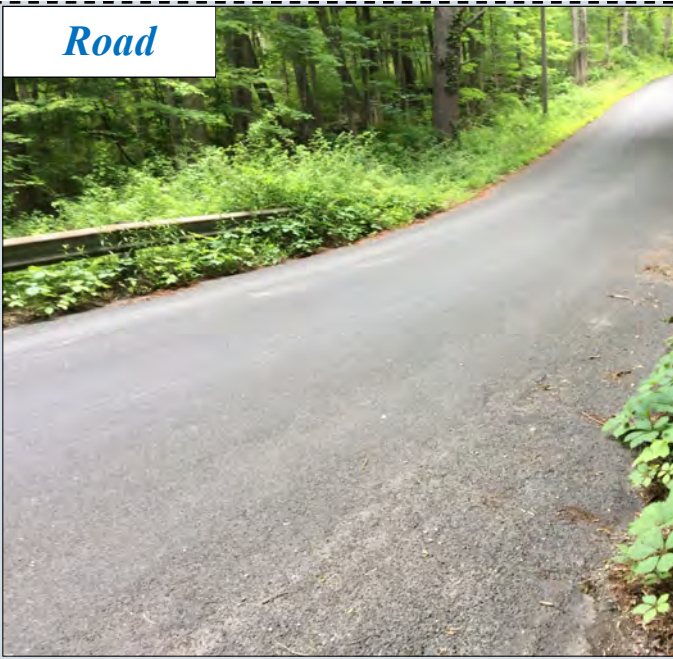
Dry Passage/Height: The average height from the dry stream back to the top of the structure directly above.

Outlet Armoring: The material placed below the outlet for the purpose of diffusing flow and minimizing scour.

Crossing Slope: The slope of the structure expressed as a percentage.

Structure Comments: Any additional comments about the structure in question.

Physical Barriers/Severity: A description of any physical barriers such as debris, grates, etc. and its severity with regards to blocking fish movement (see NAACC protocol for more details).

Road**Road**

Road Type/Surface: Paved
 Road Fill Height (feet): 4.2
 Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	32.3	7.9	0.3	No
5	45.8		0.4	No
10	57.8		0.5	No
25	76.7		0.7	No
50	93.9		1.0	No
100	113.9		1.3	No

Structure 1 of 1**Inlet****Inlet**

Inlet Shape: Round Culvert
 Inlet Type: Headwall and Wingwalls
 Inlet Grade: At Stream Grade

Outlet**Outlet**

Outlet Shape: Round Culvert
 Outlet Drop/Grade: Free Fall Onto Cascade
 Drop to Stream Surface/Bottom: 5.5/5.8

Material: Metal
 Length (feet): 30
 Dry Passage/Height: None

Physical Barrier(s)/Severity: None
 Slope (%): 3.0
 Structure Comments: None

Culvert Prioritization Results

Top 7 Crossings for Flood Risk

This chart is a summary of town and county-managed road-stream crossings with the shortest flood intervals (i.e. most likely to flood the road) based on modeling performed by the University of Connecticut. Not that only closed-bottomed structures (e.g., culverts) were modeled for risk of failure.

Photo	Flood Interval	Structure #	Road	Map Key	Crossing Code
A	2	27	Mill Road	4E	xy4193453873513191
B	2	106	Kaye Road Detour	2E	xy4200003373496673
C	2	16	Rudd Drive	3E	xy4197944973504130
D	5	24	Mill Road	4E	xy4191837473518146
E	10	52	Boston Corners Road	2E	xy4199734673507936
F	2	25	Mill Road	4E	xy4192036973518111
G	50	53	Boston Corners Road	2E	xy4200652573508196





Town Prioritization Workshop Results

May 4, 2020

HVA distributed copies of the Road-Stream Crossing Inventory document to key decision makers in Northeast., including the Town Supervisor and the Highway Supervisors for North East and Millerton. These individuals were encouraged to share the documents with other key figures for comment.

HVA then held a meeting with the town that was guided by a set of questions developed by HVA to best understand the distinct flood-risk issues at specific sites in each town. The goal of this meeting was to identify sites that were identified as risks by the town participants and determined to have a high potential for ecological restoration. Sites that exemplified the intersection of these two issues, flood resiliency and habitat restoration, were then selected in each town for further project development.

The following road-stream crossings were specifically mentioned in the North East municipal meeting. Crossings that were determined to be high priority are highlighted in gray. Meeting minutes can be found in Appendix C.

Guiding Questions:

- Q#1: Which structures regularly flood the road?
- Q#2: Has water over the road or other crossing failure blocked access for Town residents to essential services, such as Fire/EMS?
- Q#3: Which structures require regular sediment, debris and/or ice removal?
- Q#4: Are you aware of structures that are in poor condition and need to be repaired or replaced?

Photo	Structure #	Map Key	Road	Crossing Code	Notes
A	12	3E	Wakeman Road	xy4195340273517144	Cole Lawrence has observed increased frequency of flooding, about six times per summer. NAACC barrier evaluation = moderate
B	9	3E	South Center Street	xy4194997673508970	The stream takes a 90 degree turn to enter the structure; no water over the road in the past 3 years (since Cole has been around), but the situation seems to be getting worse [with the water hitting the structure as it turns]; Cole Lawrence said he hasn't had to go in and clear out debris
C	88	3E	Route 22	xy4195511973514594	Cole Lawrence densely vegetated and possibly slowing flows on the upstream end, but did not indicate that there are any issues with
D	35	5D	Perrys Corners Road	xy4189638073550359	The last section toward the outlet is pulling apart and causing the road to cave in; they have never seen it flood the road; note that this structure is a conservation priority (significant barrier)

Town Prioritization Workshop Results

May 4, 2020

Photo	Structure #	Map Key	Road	Crossing Code	Notes
E	36	5D	Perrys Corners Road	xy4189754173547786	The only issue is when the inlet gets blocked with the debris, then the water has gone over the road ~once every 5 years; Would make sense to do this structure when they do the one above, ideally within the next 5 years
F	31	5C	Morse Hill Road	xy4190063373576388	Headwall is failing; they don't have issues with flooding or debris
G	13	3E	N Center Street	xy4196367273519163	Concrete is failing; they don't have issues with flooding or debris
H	7	3D	Old post Road 2	xy4197602673525807	Poor condition, nothing left for the guiderail to attach to
I	28	5B	Sheafer Road	xy4190072073616305	There have been on-going discussions of closing the road, it is currently a town road, but there are landowners who are avid fishermen and they want to replace/remove the culvert; o Probably not worth focusing on this one because of those on-





Top Conservation Priorities

All structures ranked as significant or severe barriers to aquatic organism passage that are on town- or county-managed roads. Potential highest priorities based on conservation value are highlighted in green, as determined by being the first barrier up on a major water body or the last barrier before the headwaters. Blue highlighting indicates overlap between barrier status and flood risk.

Crossing Code	Map Index	Structure #	Barrier	Road
xy4203032073504426	1E	1	Severe barrier	Quarry Hill Road
xy4200652573508196	2E	53	Severe barrier	Boston Corners Road
xy4199350273507056	2E	4	Severe barrier	Kaye Road
xy4200081573497078	2E	107	Severe barrier	Kaye Road Detour
xy4199644173496291	2E	104	Significant barrier	Kaye Road Detour
xy4196385073518770	3E	14	Severe barrier	Beilke Road
xy4197837073507700	3E	55	Significant barrier	Rudd Pond Road
xy4193331073596181	4B	60	Severe barrier	Route 83
xy4192376273595950	4B	17	Severe barrier	Shekomeko Road
xy4191393873604909	4B	57	Significant barrier	Smithfield Road, County Road 5
xy4192838573599045	4B	59	Severe barrier	Sn Fri Road, Route 83
xy4194155173595037	4C	67	Severe barrier	McGhee Hill Road, County Road 64
xy4193532273546556	4D	69	Severe barrier	McGhee Hill Road, County Road 64
xy4191935273553896	4D	18	Severe barrier	Silver Mountain Road
xy4193453873513191	4E	27	Severe barrier	Mill Road
xy4190212773579689	5C	32	Severe barrier	Morse Hill Road
xy4190063373576388	5C	31	Significant barrier	Morse Hill Road
xy4190814273577772	5C	75	Severe barrier	Smithfield Road, County Road 5
xy4188695073591041	5C	70	Significant barrier	Smithfield Road, County Road 5
xy4189224373586691	5C	71	Significant barrier	Smithfield Road, County Road 5
xy4188867273545230	5D	33	Severe barrier	Haight Road
xy4189638073550359	5D	35	Severe barrier	Perrys Corners Road

Stream Crossings in Proximity to Vulnerable Populations

The following stream crossings were identified by Emergency Services personnel and North East Community Center (NECC) staff as being in proximity to residents who receive food, transportation, and emergency assistance through NECC. Flooding at these locations would impact NECC's ability to serve these vulnerable parts of the community.

Notes and maps from the June 4, 2021 meeting can be found in Appendix E.

Structure #	Map Key	Road	Crossing Code	Notes
12	3E	Wakeman Road	xy4195340273517144	Flooding associated with this structure exacerbates problems associated with old and failing infrastructure (e.g.. sump pumps and septic) of surrounding households—potential to cause water quality issues.
9	3E	South Center Street	xy4194997673508970	NECC is located just upstream of this crossing. Flooding here cuts off ability for NECC to provide necessary community services.
24	4E	Mill Road	xy4191837473518146	Crossing was recently upsized—putting greater pressure on downstream structure. Flooding at this location cuts off emergency access to at least two households
88	3E	Route 22	xy4195511973514594	Nearby residences served by NECC.
7	3D	Old Post Road	xy4197602673514594	Nearby residences served by NECC.

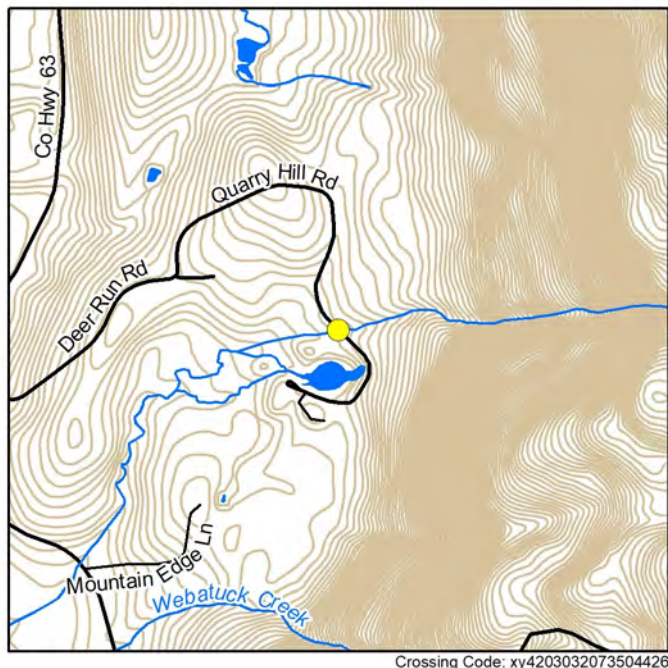
Multiple-ranked Priority Stream Crossings

The following stream crossings were ranked on at least two of the previous priority lists: conservation priority, risk of failure priority, and/or municipal priority.

Structure #	Map Key	Road	Crossing Code	Conservation Priority	Risk of Failure Priority	Municipal Priority
59	2E	Boston Corners Road	xy4200652573508196			
35	4E	Mill Road	xy4193453873513191			
24	4E	Mill Road	xy4191837473518146			
38	5C	Morse Hill Road	xy4190063373576388			
35	5D	Perrys Corner Road	xy4189638073550359			

Town-Managed Crossings

Entries are organized geographically by Map Index Key,
beginning with 1A



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.504516, 42.030392

Location Description: After 126 quarry hill Road

Date Observed: 2019-07-09

Crossing Code: xy4203032073504426

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 11.7

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 4.7

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	0.26	9.51	0.09	No
5	0.3		0.09	No
10	0.32		0.09	No
25	0.35		0.09	No
50	0.36		0.09	No
100	0.38		0.09	No

Structure 1 of 1

Material: Metal

Length (feet): 61.2

Dry Passage/Height: Yes (4.4)

Outlet Armoring: None

Physical Barrier(s) (Severity): Dry (Severe)

Slope (%): 0.03

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.4, Height: 4.8

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

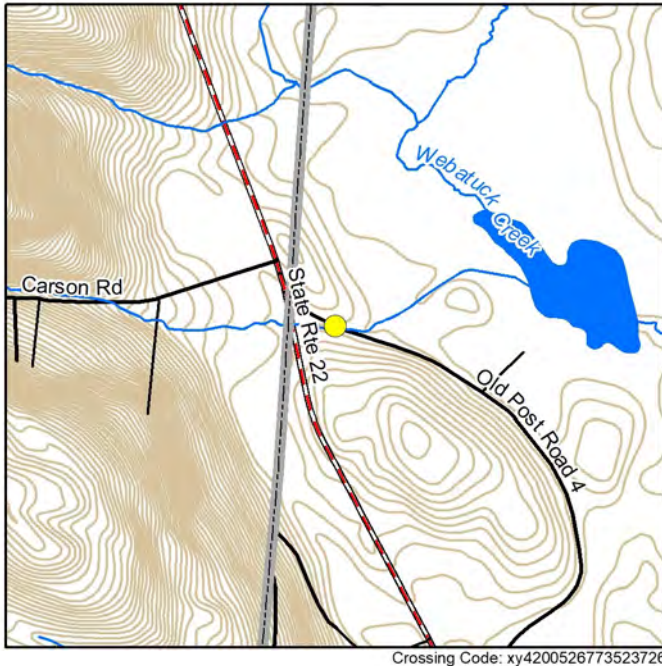
Drop to Stream Surface/Bottom: 3.3/3.3

Dimensions:

Width: 4.5, Height: 4.4

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.69

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.523707, 42.005274

Location Description: Next to mailbox ending in 6

Date Observed: 2019-07-09

Crossing Code: xy4200526773523726

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Unknown

Bankfull Width (feet): 9.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Dam at culvert 50 feet downstream unknown if scour pool would be present without dam.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.6

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	45.14	4.65	1.11	No
5	50.25		1.32	No
10	53.2		1.45	No
25	56.49		1.6	No
50	58.67		1.7	No
100	60.66		1.79	No

Structure 1 of 1

Material: Plastic
 Length (feet): 48.0
 Dry Passage/Height: No
 Outlet Armoring: None

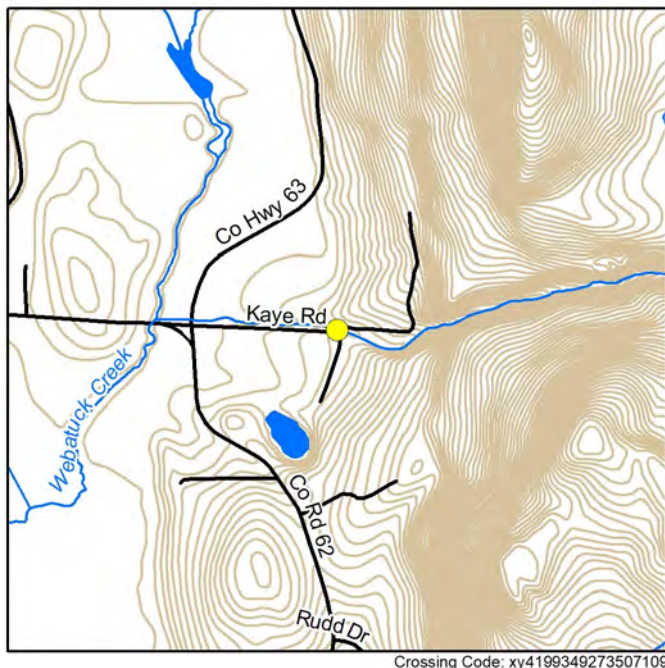
Physical Barrier(s) (Severity): None
 Slope (%): 0.03
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting
 Inlet Drop/Grade: At Stream Grade
 Dimensions:
 Width: 3.0, Height: 3.1
 Substrate/Water Width: 1.4
 Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Round Culvert
 Outlet Drop/Grade: At Stream Grade
 Drop to Stream Surface/Bottom: 0.0/0.0
 Dimensions:
 Width: 2.9, Height: 2.8
 Substrate/Water Width: 2.80
 Water Depth: 0.90



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.61

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.507079, 41.993638

Location Description: Kaye Road, near mailboxes that say 41, 44, and 87, the fourth has no address on it, in front of the larger culvert on the inlet side.

Date Observed: 2019-07-10

Crossing Code: xy4199349273507109

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

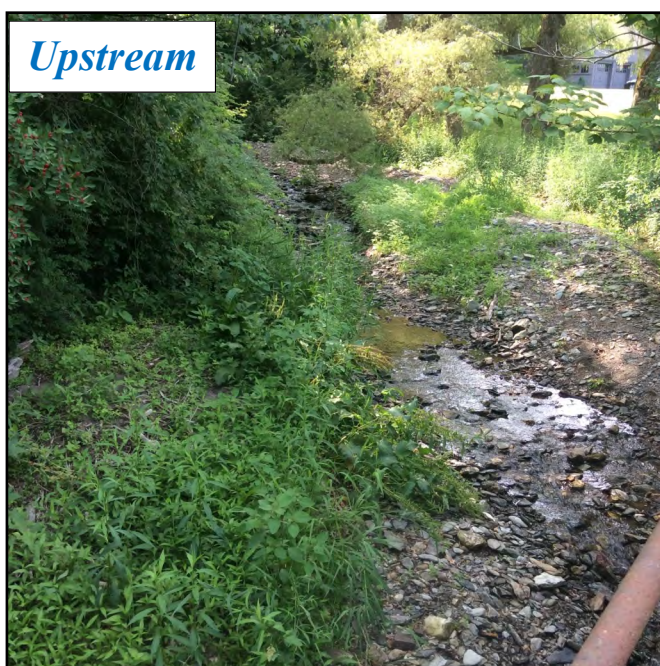
Scour Pool: None

Bankfull Width (feet): 26.0

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: This structure is basically a part of xy4199350273507056, it is the concrete structure just upstream of the other structure's inlet

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.6

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	97.54	4.2	3.2	No
5	107.89		3.42	No
10	113.85		3.54	No
25	120.5		3.67	No
50	124.92		3.76	No
100	128.95		3.84	No

Structure 1 of 1

Material: Concrete

Length (feet): 2.0

Dry Passage/Height: No

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): Other (Minor)

Slope (%): 0.09

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.2, Height: 2.6

Substrate/Water Width: 4.2

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

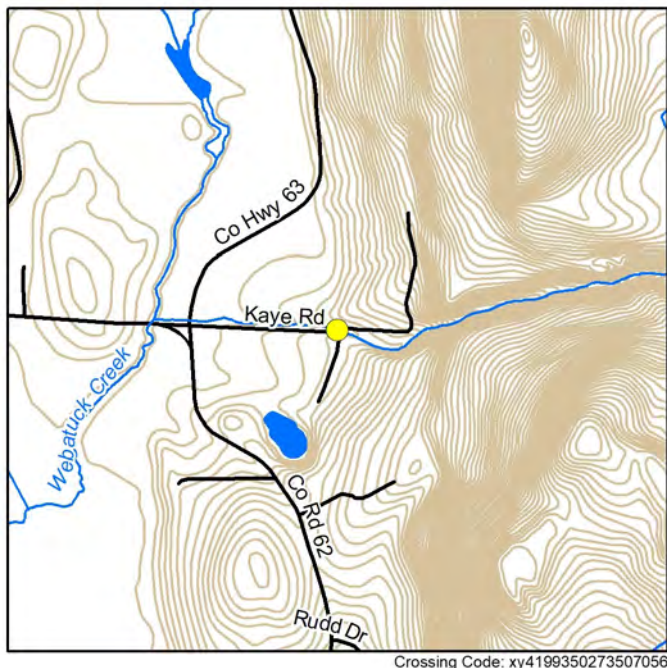
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 4.0, Height: 2.6

Substrate/Water Width: 4.00

Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score:

4.8338149540900002E-2

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.507221, 41.993537

Location Description: Kaye Road next to four mailboxes, that say 87, 41, 44, and the fourth has no address on it.

Date Observed: 2019-07-10

Crossing Code: xy4199350273507056

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 10.9

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Presence of other culvert prevented good inlet photo so I took two and put the other one as an Other photo see xy4199349273507109 for the record of the other structure just in front of the inlet

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.9

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	97.55	7.39	1.82	No
5	107.9		1.94	No
10	113.86		2	No
25	120.51		2.08	No
50	124.93		2.12	No
100	128.96		2.17	No

Structure 1 of 1

Material: Concrete

Length (feet): 24.5

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): Other (Moderate)

Slope (%): 0.04

Structure Comments: Another culvert is the barrier, makes the flow narrower and is directly in

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 11.6, Height: 5.5

Substrate/Water Width: 6.9

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 1.8/2.4

Dimensions:

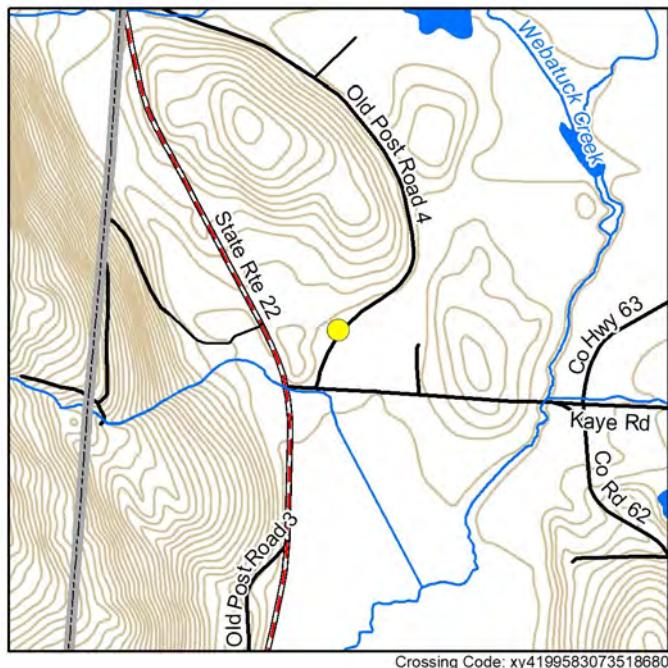
Width: 10.0, Height: 6.4

Substrate/Water Width: 10.00

Water Depth: 0.10

Additional Photo





Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.53

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.518741, 41.995713

Location Description: Next to building that says The Barn, before construction vehicle parking.

29 old post Road

Date Observed: 2019-07-10

Crossing Code: xy4199583073518680

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 100.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Upstream and downstream are wetlands areas so bankfull estimated

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.6

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	6.98	3.01	0.65	No
5	8.03		0.84	No
10	8.86		1.01	No
25	10.02		1.28	No
50	10.96		1.51	No
100	11.95		1.78	No

Structure 1 of 1

Material: Plastic
 Length (feet): 34.8
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): None
 Slope (%): 0.05
 Structure Comments: Inlet drop of 0.4 feet

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls
 Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 1.6, Height: 1.4

Substrate/Water Width: 1.6

Water Depth: 0.10

Outlet**Outlet**

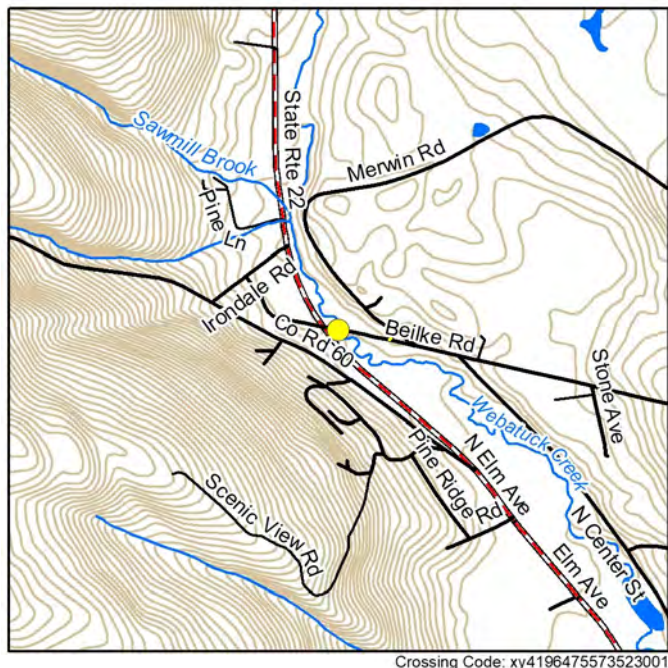
Outlet Shape: Round Culvert
 Outlet Drop/Grade: Free Fall
 Drop to Stream Surface/Bottom: 0.1/0.3

Dimensions:

Width: 1.6, Height: 1.5

Substrate/Water Width: 0.60

Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.92

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.522983, 41.964764

Location Description: 100 feet from intersection of Beilke Road and route 22.

Date Observed: 2019-07-23

Crossing Code: xy4196475573523001

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 15.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.6

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	917.68	8.58	5.3	No
5	1052.23		5.85	No
10	1139.3		6.19	No
25	1245.02		6.59	No
50	1320.62		6.87	No
100	1394.09		7.14	No

Structure 1 of 1

Material: Concrete

Length (feet): 36.2

Dry Passage/Height: Yes (4.8)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): -0.04

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 20.1, Height: 7.0

Substrate/Water Width: 15.4

Water Depth: 1.80

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

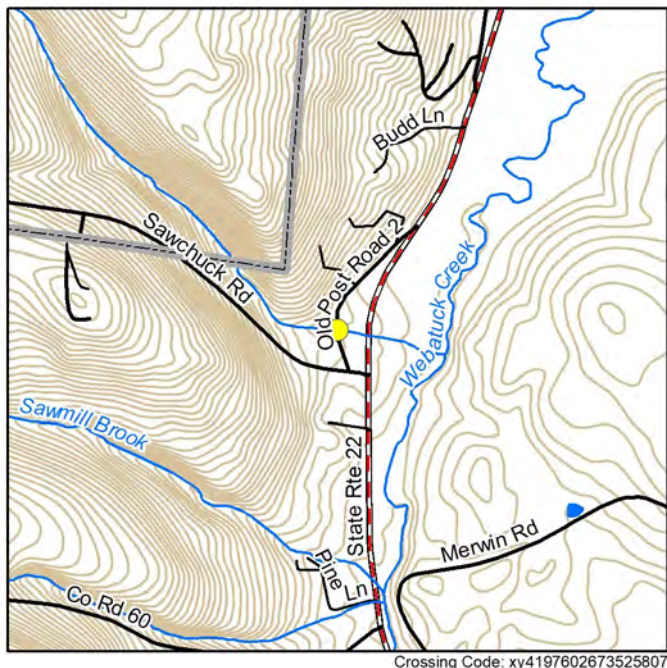
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 20.1, Height: 5.5

Substrate/Water Width: 16.80

Water Depth: 0.30



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.84

Town Comments on Condition/Maintenance:

Poor condition, nothing left for the guiderail to attach to

Overall Ranking: Tier 2 (Ranked 5 of 103)

Location

Coordinates: -73.525574, 41.976049

Location Description: In between mailbox 17 and 27 old post road 2

Date Observed: 2019-07-23

Crossing Code: xy4197602673525807

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 23.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.9

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	101.67	6.76	1.42	No
5	116.18		1.55	No
10	125.3		1.63	No
25	136.15		1.72	No
50	143.78		1.78	No
100	151.06		1.84	No

Structure 1 of 1

Material: Concrete

Length (feet): 37.8

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 14.2, Height: 2.9

Substrate/Water Width: 4.7

Water Depth: 0.70

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

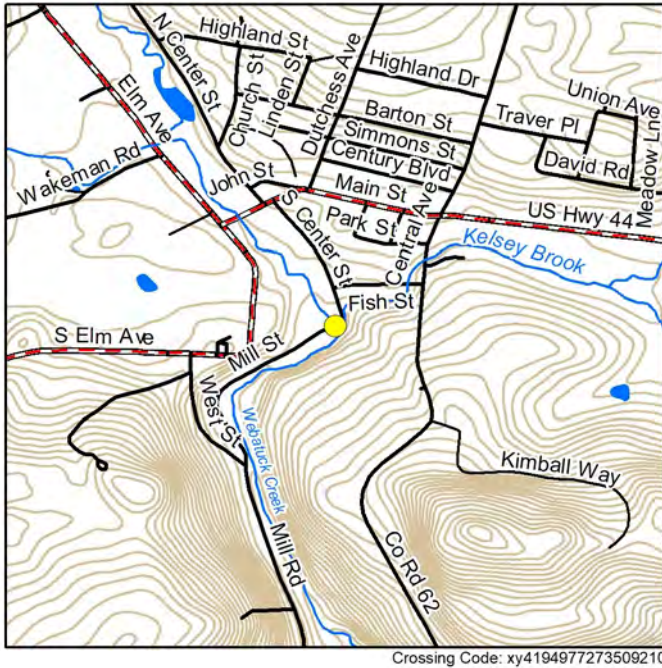
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 13.1, Height: 3.4

Substrate/Water Width: 4.90

Water Depth: 0.50



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.85

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.509228, 41.949803

Location Description: Where Mill Road curves and turns into Cross Street, near highway department building

Date Observed: 2019-07-09

Crossing Code: xy4194977273509210

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 9.7

Water Depth/Velocity Matches Stream: No-Deeper/No-Slower

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: Large pool just before inlet, possible due to confluence with Kelsey Brook, inlet is 0.8 feet from stream bottom, but is still under water

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.8

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	317.5	8.45	2.87	No
5	367.86		3.17	No
10	399.52		3.36	No
25	437.24		3.57	No
50	463.77		3.72	No
100	489.04		3.86	No

Structure 1 of 2

Material: Concrete

Length (feet): 33.4

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 13.0, Height: 7.0

Substrate/Water Width: 13.0

Water Depth: 0.90

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 13.0, Height: 7.2

Substrate/Water Width: 13.00

Water Depth: 0.90

Structure 2 of 2

Material: Concrete
Length (feet): 33.4
Dry Passage/Height (feet): No

Physical Barrier(s)/Severity: None
Slope (%):
Structure Comments: No data

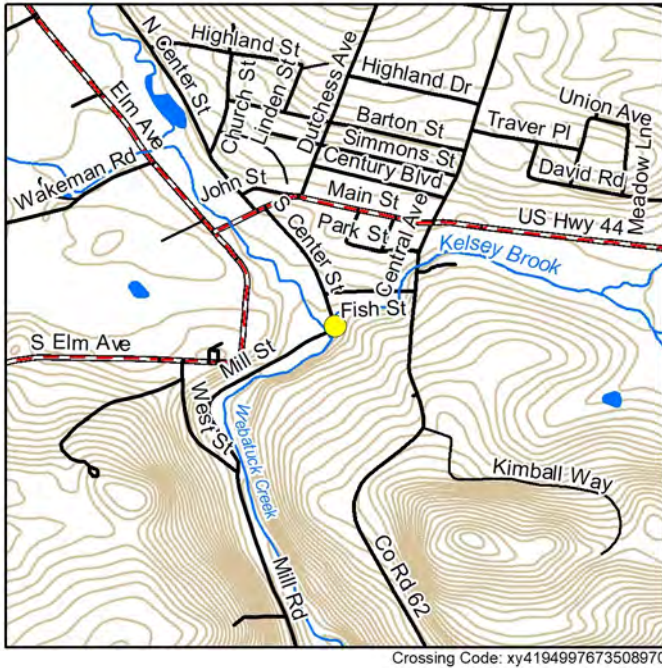
Inlet

Inlet Shape/Type: Box Culvert/Headwall
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 13.0, Height: 13.0
 Substrate/Water Width: 13.0
 Water Depth: 0.90

Outlet

Outlet Shape: Box Culvert
Outlet Drop/Grade: At Stream Grade
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 13.0, Height: 6.5
 Substrate/Water Width: 13
 Water Depth: 0.40

.....



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.84

Town Comments on Condition/Maintenance:

The stream takes a 90 degree turn to enter the structure; no water over the road in the past 3 years (since Cole has been around), but the situation seems to be getting worse [with the water hitting the structure as it turns]; Cole Lawrence said he hasn't

Overall Ranking: Not Ranked

Location

Coordinates: -73.508922, 41.949999

Location Description: Next to 4 South Center St

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 18.0

Water Depth/Velocity Matches Stream: No-

Deeper/No-Slower

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: Horizontal cracks spanning inlet and outlet headwalls

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	315.53	N/A		
5	365.48			
10	396.93			
25	434.42			
50	460.82			
100	486			

Structure 1 of 1

Material: Concrete

Length (feet): 18.4

Dry Passage/Height: Yes (4)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

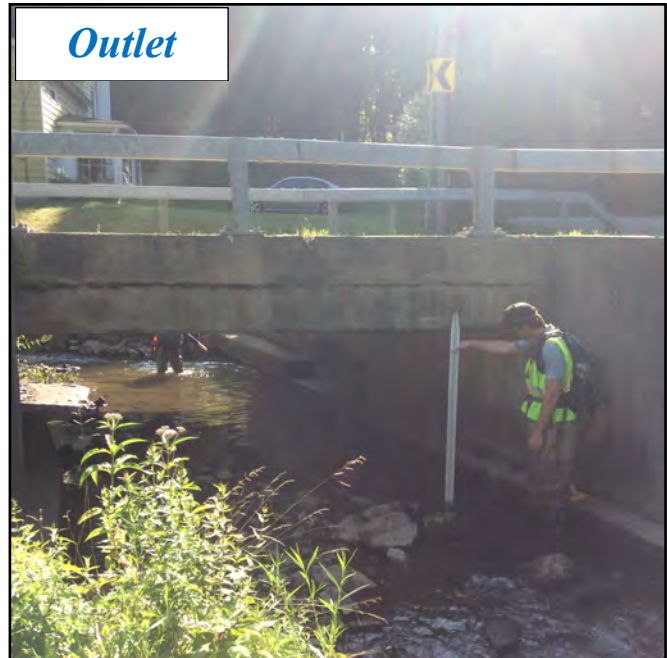
Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 13.0, Height: 6.5

Substrate/Water Width: 8.5

Water Depth: 2.00

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

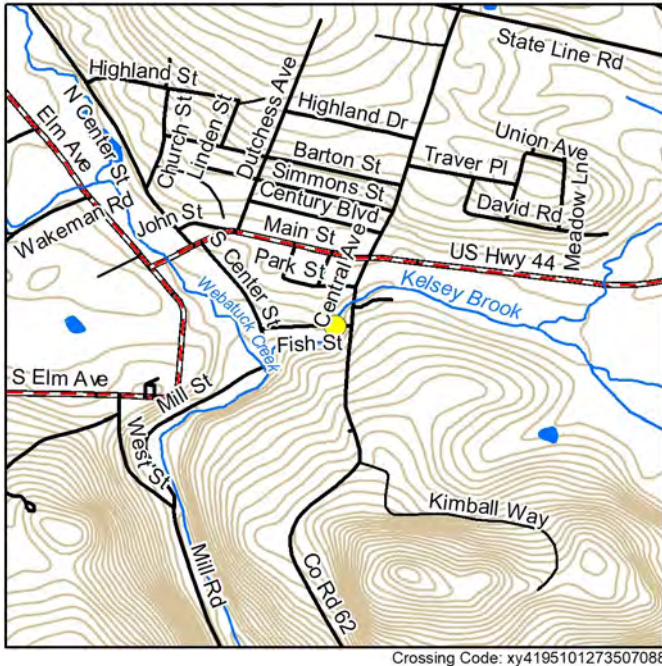
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 12.4, Height: 4.5

Substrate/Water Width: 5.20

Water Depth: 0.60



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.94

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.507019, 41.950974

Location Description: 50 feet from corner of Fish Road and South Maple Street

Date Observed: 2019-07-03

Crossing Code: xy4195101273507088

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 13.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Boulder

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: Bankfull taken downstream

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	313.37	N/A	N/A	N/A
5	362.78			
10	393.96			
25	431.18			
50	457.43			
100	482.49			

Structure 1 of 1

Material: Concrete

Length (feet): 34.9

Dry Passage/Height: Yes (8.3)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 13.9, Height: 9.8

Substrate/Water Width: 6.6

Water Depth: 0.50

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 14.0, Height: 10.5

Substrate/Water Width: 7.40

Water Depth: 0.70



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.95

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.506761, 41.951752

Location Description: Across from 20 south maple Road

Date Observed: 2019-07-03

Crossing Code: xy4195174173506554

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 19.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: Channel heavily modified downstream

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	311.18	N/A	N/A	N/A
5	360.02			
10	390.91			
25	427.85			
50	453.95			
100	478.91			

Structure 1 of 1

Material: Concrete

Length (feet): 40.7

Dry Passage/Height: Yes (2.2)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box/Bridge with Abutments/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 17.1, Height: 5.7

Substrate/Water Width: 8.2

Water Depth: 0.60

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

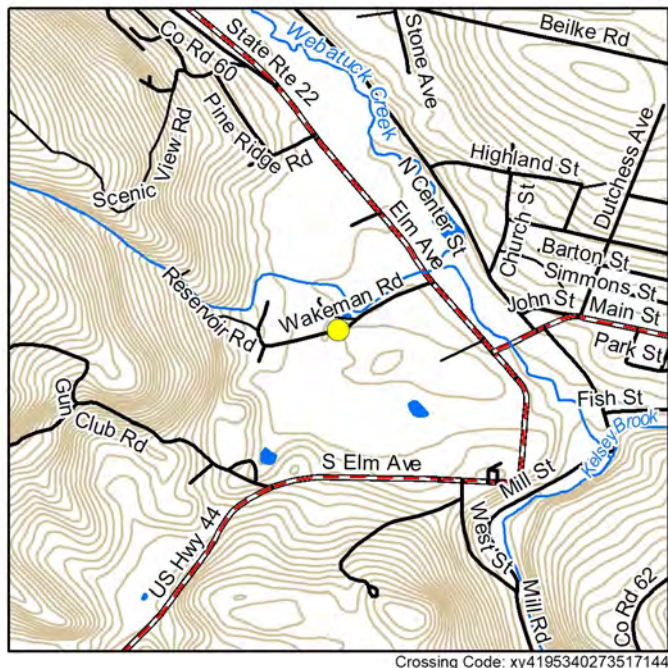
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 17.6, Height: 5.6

Substrate/Water Width: 11.40

Water Depth: 0.40



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.56

Town Comments on Condition/Maintenance:

Cole Lawrence has observed increased frequency of flooding, about six times per summer. NAACC barrier evaluation = moderate barrier to aquatic organism passage

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.517121, 41.953393

Location Description: 36 Wakeman Road

Date Observed: 2019-07-16

Crossing Code: xy4195340273517144

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.3

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Bankfull taken downstream due to inaccessibility upstream

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.7

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	18.55	3.03	1.16	No
5	20.47		1.41	No
10	21.6		1.57	No
25	22.88		1.76	No
50	23.74		1.89	No
100	24.54		2.02	No

Structure 1 of 1

Material: Metal

Length (feet): 48.7

Dry Passage/Height: Yes (1.3)

Outlet Armoring: None

Physical Barrier(s) (Severity): Fencing (Severe)

Slope (%): 0.01

Structure Comments: Fencing in front of it would prevent any animal besides a mouse from getting

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 1.3, Height: 1.3

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

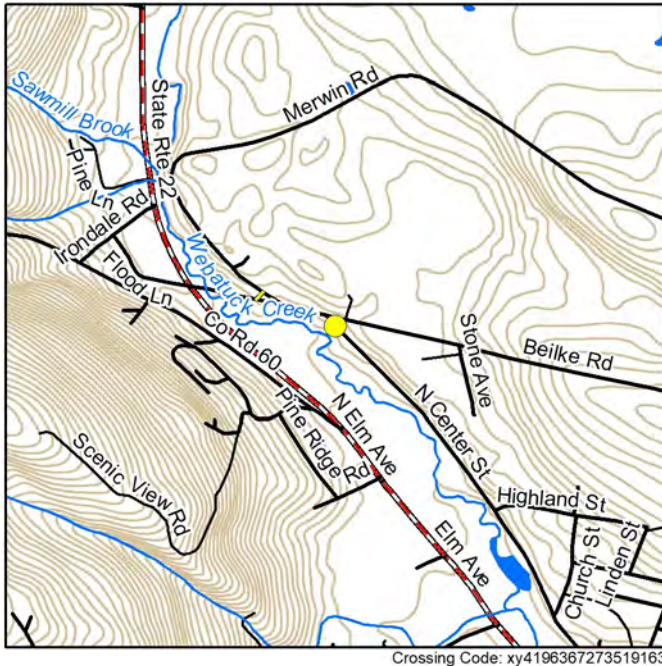
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 1.5, Height: 1.4

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.61

Town Comments on Condition/Maintenance:

Concrete is failing; they don't have issues with flooding or debris

Overall Ranking: Tier 2 (Ranked 5 of 103)

Location

Coordinates: -73.519093, 41.963726

Location Description: 50 ft from intersection of north center street and Beilke Road.

Date Observed: 2019-07-23

Crossing Code: xy4196367273519163

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

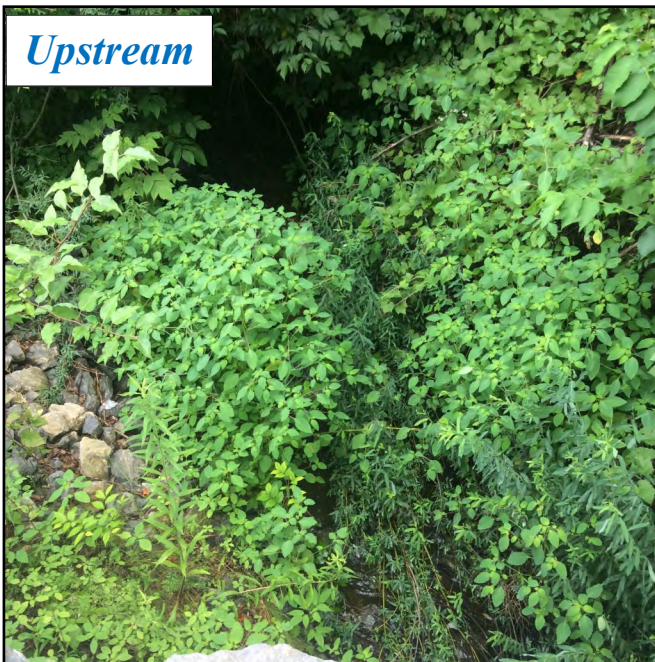
Bankfull Width (feet): 7.2

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: Wingwall starting to crumble at inlet side and headwall cracking at outlet side.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 5.3

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	21.99	9.57	1.27	No
5	25.35		1.39	No
10	28.05		1.49	No
25	31.87		1.62	No
50	34.97		1.72	No
100	38.29		1.83	No

Structure 1 of 1

Material: Concrete

Length (feet): 40.3

Dry Passage/Height: No

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: There is a gradual drop 7 feet downstream of outlet opening when the con-

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 4.3

Substrate/Water Width: 4.0

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

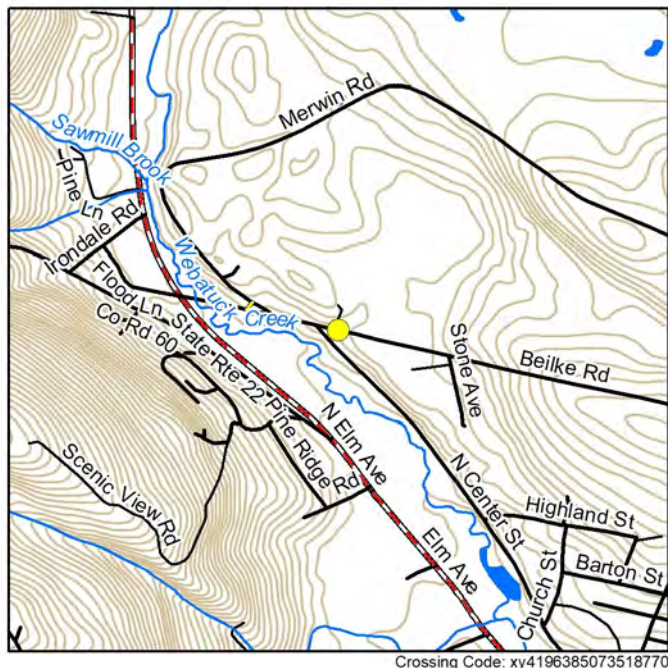
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 4.1, Height: 5.2

Substrate/Water Width: 4.10

Water Depth: 0.20



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.19

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.518934, 41.963962

Location Description: Next to mailbox for 51 Beilke Road

Date Observed: 2019-07-23

Crossing Code: xy4196385073518770

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 8.0

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.2

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	21.96	7.76	0.99	No
5	25.31		1.05	No
10	28		1.1	No
25	31.82		1.19	No
50	34.92		1.27	No
100	38.23		1.37	No

Structure 1 of 1

Material: Metal

Length (feet): 40.2

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.07

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.5, Height: 5.6

Substrate/Water Width: 2.5

Water Depth: 0.40

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall Onto Cascade

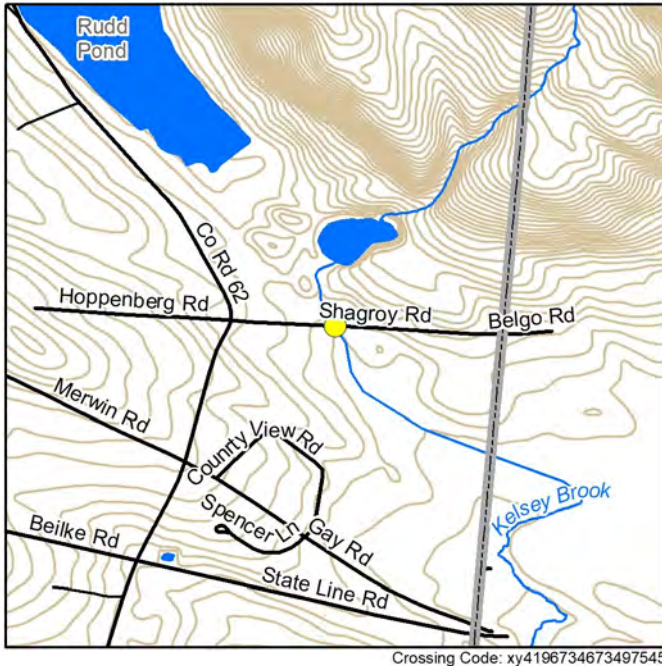
Drop to Stream Surface/Bottom: 1.0/1.4

Dimensions:

Width: 6.0, Height: 5.8

Substrate/Water Width: 3.00

Water Depth: 0.30



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.59

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.497569, 41.967345

Location Description: Before parking lot for Taconic State Park iron Mine pond area.

