

LAKE CARMİ PRIVATE ROADS EROSION INVENTORY REPORT 2019



Franklin Watershed Committee

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1. INTRODUCTION

Lake Carmi was officially designated a Lake in Crisis in March 2018 and a Crisis Response Plan was administered in August 2018. Under the Lake Carmi Crisis Response Plan, there is an extensive list detailing “Critical Path Projects” planned for the 2019 fiscal year in the context of ongoing work by partners across the watershed, fulfilling the requirements of the Lake in Crisis Act for Lake Carmi. Critical Path Projects are high priority actions planned this year across multiple sectors: agriculture, groundwater, natural resources, roads, and the lake.

Within the Crisis Response Plan Critical Path Projects, there are only two listed roads projects, and these projects are both town roads and therefore fall under the Municipal Roads General Permit (MRGP). Under the Municipal Roads General Permit, the only roads that are within jurisdiction are municipal roads. The Municipal Roads General Permit is primarily intended to achieve significant reductions in stormwater-related erosion from municipal roads, both paved and unpaved. Municipalities will implement a customized, multi-year plan to stabilize their road drainage system. The plan will include bringing road drainage systems up to basic maintenance standards, and additional corrective measures to reduce erosion as necessary to meet a TMDL or other water quality restoration effort. However, the MRGP does have its shortcomings as it does not address private roads, which make up the majority of the Lake Carmi shoreline, and therefore have the highest impact on water quality within the Lake.

In Vermont, there is a total of 18,818 road miles. Of these, 155 miles (1%) are federal roads, 2,709 miles (14%) are state highways, 2,823 miles (15%) are private roads, and 13,131 miles (70%) are town highway. Private roads may only make up 15% of the roads in Vermont, but to put the Lake Carmi watershed into perspective, Lake Carmi has 3,700 feet of road (approx. 0.7 miles of road) within 50 meters (approx. 165 ft.) of the shore, and the majority of these roads are private roads. Private roads do not fall under the MRGP and must be privately maintained.

In 2011, the following bill passed in terms of private road maintenance:

In the absence of an express agreement or requirement governing maintenance of a private road, when more than one person enjoys a common benefit from a private road, each person shall contribute ratably to the cost of maintaining the private road, and shall have the right to bring a civil action to enforce the requirement of this section.

Despite the fact this bill was passed over eight years ago, there is only one known road association within the Lake Carmi watershed. Private roads must be accounted for in their direct phosphorus loading into the Lake. Private landowners must take ownership over their own roads and the phosphorus loading these roads contribute to the lake. For this reason, it is our obligation to inventory and troubleshoot the segments of private roads that seem to be causing the most prevalent issues, as well as reach out to homeowners, and other organizations for technical and financial assistance, such as the Vermont Youth Conservation Corps, the Vermont Department of Environmental Conservation, and the Vermont Department of Transportation.

In addition to being addressed in the Crisis Response Plan, the 2008 TMDL Action Plan details the importance of private roads erosion inventorying and ongoing maintenance. In the 2008 TMDL Action Plan, Action Item #14: Town Road Erosion Inventory (Priority: High), Action

Item #15: Outreach on Private Road and Driveway Erosion Prevention (Priority: Medium), and Action Item #16: Review Town Road Maintenance Practices (Priority: Medium) are all listed as important projects to be completed by the Franklin Watershed Committee. In the 2018 TMDL Action Plan, these three items were again listed as Ongoing Action Items to be completed by the Franklin Watershed Committee.

For the many reasons listed above, the Franklin Watershed Committee decided to take on the private roads erosion inventorying project mentioned in the Crisis Response Plan and the TMDL Action Plan, in hopes of providing more information and a holistic view of the watershed in terms of the private roads within the watershed and their direct inputs into the various tributaries running directly into the lake.

2. BACKGROUND INFORMATION

The first part of this project was inventorying any and all available information or work done prior to inventorying the current state of the private roads. In this background information reconnaissance, the following three reports were found, reviewed, and summarized below.

2.1 FINDINGS FROM 2013 PRIVATE ROADS INVENTORY

In 2013, there was a Private Roads Inventory completed by KAS, Inc. The following information details the findings of this report.

KAS, Inc. completed a review and cursory assessment of private roads in the area of Lake Carmi in Franklin, Vermont that have been identified as problematic by property owners in the area.

In October 2013, walk-through inspections were completed by KAS at four roads that were identified for this project: Hammond Shore Road/Harrison Drive, Shore Road, Vic's Crossing, and Patton Shore Road.

- **Hammond Shore Road/Harrison Drive (10/22/13)**
 - Hammond Shore Road is a dead-end road that extends approximately $\frac{3}{4}$ mile from the intersection of Dewing Road. Harrison Drive is a short-looped road that intersects Hammond Shore Road and provides access to 3-4 properties on Lake Carmi. Both roads are relatively flat with almost no change in elevation along their profile.
- **Shore Road/Vic's Crossing (10/22/13)**
 - Shore Road and Vic's Crossing each intersect Lake Road (Rte. 120) and run along lakeshore properties. Both are dead-end roads. The end of each road is in close proximity to one another but they do not connect. Both are narrow.
- **Patton Shore Road (10/22/13)**
 - Patton Shore Road runs south from Lake Road for about $\frac{3}{4}$ mile along lakeshore properties.

2.2 FINDINGS FROM 2015 PRIVATE ROADS DRAINAGE STRUCTURE INVENTORY

In 2015, there was a Private Roads Drainage Structure Inventory completed. The following information details the findings of this report.

The purpose of this Road Drainage Structure Inventory and Estimated Cost of Improvements is to identify potential and current drainage and erosion problems, on private and town highways on the northern portion of Lake Carmi in the Town of Franklin. It is also a tool to create priority and budget estimates to assist with developing a long-range plan to correct drainage deficiencies that will improve the water quality of the Lake.

Most problems are reoccurring that involve erosion of ditches, swales, roadway edges and on water courses leading to the Lake. Most absences of resolutions have been restricted or delayed due to lack of funding and perhaps knowledge on how to prevent or improve some of the problems.

Correcting erosion and sediment problem areas on camp roads and town highways are twofold:

1. As an outcome of properly constructing and maintaining roadways and their drainage systems, Lake Carmi can expect to obtain long term benefits from limited reoccurring maintenance and storm damage.
2. By applying values set forth in the "Vermont Better Backroads Manual" and other recommended principles, water runoff quality can be very much improved to provide a positive impact on surrounding streams, rivers, and lakes.

The following roads were reviewed: Patton Shore Rd., Rd. to Camp #2496, Vic's Crossing, Shore Rd., King's Ct., Camp Rd. VT Rte. 120 Bridge #6, Dewing Shore Rd., and Hammond Shore Rd.

2.3 FINDINGS FROM 2017 PRIVATE ROADS DRAINAGE STRUCTURE INVENTORY

In 2017, there was a private roads drainage structure inventory completed by Smith Technical Services.

This inventory of roadway drainage and structures includes the western shore of Lake Carmi, and compliments a previous similar inventory of the northern and eastern sides of the Lake.

This inventory covers the following private roads: Westcott Shore Rd., Mullen Shore Rd., Patterson Point Rd., Tanner Junction Rd., Sandy Bay Rd., Black Woods Rd., Titemore Woods Rd., Ledge Drive, Hill Rd., and Scottish Lane. Roads with no visible drainage structures include Tanner Junction Rd., Ledge Drive, Hill Rd., and Scottish Lane.

Smith Technical Services completed a private roads drainage structure inventory, which covered the following private roads: Westcott Shore Road, Patterson Point Road, Tanner Junction Road, and Mullen Shore Road.

While reviewing the above listed roads, the consultant came up with a few general observations that may be impacting the water quality of Lake Carmi. Most, but not all of the roads were found to have characteristics as follows:

- Roadway ditches are inadequately maintained.
- Roadway surfaces are not crowned to allow for sheeting water into ditches.
- Culverts are not installed deep enough to allow for efficient drainage.
- Some culverts are undersized (in diameter and in length).

- Wheel tracks are trapping water, allowing for erosion.
- Lack of gravel for the traveling surface.

2.4 METHODS FOR 2019 PRIVATE ROADS EROSION INVENTORY

In 2019, the Franklin Watershed Committee (FWC) was awarded a Lake Champlain Basin Program Organizational Support Grant for which they used to complete a private roads erosion inventory assessment and report.

For this report, the FWC ECO AmeriCorps member completed the private roads erosion inventory. The following tasks were completed:

- Complete Quality Assurance Project Plan (QAPP) for Lake Champlain Basin Program (LCBP) Organizational Support Grant
- Gather all previous reporting on private roads available and concisely summarize findings
- Create a private roads erosion inventory datasheet template for data collection
- Collect data and observations from 30 private & town roads within the Lake Carmi watershed
- Gather all data on private roads and concisely summarize findings
- Recommend possible treatments for private roads erosion issues

Here is a list of the private roads that were inventoried for this project, broken down into four main road segments.

- Hammond Shore Road, Harrison Drive, Jenne Drive, Hemlock Lane, Cedar Lane, Lavelle Lane
- Dewing Road, Camp Road, Kings Court, Shore Road, Perry Landing Road, Vic's Crossing, Lake Road, Gallup Road, Middle Road
- Patton Shore Road, Forsyth Drive, Scottish Lane, Ledge Drive, Titemore Woods Road
- Sandy Bay Road, Black Woods, Patton West, Riley Road, Mullen Shore Road, Westcott Shore Road, Tanner Junction Road

3. INVENTORY/IMPLEMENTATION ROTATION TIMELINES

Every two years since 2013, there has been a private roads erosion inventory of some manner carried out in the Lake Carmi watershed.

Ideally, if this schedule is maintained, there could be one year of inventorying followed by one year of implementation, etc., furthering the water quality goals of Lake Carmi in regards to private roads best management practices.

The maintenance of private roads is crucial to the water quality of Lake Carmi, and a long-term commitment to the maintenance of the private roads is instrumental in seeing the long-term impacts to water quality in the watershed.

3.1 CURRENT 2010-2019 TIMELINE

- 2010-2012 Unknown
- 2013 Private Roads Inventory, KAS, Inc.
- 2014 Private Roads Project Implementation
- 2015 Private Roads Drainage Structure Inventory, Smith Technical Services
- 2016 Private Roads Project Implementation
- 2017 Private Roads Drainage Structure Inventory, Smith Technical Services
- 2018 Private Roads Project Implementation
- 2019 Private Roads Erosion Inventory, Franklin Watershed Committee

3.2 PROPOSED 2020-2029 TIMELINE

- 2020 Private Roads Project Implementation, Vermont Youth Conservation Corps
- 2021 Private Roads Inventory
- 2022 Private Roads Project Implementation
- 2023 Private Roads Drainage Structure Inventory
- 2024 Private Roads Project Implementation
- 2025 Private Roads Drainage Structure Inventory
- 2026 Private Roads Project Implementation
- 2027 Private Roads Inventory
- 2028 Private Roads Project Implementation
- 2029 Private Roads Drainage Structure Inventory

4. BEST MANAGEMENT PRACTICES

Unpaved roads, by nature of their topography and design, can, if not properly managed, contribute heavily to water quality problems. Erosion from unpaved roads and road related projects could contribute to polluted runoff, or nonpoint source pollution. This nonpoint source pollution is a major contributor to water quality problems throughout Vermont. Using structural BMPs and inexpensive routine and preventative maintenance practices can improve overall water quality while potentially reducing the cost of maintaining unpaved roads.

4.1 NONSTRUCTURAL BMP'S

The use of nonstructural approaches should precede the use of structural approaches for unpaved road management. Nonstructural BMP's are generally less expensive than structural practices. Nonstructural BMP's that minimize the creation of new runoff, limit erosion, and protect the health of water resources are highlighted below.

4.1.1. PROJECT DEVELOPMENT AND PLANNING

Proper project development and planning is critical to managing unpaved roadways and nonpoint source pollution. It can decrease existing runoff, eliminate unnecessary increases in runoff, and reduce erosion and sedimentation problems. In addition, a well thought out site design will minimize the amount of material, construction, and maintenance costs of structural BMP's.



4.1.2. MAINTENANCE OF BEST MANAGEMENT PRACTICES

BMP's must be maintained in order to function properly. BMP's are often constructed without plans or obligations for long-term maintenance. The maintenance requirements for unpaved roadway BMP structures must be considered during the selection process. For this reason, BMP's should be designed to minimize maintenance needs, wherever possible, and should take into consideration available personnel, equipment, and financial resources needed for proper maintenance.

One of the tactics that the Franklin Watershed Committee has locally implemented in the past is the launch of the "Road Captains" campaign in 2018.

This campaign sought to select a few point people to represent each one of the main private road sections (Hammond Shore Road, Dewing Road, Patton Shore Road and Sandy Bay Road). Below is the advertisement for the campaign launch.

<https://www.franklinwatershed.org/ask-a-scientist/archives/05-2018>

Originally published in the June 2018 LCCA Newsletter.

To reach our water quality goals, we need to reduce the erosion throughout the entire watershed. Roads are one of the highest contributors of phosphorus per area by land use type. Erosion from town and state roads is being addressed through the General and Municipal Roads Permits and is being largely funded by grants and local or state funds. But our private roads need work and, to make that happen, we all need to work together.



These upgrades would greatly reduce erosion, improve the driving conditions and reduce the future maintenance costs of keeping up the road. Grants that can be applied to private land are not always available, but at times we may be eligible to apply for grants that may cover as much as 50% of the costs. The Franklin Watershed Committee would apply for the grant, manage the grant and oversee the construction process, but we need your help and collaboration to make that happen. Would you be willing to become a Road Captain?

Road Captains will be the point of communication for each private road around the lake. Grant applications usually require documents such as letters of consent from landowners (and/or leasers) and pledges of cost sharing. Citizen involvement for these grants will involve organization on the citizen level for gathering these requirements and communicating with neighbors on their road. Are you the kind of person who loves to chat

with everyone on your roads and knows all about who is visiting when? Volunteer to be a road captain! Doesn't sound like something you'd be up for? Please register with us so that we can give the best contact info to your Road Captain and you can still do your part for your community. We hope for everyone to register with us.

Each road has already been inventoried and plans for the necessary improvements have been drawn up. With a little citizen powered organization we can help fund part of this work and make this water quality improving changes happen so that our children and grandchildren have cleaner water.



4.1.3. MAINTAIN NATURAL BUFFERS & DRAINAGEWAYS

Road runoff generally takes the path of least resistance.

If these drainageways are stable and well vegetated, they should be preserved.

The natural buffer located between the road and waterbody or wetland will help infiltrate runoff, reduce the velocity of runoff, and help remove some of the sediments in the runoff.

If these drainageways are unstable and lacking of vegetation, they made need to be reconstructed and seeded

Slow it, Spread It, Sink It!

4.1.4. MINIMIZE THE CREATION OF STEEP SLOPES

Steep slopes have a significant potential for erosion. Slopes steeper than 2H:1V should be avoided unless stabilization methods are employed.

4.1.5. MAINTAIN NATURAL VEGETATION

Vegetation absorbs water, which will reduce the amount of stormwater runoff the road drainage system needs to handle. Large trees are especially important because their roots help to hold soil in place, and should be protected from damage during any planned roadwork.

5. PROBLEM AREAS

The following four neighborhoods and 30 roads were observed in the 2019 Private Roads Erosion Inventory.

- Hammond Shore Road, Harrison Drive, Jenne Drive, Hemlock Lane, Cedar Lane, Lavalley Lane
- Dewing Road, Camp Road, Kings Court, Shore Road, Perry Landing Road, Vic's Crossing, Lake Road, Gallup Road, Middle Road

- Patton Shore Road, Forsyth Drive, Scottish Lane, Ledge Drive, Titemore Woods Road, Hill Road, Elmwood Road
- Sandy Bay Road, Black Woods, Patton West, Riley Road, Mullen Shore Road, Westcott Shore Road, Tanner Junction Road, Patterson Point Road

Information for this section of the 2019 Private Roads Erosion Inventory was drawn upon preliminary private roads erosion inventory observations, a series of six site visits for private roads erosion inventory data collection, as well as sampling data from the Lake Carmi Tributary Monitoring Program and the various private roads erosion inventory reports that were completed in previous years.

CRITICAL SOURCE AREAS

Critical source areas as defined by the Franklin Stormwater Master Plan.

From a stormwater management standpoint, phosphorous critical source areas are areas of development (including roads) with a high potential for stormwater runoff. In general, roads with steep grades are particularly vulnerable to runoff and likely to be identified as CSAs. In Franklin, the CSAs identified by the model include:

- Morse's Line Road (0.7-1.0 miles north of Franklin Village)
- Messier Road (0.7 miles south of Morse's Line Road)
- Hanna Road (especially near Highgate line and near Webster Road intersection)
- Webster Road (from Highgate line 1.3 miles north)
- North Sheldon Road (near Swamp Road intersection)
- Riley Road (south end near Rte. 120)
- Franklin Village (near several stream crossing locations)
- Middle Road (0.8 miles north of Franklin Village)
- Gallup Road (Rte. 120 to Middle Road; 0.9 miles north of Middle Road)
- Boston Post Road v Route 120 (at public beach on north shore of Lake Carmi)
- Hammond Shore Road (near Harrison Drive, Jenne Drive)
- Patton Shore Road (near Scottish Lane)
- Sandy Bay Road (Riley Road to Black Woods Road intersection)
- Mullen Shore Road (Riley Road to Westcott Shore Road intersection)
- Westcott Shore Road (near Patterson Point Road)

5.1 HAMMOND SHORE ROAD

Hammond Shore Road, Harrison Drive, Jenne Drive, Hemlock Lane, Cedar Lane, Lavalle Lane



Hammond Shore Road

(44.982005, -72.852919)

Background Information

Hammond Shore Road is a dead-end road that extends approximately $\frac{3}{4}$ mile from the intersection of Dewing Road.

Harrison Drive is a short-looped road that intersects Hammond Shore Road and provides access to 3-4 properties on Lake Carmi.

Problems Identified

Both roads are relatively flat with almost no change in elevation along their profile.

Potholes are prevalent along the entire length of Hammond Shore Road, particularly at the intersection with Harrison Drive.

Both roads have a relatively flat cross section (no crowning). There is a substantial vegetated ditch that runs along the east side of Hammond Shore Road to a culvert near the intersection with Harrison Drive.

The culvert receives runoff from the ditch and from a small stream that extends from agricultural fields located to the south and east.

From the culvert, the stream flows along Harrison Drive to another culvert under Harrison Drive, then to another culvert beneath a driveway and lawn, discharging at the shoreline of the lake.

The culvert is reported to discharge heavy amounts of sediment into the lake during storm events.

No significant erosion was observed on or along the roads with the exception of at either end of the culvert beneath Harrison Drive.





The ditches along Hammond Shore Road appeared to be adequately sized and vegetated with no signs of blockage or scouring.

There was no physical evidence of failure at the culverts at the time of the time of inspection.

However, it is known that the culvert under Harrison Drive was completely washed out, indicating that both culverts are likely not adequately sized.

Hammond Shore Road has many potholes. Potholes are typically caused by road sections on poorly drained soils and/or insufficient crowning or road tilting. This can be rectified by rebuilding the road with proper materials or re-grading the road to remove the potholes and then re-crowning the surface.

In addition to this, there is some orange tape lined up on the eastern side of Hammond Shore Road. The banks on the eastern side of the road are rapidly eroding and the ditches along this side of the road have partially collapsed due to the eroding banks.

Old culvert materials appear to be laid across the ditches on this side of the road, making infiltration within the ditch more difficult because of these large obstacles encompassing the ditch.

On the western side of the road, Kane Brook intersects Hammond Shore Road, and the culvert underneath Hammond Shore Road discharges directly into the lake.

Over the winter of 2018, on multiple occasions, the culvert was plugged with ice and sediment, and thawed and released in the spring.

The banks on this side of the road are also collapsing and eroding into Kane's Brook.

In the spring of 2019, the phosphorus concentrations for Kane's Brook at the intersection with Hammond Shore Road were particularly very high.

Possible Solutions

The issue of potholes can be rectified by rebuilding the road with proper materials or re-grading the road to



	<p>remove the potholes and then re-crowning the surface.</p>
	<p>Harrison Drive</p> <p>(44.976747, -72.858267)</p> <p>Background Information</p> <p>Harrison Drive is a short-looped road that intersects Hammond Shore Road and provides access to 3-4 properties on Lake Carmi.</p> <p>Problems Identified</p> <p>The intersection of Hammond Shore Road and Harrison Drive has many potholes.</p> <p>Possible Solutions</p> <p>Harrison Drive, in addition to Hammond Shore Road, is also very flat and would benefit greatly from some crowning.</p>
	<p>Jenne Drive</p> <p>(44.977349, -72.857495)</p> <p>Background Information</p> <p>Jenne Drive is a private driveway and therefore was not evaluated for this private road erosion inventory.</p>



Hemlock Lane

(44.9781, -72.8567)

Background Information

Hemlock Lane is a relatively short road with a light amount of road traffic.

Problems Identified

Hemlock Lane has many potholes and poor drainage, and little to no evidence of vegetated ditching. It is important that these short, private roads coming off of Hammond Shore Road are also maintained in an adequate manner, as they are the closest roads to the lake in the entire watershed, and could be carrying sediment from some of the more major private roads, such as Hammond Shore Road.

Possible Solutions



Cedar Lane

(44.980066, -72.854175)

Lavalle Lane

(44.980402, -72.853743)

Background Information

Problems Identified

Cedar Lane and Lavalle Lane both exhibited no visible problem areas.

Both of these roads are short and only lead to a few camps, do not have much road traffic, and do not present many visible problem areas.

Possible Solutions

5.2 DEWING ROAD

Dewing Road, Camp Road, Kings Court, Shore Road, Perry Landing Road, Vic's Crossing, Lake Road, Gallup Road, Middle Road



Dewing Road

(44.986929, -72.856291)

Background Information

Dewing Road is approximately 1.69 miles long and runs from Lake Road (VT Rte. 120) in Franklin to Stanley Hill Road in West Berkshire.

Dewing Road intersects the Mill Pond outlet at approximately 500 ft from the intersection of Lake Road and Dewing Road.

Problems Identified

There is currently a proposed project to reduce the sediment entering Lake Carmi from a private storm drain culvert under Dewing Road.

The pipe drains a privately installed catch basin that captures stormwater from the road, driveways and ditches.

The scope of the problem was identified during an inspection of the road by Coordinator of the Franklin Watershed Committee, Emily Porter-Goff, and DEC Tactical Basin Planner, Karen Bates, as well as a conversation with the camp owner who installed the catch basin and pipe.

This issue appears to involve at least 4-6 parcels and ½ mile of the town road. Each landowner and the town will need to come to an understanding of their responsibility and develop a willingness to participate in resolving the pollutant source to the Lake by capturing and treating stormwater before it enters the culvert.

Possible Solutions

The anticipated scope of the work includes improving ditches to capture road runoff and directing it through vegetated ditches and underlying culvert to four individual driveways. In

addition, some of the property owners have connected perforated pipes and trenches, draining wet areas of their property to the culvert. The project proposal provides landowner education and alternative problem solving to reduce sediment from this source as well.



Camp Road

(44.987109, -72.857407)

Background Information

Camp Road is a relatively short road that only lead to a few camps.

Problems Identified

It does not have much road traffic and does not present any visible problem areas.

Lake Carmi Tributary Monitoring Sites

Directly across the street from Camp Road is where one of the Lake Carmi Tributary Monitoring sites is located, LC05 (Dicky's Brook at Lake Road). Relatively low levels of nitrogen and phosphorous have consistently been observed here.



Kings Court

(44.987511, -72.859097)

Background Information

Kings Court is a relatively short road off of Lake Road (VT Route 120) with no visible problem areas.



Shore Road

(44.987893, -72.861157)

Background Information

Shore Road is located off of Lake Road (VT Route 120) and seems to have varying conditions.

