

# Greilickville Corridor - Stormwater Action Plan

## Runoff Basics

One of the major pathways by which many types of pollutants get to lakes and streams is through stormwater runoff. Stormwater runoff results when drops of rain fall to the ground, or snow melts, and the resulting water that does not infiltrate into the ground flows over the surface of the land. This runoff often dislodges and carries soil or sediment particles (causing streambank erosion in some places) to which many pollutants are attached. The runoff may also directly move the pollutant itself (i.e., garbage, oils, grease, gas, pesticides, etc.). The amount of stormwater runoff that occurs is dependent upon a variety of conditions including storm intensity and duration, topography, time of year, soil moisture levels, soil permeability, vegetative cover types, the extent of vegetated cover, and the amount of impervious surfaces.



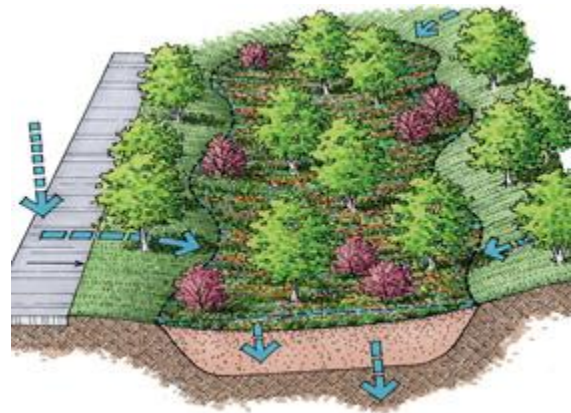
*Road and roof runoff are two sources of stormwater.*

Urban locations, like Traverse City, Elk Rapids, Suttons Bay, and Northport often produce greater amounts of runoff due to the

increased amount of impervious surfaces in these urban areas relative to more rural settings within the watershed. Impervious surfaces are those areas on land that cannot effectively absorb or infiltrate rainfall. Areas such as these may include: roads, streets, sidewalks, parking lots, and rooftops. Runoff entering the Bay and its tributaries from storm drain outlets contributes a significant amount of pollution (there are almost 20 storm drain outlets to Grand Traverse Bay in Traverse City alone). However runoff may also enter waterways through ditches and other overland sources, as well as at road stream crossings. When added up, inputs from all these small inputs of runoff can result in a massive amount of pollution entering Grand Traverse Bay. Most often the pollution is at its worst during heavy rain and snowmelt events.

## Dealing With Runoff

Low Impact Development is a set of small-scale runoff management practices implemented on a site that mimic and work with nature to reduce water runoff and pollutants. LID methods manage water and pollutants at the source, minimizing the impact to ground water, streams, rivers, lakes and coastal waters. The U.S. EPA has found that implementing LID practices saves substantial money for developers, property owners and entire communities, all while improving water quality.



Addressing pollutants with LID runoff practices is of utmost importance in the Grand Traverse region because nutrients and sediments in runoff are the biggest threats to water quality in Grand Traverse Bay and its watershed.

## Project Summary

In 2010 and 2011 staff from The Watershed Center Grand Traverse Bay (TWC) conducted initial stormwater runoff assessments for three communities in Leelanau County - Greilickville, Suttons Bay, and Northport. The purpose was to help local governments in Leelanau County begin to address pollution stemming from stormwater runoff in their communities to protect water quality and our Up North quality of life.

The analyses for Northport and Suttons Bay were different in nature from the one conducted for the Greilickville Corridor. Stormwater runoff from the entire village limits was considered for Northport and Suttons Bay, including numerous side streets and residential neighborhoods. Whereas for the Greilickville assessment TWC only looked at the M-22 Corridor from M-72 at the south boundary up to Cherry Bend Road at the north, and the western boundary at the TART trail. Most of the runoff in the Greilickville area will be from the highway and commercial businesses along the route (i.e. parking lots and rooftops).

TWC is aware of the large planning effort currently underway for the Greilickville Corridor, and is part of the Greilickville Corridor Taskforce, comprised of people with vested interests in this same section of M-22. Additionally, TWC is also aware that Elmwood Township has been working with a local consultant on ways to improve this corridor as it contains a large township park and their marina (improvements include calming/slowing traffic down on M-22, improving ways for pedestrians to cross the road, and upgrading the township park). Improvements to the township park were recently completed and include a variety of LID practices to handle stormwater (pervious parking, parking lot islands, bio-swales, rain garden). The information in this study is designed to complement existing information already gathered and developed by the Township.

Out of a total of 197.6 acres for the study area, our analyses found a total of 72 acres of impervious surface, or 37%. A one-inch rain in this area will produce approximately 260,314 ft<sup>3</sup> of runoff to Grand Traverse Bay.