Date Observed: 2019-07-30

Crossing Code: xy4196734673497545

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 6.3

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: Even though dry, significant depression at outlet resembling where a scour pool would be.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.5

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	49.91	4.22	1.71	No
5	54.98		2.07	No
10	57.89		2.3	No
25	61.13		2.56	No
50	63.28		2.75	No
100	65.24		2.92	No

Structure 1 of 2

Material: Plastic
 Length (feet): 41.0
 Dry Passage/Height: Yes (2)
 Outlet Armoring: None

Physical Barrier(s) (Severity): None
 Slope (%): 0
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.0, Height: 2.0

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.3/0.3

Dimensions:

Width: 2.0, Height: 2.0

Substrate/Water Width: 0.00

Water Depth: 0.00

Structure 2 of 2

Material: Plastic
Length (feet): 41.0
Dry Passage/Height (feet): Yes (2)

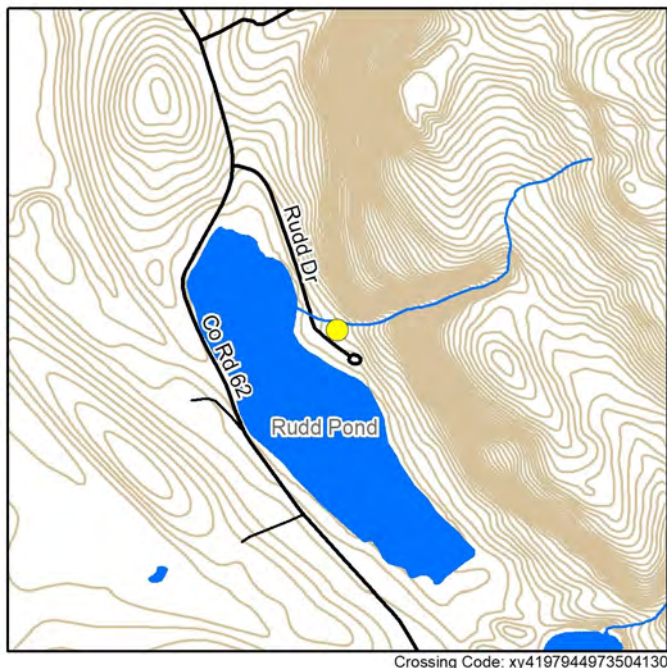
Physical Barrier(s)/Severity: None
Slope (%): 0.01
Structure Comments: No data

Inlet

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 2.0, Height: 2.0
 Substrate/Water Width: 0.0
 Water Depth: 0.00

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 0.3/0.3
Dimensions (feet):
 Width: 2.0, Height: 2.0
 Substrate/Water Width: 0
 Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.64

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.504130, 41.979449

Location Description: 25 feet upstream from visible culvert on entrance Road to Rudd Pond

Date Observed: 2019-07-30

Crossing Code: xy4197944973504130

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Unknown

Bankfull Width (feet): 27.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.5

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	26.12	0.79	1.46	Yes
5	29.29		1.81	Yes
10	31.23		2.04	Yes
25	33.51		2.33	Yes
50	35.08		2.54	Yes
100	36.57		2.75	Yes

Structure 1 of 1

Material: Concrete

Length (feet): 191.0

Dry Passage/Height: Yes (2.3)

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.07

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.5, Height: 2.3

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

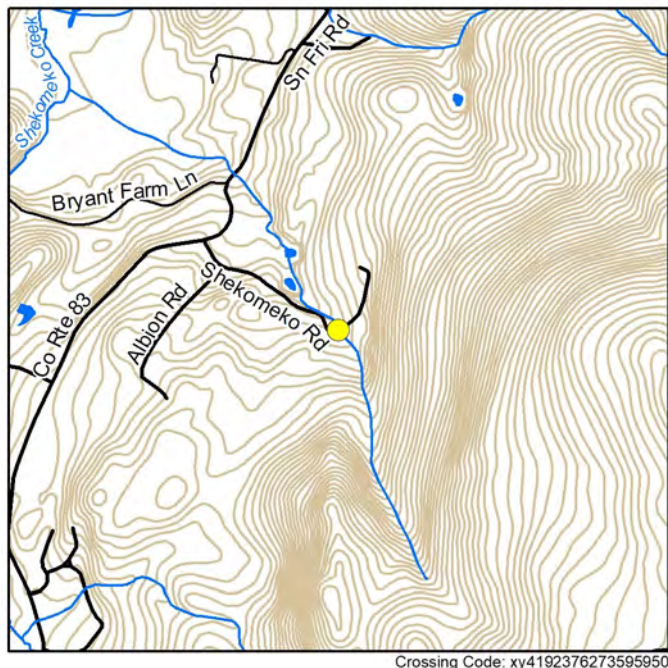
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 2.6, Height: 2.6

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.06

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.595990, 41.923647

Location Description: Near top of Shekomeko Road, at bend in road

Date Observed: 2019-07-03

Crossing Code: xy4192376273595950

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 3.7

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.6

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	99.03	6.62	1.95	No
5	103.03		2.11	No
10	105.33		2.2	No
25	107.9		2.31	No
50	109.61		2.38	No
100	111.16		2.44	No

Structure 1 of 1

Material: Metal

Length (feet): 39.0

Dry Passage/Height: Yes (4)

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.09

Structure Comments: Bottom corroding away, not extensive yet. Outlet fair distance from the

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 4.0

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

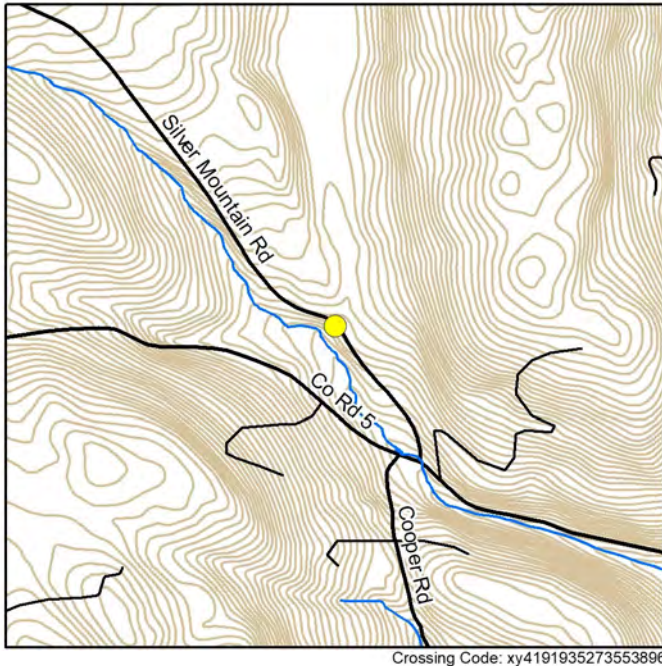
Drop to Stream Surface/Bottom: 1.7/1.7

Dimensions:

Width: 4.0, Height: 3.8

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.13

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.553851, 41.919392

Location Description: Next to mailbox for 72 Silver Mountain Road

Date Observed: 2019-07-02

Crossing Code: xy4191935273553896

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 8.4

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.3

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	36.98	7.46	2.21	No
5	44.27		2.39	No
10	48.69		2.52	No
25	53.81		2.68	No
50	57.33		2.8	No
100	60.61		2.92	No

Structure 1 of 1

Material: Metal

Length (feet): 68.3

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Moderate)

Slope (%): 0.04

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 4.2

Substrate/Water Width: 1.7

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

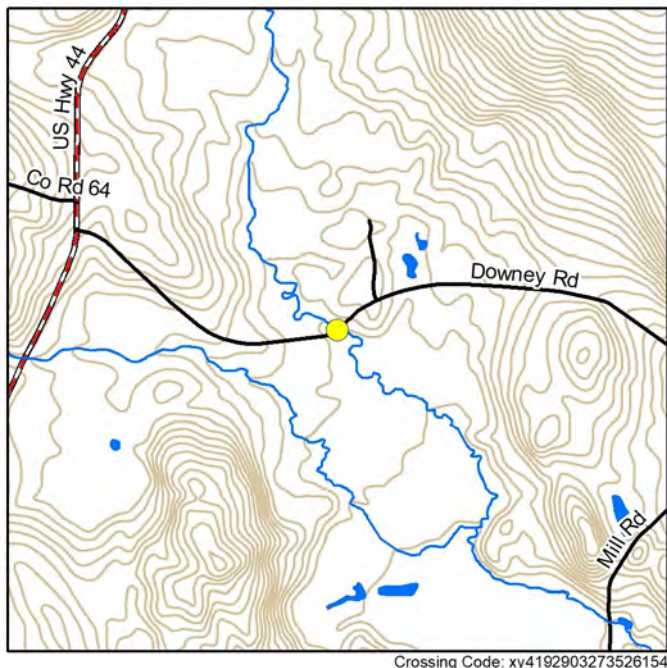
Drop to Stream Surface/Bottom: 1.2/1.5

Dimensions:

Width: 4.2, Height: 3.9

Substrate/Water Width: 1.20

Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.80

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 9 (Ranked 50 of 103)

Location

Coordinates: -73.526139, 41.928967

Location Description: Telephone pole 13

Date Observed: 2019-07-01

Crossing Code: xy4192903273526154

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 3

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.5

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 4.3

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	278.08	8.19	3	No
5	318.11		3.92	No
10	343.97		4.59	No
25	375.32		5.47	No
50	397.71		6.14	No
100	419.45		6.84	No

Structure 1 of 3

Material: Metal

Length (feet): 40.4

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): -0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.8, Height: 5.9

Substrate/Water Width: 4.0

Water Depth: 0.80

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 6.1, Height: 5.5

Substrate/Water Width: 4.60

Water Depth: 0.60

Structure 2 of 3

Material: Metal
Length (feet): 40.4
Dry Passage/Height (feet): Yes (4.2)

Physical Barrier(s)/Severity: Dry (Severe)
Slope (%):
Structure Comments: No data

Inlet

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 5.9, Height: 5.9
 Substrate/Water Width: 4.3
 Water Depth: 0.40

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Unknown
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 6.1, Height: 4.7
 Substrate/Water Width: 5
 Water Depth: 0.00

Structure 3 of 3

Material: Metal
Length (feet): 40.3
Dry Passage/Height (feet): Yes (4.7)

Physical Barrier(s)/Severity: Dry (Severe)
Structure Comments: No data

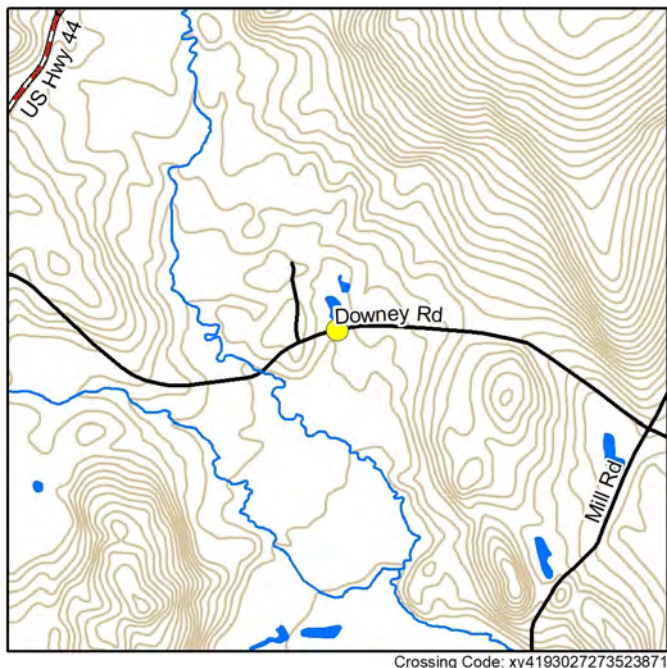
Inlet

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls
Inlet Drop/Grade: Unknown
Dimensions (feet):
 Width: 5.9, Height: 5
 Substrate/Water Width: 4.6
 Water Depth: 0

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Unknown
Drop to Stream Surface/Bottom (feet): 0/0
Dimensions (feet):
 Width: 6.1, Height: 5
 Substrate/Water Width: 5.2
 Water Depth: 0





Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.69

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.523829, 41.930242

Location Description: Next to 140 Downey Road

Date Observed: 2019-07-01

Crossing Code: xy4193027273523871

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 11.9

Water Depth/Velocity Matches Stream: Yes/No-Faster

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.8

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	17.42	5.13	0.86	No
5	20.61		1.2	No
10	22.71		1.45	No
25	25.29		1.79	No
50	27.16		2.06	No
100	28.98		2.35	No

Structure 1 of 1

Material: Concrete

Length (feet): 26.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.2, Height: 1.3

Substrate/Water Width: 1.6

Water Depth: 0.40

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

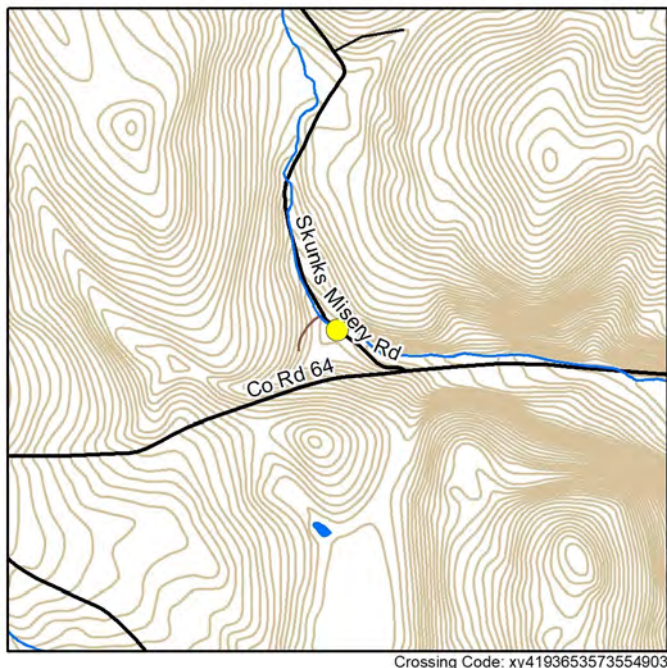
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 2.4, Height: 2.3

Substrate/Water Width: 2.40

Water Depth: 0.30



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.65

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.554942, 41.936630

Location Description: 200 feet up the Road from 24 Skunks Misery Road

Date Observed: 2019-07-02

Crossing Code: xy4193653573554903

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 7.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.3

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	108.31	5.94	2.86	No
5	124.21		3.25	No
10	134.7		3.52	No
25	147.61		3.85	No
50	156.94		4.1	No
100	166.1		4.35	No

Structure 1 of 1

Material: Metal

Length (feet): 60.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.03

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 6.0, Height: 3.6

Substrate/Water Width: 4.3

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: Free Fall

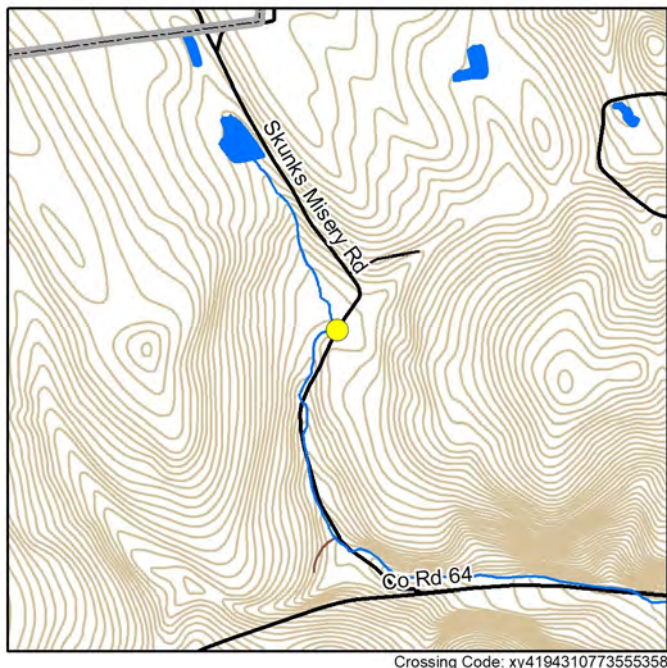
Drop to Stream Surface/Bottom: 0.3/0.6

Dimensions:

Width: 6.0, Height: 3.8

Substrate/Water Width: 2.00

Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.83

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.555334, 41.943015

Location Description: Telephone pole P42159

Date Observed: 2019-07-02

Crossing Code: xy4194310773555358

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 4.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable



Crossing Comments: Wetlands on both sides of channel, bankfull probably greater in storm event.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.5

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	17.51	4.79	1.97	No
5	19.86		2.25	No
10	21.35		2.43	No
25	23.13		2.65	No
50	24.39		2.81	No
100	25.59		2.96	No

Structure 1 of 1

Material: Metal

Length (feet): 40.9

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.4, Height: 2.3

Substrate/Water Width: 2.7

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: At Stream Grade

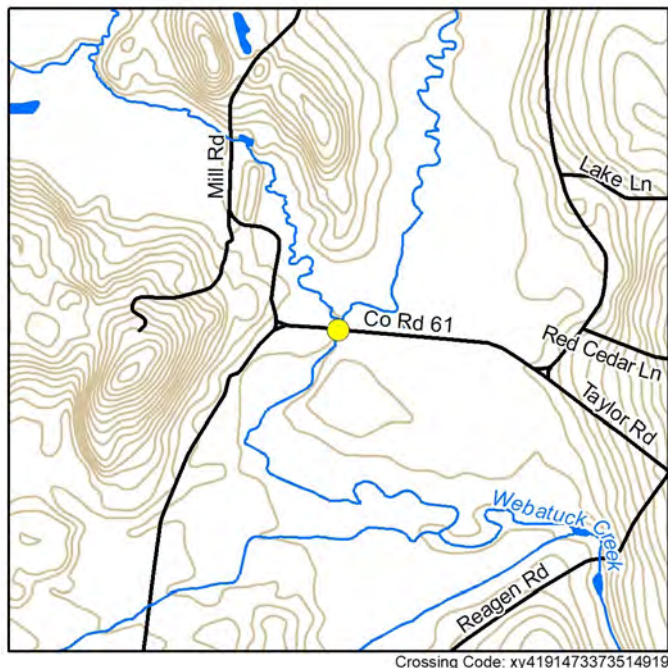
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.9, Height: 2.0

Substrate/Water Width: 3.00

Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.95

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.514854, 41.914736

Location Description: Bridge number 3343440

Date Observed: 2019-07-15

Crossing Code: xy4191473373514919

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 26.5

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: Bankfull confidence low because a tributary enters a few feet upstream

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	2084.43	N/A	N/A	N/A
5	2395.22			
10	2594.29			
25	2834.3			
50	3005.1			
100	3170.02			

Structure 1 of 1

Material: Concrete

Length (feet): 25.7

Dry Passage/Height: Yes (1.3)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Bridge with Abutments and Side Slopes/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 47.1, Height: 10.0

Substrate/Water Width: 19.8

Water Depth: 3.80

Outlet**Outlet**

Outlet Shape: Bridge with Abutments and Side Slopes

Outlet Drop/Grade: At Stream Grade

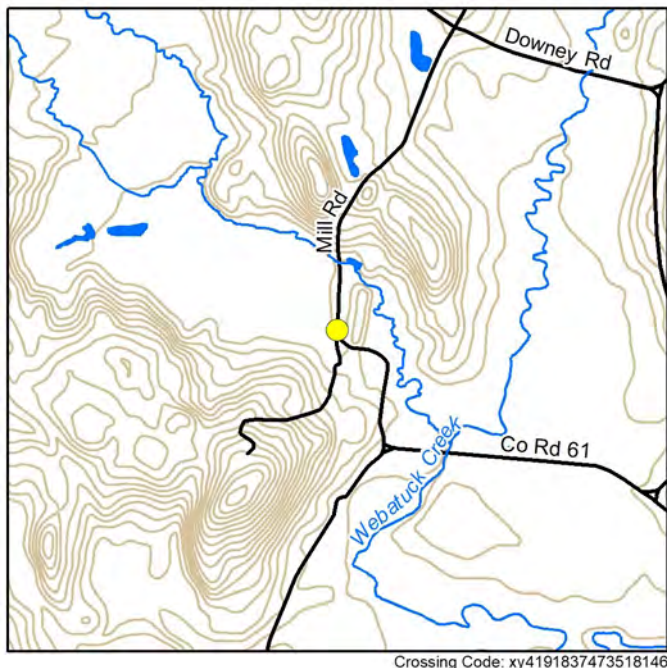
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 47.2, Height: 8.5

Substrate/Water Width: 26.40

Water Depth: 2.40



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.92

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 7 (Ranked 38 of 103)

Location

Coordinates: -73.518088, 41.918330

Location Description: Just North of Harlem Valley Rail Trail overpass

Date Observed: 2019-09-06

Crossing Code: xy4191837473518146

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: New

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 15.0

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: 100 feet downstream, the stream flows alongside Mill Road under the Harlem Valley Rail Trail where it constricts significantly (about 3 feet wide). There are cement blocks channeling the stream which is undercutting the bank in places which may

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	569.45	6.76	6.67	No
5	650.12		7.29	Yes
10	702.92		7.68	Yes
25	767.58		8.14	Yes
50	814.06		8.47	Yes
100	859.5		8.78	Yes

Structure 1 of 1

Material: Concrete

Length (feet): 30.4

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: Structure is brand new, 16 feet, built in wetlands

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 16.0, Height: 4.5

Substrate/Water Width: 16.0

Water Depth: 1.40

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

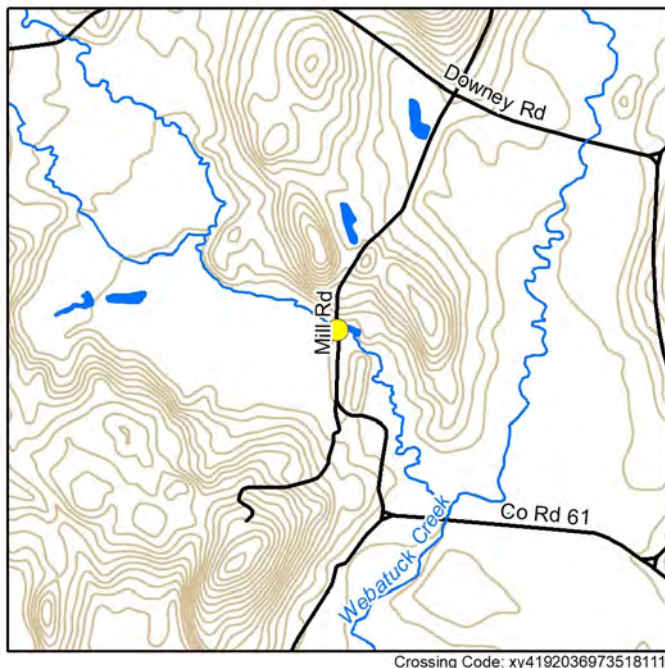
Width: 16.0, Height: 4.4

Substrate/Water Width: 16.00

Water Depth: 1.30

Additional Photos





Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.87

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 7 (Ranked 38 of 103)

Location

Coordinates: -73.518045, 41.920308

Location Description: 90 Mill Road

Date Observed: 2019-07-01

Crossing Code: xy4192036973518111

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

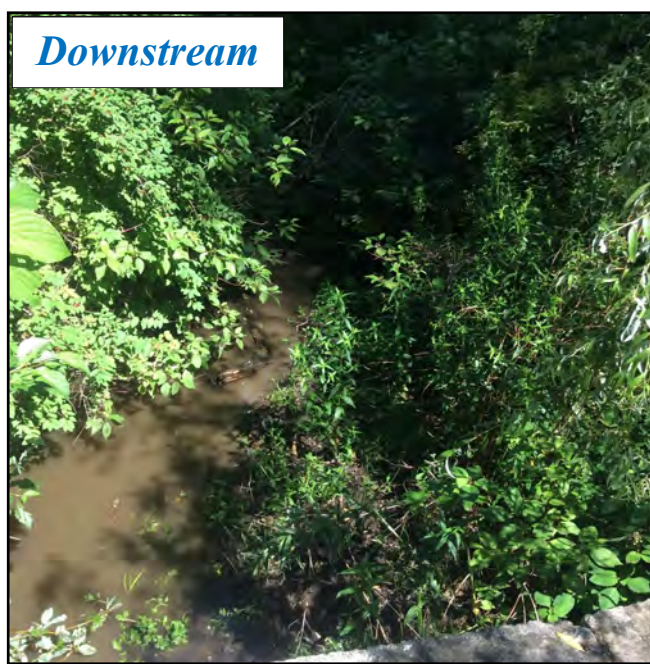
Scour Pool: None

Bankfull Width (feet): 7.5

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.2

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	563.44	4.9	4.04	Yes
5	643.14		4.4	Yes
10	695.37		4.64	Yes
25	759.42		4.94	Yes
50	805.5		5.15	Yes
100	850.58		5.36	Yes

Structure 1 of 1

Material: Metal

Length (feet): 26.2

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.0, Height: 2.7

Substrate/Water Width: 5.0

Water Depth: 0.60

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: At Stream Grade

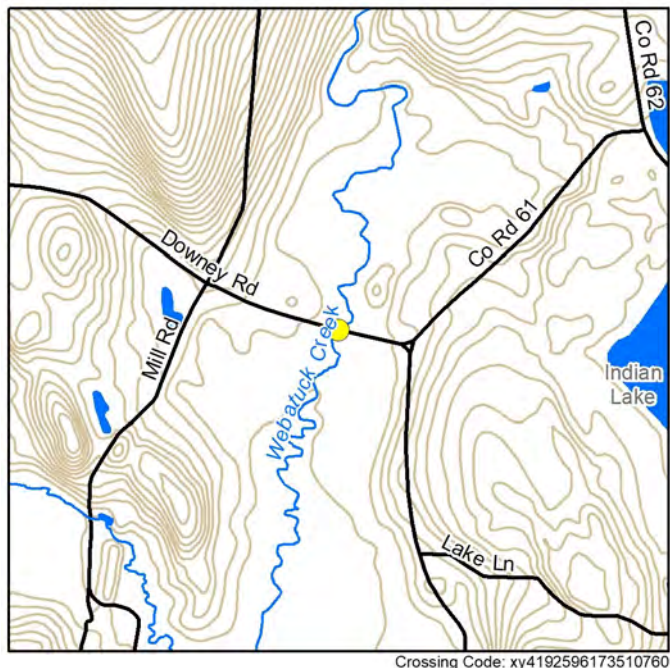
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 5.7, Height: 3.5

Substrate/Water Width: 4.00

Water Depth: 0.50



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.95

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.510816, 41.925992

Location Description: Bridge number 3343450

Date Observed: 2019-07-30

Crossing Code: xy4192596173510760

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 21.3

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	1462.7	N/A	N/A	N/A
5	1683.3			
10	1825.05			
25	1996.35			
50	2118.47			
100	2236.62			

Structure 1 of 1

Material: Concrete

Length (feet): 24.4

Dry Passage/Height: Yes (4.8)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Open Bottom Arch Bridge/Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 37.8, Height: 8.1

Substrate/Water Width: 14.7

Water Depth: 0.50

Outlet**Outlet**

Outlet Shape: Open Bottom Arch Bridge/Culvert

Outlet Drop/Grade: At Stream Grade

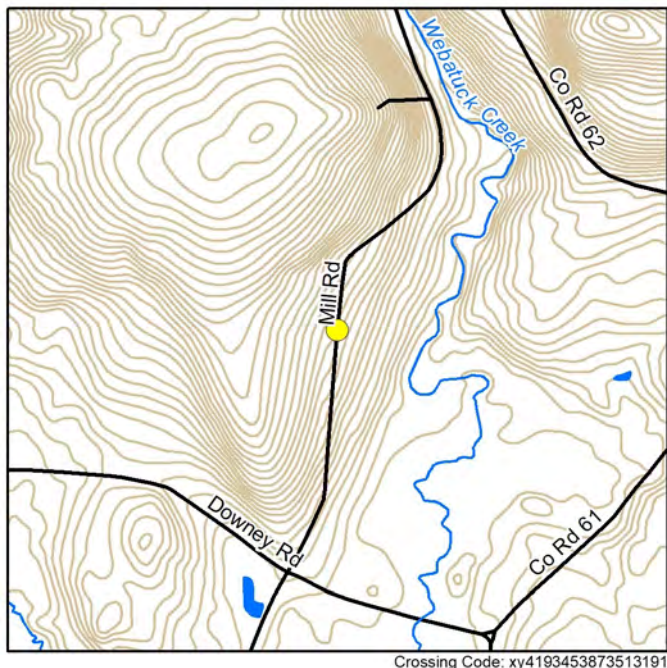
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 37.5, Height: 7.9

Substrate/Water Width: 16.00

Water Depth: 0.40



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score:

2.3968432211699999E-2

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 2 (Ranked 5 of 103)

Location

Coordinates: -73.513177, 41.934545

Location Description: 302 Mill Road

Date Observed: 2019-07-15

Crossing Code: xy4193453873513191

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 3.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.6

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	1390.2	6.14	9.12	Yes
5	1600.2		11.31	Yes
10	1735.24		12.8	Yes
25	1898.5		14.69	Yes
50	2014.94		16.09	Yes
100	2127.64		17.49	Yes

Structure 1 of 1

Material: Plastic

Length (feet): 42.0

Dry Passage/Height: Yes (3.5)

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.05

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.2, Height: 3.5

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall Onto Cascade

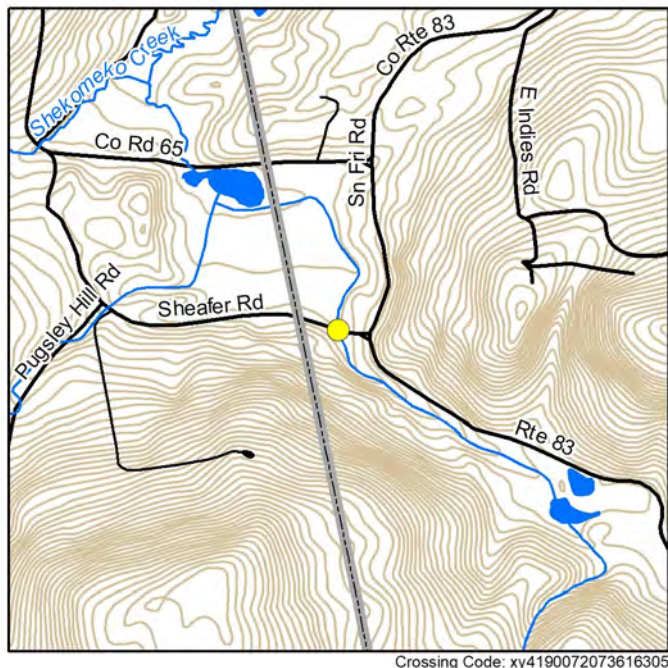
Drop to Stream Surface/Bottom: 2.2/2.2

Dimensions:

Width: 3.8, Height: 3.8

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.84

Town Comments on Condition/Maintenance:

There have been on-going discussions of closing the road, it is currently a town road, but there are landowners who are avid fishermen and they want to replace/remove the culvert; o Probably not worth focusing on this one because of those on-going conversations

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.616459, 41.900791

Location Description: 145 Sheifer Road, up 100 feet

Date Observed: 2019-07-03

Crossing Code: xy4190072073616305

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 8.7

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting



Crossing Comments: Property owner is very willing to replace

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.8

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	58.32	6.5	1.47	No
5	65.47		1.86	No
10	70.05		2.13	No
25	75.59		2.48	No
50	79.54		2.75	No
100	83.34		3.02	No

Structure 1 of 2

Material: Metal

Length (feet): 32.9

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Dry (Severe)

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.3, Height: 2.6

Substrate/Water Width: 2.5

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: Unknown

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 5.2, Height: 2.3

Substrate/Water Width: 5.20

Water Depth: 0.00

Structure 2 of 2

Material: Metal
Length (feet): 33.9
Dry Passage/Height (feet): No

Physical Barrier(s)/Severity: None
Slope (%): 0.01
Structure Comments: No data

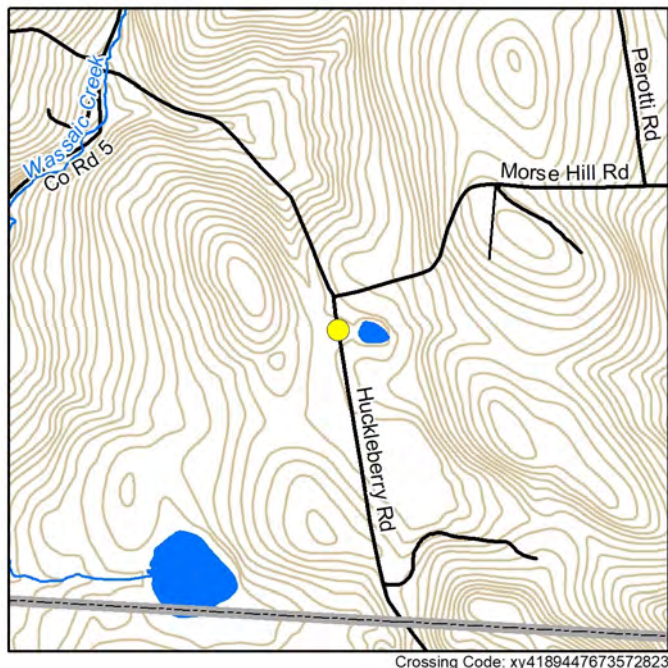
Inlet

Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Headwall and Wingwalls
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 5.3, Height: 5.3
 Substrate/Water Width: 3.8
 Water Depth: 0.10

Outlet

Outlet Shape: Pipe Arch/Elliptical Culvert
Outlet Drop/Grade: At Stream Grade
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 5.6, Height: 2.2
 Substrate/Water Width: 4
 Water Depth: 0.20

.....



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.74

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.572888, 41.894487

Location Description: Intersection of Morse Hill and Huckleberry Road about 300 feet down Huckleberry Road

Date Observed: 2019-07-22

Crossing Code: xy4189447673572823

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 3.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.9

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	21.63	4.97	0.96	No
5	26.14		1.35	No
10	29.03		1.63	No
25	32.5		2	No
50	34.97		2.28	No
100	37.33		2.57	No

Structure 1 of 1

Material: Plastic

Length (feet): 41.0

Dry Passage/Height: Yes (2.1)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.1, Height: 2.1

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

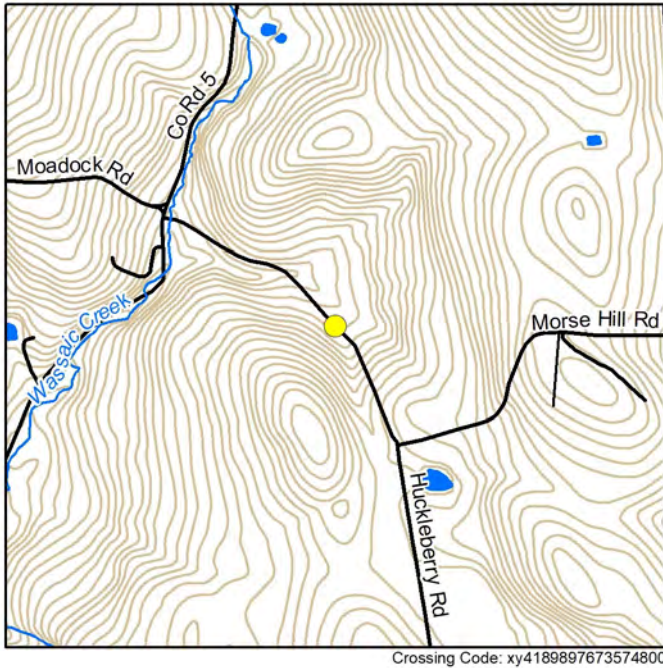
Drop to Stream Surface/Bottom: 0.3/0.3

Dimensions:

Width: 2.1, Height: 2.1

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.76

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.574777, 41.898995

Location Description: Near mailbox 76 Morse Hill

Date Observed: 2019-07-22

Crossing Code: xy4189897673574800

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.4

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.5

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	26.03	4.52	0.76	No
5	31.52		1.08	No
10	35.03		1.31	No
25	39.28		1.63	No
50	42.3		1.88	No
100	45.19		2.14	No

Structure 1 of 1

Material: Concrete

Length (feet): 36.4

Dry Passage/Height: Yes (3)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.04

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.0, Height: 3.0

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

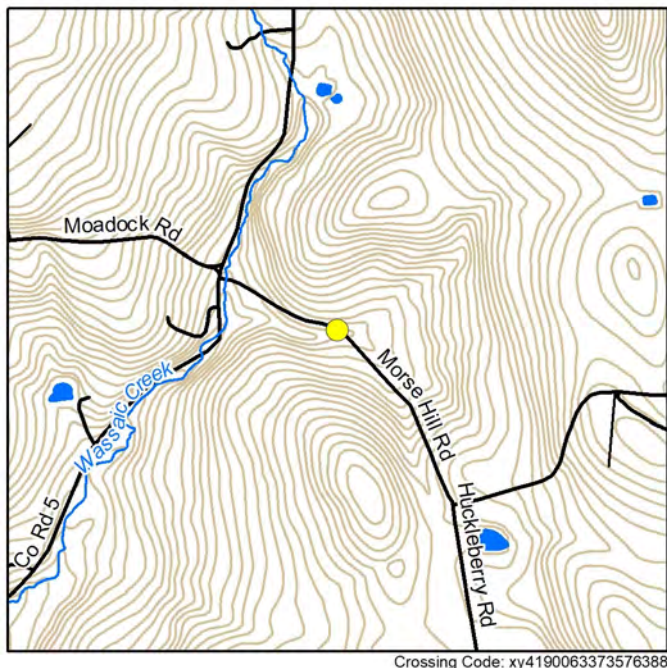
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.0, Height: 2.6

Substrate/Water Width: 2.30

Water Depth: 0.00



Results

Barrier Evaluation: Significant barrier

Aquatic Organism Passage Score: 0.27

Town Comments on Condition/Maintenance:

Headwall is failing; they don't have issues with flooding or debris

Overall Ranking: Tier 1 (Ranked 2 of 103)

Location

Coordinates: -73.576365, 41.900676

Location Description: 100 feet north of 43

Morse hill Road

Date Observed: 2019-07-22

Crossing Code: xy4190063373576388

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: Poor

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 9.3

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: There is a large concrete slab near the outlet that is not blocking flow but is redirecting it and causing small amount of debris buildup. The reason that the height is so different than width for structure 1 is that there is debris build-up in front of it

Road**Road**

Road Type: Paved

Road Fill Height (feet): 4.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	50.88	5.83	0.82	No
5	61.02		1.14	No
10	67.54		1.38	No
25	75.44		1.7	No
50	81.07		1.95	No
100	86.49		2.21	No

Structure 1 of 2

Material: Concrete

Length (feet): 30.0

Dry Passage/Height: Yes (2)

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock, Dry (Severe)

Slope (%): 0.06

Structure Comments: Height is actually 2 feet,

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.1, Height: 3.0

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.9/0.9

Dimensions:

Width: 3.0, Height: 3.1

Substrate/Water Width: 0.00

Water Depth: 0.00

Structure 2 of 2

Material: Concrete
Length (feet): 30.7
Dry Passage/Height (feet): No

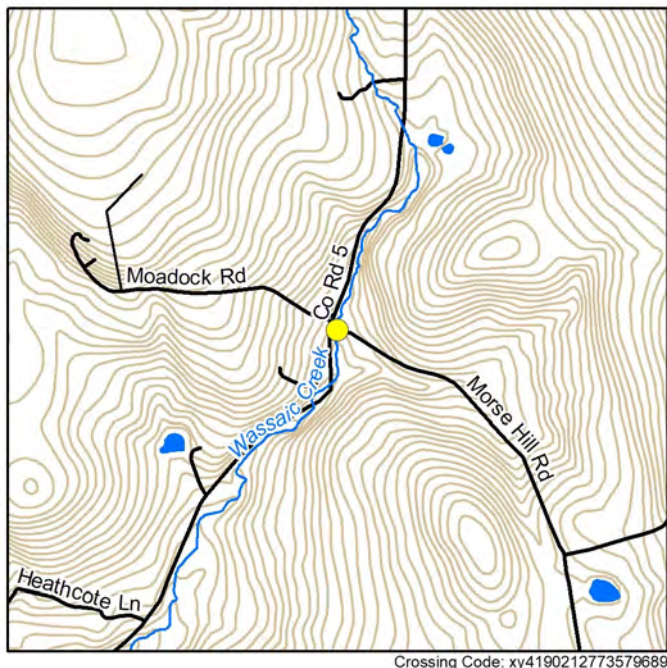
Physical Barrier(s)/Severity: None
Slope (%): 0.01
Structure Comments: No data

Inlet

Inlet Shape/Type: Round Culvert/Headwall
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 2.9, Height: 2.9
 Substrate/Water Width: 0.8
 Water Depth: 0.40

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 0.8/0.9
Dimensions (feet):
 Width: 3.0, Height: 3.1
 Substrate/Water Width: 0.8
 Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.16

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.579737, 41.902261

Location Description: At intersection of Morse Hill Road and Smithfield Road

Date Observed: 2019-07-22

Crossing Code: xy4190212773579689

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 7.1

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.8

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	107	8.8	1.69	No
5	128.16		2.82	No
10	141.83		3.65	No
25	158.45		4.78	No
50	170.36		5.66	No
100	181.85		6.58	No

Structure 1 of 1

Material: Concrete

Length (feet): 53.6

Dry Passage/Height: No

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.04

Structure Comments: Multiple small drops of less than 0.3 feet in structure

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 6.0, Height: 6.0

Substrate/Water Width: 2.2

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

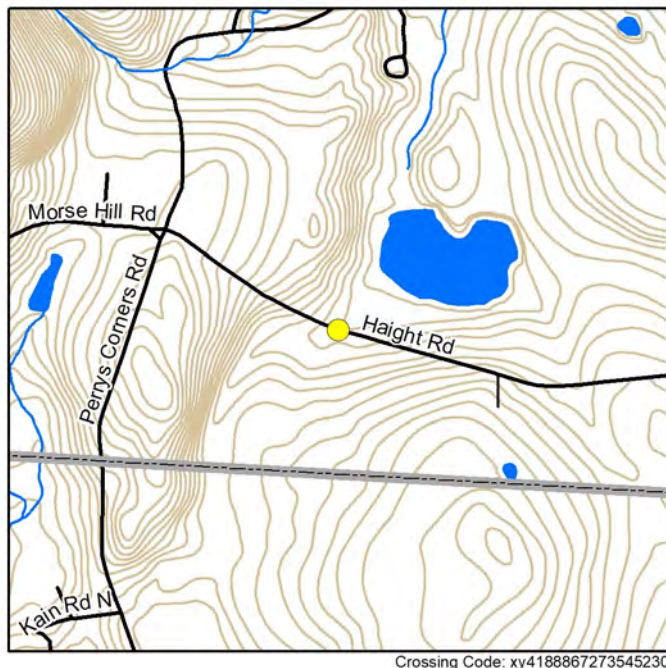
Drop to Stream Surface/Bottom: 1.1/4.3

Dimensions:

Width: 6.0, Height: 6.0

Substrate/Water Width: 1.60

Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier
Aquatic Organism Passage Score: 0.19
Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.545158, 41.888766
Location Description: Along Road next to Straus Marsh
Date Observed: 2019-06-28
Crossing Code: xy4188867273545230

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert
Number of structures/cells: 1
Condition: OK
Constriction: Severe
Alignment: Flow-Aligned
Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large
Bankfull Width (feet): 50.0
Water Depth/Velocity Matches Stream: No-Shallower/No-Faster
Structure Substrate Type: None
Structure Substrate Matches Stream? None



Crossing Comments: Bankfull was estimated due to marshes both upstream And downstream. Cows using downstream area to cross through.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 5.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	8.81	6.88	0.46	No
5	10.14		0.58	No
10	11.08		0.68	No
25	12.28		0.83	No
50	13.18		0.94	No
100	14.1		1.07	No

Structure 1 of 1

Material: Combination

Length (feet): 45.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.05

Structure Comments: The inlet is concrete and outlet plastic

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.0, Height: 1.9

Substrate/Water Width: 1.3

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

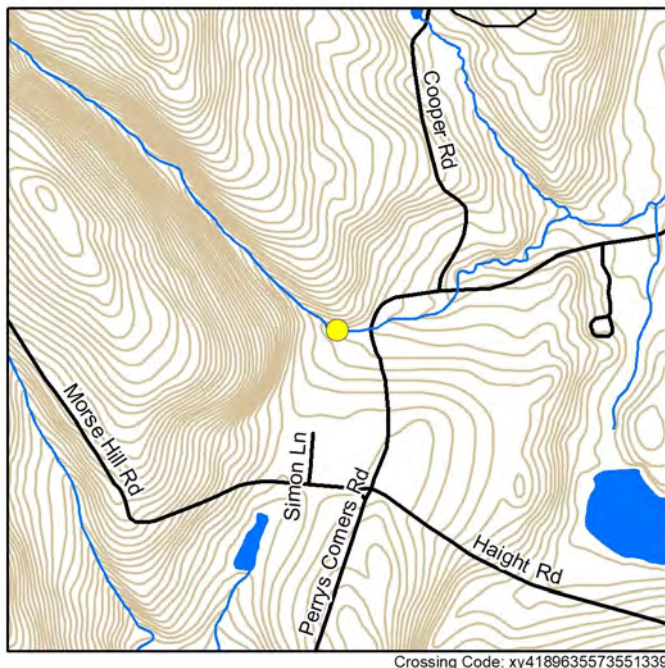
Drop to Stream Surface/Bottom: 1.0/1.5

Dimensions:

Width: 1.6, Height: 1.5

Substrate/Water Width: 0.50

Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.63

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.551339, 41.896355

Location Description: Culvert on 469 Perry's Corners Road Property. Upstream of dam

Date Observed: 2019-06-28

Crossing Code: xy4189635573551339

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 6.0

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Rock walls along upstream channel

Road**Road**

Road Type: Unpaved

Road Fill Height (feet): 0.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	54.95	4.02	0.98	No
5	64.79		1.34	No
10	71.04		1.59	No
25	78.57		1.93	No
50	83.9		2.19	No
100	89		2.46	No

Structure 1 of 1

Material: Metal

Length (feet): 31.5

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.7, Height: 4.0

Substrate/Water Width: 1.2

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

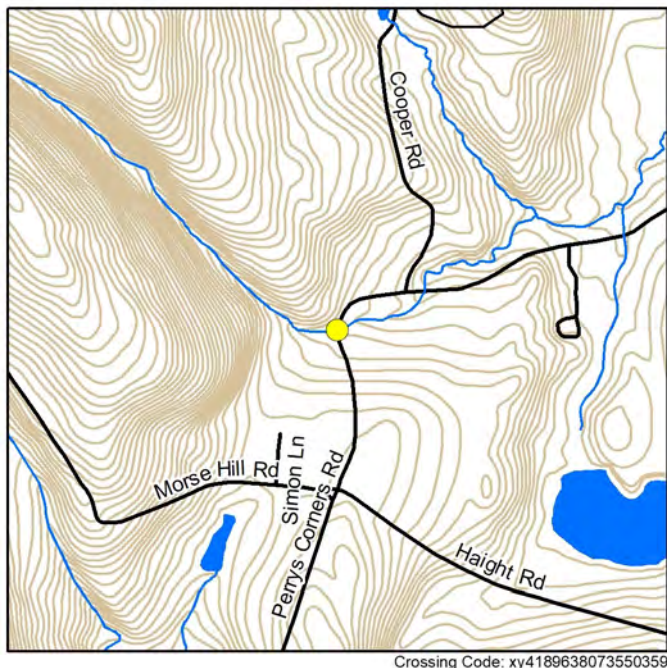
Drop to Stream Surface/Bottom: 0.1/1.3

Dimensions:

Width: 3.8, Height: 3.8

Substrate/Water Width: 1.50

Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score:

9.3072238865500007E-2

Town Comments on Condition/Maintenance:

The last section toward the outlet is pulling apart and causing the road to cave in; they have never seen it flood the road; note that this structure is a conservation priority (significant barrier)

Overall Ranking: Tier 1 (Ranked 1 of 103)

Location

Coordinates: -73.550254, 41.896382

Location Description: Right next to 469 Perry's Corners Road

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: Other

Stream Characteristics

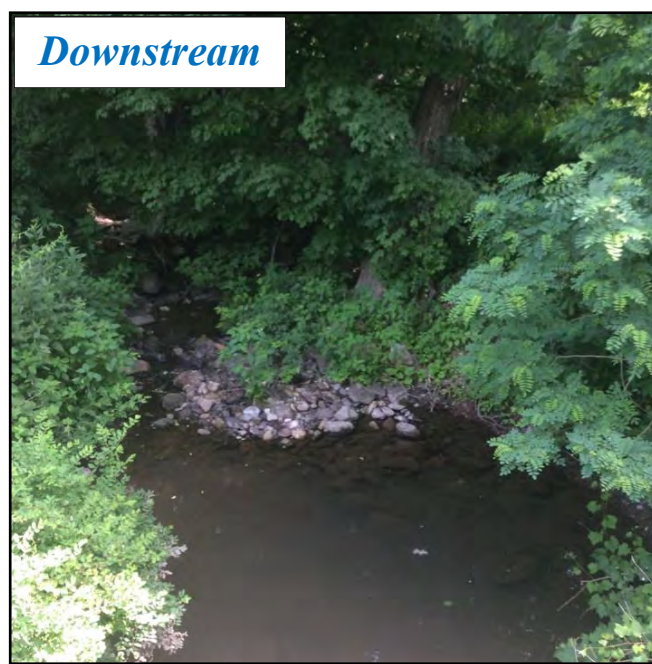
Scour Pool: Large

Bankfull Width (feet): 9.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Low estimation for bankfull because of dam upstream of culvert.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.7

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	57.12	7.73	0.49	No
5	67.36		0.58	No
10	73.88		0.65	No
25	81.74		0.74	No
50	87.31		0.8	No
100	92.66		0.87	No

Structure 1 of 1

Material: Concrete

Length (feet): 44.1

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.06

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 6.1, Height: 6.0

Substrate/Water Width: 1.3

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

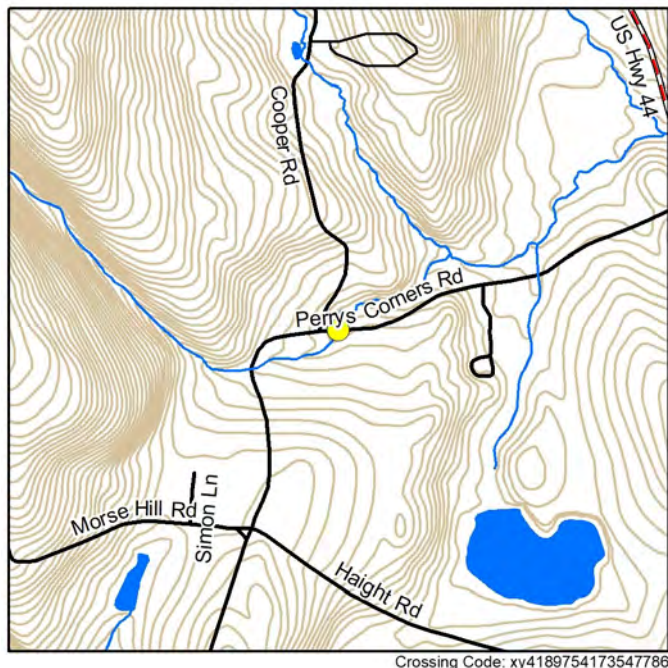
Drop to Stream Surface/Bottom: 1.4/2.1

Dimensions:

Width: 5.7, Height: 6.0

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.59

Town Comments on Condition/Maintenance:

The only issue is when the inlet gets blocked with the debris, then the water has gone over the road ~once every 5 years; Would make sense to do this structure when they do the one above, ideally within the next 5 years

Overall Ranking: Tier 1 (Ranked 3 of 103)

Location

Coordinates: -73.547933, 41.897141

Location Description: At the intersection of Perry's Corners Road and Coopers Road

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 6.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 4.5

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	62.45	8.01	0.93	No
5	73.64		1.25	No
10	80.82		1.48	No
25	89.49		1.79	No
50	95.68		2.03	No
100	101.63		2.28	No

Structure 1 of 1

Material: Concrete

Length (feet): 31.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Severe)

Slope (%): 0.05

Structure Comments: This culvert is actively

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 3.5

Substrate/Water Width: 2.3

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

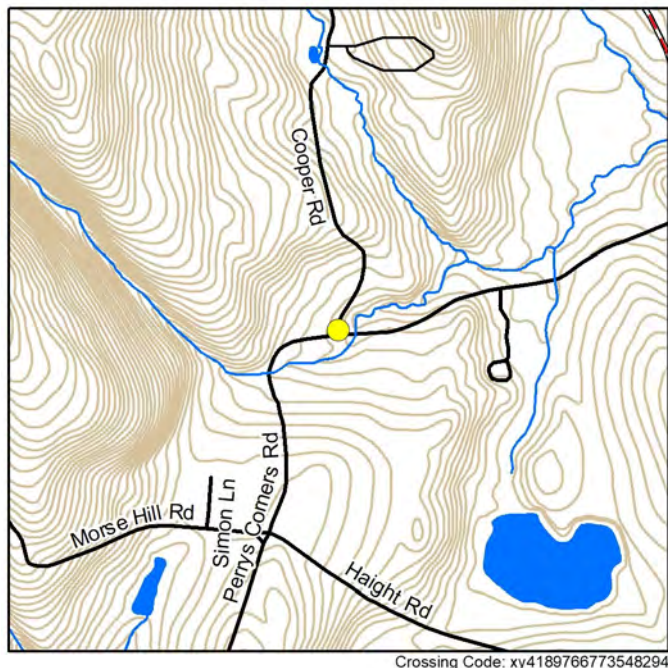
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.9, Height: 4.1

Substrate/Water Width: 3.40

Water Depth: 0.90



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.68

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 7 (Ranked 38 of 103)

Location

Coordinates: -73.548294, 41.897667

Location Description: At intersection of Cooper Road and Perry's Corners Road

Date Observed: 2019-06-28

Crossing Code: xy4189766773548294

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 100.0

Water Depth/Velocity Matches Stream: Unknown/Unknown

Structure Substrate Type: Unknown

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: The upstream is all wetlands and difficult to estimate. There is pond of standing water. Structure is collapsing and in very poor condition. Outlet side has eroded sediment hanging in front of it.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.3

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	63.11	3.28	0.93	No
5	74.43		1.25	No
10	81.69		1.48	No
25	90.46		1.79	No
50	96.72		2.03	No
100	102.75		2.28	No

Structure 1 of 1

Material: Metal

Length (feet): 38.2

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.03

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 1.5, Height: 1.0

Substrate/Water Width: 0.9

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

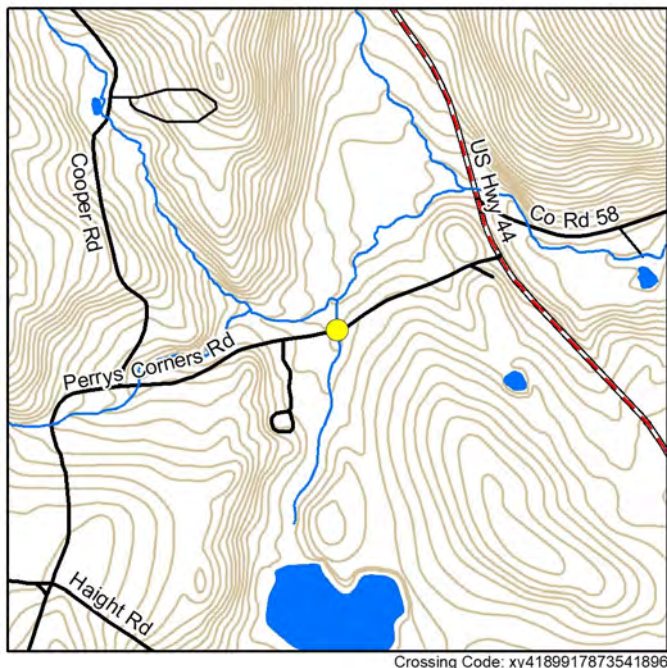
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 1.0, Height: 1.0

Substrate/Water Width: 0.40

Water Depth: 0.10



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.541952, 41.899165

Location Description: In middle of large farm near telephone pole 184222

Date Observed: 2019-06-28

Crossing Code: xy4189917873541896

Stream and Crossing

Crossing Characteristics

Crossing Type: Partially Inaccessible

Number of structures/cells: 2

Condition: OK

Constriction: Severe

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 7.7

Water Depth/Velocity Matches Stream: Unknown/Unknown

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: structure 1 is partially inaccessible since there is no outlet visible. Other photo shows where the outlet would be.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.2

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	45.83	7.11	1.77	No
5	53.08		1.95	No
10	58.2		2.08	No
25	64.8		2.23	No
50	69.81		2.35	No
100	74.87		2.46	No

Structure 1 of 2

Material: Concrete

Length (feet): 0.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 1.1

Substrate/Water Width: 0.1

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Unknown

Outlet Drop/Grade: Unknown

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 0.0, Height: 0.0

Substrate/Water Width: 0.00

Water Depth: 0.00

Structure 2 of 2

Material: Metal
Length (feet): 60.4
Dry Passage/Height (feet): No

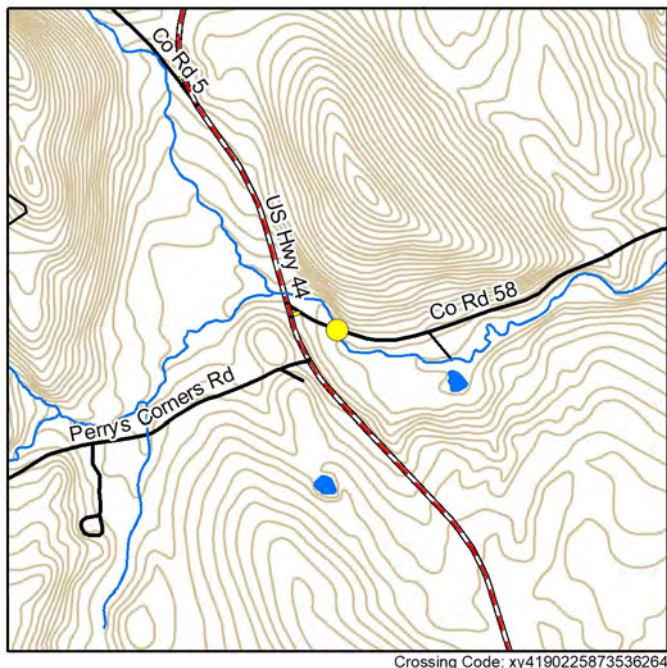
Physical Barrier(s)/Severity: None
Slope (%): 0.01
Structure Comments: The bottom is starting to erode and rust out.