Problems Identified

The first photo seen here on the left is from a sampling trip taken in late May. The second photo is from an initial private roads inventorying trip in early June. Within two weeks of taking a picture from the same location, there is a visible difference in road condition and vegetation.

Perry Landing Road

(44.986003, -72.861328)

Background Information

Perry Landing Road is a private driveway and therefore was not evaluated for this private road erosion inventory.



Vic's Crossing

(44.989702, -72.866457)

Background Information

Problems Identified

Vic's Crossing has some drainage issues reported by the homeowners in the neighborhood. However, it has been observed that the drainage issues may be due to a contiguous wetland.

The first photo on the left is where the reported drainage issues had been occurring on Vic's Crossing, underneath the cedar trees pictured. The second picture below is a picture of the contiguous wetland on Vic's Crossing.

There were a number of previous recommendations for culverts on Vic's Crossing, as listed below.



Culvert Treatment Recommendations

VC-01 (44.98903, -72.86635): Apply gravel to crown roadway to allow for sheet runoff.

VC-02 (44.98910, -72.86622): Construct stone plunge pool at culvert inlet – 12" above culvert invert elevation. Apply gravel to crown roadway to allow for sheet runoff.

VC-03 (44.98901, -72.86603): Construct stone splash pad at culvert outlet with 2 ½ inch drainage stone. Apply gravel to crown roadway to allow for sheet runoff.

VC-04 (44.98854, -72.86557): Clean culvert outlet and construct stone splash pad with 2 ½ inch drainage stone. Apply gravel to crown roadway to allow for sheet runoff.

VC-05 (44.98792, -72.86533): Apply gravel to crown roadway to allow for sheet runoff.



VC-06 (44.98759, -72.86494): Apply gravel to crown roadway to allow for sheet runoff.

VC-07 (44.98694, -72.86415): Apply gravel to crown roadway to allow for sheet runoff.

Lake Road



Gallup Road

(44.989545, -72.865989)

Background Information

While Gallup Road is not a town road, it was included in this private road erosion inventory because of its direct connection to other private roads in the Lake Carmi watershed.

Gallup Road is a gravel road that runs approximately 3.40 mi (~5.48 km) long, roughly parallel to the Canadian border east from Richard Road. Only the first 0.63 mi (~1.02 km) of Gallup Road prior to the intersection with Middle Road is the target area in this private road erosion inventory, as this is the primary segment that resides within the Lake Carmi watershed.

Problems Identified

In this segment, banks are unstable coming off of road into the ditching. For this segment, a 600-foot section of roadside ditch, along the southern edge of the road, was observed to be bare and actively eroding. In addition, the ditch has a steep back slope that is leading to slumping.

Possible Solutions

Better stormwater ditching is needed here. There are also many potholes, indicative of poorly drained soils and/or insufficient crowning or road tilting. This can be corrected by reconstructing or re-grading the road. It is recommended to build the road up in the areas of exposed ledge. Due to the slope, the ditch should be made as wide as possible with the space that is available (up to 6-8 feet wide) and vegetated with stone check dams spaced 50 to 60 feet apart.

Stormwater Master Plan Recommendations

The following information was gathered from the Franklin Stormwater Master Plan.

Gallup Road is a gravel road that runs roughly parallel to the Canadian border, east from Richard Road. A 600-foot section of roadside ditch, along the southern edge of the road, was observed to be



bare and actively eroding. In addition, the ditch has a steep back slope that is leading to slumping.

Significant evidence of sediment transport was observed. The ditch could be stabilized by making it wider, with a parabolic-shaped bottom. The ditch may need to be stone lined in sections where it is not possible to achieve a sustainable back slope. Stone check dams could also be employed in order to reduce flow velocities, limit sediment transport, and potentially create opportunities for infiltration in the ditch.

Significant evidence of sediment transport was observed. The ditch could be stabilized by making it wider, with a parabolic-shaped bottom. The ditch may need to be stone lined in sections where it is not possible to achieve a sustainable back slope. Stone check dams could also be employed in order to reduce flow velocities, limit sediment transport, and potentially create opportunities for infiltration in the ditch.



Middle Road

(44.998686, -72.867017)

Background Information

Middle Road connects downtown Franklin to East Franklin and is approximately 4.60 miles long.

This private road erosion inventory project focused on the intersection of Gallup Road and Middle Road, at approximately 3.0 miles east of Middle Road.

Problems Identified

Outlined in the Franklin Stormwater Master Plan.

0.5 mi west of Gallup Road on Middle Road, culvert outlet is perched two feet above the current streambed. Stream banks immediately downstream are actively eroding. Nearby ditches are narrow and incising. Given proximity to Lake Carmi, failing banks may be an important sediment source. Further investigation is required.

5.3 PATTON SHORE ROAD

Patton Shore Road, Forsyth Drive, Scottish Lane, Ledge Drive, Titemore Woods Road, Hill Road, Elmwood Road



Patton Shore Road

Background Information

Patton Shore Road runs south from Lake Road for about $\frac{3}{4}$ mile along lake shore properties. The topography in this area is variable and as a result the road elevation varies. There are several side roads to the west that connect the road with other homes and camps. Several potholes were present along this road as on the others and ledge could be seen exposed in a few locations.

Both Scottish Lane and Ledge Drive traverse hills that rise up from the elevation of Patton Shore Road.

Problems Identified

Neither of the two side roads had ditches and there was evidence of minor longitudinal erosion on the road surfaces where surface water had concentrated and discharged onto Patton Shore Road. A culvert is located under Patton Shore road between the two side roads that conveys a small stream. No ditches were present along the side of Patton Shore Road in this area, except for one perpendicular to the road between the culvert outlet and the lake. Water in this ditch reportedly carries a significant amount of sediment discharging into the lake during storm events.

Possible Solutions

Like the other roads inspected for this project, the most obvious problems are potholes along the full extent of the road. This can be corrected by reconstructing or re-grading the road as described for the other roads evaluated. It is recommended to build the road up in the areas of exposed ledge.

To minimize the amount of sediment washing from the Ledge Drive and Scottish Lane road surfaces, a ditch should be constructed on one side of each of these roads. Due to the slope, the ditch should be made as wide as possible with the space that is available (up to 6-8 feet wide) and vegetated with



stone check dams spaced 50 to 60 feet apart. It may be necessary to also construct a ditch on the west side of Patten Shore Road to divert flow from each of these two new ditches to the culvert.

Sediment from the road likely does impact the stream during storm events and constructing ditches as described can reduce sediment loading from the roads. It is also possible that some of the sediment that is transported to the lake via the culvert and ditch at Patton Shore Road comes from further up-gradient.

The stream was not followed upstream during the inspection as it was believed to be on private property. Review of aerial mapping for this area seems to indicate that the drainage is small and vegetated, meaning that sediment loading from up-gradient may be minimal.

Patton Shore Road has visible corrugations, also called washboards, a series of ridges and depressions across the road surface caused by lack of surface cohesion and excessive vehicle speeds.

Corrected by improving the cohesive qualities of the road surface: remix with a good percentage of fines, scarify the road surface while damp, regrade, re-crown, and roll the surface.



Forsyth Drive

(44.9877, -72.8741)

Background Information

Forsyth Drive appears to be a private drive and was not evaluated for this private road erosion inventory.



Scottish Lane

(44.984903, -72.875532)

Background Information

Scottish Lane is a short road off of Patton Shore Road.

Problems Identified

Scottish Lane has some channelized flow that may be flowing onto Patton Shore Road.

Possible Solutions

This may be corrected by crowning the road with vegetated ditching on either side.



Ledge Drive

(44.983591, -72.876549)

Background Information

Ledge Drive is a very short, rural road with no observed problem areas.



Titmore Woods Road

(44.980273, -72.879973)

Background Information

Titmore Woods Road and the intersection with Riley Road had a few potholes and erosion issues. Other than that, there were no observed problem areas.

Hill Road

(44.986905, -72.880693)

Hill Road



Elmwood Road

(44.987464, -72.879862)

Background Information

Elmwood Road appears to be an abandoned road and therefore was not evaluated for this private road erosion inventory.

5.4 SANDY BAY ROAD

Sandy Bay Road, Black Woods Road, Patton West, Riley Road, Mullen Shore Road, Westcott Shore Road, Tanner Junction Road, Patterson Point Road



Sandy Bay Road

(44.976002, -72.889444)

Background Information

Pictured here is the intersection of Sandy Bay Road and Black Woods Road.



Black Woods Road

(44.976750, -72.886652)

Background Information

Problems Identified

Black Woods has considerable evidence of channelized flow leading directly to the lake.



Patton West

Background Information

Patton West appears to be a private drive and therefore was not evaluated for this private road erosion inventory.

Riley Road

Mullen Shore Road

(44.969758, -72.894193)

Background Information

Mullen Shore Road is likely one of the steepest roads in the Lake Carmi watershed. Evidence of channelized flow down the steep slope is apparent here.

Bank stabilization is necessary here. Bank stabilization is the vegetative or structural means used to prevent erosion or failure of any slope.

Failure of a bank occurs when a section of the bank slides.

Stabilization of banks along roads and streams will prevent bank erosion and failure, both of which may





contribute considerable amounts of sediment to surface waters.

Possible Solutions

The 2019 Vermont Better Backroads Manual gives many great solutions to steep slopes and stormwater issues.

Armored Shoulder

This technique is applicable when distributed flow is present or there is shedding of road stormwater to vegetated areas down the front slope of a road. By stabilizing with stone, the road shoulder is protected and will not erode during heavy rain events.

Especially effective in the presence of distributed flow down steep slopes.

The road sub-base is reinforced immediately below the road surface.

8" minus stone is installed under the road surface to a depth of 2 to 3 feet and extends up the road shoulder.

This technique can be used with a mid-crown road surface, or an out-sloped road surface.

Stone Lined Ditches

Ditches with a slope greater than 5% may need to be stone lined to provide adequate protection against erosion and to collect sediment from higher velocity stormwater runoff.

Bank Stabilization

Seeding is the most efficient and inexpensive method to stabilize a bank and should be used wherever possible.

Grass will slow the movement of water, allowing more water to seep into the ground and minimizing the impact of runoff to surface waters.

Erosion control blankets (rolls of degradable netting embedded with hay or straw) can be used on steep



slopes to better hold seed and soil in place. Final grading should be done after topsoil is spread.

The surface should be left rough to reduce water velocity and to help hold seed and mulch.

Select a seed mixture appropriate for site soil and drainage conditions, "conservation mix" is suitable for most areas.

Broadcast seed evenly over the prepared area either by hand broadcasting or hydroseeding.

For more information, see the 2019 Vermont Better Backroads Manual.

**Westcott Shore Road
Tanner Junction Road**

(44.963550, -72.893243)

Background Information

Tanner Junction Road is a short road located off of Westcott Shore Road.

Problems Identified

There were no visible observations of problem areas on Tanner Junction Road.



Patterson Point Road

(44.962087, -72.894132)



Background Information

Patterson Point Road is a short road located off of Westcott Shore Road.

Problems Identified

There were no visible observations of problem areas on Patterson Point Road.

6. CONCLUSIONS

At the conclusion of this private roads erosion inventory project, a list of priority areas was compiled and listed as follows:

1. Sandy Bay Road, Black Woods Road
2. Hammond Shore Road, Harrison Drive
3. Mullen Shore Road
4. Patton Shore Road
5. Dewing Shore Road

These roads should be addressed first and foremost for their immediate erosion concerns. Otherwise, all other roads should be inspected and maintained on a regular basis for their potential for erosion and general water quality concerns.

7. APPENDICES

2013 KAS Private Roads Inventory
2015 Smith Technical Services Drainage Structure Inventory
2017 Smith Technical Services Drainage Structure Inventory
Overview of Private Road Fixes, Compiled by Karen Bates, VT DEC



November 14, 2013

Ms. Bethany Remmers
Assistant Director
Northwest Regional Planning Commission
75 Fairfield Street
St. Albans, VT 05478

RE: Private Roads Assessment and Recommendations, Lake Carmi Area,
Franklin, Vermont

368 Avenue D, Suite 15
PO Box 787
Williston, VT 05495
www.kas-consulting.com

802.383.0486 p
802.383.0490 f

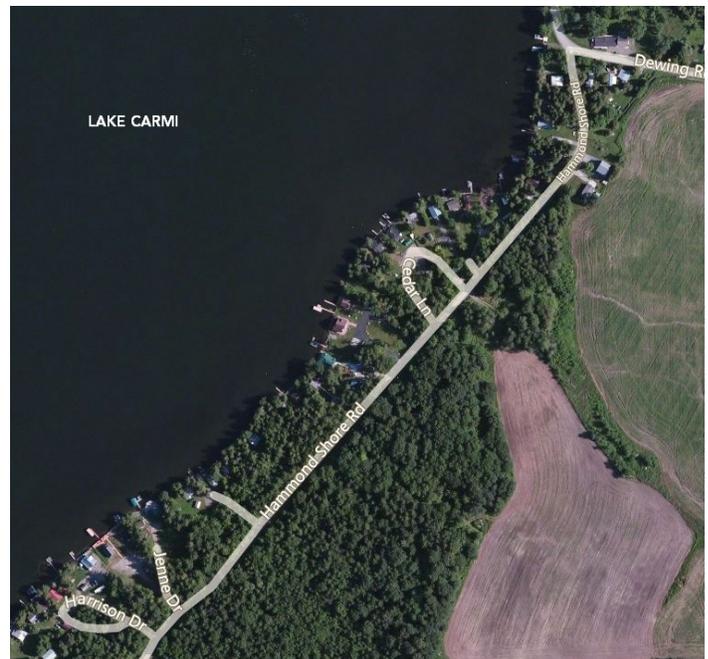
Dear Bethany,

KAS, Inc. has completed a review and cursory assessment of private roads in the area of Lake Carmi in Franklin, Vermont that have been identified as problematic by property owners in the area. The purpose of the site visits and this letter are to identify design, construction, or maintenance issues with these private roads, and to offer recommendations to improve the roads and implement best management practices that will result in a better functioning road and reduce runoff impacts. This work has been completed in accordance with the scope of work and estimate provided to the Northwest Regional Planning Commission (NRPC) on September 9, 2013.

On October 22, 2013, walk-through inspections were completed by Erik Sandblom, P.E., of KAS, at four roads that were identified for this project: (1) Hammond Shore Road / Harrison Drive; (2) Shore Road; (3) Vic's Crossing; and, (4) Patton Shore Road. The site visits were conducted unaccompanied. All roads are surfaced with gravel.

Hammond Shore Road / Harrison Drive

Hammond Shore Road is a dead end road that extends approximately $\frac{3}{4}$ mile from the intersection of Dewing Road. Harrison Drive is a short looped road that intersects Hammond Shore Road and provides access to 3-4 properties on Lake Carmi. Both roads are relatively flat with almost no change in elevation along their profile. Potholes are prevalent along the entire length of Hammond Shore Road,





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particularly at the intersection with Harrison Drive. Both roads have a relatively flat cross section (i.e., no crown). A substantial vegetated ditch runs along the east side of Hammond Shore Road to a culvert near the intersection with Harrison Drive. The culvert receives runoff from the ditch and from a small stream that extends from agricultural fields located to the south and east. From the culvert, the stream flows along Harrison Drive to another culvert under Harrison Drive, then to another culvert beneath a driveway and lawn, discharging at the shoreline of the lake. The culvert is reported to discharge heavy amounts of sediment into the lake during storm events.



No significant erosion was observed on or along the roads with the exception of at either end of the culvert beneath Harrison Drive. The ditches along Hammond Shore Road appeared to be adequately sized and vegetated with no signs of blockage or scouring. A hydrologic / hydraulic analysis was not performed to evaluate the culverts. There was no physical evidence of failure at the culverts at the time of this inspection; however, it is known that the culvert under Harrison Drive was completely washed out last year (observed during another project completed by KAS), indicating that both culverts are likely not adequately sized.

A significant issue along these roads is potholes. Potholes are typically caused by road sections on poorly drained soils and/or insufficient crown or road tilting. This can be rectified by rebuilding the road with proper materials or re-grading the road to remove the potholes and then re-crowning the surface as shown in the following illustration.

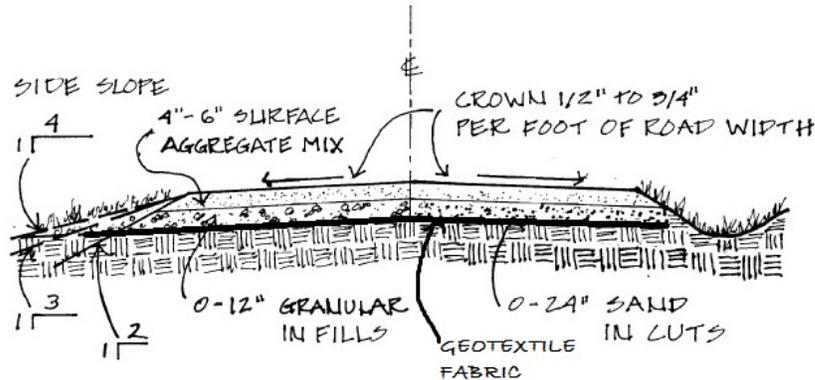


Image modified from: "The Massachusetts Unpaved Roads BMP Manual", 2001

A hydrologic / hydraulic study of the culverts should be completed in order to determine the proper sizing for the culverts located under Hammond Shore Road and Harrison Drive. The results of the study would determine what improvements would be necessary to ensure that the culverts are adequately sized and properly aligned.

The erosion observed in the vicinity of the culvert at Harrison Drive can be corrected by constructing a proper headwall or at either end of the culvert. Currently, strips of sawmill scrap wood and steel from a salvaged guardrail have been laid along the road and do not adequately retain the road material. They should be replaced with a proper timber or stone headwall that is constructed tight to the culvert and substantial enough to retain road materials behind it.

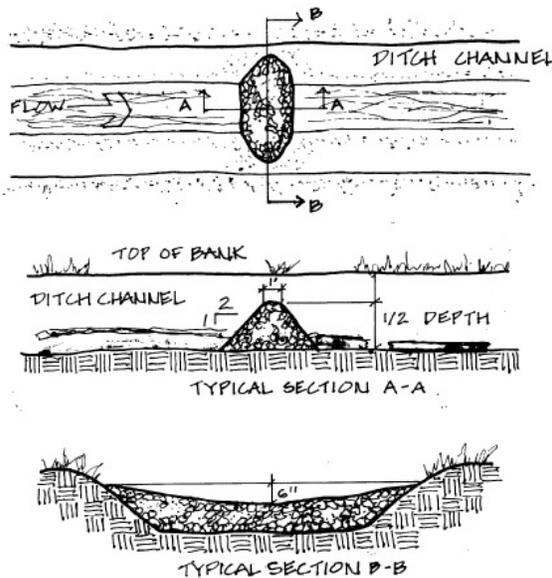


Image from: "The Massachusetts Unpaved Roads BMP Manual", 2001



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Page 4

Based on the observations made in the field, the roads may be contributing to some degree to the sediment loading of the small stream and culvert to the lake. This can be improved by following the recommendations provided in addition to the construction of stone check dams, as in the illustration on the preceding page, in the ditch along Hammond Shore Road.

The most likely cause of sediment loading to the stream, however, is upstream of the culvert and not a direct result of the roads. It appears that the stream is located adjacent to an active agricultural field and receives runoff from the field. Sediment loading to the stream could be reduced by establishing an adequate vegetated buffer along the stream and/or modifying agricultural practices. It also is possible to reduce sediment loading to the lake by trapping the sediment in the stream by constructing a settling pond or other treatment practice in-line. The most technically feasible location for this is just upstream of the culvert that runs under Hammond Shore Road, but there may also be room between the culverts under Hammond Shore Road and Harrison Drive.

Shore Road / Vic's Crossing

These two roads are addressed together as they are located in close proximity and are similarly constructed.



Shore Road and Vic's Crossing each intersect Lake Road (Vermont Highway 120) and run along lakeshore properties. Both are dead-end roads. The end of each road is in close proximity to the other but they do not connect. Both are very narrow, 12-15 feet wide, and they are each about ¼ mile in length. About



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half of Shore Road runs from Lake Road through a wooded undeveloped section of land that appeared to be very wet at the time of the inspection. Potholes are an obvious problem on both roads. Both roads are relatively flat in profile and in cross section. There was no sign of significant erosion on either of the roads.



A large puddle was observed on Shore Road at the curve as the road transitions its alignment to be parallel with the shoreline of the lake. No culverts or ditches were observed along Shore Road.

The road surface on Vic's crossing appeared to be made up of a dense hard material that was well compacted. Small ditches were observed on the north side of Vic's crossing and several culverts cross the road to allow those ditches to drain. The land on the north side of the road appeared to be wet and the ditches and culverts had apparently been installed to allow water to drain to the lake. The culverts varied in size from about 6" to 18" and exhibited a wide range of condition.

Potholes and drainage around the roads appeared to be the most significant issues at Shore Road and Vic's crossing. The potholes are best addressed by reconstructing or re-grading the road as recommended for Hammond Shore Road. The only major drainage issue along Shore Road is at the curve. Building up the road or re-grading here would likely not be sufficient as water from the north side of the road would still be allowed to pool. It is recommended that a ditch be constructed along the inside edge of the curve so that water drains to the south and west towards and beyond an existing tree stump at the side of the road. It may be necessary to remove the tree stump. A culvert should be installed under Shore Road just to the east of the tree stump to discharge approximately between the two camp buildings located here. It is recommended that the ditch be seeded and mulched so that vegetation



Ms. Bethany Remmers
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establishes. It may also be necessary to extend a shallow ditch or swale from the culvert discharge to the lake to prevent surface water from impacting either of the two camps.



Some of the culverts located along Vic's crossing appeared to be damaged / crushed or were likely undersized. These should be replaced and the outlets stabilized with stone or vegetation if the flow is small. If possible, a minimum culvert diameter of 18" should be used with a minimum of one foot of fill over it. The inlet and outlet of each culvert should be protected with stone and headwalls should be used if the ends of the culverts are close to the edge of the road. It may be necessary to construct a ditch at the outlets of the new culverts or otherwise re-grade the ground surface at the outlets since many of the existing culverts are very shallow.

Patten Shore Road

Patten Shore Road runs south from Lake Road for about $\frac{3}{4}$ mile along lake shore properties. The topography in this area is variable and as a result the road elevation varies. There are several side roads to the west that connect the road with other homes and camps. Several potholes were present along this road as on the others and ledge could be seen exposed in a few locations.

The inspection of Patton Shore Road was



focused on the area between Scottish Lane and Ledge Drive and included those two side roads. Both Scottish Lane and Ledge Drive traverse hills that rise up from the elevation of Patton Shore Road. Neither of the two side roads had ditches and there was evidence of minor longitudinal erosion on the road surfaces where surface water had concentrated and discharged onto Patton Shore Road. A culvert is located under Patton Shore road between the two side roads that conveys a small stream. No ditches were present along the side of Patton Shore Road in this area, except for one perpendicular to the road between the culvert outlet and the lake. Water in this ditch reportedly carries a significant amount of sediment discharging into the lake during storm events.



Like the other roads inspected for this project, the most obvious problems is potholes along the full extent of the road. This can be corrected by reconstructing or re-grading the road as described for the other roads evaluated. It is recommended to build the road up in the areas of exposed ledge.

To minimize the amount of sediment washing from the Ledge Drive and Scottish Lane road surfaces, a ditch should be constructed on one side of each of these roads. Due to the slope, the ditch should be made as wide as possible with the space that is available (up to 6-8 feet wide) and vegetated with stone check dams spaced 50 to 60 feet apart. It may be necessary to also construct a ditch on the west side of Patten Shore Road to divert flow from each of these two new ditches to the culvert.