Inlet

Inlet Shape/Type: Round Culvert/Headwall
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 5.6, Height: 5.6
 Substrate/Water Width: 4.0
 Water Depth: 0.40

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 1.8/2.4
Dimensions (feet):
 Width: 5.5, Height: 4.4
 Substrate/Water Width: 1.2
 Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.83

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.536094, 41.902278

Location Description: 200 ft from where 44 and 58 meet

Date Observed: 2019-07-01

Crossing Code: xy4190225873536264

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

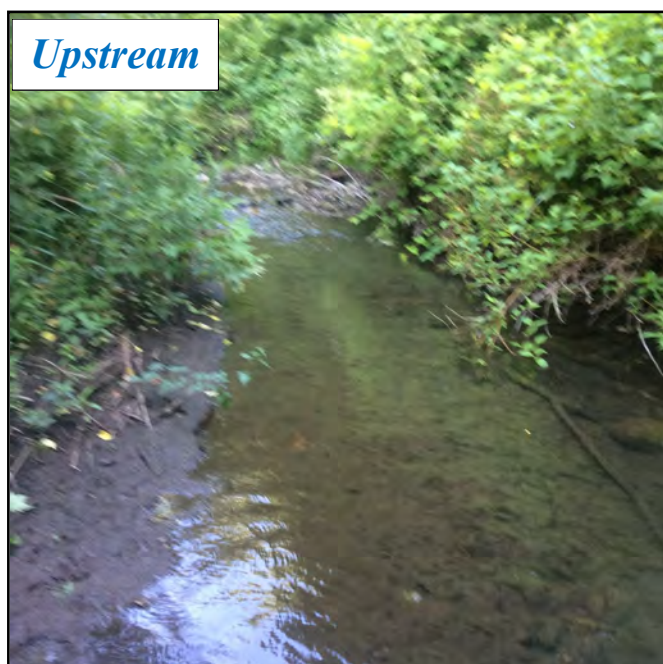
Scour Pool: None

Bankfull Width (feet): 11.9

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable



Crossing Comments: Roadfill averaged between two pipes

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.7

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	341.14	10.05	6.69	No
5	400.1		7.46	No
10	437.42		7.92	No
25	482.1		8.46	No
50	513.67		8.83	No
100	543.83		9.17	No

Structure 1 of 2

Material: Concrete

Length (feet): 27.0

Dry Passage/Height: Yes (5)

Outlet Armoring: None

Physical Barrier(s) (Severity): Dry (Severe)

Slope (%): -0.03

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: Unknown

Dimensions:

Width: 14.1, Height: 6.1

Substrate/Water Width: 14.1

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Unknown

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 14.0, Height: 5.6

Substrate/Water Width: 14.00

Water Depth: 0.00

Structure 2 of 2

Material: Concrete
Length (feet): 28.6
Dry Passage/Height (feet): No

Inlet

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions (feet):

Width: 14.1, Height: 14.1

Substrate/Water Width: 8.8

Water Depth: 1.00

Physical Barrier(s)/Severity: None

Slope (%):

Structure Comments: Observed minnows, crayfish, and small trout on the inlet side, saw only minnows and crayfish crossing. Trout attempted to cross when it saw us coming but turned around because it could not swim through. The bottom of the culvert was about 0.2 feet off of the streambed

Outlet

Outlet Shape: Box Culvert

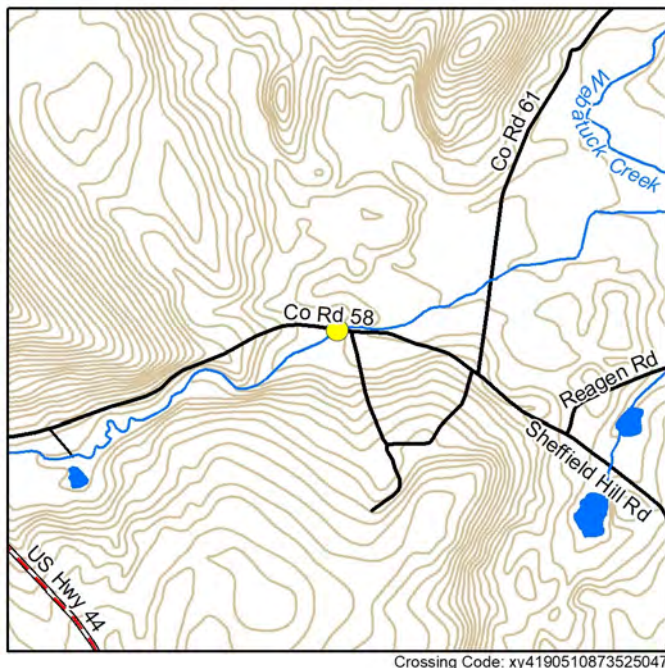
Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom (feet): 0.0/0.2

Dimensions (feet):

Width: 13.7, Height: 7.3

Substrate/Water Width: 12.7



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.99

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.524907, 41.905057

Location Description: Bridge number 334310

Date Observed: 2019-07-02

Crossing Code: xy4190510873525047

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Full Channel & Banks

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

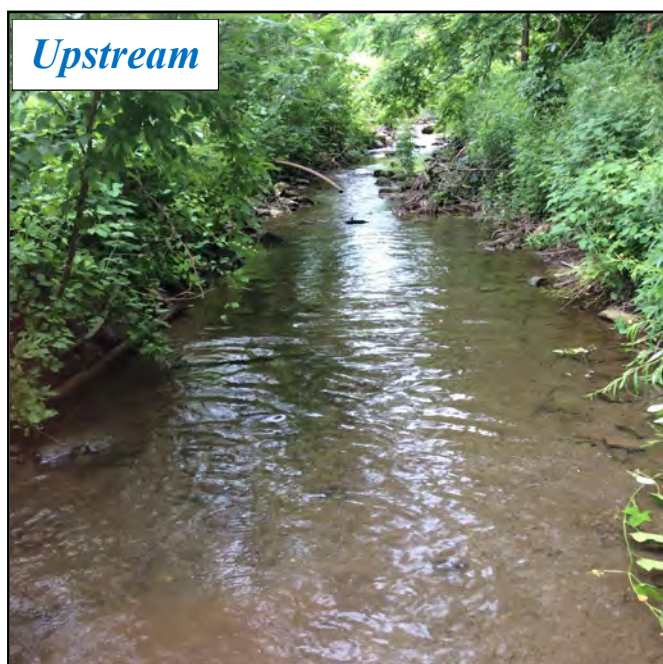
Scour Pool: None

Bankfull Width (feet): 11.4

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	393.59	N/A	N/A	N/A
5	460.68			
10	503.44			
25	554.88			
50	591.4			
100	626.47			

Structure 1 of 1

Material: Concrete

Length (feet): 38.5

Dry Passage/Height: Yes (3.2)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 36.1, Height: 4.4

Substrate/Water Width: 17.5

Water Depth: 0.50

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

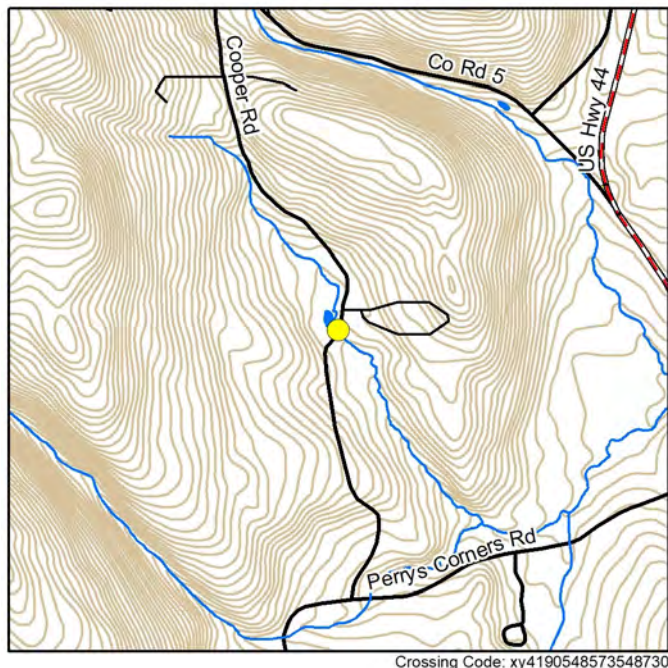
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 35.9, Height: 4.3

Substrate/Water Width: 10.60

Water Depth: 0.30



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.75

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.548755, 41.905486

Location Description: Right near 111 Coopers Road

Date Observed: 2019-06-28

Crossing Code: xy4190548573548730

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 100.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: The pictures aren't the best but we spent so long clearing away that it's the best we could do.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.8

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	26.38	6.29	0.7	No
5	29.96		0.79	No
10	32.05		0.84	No
25	34.4		0.91	No
50	35.98		0.96	No
100	37.43		1	No

Structure 1 of 1

Material: Metal

Length (feet): 30.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 3.5

Substrate/Water Width: 3.2

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

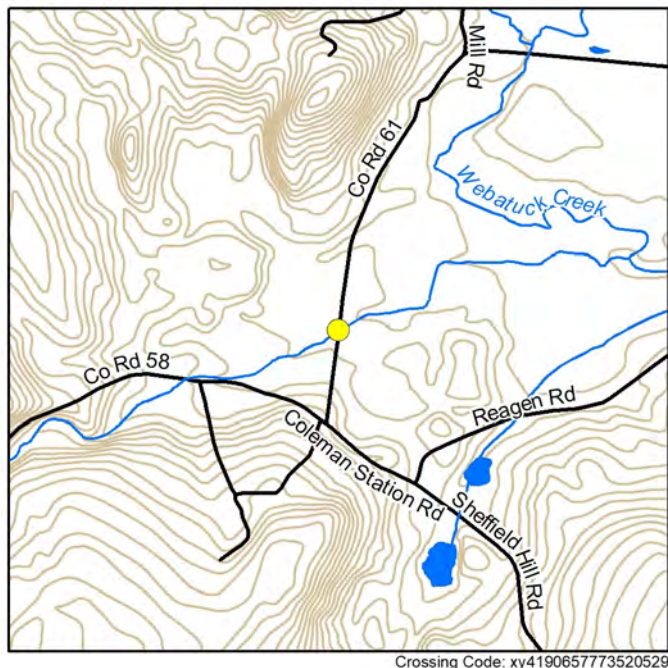
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 4.0, Height: 3.8

Substrate/Water Width: 3.20

Water Depth: 0.30



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.73

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.520584, 41.906500

Location Description: Culvert number 3343420

Date Observed: 2019-07-15

Crossing Code: xy4190657773520529

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 12.6

Water Depth/Velocity Matches Stream: Yes/No-Slower

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.5

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	403.77	6.27	2.78	No
5	472.45		3.09	No
10	516.31		3.29	No
25	569.15		3.51	No
50	606.71		3.67	No
100	642.83		3.82	No

Structure 1 of 1

Material: Concrete

Length (feet): 52.4

Dry Passage/Height: Yes (2)

Outlet Armoring: None

Physical Barrier(s) (Severity): Dry (Severe)

Slope (%): 0

Structure Comments: There was water in the structure at the inlet and up to about 2 feet before

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 21.1, Height: 3.8

Substrate/Water Width: 13.2

Water Depth: 0.70

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

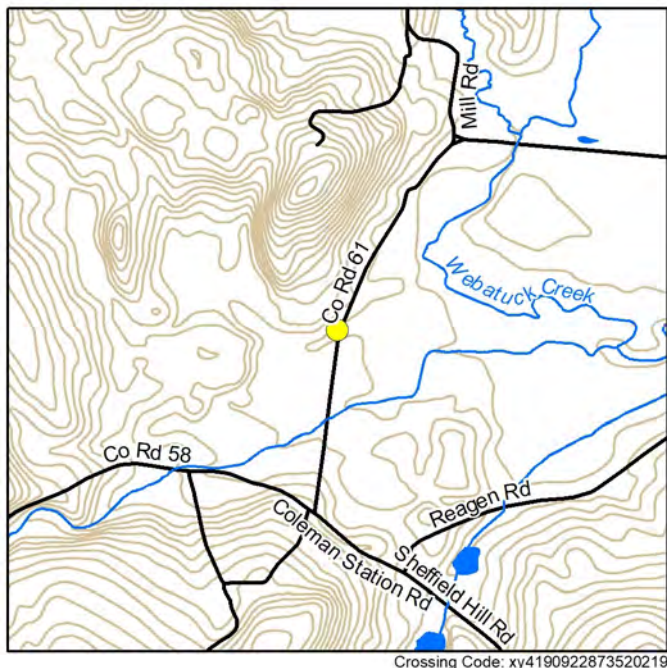
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 22.0, Height: 2.8

Substrate/Water Width: 22.00

Water Depth: 0.00



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.85

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.520092, 41.909200

Location Description: Culvert number 3369410

Date Observed: 2019-07-15

Crossing Code: xy4190922873520219

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 2.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	30.25	7.12	1.92	No
5	34.27		2.08	No
10	36.97		2.18	No
25	40.34		2.31	No
50	42.82		2.41	No
100	45.26		2.49	No

Structure 1 of 1

Material: Concrete

Length (feet): 57.0

Dry Passage/Height: Yes (4.3)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 11.1, Height: 4.9

Substrate/Water Width: 1.9

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

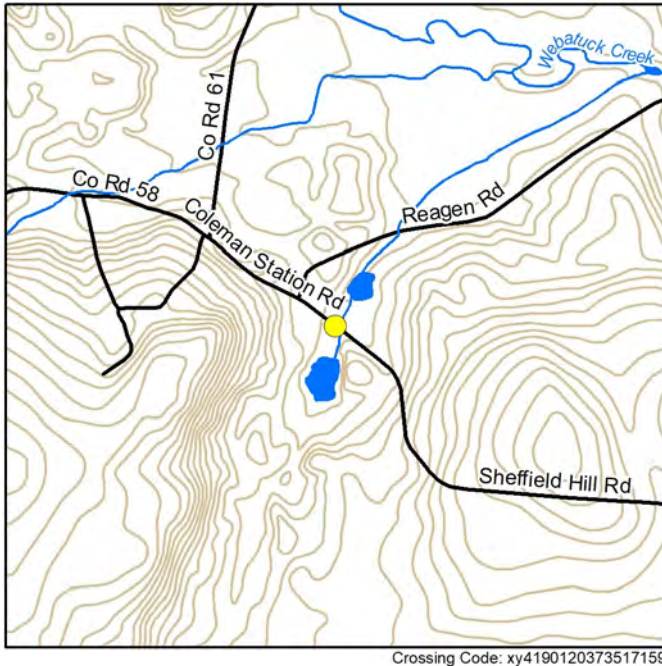
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 10.8, Height: 4.8

Substrate/Water Width: 4.40

Water Depth: 0.40

**Results**

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.50

Town Comments on Condition/Maintenance: No Comment

*Overall Ranking: Tier 7 (Ranked 38 of 103)***Location**

Coordinates: -73.516912, 41.901030

Location Description: 257 Sheffield Hill Road

Date Observed: 2019-07-02

Crossing Code: xy4190120373517159

Stream and Crossing**Crossing Characteristics**

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 100.0

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Comparable

Upstream**Downstream****Crossing Comments:** There is a channel flowing around culvert. Very poor shape. Metal corroding and land over culvert eroding. Bankfull is estimated due to upstream being a pond.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	51.83	5.51	0.92	No
5	58.93		1.15	No
10	64.14		1.33	No
25	71.08		1.59	No
50	76.44		1.81	No
100	81.95		2.05	No

Structure 1 of 1

Material: Metal

Length (feet): 36.5

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Moderate)

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.9, Height: 2.5

Substrate/Water Width: 2.9

Water Depth: 0.80

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 2.9, Height: 3.0

Substrate/Water Width: 2.00

Water Depth: 0.20



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.50

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.515255, 41.903954

Location Description: Fifty feet from 41 Reagan Road

Date Observed: 2019-07-02

Crossing Code: xy4190397773515298

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 100.0

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.8

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	59.74	6.83	1.06	No
5	67.92		1.3	No
10	73.86		1.47	No
25	81.74		1.72	No
50	87.79		1.92	No
100	93.99		2.14	No

Structure 1 of 1

Material: Metal

Length (feet): 38.5

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Fencing (Severe)

Slope (%): 0.03

Structure Comments: On the inlet side the fencing was very clogged with sediment and debris, it

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 1.9, Height: 3.0

Substrate/Water Width: 1.9

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: At Stream Grade

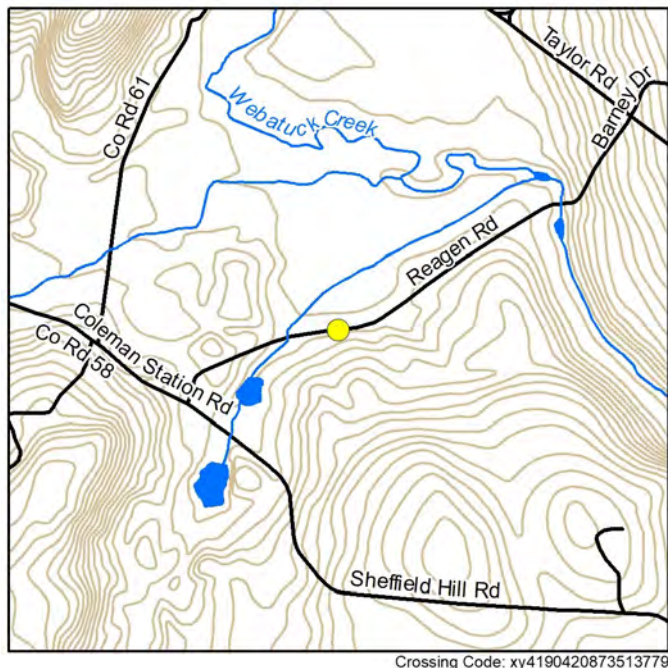
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.7, Height: 2.7

Substrate/Water Width: 3.50

Water Depth: 1.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.69

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.512723, 41.904472

Location Description: Right after white posted private property sign with small white road sign indicating inlet

Date Observed: 2019-07-15

Crossing Code: xy4190420873513779

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.6

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	59.93	2.89	1.09	No
5	68.13		1.33	No
10	74.1		1.52	No
25	82.01		1.78	No
50	88.08		1.99	No
100	94.3		2.21	No

Structure 1 of 1

Material: Plastic

Length (feet): 40.0

Dry Passage/Height: Yes (1.3)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.05

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 1.3, Height: 1.3

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

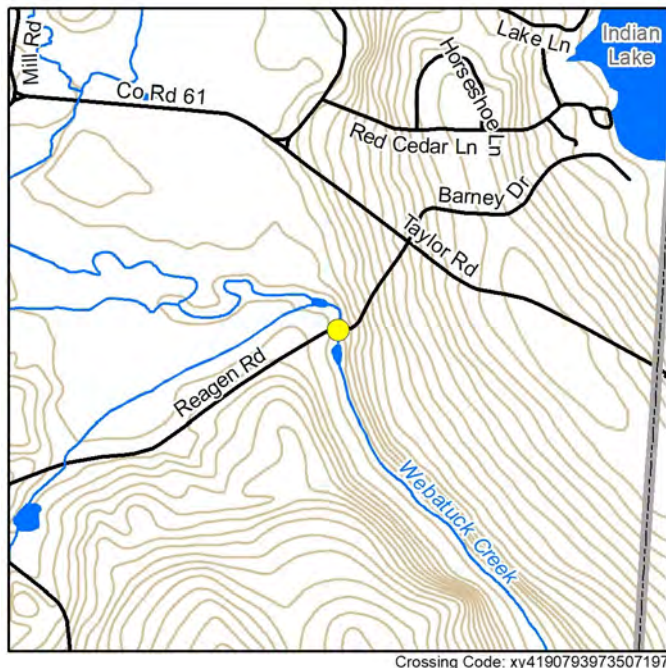
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 1.4, Height: 1.3

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.99

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.507106, 41.907931

Location Description: Bridge number 334343002

Date Observed: 2019-07-15

Crossing Code: xy4190793973507197

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 23.5

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: Town

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	2616.87	N/A	N/A	N/A
5	2986.37			
10	3239.25			
25	3558.98			
50	3796.56			
100	4032.78			

Structure 1 of 1

Material: Concrete

Length (feet): 28.3

Dry Passage/Height: Yes (9.7)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 40.0, Height: 10.4

Substrate/Water Width: 32.5

Water Depth: 0.80

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

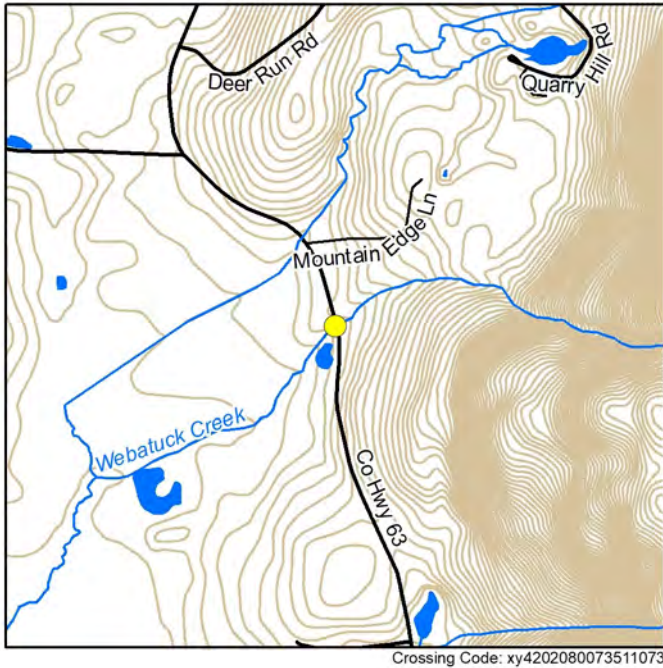
Width: 40.0, Height: 10.9

Substrate/Water Width: 33.50

Water Depth: 1.20

County-Managed Crossings

Entries are organized geographically by Map Index Key,
beginning with 1A



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.60

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.511085, 42.020729

Location Description: Across from 1394 Boston Corners Road

Date Observed: 2019-07-23

Crossing Code: xy4202080073511073

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: Other

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 9.7

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: Culvert is double circular culvert at inlet. Five feet inside structure, it turns to a box culvert then it turns to a single elliptical arch culvert at outlet.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.3

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	26.42	4.45	0.81	No
5	30.47		1.06	No
10	33		1.23	No
25	36.02		1.45	No
50	38.15		1.62	No
100	40.17		1.79	No

Structure 1 of 2

Material: Metal

Length (feet): 34.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock, Free Fall (Minor)

Slope (%): 0.03

Structure Comments: Drop of 0.8 feet

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 3.2, Height: 3.3

Substrate/Water Width: 1.2

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.3/0.8

Dimensions:

Width: 5.3, Height: 2.9

Substrate/Water Width: 3.80

Water Depth: 0.10

Structure 2 of 2

Material: Metal
Length (feet): 34.0
Dry Passage/Height (feet): No

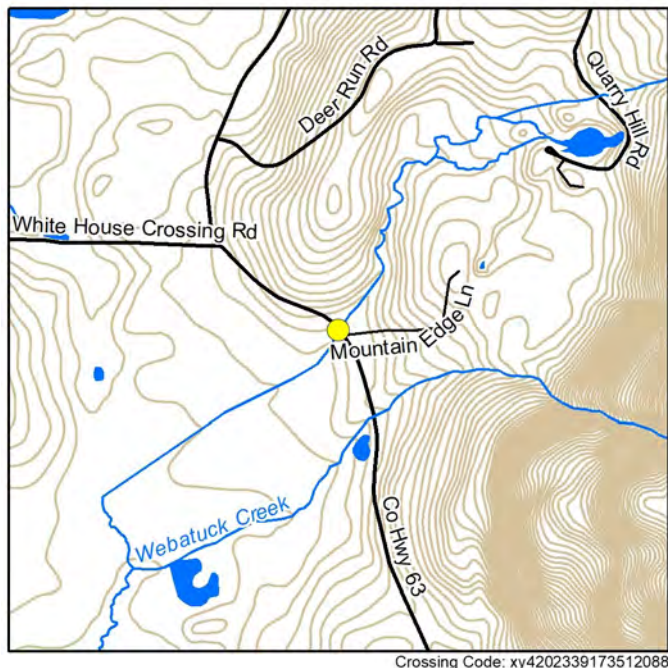
Physical Barrier(s)/Severity: Debris/Sediment/
Rock,Free Fall (Minor)
Slope (%): 0.03
Structure Comments: Inlet drop of 1 foot due to
substrate

Inlet

Inlet Shape/Type: Round Culvert/Headwall and
Wingwalls
Inlet Drop/Grade: Inlet Drop
Dimensions (feet):
 Width: 3.0, Height: 3.0
 Substrate/Water Width: 1.3
 Water Depth: 0.20

Outlet

Outlet Shape: Pipe Arch/Elliptical Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 0.3/0.8
Dimensions (feet):
 Width: 5.3, Height: 2.9
 Substrate/Water Width: 3.8
 Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.68

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 9 (Ranked 50 of 103)

Location

Coordinates: -73.512069, 42.023490

Location Description: Up the Road from 1450 mountain edge lane

Date Observed: 2019-07-23

Crossing Code: xy4202339173512088

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

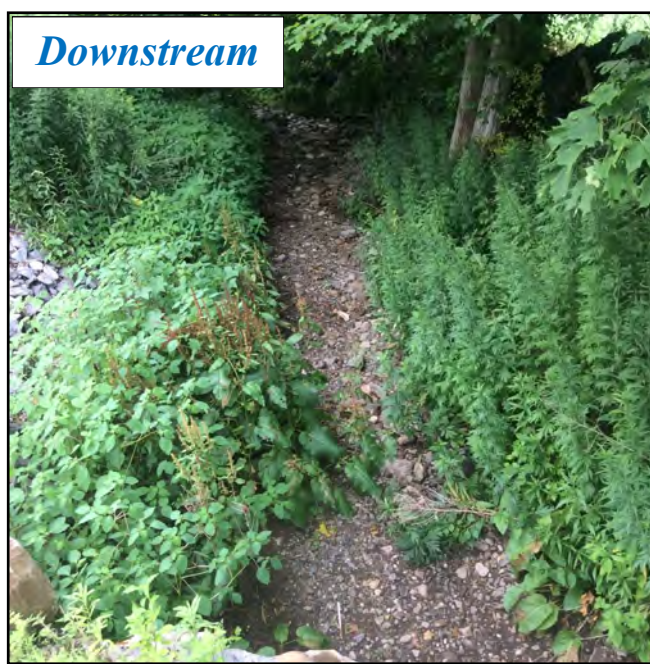
Scour Pool: Small

Bankfull Width (feet): 7.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Could not get a better inlet photo due to heavy tree blocking picture.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.1

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	11.19	6.26	0.5	No
5	12.93		0.5	No
10	14		0.5	No
25	15.27		0.5	No
50	16.15		0.5	No
100	16.98		0.5	No

Structure 1 of 1

Material: Plastic
 Length (feet): 59.3
 Dry Passage/Height: Yes (4)
 Outlet Armoring: None

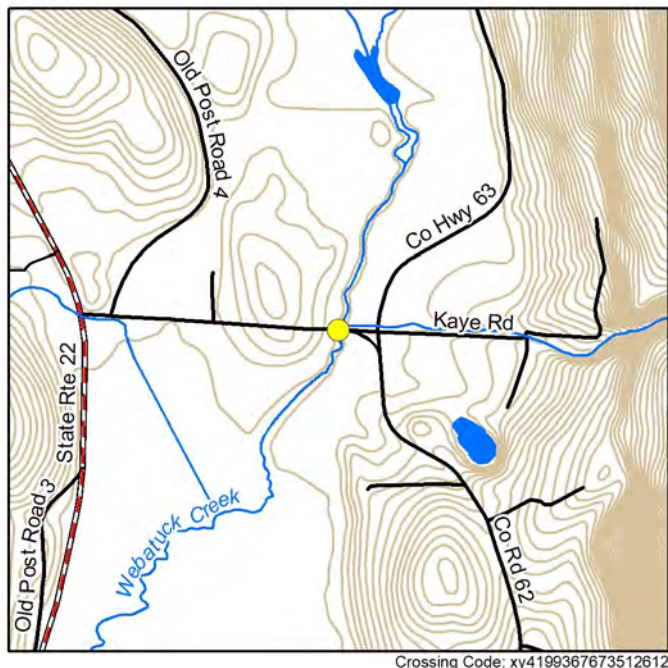
Physical Barrier(s) (Severity): None
 Slope (%): 0.01
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls
 Inlet Drop/Grade: Unknown
 Dimensions:
 Width: 4.0, Height: 4.1
 Substrate/Water Width: 0.0
 Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert
 Outlet Drop/Grade: At Stream Grade
 Drop to Stream Surface/Bottom: 0.0/0.0
 Dimensions:
 Width: 3.8, Height: 3.0
 Substrate/Water Width: 3.60
 Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.70

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.512503, 41.993678

Location Description: Rudd pond Road, 100 ft from intersection with Boston Corners Road

Date Observed: 2019-07-10

Crossing Code: xy4199367673512612

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 2

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 100.0

Water Depth/Velocity Matches Stream: No-Shallower/No-Slower

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: Bridge number 3343370, upstream is a wetlands

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	440.61	N/A	N/A	N/A
5	500.6			
10	536.26			
25	577.03			
50	604.64			
100	630.23			

Structure 1 of 2

Material: Concrete

Length (feet): 25.5

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/Rock (Severe)

Slope (%):

Structure Comments: Beaver dam blocking flow

Inlet**Inlet**

Inlet Shape/Type: Box/Bridge with Abutments/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 13.2, Height: 5.1

Substrate/Water Width: 9.6

Water Depth: 0.90

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 13.2, Height: 5.3

Substrate/Water Width: 8.10

Water Depth: 0.20

Structure 2 of 2

Material: Concrete
Length (feet): 25.5
Dry Passage/Height (feet): No

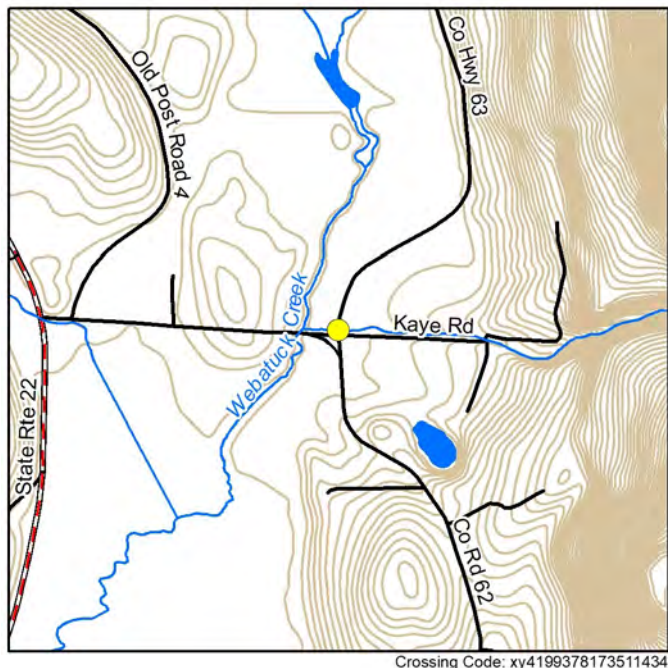
Inlet

Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 13.0, Height: 13.0
 Substrate/Water Width: 3.1
 Water Depth: 1.20

Physical Barrier(s)/Severity: Debris/Sediment/
Rock (Moderate)
Slope (%): 0
Structure Comments: Dry passage in structure
one does not connect to land on the outlet side

Outlet

Outlet Shape: Box/Bridge with Abutments
Outlet Drop/Grade: At Stream Grade
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 13.0, Height: 5.2
 Substrate/Water Width: 13
 Water Depth: 0.90



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.89

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.511430, 41.993707

Location Description: Intersection of Rudd Pond Road, Kaye Road, and Boston Corners Road.

Date Observed: 2019-07-10

Crossing Code: xy4199378173511434

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 12.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Comparable



Crossing Comments: Dam just upstream, beaver dam just downstream

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.8

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	98.28	6.92	4.01	No
5	108.74		4.29	No
10	114.77		4.45	No
25	121.49		4.62	No
50	125.96		4.73	No
100	130.04		4.83	No

Structure 1 of 1

Material: Concrete

Length (feet): 30.5

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 12.0, Height: 5.1

Substrate/Water Width: 7.5

Water Depth: 0.70

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

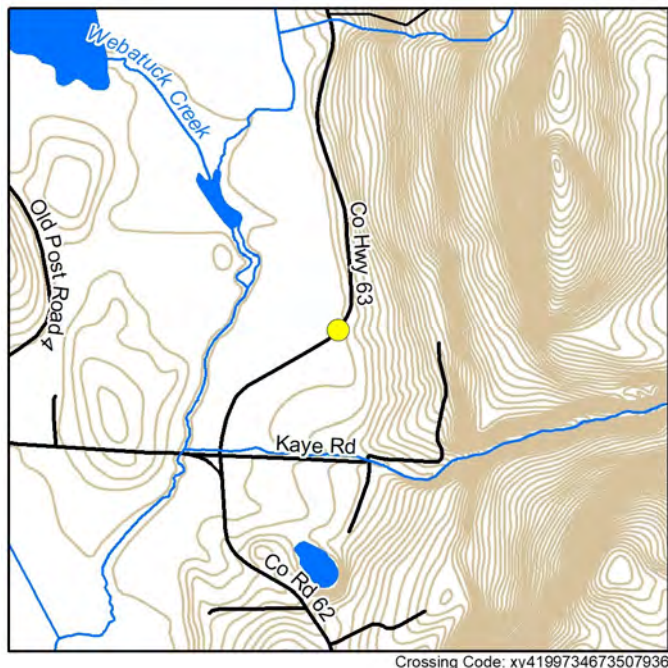
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 12.7, Height: 4.9

Substrate/Water Width: 12.70

Water Depth: 0.60



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.67

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 7 (Ranked 38 of 103)

Location

Coordinates: -73.508150, 41.997191

Location Description: 1000 feet up Boston Corners Road from intersection with Rudd Pond Road next to small white signs on either side of the Road meant to show location

Date Observed: 2019-07-23

Crossing Code: xy4199734673507936

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 100.0

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.2

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	333.39	4.14	3.06	No
5	388.33		3.86	No
10	423.24		4.4	Yes
25	465.14		5.09	Yes
50	494.84		5.59	Yes
100	523.33		6.09	Yes

Structure 1 of 2

Material: Plastic
 Length (feet): 39.5
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
 Rock (Minor)
 Slope (%): -0.01
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting
 Inlet Drop/Grade: At Stream Grade
 Dimensions:
 Width: 2.0, Height: 1.7
 Substrate/Water Width: 1.9
 Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert
 Outlet Drop/Grade: At Stream Grade
 Drop to Stream Surface/Bottom: 0.0/0.0
 Dimensions:
 Width: 2.0, Height: 1.5
 Substrate/Water Width: 2.00
 Water Depth: 0.30

Structure 2 of 2

Material: Plastic
Length (feet): 41.0
Dry Passage/Height (feet): No

Inlet

Inlet Shape/Type: Round Culvert/Projecting
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 2.0, Height: 2.0
 Substrate/Water Width: 1.9
 Water Depth: 0.50

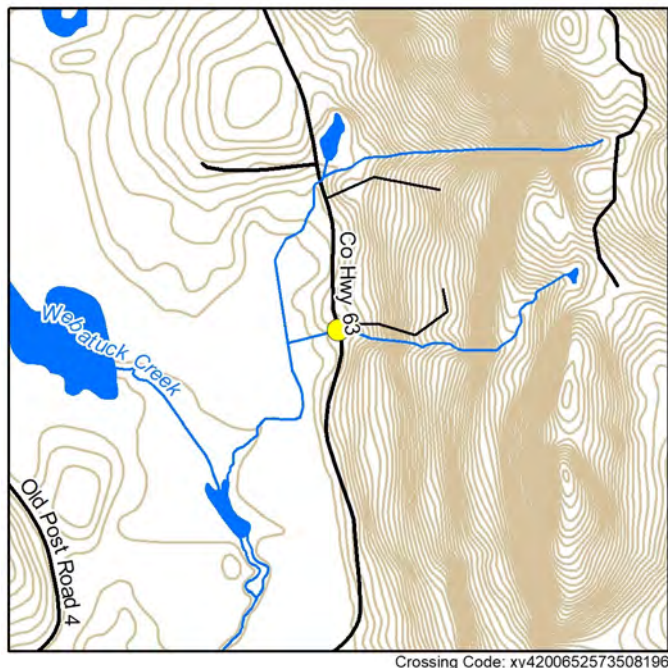
Physical Barrier(s)/Severity: Deformation
(Minor)

Slope (%):

Structure Comments: Rocks and sediment clogging outlet side, outlet side also pretty buried under grass and slightly collapsed

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: At Stream Grade
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 2.0, Height: 1.1
 Substrate/Water Width: 2
 Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 4 (Ranked 10 of 103)

Location

Coordinates: -73.508196, 42.006525

Location Description: 50 feet from 204 Boston Corners Road

Date Observed: 2019-07-10

Crossing Code: xy4200652573508196

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 6.0

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Stream split off into two stream starts just upstream so we picked one and took bankfull in just one of them

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.6

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	62.7	4.01	2.21	No
5	71.83		2.89	No
10	77.65		3.38	No
25	84.65		4.01	No
50	89.61		4.48	Yes
100	94.4		4.97	Yes

Structure 1 of 1

Material: Plastic
 Length (feet): 48.2
 Dry Passage/Height: No
 Outlet Armoring: Not Extensive

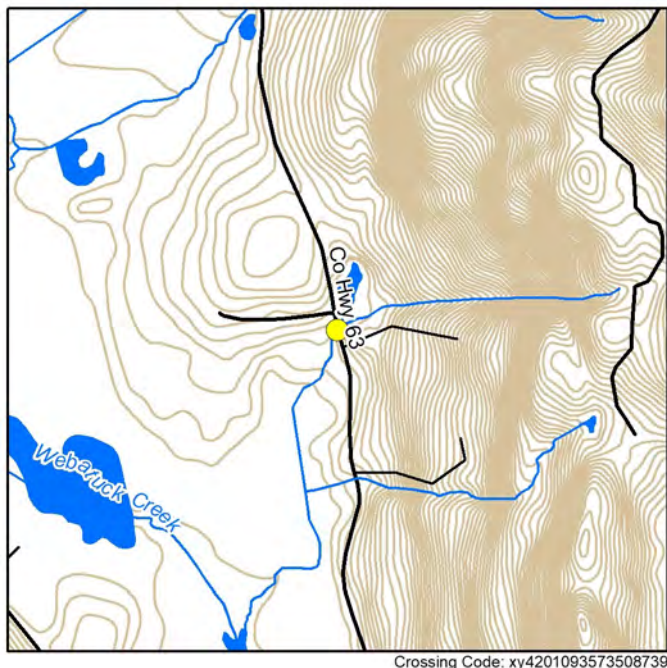
Physical Barrier(s) (Severity): None
 Slope (%): 0.03
 Structure Comments: Inlet drop 0.3 feet

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall
 Inlet Drop/Grade: Inlet Drop
 Dimensions:
 Width: 1.5, Height: 1.4
 Substrate/Water Width: 0.9
 Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert
 Outlet Drop/Grade: Cascade
 Drop to Stream Surface/Bottom: 2.9/3.0
 Dimensions:
 Width: 1.6, Height: 1.5
 Substrate/Water Width: 0.50
 Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.77

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 9 (Ranked 50 of 103)

Location

Coordinates: -73.509349, 42.011270

Location Description: Just before 1271 Boston Corners Road also called Chelonia
Just before 1271 Boston Corners Road also called Cielo Farm.

Date Observed: 2019-07-23

Crossing Code: xy4201093573508739

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 4.3

Water Depth/Velocity Matches Stream: Yes/No-Slower

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.8

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	46.77	5.76	0.81	No
5	53.92		1.06	No
10	58.44		1.24	No
25	63.86		1.47	No
50	67.69		1.65	No
100	71.36		1.82	No

Structure 1 of 1

Material: Plastic
 Length (feet): 50.0
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
 Rock (Minor)
 Slope (%): 0.03
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 3.0

Substrate/Water Width: 3.7

Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 4.2, Height: 3.8

Substrate/Water Width: 2.80

Water Depth: 0.50



Results

Barrier Evaluation: Significant barrier

Aquatic Organism Passage Score: 0.26

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 8 (Ranked 46 of 103)

Location

Coordinates: -73.507663, 41.978383

Location Description: 50 feet from Rudd Pond boat launch

Date Observed: 2019-07-30

Crossing Code: xy4197837073507700

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

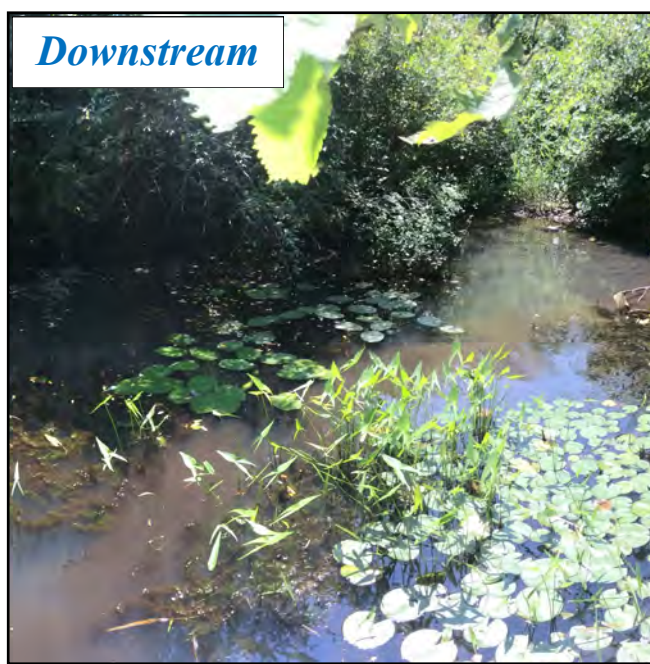
Scour Pool: Large

Bankfull Width (feet): 1,000.0

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.7

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	18.39	8.08	1.48	No
5	20.27		1.58	No
10	21.49		1.65	No
25	22.99		1.73	No
50	24.07		1.78	No
100	25.12		1.84	No

Structure 1 of 1

Material: Concrete

Length (feet): 53.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Free Fall, Fencing (Severe)

Slope (%): -0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Other

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 2.5, Height: 5.4

Substrate/Water Width: 2.5

Water Depth: 1.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

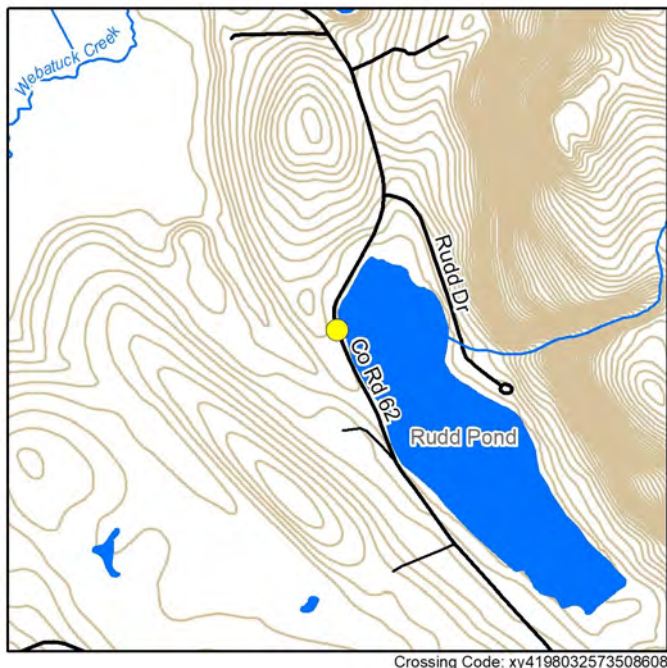
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.3, Height: 3.3

Substrate/Water Width: 2.60

Water Depth: 0.60



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.508676, 41.981034

Location Description:

Date Observed: 2019-07-30

Crossing Code: xy4198032573508608

Stream and Crossing

Crossing Characteristics

Crossing Type: Partially Inaccessible

Number of structures/cells: 1

Condition: Unknown

Constriction: No data

Alignment: Flow-Aligned

Internal Features/Structures: No data

Stream Characteristics

Scour Pool: No data

Bankfull Width (feet): 0.0

Water Depth/Velocity Matches Stream: /

Structure Substrate Type:

Structure Substrate Matches Stream?



Crossing Comments: Structure was buried and inaccessible on the outlet side. Outlet side is Rudd Pond. Inlet is extremely overgrown and sediment has clogged the inlet pipe.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	80.09	N/A	N/A	N/A
5	88.16			
10	92.8			
25	97.98			
50	101.42			
100	104.56			

Structure 1 of 1

Material: No data

Length (feet): 0.0

Dry Passage/Height:

Outlet Armoring:

Physical Barrier(s) (Severity):

Slope (%):

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

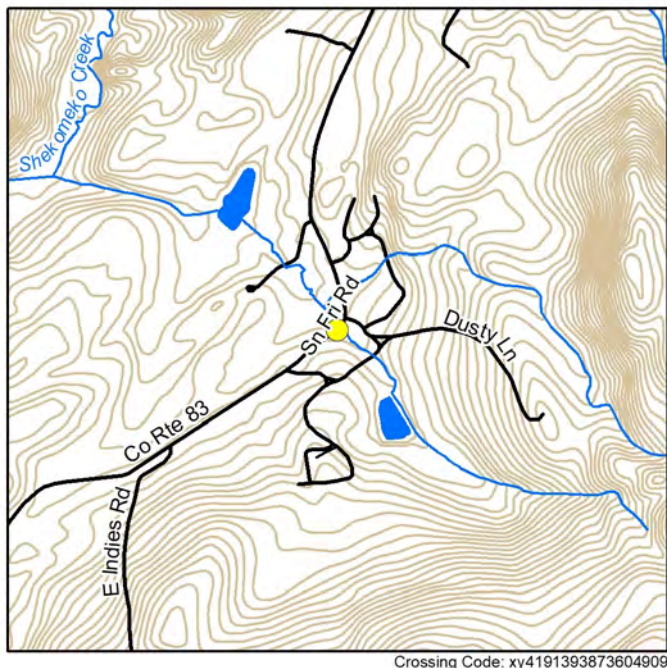
Inlet Drop/Grade: Clogged/Collapsed/Submerged

Dimensions:

Width: 1.0, Height: 0.5

Substrate/Water Width: 1.0

Water Depth: 0.30



Results

Barrier Evaluation: Significant barrier

Aquatic Organism Passage Score: 0.33

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 7 (Ranked 38 of 103)

Location

Coordinates: -73.604832, 41.914015

Location Description: Crossing 20 feet from Dusty Lane private drive

Date Observed: 2019-07-03

Crossing Code: xy4191393873604909

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 7.6

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.5

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	60.21	6.69	3.22	No
5	62.48		3.25	No
10	63.96		3.27	No
25	65.77		3.3	No
50	67.07		3.32	No
100	68.34		3.34	No

Structure 1 of 1

Material: Metal

Length (feet): 40.9

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.0, Height: 5.0

Substrate/Water Width: 2.6

Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

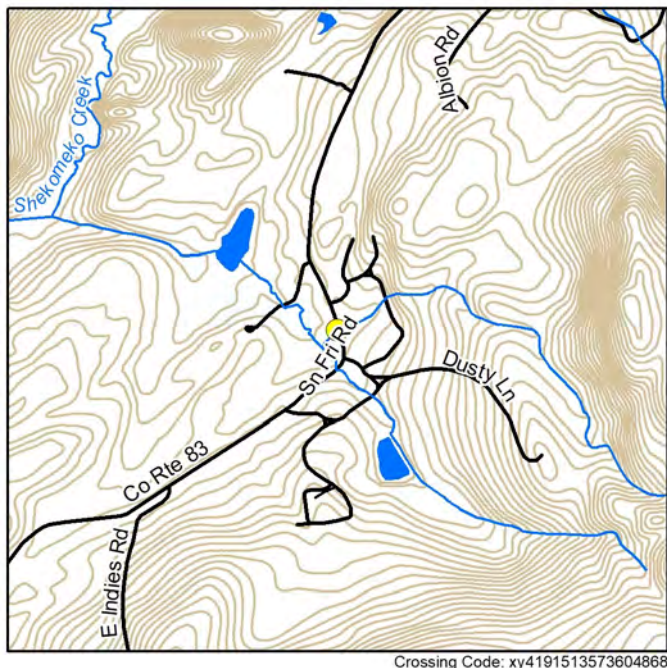
Drop to Stream Surface/Bottom: 0.7/2.0

Dimensions:

Width: 4.9, Height: 5.0

Substrate/Water Width: 1.90

Water Depth: 0.20



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.85

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.604728, 41.914922

Location Description: About 100 feet up from intersection with dusty lane, before new 45mph speed limit sign

Date Observed: 2019-07-03

Crossing Code: xy4191513573604868

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Skewed ($>45^\circ$)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 1.0

Water Depth/Velocity Matches Stream: Yes/No-Slower

Structure Substrate Type: Unknown

Structure Substrate Matches Stream? Unknown

Upstream



Downstream



Crossing Comments: Fences on either side with mowed grass, neither side is very natural and we estimated the bankfull measurements across 25 feet

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.9

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	20.45	5.07	1.7	No
5	20.97		1.74	No
10	21.28		1.76	No
25	21.61		1.8	No
50	21.83		1.82	No
100	22.04		1.84	No

Structure 1 of 1

Material: Concrete

Length (feet): 32.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.0, Height: 2.2

Substrate/Water Width: 1.0

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

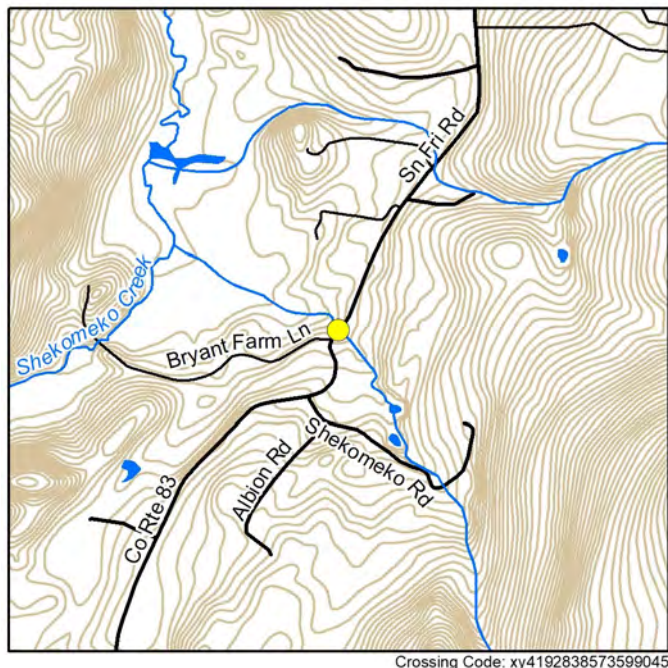
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 2.0, Height: 1.8

Substrate/Water Width: 2.00

Water Depth: 0.40



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 4 (Ranked 10 of 103)

Location

Coordinates: -73.598988, 41.928331

Location Description: 1403 Sn Fri Rd, Route 83

Date Observed: 2019-07-11

Crossing Code: xy4192838573599045

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 7.3

Water Depth/Velocity Matches Stream: No-Shallower/No-Slower

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	115.3	8.04	2.14	No
5	138.29		2.42	No
10	153.58		2.59	No
25	172.57		2.8	No
50	186.42		2.95	No
100	200.03		3.1	No

Structure 1 of 1

Material: Concrete

Length (feet): 48.2

Dry Passage/Height: Yes (6)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: Inlet perch height is 0.1 feet, substrate partially in culvert, not 25%

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: Perched

Dimensions:

Width: 10.0, Height: 6.0

Substrate/Water Width: 3.0

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

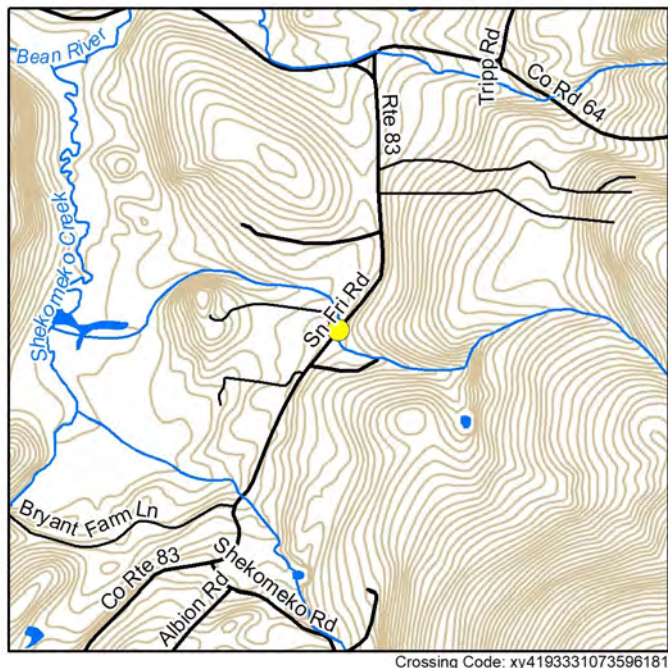
Drop to Stream Surface/Bottom: 3.6/3.7

Dimensions:

Width: 10.1, Height: 6.0

Substrate/Water Width: 2.80

Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.11

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 4 (Ranked 10 of 103)

Location

Coordinates: -73.596097, 41.933225

Location Description: Next to 1485 on Route 83

Date Observed: 2019-07-08

Crossing Code: xy4193331073596181

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 10.5

Water Depth/Velocity Matches Stream: No-Shallower/No-Slower

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.6

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	83.37	7.48	1.71	No
5	86.38		1.75	No
10	88.21		1.77	No
25	90.32		1.8	No
50	91.77		1.82	No
100	93.13		1.84	No

Structure 1 of 1

Material: Concrete

Length (feet): 33.9

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: Inlet drop 1.5 feet

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 10.0, Height: 5.9

Substrate/Water Width: 0.8

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

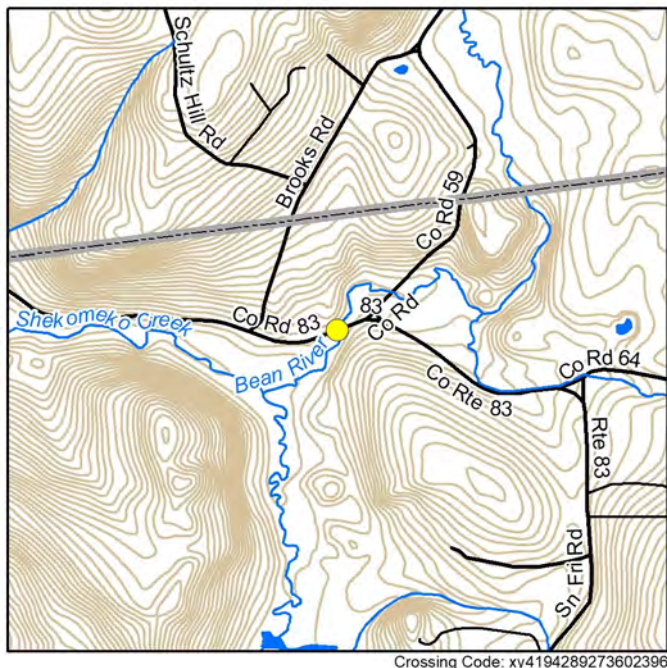
Drop to Stream Surface/Bottom: 1.3/1.6

Dimensions:

Width: 10.0, Height: 5.9

Substrate/Water Width: 8.00

Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.76

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.602437, 41.943041

Location Description: 150 ft from intersection of route 83 and bean river Road, culvert number 3343010

Date Observed: 2019-07-03

Crossing Code: xy4194289273602396

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 18.7

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	75.05	5.39	1.51	No
5	78.44		1.56	No
10	80.57		1.59	No
25	83.1		1.62	No
50	84.88		1.64	No
100	86.58		1.66	No

Structure 1 of 2

Material: Concrete

Length (feet): 32.6

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

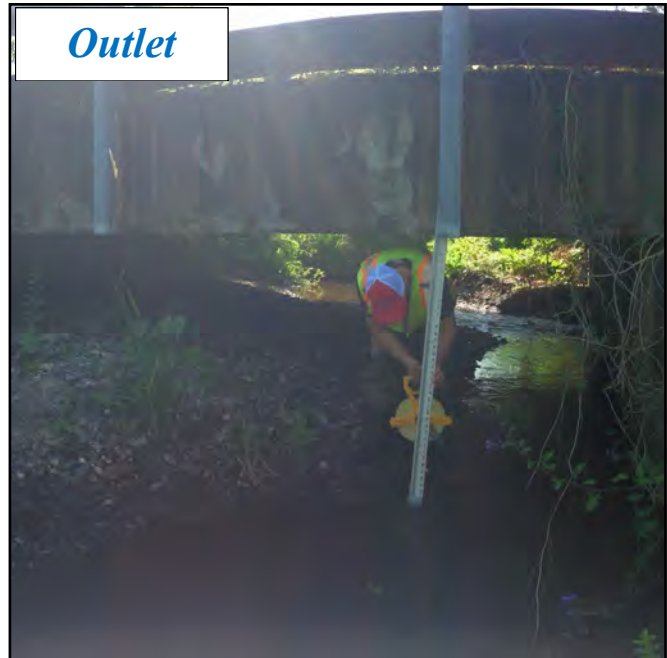
Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 10.1, Height: 5.0

Substrate/Water Width: 9.3

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 10.3, Height: 5.1

Substrate/Water Width: 7.40

Water Depth: 0.20

Structure 2 of 2

Material: Concrete
Length (feet): 32.8
Dry Passage/Height (feet): Yes (4)

Physical Barrier(s)/Severity: Dry (Severe)
Slope (%): 0.01
Structure Comments: No data

Inlet

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 10.0, Height: 10.0
 Substrate/Water Width: 10.0
 Water Depth: 0.00

Outlet

Outlet Shape: Box Culvert
Outlet Drop/Grade: At Stream Grade
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 10.2, Height: 4.4
 Substrate/Water Width: 10.2
 Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.79

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.601271, 41.943553

Location Description: 100ft from stop sign at corner of Pulvers corner Road and route 83

Date Observed: 2019-07-03

Crossing Code: xy4194349273601264

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.6

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	74.98	5.25	2	No
5	78.38		2.18	No
10	80.52		2.3	No
25	83.06		2.45	No
50	84.85		2.55	No
100	86.55		2.66	No

Structure 1 of 1

Material: Concrete

Length (feet): 56.7

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.6, Height: 2.3

Substrate/Water Width: 2.1

Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

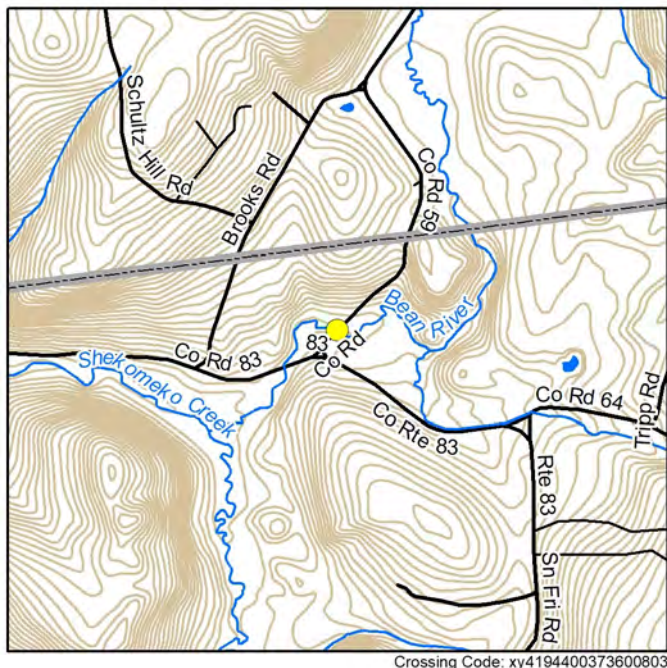
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 2.7, Height: 2.2

Substrate/Water Width: 2.30

Water Depth: 0.40



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.88

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.600669, 41.944069

Location Description: Bridge 3343390, intersection of route 83 and Bean River Road

Date Observed: 2019-07-03

Crossing Code: xy4194400373600803

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

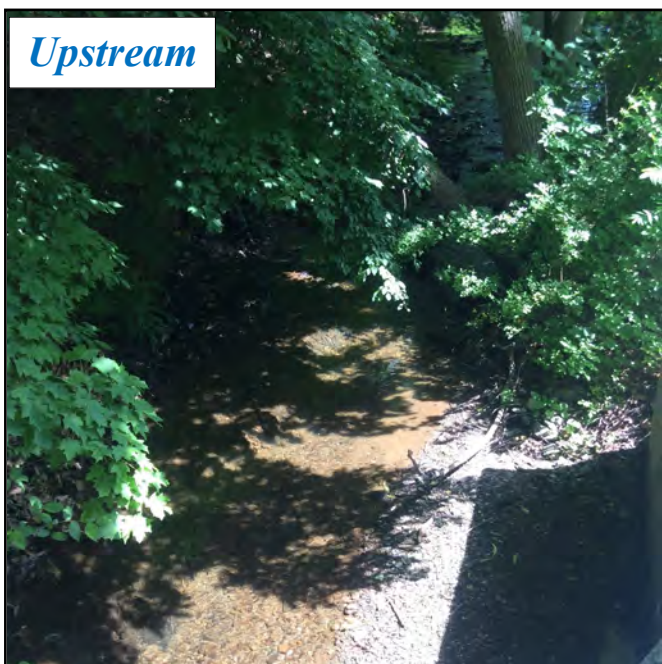
Bankfull Width (feet): 8.6

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	74.39	N/A	N/A	N/A
5	77.82			
10	79.98			
25	82.54			
50	84.35			
100	86.07			

Structure 1 of 1

Material: Combination

Length (feet): 24.1

Dry Passage/Height: Yes (2.5)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box/Bridge with Abutments/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 24.9, Height: 4.4

Substrate/Water Width: 7.2

Water Depth: 0.60

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

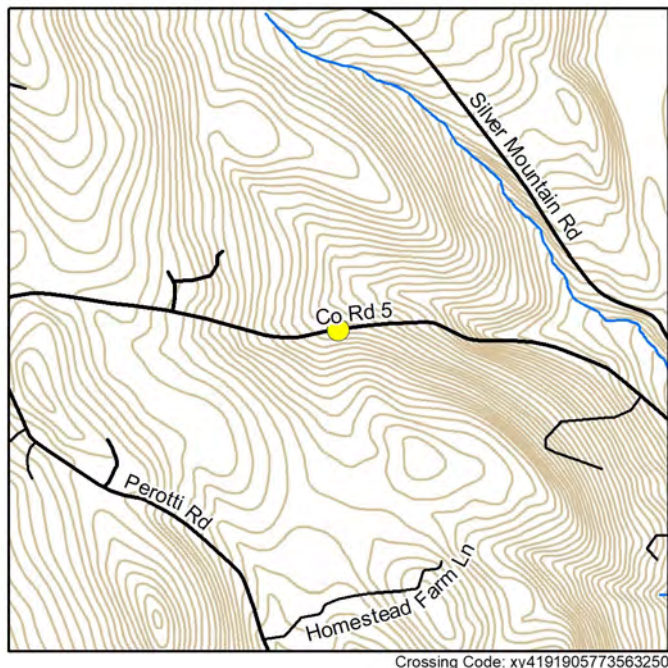
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 25.0, Height: 4.6

Substrate/Water Width: 4.30

Water Depth: 0.40



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.64

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.563418, 41.919053

Location Description: 200 feet away from 680 Smithfield Road

Date Observed: 2019-07-02

Crossing Code: xy4191905773563250

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.3

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.7

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	8.27	7.28	0.39	No
5	9.81		0.4	No
10	10.8		0.41	No
25	12.01		0.42	No
50	12.87		0.42	No
100	13.72		0.43	No

Structure 1 of 1

Material: Concrete

Length (feet): 50.0

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Minor)

Slope (%): 0.07

Structure Comments: Outlet drop was very small

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.5, Height: 3.6

Substrate/Water Width: 1.2

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

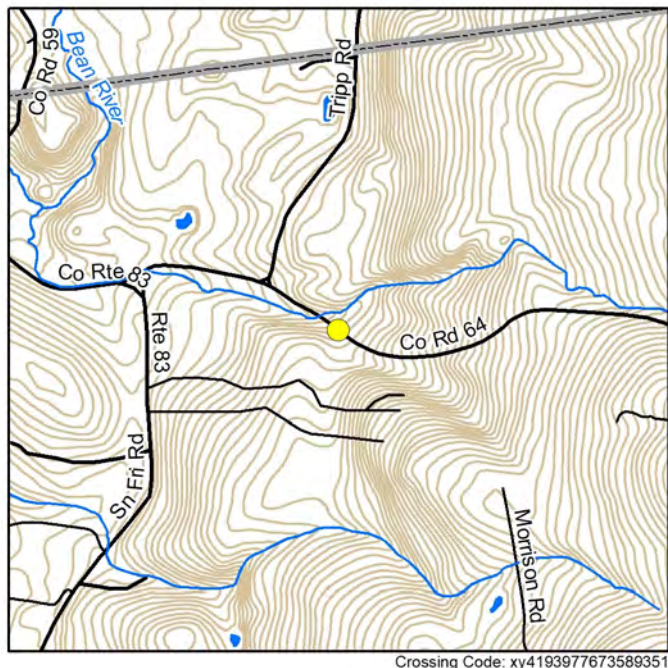
Drop to Stream Surface/Bottom: 0.1/0.1

Dimensions:

Width: 3.5, Height: 3.6

Substrate/Water Width: 0.90

Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.61

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.589348, 41.939803

Location Description: 200 ft uphill of 65 McGhee Road

McGhee Road

Date Observed: 2019-07-02

Crossing Code: xy4193977673589351

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 5.7

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	71.75	8.74	2.12	No
5	75.06		2.14	No
10	77.14		2.16	No
25	79.62		2.18	No
50	81.36		2.2	No
100	83.02		2.22	No

Structure 1 of 1

Material: Metal

Length (feet): 53.0

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.1

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 10.0, Height: 6.7

Substrate/Water Width: 1.9

Water Depth: 0.40

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

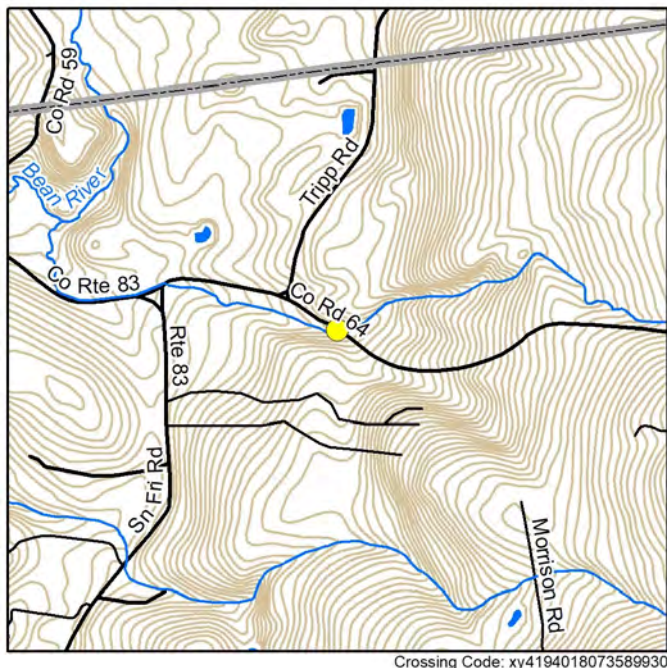
Drop to Stream Surface/Bottom: 0.4/1.0

Dimensions:

Width: 10.0, Height: 6.2

Substrate/Water Width: 1.80

Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.91

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.590024, 41.940196

Location Description: 65 McGehee Road

Date Observed: 2019-07-02

Crossing Code: xy4194018073589930

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: Poor

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 16.8

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Upstream



Downstream

Crossing Comments: Landowner right next to bridge says that the town is already planning on replacing this structure.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	72.24	21.68	1.92	No
5	75.61		2.03	No
10	77.72		2.11	No
25	80.24		2.19	No
50	82		2.24	No
100	83.69		2.3	No

Structure 1 of 1

Material: Concrete

Length (feet): 26.9

Dry Passage/Height: Yes (7.1)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): -0.06

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

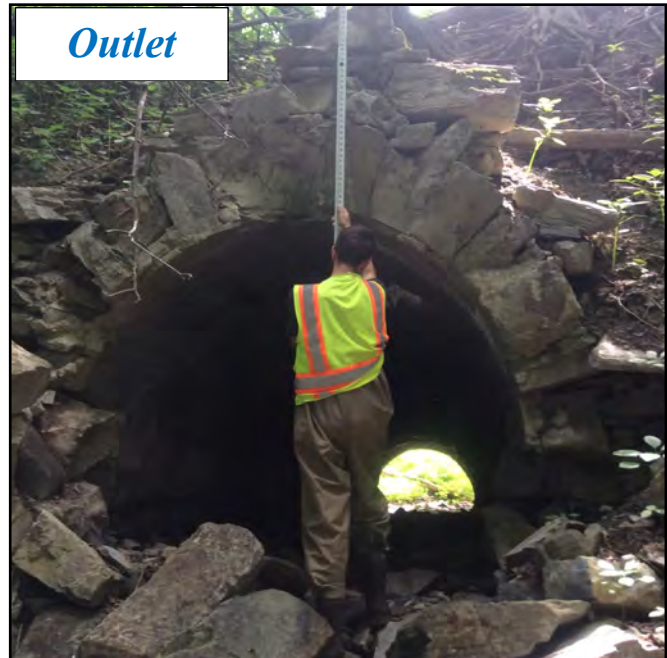
Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 7.0, Height: 10.3

Substrate/Water Width: 4.0

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

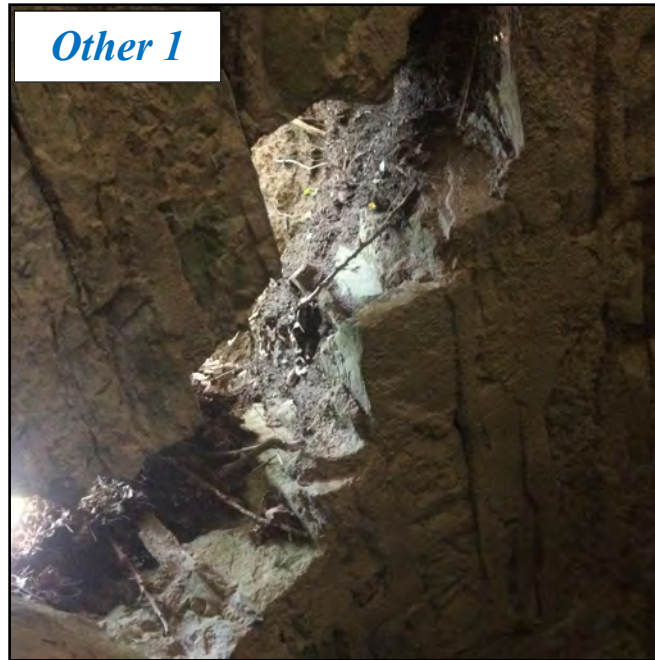
Dimensions:

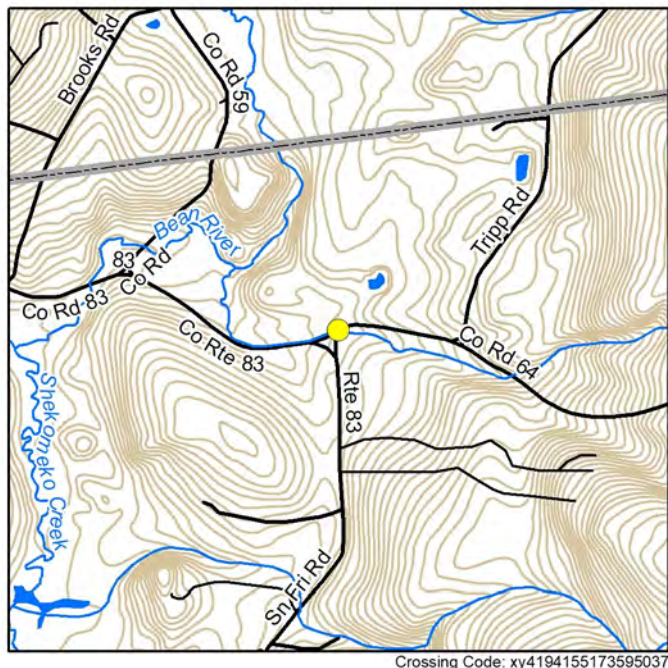
Width: 7.2, Height: 11.4

Substrate/Water Width: 7.20

Water Depth: 0.50

Additional Photo





Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.06

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.594766, 41.941468

Location Description: McGhee Hill Road and Route 83 intersection, near large red barn

Date Observed: 2019-07-08

Crossing Code: xy4194155173595037

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 8.4

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.5

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	73.63	7.03	1.88	No
5	77.07		1.94	No
10	79.22		1.97	No
25	81.79		2.01	No
50	83.6		2.04	No
100	85.32		2.07	No

Structure 1 of 1

Material: Concrete

Length (feet): 32.4

Dry Passage/Height: Yes (4.5)

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.03

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 7.6, Height: 4.5

Substrate/Water Width: 4.5

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

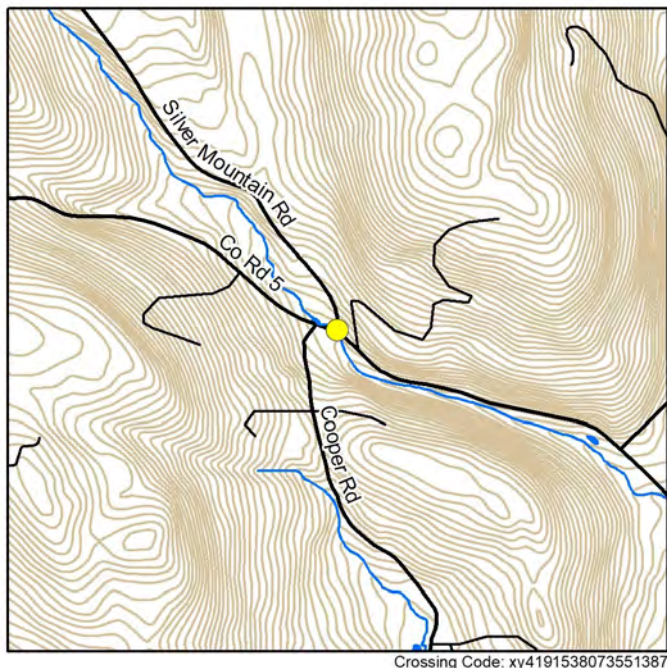
Drop to Stream Surface/Bottom: 1.7/1.7

Dimensions:

Width: 7.6, Height: 5.2

Substrate/Water Width: 5.20

Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.72

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.551558, 41.915398

Location Description: At corner of Smithfield Road and Silver Mountain Road.

Date Observed: 2019-07-02

Crossing Code: xy4191538073551387

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 10.9

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	133.24	N/A	N/A	N/A
5	158.36			
10	173.89			
25	192.2			
50	204.9			
100	216.9			

Structure 1 of 1

Material: Concrete

Length (feet): 46.0

Dry Passage/Height: Yes (7.4)

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Severe)

Slope (%): 0

Structure Comments: The outlet side is starting to

Inlet**Outlet****Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 16.8, Height: 8.1

Substrate/Water Width: 12.3

Water Depth: 0.50

Outlet

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

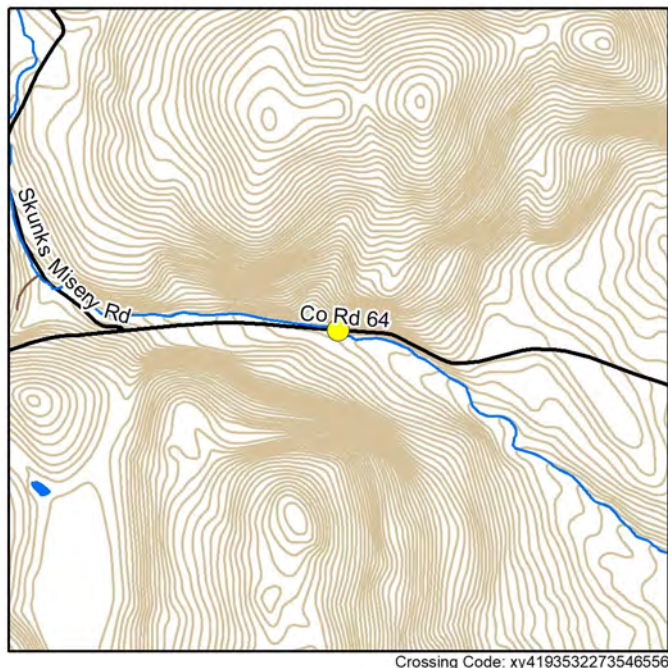
Width: 15.0, Height: 8.8

Substrate/Water Width: 1.00

Water Depth: 0.20

Additional Photo





Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.03

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.546609, 41.935168

Location Description: Next to 593 McGhee hill Road

Date Observed: 2019-07-02

Crossing Code: xy4193532273546556

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

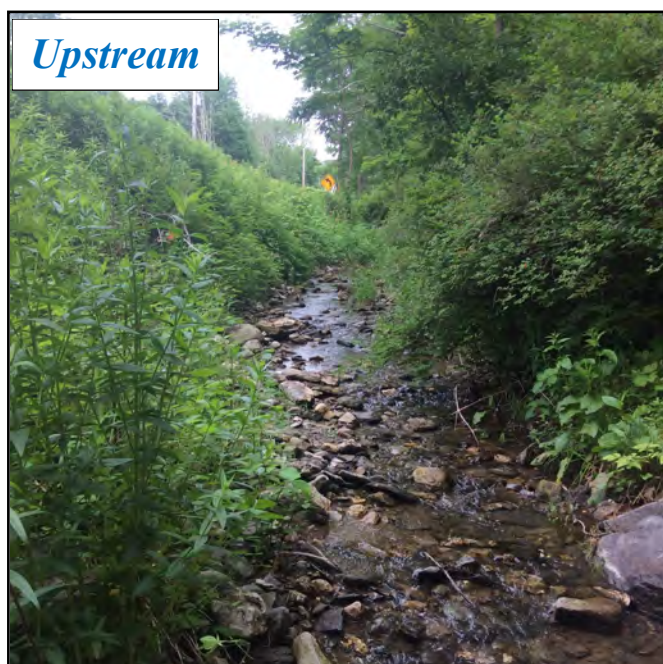
Scour Pool: Large

Bankfull Width (feet): 9.3

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Each internal free fall creates under 1 foot of a drop. There are five of them.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 5.4

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	130.7	12.29	2.73	No
5	149.17		3.45	No
10	161.45		3.97	No
25	176.71		4.68	No
50	187.83		5.24	No
100	198.76		5.82	No

Structure 1 of 1

Material: Concrete

Length (feet): 112.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Free Fall (Minor)

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 6.5, Height: 6.9

Substrate/Water Width: 2.5

Water Depth: 0.50

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

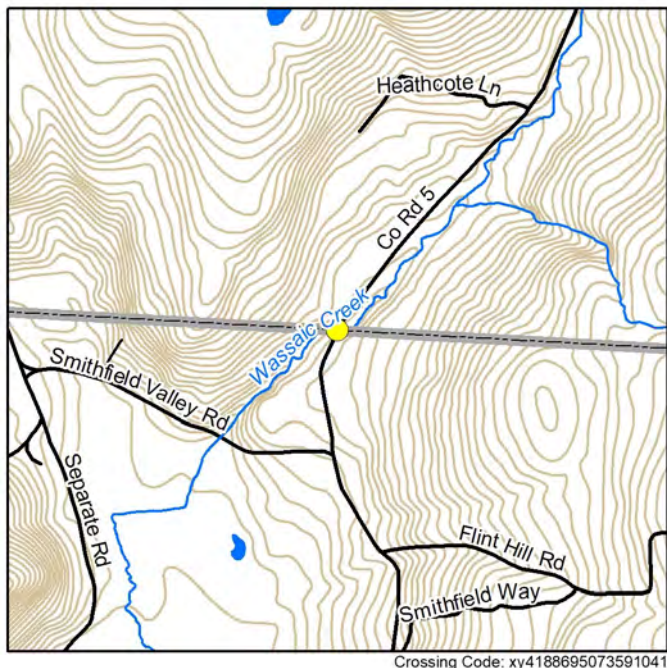
Drop to Stream Surface/Bottom: 2.0/3.8

Dimensions:

Width: 6.9, Height: 6.9

Substrate/Water Width: 2.10

Water Depth: 0.10



Results

Barrier Evaluation: Significant barrier

Aquatic Organism Passage Score: 0.33

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 8 (Ranked 46 of 103)

Location

Coordinates: -73.590996, 41.886939

Location Description: Culvert number 3342620

Date Observed: 2019-07-24

Crossing Code: xy4188695073591041

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 11.7

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.2

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	290.3	8.18	3	No
5	349.38		3.41	No
10	387.26		3.66	No
25	433.09		3.95	No
50	465.71		4.16	No
100	497.04		4.35	No

Structure 1 of 1

Material: Concrete

Length (feet): 35.2

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: Perched by 0.3 feet

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: Perched

Dimensions:

Width: 14.8, Height: 6.0

Substrate/Water Width: 12.5

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

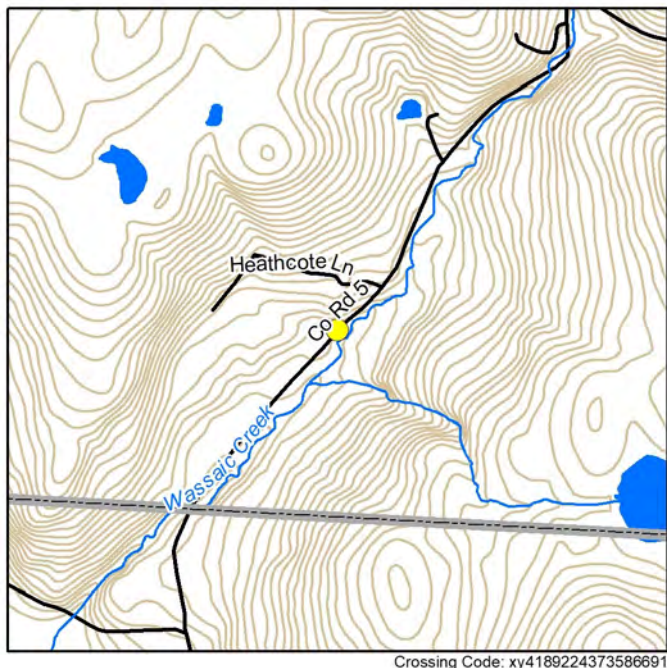
Drop to Stream Surface/Bottom: 0.7/1.0

Dimensions:

Width: 14.8, Height: 6.0

Substrate/Water Width: 12.80

Water Depth: 0.10



Results

Barrier Evaluation: Significant barrier

Aquatic Organism Passage Score: 0.33

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 3 (Ranked 9 of 103)

Location

Coordinates: -73.586691, 41.892243

Location Description: 81 Smithfield Road

Date Observed: 2019-07-24

Crossing Code: xy4189224373586691

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Spans Only Bankfull/Active Channel

Alignment: Skewed ($>45^\circ$)

Internal Features/Structures: Other

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 2.0

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Contrasting



Crossing Comments: Forks off upstream into two channels, one leads to pond 15 feet up the other is presumably for runoff and is dry. Only one bankfull measurement due to brevity of upstream channel before it opens up to the pond. Condition poor due to corrosion at bottom.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.9

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	13.13	5.38	0.57	No
5	15.65		0.75	No
10	17.22		0.87	No
25	19.09		1.04	No
50	20.4		1.16	No
100	21.64		1.28	No

Structure 1 of 1

Material: Metal

Length (feet): 42.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Moderate)

Slope (%): 0.06

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.5, Height: 2.5

Substrate/Water Width: 1.8

Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.7/0.9

Dimensions:

Width: 2.5, Height: 2.4

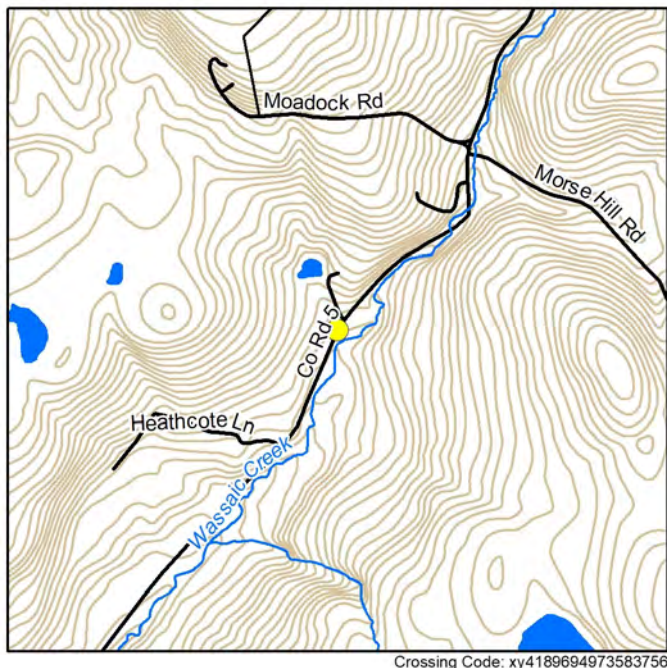
Substrate/Water Width: 1.00

Water Depth: 0.10

Additional Photo

Other 1





Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.76

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.583702, 41.897014

Location Description: Next to mailbox for 203 Smithfield Road

Date Observed: 2019-07-24

Crossing Code: xy4189694973583756

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 4.3

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Comparable



Crossing Comments: Next to Farm with horses and livestock grazing close by. Utility pipe entering near inlet.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.8

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	188.33	4.31	1.45	No
5	226.68		2.08	No
10	251.33		2.54	No
25	281.21		3.17	No
50	302.52		3.66	No
100	323.02		4.17	No

Structure 1 of 1

Material: Concrete

Length (feet): 50.1

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.0, Height: 2.5

Substrate/Water Width: 2.2

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

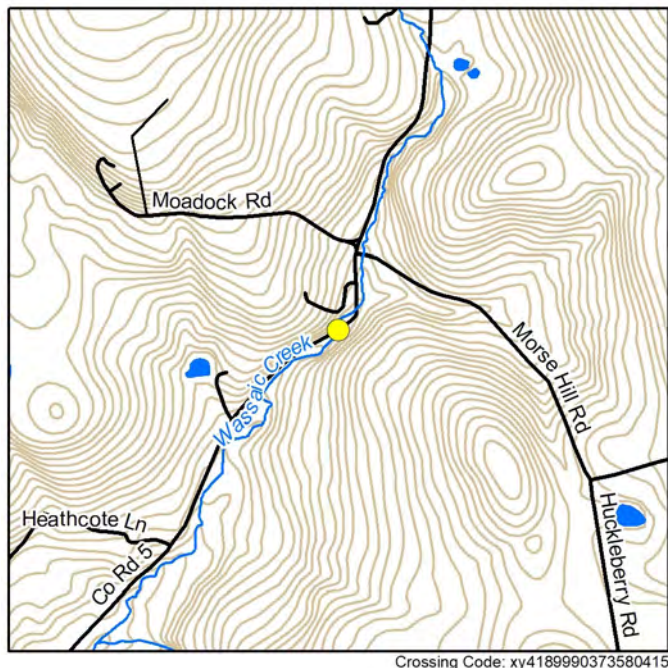
Drop to Stream Surface/Bottom: 0.1/0.2

Dimensions:

Width: 3.0, Height: 2.6

Substrate/Water Width: 0.90

Water Depth: 0.20



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.61

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.580580, 41.899978

Location Description: 100 ft up from 249 Smithfield Road

Date Observed: 2019-07-24

Crossing Code: xy4189990373580415

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Skewed ($>45^\circ$)

Internal Features/Structures: Baffles/Weirs

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 11.7

Water Depth/Velocity Matches Stream: No-Shallower/No-Slower

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.4

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	162.58	7.4	1.13	No
5	195.6		1.61	No
10	216.87		1.97	No
25	242.69		2.45	No
50	261.14		2.83	No
100	278.91		3.22	No

Structure 1 of 2

Material: Concrete

Length (feet): 49.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.0, Height: 4.9

Substrate/Water Width: 1.8

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.4/2.5

Dimensions:

Width: 5.1, Height: 5.0

Substrate/Water Width: 0.90

Water Depth: 0.10

Structure 2 of 2

Material: Concrete
Length (feet): 49.0
Dry Passage/Height (feet): No

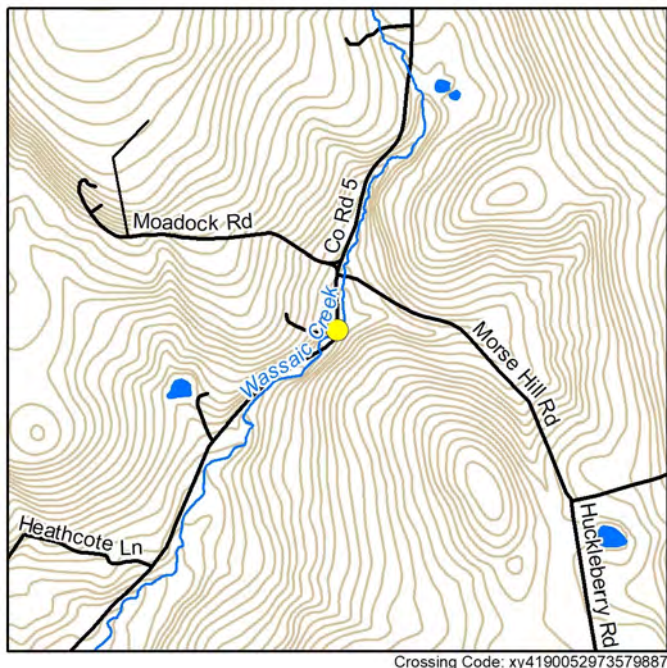
Physical Barrier(s)/Severity: None
Slope (%): 0.02
Structure Comments: No data

Inlet

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 4.5, Height: 4.5
 Substrate/Water Width: 0.9
 Water Depth: 0.20

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 0.4/1.8
Dimensions (feet):
 Width: 5.1, Height: 4.9
 Substrate/Water Width: 1.6
 Water Depth: 0.20



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.98

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.579883, 41.900490

Location Description: 200 ft from 249 Smithfield Road

Date Observed: 2019-07-24

Crossing Code: xy4190052973579887

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

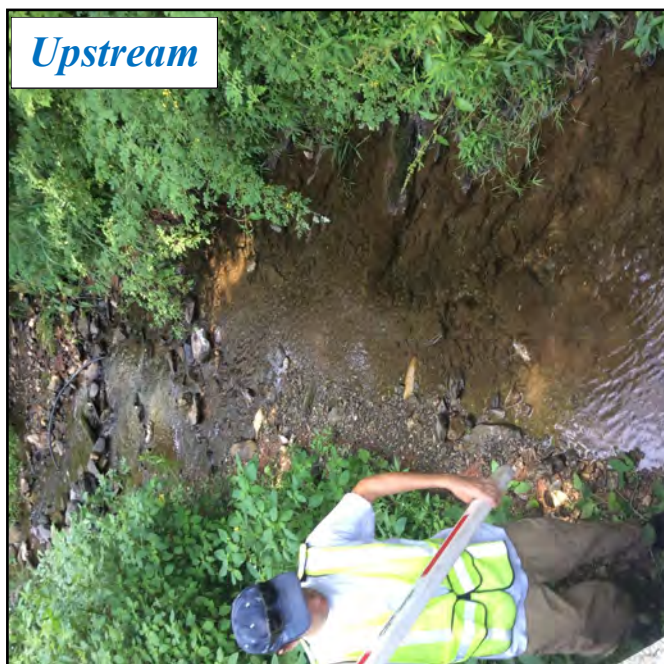
Scour Pool: None

Bankfull Width (feet): 11.7

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: Bankfull taken downstream due to multiple channels upstream.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	161.24	N/A	N/A	N/A
5	193.94			
10	215.02			
25	240.6			
50	258.87			
100	276.49			

Structure 1 of 1

Material: Concrete

Length (feet): 53.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 20.0, Height: 4.5

Substrate/Water Width: 10.8

Water Depth: 0.50

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

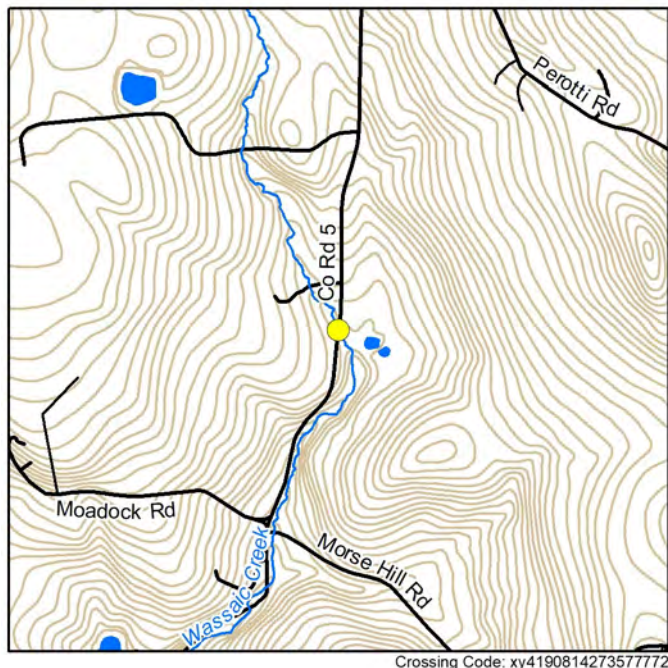
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 19.8, Height: 4.6

Substrate/Water Width: 15.90

Water Depth: 0.20



Results

Barrier Evaluation: Severe barrier
Aquatic Organism Passage Score: 0.03
Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.577715, 41.908206
Location Description: Near mailbox 37 Smithfield Road
Date Observed: 2019-07-22
Crossing Code: xy4190814273577772

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert
Number of structures/cells: 1
Condition: OK
Constriction: Moderate
Alignment: Flow-Aligned
Internal Features/Structures: None

Stream Characteristics

Scour Pool: None
Bankfull Width (feet): 4.6
Water Depth/Velocity Matches Stream: No-Shallower/No-Slower
Structure Substrate Type: None
Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.2

Road Ownership: County

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	75.52	9.16	1.78	No
5	90.51		2	No
10	100.15		2.16	No
25	111.83		2.38	No
50	120.16		2.55	No
100	128.18		2.72	No

Structure 1 of 1

Material: Concrete

Length (feet): 118.9

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.7, Height: 6.0

Substrate/Water Width: 0.9

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 2.0/2.0

Dimensions:

Width: 5.9, Height: 6.0

Substrate/Water Width: 0.00

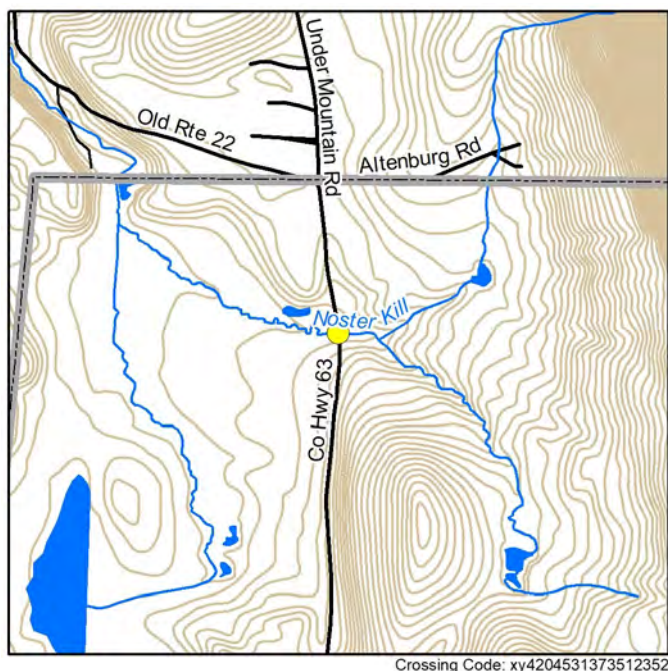
Water Depth: 0.00

Additional Photo



State-Managed Crossings

Entries are organized geographically by Map Index Key,
beginning with 1A



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.84

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.512366, 42.045345

Location Description: 1758 Boston Corners Road, bridge N-1

Date Observed: 2019-07-09

Crossing Code: xy4204531373512352

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 6.0

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	69.97	N/A	N/A	N/A
5	74.15			
10	76.91			
25	80.3			
50	82.74			
100	85.15			

Structure 1 of 1

Material: Concrete

Length (feet): 25.5

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%):

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 17.7, Height: 3.8

Substrate/Water Width: 17.7

Water Depth: 0.80

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

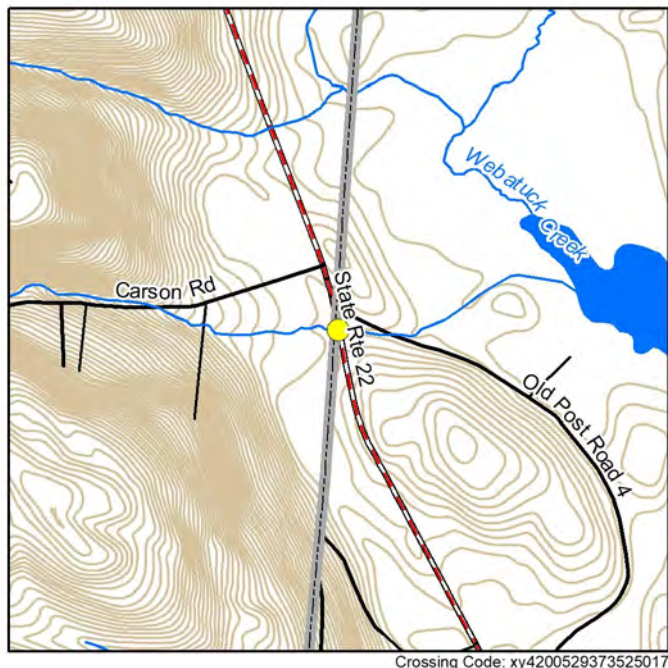
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 17.8, Height: 3.7

Substrate/Water Width: 9.10

Water Depth: 0.60



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.78

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 9 (Ranked 50 of 103)

Location

Coordinates: -73.525008, 42.005416

Location Description: Culvert C823118, next to Farm on Route 22

Date Observed: 2019-07-09

Crossing Code: xy4200529373525017

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.2

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road



Road

Road Type: Paved

Road Fill Height (feet): 5.1

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	44.62	6.17	1.49	No
5	49.65		1.6	No
10	52.55		1.66	No
25	55.77		1.73	No
50	57.92		1.77	No
100	59.88		1.81	No

Structure 1 of 1

Material: Concrete

Length (feet): 50.5

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.03

Structure Comments: None

Inlet



Inlet

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.1, Height: 1.1

Substrate/Water Width: 4.5

Water Depth: 0.10

Outlet



Outlet

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

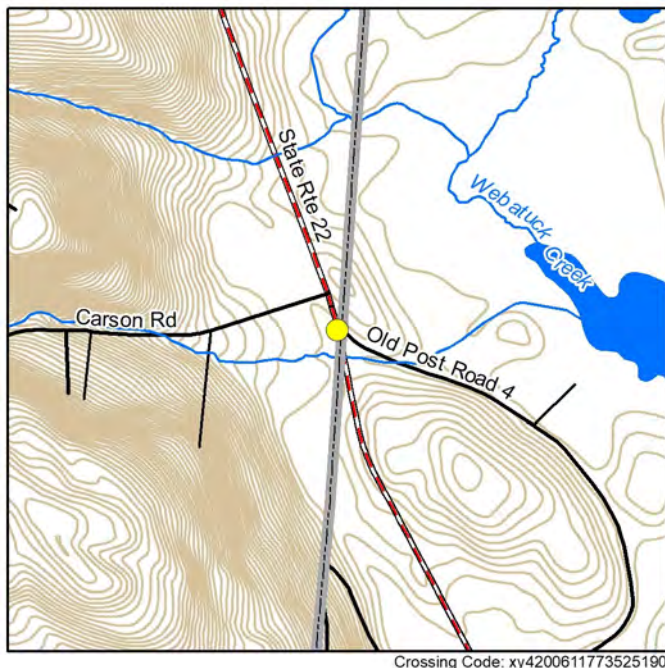
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 4.8, Height: 0.7

Substrate/Water Width: 4.80

Water Depth: 0.40



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.63

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.525442, 42.006166

Location Description: Right near entrance to willow brook farms on intersection of Route 22 and old post Road 4

Date Observed: 2019-07-09

Crossing Code: xy4200611773525190

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 3.0

Water Depth/Velocity Matches Stream: No-Deeper/No-Slower

Structure Substrate Type: None

Structure Substrate Matches Stream? None

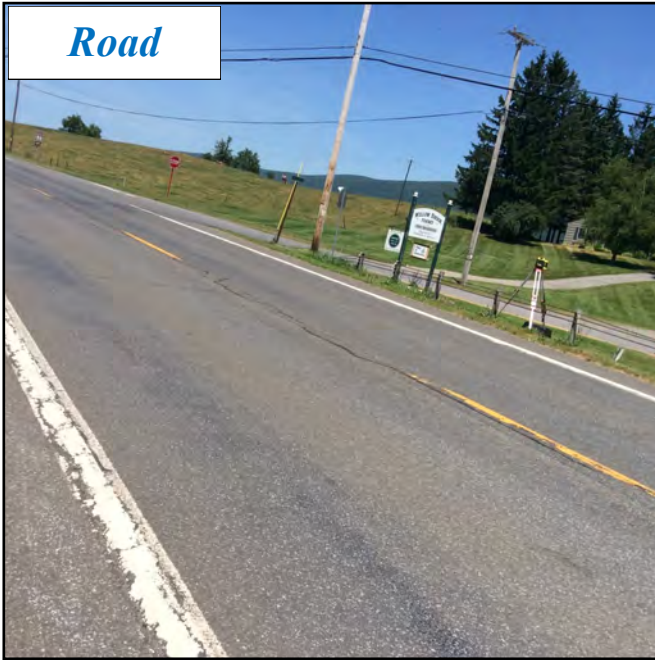
Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 4.9

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	44.25	6.99	1.66	No
5	48.71		2	No
10	51.27		2.22	No
25	54.12		2.47	No
50	56.01		2.65	No
100	57.74		2.81	No

Structure 1 of 1

Material: Concrete

Length (feet): 57.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.1, Height: 2.1

Substrate/Water Width: 1.4

Water Depth: 0.40

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

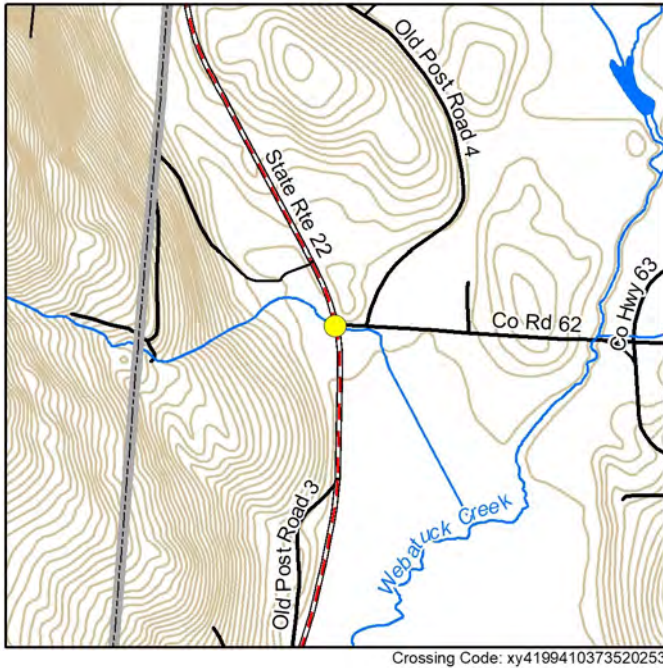
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 1.9, Height: 1.9

Substrate/Water Width: 1.90

Water Depth: 1.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.81

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.520372, 41.994028

Location Description: At intersection of Route 22 and Rudd Pond Road, C824032

Date Observed: 2019-07-10

Crossing Code: xy4199410373520253

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 6.2

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.6

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	48.46	5.43	1.71	No
5	53.59		1.83	No
10	56.84		1.9	No
25	60.72		1.99	No
50	63.46		2.05	No
100	66.08		2.11	No

Structure 1 of 1

Material: Concrete

Length (feet): 50.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.0, Height: 2.8

Substrate/Water Width: 3.7

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

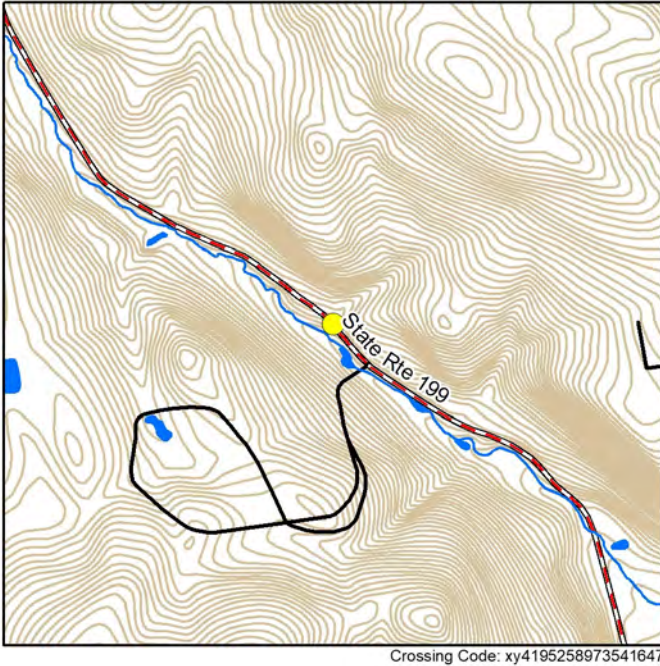
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 5.0, Height: 2.8

Substrate/Water Width: 3.30

Water Depth: 0.30



Results

Barrier Evaluation: Significant barrier

Aquatic Organism Passage Score: 0.27

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 8 (Ranked 46 of 103)

Location

Coordinates: -73.541647, 41.952589

Location Description: Culvert C824087

Date Observed: 2019-07-31

Crossing Code: xy4195258973541647

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 7.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: Bankfull low estimated due to overgrown vegetation and dry condition. Fencing on top of outlet, see other photo

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.8

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	12.19	7.85	2.32	No
5	13.46		2.44	No
10	14.2		2.51	No
25	15.02		2.58	No
50	15.57		2.63	No
100	16.07		2.68	No

Structure 1 of 1

Material: Concrete

Length (feet): 43.5

Dry Passage/Height: Yes (5.1)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.15

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.0, Height: 5.1

Substrate/Water Width: 5.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

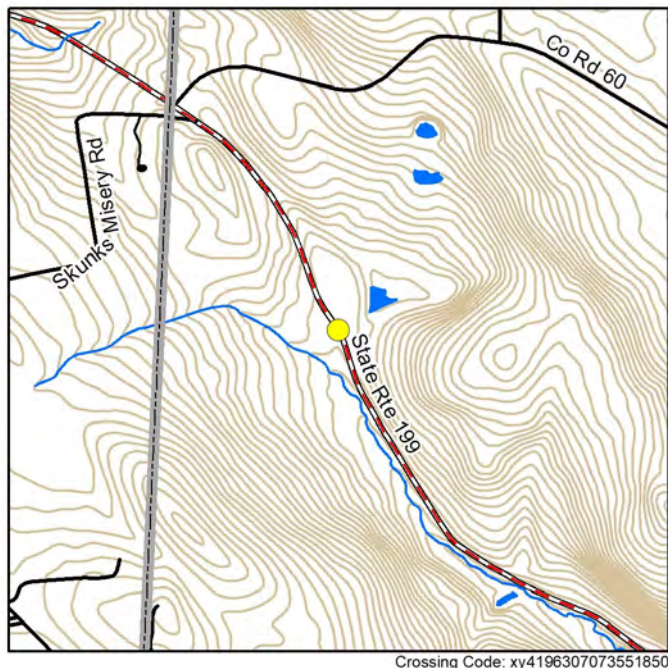
Drop to Stream Surface/Bottom: 0.8/0.8

Dimensions:

Width: 5.1, Height: 5.4

Substrate/Water Width: 5.10

Water Depth: 0.00



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.41

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.551828, 41.963161

Location Description: 4264 route 199 about 400 ft south

Date Observed: 2019-07-30

Crossing Code: xy4196307073551850

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 1,000.0

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.7

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	26.19	3.42	1.42	No
5	30.29		1.73	No
10	32.95		1.93	No
25	36.19		2.17	No
50	38.52		2.33	No
100	40.78		2.49	No

Structure 1 of 1

Material: Concrete

Length (feet): 50.0

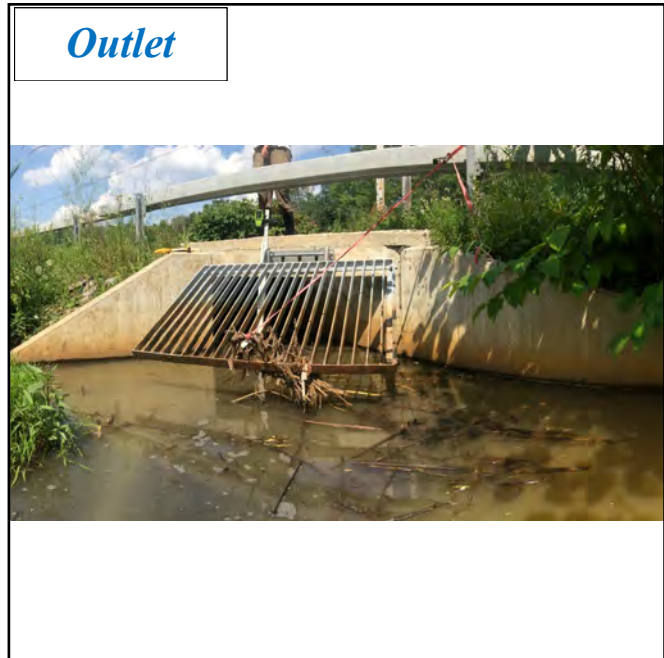
Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/Rock, Free Fall, Fencing (Severe)

Slope (%): 0.05

Structure Comments: So clogged with debris we

Inlet**Outlet****Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: Clogged/Collapsed/Submerged
Dimensions:

Width: 5.4, Height: 1.7

Substrate/Water Width: 5.4

Water Depth: 0.10

Outlet

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

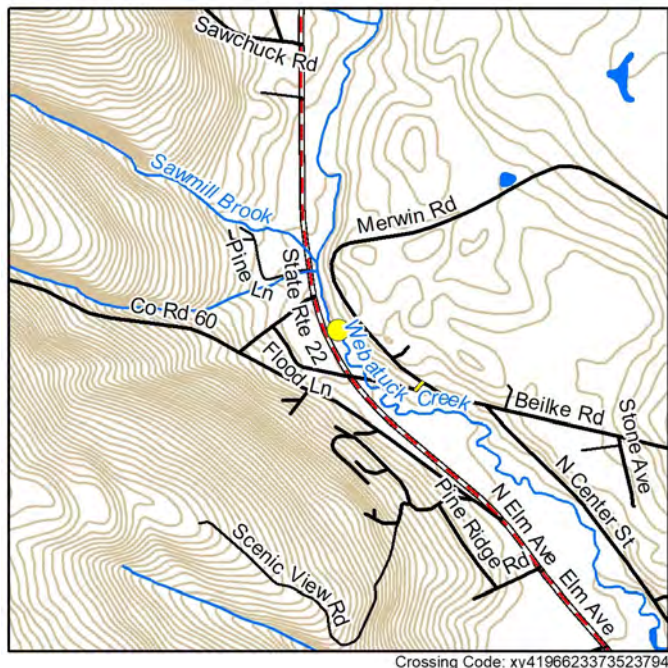
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 5.7, Height: 4.0

Substrate/Water Width: 5.70

Water Depth: 0.70



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.98

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.523912, 41.966273

Location Description: 6074 Route 22

Date Observed: 2019-07-23

Crossing Code: xy4196623373523794

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: Poor

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 15.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: Hole in deck of bridge

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	912.16	N/A	N/A	N/A
5	1045.76			
10	1132.23			
25	1237.25			
50	1312.34			
100	1385.33			

Structure 1 of 1

Material: Combination

Length (feet): 11.7

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 17.9, Height: 5.5

Substrate/Water Width: 16.1

Water Depth: 0.70

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

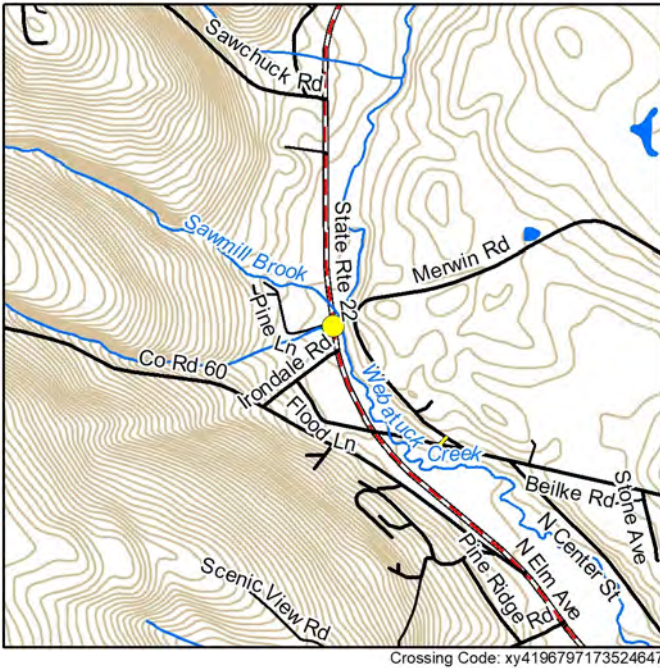
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 17.0, Height: 5.8

Substrate/Water Width: 15.10

Water Depth: 1.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.77

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.524720, 41.967772

Location Description: Next to intersection of Route 22 and Pine Lane

Date Observed: 2019-07-23

Crossing Code: xy4196797173524647

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.7

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.3

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	875.52	3.95	6.43	Yes
5	1003.2		7.14	Yes
10	1085.94		7.6	Yes
25	1186.53		8.14	Yes
50	1258.49		8.53	Yes
100	1328.49		8.9	Yes

Structure 1 of 1

Material: Metal

Length (feet): 51.0

Dry Passage/Height: Yes (2.7)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.4, Height: 2.7

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: At Stream Grade

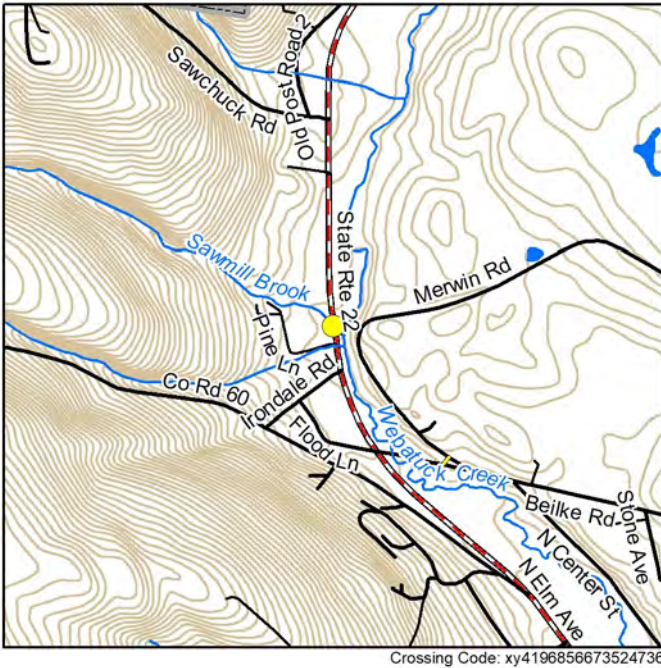
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 5.4, Height: 2.0

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.75

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.524633, 41.968698

Location Description: Next to Charlie's repair shop

Date Observed: 2019-07-23

Crossing Code: xy4196856673524736

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 9.7

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.9

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	874.58	6.09	6.62	Yes
5	1002.1		7.25	Yes
10	1084.75		7.65	Yes
25	1185.22		8.11	Yes
50	1257.11		8.44	Yes
100	1327.04		8.75	Yes

Structure 1 of 2

Material: Concrete

Length (feet): 116.7

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: Inside structure water depth is 0.5 feet. Inlet drop of 0.8 feet; water is deeper

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 5.8, Height: 1.8

Substrate/Water Width: 5.8

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 2.5, Height: 1.5

Substrate/Water Width: 2.40

Water Depth: 0.10

Structure 2 of 2

Material: Concrete
Length (feet): 111.5
Dry Passage/Height (feet): No

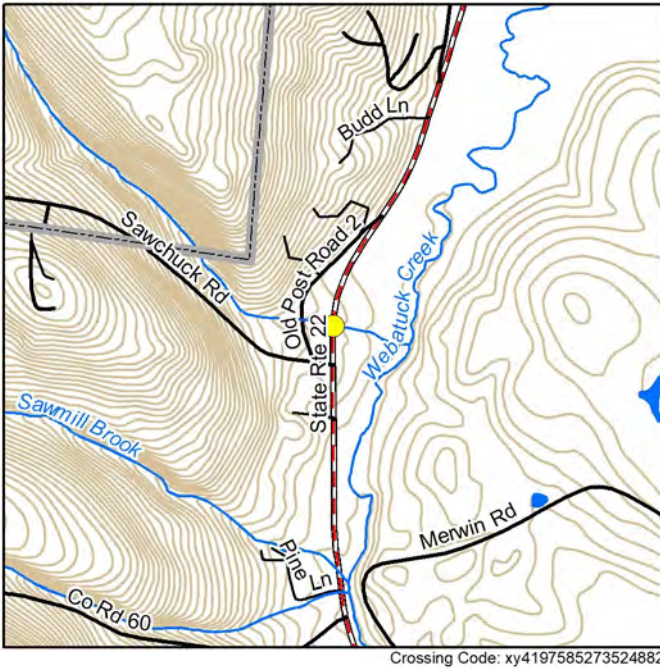
Physical Barrier(s)/Severity: Debris/Sediment/
Rock,Dry (Severe)
Slope (%): 0.01
Structure Comments: No data

Inlet

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls
Inlet Drop/Grade: Clogged/Collapsed/
Submerged
Dimensions (feet):
 Width: 6.0, Height: 6.0
 Substrate/Water Width: 0.0
 Water Depth: 0.00

Outlet

Outlet Shape: Pipe Arch/Elliptical Culvert
Outlet Drop/Grade: At Stream Grade
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 2.5, Height: 1.3
 Substrate/Water Width: 0
 Water Depth: 0.00



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.19

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.524798, 41.975787

Location Description: Bridge number c824031

Date Observed: 2019-07-30

Crossing Code: xy4197585273524882

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 16.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.0

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	102.53	7.31	3.77	No
5	117.19		4.11	No
10	126.4		4.32	No
25	137.36		4.56	No
50	145.07		4.72	No
100	152.42		4.88	No

Structure 1 of 2

Material: Concrete

Length (feet): 47.6

Dry Passage/Height: Yes (5.3)

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.06

Structure Comments: inlet drop of 4 feet because of debris build-up

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 4.0, Height: 5.3

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 1.6/1.6

Dimensions:

Width: 4.0, Height: 5.3

Substrate/Water Width: 0.00

Water Depth: 0.00

Structure 2 of 2

Material: Concrete
Length (feet): 47.7
Dry Passage/Height (feet): Yes (5.3)

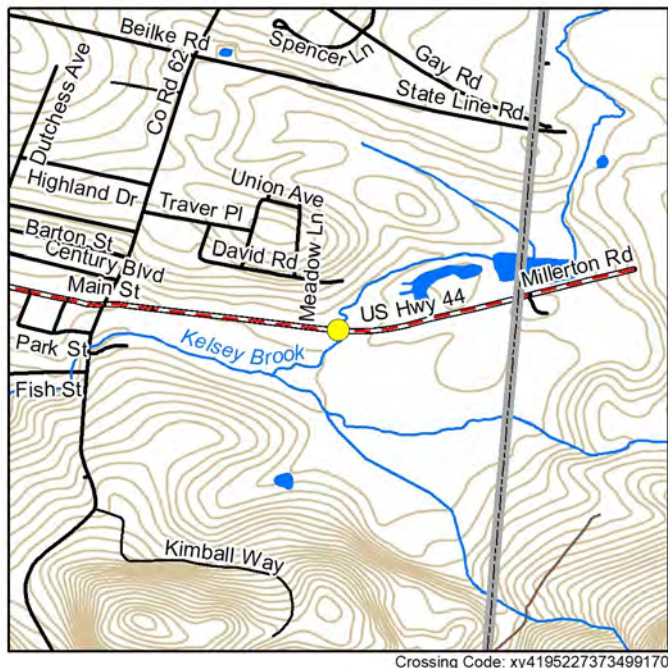
Physical Barrier(s)/Severity:
Slope (%): 0.06
Structure Comments: Inlet drop of 4 feet because
of debris build-up

Inlet

Inlet Shape/Type: Box Culvert/Headwall and
Wingwalls
Inlet Drop/Grade: Inlet Drop
Dimensions (feet):
 Width: 4.0, Height: 4.0
 Substrate/Water Width: 0.0
 Water Depth: 0.00

Outlet

Outlet Shape: Box Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 1.0/1.0
Dimensions (feet):
 Width: 4.0, Height: 5.2
 Substrate/Water Width: 0
 Water Depth: 0.00



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.84

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.499195, 41.952273

Location Description: Bridge number C824038.

Between American legion post 178 and Dave's TV

Date Observed: 2019-07-30

Crossing Code: xy4195227373499170

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 10.6

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.1

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	218.42	10.11	3.91	No
5	255.11		4.34	No
10	277.77		4.59	No
25	304.42		4.89	No
50	322.9		5.08	No
100	340.33		5.27	No

Structure 1 of 1

Material: Concrete

Length (feet): 39.9

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 8.0, Height: 6.5

Substrate/Water Width: 8.0

Water Depth: 0.60

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

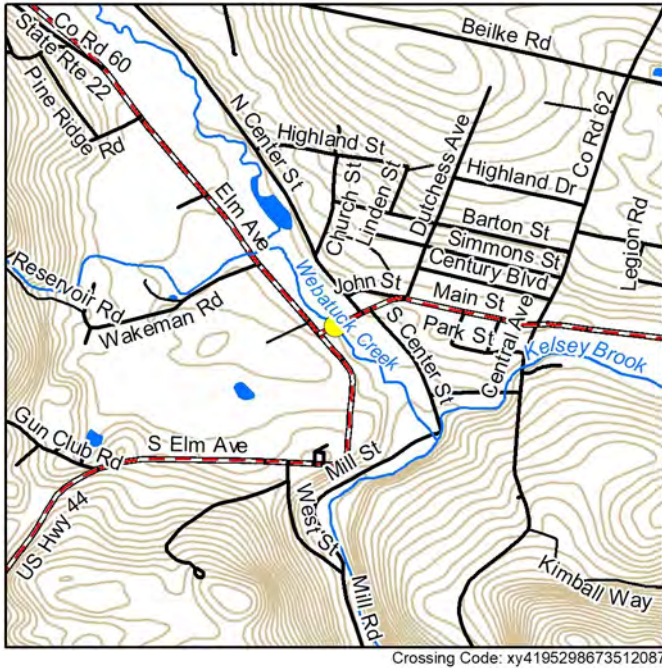
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 8.1, Height: 6.2

Substrate/Water Width: 8.10

Water Depth: 1.50



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.88

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.512001, 41.953093

Location Description: Next to Harney and Sons tea, C82505

Date Observed: 2019-07-03

Crossing Code: xy4195298673512087

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 20.1

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: Channel modification occurring further upstream. See other photo

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	1021.15	N/A	N/A	N/A
5	1174.03			
10	1272.23			
25	1390.85			
50	1475.39			
100	1557.16			

Structure 1 of 1

Material: Concrete

Length (feet): 49.1

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/Rock (Moderate)

Slope (%):

Structure Comments: Large logs and concrete

Inlet**Outlet****Inlet**

Inlet Shape/Type: Box/Bridge with Abutments/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 19.4, Height: 10.4

Substrate/Water Width: 15.5

Water Depth: 0.90

Outlet

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

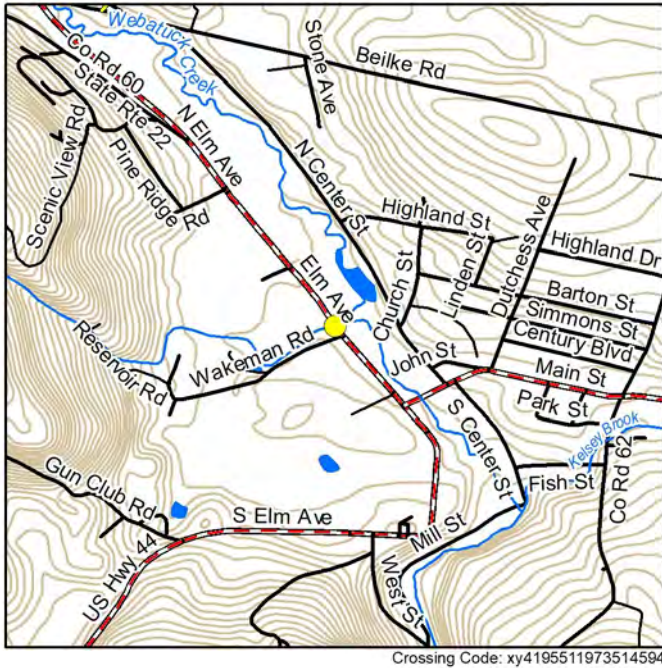
Width: 18.8, Height: 10.0

Substrate/Water Width: 18.80

Water Depth: 0.80

Additional Photo





Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.92

Town Comments on Condition/Maintenance:

Cole Lawrence densely vegetated and possibly slowing flows on the upstream end, but did not indicate that there are any issues with the actual structure

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.514607, 41.955047

Location Description: Culvert number C824029, intersection of Wakeman and Route 22, next to four brothers pizza.

Date Observed: 2019-07-16

Crossing Code: xy4195511973514594

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 6.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 3.7

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	43.81	7.28	2.62	No
5	48.89		2.82	No
10	51.82		2.93	No
25	55.11		3.05	No
50	57.3		3.13	No
100	59.3		3.2	No

Structure 1 of 1

Material: Concrete

Length (feet): 57.8

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 8.1, Height: 3.6

Substrate/Water Width: 3.9

Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

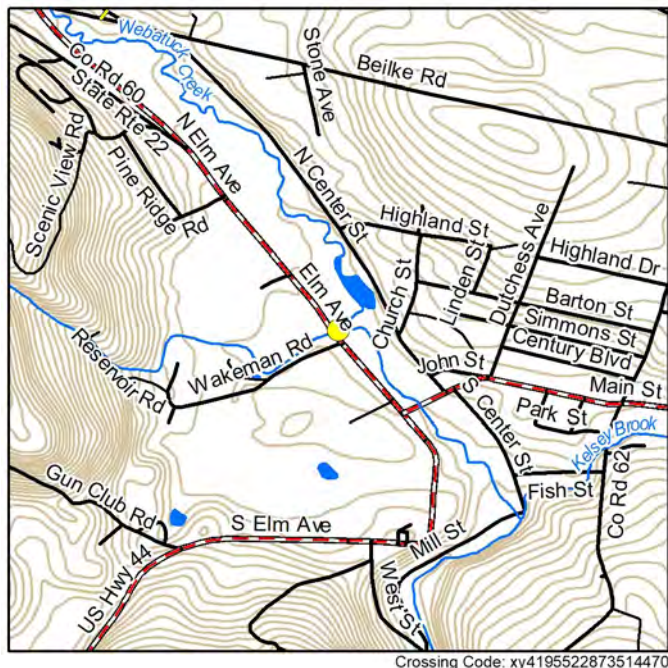
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 8.3, Height: 4.2

Substrate/Water Width: 6.30

Water Depth: 0.10



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.514470, 41.955228

Location Description: Route 22 near intersection with wakeman, next to four brothers pizza

Date Observed: 2019-07-16

Crossing Code: xy4195522873514470

Stream and Crossing

Crossing Characteristics

Crossing Type: No Upstream Channel

Number of structures/cells: 1

Condition: OK

Constriction: No data

Alignment: Flow-Aligned

Internal Features/Structures: No data

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 0.0

Water Depth/Velocity Matches Stream: Unknown/Unknown

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Downstream



Crossing Comments: We are unsure if this is a buried stream or just runoff from four brothers pizza, it seems like a lot of water for runoff though.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	49.32	N/A	N/A	N/A
5	54.64			
10	57.77			
25	61.32			
50	63.71			
100	65.92			

Structure 1 of 1

Material: Concrete

Length (feet): 0.0

Dry Passage/Height: No

Outlet Armoring: Extensive

Physical Barrier(s) (Severity):

Slope (%): 0

Structure Comments: None

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall Onto Cascade

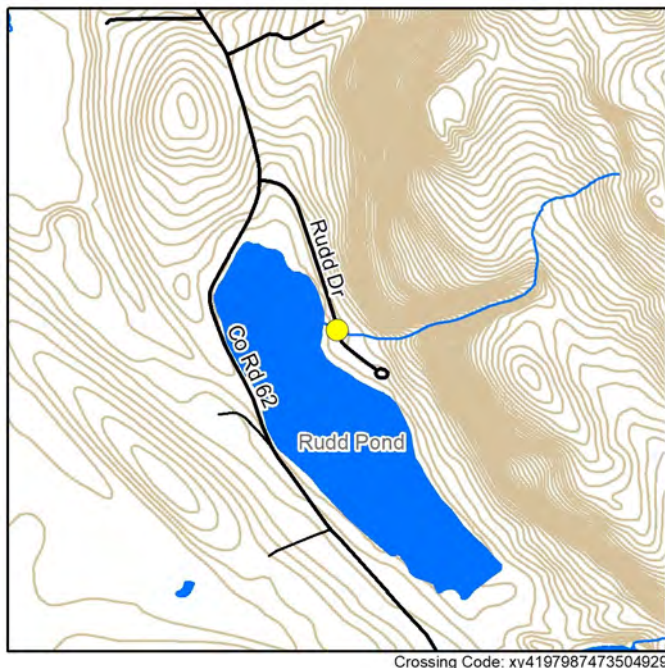
Drop to Stream Surface/Bottom: 1.6/1.9

Dimensions:

Width: 1.9, Height: 2.3

Substrate/Water Width: 1.90

Water Depth: 0.20



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.62

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.505041, 41.979988

Location Description: 50 ft after ticket booth at entrance of taconic State Park

Date Observed: 2019-07-30

Crossing Code: xy4197987473504929

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 7.6

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Starts as concrete pipe ends as metal

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.5

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	26.14	5	1.52	No
5	29.31		1.89	No
10	31.26		2.14	No
25	33.54		2.46	No
50	35.12		2.69	No
100	36.61		2.91	No

Structure 1 of 1

Material: Combination

Length (feet): 106.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.04

Structure Comments: Dry at inlet, at outlet is Rudd Pond.

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.5, Height: 2.5

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

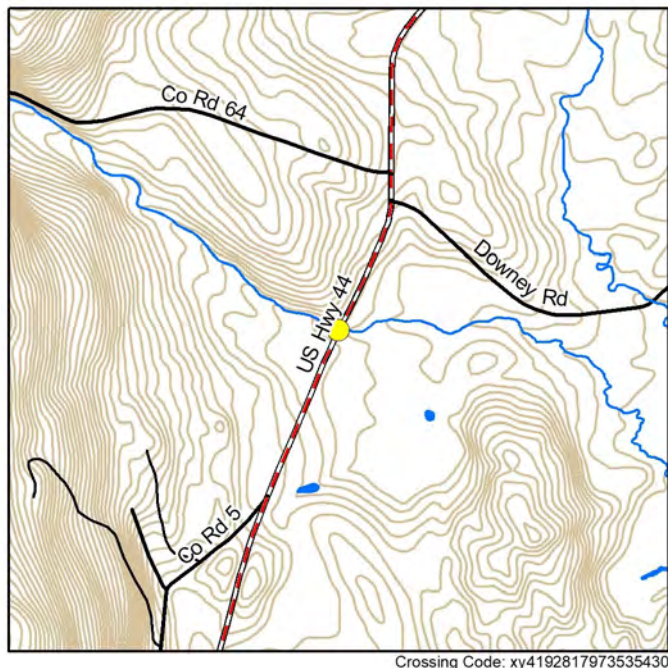
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 2.5, Height: 1.9

Substrate/Water Width: 2.50

Water Depth: 1.40



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.82

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.535451, 41.928183

Location Description: Next to 5621 route 22

Date Observed: 2019-07-01

Crossing Code: xy4192817973535430

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 12.5

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 1.3

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	164.58	9.16	3.62	No
5	185.53		3.93	No
10	197.87		4.1	No
25	211.88		4.29	No
50	221.32		4.42	No
100	230.02		4.53	No

Structure 1 of 1

Material: Concrete

Length (feet): 50.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): -0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 7.9, Height: 7.9

Substrate/Water Width: 7.9

Water Depth: 0.70

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

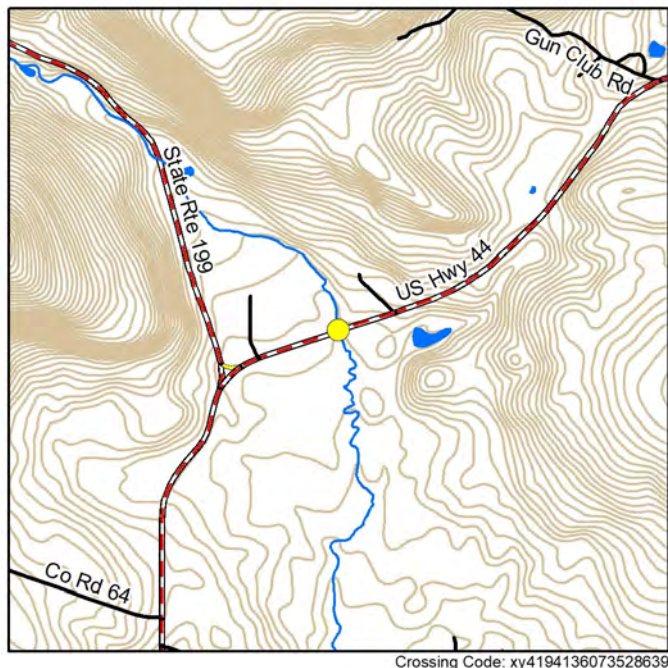
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 8.1, Height: 5.4

Substrate/Water Width: 8.10

Water Depth: 0.20



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.11

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 2 (Ranked 5 of 103)

Location

Coordinates: -73.528571, 41.941367

Location Description: Next to Silimar Farm, number C82028A

Date Observed: 2019-07-30

Crossing Code: xy4194136073528639

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 8.3

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: Inside ledges crumbling.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 2.6

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	187.93	7.85	3.43	No
5	214.25		3.74	No
10	231.28		3.93	No
25	251.96		4.16	No
50	266.73		4.32	No
100	281.08		4.48	No

Structure 1 of 1

Material: Concrete

Length (feet): 42.9

Dry Passage/Height: Yes (5.2)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.04

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 8.1, Height: 5.2

Substrate/Water Width: 5.1

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

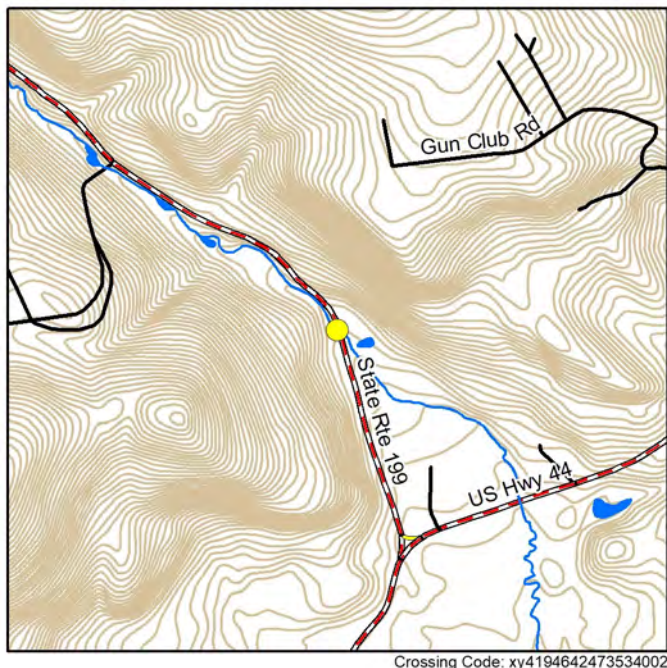
Drop to Stream Surface/Bottom: 1.3/1.3

Dimensions:

Width: 8.1, Height: 6.2

Substrate/Water Width: 8.10

Water Depth: 0.00



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.88

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.534069, 41.946475

Location Description: Next to 4569 route 199 mailbox

Date Observed: 2019-07-03

Crossing Code: xy4194642473534002

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 17.5

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting



Crossing Comments: Dam 75 feet downstream of crossing.

Road**Road**

Road Type: Paved

Road Fill Height (feet): 0.0

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	172.41	N/A	N/A	N/A
5	196.05			
10	211.41			
25	230.12			
50	243.5			
100	256.54			

Structure 1 of 1

Material: Concrete

Length (feet): 45.5

Dry Passage/Height: Yes (2.6)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 20.0, Height: 4.1

Substrate/Water Width: 13.3

Water Depth: 0.80

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

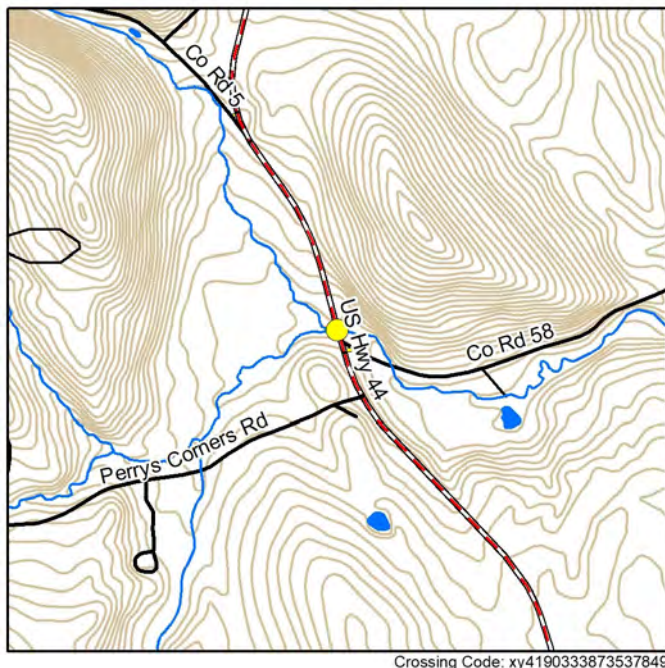
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 19.6, Height: 3.8

Substrate/Water Width: 13.90

Water Depth: 0.40



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.61

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.537808, 41.903274

Location Description: Bridge number 1016770

Date Observed: 2019-07-01

Crossing Code: xy4190333873537849

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

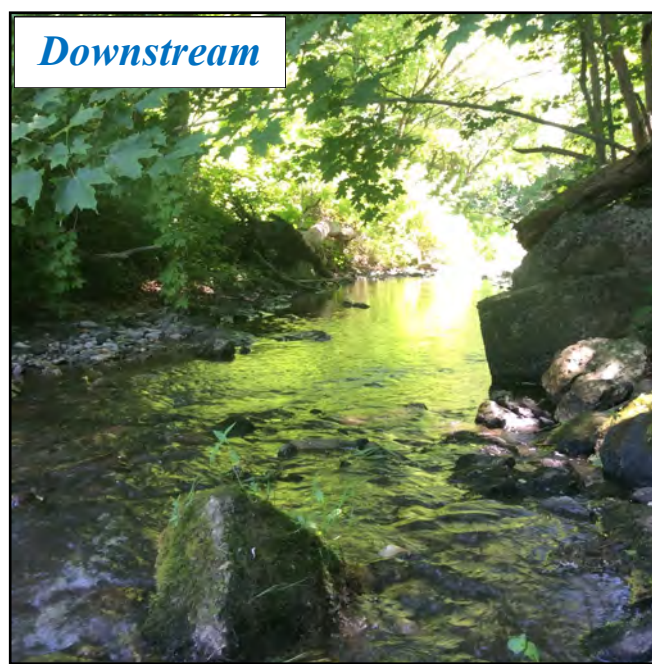
Scour Pool: Small

Bankfull Width (feet): 16.6

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Paved

Road Fill Height (feet): 6.7

Road Ownership: State

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	338.96	14.26	7.3	No
5	397.51		8.11	No
10	434.58		8.6	No
25	478.97		9.16	No
50	510.33		9.55	No
100	540.3		9.92	No

Structure 1 of 2

Material: Concrete

Length (feet): 61.5

Dry Passage/Height: Yes (7.2)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.03

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 12.8, Height: 8.0

Substrate/Water Width: 11.7

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.4/1.0

Dimensions:

Width: 12.8, Height: 7.9

Substrate/Water Width: 9.40

Water Depth: 0.10

Structure 2 of 2

Material: Concrete
Length (feet): 62.5
Dry Passage/Height (feet): Yes (7.2)

Physical Barrier(s)/Severity: None
Slope (%): 0.04
Structure Comments: No data

Inlet

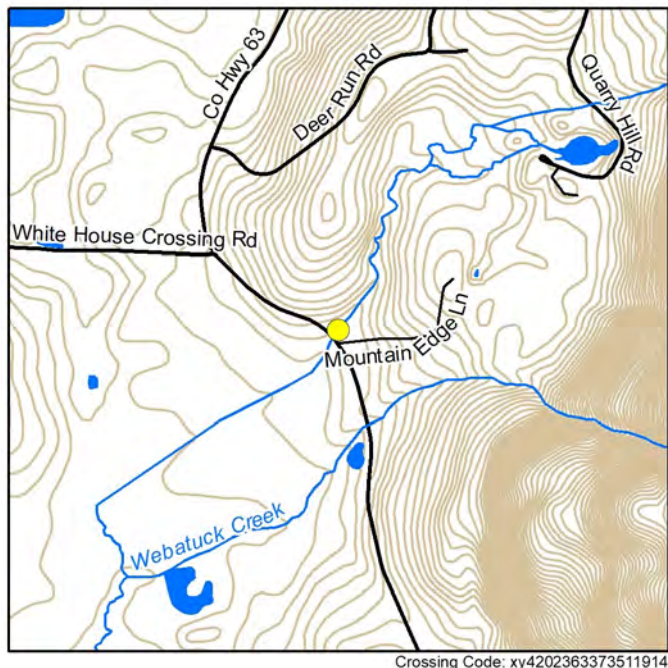
Inlet Shape/Type: Box Culvert/Headwall and Wingwalls
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 12.8, Height: 12.8
 Substrate/Water Width: 10.7
 Water Depth: 0.10

Outlet

Outlet Shape: Box Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 1.0/1.7
Dimensions (feet):
 Width: 12.8, Height: 7.9
 Substrate/Water Width: 11.8
 Water Depth: 0.10

Private/Other Crossings

Entries are organized geographically by Map Index Key,
beginning with 1A



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.67

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.511914, 42.023633

Location Description: 50ft from intersection of mountain edge lane and Boston Corners Road.

Date Observed: 2019-07-24

Crossing Code: xy4202363373511914

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Unknown

Bankfull Width (feet): 5.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Contrasting



Upstream



Downstream

Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 1.3

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	11.19	3.86	0.47	No
5	12.92		0.47	No
10	13.99		0.47	No
25	15.25		0.48	No
50	16.13		0.48	No
100	16.96		0.48	No

Structure 1 of 2

Material: Metal

Length (feet): 20.0

Dry Passage/Height: Yes (1.9)

Outlet Armoring: None

Physical Barrier(s) (Severity): Dry (Moderate)

Slope (%): -0.02

Structure Comments: 1.4 feet inlet drop due to debris build up

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 2.8, Height: 2.6

Substrate/Water Width: 1.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.0, Height: 1.9

Substrate/Water Width: 2.70

Water Depth: 0.00

Structure 2 of 2

Material: Metal
Length (feet): 19.2
Dry Passage/Height (feet): Yes (1.8)

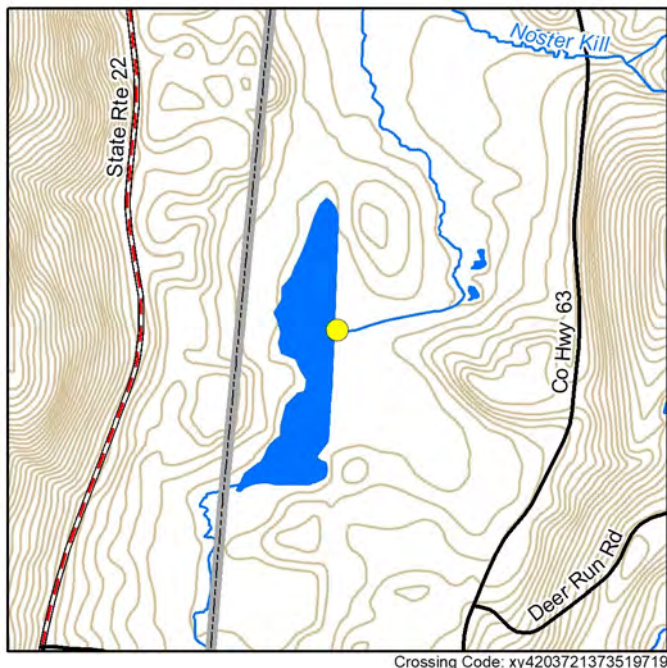
Physical Barrier(s)/Severity: Dry (Moderate)
Slope (%):
Structure Comments: 1.4 inlet drop due to build up of debris at inlet.

Inlet

Inlet Shape/Type: Round Culvert/Projecting
Inlet Drop/Grade: Inlet Drop
Dimensions (feet):
 Width: 2.8, Height: 2.8
 Substrate/Water Width: 1.3
 Water Depth: 0.00

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: At Stream Grade
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 3.1, Height: 1.8
 Substrate/Water Width: 2.9
 Water Depth: 0.00

**Results**

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.519796, 42.037183

Location Description: At least 0.5 mile from intersection of White House crossing Road and HVRT heading north on trail. Crossing is 10 ft after stake HD50 80

Date Observed: 2019-07-24

Crossing Code: xy4203721373519719

Stream and Crossing**Crossing Characteristics**

Crossing Type: Partially Inaccessible

Number of structures/cells: 1

Condition: Unknown

Constriction: No data

Alignment: Flow-Aligned

Internal Features/Structures: No data

Stream Characteristics

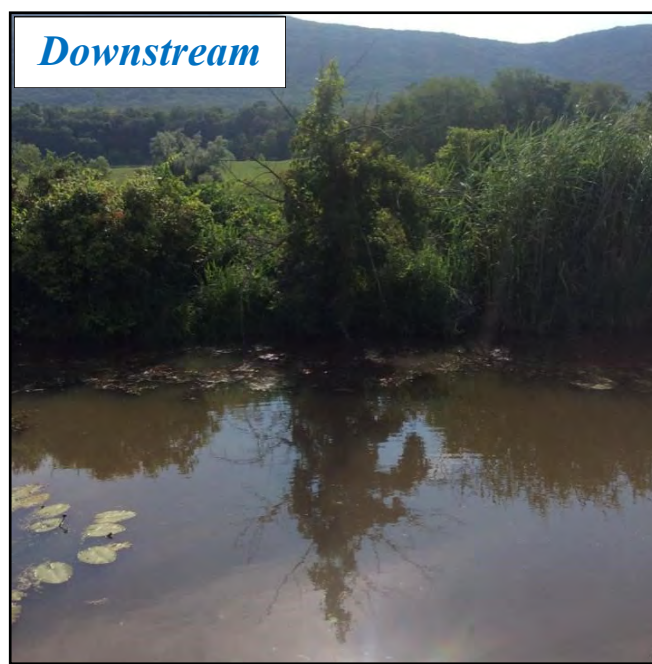
Scour Pool: No data

Bankfull Width (feet): 0.0

Water Depth/Velocity Matches Stream: /

Structure Substrate Type:

Structure Substrate Matches Stream?



Crossing Comments: The structure is buried more than 3 feet underwater on the unfinished section of the Harlem Valley Rail Trail

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	112.1	N/A	N/A	N/A
5	120.6			
10	126.25			
25	133.26			
50	138.38			
100	143.41			

Structure 1 of 1

Material: Concrete

Length (feet): 0.0

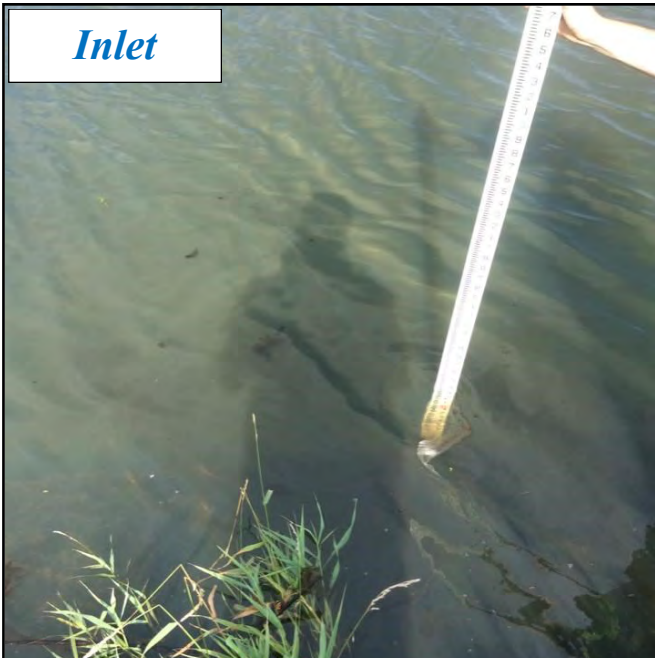
Dry Passage/Height:

Outlet Armoring:

Physical Barrier(s) (Severity):

Slope (%):

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade:

Dimensions:

Width: 0.0, Height: 0.0

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade:

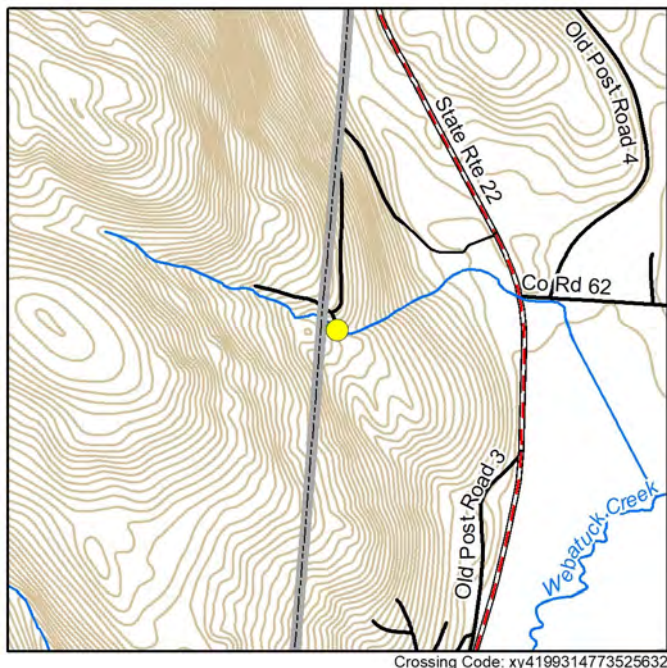
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 0.0, Height: 0.0

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.525632, 41.993147

Location Description: Private property owned by Roger Alcay, Indian Ovens LLC

Date Observed: 2019-08-06

Crossing Code: xy4199314773525632

Stream and Crossing

Crossing Characteristics

Crossing Type: Inaccessible

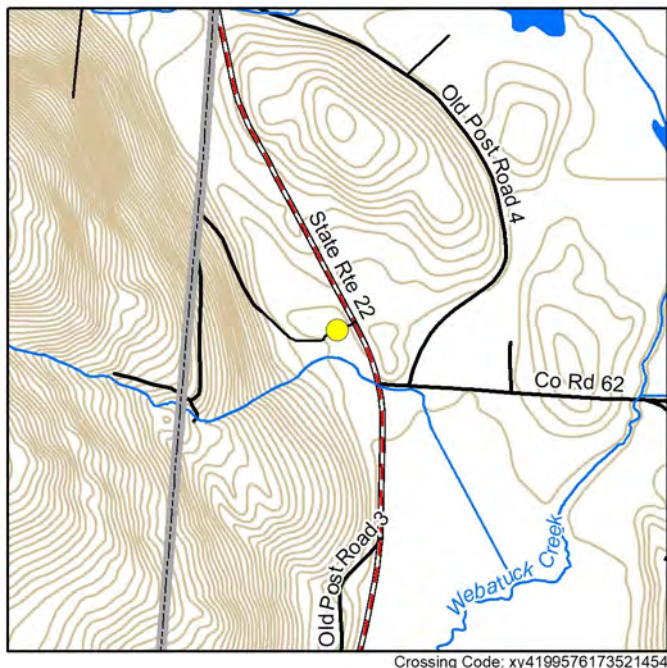
Road

Road Type: Driveway

Road Fill Height (feet): 0.0

Road Ownership: Private

Crossing Comments: HVA interns could not get permission to go on property to assess the structure, they spoke with someone at the end of the driveway, Mike from Alcay Farms, and were told they couldn't go up there and that there was not a bridge up there anyway



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.44

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.521454, 41.995761

Location Description: Private drive right before little sign that says 2282041363

Date Observed: 2019-08-06

Crossing Code: xy4199576173521454

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: Baffles/Weirs

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 100.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: Farmer mentioned that he installed the pipe himself

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 1.3

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	28.84	2.57	1.34	No
5	32.19		1.59	No
10	34.32		1.76	No
25	36.87		1.98	No
50	38.67		2.14	No
100	40.41		2.29	No

Structure 1 of 1

Material: Plastic

Length (feet): 19.3

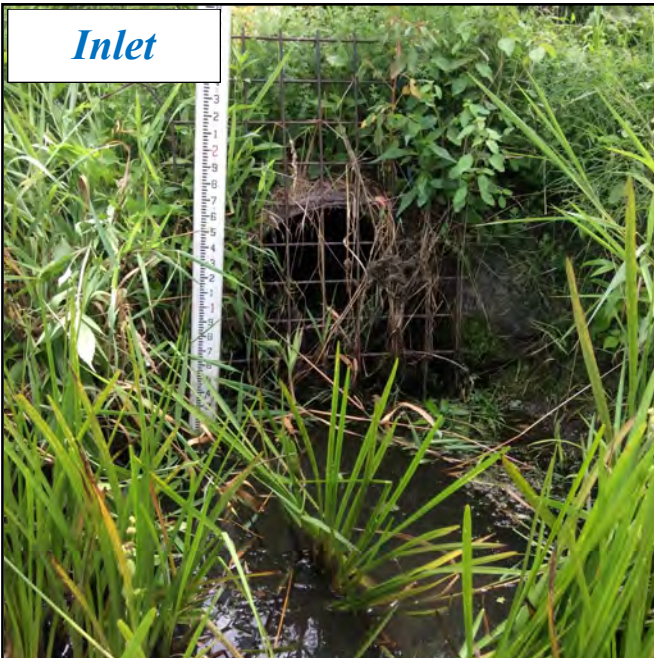
Dry Passage/Height: Yes (1.3)

Outlet Armoring: None

Physical Barrier(s) (Severity): Fencing (Moderate)

Slope (%): 0.06

Structure Comments: Perched by 0.3 feet, grate

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: Perched

Dimensions:

Width: 1.3, Height: 1.3

Substrate/Water Width: 1.3

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

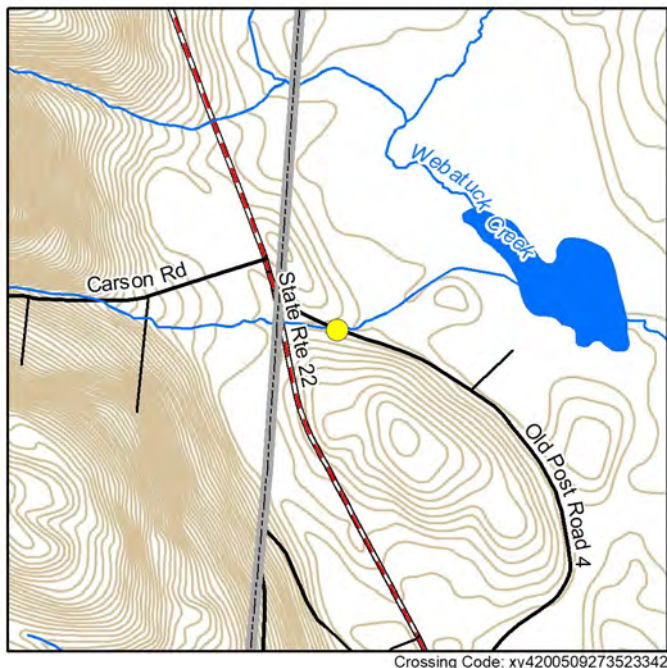
Drop to Stream Surface/Bottom: 0.4/0.4

Dimensions:

Width: 1.5, Height: 1.5

Substrate/Water Width: 0.00

Water Depth: 0.00

**Results**

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.69

Town Comments on Condition/Maintenance: No Comment

*Overall Ranking: Tier 11 (Ranked 73 of 103)***Location**

Coordinates: -73.523399, 42.005255

Location Description: Willow Brook Farms on driveway next to 89591 telephone pole.

Date Observed: 2019-08-06

Crossing Code: xy4200509273523342

Stream and Crossing**Crossing Characteristics**

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

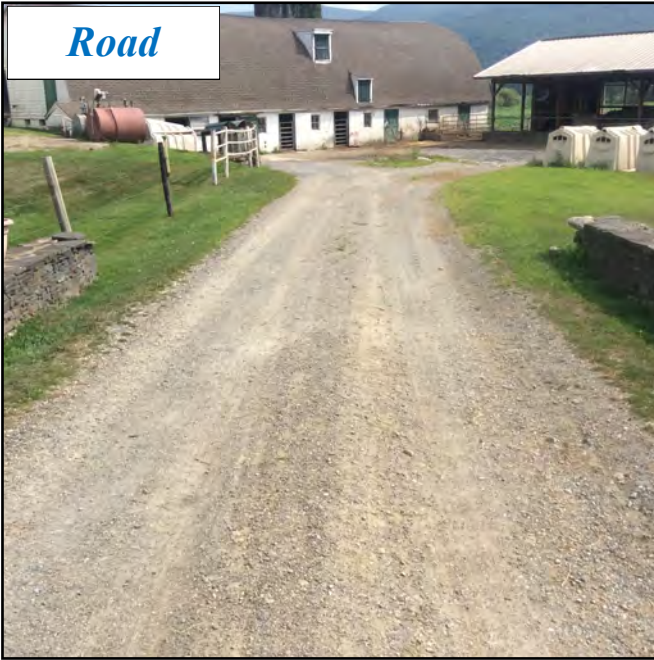
Bankfull Width (feet): 29.3

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream***Downstream*****Crossing Comments:** Dam and another culvert upstream of culvert

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 1.1

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	45.16	4.2	0.84	No
5	50.28		1.14	No
10	53.23		1.33	No
25	56.53		1.55	No
50	58.71		1.7	No
100	60.71		1.85	No

Structure 1 of 1

Material: Metal

Length (feet): 20.7

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.1, Height: 3.1

Substrate/Water Width: 1.4

Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

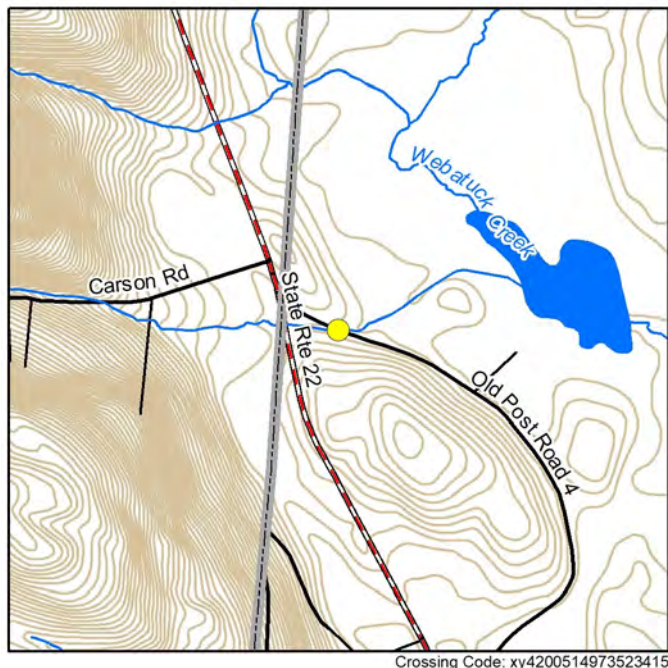
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.2, Height: 3.1

Substrate/Water Width: 2.40

Water Depth: 0.50



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.70

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.523454, 42.005180

Location Description: Willow Brook Farms. Under driveway next to dam and pond.