Sediment from the road likely does impact the stream during storm events and



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constructing ditches as described can reduce sediment loading from the roads. It is also possible that some of the sediment that is transported to the lake via the culvert and ditch at Patten Shore Road comes from further up-gradient. The stream was not followed upstream during the inspection as it was believed to be on private property. Review of aerial mapping for this area seems to indicate that the drainage is small and vegetated, meaning that sediment loading from up-gradient may be minimal.

KAS is pleased to have performed this assessment for the NRPC. If you have any questions or require additional information, please feel free to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "Erik C.F. Sandblom". The signature is fluid and cursive, with a long horizontal stroke at the end.

Erik C.F. Sandblom, P.E.
Principal Engineer

- References:
- 1) "The Massachusetts Unpaved Roads BMP Manual", Berkshire Regional Planning Commission, 2001, USEPA Project 98-06/319.
 - 2) "Mitigating Flood Damage to Vermont Local Roads", FEMA/Vermont Emergency Management, December 2011.
 - 3) "Gravel Road Maintenance Manual", Maine Department of Environmental Protection Bureau of Land and Water Quality, April 2010.

Introduction

Purpose

The purpose of this Road Drainage Structure Inventory and Estimated Cost of Improvements is to identify potential and current drainage and erosion problems, on private and town highways on the northern portion of Lake Carmi in the Town of Franklin. It is also a tool to create a priority and budget estimates to assist with developing a long range plan to correct drainage deficiencies that will improve the water quality of the Lake.

Most problems are reoccurring that involve erosion of ditches, swales, roadway edges and on water courses leading to the Lake. Most absences of resolutions have been restricted or delayed due to lack of funding and perhaps knowledge on how to prevent or improve some of the problems.

Correcting Erosion and Sediment problem areas on Camp roads and Town Highways are twofold:

1. As an outcome of properly constructing and maintaining Roadways and their drainage systems, Lake Carmi can expect to obtain long term benefits from limited reoccurring maintenance and storm damage.
2. By applying values set forth in the "Vermont Better Backroads Manual" and other recommended principles, water run-off quality can be very much improved to provide a positive impact on surrounding streams, rivers, and lakes.

The Franklin Watershed Committee realizes its responsibility to respect the environment and has actively been involved in recent years in adopting standards that have included the practices in the above referenced manual and have also been actively pursuing Grants to improve critical sites for erosion and water quality issues.

The Franklin Watershed Committee is grateful for the opportunity to receive a Better Backroads Grant to complete this "Inventory and Budget Plan".

Patton Shore

Cost Estimate Worksheet - Patton Shore

Project ID - PS - 1

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	30	\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.	14	\$ 40.50	1.5	\$ 113.85	
Gravel	301.28	C.Y.	16	\$ 46.42	1.5	\$ 1,114.08	100X14X0.25/27=12.96X1.25=
All Purpose Excavator Rental	608.25	Hr.	3	\$ 72.44	1.5	\$ 325.98	16.22 C.Y.
Truck Rental	608.37	Hr.	2	\$ 65.27	1.5	\$ 195.81	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.	5	\$ 8.06	1.5	\$ 60.45	
Mulch	651.25	Ton	0.1	\$ 544.15	1.5	\$ 81.62	
					Total	\$ 1,891.79	

Cost Estimate Worksheet - Patton Shore

Project ID - PS - 2

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	50	\$ 2.53	1.5	\$ 189.75	
Type 1 Stone Fill	613.1	C.Y.	20	\$ 40.50	1.5	\$ 1,215.00	Plunge Pool - Check Dam
Gravel	301.28	C.Y.	15	\$ 46.42	1.5	\$ 1,044.45	
All Purpose Excavator Rental	608.25	Hr.	2	\$ 72.44	1.5	\$ 217.32	
Truck Rental	608.37	Hr.	2	\$ 65.27	1.5	\$ 195.81	
Temporary Erosion Matting	653.2	S.Y.	100	\$ 2.20	1.5	\$ 330.00	60X15/9=100 S.Y.
Seed	651.15	Lb.	10	\$ 8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.1	\$ 544.15	1.5	\$ 81.62	
Culvert - 36"X 58' Assumed	601.263	L.F.	58	\$ 62.00	1.5	\$ 5,394.00	Culvert size and length to be determined by Hydraulic Study and Engineering
					Total	\$ 8,788.85	

Cost Estimate Worksheet - Patton Shore

Project ID - PS - 3

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	50	\$ 2.53	1.5	\$ 189.75	
Type 1 Stone Fill	613.1	C.Y.	20	\$ 40.50	1.5	\$ 1,215.00	Plunge Pool - Check Dam
Gravel	301.28	C.Y.	16	\$ 46.42	1.5	\$ 1,114.08	
All Purpose Excavator Rental	608.25	Hr.	2	\$ 72.44	1.5	\$ 217.32	
Truck Rental	608.37	Hr.	2	\$ 65.27	1.5	\$ 195.81	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.	10	\$ 8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.1	\$ 544.15	1.5	\$ 81.62	
					Total	\$ 3,134.48	

Cost Estimate Worksheet - Patton Shore

Project ID - PS - 4

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	50	\$ 2.53	1.5	\$ 189.75	
Type 1 Stone Fill	613.1	C.Y.	20	\$ 40.50	1.5	\$ 1,215.00	Plunge Pool - Check Dam
Gravel	301.28	C.Y.	16	\$ 46.42	1.5	\$ 1,114.08	
All Purpose Excavator Rental	608.25	Hr.	2	\$ 72.44	1.5	\$ 217.32	
Truck Rental	608.37	Hr.	2	\$ 65.27	1.5	\$ 195.81	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.	10	\$ 8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.1	\$ 544.15	1.5	\$ 81.62	
					Total	\$ 3,134.48	

Cost Estimate Worksheet - Patton Shore

Project ID - PS - 5

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	50	2.53	1.5	\$ 189.75	
Type 1 Stone Fill	613.1	C.Y.	20	40.50	1.5	\$ 1,215.00	Plunge Pool - Check Dam
Gravel	301.28	C.Y.	16	46.42	1.5	\$ 1,114.08	
All Purpose Excavator Rental	608.25	Hr.	2	72.44	1.5	\$ 217.32	
Truck Rental	608.37	Hr.	2	65.27	1.5	\$ 195.81	
Temporary Erosion Matting	653.2	S.Y.		2.20		\$ -	
Seed	651.15	Lb.	10	8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.1	544.15	1.5	\$ 81.62	
					Total	\$ 3,134.48	

Cost Estimate Worksheet - Patton Shore

Project ID - PS - 6

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	50	2.53	1.5	\$ 189.75	
Type 1 Stone Fill	613.1	C.Y.	20	40.50	1.5	\$ 1,215.00	Plunge Pool - Check Dam
Gravel	301.28	C.Y.	16	46.42	1.5	\$ 1,114.08	
All Purpose Excavator Rental	608.25	Hr.	2	72.44	1.5	\$ 217.32	
Truck Rental	608.37	Hr.	2	65.27	1.5	\$ 195.81	
Temporary Erosion Matting	653.2	S.Y.		2.20		\$ -	
Seed	651.15	Lb.	10	8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.1	544.15	1.5	\$ 81.62	
					Total	\$ 3,134.48	

someone has done

OWNER = home lot

Franklin Watershed

**Infrastructure Site Inventory
for Water Quality Improvements**

Road Name	31 Patton Shore Rd.	Remarks:
TH #	N/A	31 Patton Shore Rd
Site ID	PS - 1	
GPS	44.98932°	
	72.87378°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Culvert - outlet - ditch	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	15" x 25' HDPEP	Polyethenene pipe
Priority - Low - Moderate - High		
Roadway Width	14'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	120' +/-	
Name of Stream	N/A	

Inv. Date: 11/05/2014

- Recommended Treatment:**
- 1.- Construct Stone Plunge Pool on outlet of culvert. Top of stone to be 4" +/- above invert elevation.
 2. - Apply gravel to crown roadway to allow for sheet runoff.
- Note:** Wetlands on inlet end of culvert.

Estimated Cost:
See attached Sheet.

Notes:

2016 - new culvert
Fall all stone lining
larger than before
* draining wetland

Patton Shore (1) Pictures



not done

Franklin Watershed

Infrastructure Site Inventory
for Water Quality Improvements

		Remarks:
Road Name	218 Patton Shore Rd.	
TH #	N/A	just after 218 Patton Rd
Site ID	PS - 2	
GPS	44.98624° 72.87477°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Culvert outlet - ditch	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	(12"-15") X 58' CMP	Poor Condition - 12" inlet - 15' outlet (Corrugated Metal Pipe)
Priority - Low - Moderate - High		
Roadway Width	14'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	120' +/-	
Name of Stream	N/A	
		Inv. Date: 11/05/2014

Recommended Treatment:

1. - Replace culvert with new XXXXXX (Recommended size from Hydraulic Study) ?
2. - Construct 60' +/- stone lined swale at culvert inlet.
3. - Construct Stone Plunge Pool at culvert outlet.
4. - Construct Stone Check Dam at Lake edge.
5. - Apply gravel to crown roadway to allow for sheet runoff.

Needs new culvert

Estimated Cost:

See attached Sheet.

Notes:

Patton Shore (2) Pictures



done

Just before 421 PS - Benevento

Franklin Watershed

**Infrastructure Site Inventory
for Water Quality Improvements**

		Remarks:
Road Name	Patton Shore Rd.	
TH #	N/A	before 421 Patton Shore
Site ID	PS - 3	
GPS	44.98441° 72.87595°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Culvert outlet - ditch	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	24" X 35' HDPEP Culvert	Good Condition
Priority - Low - Moderate - High		
Roadway Width	13'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	75' +/-	
Name of Stream	N/A	
		Inv. Date: 11/05/2014

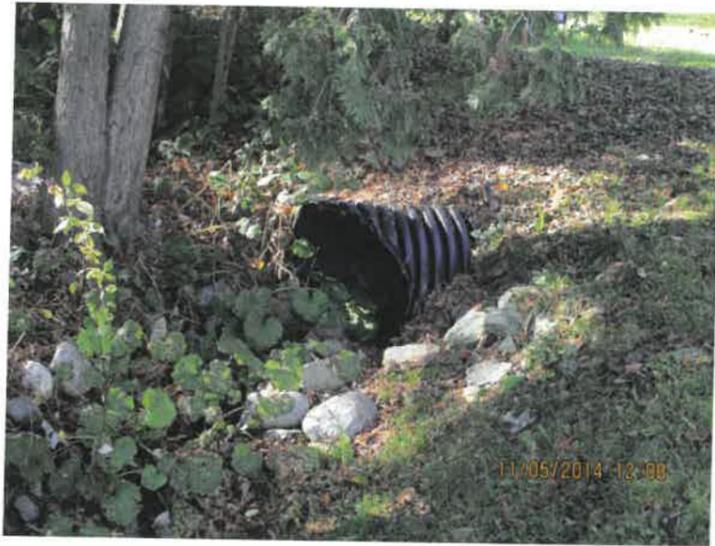
Recommended Treatment:
1. - Construct Stone Plunge Pool at culvert outlet.
2. - Construct Stone Check Dam at Lake edge.
3. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:
See attached Sheet.

Notes:

Patton Shore (3) Pictures

done
421 - Patton SR
Just before Benerento



done

Franklin Watershed Infrastructure Site Inventory for Water Quality Improvements

Road Name	555 Patton Shore Rd.	Remarks:
TH #	N/A	# 555 - Patton Shore Rd
Site ID	PS - 4	Lyman
GPS	44.98321°	
	72.87825°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Culvert outlet - ditch	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	36" X 20' HDPEP Culvert	Good Condition
Priority - Low - Moderate - High		
Roadway Width	14'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	75' +/-	
Name of Stream	N/A	

Recommended Treatment:
 1. - Construct Stone Plunge Pool at culvert outlet 12" above culvert invert elevation.
 2. - Clean outlet channel of debris.
 3. - Construct Stone Check Dam at Lake edge.
 3. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:
 See attached Sheet.

Notes:
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Inv. Date: 11/05/2014

Patton Shore (4) Pictures



dme

Franklin Watershed		Infrastructure Site Inventory for Water Quality Improvements	
		Remarks:	
Road Name	683 Patton Shore Rd.	# 683 PSR	
TH #	683 N/A		
Site ID	PS - 5	Loiselle Camp	
GPS	44.98166°		
	72.87936°		
Drainage Structure Type: Road Ditch - Road Slope - Other	Culvert outlet - ditch		
Erosion Frequency	Spring Runoff - Rain Storms		
Dimensions	56" X 39" X 33' CMP Culvert	Good Condition	
Priority - Low - Moderate - High			
Roadway Width	12'	Traveled Way	
Surface Type	Gravel		
Road Grade: % Grade	Flat		
Distance to edge of Lake Carmi	150' +/-		
Name of Stream	N/A		
		Inv. Date: 11/05/2014	
Recommended Treatment:			
1. - Clean existing Stone Plunge Pool at culvert outlet. Add Type 1 Stone to 4" above culvert invert. 12" narrow 2. - Add Stone Lined ditch or Erosion matting to ditch between Plunge Pool and culvert under drive. 3. - Optional: - Construct Stone Check Dam at Lake edge. 3. - Apply gravel to crown roadway to allow for sheet runoff.			
Estimated Cost:			
See attached Sheet. 20 ea est. minus - 1 CY			
Notes:			

9/10/14

Patton Shore (5) Pictures

done



done - IS

Franklin Watershed

**Infrastructure Site Inventory
for Water Quality Improvements**

Road Name	735 Patton Shore Rd.	after	Remarks:
TH #	N/A	705	Patton Shore Road
Site ID	PS-6		Tatco camp
GPS	44.98321° -93110		
	72.87825° -87776		
Drainage Structure Type:	Road		
Ditch - Road Slope - Other	Culvert outlet - ditch		
Erosion Frequency	Spring Runoff - Rain Storms		
Dimensions	49" X 33" X 28' CMP Culvert		Good Condition- New
Priority - Low - Moderate - High			
Roadway Width	13'		Traveled Way
Surface Type	Gravel		
Road Grade: % Grade	Flat		
Distance to edge of Lake Carmi	140' +/-		
Name of Stream	N/A		
			Inv. Date: 11/05/2014

Recommended Treatment:

1. - Construct Stone Plunge Pool at culvert outlet 12" above culvert invert elevation.
2. - Construct Stone Check Dam at Lake edge.
3. - Apply gravel to crown roadway to allow for sheet runoff.

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Estimated Cost:

See attached Sheet.

Notes:

Patton Shore (6) Pictures

after 705
~~next to~~ Patton Shore



Rd to Camp
2946

Cost Estimate Worksheet

Project ID - Road to Camp # 2946

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
					Total	\$ -	

OK - No Structures - Problems

Franklin Watershed		
Infrastructure Site Inventory for Water Quality Improvements		
		Remarks:
Road Name	Road to Camp 2946	<i>No structures - No improvements noted.</i>
TH #	n/a	
Site ID		
GPS		
Drainage Structure Type: Road - Ditch - Road Slope - Other		
Erosion Frequency		
Dimensions		
Priority - Low - Moderate - High		
Roadway Width		Traveled Way
Surface Type		
Road Grade: % Grade		
Distance to edge of Lake Carmi		
Name of Stream		
		Inv. Date: 11/25/2014
Recommended Treatment: No Drainage structures or treatment needed.		
Estimated Cost: See attached Sheet.		
Notes:		

Nic's Crossing

Cost Estimate Worksheet - Vic's Crossing

Project ID - VC - 1

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.	6.5	\$ 46.42	1.5	\$ 452.60	11' x 50' x.0.25'=137.5+27=5.09x1.25=6.36 C.Y.
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
					Total	\$ 452.60	

Project ID - VC - 2

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.	3	\$ 40.50	1.5	\$ 182.25	
Gravel	301.28	C.Y.	7	\$ 46.42	1.5	\$ 487.41	12' x 50' x.0.25'=150+27=5.55x1.25=6.94 C.Y.
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
					Total	\$ 669.66	

Project ID -VC - 3									
Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks		
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -			
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -			
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -			
Gravel	301.28	C.Y.	7	\$ 46.42	1.5	\$ 487.41	12' x 50' x 0.25' = 150 ÷ 27 = 5.55 x 1.25 = 6.94 C.Y.		
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -			
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -			
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -			
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -			
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -			
					Total	\$ 487.41			
Project ID VC - 4									
Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks		
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -			
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -			
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -			
Gravel	301.28	C.Y.	7	\$ 46.42	1.5	\$ 487.41	12' x 50' x 0.25' = 150 ÷ 27 = 5.55 x 1.25 = 6.94 C.Y.		
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -			
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -			
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -			
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -			
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -			
					Total	\$ 487.41			

Project ID - VC - 5

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$	
Gravel	301.28	C.Y.	6.5	\$ 46.42	1.5	\$ 452.60	11' x 50'
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$	x.0.25'=1375+27=5.09x1.25=6.36 C.Y.
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$	
Seed	651.15	Lb.		\$ 8.06	1.5	\$	
Mulch	651.25	Ton		\$ 544.15	1.5	\$	
Total					Total	\$ 452.60	

Project ID - VC - 6

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$	
Gravel	301.28	C.Y.	6.5	\$ 46.42	1.5	\$ 452.60	11' x 50'
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$	x.0.25'=1375+27=5.09x1.25=6.36 C.Y.
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$	
Seed	651.15	Lb.		\$ 8.06	1.5	\$	
Mulch	651.25	Ton		\$ 544.15	1.5	\$	
Total					Total	\$ 452.60	

Project ID - VC - 7

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.	5.5	\$ 46.42	1.5	\$ 255.31	9' x 50'
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	x.0.25'=112.5÷27=4.17x1.25=5.20 C.Y.
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
					Total	\$ 255.31	

**Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements**

Road Name	Vic's Crossing	
TH #	N/A	
Site ID	VC- 1	
GPS	44.98903°	
	72.86635°	
Structure Type: Road - Ditch - Road Slope - Other	None	
Erosion Frequency		
Dimensions	Catch Basin	
Priority - Low - Moderate - High		
Roadway Width	11	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	80' +/-	
Name of Stream	N/A	
		Inv. Date: 11/05/2014

Recommended Treatment:

1. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:

See attached Sheet.

Notes:

Vic's Crossing (1) Pictures



**Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements**

Road Name	Vic's Crossing	
TH #	N/A	
Site ID	VC- 2	
GPS	44.98910°	
	72.86622°	
Structure Type: Road - Ditch - Road Slope - Other	Roadway	Culvert inlet ditch has been stone lined
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	12" X 140' HDPEP Culvert	Good Condition
Priority - Low - Moderate - High		
Roadway Width	12'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	90' +/-	
Name of Stream	N/A	

Inv. Date: 11/05/2014

- Recommended Treatment:**
1. - Construct Stone Plunge Pool at culvert inlet - 12" above culvert invert elevation.
 2. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:
See attached Sheet.

3 cy

Notes:

Vic's Crossing (2) Pictures



check dam

**Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements**

Road Name	Vic's Crossing	
TH #	N/A	
Site ID	VC- 3	
GPS	44.98901°	
	72.86603°	
Structure Type: Road - Ditch - Road Slope - Other	None	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	10" X 17' Plastic Pipe	Possible Sleeve for Power
Priority - Low - Moderate - High		
Roadway Width	12	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	80' +/-	
Name of Stream	N/A	
		Inv. Date: 11/05/2014

Recommended Treatment:

1. - Construct Stone Splash Pad at culvert outlet with 2-1/2 Inch Drainage Stone.
2. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:

See attached Sheet.

Notes:

Vic's Crossing (3) Pictures



done-JB

**Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements**

Road Name	Vic's Crossing	88 Vic's Crossing
TH #	N/A	
Site ID	VC-4	
GPS	44.98854°	
	72.86557°	
Structure Type: Road - Ditch - Road Slope - Other	None	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	8" X 12" Plastic Pipe	Outlet covered.
Priority - Low - Moderate - High		
Roadway Width	11	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	90' +/-	
Name of Stream	N/A	
		Inv. Date: 11/05/2014

Recommended Treatment:
1. - Clean culvert outlet and Construct Stone Splash Pad with 2-1/2 Inch Drainage Stone.
2. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:
See attached Sheet.

Notes:

Vic's Crossing (4) Pictures



on boundary
88 UC Robt. + Nancy Mongeau
98 UC Bill + Cathy
Spear

**Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements**

Road Name	Vic's Crossing	
TH #	N/A	
Site ID	VC- 5	
GPS	44.98792°	
	72.86533°	
Structure Type: Road - Ditch - Road Slope - Other	None	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	10" X 18" Plastic Pipe	Good condion - Outlet Stoned with Splash Pad
Priority - Low - Moderate - High		
Roadway Width	11	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	90' +/-	
Name of Stream	N/A	
		Inv. Date: 11/05/2014

Recommended Treatment:

1. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:

See attached Sheet.

Notes:

Vic's Crossing (5) Pictures



**Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements**

Road Name	Vic's Crossing	
TH #	N/A	
Site ID	VC- 6	
GPS	44.98759°	
	72.86494°	
Structure Type: Road - Ditch - Road Slope - Other	None	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	4" Flexible Plastic Pipe	
Priority - Low - Moderate - High		
Roadway Width	11	<i>Traveled Way</i>
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	80' +/-	
Name of Stream	N/A	
		Inv. Date: 11/05/2014

Recommended Treatment:

. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:

See attached Sheet.

Notes:

Vic's Crossing (6) Pictures



**Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements**

Road Name	Vic's Crossing	
TH #	N/A	
Site ID	VC- 7	
GPS	44.98694°	
	72.86415°	
Structure Type: Road - Ditch - Road Slope - Other	None	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	(2) 4" X 15' Flexible Drainage Pipe	
Priority - Low - Moderate - High		
Roadway Width	11	<i>Traveled Way</i>
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	120' _/-	
Name of Stream	N/A	
		Inv. Date: 11/05/2014

Recommended Treatment:

1. - Apply gravel to crown roadway to allow for sheet runoff.

Estimated Cost:

See attached Sheet.

Notes:

Vic's Crossing (7) Pictures



Shore Rd.

Cost Estimate Worksheet - Shore Road

257 Shore Rd
County
Costs

Project ID = SR - 1

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	60	\$ 2.53	1.5	\$ 227.70	
Type 1 Stone Fill	613.1	C.Y.	17	\$ 40.50	1.5	\$ 1,032.75	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.	2	\$ 72.44	1.5	\$ 217.32	
Truck Rental	608.37	Hr.	2	\$ 65.27	1.5	\$ 195.81	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.	10	\$ 8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.1	\$ 544.15	1.5	\$ 81.62	4 Bales
			Total		Total	\$ 1,876.10	

Cost Estimate Worksheet - Shore Road

Project ID = SR - 2

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
			Total		Total	\$ -	

Cost Estimate Worksheet - Shore Road

OK - No Treatment

Project ID = SR - 3

OK - No Treatment

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
			Total		Total	\$ -	

Cost Estimate Worksheet - Shore Road

Project ID = SR - 4

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	50	\$ 2.53	1.5	\$ 189.75	
Type 1 Stone Fill	613.1	C.Y.	14	\$ 40.50	1.5	\$ 850.50	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.	2	\$ 72.44	1.5	\$ 217.32	
Truck Rental	608.37	Hr.	2	\$ 65.27	1.5	\$ 195.81	Mini
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.	10	\$ 8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.1	\$ 544.15	1.5	\$ 81.62	
			Total		Total	\$ 1,655.90	

done - JB
in 2015

Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements

		Remarks:
Road Name	Shore Road	By Costas Camp # 257
TH #	n/a	
Site ID	SR - 1	
GPS	N - 44.98644°	
	W - 72.86346°	
Structure Type: Road - Ditch - Road Slope - Other	Ditch/Swale	
Erosion Frequency	Spring Runoff - Storms	
Dimensions		
Priority - Low - Moderate - High		
Roadway Width	n/a	Traveled Way
Surface Type	n/a	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	150' from Foot Bridge	
Name of Stream	N/A	
		Inv. Date: 11/25/2014

Recommended Treatment:

1. - Construct Stone Check Dam at edge of lake. (15X5X2) - 6 C.Y. Type 1 Stone Fill
2. - Stone Line ditch 20' upstream of Check Dam. (20X15X1) - 11 C.Y. Type 1 Stone Fill

Estimated Cost:
See attached Sheet.