Date Observed: 2019-08-06

Crossing Code: xy4200514973523415

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 29.3

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: Dam 6 feet upstream from inlet

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 1.5

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	45.16	6.67	0.82	No
5	50.28		1.04	No
10	53.23		1.17	No
25	56.53		1.33	No
50	58.71		1.44	No
100	60.71		1.55	No

Structure 1 of 1

Material: Metal

Length (feet): 17.9

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): -0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.3, Height: 5.2

Substrate/Water Width: 4.1

Water Depth: 0.80

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

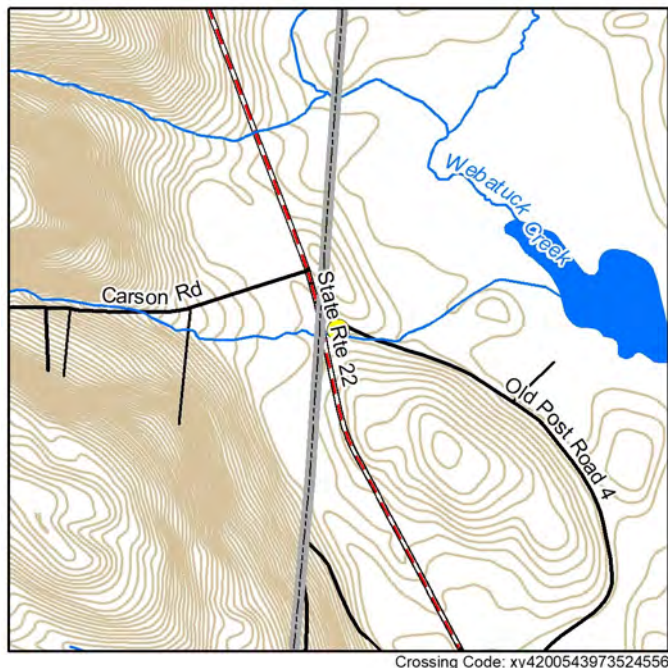
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 4.9, Height: 4.0

Substrate/Water Width: 3.60

Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.04

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.524556, 42.005439

Location Description: Bridge in front of Willow Brook Farm

Date Observed: 2019-07-09

Crossing Code: xy4200543973524556

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 200.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	44.8	N/A	N/A	N/A
5	49.85			
10	52.76			
25	56.01			
50	58.17			
100	60.13			

Structure 1 of 1

Material: Wood

Length (feet): 4.7

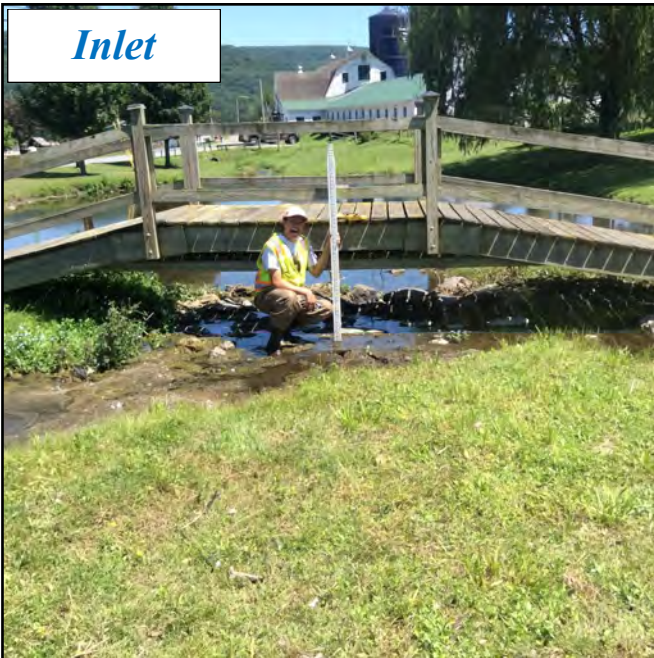
Dry Passage/Height: Yes (2)

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Bridge with Side Slopes/None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 21.6, Height: 2.0

Substrate/Water Width: 14.3

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: Cascade

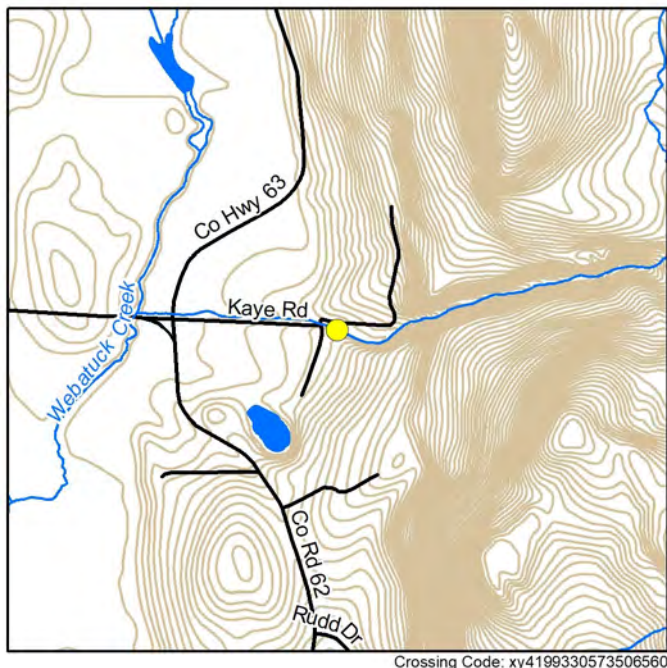
Drop to Stream Surface/Bottom: 1.9/2.5

Dimensions:

Width: 21.6, Height: 1.8

Substrate/Water Width: 12.20

Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.99

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.506683, 41.993181

Location Description: Next to watershed center building next to Kaye Road

Date Observed: 2019-07-10

Crossing Code: xy4199330573506560

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Full Channel & Banks

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 16.2

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	97.54	N/A	N/A	N/A
5	107.89			
10	113.85			
25	120.49			
50	124.91			
100	128.94			

Structure 1 of 1

Material: Wood

Length (feet): 4.2

Dry Passage/Height: Yes (4.4)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 41.7, Height: 5.9

Substrate/Water Width: 6.2

Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

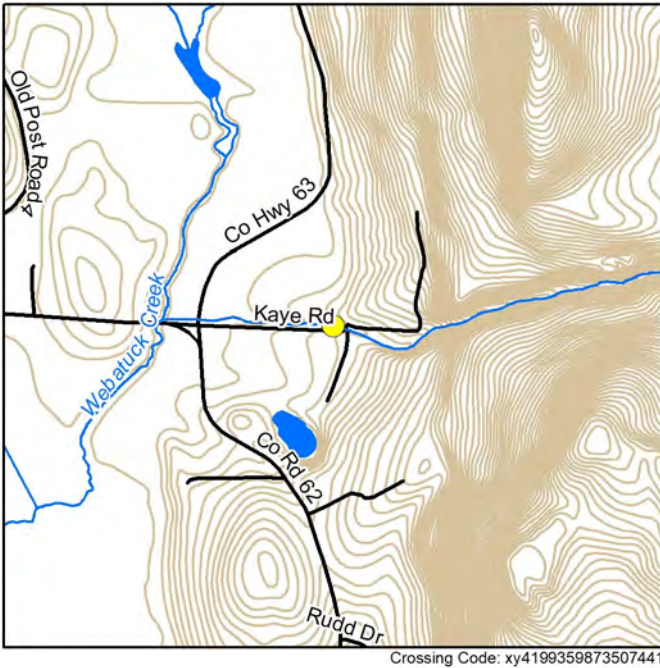
Width: 41.7, Height: 5.9

Substrate/Water Width: 8.00

Water Depth: 0.20

Additional Photo





Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.95

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.507527, 41.993395

Location Description: Near mailboxes 41, 44, 87 on Kaye Road. Behind turquoise house

Date Observed: 2019-07-10

Crossing Code: xy4199359873507441

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 10.9

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable

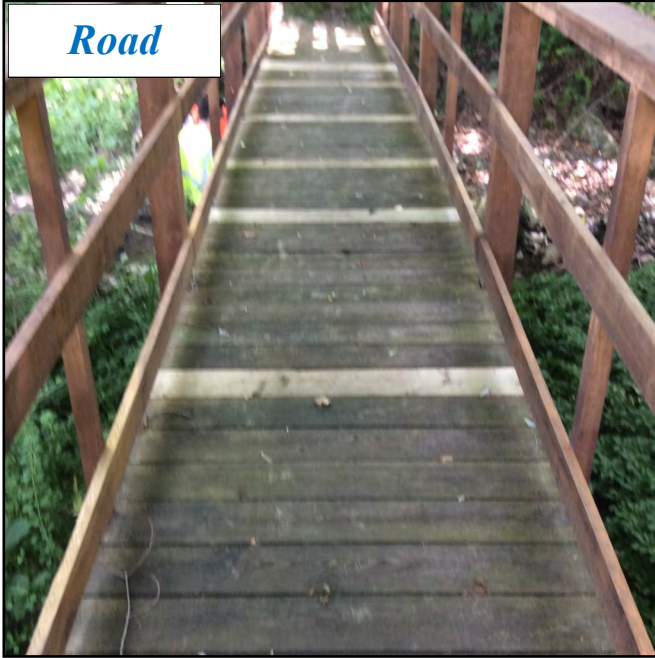
Upstream



Downstream



Crossing Comments: Steep free fall about 4 feet high is 30 feet downstream of this bridge.

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	97.61	N/A	N/A	N/A
5	107.97			
10	113.93			
25	120.58			
50	125.01			
100	129.04			

Structure 1 of 1

Material: Wood

Length (feet): 3.1

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Bridge with Side Slopes/None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 17.5, Height: 1.4

Substrate/Water Width: 12.0

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: At Stream Grade

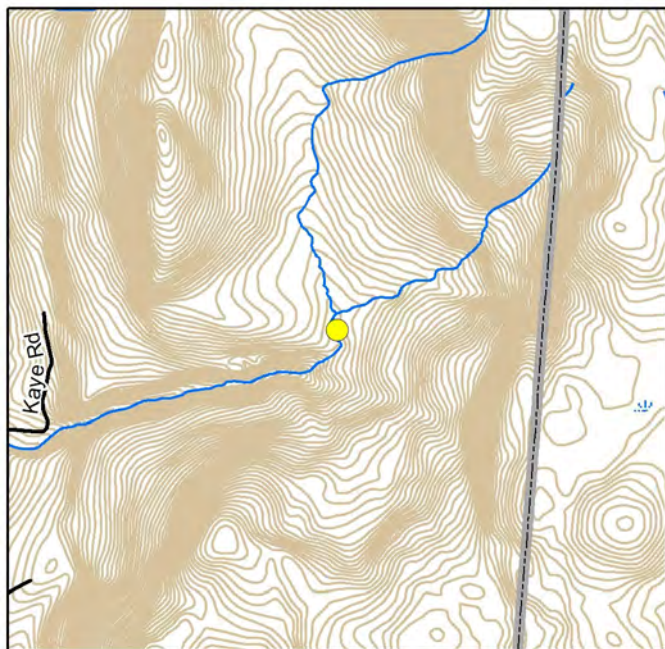
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 17.5, Height: 1.5

Substrate/Water Width: 10.90

Water Depth: 0.10



Crossing Code: xy4199644173496291

Results

Barrier Evaluation: Significant barrier

Aquatic Organism Passage Score: 0.33

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 7 (Ranked 38 of 103)

Location

Coordinates: -73.496259, 41.996537

Location Description: 20 feet from white gravel driveway on Kaye Road detour

Date Observed: 2019-07-24

Crossing Code: xy4199644173496291

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Severe

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 14.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road



Road

Road Type: Unpaved

Road Fill Height (feet): 2.8

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	66.35	5.7	1.74	No
5	73.81		2.12	No
10	78.12		2.36	No
25	82.91		2.65	No
50	86.11		2.84	No
100	89.01		3.03	No

Structure 1 of 2

Material: Metal

Length (feet): 16.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.06

Structure Comments: None

Inlet



Inlet

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.8, Height: 4.1

Substrate/Water Width: 1.4

Water Depth: 0.20

Outlet



Outlet

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.7/0.8

Dimensions:

Width: 4.0, Height: 4.1

Substrate/Water Width: 0.90

Water Depth: 0.10

Structure 2 of 2

Material: Metal
Length (feet): 19.0
Dry Passage/Height (feet): Yes (2.7)

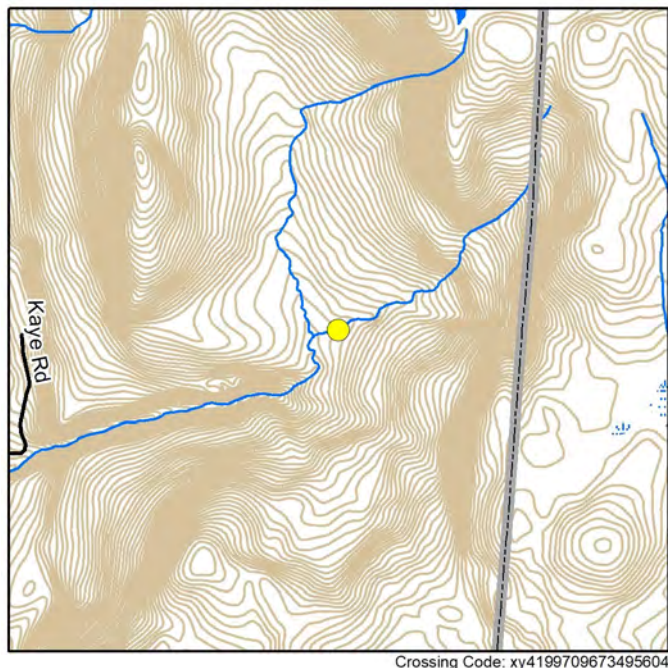
Physical Barrier(s)/Severity:
Slope (%): 0.04
Structure Comments: No data

Inlet

Inlet Shape/Type: Round Culvert/Projecting
Inlet Drop/Grade: Clogged/Collapsed/
Submerged
Dimensions (feet):
 Width: 2.0, Height: 2.0
 Substrate/Water Width: 0.0
 Water Depth: 0.00

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 0.7/0.8
Dimensions (feet):
 Width: 2.0, Height: 2.1
 Substrate/Water Width: 0
 Water Depth: 0.00



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.41

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.495690, 41.997128

Location Description: 0.25 mile up Road from crossing ending in 6529

Date Observed: 2019-07-24

Crossing Code: xy4199709673495604

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

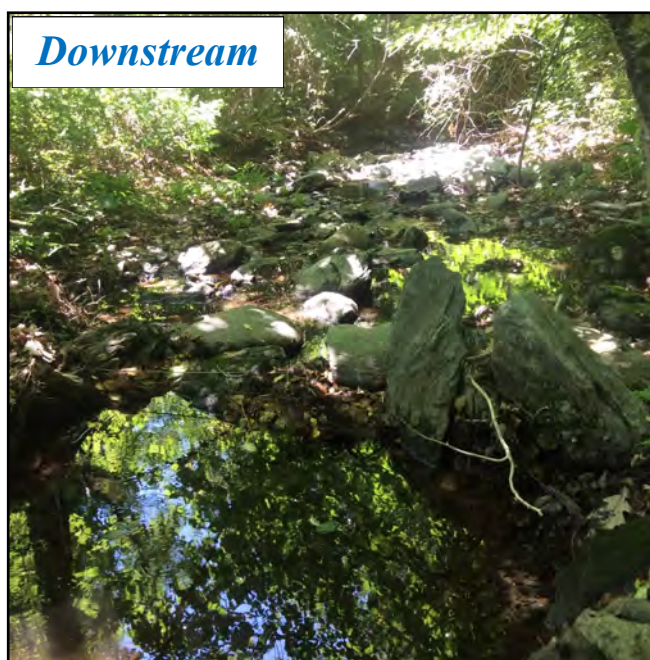
Scour Pool: Large

Bankfull Width (feet): 10.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Unpaved

Road Fill Height (feet): 0.6

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	23.98	4.63	0.45	No
5	27.08		0.53	No
10	28.95		0.57	No
25	31.09		0.63	No
50	32.55		0.67	No
100	33.91		0.71	No

Structure 1 of 1

Material: Metal

Length (feet): 15.7

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.05

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.1, Height: 4.0

Substrate/Water Width: 1.3

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall Onto Cascade

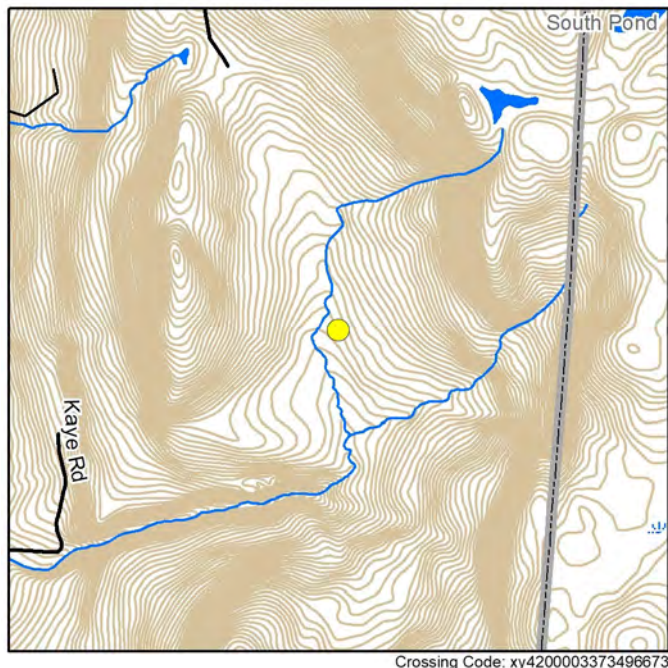
Drop to Stream Surface/Bottom: 0.6/0.8

Dimensions:

Width: 4.0, Height: 4.1

Substrate/Water Width: 0.90

Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier
Aquatic Organism Passage Score: 0.75
Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.496603, 42.000065
Location Description: 0.25 down the road from mt riga no trespassing gate.
Date Observed: 2019-07-24
Crossing Code: xy4200003373496673

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert
Number of structures/cells: 1
Condition: OK
Constriction: Severe
Alignment: Flow-Aligned
Internal Features/Structures: None

Stream Characteristics

Scour Pool: Unknown
Bankfull Width (feet): 7.0
Water Depth/Velocity Matches Stream: Dry/Dry
Structure Substrate Type: Silt
Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Unpaved

Road Fill Height (feet): 0.1

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	33.29	1.01	1.08	Yes
5	37.61		1.32	Yes
10	40.23		1.48	Yes
25	43.28		1.67	Yes
50	45.37		1.81	Yes
100	47.34		1.95	Yes

Structure 1 of 1

Material: Metal

Length (feet): 19.7

Dry Passage/Height: Yes (1.1)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.07

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 1.5, Height: 1.1

Substrate/Water Width: 0.5

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

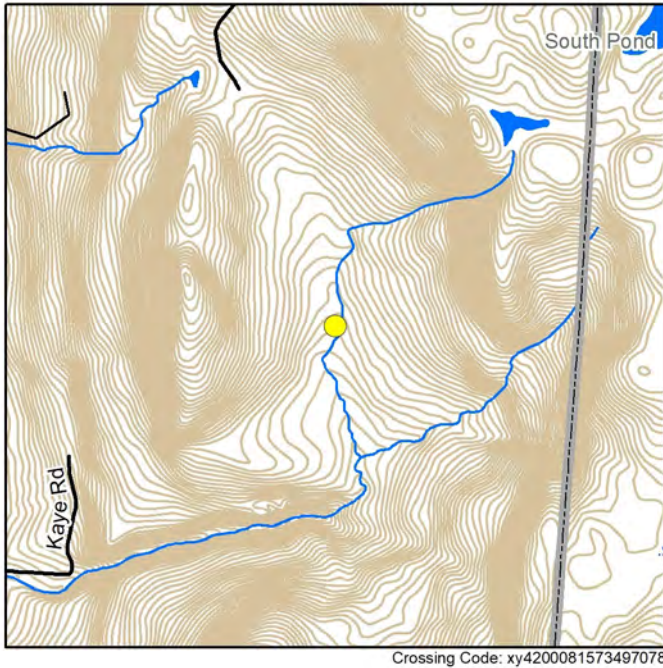
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 1.5, Height: 1.3

Substrate/Water Width: 0.40

Water Depth: 0.00



Results

Barrier Evaluation: Severe barrier
Aquatic Organism Passage Score: 0.009
Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.497194, 42.001068
Location Description: Less than a quarter of a mile from last crossing. Right before you cross the gate.
Date Observed: 2019-07-24
Crossing Code: xy4200081573497078

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert
Number of structures/cells: 1
Condition: OK
Constriction: Severe
Alignment: Flow-Aligned
Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small
Bankfull Width (feet): 7.0
Water Depth/Velocity Matches Stream: Yes/Yes
Structure Substrate Type: None
Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Unpaved

Road Fill Height (feet): 2.1

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	32.18	4.13	1.16	No
5	36.37		1.45	No
10	38.91		1.65	No
25	41.86		1.89	No
50	43.89		2.06	No
100	45.79		2.24	No

Structure 1 of 1

Material: Metal

Length (feet): 21.4

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Other (Severe)

Slope (%): 0.08

Structure Comments: Free fall at outlet would be a barrier

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.0, Height: 2.0

Substrate/Water Width: 0.7

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall Onto Cascade

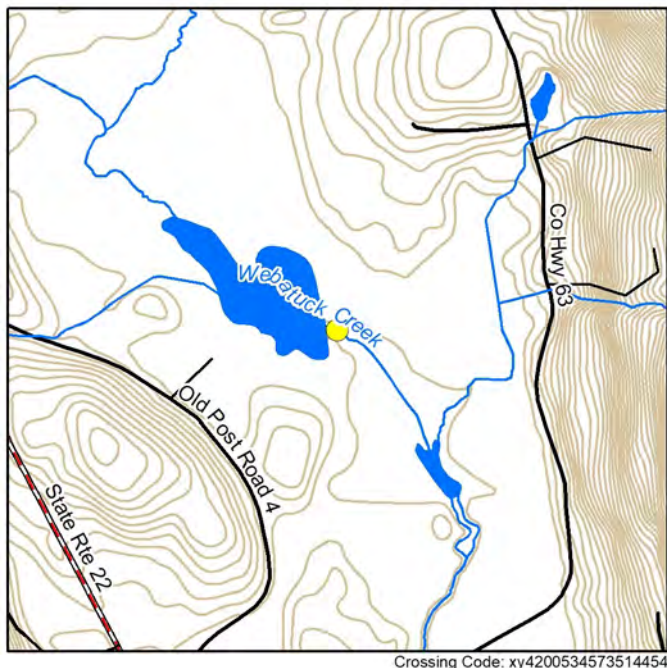
Drop to Stream Surface/Bottom: 2.6/3.3

Dimensions:

Width: 3.0, Height: 3.1

Substrate/Water Width: 0.90

Water Depth: 0.10



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.514421, 42.005379

Location Description: There is an incomplete trail that separates a lake from this bog area.

Date Observed: 2019-07-23

Crossing Code: xy4200534573514454

Stream and Crossing

Crossing Characteristics

Crossing Type: Partially Inaccessible

Number of structures/cells: 1

Condition: Poor

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

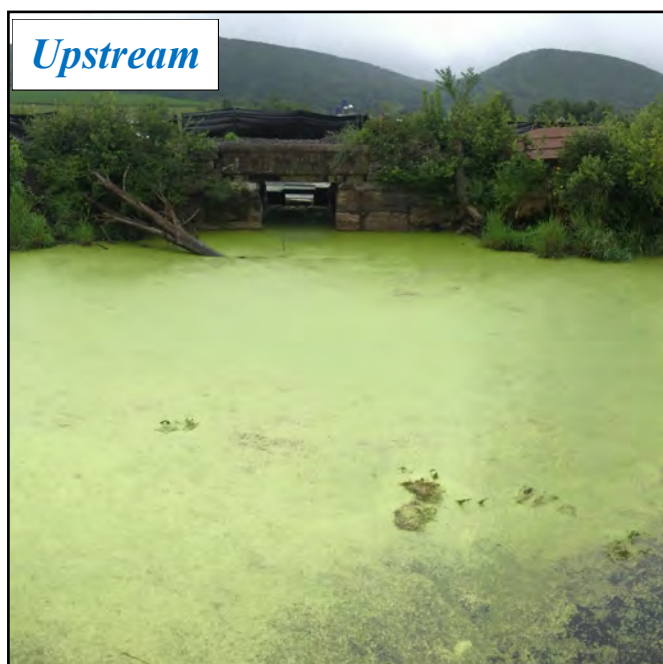
Scour Pool: Large

Bankfull Width (feet): 1,000.0

Water Depth/Velocity Matches Stream: Yes/No-Slower

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 1.5

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	238.28	N/A	N/A	N/A
5	276.65			
10	301.47			
25	331.64			
50	353.26			
100	374.24			

Structure 1 of 1

Material: Concrete

Length (feet): 0.0

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): Debris/Sediment/Rock (Severe)

Slope (%):

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: Clogged/Collapsed/Submerged

Dimensions:

Width: 0.0, Height: 0.0

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

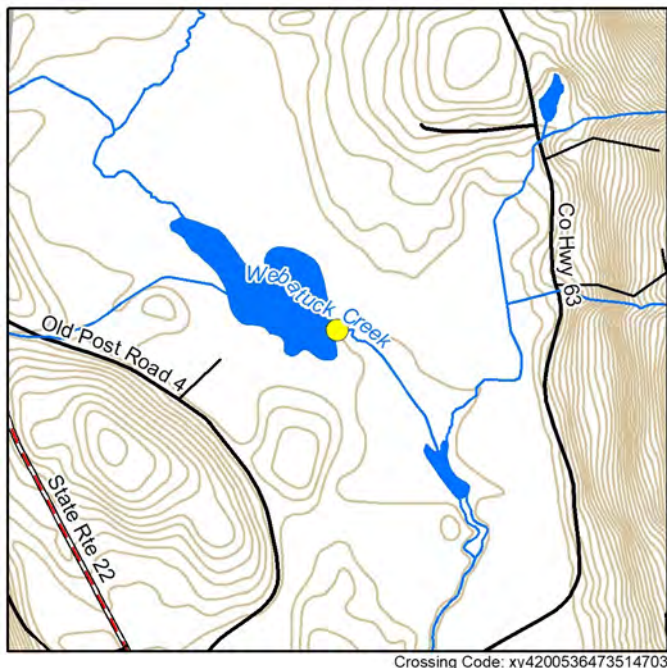
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 7.0, Height: 4.0

Substrate/Water Width: 7.00

Water Depth: 1.50



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.45

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.514764, 42.005348

Location Description: I think this is the Harlem rail trail. We accessed this via a mile long hike through a marsh.

Date Observed: 2019-07-23

Crossing Code: xy4200536473514703

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: Baffles/Weirs

Stream Characteristics

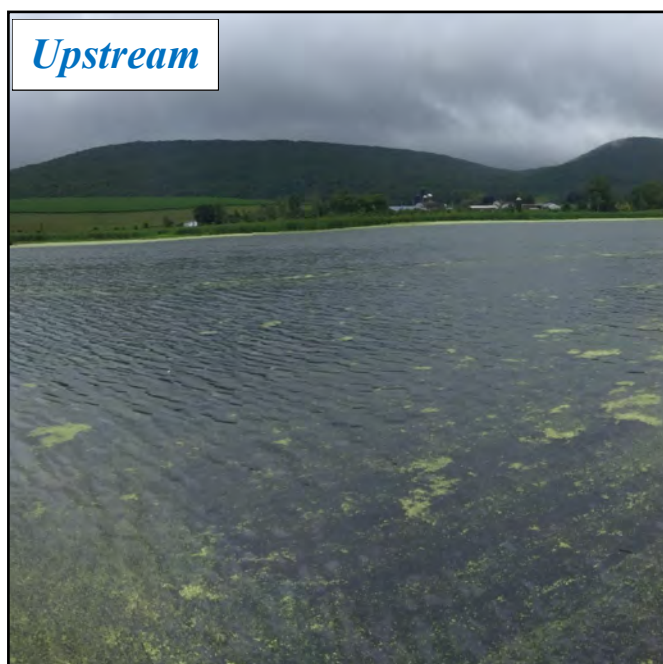
Scour Pool: Large

Bankfull Width (feet): 1,000.0

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Unknown

Structure Substrate Matches Stream? Unknown



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 1.1

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	237.42	5.44	3.23	No
5	275.63		3.33	Yes
10	300.37		3.4	Yes
25	330.43		3.47	Yes
50	351.97		3.53	Yes
100	372.9		3.58	Yes

Structure 1 of 1

Material: Concrete

Length (feet): 16.0

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): Free Fall (Severe)

Slope (%): 0.15

Structure Comments: Inlet drop is 0.6 feet

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 6.7, Height: 6.5

Substrate/Water Width: 6.7

Water Depth: 3.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

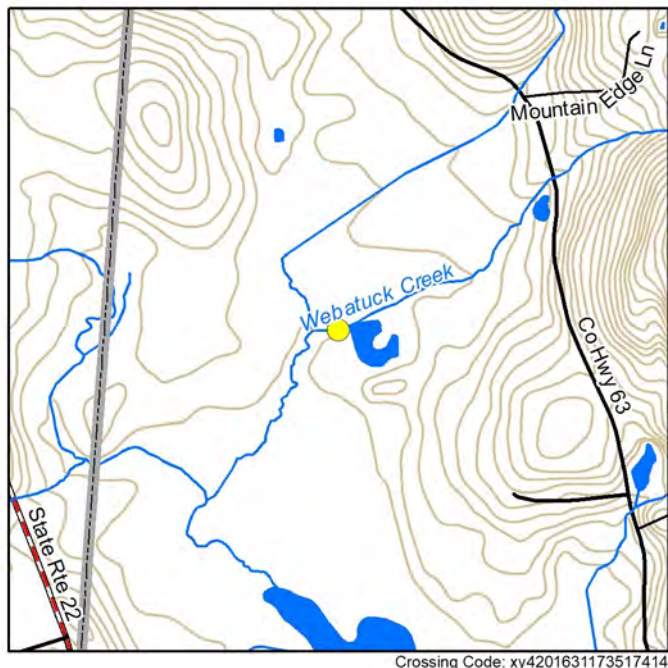
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 6.3, Height: 5.8

Substrate/Water Width: 6.30

Water Depth: 1.70



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.74

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.517166, 42.016323

Location Description: 20 ft upstream of culvert on Harlem Valley Rail Trail ending in 7264

Date Observed: 2019-07-24

Crossing Code: xy4201631173517414

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: Poor

Constriction: Severe

Alignment: Skewed ($>45^\circ$)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

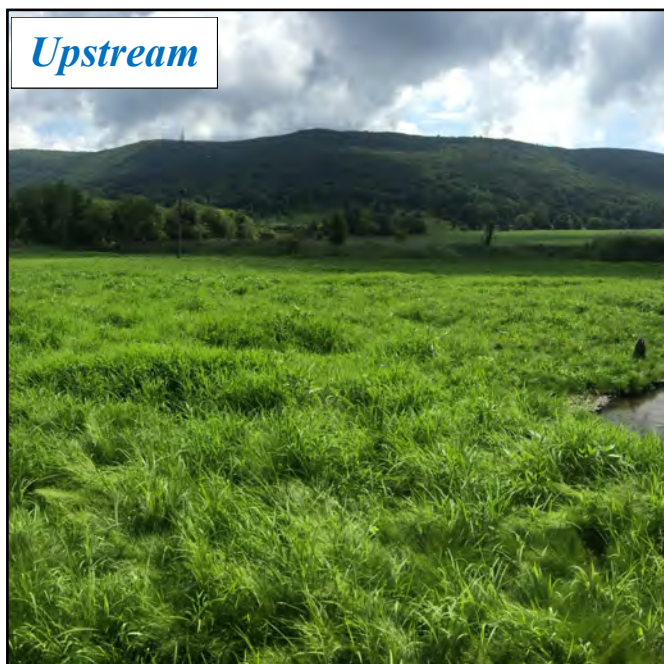
Bankfull Width (feet): 50.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	42.23	N/A	N/A	N/A
5	48.97			
10	53.41			
25	58.88			
50	62.83			
100	66.71			

Structure 1 of 1

Material: Concrete

Length (feet): 17.8

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/Rock (Minor)

Slope (%):

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box/Bridge with Abutments/Headwall and Wingwalls

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 8.0, Height: 1.1

Substrate/Water Width: 6.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.3, Height: 2.7

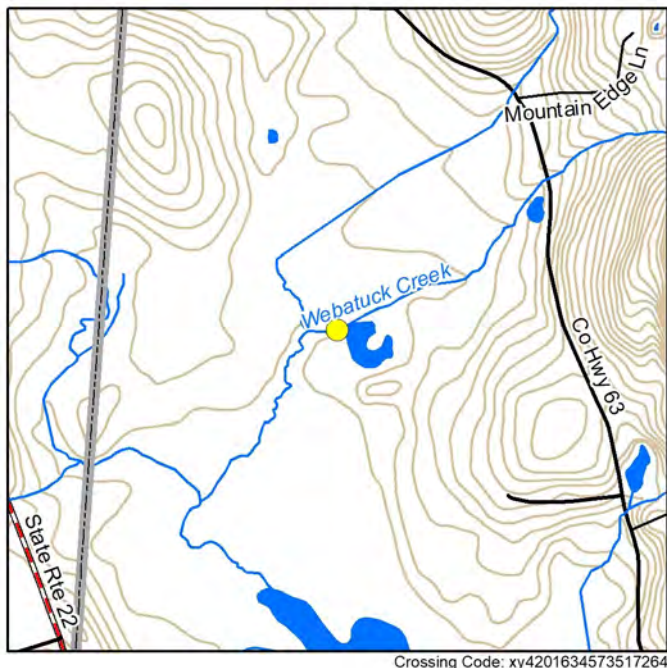
Substrate/Water Width: 3.20

Water Depth: 1.30

Additional Photo

Other 1





Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.85

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.517299, 42.016284

Location Description: A mile down Harlem Valley Rail Trail, accessed from White House

Crossing Road. 93 00 spray painted on gravel.

Date Observed: 2019-07-24

Crossing Code: xy4201634573517264

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

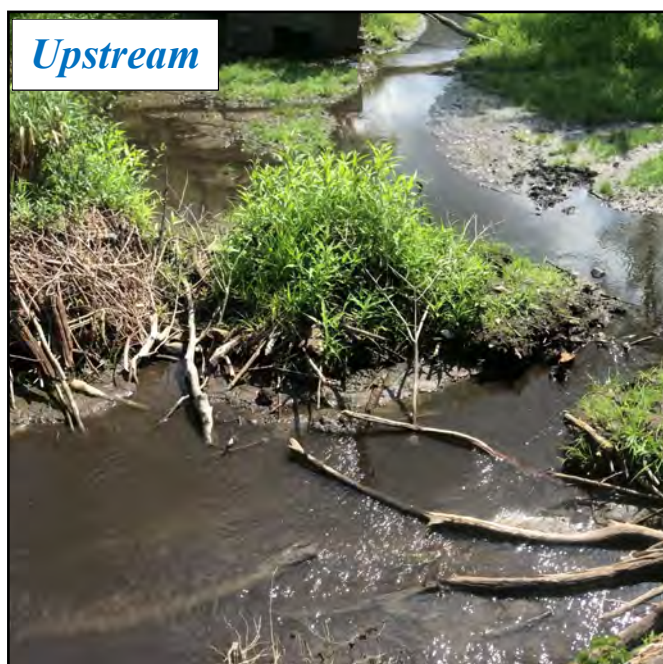
Scour Pool: None

Bankfull Width (feet): 75.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	42.23	N/A	N/A	N/A
5	48.97			
10	53.41			
25	58.88			
50	62.83			
100	66.71			

Structure 1 of 1

Material: Concrete

Length (feet): 20.4

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Minor)

Slope (%):

Structure Comments: None

Inlet**Outlet****Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 11.5, Height: 2.1

Substrate/Water Width: 11.5

Water Depth: 0.90

Outlet

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

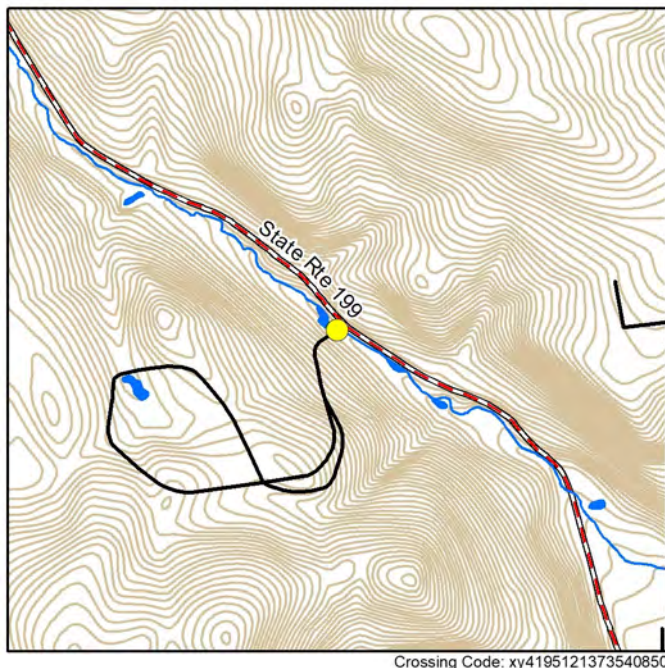
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 12.3, Height: 1.9

Substrate/Water Width: 12.30

Water Depth: 0.60



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.04

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.540879, 41.951275

Location Description: Between yellow "4504" sign and entrance to driveway from Route 199

Date Observed: 2019-07-31

Crossing Code: xy4195121373540850

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 10.0

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 19.8

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	133.49	24.82	2.81	No
5	152.8		2.96	No
10	165.33		3.07	No
25	180.57		3.19	No
50	191.48		3.28	No
100	202.09		3.37	No

Structure 1 of 1

Material: Metal
 Length (feet): 100.0
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): None
 Slope (%): 0.06
 Structure Comments: Inlet drop of 6.2 feet.
 Length was estimated.

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting
 Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 12.5, Height: 5.0

Substrate/Water Width: 1.2

Water Depth: 0.10

Outlet**Outlet**

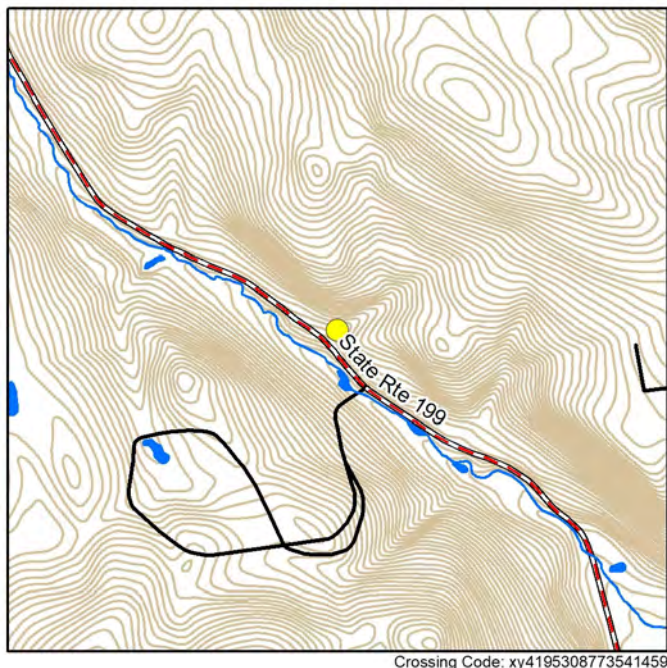
Outlet Shape: Round Culvert
 Outlet Drop/Grade: Free Fall
 Drop to Stream Surface/Bottom: 1.9/2.4

Dimensions:

Width: 4.0, Height: 3.7

Substrate/Water Width: 1.30

Water Depth: 0.20



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.19

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.541459, 41.953087

Location Description: Across from 4424

McGhee White House. Upstream of xy....1647

Date Observed: 2019-08-06

Crossing Code: xy4195308773541459

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 6.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	12.15	N/A		
5	13.42			
10	14.16			
25	14.98			
50	15.52			
100	16.02			

Structure 1 of 1

Material: Concrete

Length (feet): 52.3

Dry Passage/Height: Yes (5.8)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Open Bottom Arch Bridge/Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.8, Height: 5.8

Substrate/Water Width: 5.8

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Open Bottom Arch Bridge/Culvert

Outlet Drop/Grade: Free Fall

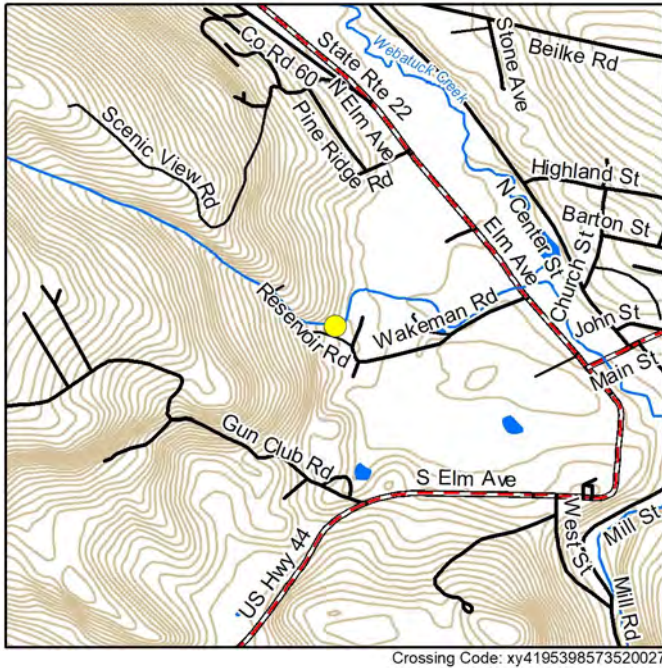
Drop to Stream Surface/Bottom: 1.0/1.0

Dimensions:

Width: 5.7, Height: 7.6

Substrate/Water Width: 5.70

Water Depth: 0.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.74

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.520073, 41.953799

Location Description: 100 feet behind house 71

Wakeman Rd in the woods

Date Observed: 2019-07-16

Crossing Code: xy4195398573520027

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 4.7

Water Depth/Velocity Matches Stream: No-Shallower/No-Slower

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: Bridge is very overgrown and starting to crumble at sides. Woman mentioned that a major flood happened recently where the water was 2 feet high and coming down to her house from this wooded area.

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	21.91	N/A	N/A	N/A
5	24.83			
10	26.67			
25	28.86			
50	30.41			
100	31.89			

Structure 1 of 1

Material: Concrete

Length (feet): 19.4

Dry Passage/Height: Yes (3)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

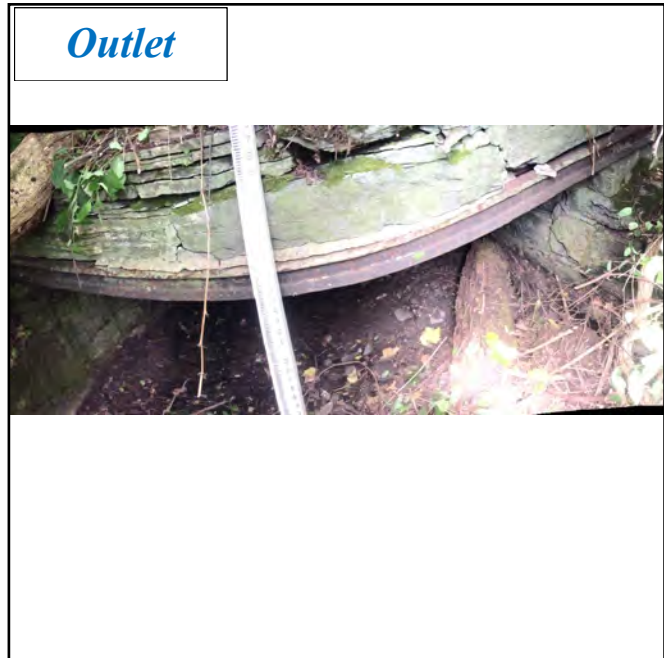
Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 7.5, Height: 2.6

Substrate/Water Width: 3.8

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

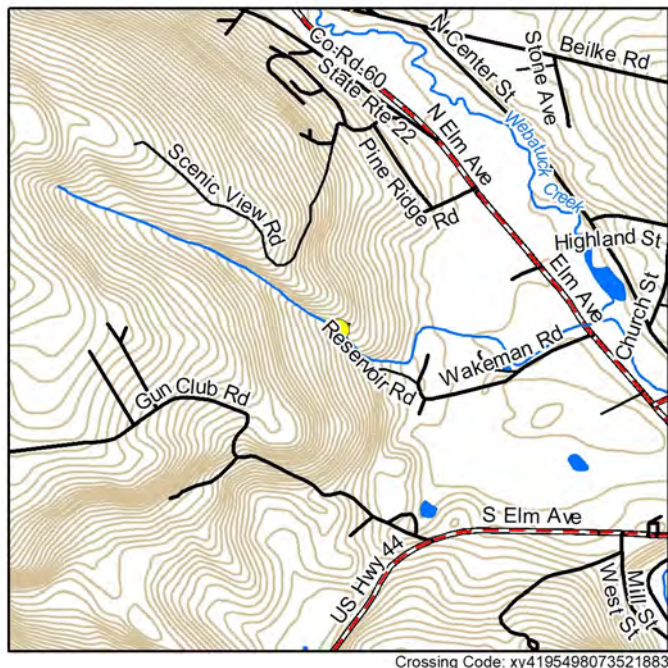
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 9.1, Height: 3.2

Substrate/Water Width: 1.80

Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.522048, 41.954844

Location Description: 32 Reservoir Road driveway

Date Observed: 2019-07-16

Crossing Code: xy4195498073521883

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 10.3

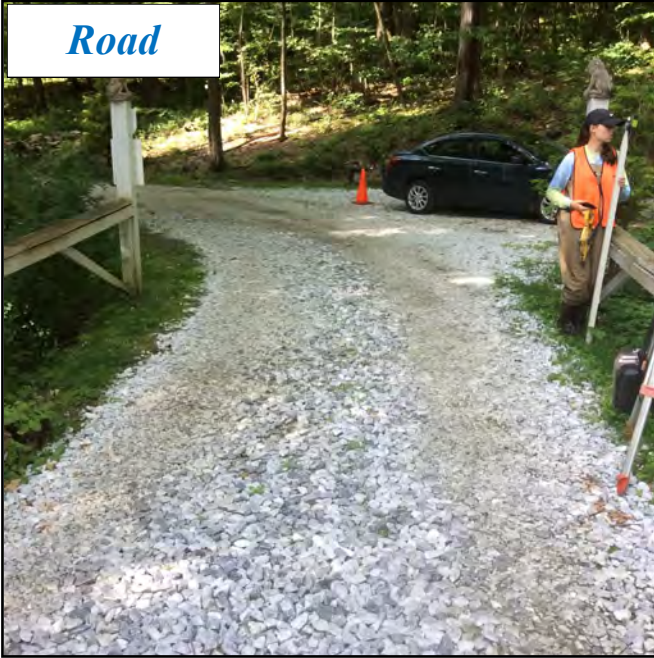
Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 1.2

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	20.91	4.23	1.84	No
5	23.7		2.03	No
10	25.46		2.15	No
25	27.55		2.3	No
50	29.01		2.41	No
100	30.41		2.5	No

Structure 1 of 1

Material: Metal

Length (feet): 15.8

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.06

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.6, Height: 3.0

Substrate/Water Width: 1.4

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: Free Fall Onto Cascade

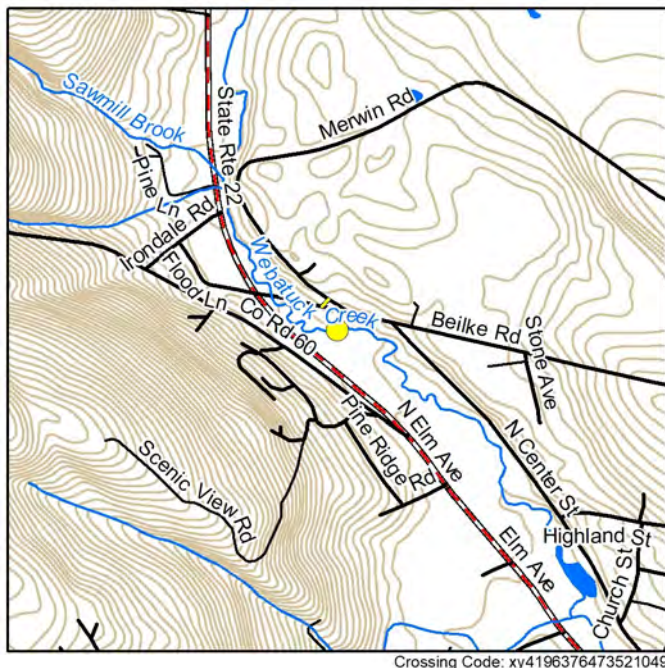
Drop to Stream Surface/Bottom: 3.9/4.0

Dimensions:

Width: 4.5, Height: 3.2

Substrate/Water Width: 1.50

Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.95

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.521053, 41.963786

Location Description: 50 ft away from intersection of Harlem Valley Rail Trail and Beilke Rd

Date Observed: 2019-08-01

Crossing Code: xy4196376473521049

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 19.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Comparable



Upstream



Downstream

Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	921.89	N/A	N/A	N/A
5	1057.15			
10	1144.66			
25	1250.91			
50	1326.87			
100	1400.69			

Structure 1 of 1

Material: Combination

Length (feet): 23.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%):

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Open Bottom Arch Bridge/
Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 12.5, Height: 8.3

Substrate/Water Width: 12.5

Water Depth: 1.00

Outlet**Outlet**

Outlet Shape: Open Bottom Arch Bridge/Culvert

Outlet Drop/Grade: At Stream Grade

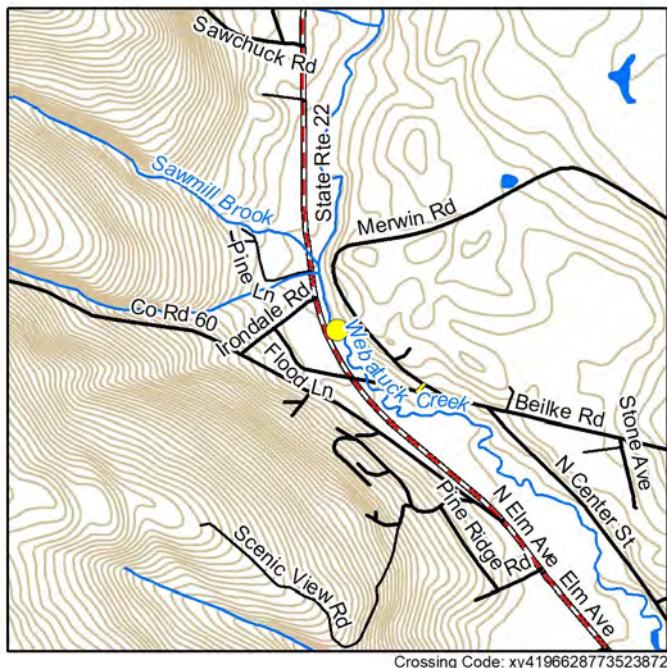
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 12.1, Height: 7.3

Substrate/Water Width: 12.10

Water Depth: 1.10

**Results**

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.98

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.524086, 41.966393

Location Description: In driveway of 6078 Route 22

Date Observed: 2019-07-23

Crossing Code: xy4196628773523872

Stream and Crossing**Crossing Characteristics**

Crossing Type: Bridge

Number of structures/cells: 1

Condition: Poor

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

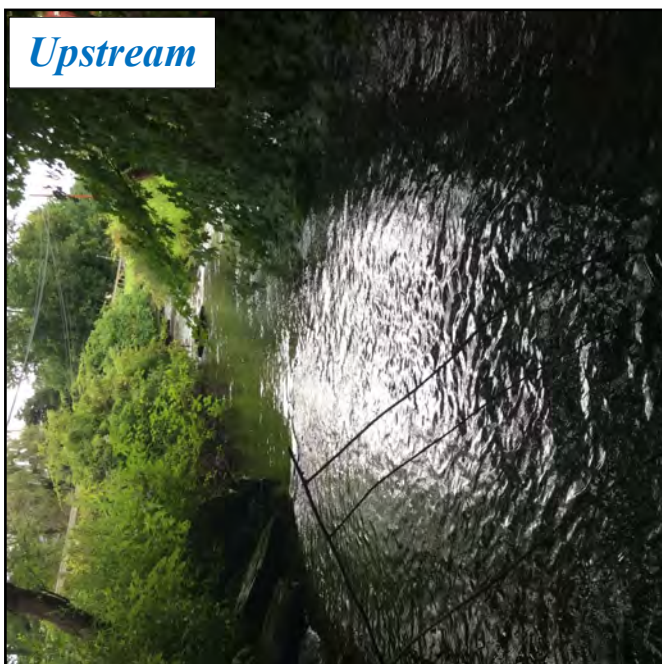
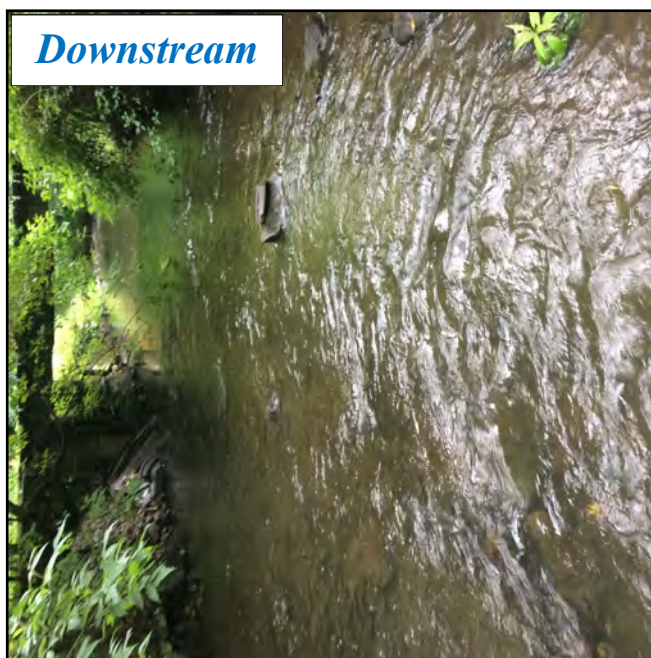
Scour Pool: None

Bankfull Width (feet): 15.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable

Upstream**Downstream**

Crossing Comments: The bridge is in poor condition because pieces of wood and the underside of the bridge on the outlet side is falling down and separating.