Notes:

Shore Road (1) Pictures



Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements

		Remarks:
Road Name	Shore Road	
TH #	n/a	
Site ID	SR - 2	
GPS	N - 44.98644°	
	W - 72.86297°	
Structure Type: Road - Ditch - Road Slope - Other	Culvert/Pipe	
Erosion Frequency	Spring Runoff - Storms	
Dimensions		
Priority - Low - Moderate - High		
Roadway Width	10'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	100' - Road to Lake	
Name of Stream	N/A	
		Inv. Date: 11/25/2014

Recommended Treatment:
None

Estimated Cost:
See attached Sheet.

Notes:

Shore Road (2) Pictures



done

Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements

Road Name	Hammond Shore Road	Remarks:
TH #	N/A	At intersection with Dewing Shore
Site ID	HS - 1	
GPS	N 44.98200° W 72.85298°	
Drainage StructureType: Road - Ditch - Road Slope - Other	Corrugated Metal Culvert	
Frequency	Spring Runoff & Rain Storms	
Dimensions	18" X ?	Can not find inlet
Priority - Low - Moderate - High		
Roadway Width	20'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	50' +/-	
Name of Stream	N/A	
Recommended Treatment:		Inv. Date: 11/25/2014

1.- Construct Stone Plunge Pool at end of culvert.

Estimated Cost:
 See attached Sheet.

Notes:

Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements

		Remarks:
Road Name	Shore Road	<i>By Costas Camp # 257</i>
TH #	n/a	
Site ID	SR - 3	
GPS	N - 44.98600°	
	W - 72.86184°	
Structure Type: Road - Ditch - Road Slope - Other	Culvert/Pipe	
Erosion Frequency	Spring Runoff - Storms	
Dimensions		
Priority - Low - Moderate - High		
Roadway Width	10'	<i>Traveled Way</i>
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	90' +/- Road to Lake	
Name of Stream	N/A	
		Inv. Date: 11/25/2014

Recommended Treatment:
Existing 6"X 20' Plastic culvert under road with Stone Lined inlet and outlet. Looks like a proper treatment.
No recommended treatment.

Estimated Cost:
See attached Sheet.

Notes:

Shore Road (3) Pictures



dme-JB
2015

Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements

		Remarks:
Road Name	Shore Road	
TH #	n/a	
Site ID	SR - 4	26 Perry Landing Rd.
GPS	N - 44.98644°	
	W - 72.86077°	
Structure Type: Road - Ditch - Road Slope - Other	Ditch/Swale	
Erosion Frequency	Spring Runoff - Storms	
Dimensions		
Priority - Low - Moderate - High		
Roadway Width	n/a	Traveled Way
Surface Type	n/a	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	140' from Foot Bridge	
Name of Stream	N/A	
		Inv. Date: 11/25/2014

Recommended Treatment: Swale east of Perry Camp
 1. - Reinforce Stone Check Dam at edge of lake. - 3 C.Y. Type 1 Stone Fill
 2. - Stone Line ditch 25' upstream of Check Dam. (25X12X1) - 11 C.Y. Type 1 Stone Fill

Estimated Cost:
 See attached Sheet.

Notes:

Shore Road (4) Pictures

26 Perry
Lindsay



King's Court

Cost Estimate Worksheet - Kings Court Road

Project ID - KC- 1

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	25	\$ 2.53	1.5	\$ 94.88	
Type 1 Stone Fill	613.1	C.Y.	9	\$ 40.50	1.5	\$ 546.75	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.	2	\$ 72.44	1.5	\$ 217.32	Mini
Truck Rental	608.37	Hr.	2	\$ 65.27	1.5	\$ 195.81	Mini
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.	5	\$ 8.06	1.5	\$ 60.45	
Mulch	651.25	Ton	0.1	\$ 544.15	1.5	\$ 81.62	
					Total	\$ 1,196.83	

done - JB

Franklin Watershed		
Infrastructure Site Inventory for Water Quality Improvements		
		Remarks:
Road Name	Kings Court	
TH #		between
Site ID	KC - 1	
GPS	N - 44.98634°	66 King's Cut
	W - 72.85961°	at Lake
Drainage Structure Type: Road - Ditch - Road Slope - Other	Ditch/Swale	
Erosion Frequency	Spring Runoff/ Storms	runoff → TWSing
Dimensions	n/a	
Priority - Low - Moderate - High		
Roadway Width	n/a	Traveled Way
Surface Type	n/a	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	At Lake's edge	
Name of Stream	N/A	
		Inv. Date: 11/25/2014
Recommended Treatment:		
1. - Construct Stone Check Dam upstream of Foot Bridge 15' from lake's edge. (4 C.Y.) 2.- Stone Line ditch betwee check dam and lake. (2 C.Y.)		
<p style="text-align: center;">9' m estimate</p>		
Estimated Cost:		
See attached Sheet.		
Notes:		

Kings Court (1) Pictures



Camp Rd.

Cost Estimate Worksheet - Camp Rd.

Project ID - Camp Rd.						
Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	
Gravel	301.28	C.Y.		\$ 46.42	1.5	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	
Seed	651.15	Lb.		\$ 8.06	1.5	
Mulch	651.25	Ton		\$ 544.15	1.5	
					Total	\$.

No structures noted- no improvements needed.

Franklin Watershed		
Infrastructure Site Inventory for Water Quality Improvements		
		Remarks:
Road Name	Camp Road	<i>No Structures- No Improvements needed.</i>
TH #	n/a	
Site ID	Camp Road	
GPS		
Drainage Structure Type: Road - Ditch - Road Slope - Other		
Erosion Frequency		
Dimensions		
Priority - Low - Moderate - High		
Roadway Width		<i>Traveled Way</i>
Surface Type		
Road Grade: % Grade		
Distance to edge of Lake Carmi		
Name of Stream		
		Inv. Date: 11/25/2014
Recommended Treatment: No drainage structures located or improvements needed.		
Estimated Cost: See attached Sheet.		
Notes:		

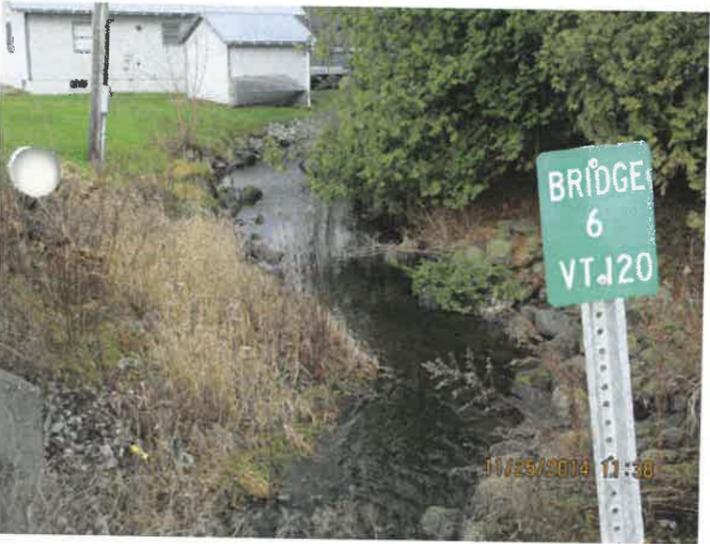
VT 120 - Bridge

Cost Estimate Worksheet - Vt. 120 - Bridge 6

VT. 120 - Bridge 6						
<u>Item</u>	<u>Vtrans Item No.</u>	<u>Unit</u>	<u>Number of Units</u>	<u>Unit Cost</u>	<u>Factor</u>	<u>Remarks</u>
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -
Type 1 Stone Fill	613.1	C.Y.	70	\$ 40.50	1.5	\$ 4,252.50
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -
					Total	\$ 4,252.50

VT 120 Bridge 6 (1) Pictures

Some work has been done



FRANKLIN WATERSHED - BETTER BACKROADS INVENTORY AND CAMITOL BUDGET

Items I need to follow up with:

- Do we want to add gravel at sites where improvements take place to allow water to sheet off road rather than collect and runoff at low points, potentially causing erosion?
- Patton Shore – PS-2 – Has Hydraulic Study been completed at this site?
- Hammond Shore – Cannot find inlet of culvert under Hammond/Dewing shore intersection?
- Recommend Hydraulic Studies for HS – 2, HS – 3 and HS – 4 prior to mediation efforts.
- Would like to review suggested repairs in field with Alisha.
- Property owners need to be on board with most projects.



Dewing Shore

Cost Estimate Worksheet - Dewing Shore

Project ID - DS - 1		New Bridge - No improvements noted.					
Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
			Total		Total	\$ -	

Cost Estimate Worksheet - Dewing Shore

Project ID - DS - 2		Bridge - No improvements noted.					
Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
			Total		Total	\$ -	

Cost Estimate Worksheet - Dewing Shore

Project ID - DS - 3

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	No improvements noted.
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
					Total	\$ -	

Cost Estimate Worksheet - Dewing Shore

Project ID - DS - 4

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	No improvements noted.
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.		\$ 40.50	1.5	\$ -	
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
					Total	\$ -	

Cost Estimate Worksheet - Dewing Shore

Project ID - DS - 5

No improvements noted.

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.	8.90	\$	1.5	\$	-
Geotextile Fabric	649.31	S.Y.	2.53	\$	1.5	\$	-
Type 1 Stone Fill	613.1	C.Y.	40.50	\$	1.5	\$	-
Gravel	301.28	C.Y.	46.42	\$	1.5	\$	-
All Purpose Excavator Rental	608.25	Hr.	72.44	\$	1.5	\$	-
Truck Rental	608.37	Hr.	65.27	\$	1.5	\$	-
Temporary Erosion Matting	653.2	S.Y.	2.20	\$	1.5	\$	-
Seed	651.15	Lb.	8.06	\$	1.5	\$	-
Mulch	651.25	Ton	544.15	\$	1.5	\$	-
					Total	\$	-

Franklin Watershed		
Infrastructure Site Inventory for Water Quality Improvements		
		Remarks:
Road Name	Dewing Shore	
TH #	TH 18	
Site ID	DS - 1	
GPS	N 44.98607°	
	W 72.85473°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Concrete Bridge	New 2014
Erosion Frequency	Spring Runoff & Rain Storms	
Dimensions	20'X5'	24' wide roadway width
Priority - Low - Moderate - High		
Roadway Width	24'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	At lake's edge	
Name of Stream	Lake Carmi Outlet	
		Inv. Date: 11/25/2014
Recommended Treatment: No Recommendations		
Estimated Cost: See attached Sheet.		
Notes:		

Dewing Shore (1) Pictures



Franklin Watershed		
Infrastructure Site Inventory for Water Quality Improvements		
		Remarks:
Road Name	Dewing Shore	
TH #	TH 18	
Site ID	DS - 2	
GPS	N 44.98460°	
	W 72.85357°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Concrete Bridge	
Erosion Frequency	Spring Runoff & Rain Storms	
Dimensions	8'X3.5'	21' wide
Priority - Low - Moderate - High		
Roadway Width	31'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	At lakes' edge	
Name of Stream	N/A	
		Inv. Date: 11/25/2014
Recommended Treatment:		
Estimated Cost: See attached Sheet.		
Notes:		

Dewing Shore (2) Pictures



Franklin Watershed**Infrastructure Site Inventory for Water Quality Improvements**

		Remarks:
Road Name	Dewing Shore	
TH #	TH 18	
Site ID	DS - 3	
GPS	N 44.98292°	
	W 72.85322°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Culvert	
Erosion Frequency	Spring Runoff & Rain Storms	
Dimensions	15" X 32' Corrugated Metal Culvert	Good Condition
Priority - Low - Moderate - High		
Roadway Width	18'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	5'	
Name of Stream	N/A	
		Inv. Date: 11/25/2014

Recommended Treatment:

Estimated Cost:
See attached Sheet.

Notes:

Dewing Shore (3) Pictures



Franklin Watershed		
Infrastructure Site Inventory for Water Quality Improvements		
		Remarks:
Road Name	Dewing Shore	
TH #	TH 18	
Site ID	DS - 4	
GPS	N 44.98265°	
	W 72.85316°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	High Density Polyethelene Pipe (HDPEP)	Drop Inlet on Inlet end.
Erosion Frequency	Spring Runoff & Rain Storms	
Dimensions	15"X36'	Drop Inlet on Inlet end.
Priority - Low - Moderate - High		
Roadway Width	20'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	At lake's edge	
Name of Stream	N/A	
		Inv. Date: 11/25/2014
Recommended Treatment:		
Estimated Cost: Pipe		
See attached Sheet.		
Notes:		

Dewing Shore (4) Pictures



Dewing Shore (5) Pictures



Hammond Shore

Cost Estimate Worksheet - Hammond Shore

Project ID - HS - 1

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.		\$ 2.53	1.5	\$ -	
Type 1 Stone Fill	613.1	C.Y.	14	\$ 40.50	1.5	\$ 850.50	Construct Plunge Pool @ culvert outlet.
Gravel	301.28	C.Y.		\$ 46.42	1.5	\$ -	
All Purpose Excavator Rental	608.25	Hr.		\$ 72.44	1.5	\$ -	
Truck Rental	608.37	Hr.		\$ 65.27	1.5	\$ -	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.		\$ 8.06	1.5	\$ -	
Mulch	651.25	Ton		\$ 544.15	1.5	\$ -	
					Total	\$ 850.50	

Cost Estimate Worksheet - Hammond Shore

Project ID - HS - 2

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	135	\$ 2.53	1.5	\$ 512.33	100X12÷9 = 133
Type 1 Stone Fill	613.1	C.Y.	14	\$ 40.50	1.5	\$ 850.50	Outlet Plunge Pool
Type 2 Stone Fill	613.11	C.Y.	120	\$ 35.25	1.5	\$ 6,345.00	Inlet Check Dams - Inlet Head wall - Road Slope
Gravel	301.28	C.Y.	16	\$ 46.42	1.5	\$ 1,114.08	100X14X0.25÷27=12.96X1.25=16.2
All Purpose Excavator Rental	608.25	Hr.	2	\$ 72.44	1.5	\$ 217.32	
Truck Rental	608.37	Hr.	2	\$ 65.27	1.5	\$ 195.81	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20		\$ -	
Seed	651.15	Lb.	10	\$ 8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.2	\$ 544.15	1.5	\$ 163.25	
					Total	\$ 9,519.18	

Cost Estimate Worksheet - Hammond Shore

Project ID - HS - 3

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	50	\$ 2.53	1.5	\$ 189.75	
Type 1 Stone Fill	613.1	C.Y.	20	\$ 40.50	1.5	\$ 1,215.00	Plunge Pool - Check Dams
Gravel	301.28	C.Y.	16	\$ 46.42	1.5	\$ 1,114.08	100X14X0.25+27=12.96X1.25=16.2
All Purpose Excavator Rental	608.25	Hr.	4	\$ 72.44	1.5	\$ 434.64	
Truck Rental	608.37	Hr.	4	\$ 65.27	1.5	\$ 391.62	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.	10	\$ 8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.2	\$ 544.15	1.5	\$ 163.25	
Culvert (36" Corrugated Polyethylene Pipe)	601.203	L.F.	40	\$ 62.00	1.5	\$ 3,720.00	36" X 40' +/- Depending on Hydraulic Study & Engineering
					Total	\$ 7,349.24	

Cost Estimate Worksheet - Hammond Shore

Project ID - HS - 4

Item	Vtrans Item No.	Unit	Number of Units	Unit Cost	Factor	Total	Remarks
Common Excavation	203.15	C.Y.		\$ 8.90	1.5	\$ -	
Geotextile Fabric	649.31	S.Y.	50	\$ 2.53	1.5	\$ 189.75	
Type 1 Stone Fill	613.1	C.Y.	20	\$ 40.50	1.5	\$ 1,215.00	
Gravel	301.28	C.Y.	16	\$ 46.42	1.5	\$ 1,114.08	
All Purpose Excavator Rental	608.25	Hr.	4	\$ 72.44	1.5	\$ 434.64	
Truck Rental	608.37	Hr.	4	\$ 65.27	1.5	\$ 391.62	
Temporary Erosion Matting	653.2	S.Y.		\$ 2.20	1.5	\$ -	
Seed	651.15	Lb.	10	\$ 8.06	1.5	\$ 120.90	
Mulch	651.25	Ton	0.2	\$ 544.15	1.5	\$ 163.25	
Culvert (36" Corrugated Polyethylene Pipe)	601.203	L.F.	40	\$ 62.00	1.5	\$ 3,720.00	36" X 40' +/- Depending on Hydraulic Study & Engineering
					Total	\$ 7,349.24	

Hammond Shore (1) Pictures



Franklin Watershed		
Infrastructure Site Inventory for Water Quality Improvements		
		Remarks:
Road Name	Hammond Shore Road	
TH #	N/A	
Site ID	HS - 2	
GPS	N 44.98063°	
	W 72.85347°	
Drainage StructureType: Road - Ditch - Road Slope - Other	Reinforced Concrete Culvert	
Frequency	Spring Runoff & Rain Storms	
Dimensions	36"X 50'	
Priority - Low - Moderate - High		
Roadway Width	14'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	100' +/-	
Name of Stream	N/A	
		Inv. Date: 11/25/2014
Recommended Treatment:	Has existing Stone Splash Pool & Check Dam	
	1.- Repair Splash Pool and Check Dam. 2.- Needs Headwall on Inlet end. 3.- Needs roadway embankment stabilization with Stone Fill (Type 3) 100x12x3 4.- Stone check Dam around culvert inlet. 5.- Recommend Hydraulic Study for this site prior to repairs.	
Estimated Cost:	See attached Sheet.	
	Type 1 - 141 CY Type 2 - 120 CY	
Notes:		

Hammond Shore (2) Pictures



Franklin Watershed
Infrastructure Site Inventory for Water Quality Improvements

		Remarks:
Road Name	Hammond Shore Road	
TH #	N/A	
Site ID	HS - 3	
GPS	N 44.97820	
	W 72.85639	
Drainage StructureType: Road - Ditch - Road Slope - Other	Reinforced Concrete Culvert	Outlet end is half full.
Frequency	Spring Runoff & Rain Storms	
Dimensions	18"X24'	
Priority - Low - Moderate - High		
Roadway Width	16'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	220' +/-	
Name of Stream	N/A	
		Inv. Date: 11/25/2014

Recommended Treatment:
1.- Recommend Hydraulic Study for this site prior to repairs.
2.-Replace Culvert - is too short for the roadway.
3.- Construct Stone Plunge Pool at culvert outlet and Stone check Dams at culvert inlet.

Estimated Cost:
See attached Sheet.

Notes:

Hammond Shore (3) Pictures



Franklin Watershed		
Infrastructure Site Inventory for Water Quality Improvements		
		Remarks:
Road Name	Hammond Shore Road	
TH #	N/A	
Site ID	HS - 4	
GPS	N 44.97701	
	W 72.85793	
Drainage StructureType: Road - Ditch - Road Slope - Other	Corrugated Metal Culvert	
Frequency	Spring Runoff & Rain Storms	
Dimensions	24"X 20'	
Priority - Low - Moderate - High		
Roadway Width	13'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	Flat	
Distance to edge of Lake Carmi	360' +/-	
Name of Stream	N/A	
		Inv. Date: 11/25/2014
Recommended Treatment: Replace Culvert 1.- Complete a Hydraulic Study 2.-Replace Culvert with redommended size. 3.- Construct Stone Plunge Pool at culvert outlet and Stone check Dams at culvert inlet.		
See attached Sheet.		
Notes:		

Hammond Shore (4) Pictures



Lake Carmi Drainage Structure Inventory
for
Franklin Watershed Committee



Prepared by
Smith Technical Services
June 2017

2017 Franklin Watershed Private Road Drainage Structure Inventory

This Inventory of roadway drainage and structures is of the Westerly Shore of Lake Carmi, and compliments a previous similar inventory of the North and East side of the Lake.

This Inventory covers the following private roads:

Wescott Shore Rd., Mullen Shore Rd., Patterson Point Rd., Tanner Junction Rd., Sandy Bay Rd., Black Woods Rd., Titemore Woods Rd., Ledge Drive, Hill Rd., and Scottish Lane. Roads with no visible drainage structures are Tanner Junction Rd., Ledge Drive, Hill Rd., and Scottish Lane.

While reviewing the above listed roads, I found some things in general that would be detrimental to Water Quality of Lake Carmi. Most, but not all of the roads have characteristics as follows:

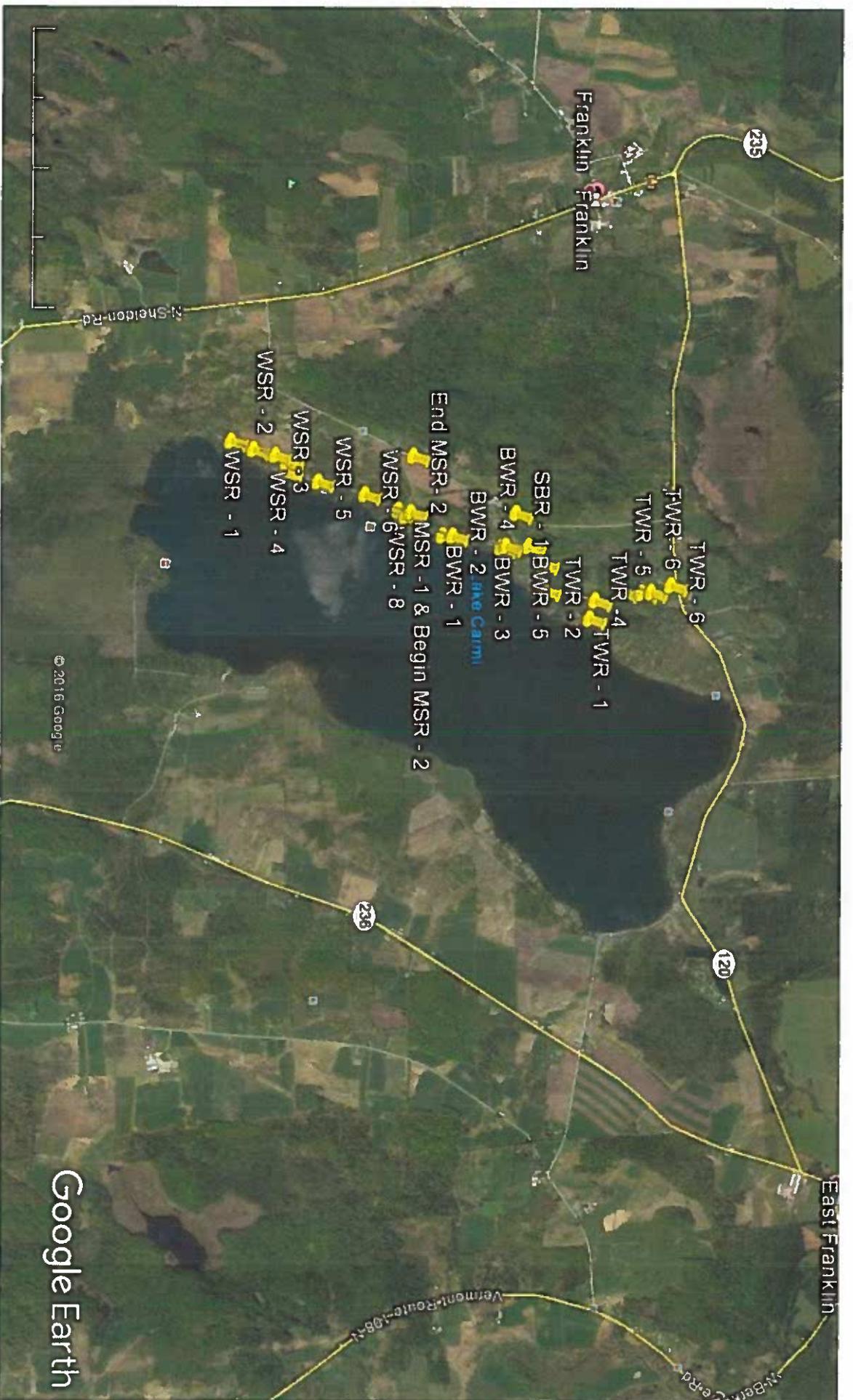
- Roadway ditches are inadequately maintained.
- Roadway surfaces are not crowned to allow for sheading water into ditches.
- Culverts are not installed deep enough to allow for efficient drainage.
- Some culverts are undersized. (diameter and length)
- Wheel tracks are trapping water allowing for erosion.
- Lack of gravel for the traveling surface

While many improvements have previously been made, it would be well to keep in mind the things listed above going forward, to enhance the time, effort and expense.

Most of the recommendations made here are from the Better Roads Manual, which are relatively straightforward, and allow some deviation in design to fit the present circumstances.

Jim Smith

Smith Technical Services



Google Earth



Google Earth

FRANKLIN WATERSHED INVENTORY 2017

Westcott Shore Road – WSR 1 – WSR 8

Patterson Point Road – PPR – 1

Tanner Junction Road – No Items to report

Mullen Shore Road – MSR – 1 & MSR - 2



Google Earth

feet
km



Google Earth



Franklin Watershed

Infrastructure Site Inventory for Water Quality Improvements

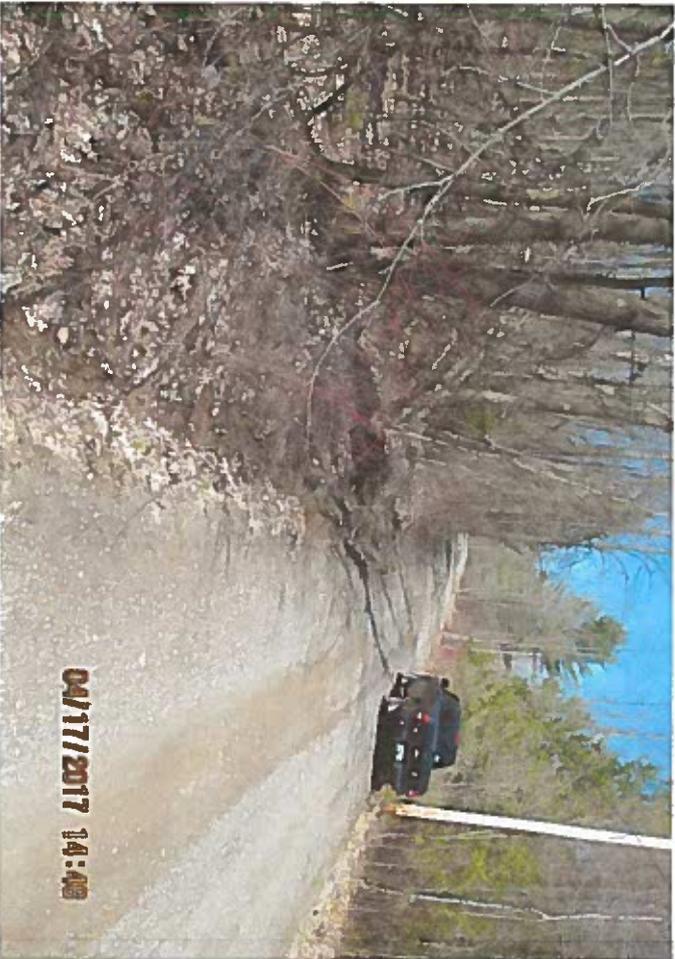
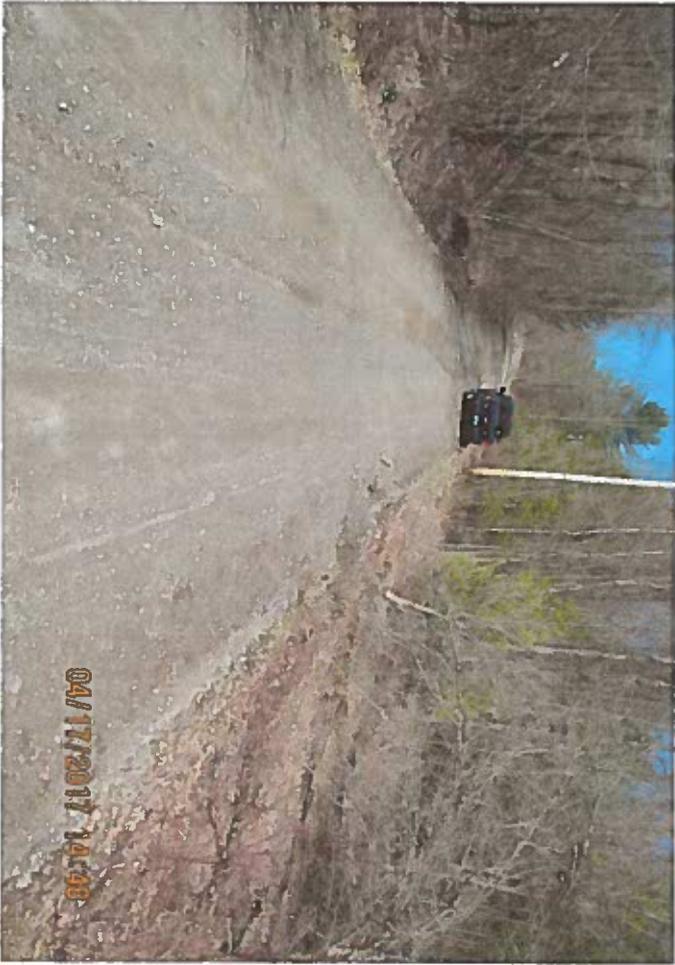
		Remarks:
Road Name	Wescott Shore Rd.	
TH #	N/A	
Site ID	WSR - 1	
GPS	N-44.95879°	100' +/- North of Camp 866
	W - 72.89542°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Road Culvert - Concrete Pipe	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	12" X 16'	
Priority - Low - Moderate - High	High	
Roadway Width	14'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	2%	
Distance to edge of Lake Carmi	205'	
Name of Stream		
	Inventory Date:	04/18/17

Recommended Treatment:

1. - Replace culvert with new 18" X 20' Mimimum
2. - Construct Stone Plunge Pool at culvert outlet.

Estimated Cost:		
18"X20' Cvorrugated Metal Culvert	20 X \$75.00 = \$1500	\$ 1,500.00
10' Round Plunge Pool - Outlet	3 C.Y, Type 1 Stone @\$50	\$150.00
		Total = \$1,650.00

Notes:



Franklin Watershed

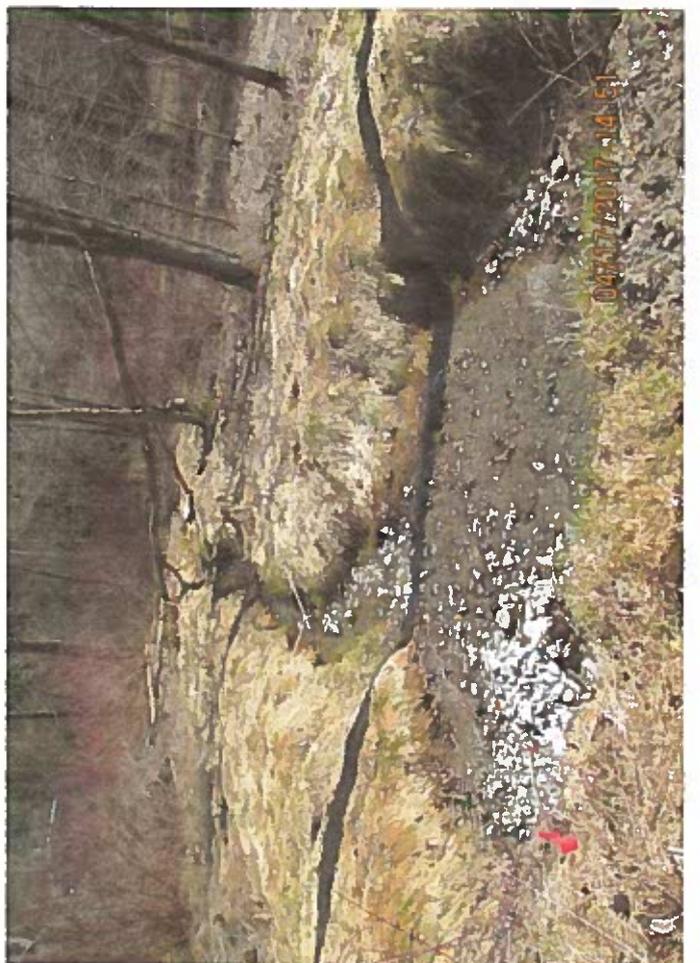
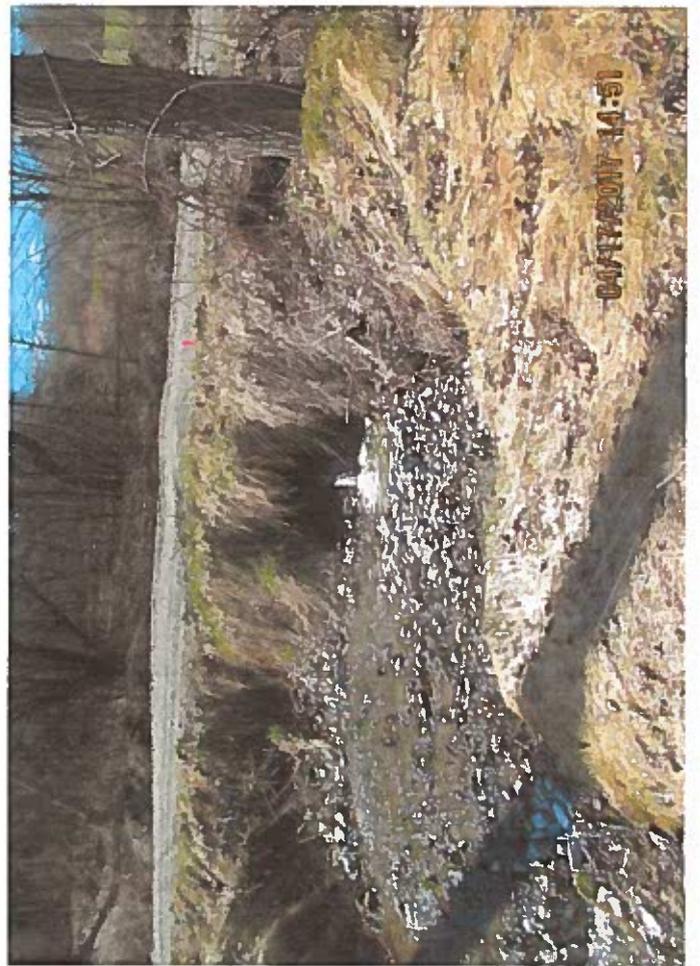
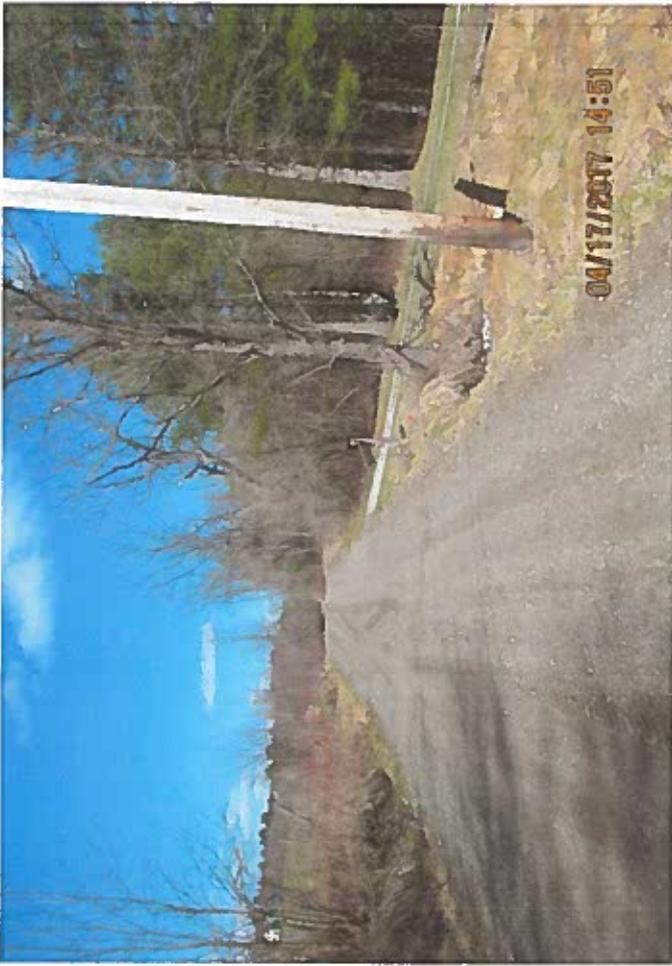
**Infrastructure Site Inventory
for Water Quality Improvements**

		Remarks:
Road Name	Wescott Shore Rd.	
TH #	N/A	
Site ID	WSR - 2	
GPS	N-44.96014° W - 72.87471°	40 +/- South of Camp 725
Drainage Structure Type: Road - Ditch - Road Slope - Other	Road Culvert - HDPEP Pipe	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	18" X 20'	Could be lowered 12": +/-
Priority - Low - Moderate - High	Low	
Roadway Width	14'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	2%	
Distance to edge of Lake Carmi		
Name of Stream		
	Inventory Date:	04/18/17

Recommended Treatment:
Lower Culvert 1+/- foot, construct Plunge Pool outlet. Regrade inlet ditch to new culvert grade.

Estimated Cost:		
10' Round Plunge Pool - Outlet	3 C.Y, Type 1 Stone @\$50	\$150.00
		Total - 150.00

Notes:



Franklin Watershed

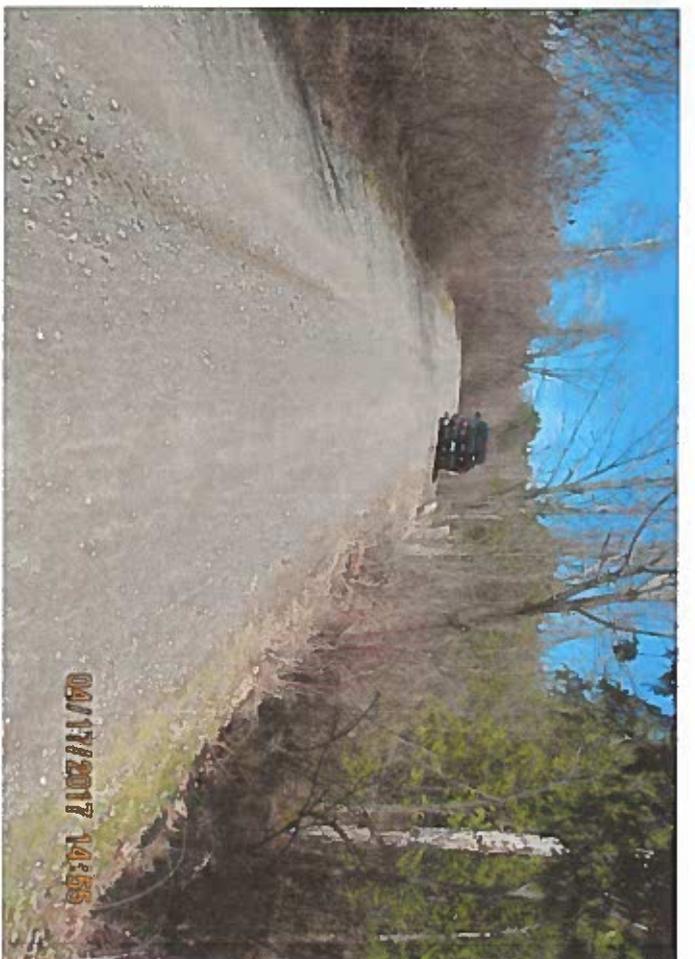
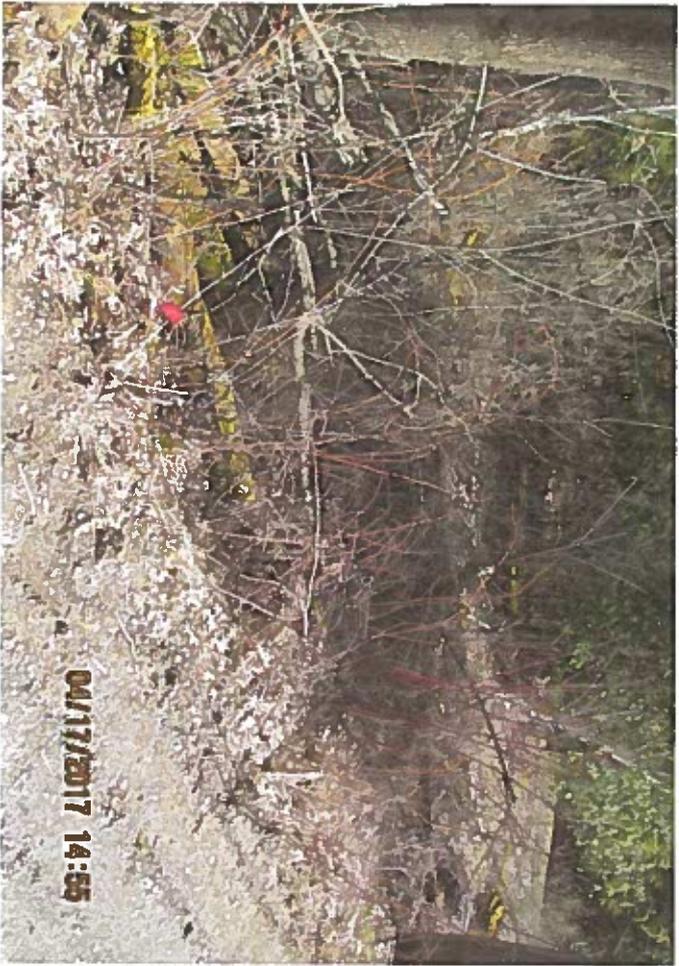
**Infrastructure Site Inventory
for Water Quality Improvements**

		Remarks:
Road Name	Wescott Shore Rd.	
TH #	N/A	
Site ID	WSR - 3	
GPS	N-44.96147°	100' North of Camp 647
	W - 72.89422°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Road Culvert - Corrugated Metal Pipe	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	12" X 20'	
Priority - Low - Moderate - High	Low	
Roadway Width	14'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	2%	
Distance to edge of Lake Carmi		
Name of Stream		
	Inventory Date:	04/18/17

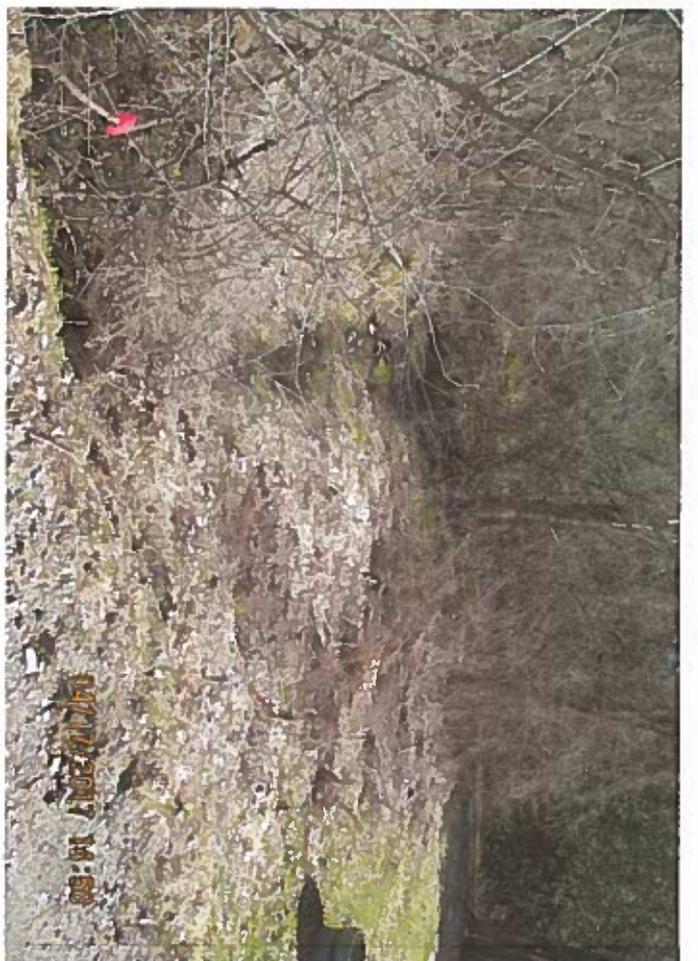
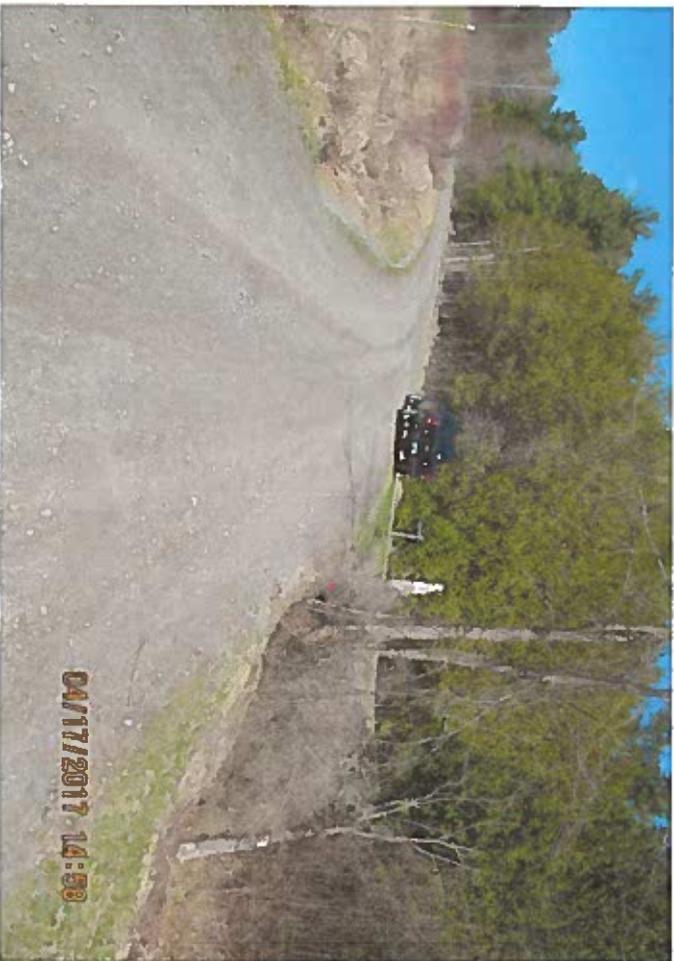
Recommended Treatment:
Install new 18" X 24' Corrugated Metal Pipe with Plunge Pool at outlet.