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	912.16	N/A	N/A	
5	1045.76		N/A	
10	1132.23		N/A	
25	1237.25		N/A	
50	1312.34		N/A	
100	1385.33		N/A	

Structure 1 of 1

Material: Combination

Length (feet): 32.1

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 18.0, Height: 6.2

Substrate/Water Width: 14.4

Water Depth: 0.60

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 18.6, Height: 5.8

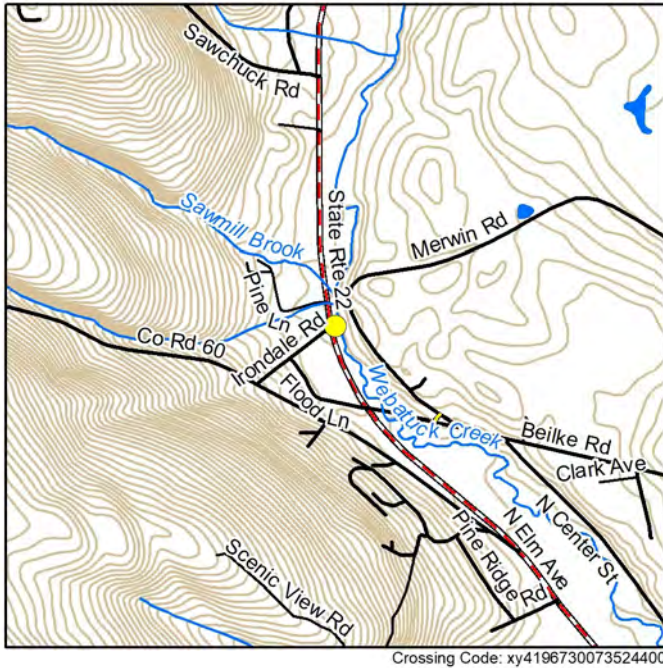
Substrate/Water Width: 16.50

Water Depth: 0.60

Additional Photo

Other 1





Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.90

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.524347, 41.967263

Location Description: Bridge at driveway of Old Mill of Irondale Antiques store

Date Observed: 2019-07-23

Crossing Code: xy4196730073524400

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 42.0

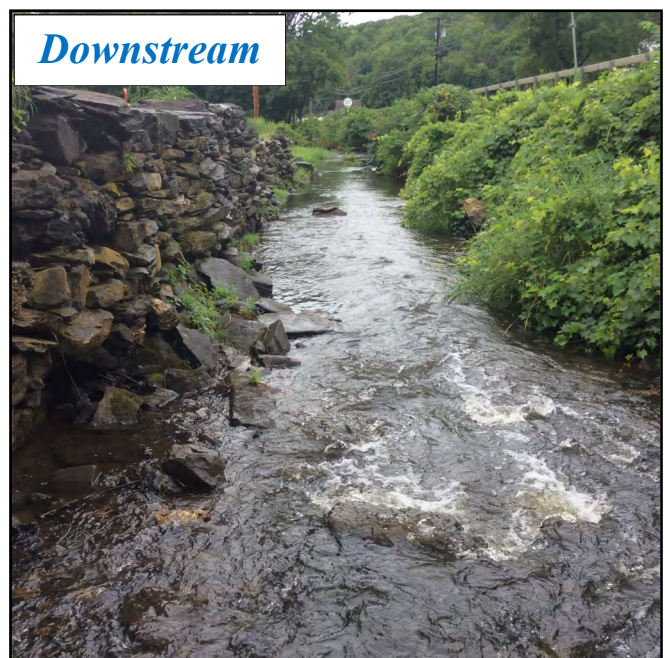
Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Upstream



Downstream

Crossing Comments: None

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	897.77	N/A	N/A	N/A
5	1029.33			
10	1114.43			
25	1217.74			
50	1291.6			
100	1363.38			

Structure 1 of 1

Material: Combination

Length (feet): 26.3

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%):

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 17.4, Height: 6.4

Substrate/Water Width: 17.4

Water Depth: 0.80

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

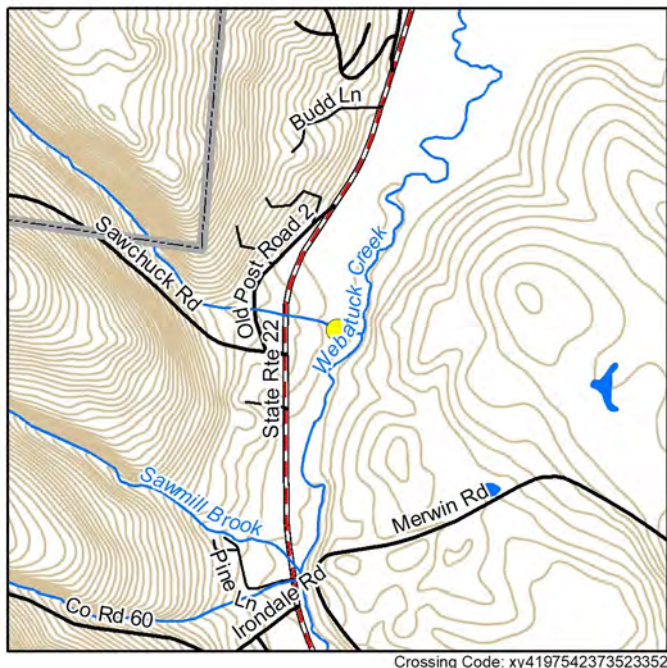
Width: 17.6, Height: 6.3

Substrate/Water Width: 17.60

Water Depth: 0.30

Road: Harlem Valley Rail Trail

Stream:



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.523352, 41.975423

Location Description: East of Route 22, probably on the Harlem Valley Rail Trail

Date Observed: 2019-08-06

Crossing Code: xy4197542373523352

Stream and Crossing

Crossing Characteristics

Crossing Type: Inaccessible

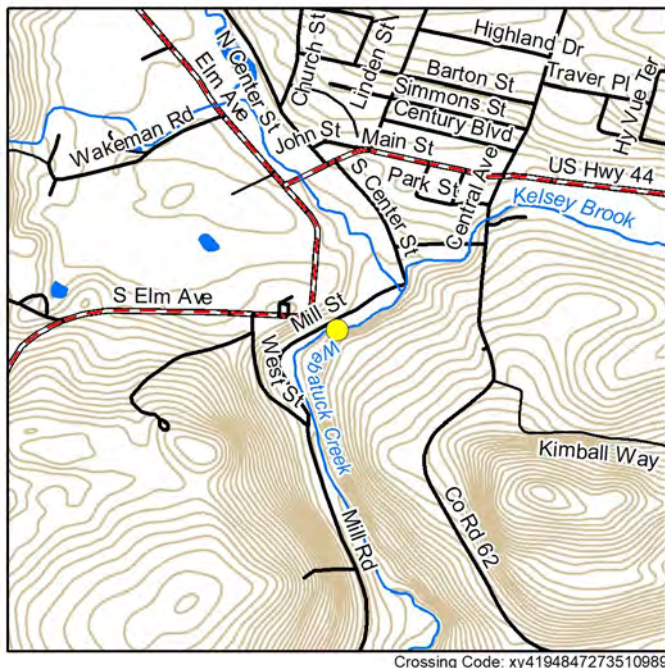
Crossing Comments: Inaccessible, this section of the Harlem Valley Rail Trail is currently under construction and closed to the public

Road

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private



Crossing Code: xy4194847273510989

Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.99

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.510715, 41.948499

Location Description: Harlem Valley Rail trail after it crosses mill street

Date Observed: 2019-07-09

Crossing Code: xy4194847273510989

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

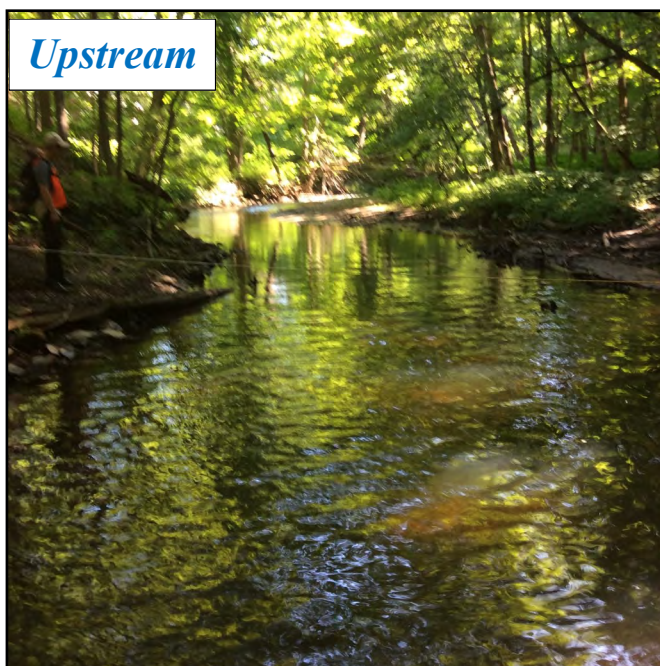
Scour Pool: None

Bankfull Width (feet): 34.5

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	1346.87	N/A	N/A	N/A
5	1550.66			
10	1681.05			
25	1838.14			
50	1949.88			
100	2057.68			

Structure 1 of 1

Material: Combination

Length (feet): 14.4

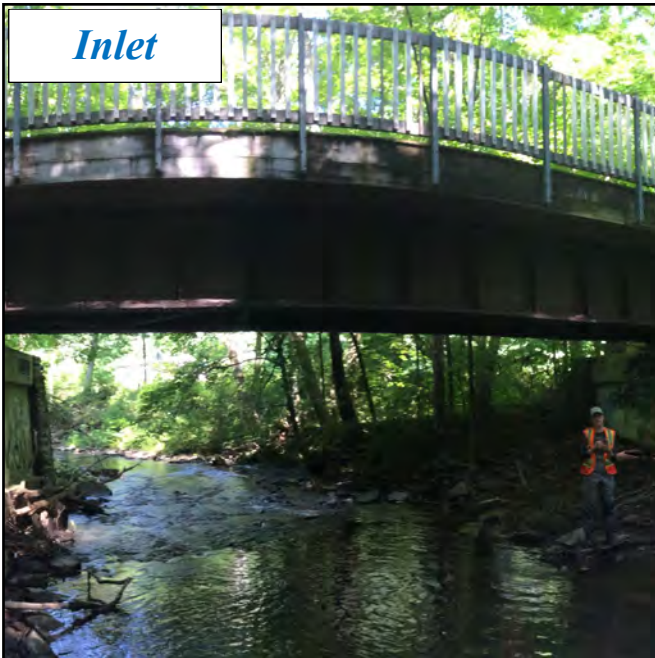
Dry Passage/Height: Yes (9.9)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 38.2, Height: 10.9

Substrate/Water Width: 23.4

Water Depth: 1.00

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

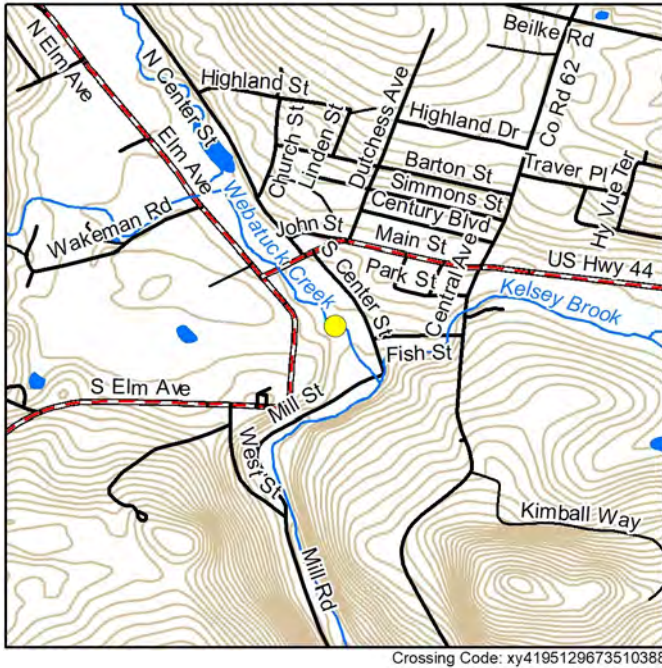
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 38.5, Height: 10.7

Substrate/Water Width: 25.10

Water Depth: 0.70



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.90

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.510356, 41.951359

Location Description: Rail trail crossing quarter mile from intersection with 22, upstream from salt shed

Date Observed: 2019-07-09

Crossing Code: xy4195129673510388

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 24.0

Water Depth/Velocity Matches Stream: Yes/No-Faster

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	1027	N/A	N/A	N/A
5	1181.27			
10	1280.2			
25	1399.59			
50	1484.61			
100	1566.76			

Structure 1 of 1

Material: Combination

Length (feet): 17.9

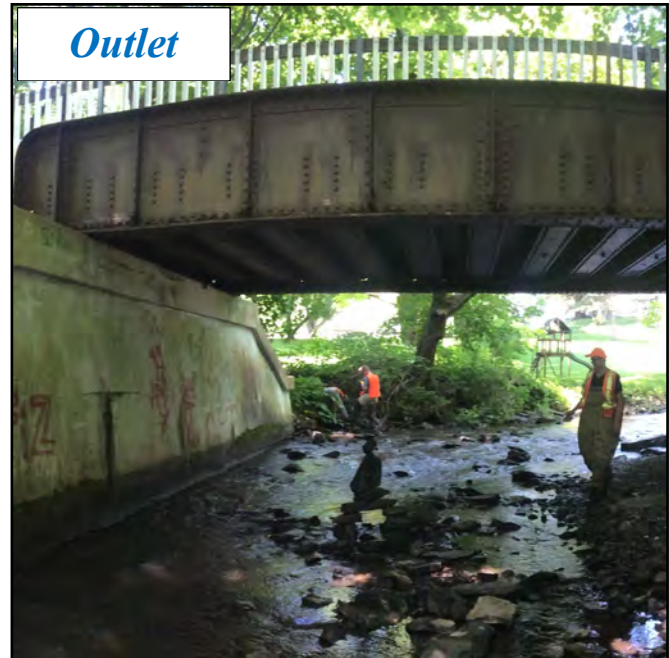
Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%):

Structure Comments: None

Inlet**Outlet****Inlet**

Inlet Shape/Type: Box/Bridge with Abutments/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 27.5, Height: 10.1

Substrate/Water Width: 26.3

Water Depth: 0.50

Outlet

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

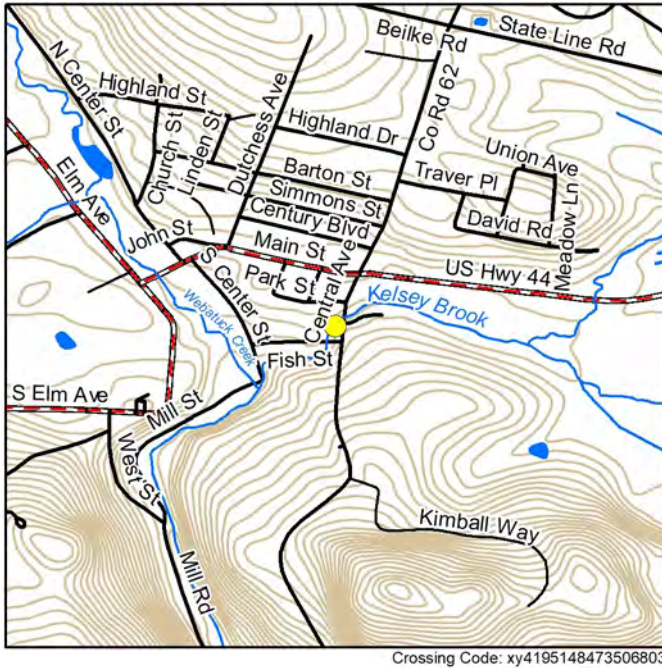
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 27.6, Height: 10.1

Substrate/Water Width: 16.00

Water Depth: 0.60



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.93

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.506665, 41.951483

Location Description: In driveway of 20 South Maple Road

Date Observed: 2019-07-03

Crossing Code: xy4195148473506803

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

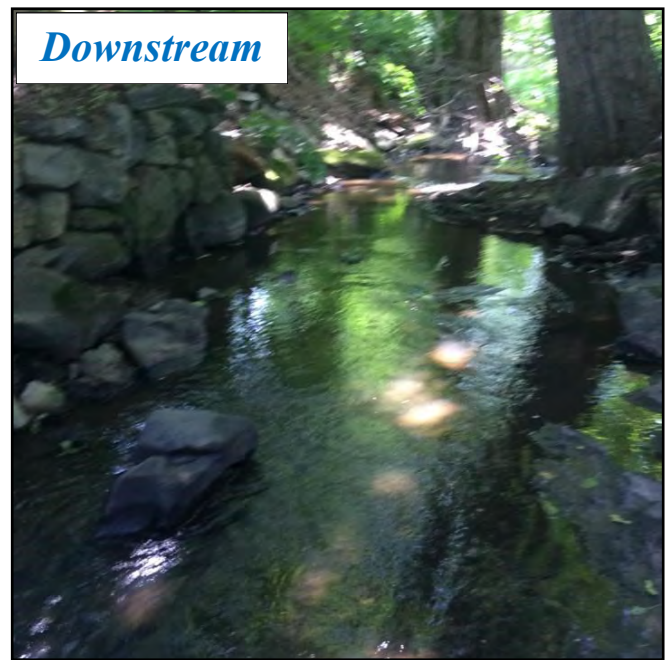
Scour Pool: None

Bankfull Width (feet): 19.0

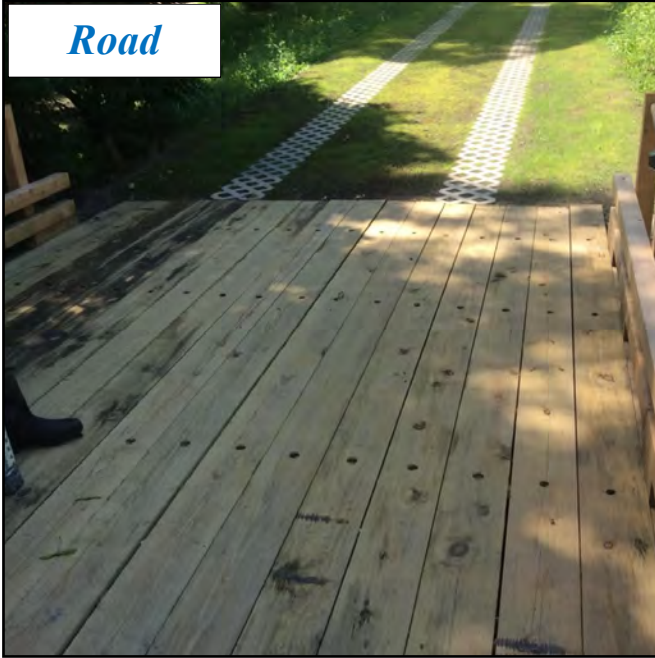
Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Boulder

Structure Substrate Matches Stream? Contrasting



Crossing Comments: Channel upstream heavily modified. Taking more natural bankfull that we used for crossing upstream of this bridge.

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	312.61	N/A	N/A	N/A
5	361.82			
10	392.89			
25	430			
50	456.19			
100	481.21			

Structure 1 of 1

Material: Concrete

Length (feet): 11.7

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 10.2, Height: 7.9

Substrate/Water Width: 4.1

Water Depth: 0.50

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 10.2, Height: 7.6

Substrate/Water Width: 7.00

Water Depth: 0.20



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.68

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 7 (Ranked 38 of 103)

Location

Coordinates: -73.503439, 41.951565

Location Description: Next to red barn, just behind Millerton square shopping plaza, may be old farm Road or trail

Date Observed: 2019-07-26

Crossing Code: xy4195156573503439

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: Poor

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 15.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: There is a large pool at inlet side due to debris damming up both inlet structures. Structure in poor condition. Tops are flattening out.

Road**Road**

Road Type: Trail

Road Fill Height (feet): 1.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	302.69	6.59	2.89	No
5	349.5		3.81	No
10	379.4		4.48	No
25	415.4		5.35	No
50	440.99		6.01	No
100	465.65		6.69	Yes

Structure 1 of 2

Material: Metal

Length (feet): 23.6

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Moderate)

Slope (%): 0.03

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 6.0, Height: 5.5

Substrate/Water Width: 1.5

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 5.5, Height: 6.1

Substrate/Water Width: 3.60

Water Depth: 0.70

Structure 2 of 2

Material: Metal
Length (feet): 24.3
Dry Passage/Height (feet): No

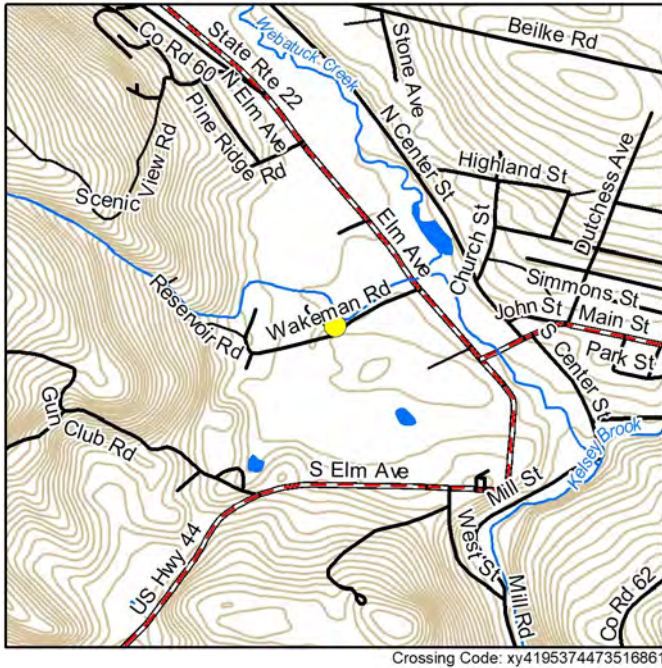
Physical Barrier(s)/Severity: Debris/Sediment/
Rock (Moderate)
Slope (%): 0.01
Structure Comments: No data

Inlet

Inlet Shape/Type: Round Culvert/Projecting
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 6.8, Height: 6.8
 Substrate/Water Width: 6.2
 Water Depth: 0.90

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 0.4/0.8
Dimensions (feet):
 Width: 7.2, Height: 3.9
 Substrate/Water Width: 5.3
 Water Depth: 0.30



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.58

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.516817, 41.953672

Location Description: Intersection of Brook lane and Wakeman Road

Date Observed: 2019-07-16

Crossing Code: xy4195374473516861

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 5.3

Water Depth/Velocity Matches Stream: Dry/Dry

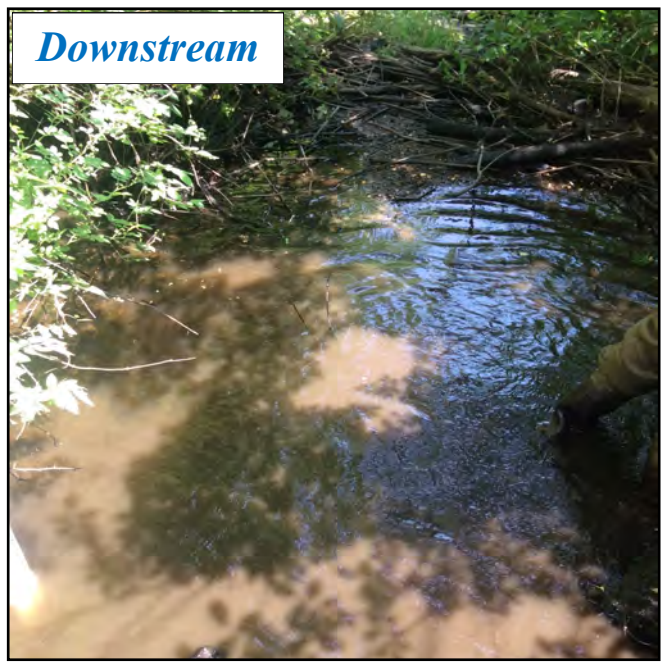
Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Unpaved

Road Fill Height (feet): 0.9

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	18.55	3.89	1.16	No
5	20.48		1.4	No
10	21.61		1.55	No
25	22.89		1.73	No
50	23.75		1.86	No
100	24.55		1.98	No

Structure 1 of 1

Material: Concrete

Length (feet): 24.9

Dry Passage/Height: Yes (3)

Outlet Armoring: None

Physical Barrier(s) (Severity): Fencing, Dry (Severe)

Slope (%): 0.05

Structure Comments: Fencing makes it impossi-

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.0, Height: 3.0

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

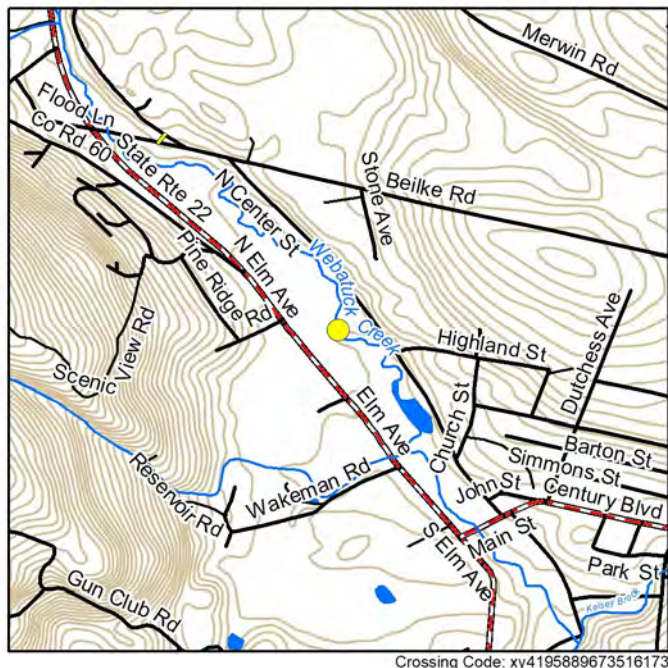
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 3.0, Height: 3.1

Substrate/Water Width: 1.10

Water Depth: 0.30



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.61

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.516001, 41.958935

Location Description: Perpendicular to new part of Rail Trail.

Date Observed: 2019-07-16

Crossing Code: xy4195889673516173

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: Poor

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

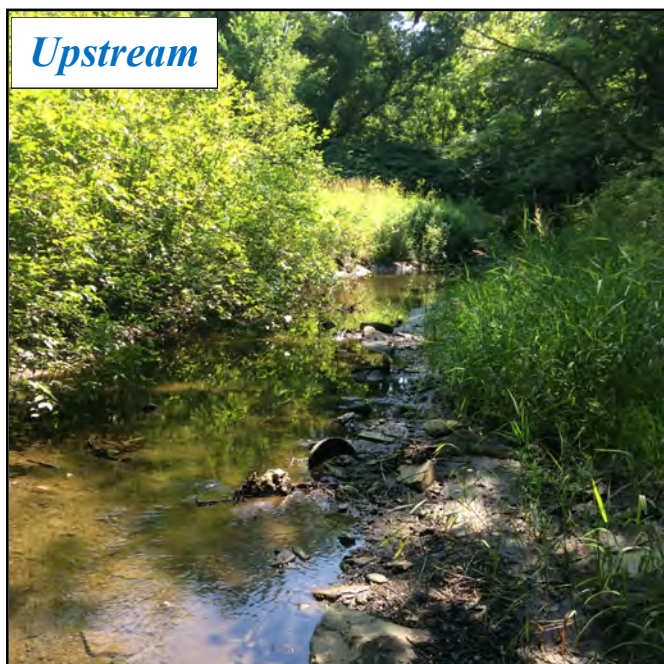
Bankfull Width (feet): 17.3

Water Depth/Velocity Matches Stream: No-Deeper/No-Slower

Structure Substrate Type: Boulder

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	961.57	N/A	N/A	N/A
5	1105.33			
10	1197.48			
25	1308.64			
50	1387.78			
100	1464.23			

Structure 1 of 1

Material: Concrete

Length (feet): 24.8

Dry Passage/Height: Yes (7.7)

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): Debris/Sediment/Rock (Severe)

Slope (%): 0

Structure Comments: Raccoon tracks in dry pas-

Inlet**Inlet**

Inlet Shape/Type: Box/Bridge with Abutments/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 11.9, Height: 8.8

Substrate/Water Width: 5.1

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

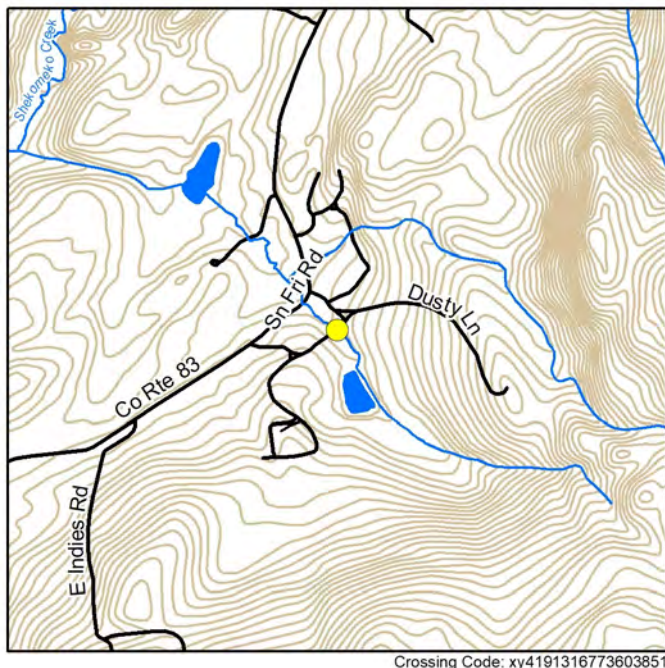
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 11.9, Height: 9.0

Substrate/Water Width: 5.50

Water Depth: 0.50



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.603851, 41.913167

Location Description: Private Road on Dunromin' Arabians property

Date Observed: 2019-08-06

Crossing Code: xy4191316773603851

Stream and Crossing

Crossing Characteristics

Crossing Type: Inaccessible

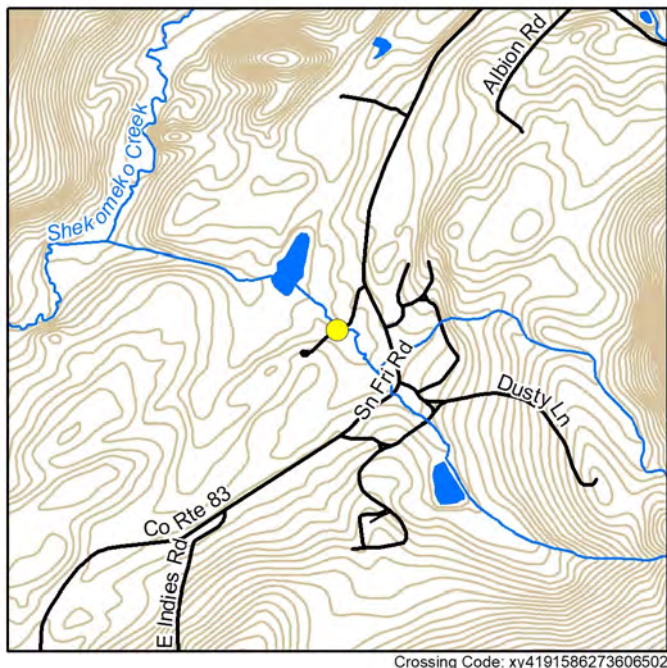
Crossing Comments: Inaccessible, due to a gated private property. HVA interns spoke with Erica from the farm and she said she would get in touch to schedule a time for us to assess the structures, but we never heard from her. We could not get a hold of the property owners.

Road

Road Type: Driveway

Road Fill Height (feet): 0.0

Road Ownership: Private



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.41

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 9 (Ranked 50 of 103)

Location

Coordinates: -73.606526, 41.915889

Location Description: About 75 yards down the driveway of 1219 Smithfield Valley Road

Date Observed: 2019-07-02

Crossing Code: xy4191586273606502

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 5.3

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Upstream



Downstream

Crossing Comments: There is a dam 5-10 feet from inlet, it's creating a waterfall.

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 2.6

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	60.6	6.09	2.93	No
5	63.44		3.03	No
10	65.27		3.11	No
25	67.48		3.19	No
50	69.06		3.26	No
100	70.58		3.32	No

Structure 1 of 1

Material: Metal

Length (feet): 28.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.5, Height: 3.5

Substrate/Water Width: 3.6

Water Depth: 0.50

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

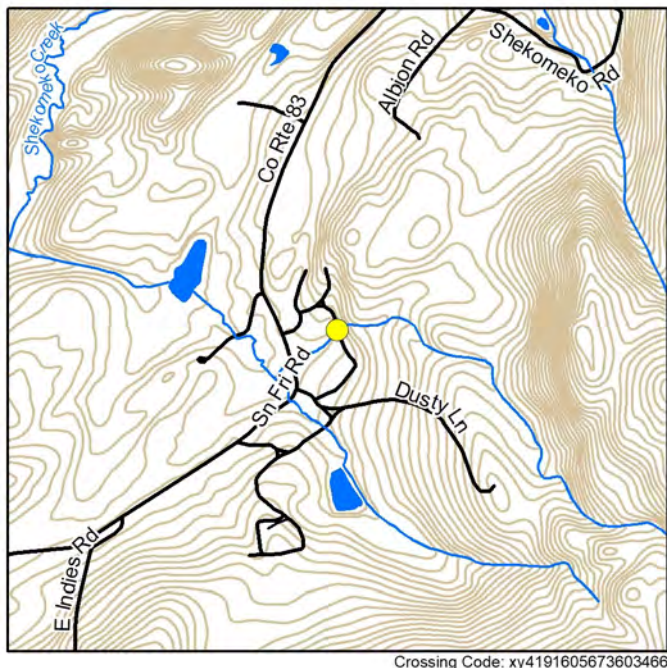
Drop to Stream Surface/Bottom: 0.6/1.2

Dimensions:

Width: 4.3, Height: 3.3

Substrate/Water Width: 2.70

Water Depth: 0.20



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.603466, 41.916056

Location Description: Dunromin' Arabians horse farm property

Date Observed: 2019-08-06

Crossing Code: xy4191605673603466

Stream and Crossing

Crossing Characteristics

Crossing Type: Inaccessible

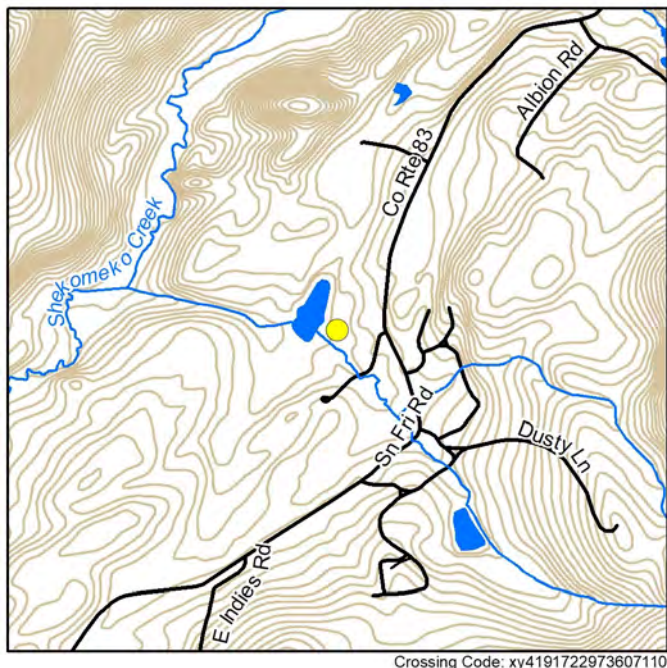
Crossing Comments: Inaccessible, due to a gated private property. HVA interns spoke with Erica from the farm and she said she would get in touch to schedule a time for us to assess the structures, but we never heard from her. We could not get a hold of the property owners.

Road

Road Type: No data

Road Fill Height (feet): 0.0

Road Ownership: Private



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.75

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.607110, 41.917229

Location Description: Footbridge is not on trail that follows river from driveway down to wetlands and woods

Date Observed: 2019-07-02

Crossing Code: xy4191722973607110

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: New

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 6.5

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	61.63	N/A	N/A	N/A
5	64.96			
10	67.1			
25	69.69			
50	71.53			
100	73.31			

Structure 1 of 1

Material: Wood

Length (feet): 4.0

Dry Passage/Height: Yes (1.5)

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Severe)

Slope (%): 0

Structure Comments: There is water on the inlet

Inlet**Inlet**

Inlet Shape/Type: Bridge with Side Slopes/None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 12.0, Height: 3.2

Substrate/Water Width: 3.6

Water Depth: 0.30

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: At Stream Grade

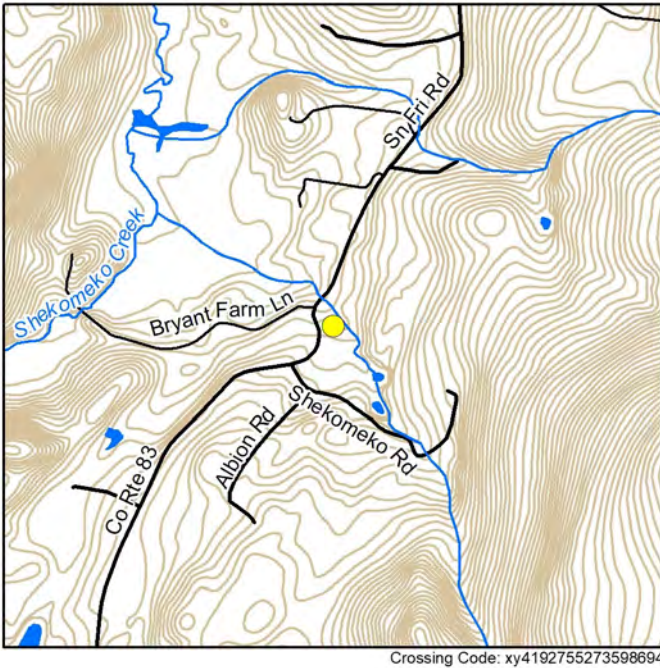
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 12.0, Height: 2.5

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.82

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.598694, 41.927552

Location Description: 1398 County Road 83, in back yard

Date Observed: 2019-07-11

Crossing Code: xy4192755273598694

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Full Channel & Banks

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 4.1

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: The streambed under this bridge is dry because a grate just upstream carries the stream through 2 metal pipes and out into a concrete channel

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	111.52	N/A	N/A	N/A
5	116.53			
10	119.86			
25	124			
50	127.02			
100	129.99			

Structure 1 of 1

Material: Wood

Length (feet): 5.1

Dry Passage/Height: Yes (1.4)

Outlet Armoring: None

Physical Barrier(s) (Severity): Dry (Severe)

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Bridge with Side Slopes/None

Inlet Drop/Grade: Unknown

Dimensions:

Width: 14.0, Height: 2.4

Substrate/Water Width: 3.4

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: Unknown

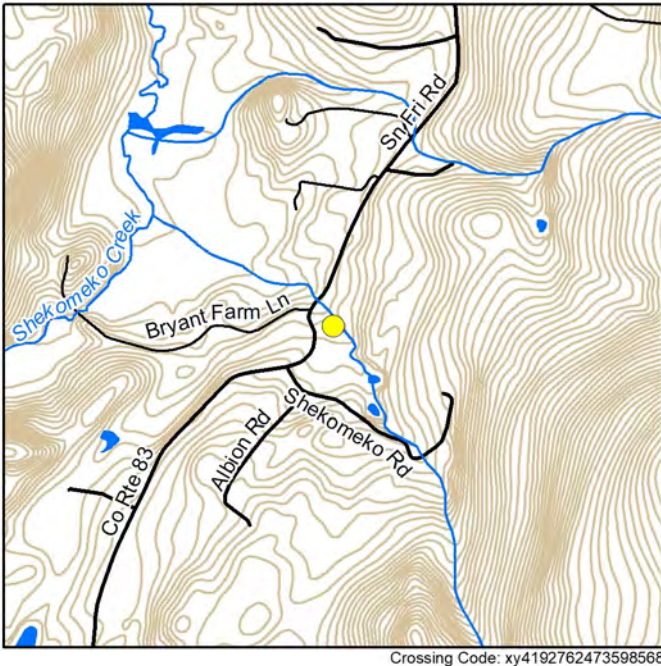
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 14.0, Height: 2.4

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.56

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.598568, 41.927624

Location Description: 1398 County Road 83 in back yard.

Date Observed: 2019-07-11

Crossing Code: xy4192762473598568

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 4.1

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: This structure runs underneath the bridge at xy4192755273598694, Outlets emptied into channel

Road**Road**

Road Type: Trail

Road Fill Height (feet): 2.3

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	107.66	6.93	2.59	No
5	111.04		2.88	No
10	113.28		3.09	No
25	116.08		3.35	No
50	118.11		3.56	No
100	120.11		3.77	No

Structure 1 of 2

Material: Metal

Length (feet): 22.5

Dry Passage/Height: No

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): Free Fall (Severe)

Slope (%): 0.05

Structure Comments: Inlet drop height is the height we measured for the structure. Outlet drop

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Other (Describe in comments section)

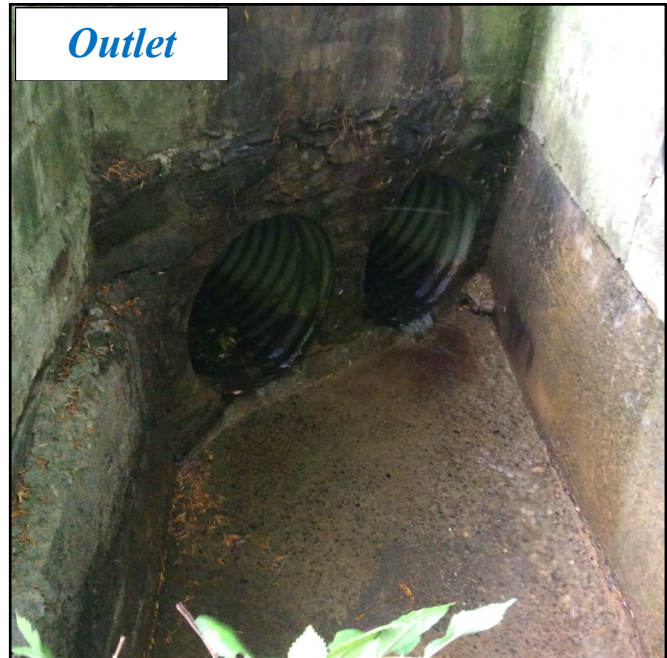
Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 2.1, Height: 4.5

Substrate/Water Width: 2.1

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.3/0.3

Dimensions:

Width: 2.2, Height: 2.0

Substrate/Water Width: 0.90

Water Depth: 0.20

Structure 2 of 2

Material: Metal
Length (feet): 22.6
Dry Passage/Height (feet): No

Inlet

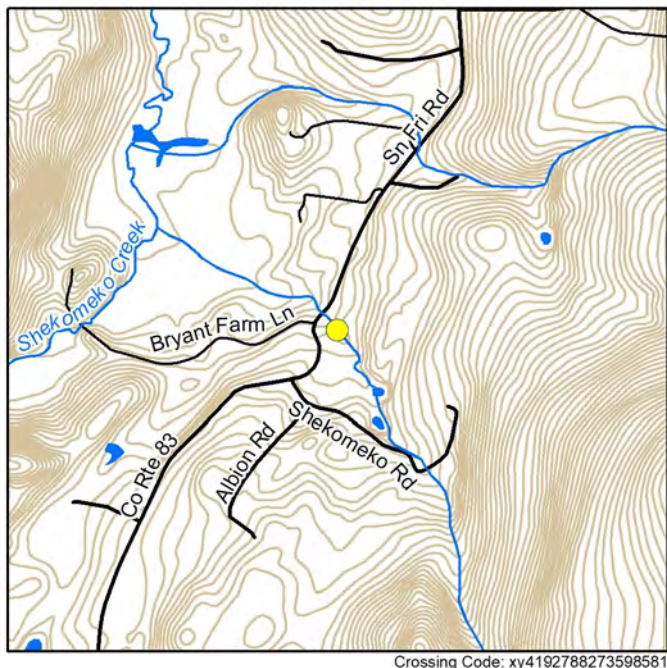
Inlet Shape/Type: Round Culvert/Other
(Describe in comments section)
Inlet Drop/Grade: Inlet Drop
Dimensions (feet):
 Width: 2.1, Height: 2.1
 Substrate/Water Width: 2.1
 Water Depth: 0.10

Physical Barrier(s)/Severity: Free Fall (Severe)
Slope (%): 0.05
Structure Comments: Inlet drop height is the height we measured for the structure. Outlet drop to water surface was 0.25 feet for both culverts,

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 0.3/0.3
Dimensions (feet):
 Width: 2.2, Height: 2.0
 Substrate/Water Width: 0.7
 Water Depth: 0.10

.....



Results

Barrier Evaluation: no score - missing data

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 10 (Ranked 55 of 103)

Location

Coordinates: -73.598862, 41.927831

Location Description: Located directly across from 1398 Country Road 83

Date Observed: 2019-07-11

Crossing Code: xy4192788273598581

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: Other

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 4.3

Water Depth/Velocity Matches Stream: Unknown/Unknown

Structure Substrate Type: Unknown

Structure Substrate Matches Stream? Unknown

Upstream



Downstream



Crossing Comments: Upstream is completely channelized, we used the more natural downstream for the bankfull measurements.

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 4.2

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	112.48	7.99	3.63	No
5	121		3.84	No
10	126.65		3.97	No
25	133.69		4.13	No
50	138.82		4.24	No
100	143.85		4.36	No

Structure 1 of 1

Material: Concrete

Length (feet): 60.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Free Fall (Severe)

Slope (%): 0.17

Structure Comments: Five drops on the inside of the structure. Three are about 0.4 feet in height,

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/None

Inlet Drop/Grade: Inlet Drop

Dimensions:

Width: 3.5, Height: 3.8

Substrate/Water Width: 3.5

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

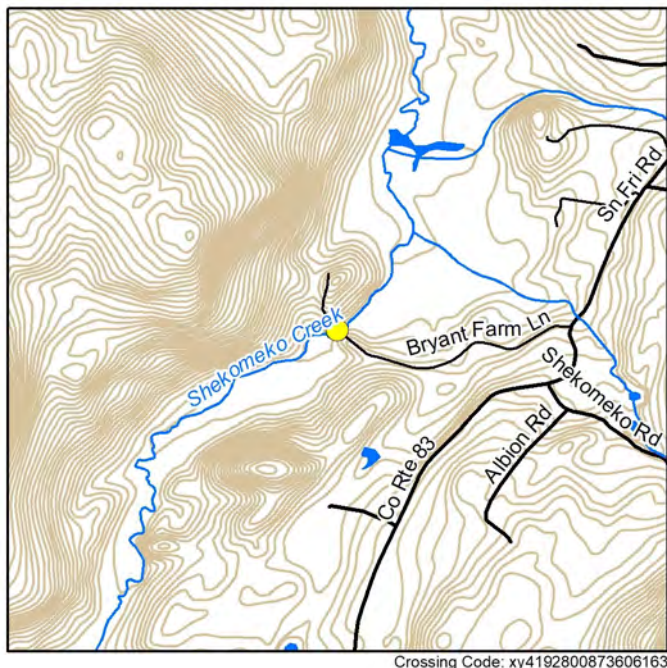
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 4.0, Height: 3.5

Substrate/Water Width: 4.00

Water Depth: 0.30



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.07

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 5 (Ranked 13 of 103)

Location

Coordinates: -73.606273, 41.928120

Location Description: 0.5 mile up Bryant Farm Road before giant grey house with modern architecture style

Date Observed: 2019-07-08

Crossing Code: xy4192800873606163

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 13.5

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: Elevation needed but too steep for stadia rod, need to do benchmarking

Road**Road**

Road Type: Unpaved

Road Fill Height (feet): 34.8

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	298.73	45.07	4.66	No
5	368.5		5.67	No
10	412.83		6.36	No
25	466.04		7.22	No
50	503.76		7.87	No
100	539.94		8.51	No

Structure 1 of 1

Material: Rock/Stone

Length (feet): 112.9

Dry Passage/Height: No

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Open Bottom Arch Bridge/Culvert/Headwall and Wingwalls

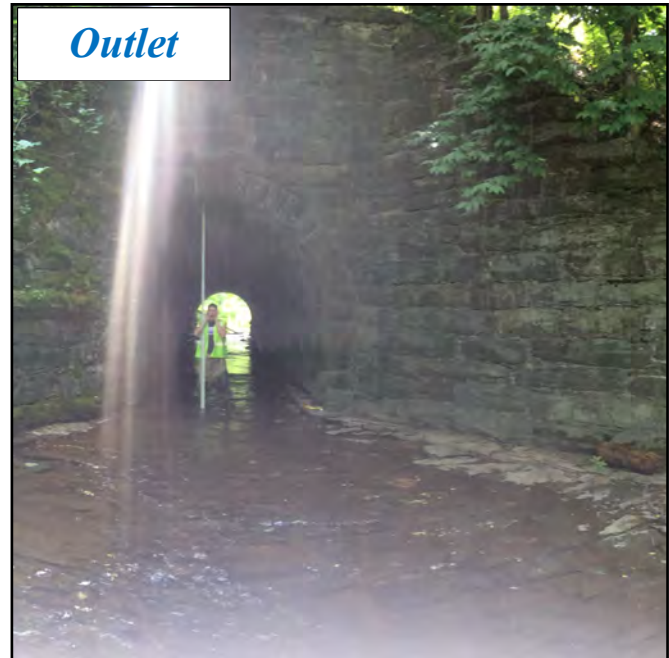
Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 12.0, Height: 10.3

Substrate/Water Width: 12.0

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Open Bottom Arch Bridge/Culvert

Outlet Drop/Grade: Free Fall Onto Cascade

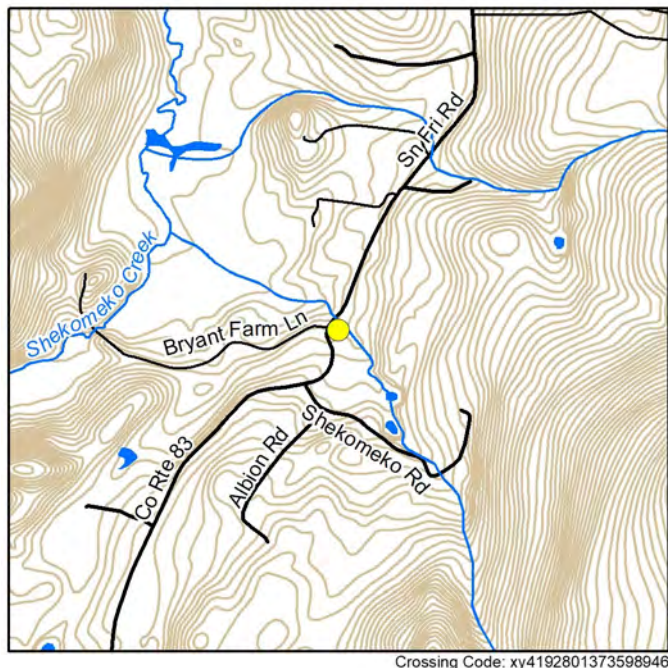
Drop to Stream Surface/Bottom: 1.6/2.1

Dimensions:

Width: 12.0, Height: 11.0

Substrate/Water Width: 11.10

Water Depth: 0.40



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.96

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.598785, 41.927914

Location Description: Across from 1401 Sn Fri Road, Route 83, upstream of first footbridge

Date Observed: 2019-07-11

Crossing Code: xy4192801373598946

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 4.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	114.78	N/A		
5	123.04			
10	128.53			
25	135.35			
50	140.33			
100	145.22			

Structure 1 of 1

Material: Wood

Length (feet): 6.4

Dry Passage/Height: Yes (1)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Bridge with Side Slopes/None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 16.2, Height: 2.3

Substrate/Water Width: 2.8

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: At Stream Grade

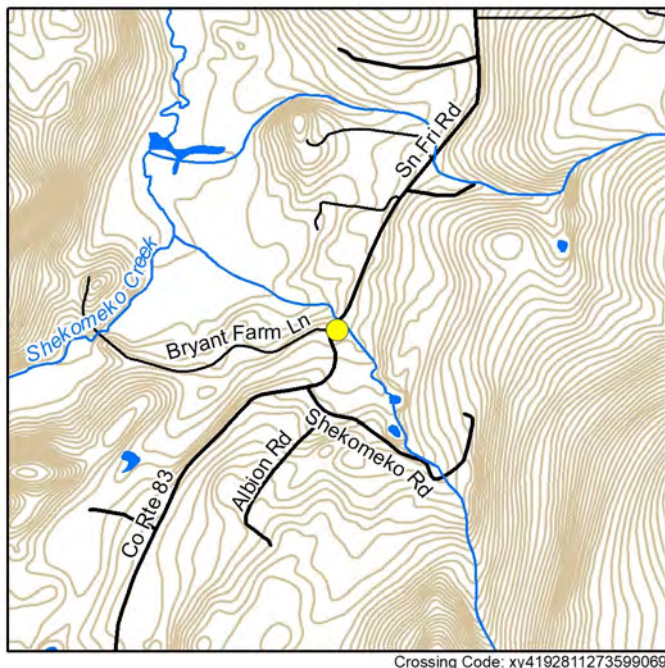
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 16.3, Height: 2.6

Substrate/Water Width: 3.60

Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.91

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.599015, 41.928092

Location Description: 25 feet from 1401 Sn Fri Road, Route 83

Date Observed: 2019-07-11

Crossing Code: xy4192811273599069

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 4.3

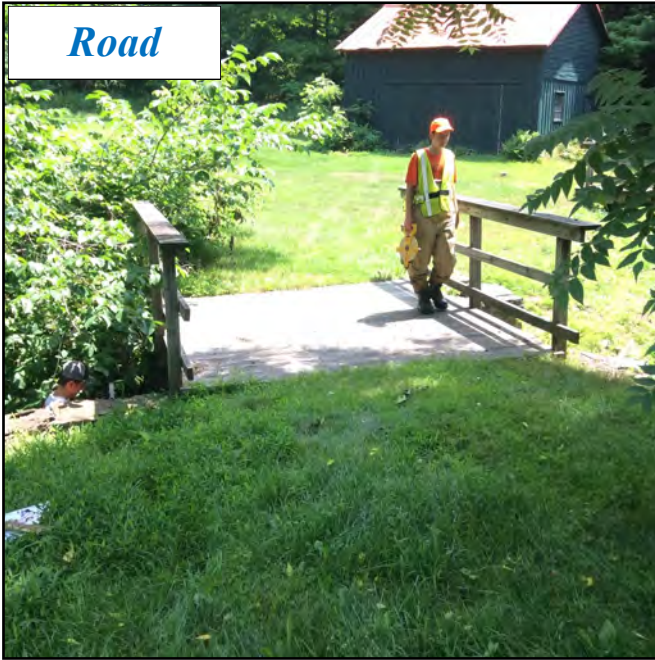
Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Gravel

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	114.39	N/A	N/A	N/A
5	123.93			
10	130.28			
25	138.16			
50	143.91			
100	149.56			

Structure 1 of 1

Material: Combination

Length (feet): 10.0

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.5, Height: 5.6

Substrate/Water Width: 5.0

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

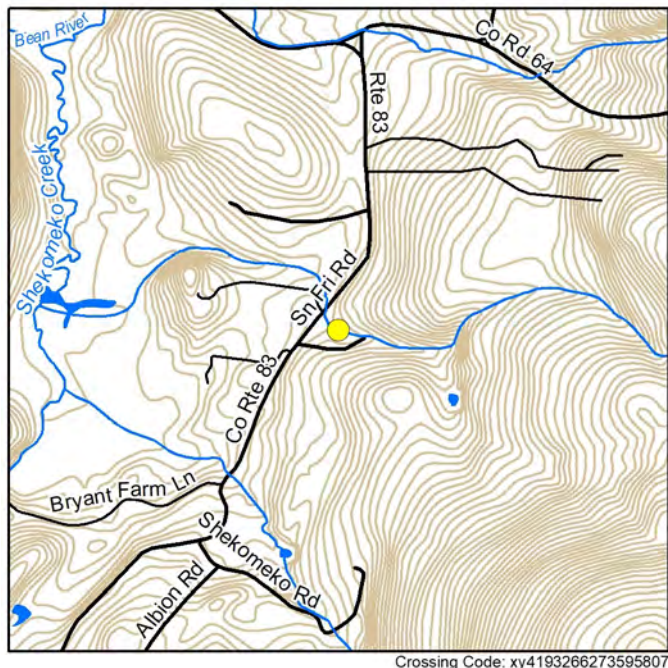
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 5.2, Height: 5.6

Substrate/Water Width: 5.20

Water Depth: 0.20



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 1 (Ranked 3 of 103)

Location

Coordinates: -73.595807, 41.932662

Location Description: 700ft upstream of crossing on Route 83

Date Observed: 2019-07-08

Crossing Code: xy4193266273595807

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: Poor

Constriction: Moderate

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 10.5

Water Depth/Velocity Matches Stream: No-Shallower/No-Faster

Structure Substrate Type: None

Structure Substrate Matches Stream? Contrasting

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 8.5

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	82.28	12.71	2.41	No
5	85.25		2.47	No
10	87.06		2.5	No
25	89.16		2.54	No
50	90.6		2.57	No
100	91.94		2.59	No

Structure 1 of 1

Material: Concrete

Length (feet): 45.7

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Free Fall (Minor)

Slope (%): 0.06

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 6.0, Height: 4.2

Substrate/Water Width: 4.3

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: At Stream Grade

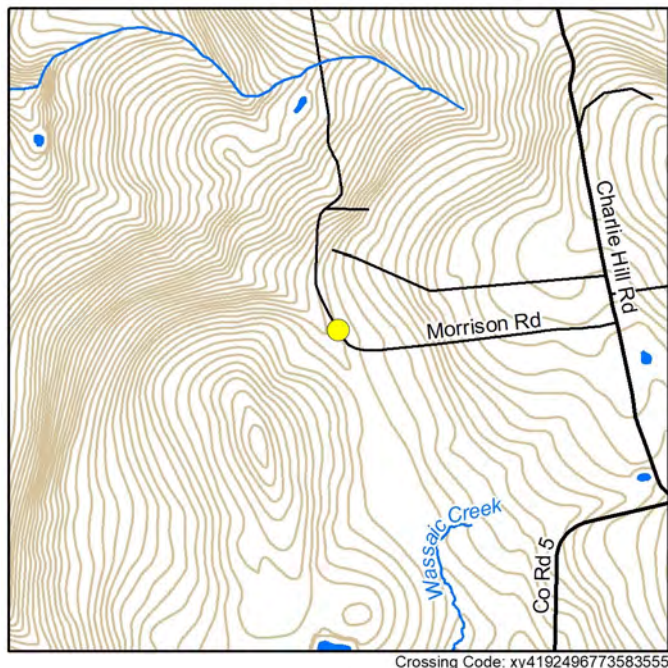
Drop to Stream Surface/Bottom: 3.8/4.0

Dimensions:

Width: 6.2, Height: 4.2

Substrate/Water Width: 3.40

Water Depth: 0.20



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.19

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.583561, 41.924640

Location Description: 50 feet up dirt road from metal gate on Morrison Road

Date Observed: 2019-07-31

Crossing Code: xy4192496773583555

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 20.0

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: Bankfull estimated due to no easy to determine upstream channel and mostly wetland.