Estimated Cost:		
10' Round Plunge Pool - Outlet	3 C.Y, Type 1 Stone @\$50	\$ 150.00
18" X 24' Corrugated Metal Pipe	24X \$75.00=	\$ 1,800.00
		\$ 1,950.00

Notes:



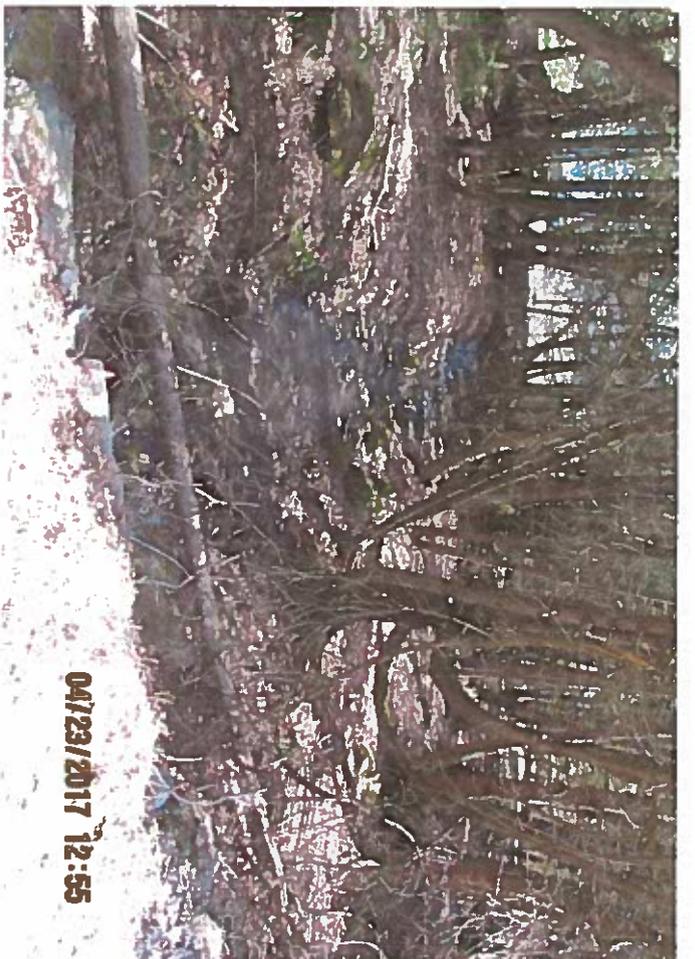
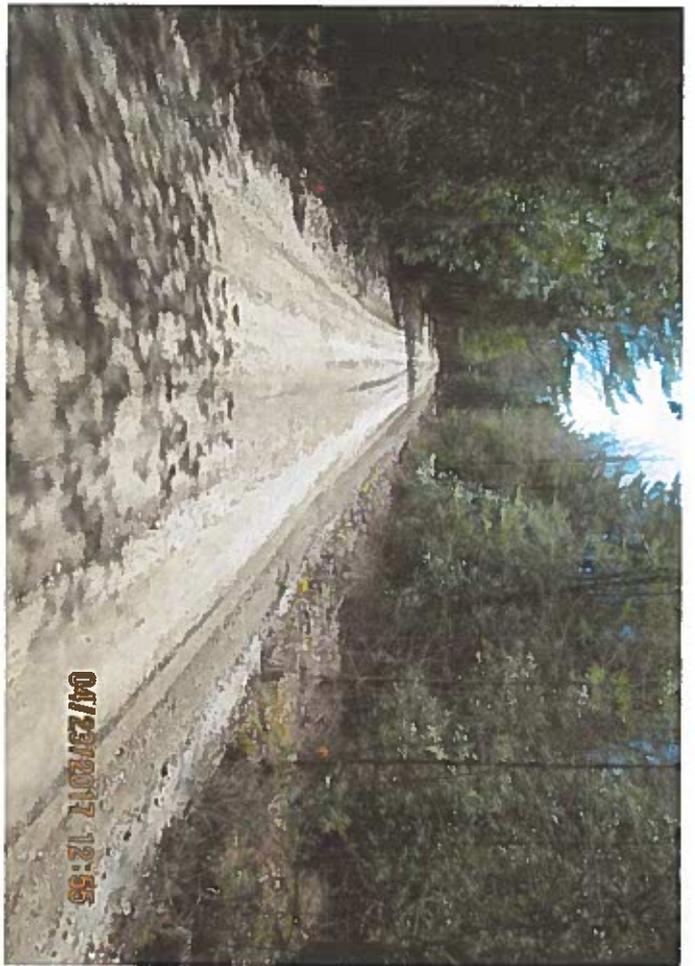
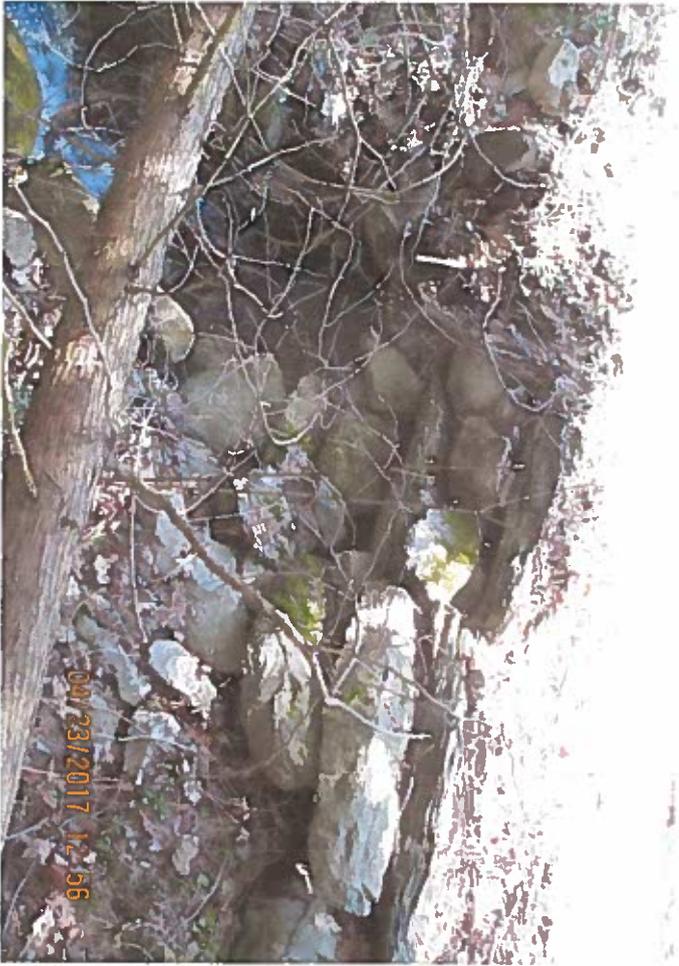
Franklin Watershed		Infrastructure Site Inventory for Water Quality Improvements	
		Remarks:	
Road Name	Wescott Shore Rd.		
TH #	N/A		
Site ID	WSR - 4		
GPS	N-44.96213°		
	W - 72.89361°	50' +/- ' North of Camp 593	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Road Culvert - Corrugated Metal Pipe		
Erosion Frequency	Spring Runoff - Rain Storms		
Dimensions	12" X 20'		
Priority - Low - Moderate - High	Low		
Roadway Width	14'	Traveled Way	
Surface Type	Gravel		
Road Grade: % Grade	2%		
Distance to edge of Lake Carmi	337		
Name of Stream			
	Inventory Date:	04/18/17	
Recommended Treatment:			
Install new 24" X 30' Corrugated Metal 10' Round Plunge Pool - Outlet	3 C.Y, Type 1 Stone @\$50		\$150.00
Estimated Cost:			
10' Round Plunge Pool - Outlet	3 C.Y, Type 1 Stone @\$50	\$	150.00
		\$	150.00
Notes:			



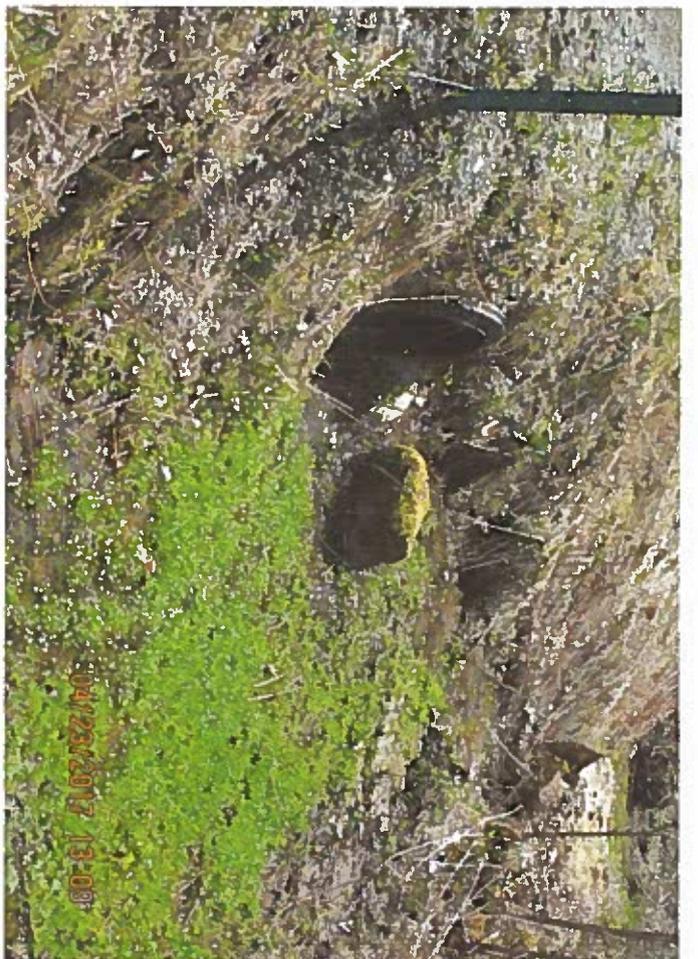
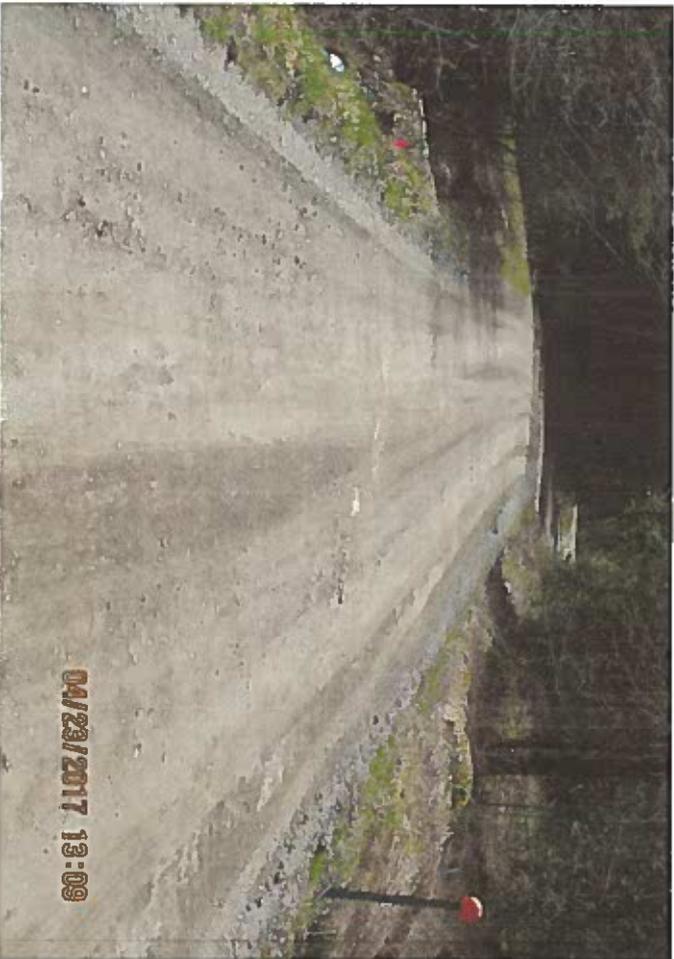
Franklin Watershed		Infrastructure Site Inventory for Water Quality Improvements
		Remarks:
Road Name	Wescott Shore Rd.	
TH #	N/A	
Site ID	WSR - 5	
GPS	N-44.96405°	
	W-72. 89196°	200'+/- ' North of Tanner Junction Rd.
Drainage Structure Type: Road - Ditch - Road Slope - Other	Road Culvert - Corrugated Metal Pipe Arch	Concrete Headwalls - New recently
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	5.5' X 3.3' X 30'	
Priority - Low - Moderate - High	Low	
Roadway Width	14'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	0%	
Distance to edge of Lake Carmi	318%	
Name of Stream		
	Inventory Date:	4/18/17
Recommended Treatment:		
Clean Plunge Pool - Outlet		\$ 50.00
Estimated Cost:		
Labor	2 Hrs.	\$ 50.00
		Total - \$50.00
Notes: Some silt in Plunge Pool @ outlet.		



Franklin Watershed		Infrastructure Site Inventory for Water Quality Improvements	
		Remarks:	
Road Name	Wescott Shore Rd.		
TH #	N/A		
Site ID	WSR - 6		
GPS	N-44.96687° W-72. 89092°	40' +/- ' South of camp 187	
Drainage Structure Type: - Ditch - Road Slope - Other	Road Road Culvert - HDPEP	Good Condition	
Erosion Frequency	Spring Runoff - Rain Storms		
Dimensions	24" X 20'		
Priority - Low - Moderate - High	Low		
Roadway Width	14'	Traveled Way	
Surface Type	Gravel		
Road Grade: % Grade	0%		
Distance to edge of Lake Cami	318%		
Name of Stream			
	Inventory Date:	4/24/17	
Recommended Treatment:			
Construct 10' Round Plunge Pool - Outlet			
Check Dams north and South of Inlet in Roadway Ditches			
Estimated Cost:			
10' Round Plunge Pool - Outlet	3 C.Y, Type 1 Stone @\$50	\$	150.00
(2) Check Dams	3 C.Y, Type 1 Stone @\$50	\$	150.00
		Total	\$300.00
Notes: Some silt in Plunge Pool @ outlet.			



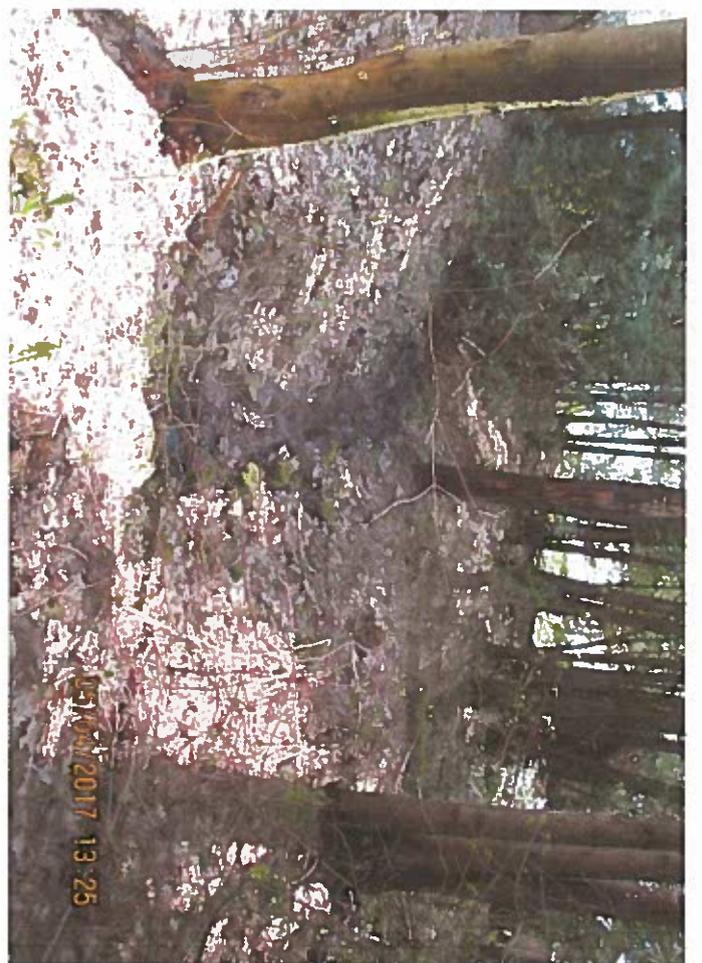
WSR-6

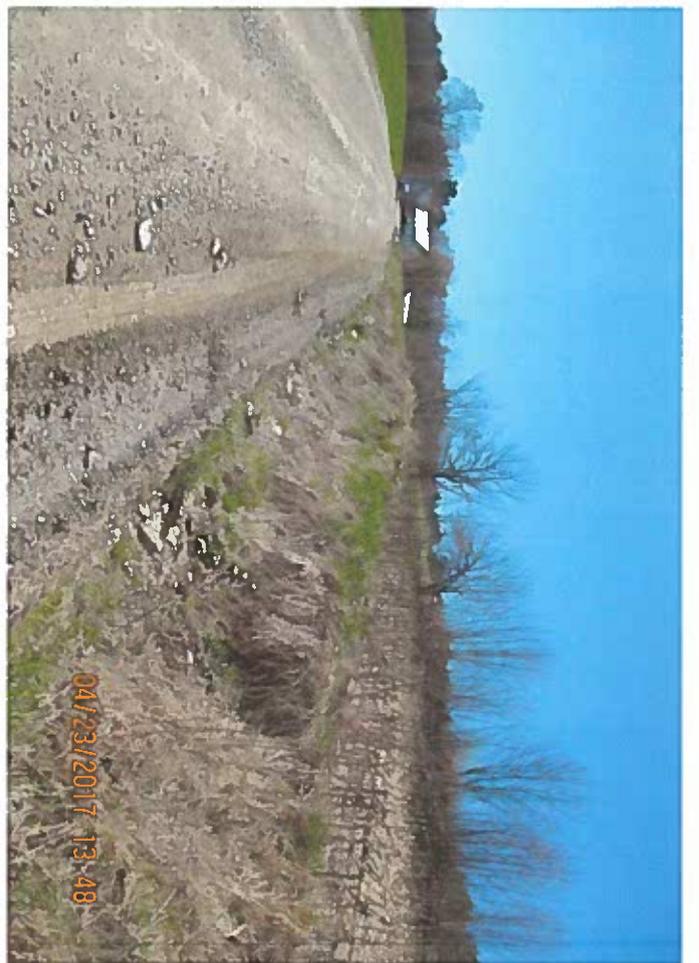
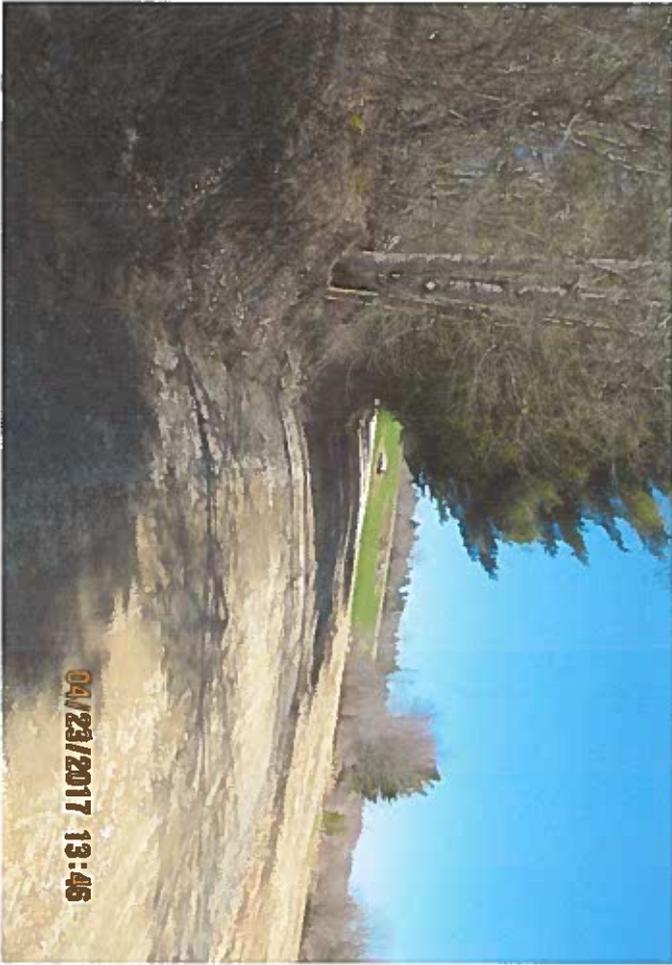


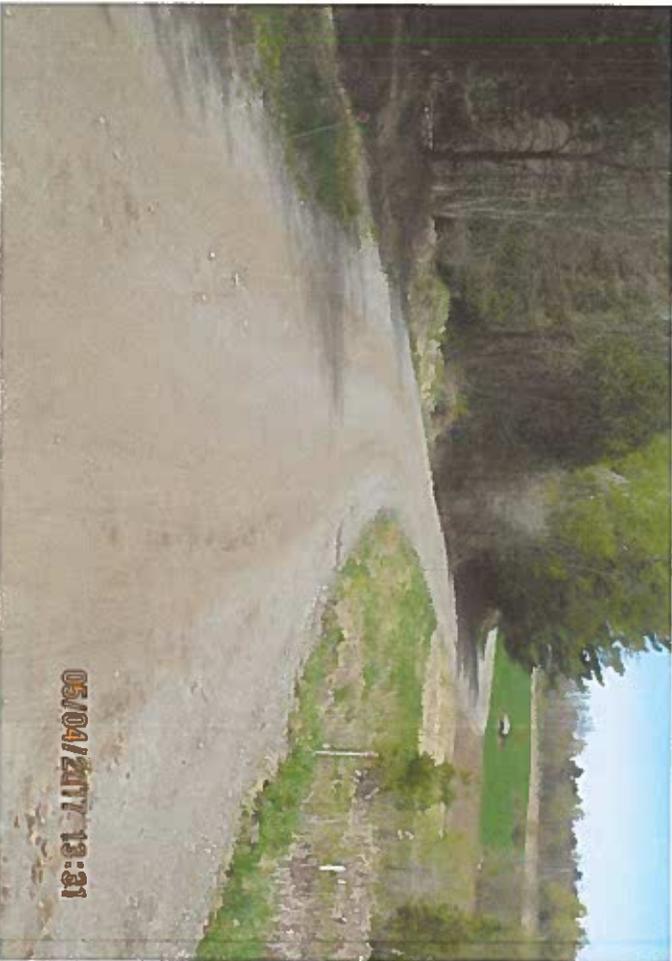
Franklin Watershed		Infrastructure Site Inventory for Water Quality Improvements	
		Remarks:	
Road Name	Wescott Shore Rd.		
TH #	N/A		
Site ID	WSR - 8		
GPS	N-44.96931°		
	W-72. 88903°	50 +/- ' South of Mullen Ed.	
Drainage Structure Type: - Ditch - Road Slope - Other	Road Road Culvert - HDPEP	Good Condition	
Erosion Frequency	Spring Runoff - Rain Storms		
Dimensions	24" X 20'		
Priority - Low - Moderate - High	Low		
Roadway Width	14'	Traveled Way	
Surface Type	Gravel		
Road Grade: % Grade	1%		
Distance to edge of Lake Carmi	311'		
Name of Stream			
	Inventory Date:	4/24/17	
Recommended Treatment:			
Construct 10' Round Check Dam - Inlet			
10' Round Plunge Pool - Outlet			
Stone Headwall both Inlet & Outlet need repair/reconstruct.			
Estimated Cost:			
(2) - 10' Round Plunge Pool - Outlet	6 C.Y, Type 1 Stone @\$50		\$300.00
Headwalls	Labor & Materials	\$	300.00
		Total	\$600.00
Notes: Some silt in Plunge Pool @ outlet.			



Franklin Watershed		Infrastructure Site Inventory for Water Quality Improvements	
		Remarks:	
Road Name	Patterson Point Rd.		
TH #	N/A		
Site ID	PPR -1		
GPS	N-44.96208°		
	W-72. 89275°		
Drainage Structure Type: Road - Ditch - Road Slope - Other	Road Culvert - HDPEP	Good Condition	
Erosion Frequency	Spring Runoff - Rain Storms		
Dimensions	6" X 20'		
Priority - Low - Moderate - High	Low		
Roadway Width	10	Traveled Way	
Surface Type	Gravel		
Road Grade: % Grade	0%		
Distance to edge of Lake Carmi	122%		
Name of Stream			
	Inventory Date:	4/24/17	
Recommended Treatment:			
Install 12" min. culvert			
Construct 8' Check Dam - Outlet			
Grade ditches to match new culvert - inlet			
Estimated Cost:			
12" X 20' Culvert	20 X \$70 = \$1400	\$	1,400.00
2 C.Y. Type 1 Stone	2X \$50= \$100	\$	100.00
Grading Ditches	\$200 Est.	\$	200.00
		Total	\$1700.00
Notes: Some silt in Plunge Pool @ outlet.			







MSR-2



Google Earth

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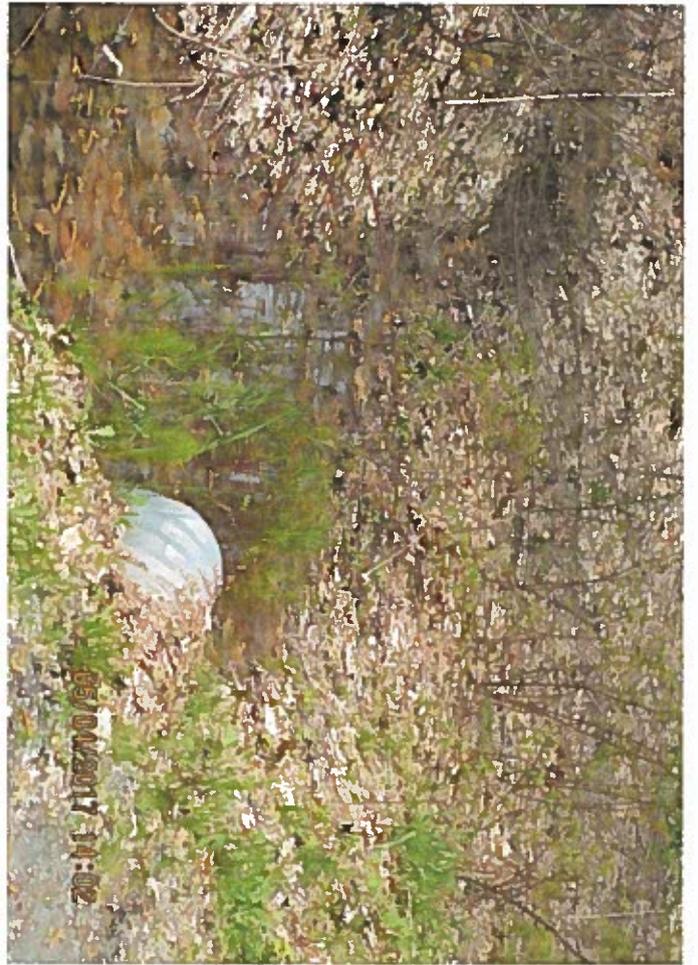
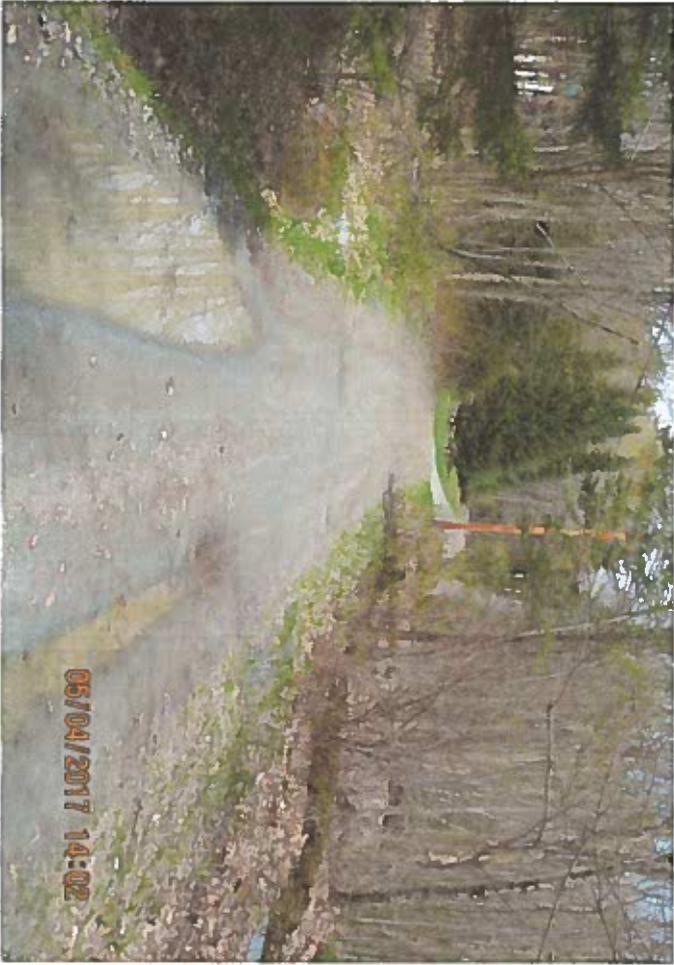
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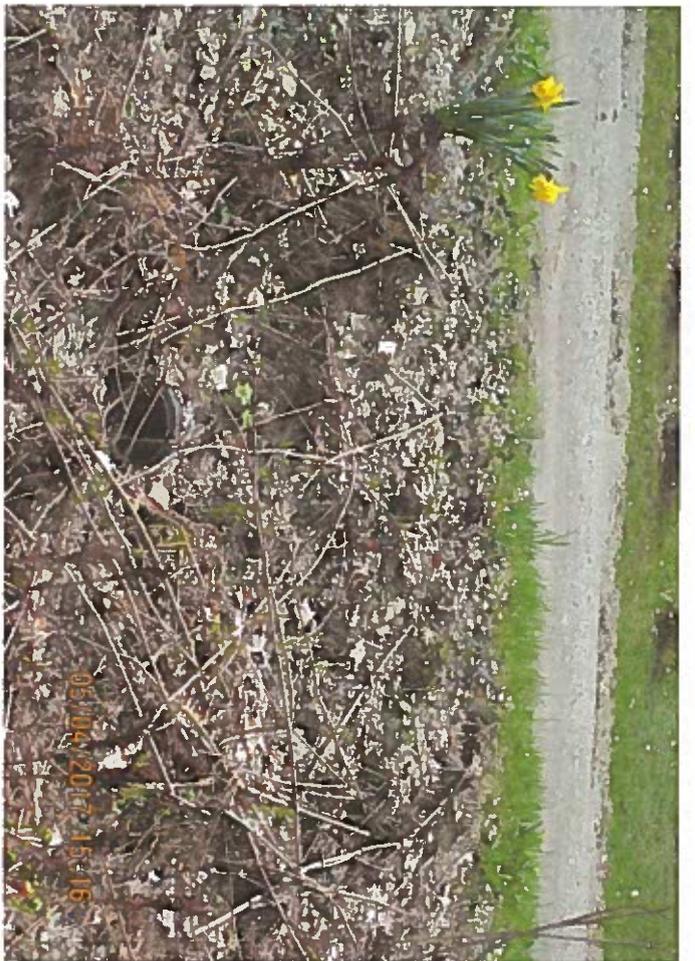
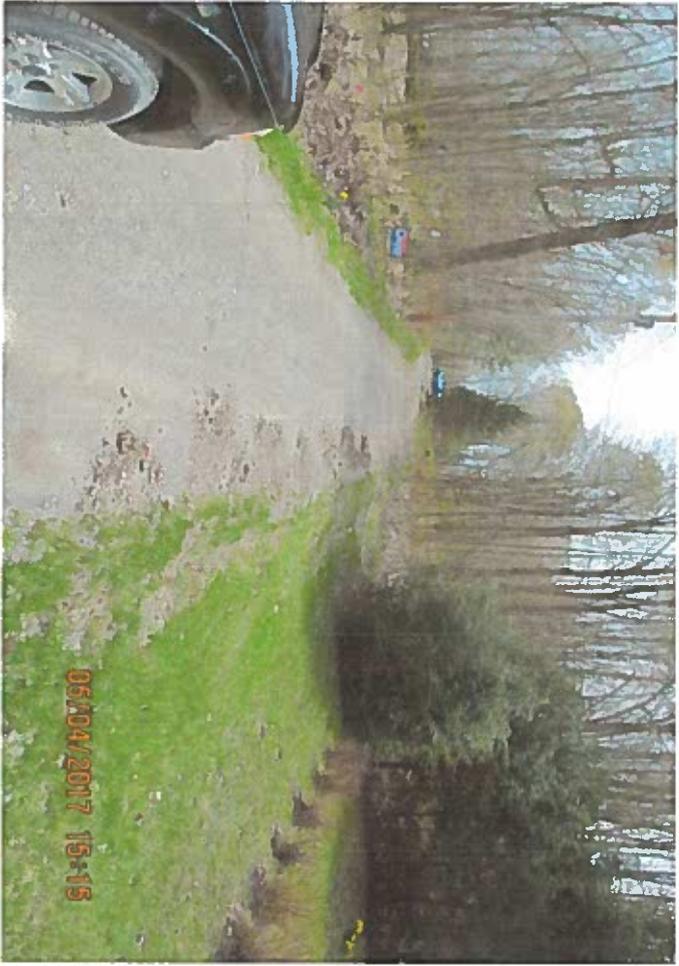
feet
meters

2000

800







BWE-2

Franklin Watershed

**Infrastructure Site Inventory
for Water Quality Improvements**

		Remarks:
Road Name	Black Woods Road	
TH #	N/A	
Site ID	BWR - 3	
GPS	N-44.97506°	50' +/- North of Camp 127
	W - 72.88644°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Road Culvert - Corrugated Metal Pipe	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	30" X 54'	Good Condition
Priority - Low - Moderate - High	Moderate	
Roadway Width	13	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	2%	
Distance to edge of Lake Carmi	180'	
Name of Stream		
	Inventory Date:	05/04/17

Recommended Treatment:

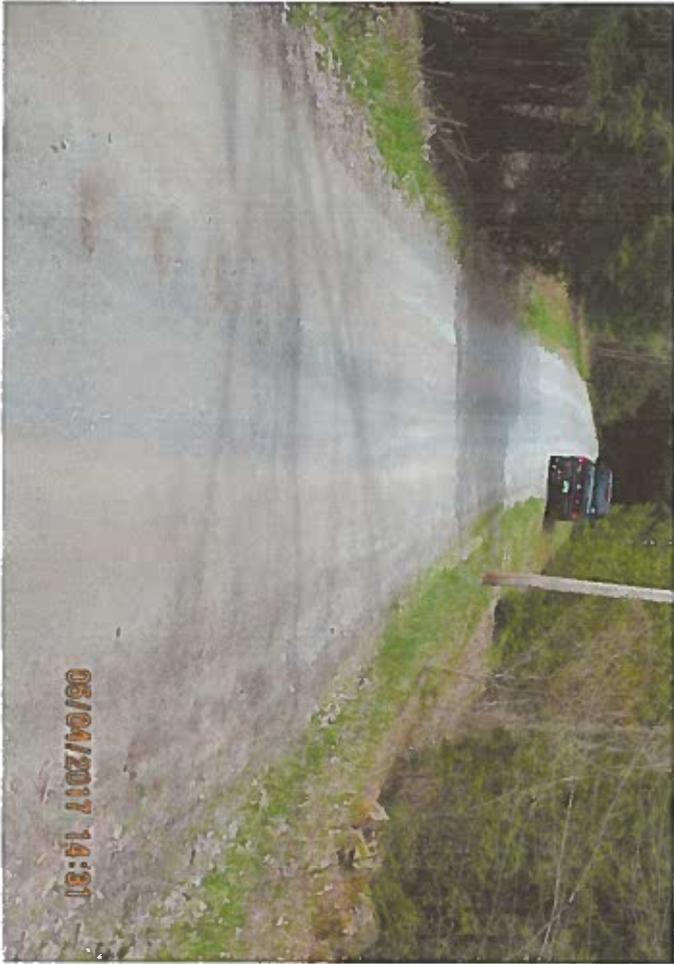
1. Construct Plunge Pool - Outlet.
2. Stone Check Dam on stream upstream of culvert
3. Stone Check Dam on ditch north of Culvert.

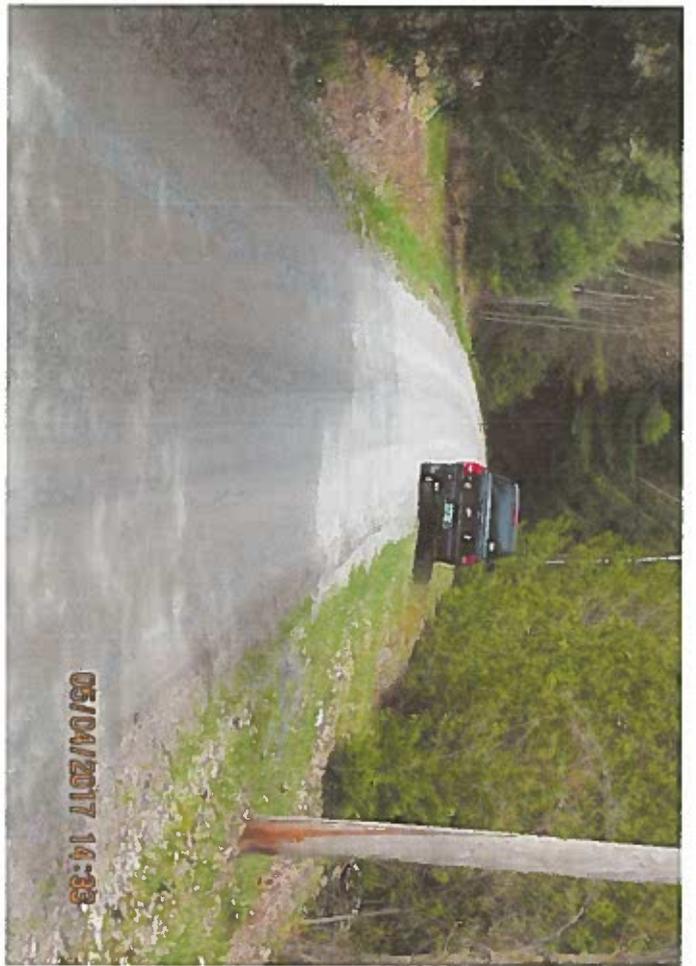
Estimate

10" Stone Plunge Pool	3.5 C.Y. Stone Fill- Type 1@\$50	3.5 C.Y. Stone Fill- Type 1@\$50	✓
(2) Stone Check Dams	7 C.Y. Stone Fill- Type 1@\$50	7 C.Y. Stone Fill- Type 1@\$50	✓
		Total	\$525.00

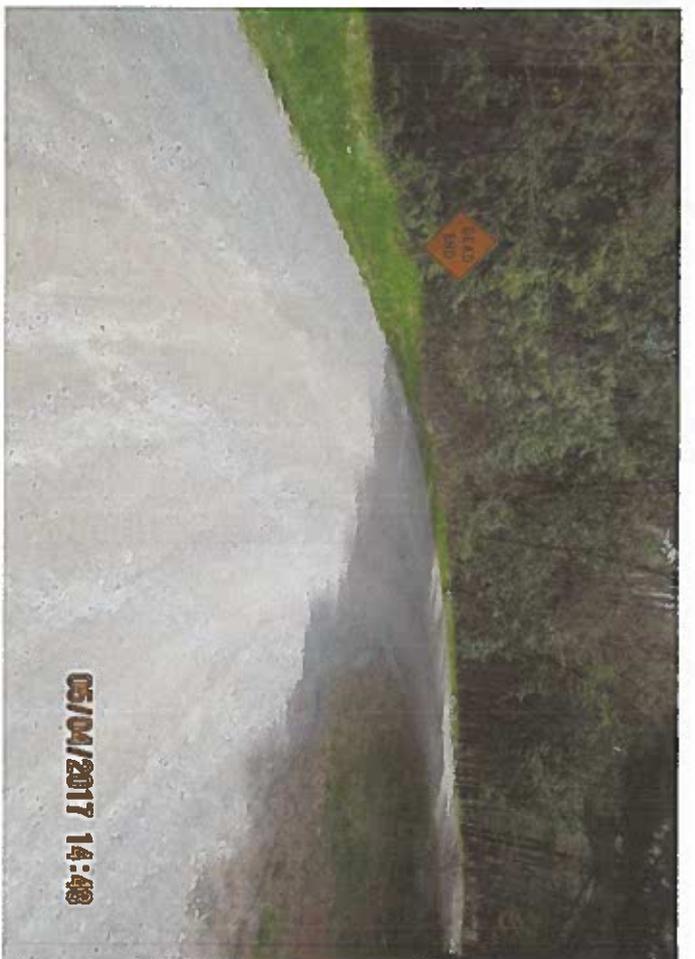
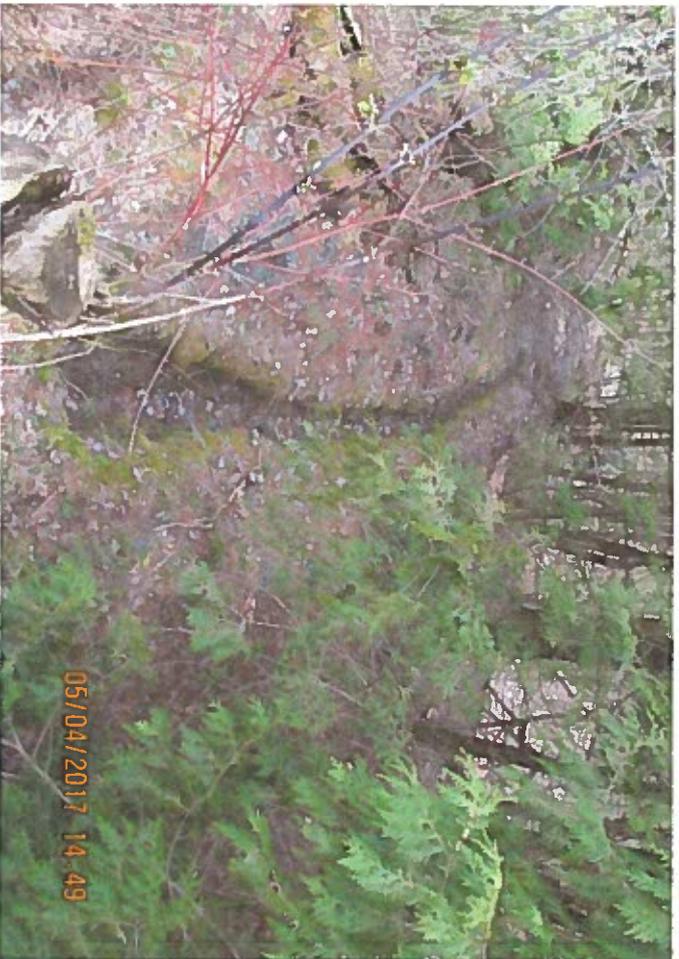
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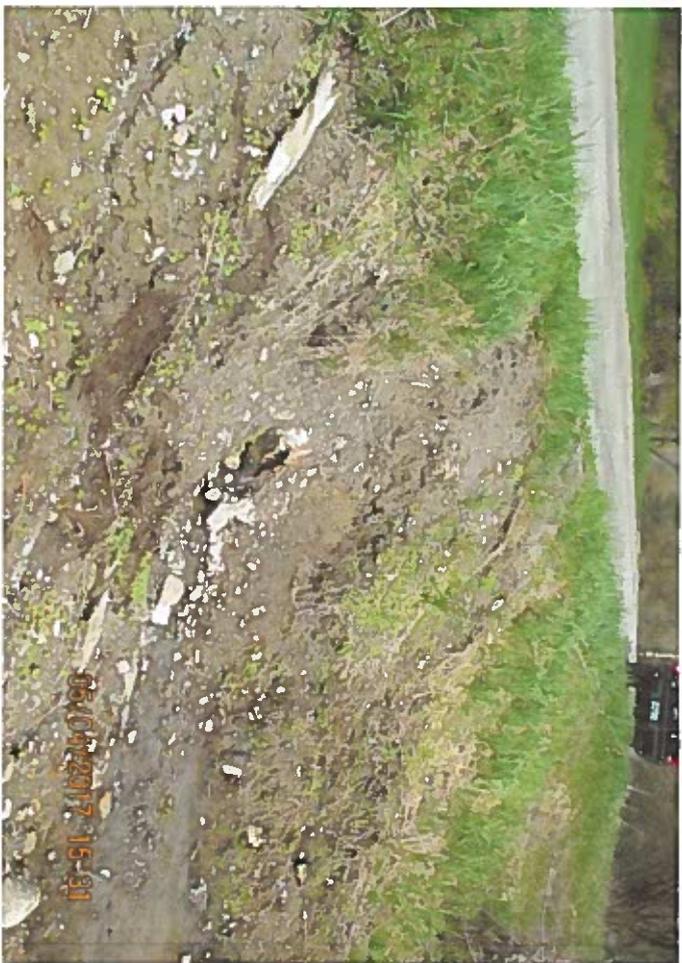
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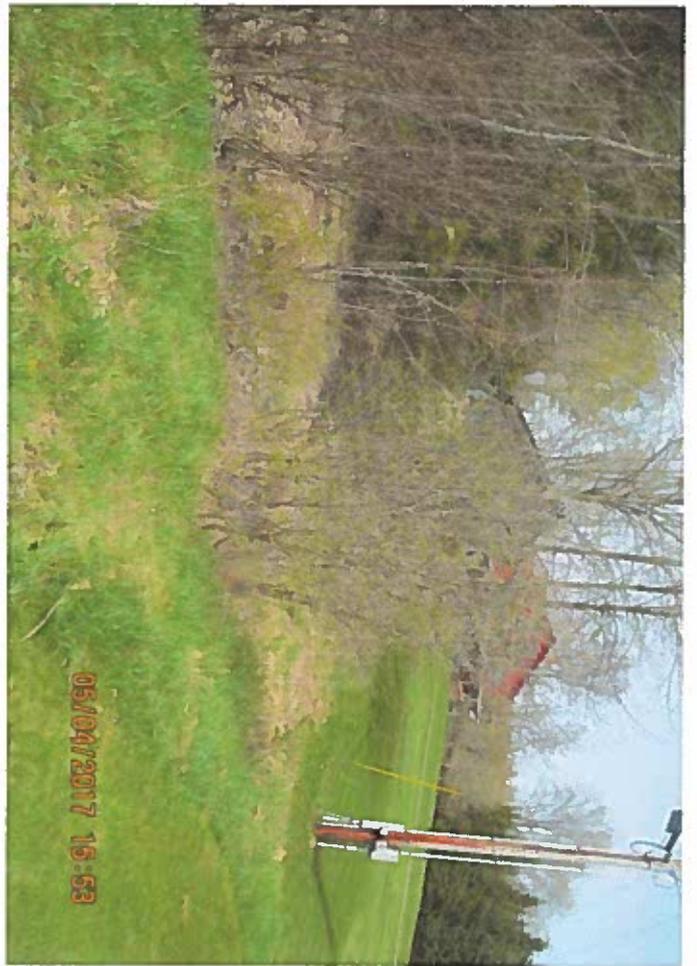


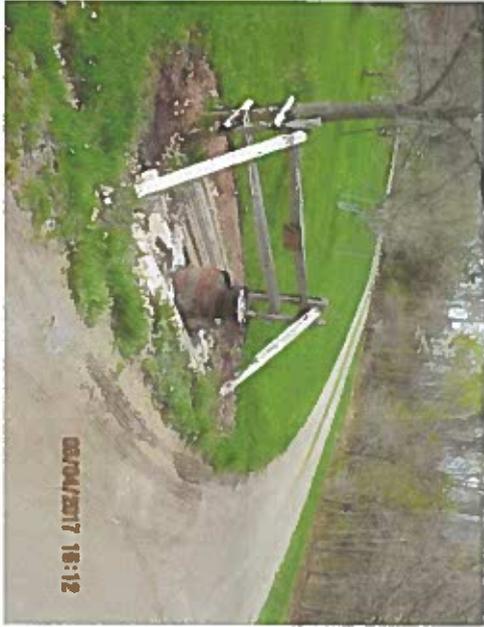
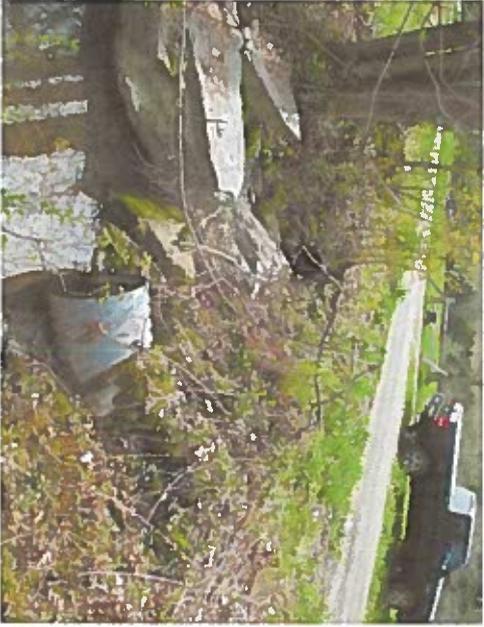


Franklin Watershed		Infrastructure Site Inventory for Water Quality Improvements
		Remarks:
Road Name	Black Woods Road	
TH #	N/A	
Site ID	BWR - 5	
GPS	N-44.97675°	60 +/- South of Sandy bay Rd.
	W - 72.88653°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Road Culvert - Concrete Pipe	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	18" X 60'	Fair Condition
Priority - Low - Moderate - High	Moderate	
Roadway Width	13	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	2%	
Distance to edge of Lake Carmi	345'	
Name of Stream		
	Inventory Date:	05/04/17
Recommended Treatment: 1. Stone line existing ditch (20' +/-) - Outlet. 2. Stone Check Dam on stream upstream of culvert		
Estimate		
10' Stone Check Dam	3.5 C.Y. Stone Fill- Type 1@\$50	\$175.00
20 L.F. Stone Ditch.	5 C.Y. Stone Fill- Type 1@\$50	\$250.00
	Total	\$425.00
Notes:		









FRANKLIN WATERSHED INVENTORY 2017

Titemore Woods Rd. – TWR – 1 – TWR-8

Hill Road - No Drainage Structures Visible.