Road**Road**

Road Type: Unpaved

Road Fill Height (feet): 4.7

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	59.54	7.46	1.99	No
5	61.93		2.14	No
10	63.38		2.23	No
25	65.06		2.34	No
50	66.21		2.42	No
100	67.28		2.49	No

Structure 1 of 1

Material: Plastic

Length (feet): 35.0

Dry Passage/Height: Yes (5)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.05

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Projecting

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 3.0, Height: 3.0

Substrate/Water Width: 0.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

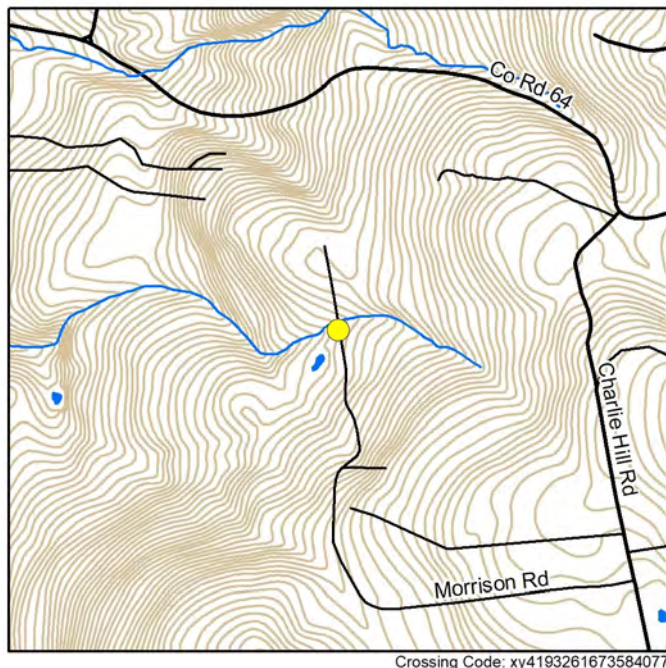
Drop to Stream Surface/Bottom: 1.0/1.0

Dimensions:

Width: 3.0, Height: 3.0

Substrate/Water Width: 0.00

Water Depth: 0.00



Results

Barrier Evaluation: Severe barrier

Aquatic Organism Passage Score: 0.00

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 6 (Ranked 27 of 103)

Location

Coordinates: -73.584172, 41.932815

Location Description: Next to 133 Morrison Road. Private Road

Date Observed: 2019-07-24

Crossing Code: xy4193261673584077

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 8.8

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: There is a large fence 15 feet upstream from the inlet with some debris blocking some flow of the stream.

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 9.2

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	75.16	11.75	2.01	No
5	78.13		2.06	No
10	79.93		2.09	No
25	82.02		2.13	No
50	83.46		2.16	No
100	84.8		2.18	No

Structure 1 of 1

Material: Concrete

Length (feet): 70.8

Dry Passage/Height: No

Outlet Armoring: Not Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.02

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Box Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 6.1, Height: 2.6

Substrate/Water Width: 5.7

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Box Culvert

Outlet Drop/Grade: Free Fall

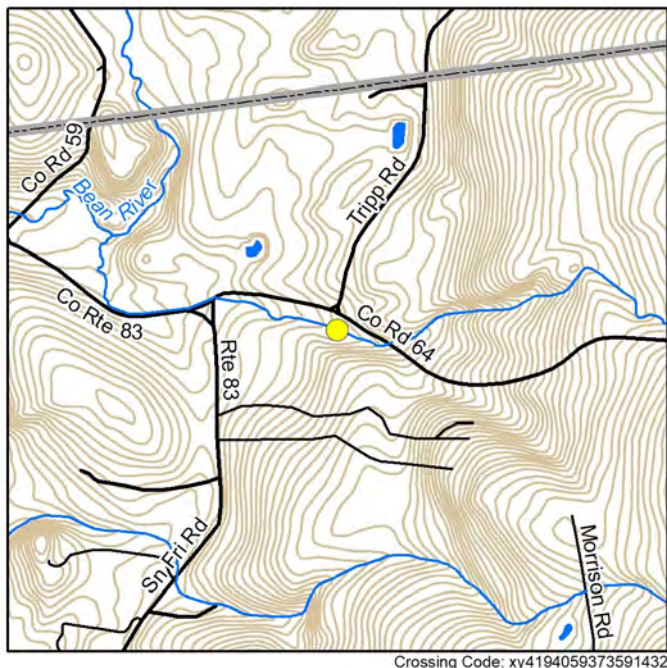
Drop to Stream Surface/Bottom: 3.0/3.1

Dimensions:

Width: 6.1, Height: 3.0

Substrate/Water Width: 4.10

Water Depth: 0.10



Results

Barrier Evaluation: Severe barrier
 Aquatic Organism Passage Score: 0.00
 Town Comments on Condition/Maintenance: No
 Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.591409, 41.940343
 Location Description: Quarter mile from
 McGhee Road uphill in woods. Has 1912 on
 headwall.
 Date Observed: 2019-07-08
 Crossing Code: xy4194059373591432

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge
 Number of structures/cells: 1
 Condition: Poor
 Constriction: Spans Only Bankfull/Active Channel
 Alignment: Skewed (>45°)
 Internal Features/Structures: None

Stream Characteristics

Scour Pool: None
 Bankfull Width (feet): 3.8
 Water Depth/Velocity Matches Stream: Dry/Dry
 Structure Substrate Type: Cobble
 Structure Substrate Matches Stream? Comparable



Upstream



Downstream

Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	73.03	N/A	N/A	N/A
5	76.46			
10	78.61			
25	81.16			
50	82.96			
100	84.67			

Structure 1 of 1

Material: Concrete

Length (feet): 53.0

Dry Passage/Height: Yes (4.8)

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Headwall and Wingwalls

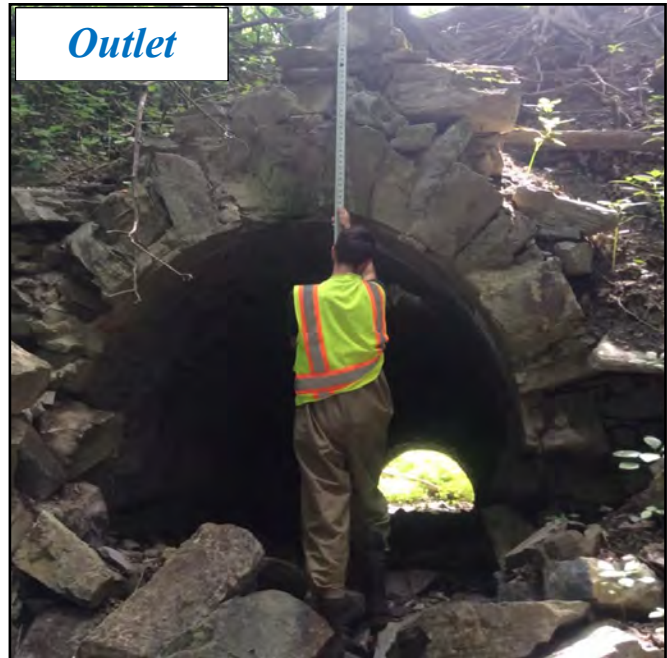
Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 7.8, Height: 4.8

Substrate/Water Width: 7.8

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: Free Fall Onto Cascade

Drop to Stream Surface/Bottom: 8.1/8.1

Dimensions:

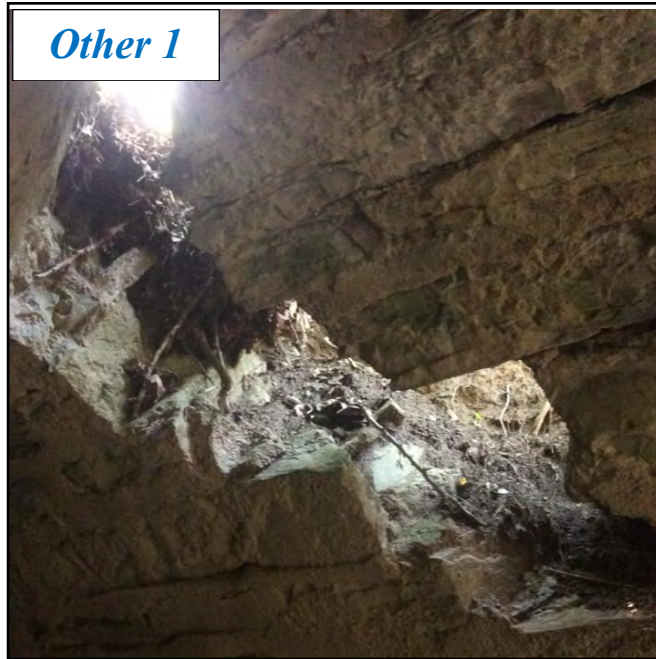
Width: 7.5, Height: 6.6

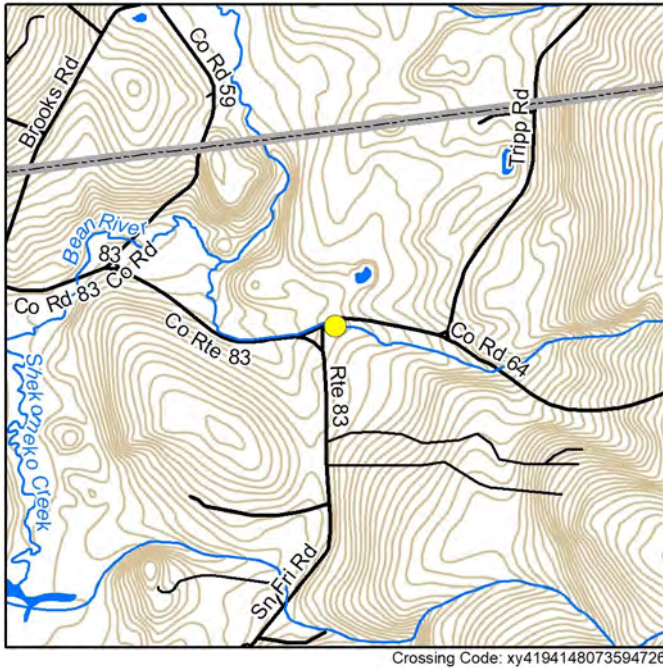
Substrate/Water Width: 7.50

Water Depth: 0.00

Additional Photo

Other 1





Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.97

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.594726, 41.941480

Location Description: Near intersection of McGhee Hill Road and Route 83, next to white house

Date Observed: 2019-07-08

Crossing Code: xy4194148073594726

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 8.4

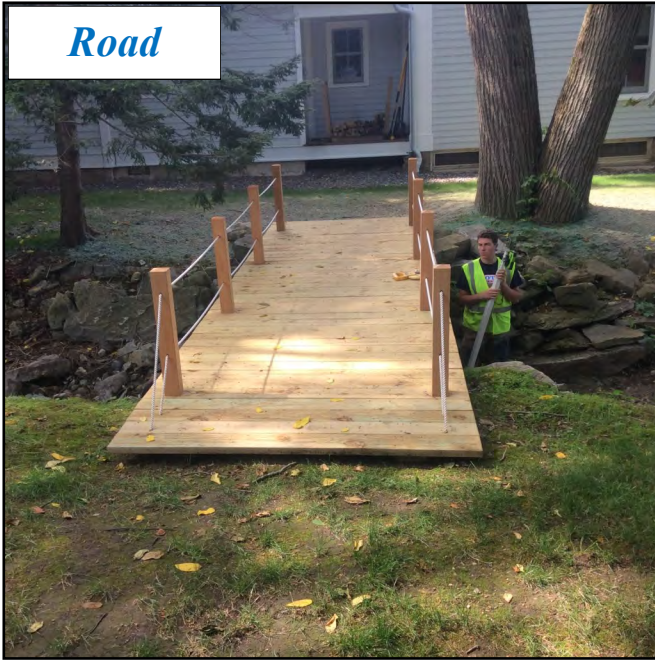
Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	73.32	N/A	N/A	N/A
5	76.61			
10	78.68			
25	81.14			
50	82.87			
100	84.52			

Structure 1 of 1

Material: Wood

Length (feet): 6.1

Dry Passage/Height: Yes (3.2)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Bridge with Side Slopes/None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 10.3, Height: 3.2

Substrate/Water Width: 5.0

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: At Stream Grade

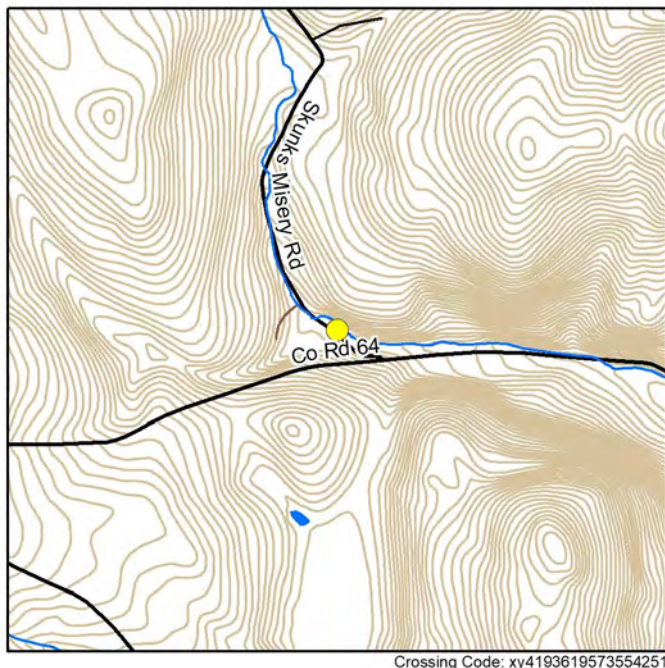
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 9.2, Height: 3.2

Substrate/Water Width: 5.00

Water Depth: 0.00



Results

Barrier Evaluation: Significant barrier

Aquatic Organism Passage Score: 0.33

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 8 (Ranked 46 of 103)

Location

Coordinates: -73.554169, 41.935989

Location Description: 24 Skunks Misery

Date Observed: 2019-07-02

Crossing Code: xy4193619573554251

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 9.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 2.2

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	108.53	8.16	2.77	No
5	124.45		3.24	No
10	134.96		3.59	No
25	147.9		4.05	No
50	157.26		4.41	No
100	166.43		4.79	No

Structure 1 of 1

Material: Metal

Length (feet): 32.0

Dry Passage/Height: No

Outlet Armoring: Extensive

Physical Barrier(s) (Severity): None

Slope (%): 0.05

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 5.7, Height: 6.0

Substrate/Water Width: 2.0

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.7/1.0

Dimensions:

Width: 5.9, Height: 6.1

Substrate/Water Width: 1.60

Water Depth: 0.20



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.69

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.555772, 41.937648

Location Description: 47 Skunks Misery Road

Date Observed: 2019-07-02

Crossing Code: xy4193695773555521

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 9.6

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road

Road Type: Driveway

Road Fill Height (feet): 3.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	63.82	6.98	2	No
5	71.04		2.42	No
10	75.3		2.68	No
25	80.13		3	No
50	83.38		3.22	No
100	86.38		3.43	No

Structure 1 of 1

Material: Metal
 Length (feet): 28.0
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): None
 Slope (%): 0.02
 Structure Comments: None

***Inlet*****Inlet**

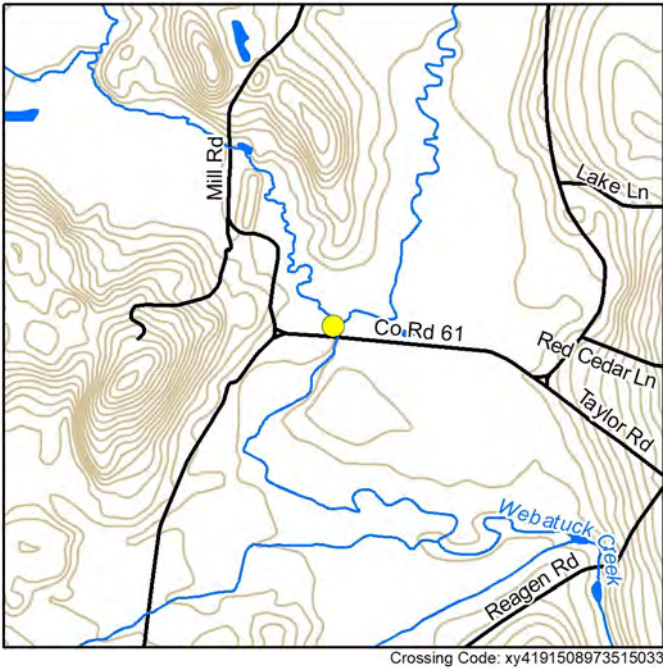
Inlet Shape/Type: Round Culvert/Projecting
 Inlet Drop/Grade: At Stream Grade
 Dimensions:

Width: 4.0, Height: 4.0
 Substrate/Water Width: 1.6
 Water Depth: 0.30

***Outlet*****Outlet**

Outlet Shape: Round Culvert
 Outlet Drop/Grade: At Stream Grade
 Drop to Stream Surface/Bottom: 0.0/0.0
 Dimensions:

Width: 4.0, Height: 4.2
 Substrate/Water Width: 2.50
 Water Depth: 0.60



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.97

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.515060, 41.915085

Location Description: In backyard of 173 Indian Lake Road

Date Observed: 2019-07-15

Crossing Code: xy4191508973515033

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 13.2

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	2084.25	N/A	N/A	N/A
5	2395			
10	2594.05			
25	2834.05			
50	3004.84			
100	3169.76			

Structure 1 of 1

Material: Wood

Length (feet): 5.5

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Bridge with Side Slopes/None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 20.3, Height: 3.6

Substrate/Water Width: 11.4

Water Depth: 0.60

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: At Stream Grade

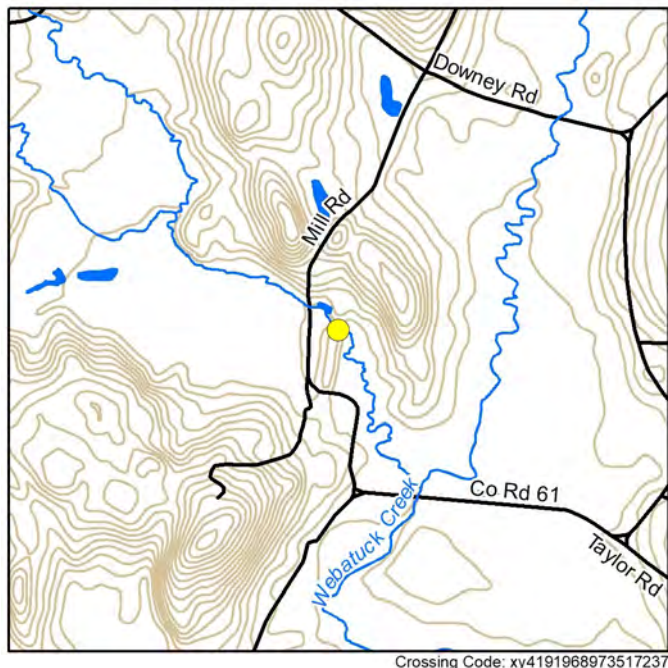
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 20.0, Height: 3.4

Substrate/Water Width: 12.10

Water Depth: 0.40



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.85

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.517225, 41.919735

Location Description: 2000 ft from intersection of Harlem Valley Rail Trail and Mill Road

Date Observed: 2019-07-30

Crossing Code: xy4191968973517237

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 50.0

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Silt

Structure Substrate Matches Stream? Comparable



Crossing Comments: Metal siding to stream in culvert falling off. Bankfull estimated due to dense wetlands on both sides.

Road**Road**

Road Type: Trail

Road Fill Height (feet): 16.4

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	568.53	24.1	3.65	No
5	649.02		4.75	No
10	701.72		5.55	No
25	766.29		6.61	No
50	812.7		7.44	No
100	858.08		8.29	No

Structure 1 of 1

Material: Rock/Stone

Length (feet): 52.9

Dry Passage/Height: Yes (5)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Pipe Arch/Elliptical Culvert/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 9.1, Height: 7.3

Substrate/Water Width: 3.8

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Pipe Arch/Elliptical Culvert

Outlet Drop/Grade: At Stream Grade

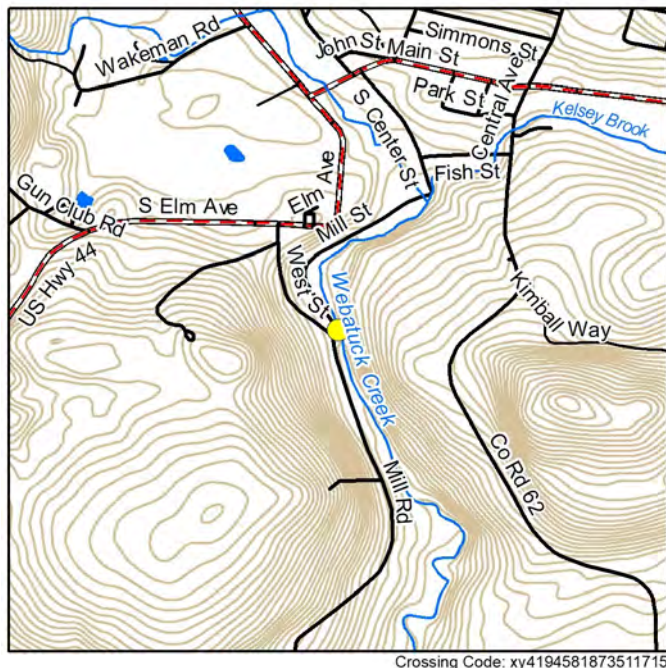
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 9.2, Height: 7.5

Substrate/Water Width: 4.10

Water Depth: 0.40



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.95

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.511795, 41.945958

Location Description: Plaque on bridge says "Mill Road Bridge". 50 feet from 27 West Street mailbox.

Date Observed: 2019-07-30

Crossing Code: xy4194581873511715

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Skewed (>45°)

Internal Features/Structures: None

Stream Characteristics

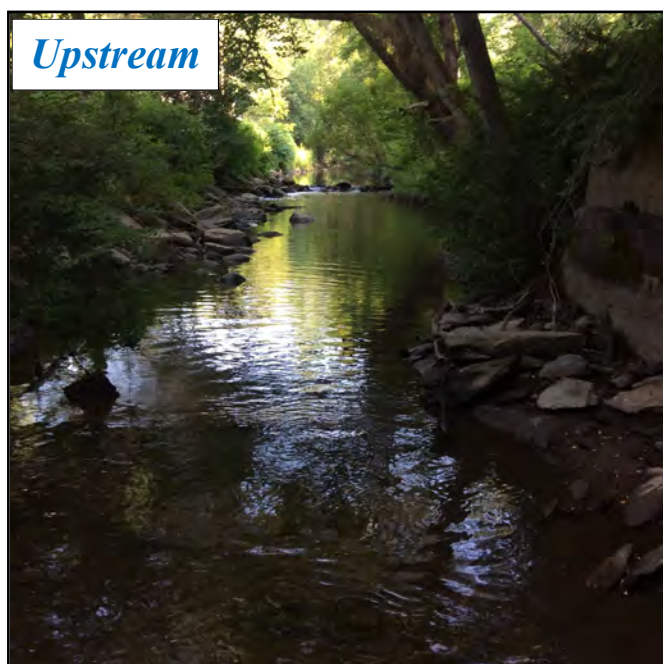
Scour Pool: None

Bankfull Width (feet): 22.3

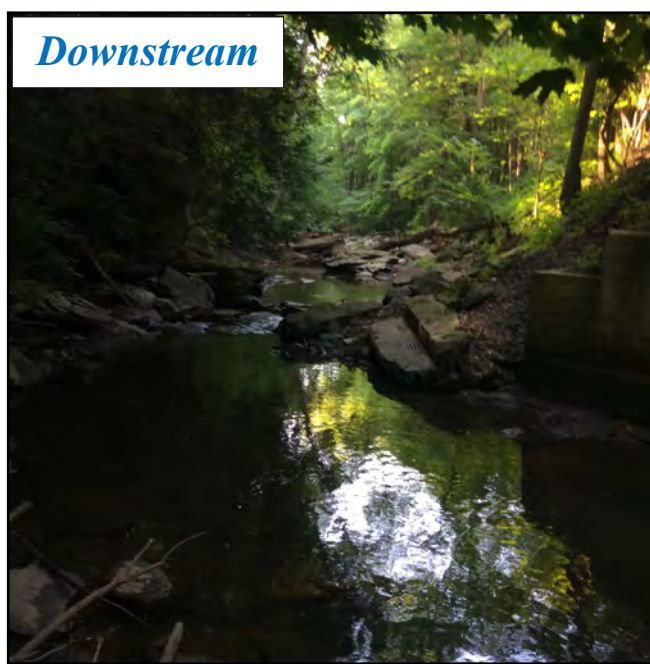
Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Cobble

Structure Substrate Matches Stream? Comparable



Upstream



Downstream

Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	1352.79	N/A	N/A	N/A
5	1557.24			
10	1688.12			
25	1845.87			
50	1958.11			
100	2066.43			

Structure 1 of 1

Material: Combination

Length (feet): 7.4

Dry Passage/Height: Yes (9.9)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 31.5, Height: 12.8

Substrate/Water Width: 0.5

Water Depth: 0.50

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

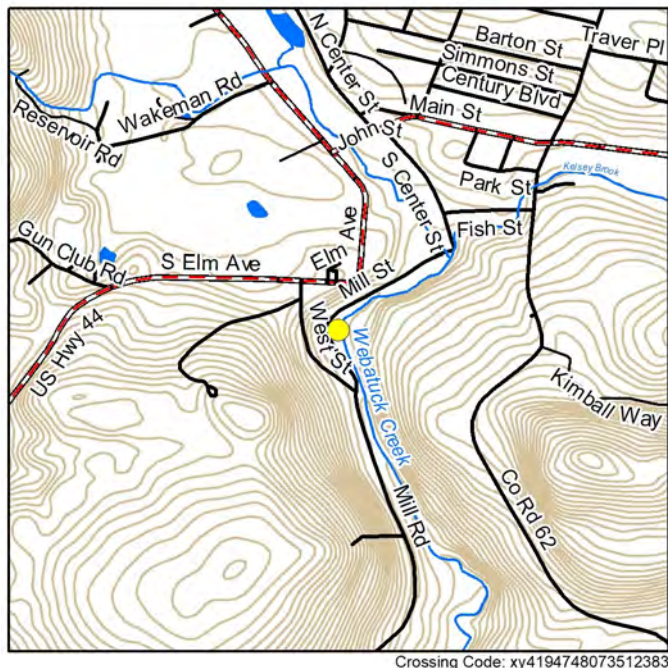
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 31.6, Height: 12.9

Substrate/Water Width: 14.00

Water Depth: 1.20



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.74

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.512383, 41.947480

Location Description: Behind red house on Mill Road

Date Observed: 2019-07-09

Crossing Code: xy4194748073512383

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 31.7

Water Depth/Velocity Matches Stream: No-Deeper/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Comparable



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	1349.71	N/A	N/A	N/A
5	1553.83			
10	1684.46			
25	1841.87			
50	1953.86			
100	2061.92			

Structure 1 of 1

Material: Wood

Length (feet): 5.7

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): Debris/Sediment/
Rock (Severe)

Slope (%):

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Bridge with Side Slopes/None

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 6.6, Height: 1.2

Substrate/Water Width: 6.6

Water Depth: 0.40

Outlet**Outlet**

Outlet Shape: Bridge with Side Slopes

Outlet Drop/Grade: At Stream Grade

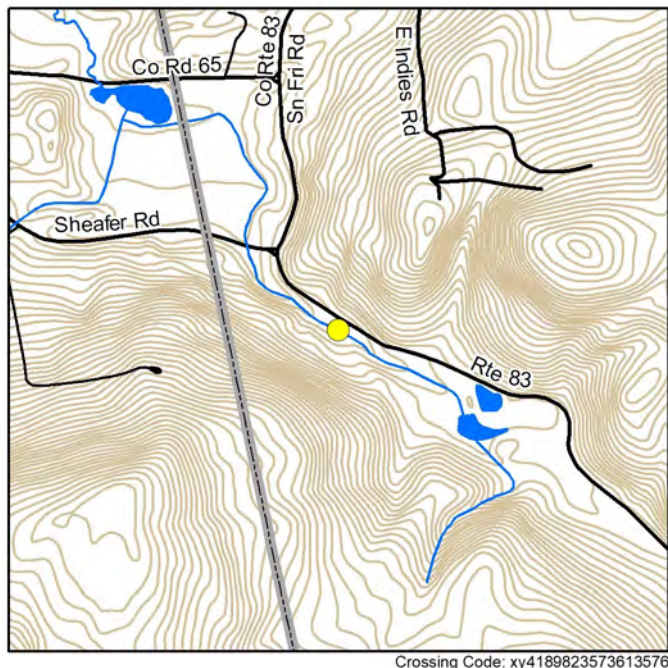
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 24.3, Height: 3.5

Substrate/Water Width: 24.30

Water Depth: 2.00



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.61

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.613354, 41.898281

Location Description: 895 Smithfield Valley Road

Date Observed: 2019-07-03

Crossing Code: xy4189823573613576

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 9.1

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Contrasting



Crossing Comments: Does not appear to be any rocks or fill ,arterial between pipes. Put sticks to prevent water flow underneath and in between the pipes.

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 3.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	52.33	6.73	1.02	No
5	57.18		1.22	No
10	60.29		1.35	No
25	64.06		1.52	No
50	66.74		1.64	No
100	69.32		1.77	No

Structure 1 of 2

Material: Metal

Length (feet): 20.6

Dry Passage/Height: No

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0.01

Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 3.8

Substrate/Water Width: 2.6

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

Drop to Stream Surface/Bottom: 0.4/0.8

Dimensions:

Width: 4.0, Height: 4.1

Substrate/Water Width: 1.50

Water Depth: 0.20

Structure 2 of 2

Material: Metal
Length (feet): 20.8
Dry Passage/Height (feet): No

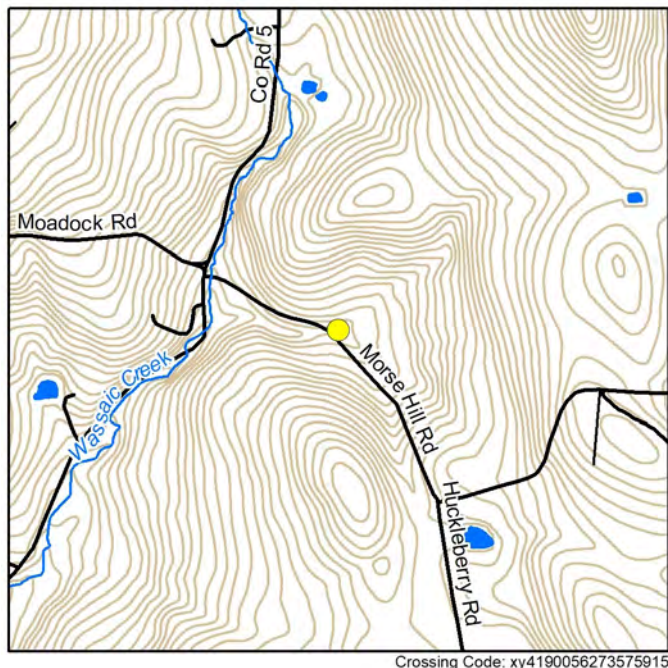
Physical Barrier(s)/Severity: None
Slope (%): 0.01
Structure Comments: No data

Inlet

Inlet Shape/Type: Round Culvert/Headwall
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 4.0, Height: 4.0
 Substrate/Water Width: 2.5
 Water Depth: 0.20

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: Free Fall
Drop to Stream Surface/Bottom (feet): 0.4/0.6
Dimensions (feet):
 Width: 4.1, Height: 4.0
 Substrate/Water Width: 1.2
 Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.77

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.575896, 41.900452

Location Description: At beginning of driveway of 43 Morse Hill Road

Date Observed: 2019-08-01

Crossing Code: xy4190056273575915

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Small

Bankfull Width (feet): 5.0

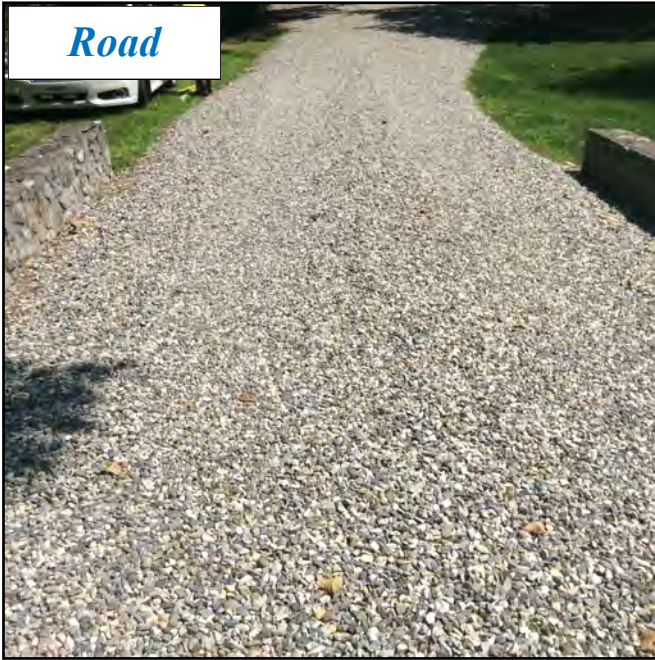
Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 1.5

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	50.75	4.49	0.89	No
5	60.86		1.18	No
10	67.36		1.4	No
25	75.23		1.67	No
50	80.85		1.89	No
100	86.26		2.1	No

Structure 1 of 1

Material: Plastic
 Length (feet): 20.0
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): None
 Slope (%): 0.05
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Wingwalls
 Inlet Drop/Grade: At Stream Grade
 Dimensions:

Width: 3.0, Height: 3.0

Substrate/Water Width: 1.0

Water Depth: 0.10

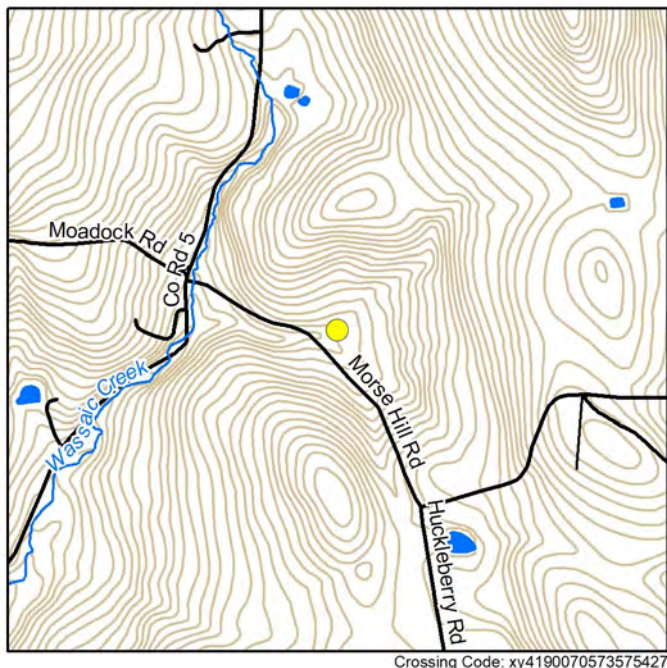
Outlet**Outlet**

Outlet Shape: Round Culvert
 Outlet Drop/Grade: Free Fall
 Drop to Stream Surface/Bottom: 0.1/0.5
 Dimensions:

Width: 3.1, Height: 2.9

Substrate/Water Width: 0.60

Water Depth: 0.10



Results

Barrier Evaluation: Minor barrier

Aquatic Organism Passage Score: 0.64

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.575427, 41.900705

Location Description: On driveway of 43 Morse Hill Road

Date Observed: 2019-08-01

Crossing Code: xy4190070573575427

Stream and Crossing

Crossing Characteristics

Crossing Type: Multiple Culvert

Number of structures/cells: 2

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: Large

Bankfull Width (feet): 10.6

Water Depth/Velocity Matches Stream: Yes/Yes

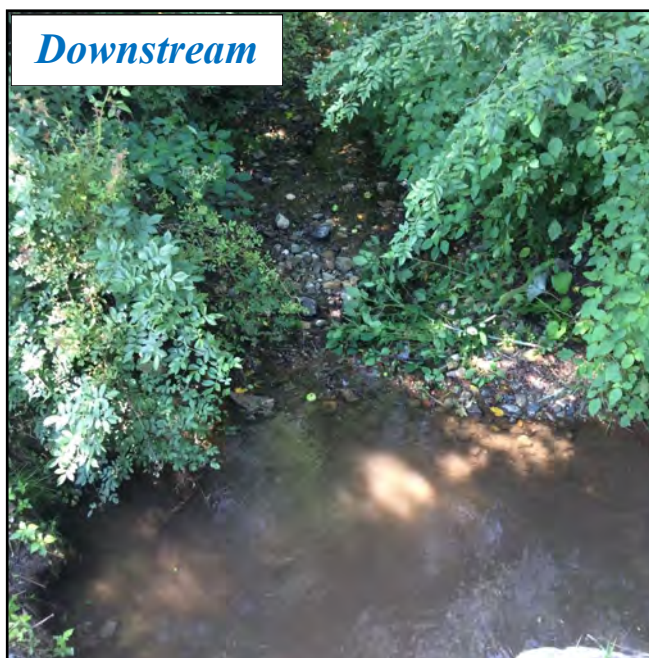
Structure Substrate Type: None

Structure Substrate Matches Stream? None

Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 0.6

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	12.86	2.76	0.82	No
5	14.94		1.07	No
10	16.3		1.24	No
25	17.96		1.48	No
50	19.15		1.67	No
100	20.32		1.86	No

Structure 1 of 2

Material: Plastic
 Length (feet): 20.0
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): None
 Slope (%): 0.09
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 2.1, Height: 2.0

Substrate/Water Width: 0.9

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 2.4, Height: 2.0

Substrate/Water Width: 2.00

Water Depth: 0.50

Structure 2 of 2

Material: Plastic
Length (feet): 19.5
Dry Passage/Height (feet): No

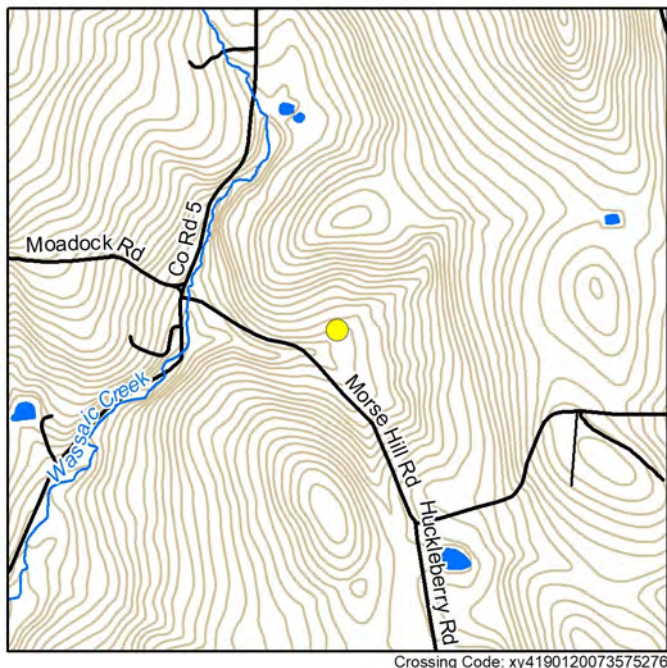
Physical Barrier(s)/Severity: None
Slope (%): 0.1
Structure Comments: Water depth did not even reach 0.1 feet, so we recorded as 0.

Inlet

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls
Inlet Drop/Grade: At Stream Grade
Dimensions (feet):
 Width: 2.1, Height: 2.1
 Substrate/Water Width: 0.5
 Water Depth: 0.00

Outlet

Outlet Shape: Round Culvert
Outlet Drop/Grade: At Stream Grade
Drop to Stream Surface/Bottom (feet): 0.0/0.0
Dimensions (feet):
 Width: 2.3, Height: 2.2
 Substrate/Water Width: 0.3
 Water Depth: 0.00



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.50

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.575276, 41.901200

Location Description: Driveway of 43 Morse Hill Road

Date Observed: 2019-08-01

Crossing Code: xy4190120073575276

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Moderate

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None

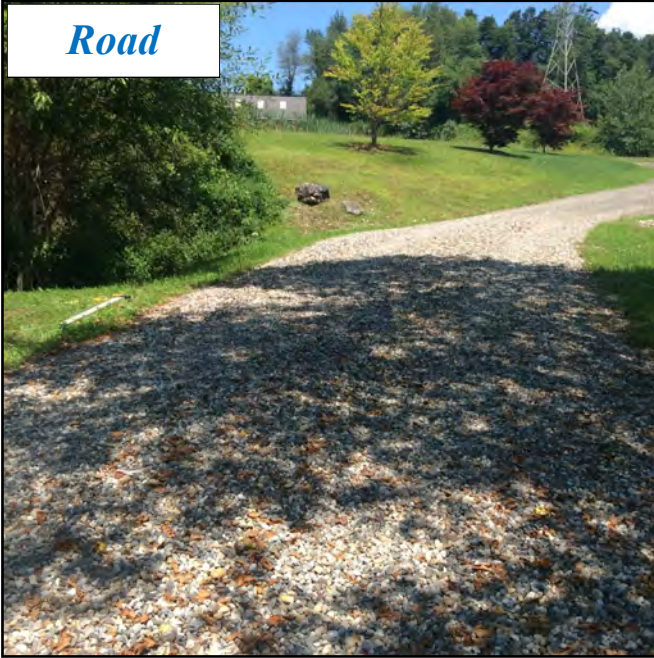
Upstream



Downstream



Crossing Comments: None

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 1.1

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	12.28	4.88	0.35	No
5	14.25		0.4	No
10	15.53		0.43	No
25	17.11		0.48	No
50	18.24		0.51	No
100	19.35		0.55	No

Structure 1 of 1

Material: Plastic
 Length (feet): 40.0
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): None
 Slope (%): 0.05
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 4.0, Height: 3.8

Substrate/Water Width: 1.1

Water Depth: 0.10

Outlet**Outlet**

Outlet Shape: Round Culvert

Outlet Drop/Grade: Free Fall

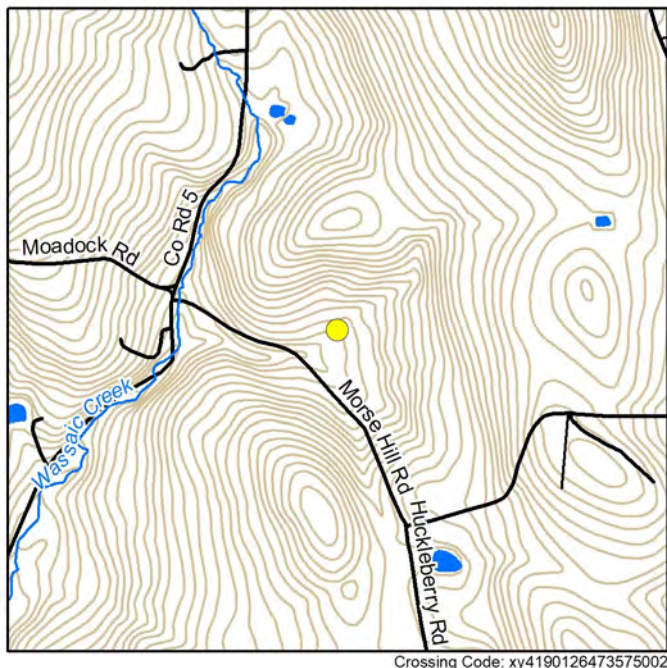
Drop to Stream Surface/Bottom: 0.5/0.7

Dimensions:

Width: 4.1, Height: 3.9

Substrate/Water Width: 0.70

Water Depth: 0.10



Results

Barrier Evaluation: Moderate barrier

Aquatic Organism Passage Score: 0.51

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Tier 11 (Ranked 73 of 103)

Location

Coordinates: -73.575002, 41.901264

Location Description: Culvert is on 43 Morse Hill Road

Date Observed: 2019-08-01

Crossing Code: xy4190126473575002

Stream and Crossing

Crossing Characteristics

Crossing Type: Culvert

Number of structures/cells: 1

Condition: OK

Constriction: Severe

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

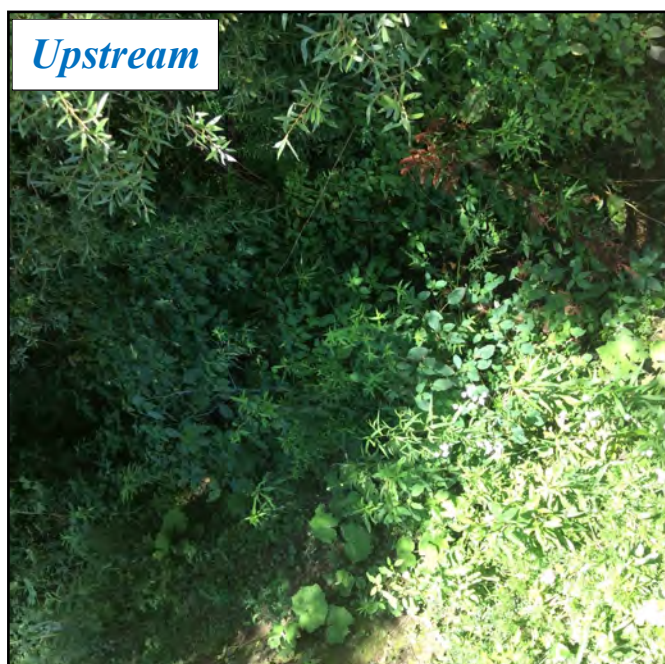
Scour Pool: Large

Bankfull Width (feet): 5.3

Water Depth/Velocity Matches Stream: No-Shallower/Yes

Structure Substrate Type: None

Structure Substrate Matches Stream? None



Crossing Comments: None

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 3.1

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	12.28	5.84	0.39	No
5	14.25		0.49	No
10	15.53		0.56	No
25	17.11		0.65	No
50	18.24		0.73	No
100	19.35		0.81	No

Structure 1 of 1

Material: Plastic
 Length (feet): 33.0
 Dry Passage/Height: No
 Outlet Armoring: None

Physical Barrier(s) (Severity): None
 Slope (%): 0.04
 Structure Comments: None

Inlet**Inlet**

Inlet Shape/Type: Round Culvert/Headwall
 Inlet Drop/Grade: At Stream Grade
 Dimensions:

Width: 3.2, Height: 2.7

Substrate/Water Width: 0.9

Water Depth: 0.10

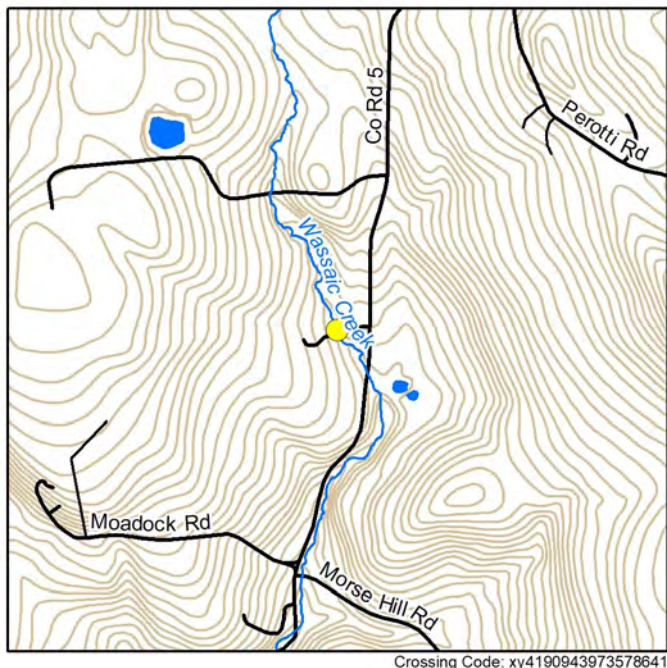
Outlet**Outlet**

Outlet Shape: Round Culvert
 Outlet Drop/Grade: Free Fall
 Drop to Stream Surface/Bottom: 0.4/0.8
 Dimensions:

Width: 3.1, Height: 2.9

Substrate/Water Width: 0.80

Water Depth: 0.10



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.98

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.578651, 41.909411

Location Description: Honour Farm on Route 5 next to large white barn and silos

Date Observed: 2019-07-24

Crossing Code: xy4190943973578641

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 5.3

Water Depth/Velocity Matches Stream: Yes/Yes

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Comparable

Upstream



Downstream



Crossing Comments: Raccoon prints found inside structure.

Road**Road**

Road Type: Driveway

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	67.66	N/A	N/A	
5	81.14		N/A	
10	89.79		N/A	
25	100.25		N/A	
50	107.7		N/A	
100	114.87		N/A	

Structure 1 of 1

Material: Combination

Length (feet): 30.7

Dry Passage/Height: Yes (4.2)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 10.5, Height: 4.8

Substrate/Water Width: 2.7

Water Depth: 0.20

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

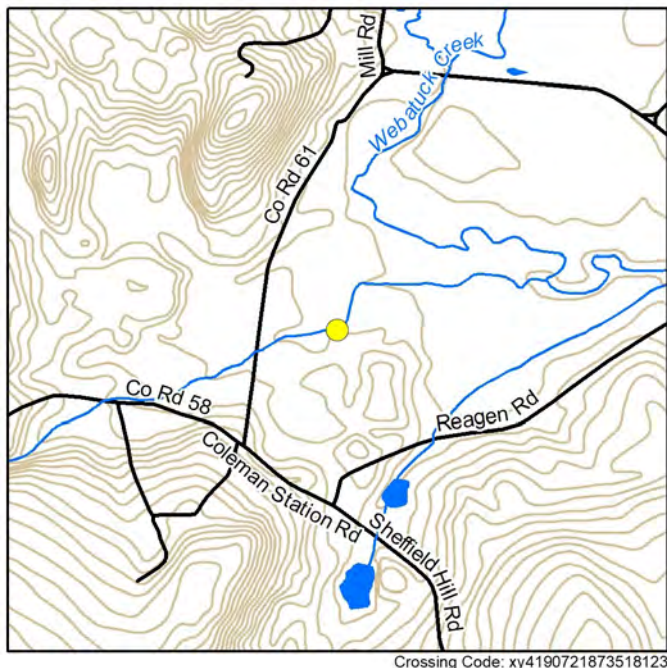
Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 7.5, Height: 4.6

Substrate/Water Width: 4.60

Water Depth: 0.50



Results

Barrier Evaluation: Insignificant barrier

Aquatic Organism Passage Score: 0.97

Town Comments on Condition/Maintenance: No Comment

Overall Ranking: Not Ranked

Location

Coordinates: -73.518185, 41.907351

Location Description: Harlem Valley Rail Trail half mile up from intersection with Coleman station Road heading north. Wooden fence shows where it is.

Date Observed: 2019-07-30

Crossing Code: xy4190721873518123

Stream and Crossing

Crossing Characteristics

Crossing Type: Bridge

Number of structures/cells: 1

Condition: OK

Constriction: Spans Only Bankfull/Active Channel

Alignment: Flow-Aligned

Internal Features/Structures: None

Stream Characteristics

Scour Pool: None

Bankfull Width (feet): 8.3

Water Depth/Velocity Matches Stream: Dry/Dry

Structure Substrate Type: Sand

Structure Substrate Matches Stream? Contrasting



Crossing Comments: None

Road**Road**

Road Type: Trail

Road Fill Height (feet): 0.0

Road Ownership: Private

Return Interval (Years)	Peak Flow (cfs)	Road Height (feet)	Stage Height (feet)	Overtop
2	406.58	N/A	N/A	
5	475.7		N/A	
10	519.87		N/A	
25	573.09		N/A	
50	610.95		N/A	
100	647.36		N/A	

Structure 1 of 1

Material: Concrete

Length (feet): 20.8

Dry Passage/Height: Yes (5.5)

Outlet Armoring: None

Physical Barrier(s) (Severity): None

Slope (%): 0

Structure Comments: None

Inlet**Inlet**Inlet Shape/Type: Box/Bridge with Abutments/
Headwall and Wingwalls

Inlet Drop/Grade: At Stream Grade

Dimensions:

Width: 8.9, Height: 5.6

Substrate/Water Width: 8.9

Water Depth: 0.00

Outlet**Outlet**

Outlet Shape: Box/Bridge with Abutments

Outlet Drop/Grade: At Stream Grade

Drop to Stream Surface/Bottom: 0.0/0.0

Dimensions:

Width: 9.1, Height: 5.6

Substrate/Water Width: 9.10

Water Depth: 0.00