Elwood Rd. - No Drainage Structures Visible.

Scottish Lane - No Drainage Structures Visible.

Ledge Drive – No Drainage Structures Visible.



Google Earth

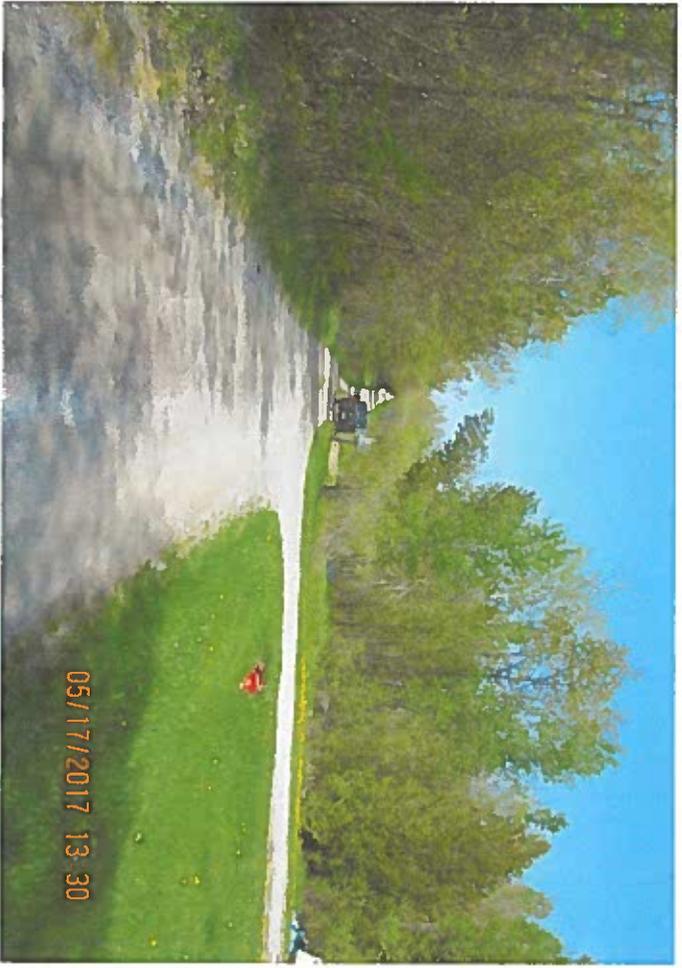
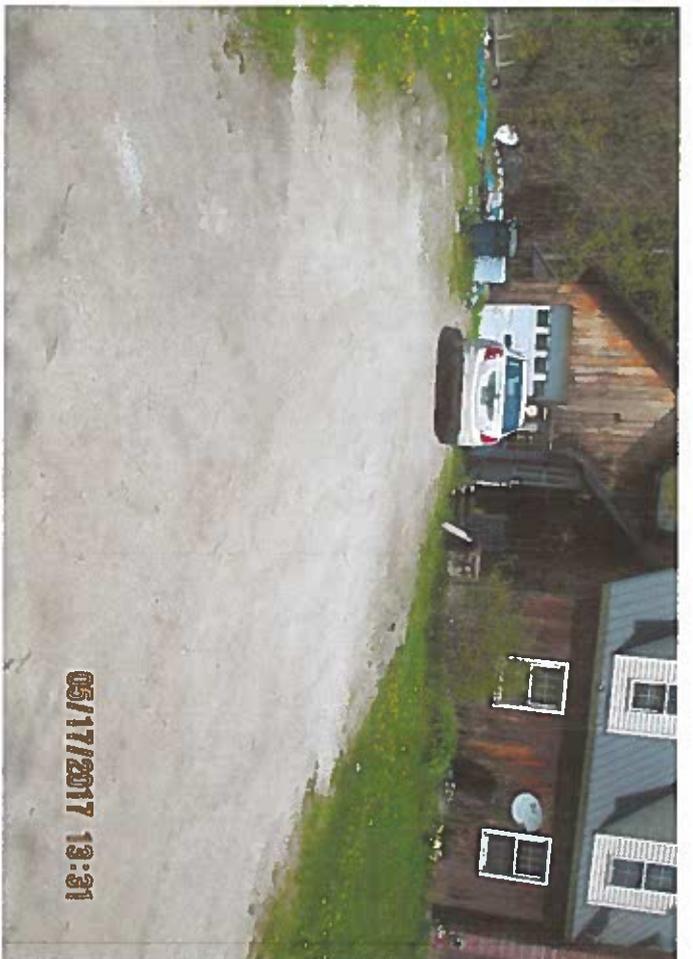
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feet
meters

2000

900





TWR-1

Franklin Watershed

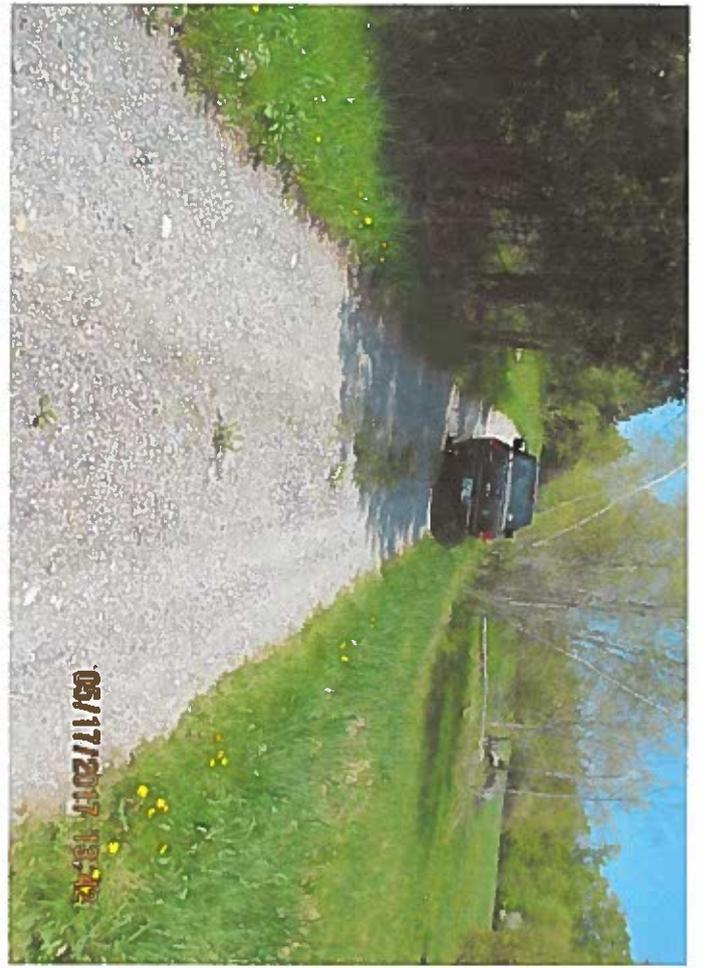
**Infrastructure Site Inventory
for Water Quality Improvements**

		Remarks:
Road Name	Titemore Woods Rd.	
TH #	N/A	
Site ID	TWR - 2	
GPS	N-44.98075°	
	W - 72.88194°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Possible Culvert	
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions		
Priority - Low - Moderate - High	Low	
Roadway Width	9'	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	7%	
Distance to edge of Lake Carmi	650	
Name of Stream		
	Inventory Date:	05/17/17

Recommended Treatment:

Can not find Inlet or Outlet. Pond of water on inlet end. No treatment needed at this time.

Notes:



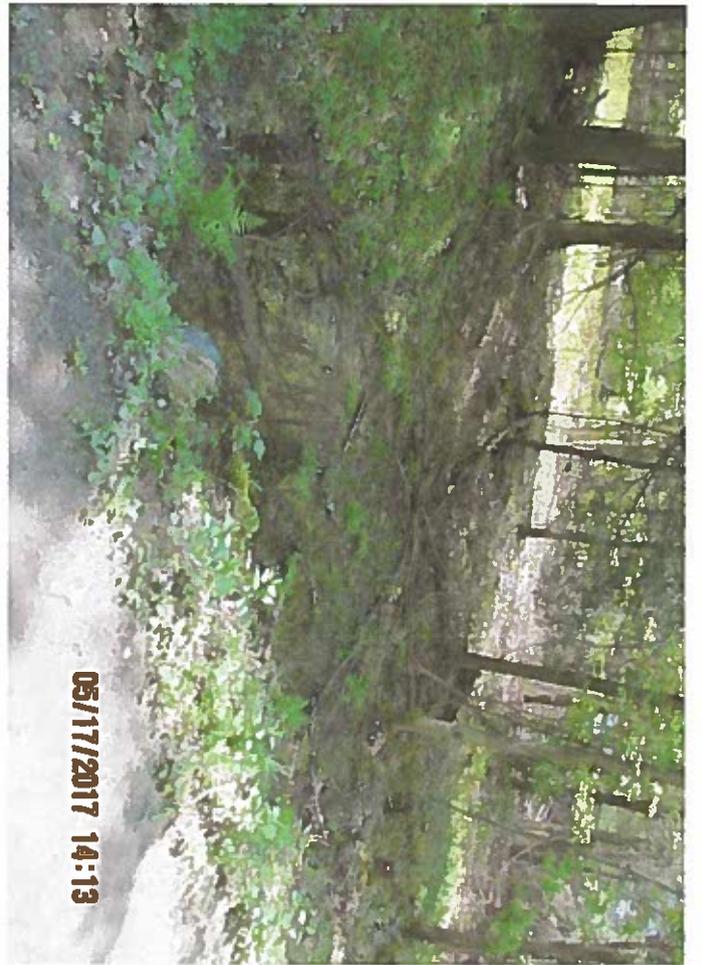
Franklin Watershed

**Infrastructure Site Inventory
for Water Quality Improvements**

		Remarks:
Road Name	Titemore Woods Rd.	
TH #	N/A	
Site ID	TWR - 3	
GPS	N-44.98232° W - 72.88265°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	HDPEP Culvert	Good Condition
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	8" X 20'	
Priority - Low - Moderate - High	Low	
Roadway Width	10	Traveled Way
Surface Type	Earth and Grass	
Road Grade: % Grade	0%	
Distance to edge of Lake Carmi	990'	
Name of Stream		
	Inventory Date:	05/17/17
Recommended Treatment: No treatment recommended at this time.		
Notes: Culvert also used as sap transfer line.		







Franklin Watershed		Infrastructure Site Inventory for Water Quality Improvements
		Remarks:
Road Name	Titemore Woods Rd.	
TH #	N/A	
Site ID	TWR - 6	
GPS	N-44.98528°	
	W - 72.88322°	
Drainage Structure Type: Road - Ditch - Road Slope - Other	Concrete Catch Basin with Grate	Fair Condition
Erosion Frequency	Spring Runoff - Rain Storms	
Dimensions	2' X 2' +/-	
Priority - Low - Moderate - High	Moderate	
Roadway Width	10	Traveled Way
Surface Type	Gravel	
Road Grade: % Grade	0%	
Distance to edge of Lake Carmi	1685'	
Name of Stream		
	Inventory Date:	05/17/17
Recommended Treatment: None - Grass covered inlet and outlet.		
Notes: Was not able to locate outlet.		

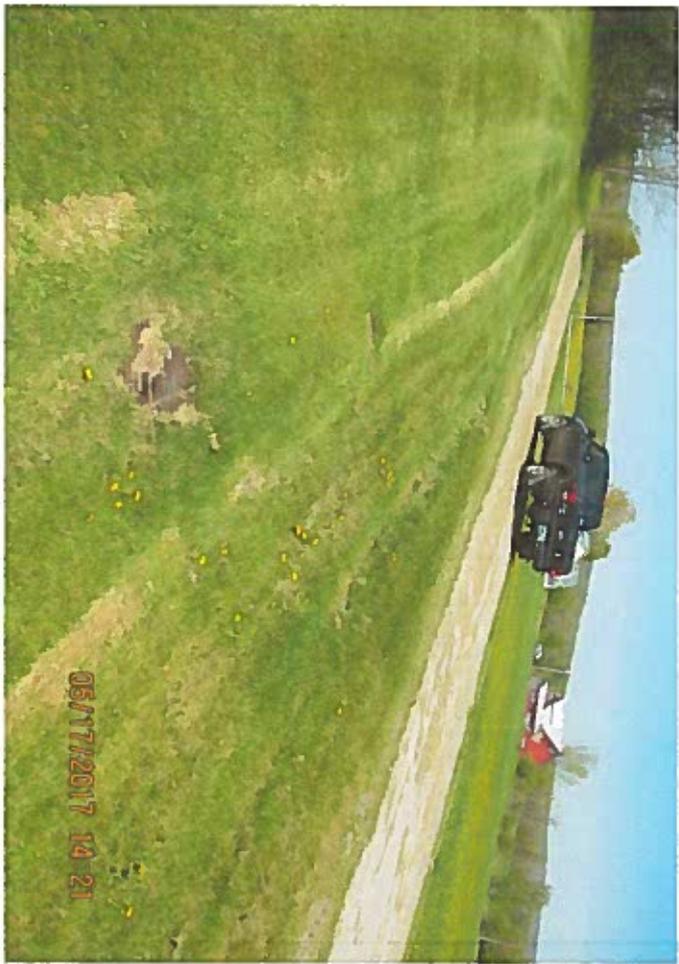
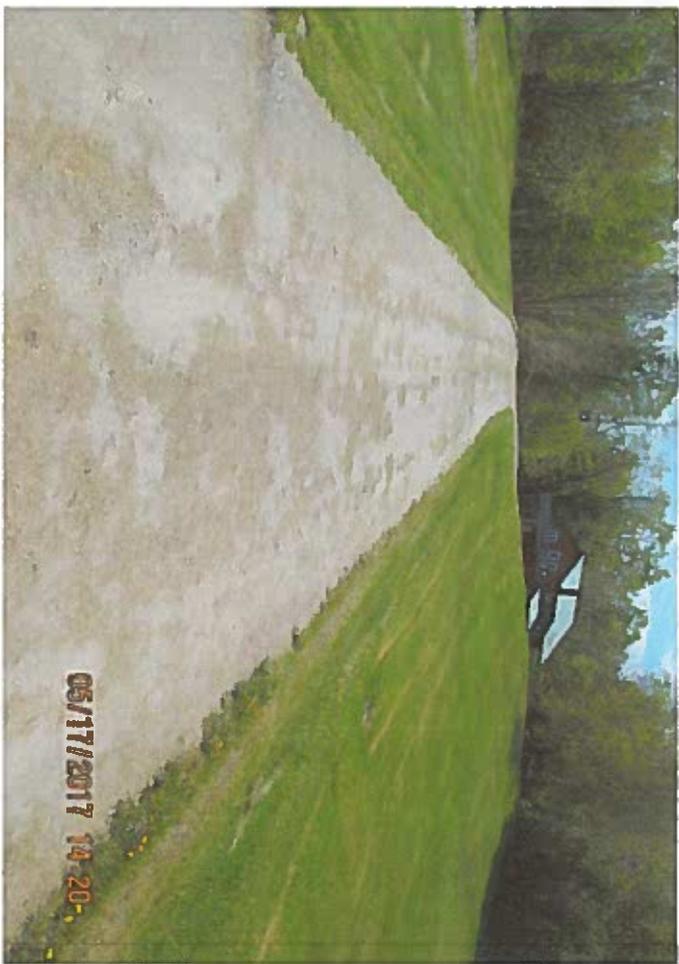
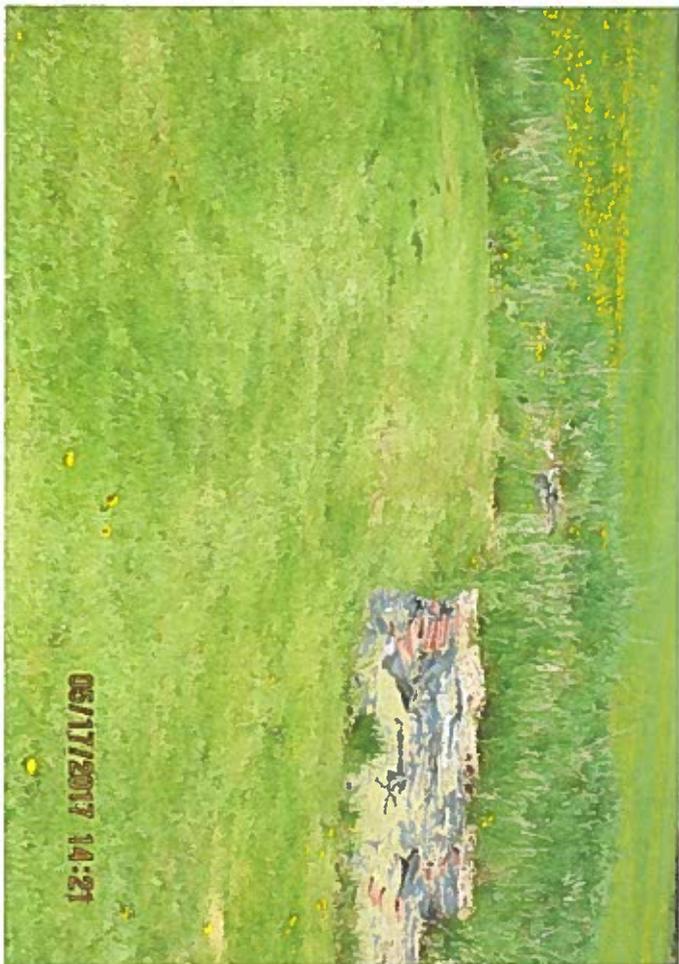


Table 1. Lake Carmi Watershed private road work identified in FWC- supported assessments as of 2018. Summarized by Karen Bates, DEC

Road name/ project # and Status	Address	Project (work still needed in bold)	Year complete	Funding Source/grant #/amount	Road Assessment ref. # (see Table 2)
Camp Road CR-1 - no treatment					4
Kings Court K-1	end of KC between 66 king's Court and lake	could enhance work	2016	private	4
Hammond Shore		Dewing/Hammond Waterbar installation w/ plunge pools	2013?	2012-319 DEC Grant (319)	
Hammond Shore (HS)		Hammond shore (part of Dewing) - -waterbar with 60X 4ft infiltration bed	2013	319	2
HS - 1 - done	intersection of Dewing Road and Hammond Shore Road)	Clean out needed	2015		4
HS - 2 -		very large project - 132 CY not done			4
HS - 3 -		needs study for culvert			4
HS 4 -		needs study for culvert - (owner may have replaced culvert)	2015?	private?	4
Harrison Drive	off Hammond Shore Road	headwalls to culvert, check dam on Hammond Shore road			2
Mullen Shore Road - MR -1 & 2					5
Patten Shore		Patton Shore Rd Infiltration bed installation/or waterbar installation with plunge pool?	2013	2012 -319	
Patten Shore			2013	DEC Ecosystem Restoration Program (ERP)	1
Patton Shore (PS)	Ledge Drive and Scottish lane	Road ditch on one side, vegetated and stone lined check dams			2
Patton Shore (PS)	downstream of above roads	Road ditch to catch runoff from above two roads			2

PS -1 DONE - (no) - 31 PSR	31 Paterson shore	owner may have done new culvert and stone lined ditch	2016	private	4
Road name (project#)	Address	Project (work still needed in bold)	Year complete	Funding Source/grant #/amount	Road Assessment ref. # (see Table 2)
PS -2 culvert needs study before replacing - (no) just	After 218 Paterson shore		2016	private	4
PS-3 DONE? needs plunge pool & check dam 20 CY- Benevento before 421 PSR	421 Paterson shore (just before) Benevento		2016	private	4
PS- 4 DONE - 555 PSR (Lyman)	555 Paterson shore (Lyman)	plunge pool and check dam 20 CY	2016	private	4
PS - 5 DONE	683 PSR (Loiselle)	stone ling ditch between existing plunge pool and road	2016	private	4
PS- 6 Done - Paterson Point Road - PPR-1	after 705 PSR (Tatro)	?	2016	private	4
Harrison Drive			2013	ERP	1
Shore Road (SR)			2013	ERP	1
SR - 1 done - SR - 2 no treatment	betw Costa and Larose camp	?	2015	private	4
SR - 3 no treatment					4
SR - 4 done	Perry camp	?	2015	private	4
Vic Crossing (VC)			2013	ERP	1
VC- 1 Nothing					4
VC -2	(Hendrickson camp)	Small plunge pool at inlet - extremely small job - Stone lining done	2015	private	4
VC -3 too small					4
VC 4 done - too small			2015	private	4
VC -5 done - too small			2015	private	4
VC 6 - no work					4
VC 7- no work					4
Wescott Shore Road (WSR)		Ditch work and clean out	2007		

WSR 1 - WSR 8		includes culvert, plunge pools, ditch work, check dams			5
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Table 2. List of road assessments completed for Lake Carmi watershed

Road Assessment	Year	Roads Covered	Contractor	Funding Source	Reference number	NOTES
Carmi Consulting - FWC/DEC	2007	Lake Carmi roads and culverts	Carmi Consulting	319	1	17 high priority culverts along with medium and low priority culverts identified for fixes
Private roads - NRPC	2013	Hammond Shore, Harrison Drive, Shore Road, Vic's Crossing, Patten Shore	KAS consulting	ERP	2	General recommendations in narrative form, including need to crown roads, and ensure culverts were right size
Stormwater Master Planning by DEC	2014	Town of Franklin	Stone environmental	ERP/10,000	3	
Phase I Camp roads with additional detail -FWC	2015	Hammond Shore, Patton shore, vic ' s crossing, shore road	Jim Smith	BBR	4	
Phase 2 Camp Road Study - FWC	2017	Westerly shore: roads and culverts	Jim Smith	ERP	5	
Better Back Road Capital Inventory	2011-2013				6	
Franklin Town Road Erosion Inventory -NRPC	2017		(NRCS)	CWIP	7	
Franklin Watershed Committee assessment by AmeriCorps	2019	all camp roads?	AmeriCorps member Catie Bartone	FWC		