The following 'Action Plan' and accompanying pictures identify major points of runoff entry to the watershed as well priority sites for improvement. In this way we can best utilize limited funds to make improvements where they would have the most effect. Of specific concern are the large areas of impervious surface at the Elmwood Township and Harbor West Marinas, as well as other commercial businesses and developments.

**Findings/Recommendations**

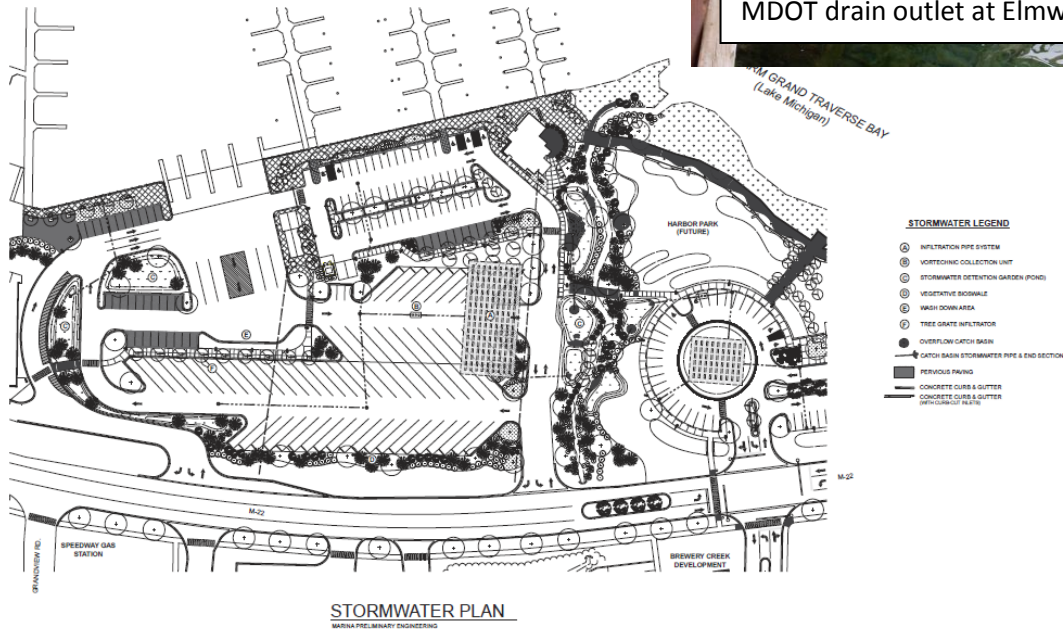
- General management -
  - Use Phosphorus-free fertilizers on village property (on areas currently being fertilized)
  - Install porous pavement where possible: paver stones, porous concrete
  - Consider, for large parking areas (i.e. marina and school lots), installing infiltration islands to direct runoff into

- Elmwood Township Marina -

As stated above, stormwater runoff is a big issue for areas with large amounts of impervious surfaces like Elmwood Township Marina. The Township's consultant, Gosling Czubak, came up with an exceptional stormwater management plan shown below. A more detailed drawing can be found in their report to the Township. Additionally, a large MDOT stormdrain discharges at the northern boundary of the marina and the possibility of installing a stormwater treatment device should be explored.



MDOT drain outlet at Elmwood Marina



SHEET NO. 3 OF 23	<h2 style="margin: 0;">Greilickville Harbor Park</h2> <h3 style="margin: 0;">MARINA PRELIMINARY ENGINEERING - STORMWATER PLAN</h3> <p style="margin: 0;">Elmwood Charter Township</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>PROJECT</td><td>Township Marina, Wisconsin</td></tr> <tr><td>DESIGNER</td><td>Preliminary Engineering</td></tr> <tr><td>CLIENT</td><td>Elmwood Charter Township</td></tr> <tr><td>DATE</td><td>March 2017</td></tr> <tr><td>JOB #</td><td>2017-03-01</td></tr> <tr><td>SCALE</td><td>1"=40'</td></tr> <tr><td>REVISIONS</td><td>10-28-07</td></tr> </table>	PROJECT	Township Marina, Wisconsin	DESIGNER	Preliminary Engineering	CLIENT	Elmwood Charter Township	DATE	March 2017	JOB #	2017-03-01	SCALE	1"=40'	REVISIONS	10-28-07			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Engineers</td><td>Professional</td></tr> <tr><td>Surveyors</td><td>Professional</td></tr> <tr><td>Planners</td><td>Professional</td></tr> <tr><td>Architects</td><td>Professional</td></tr> </table> <p style="font-size: small; margin: 0;">       Gosling Czubak        ENGINEERING ARCHITECTS, P.C.        1200 Center Road, Suite 100        Madison, WI 53706-1500        Phone: 608-441-0001        201-222-0222 Fax: 608-441-0002        Fax: 608-441-0002     </p>	Engineers	Professional	Surveyors	Professional	Planners	Professional	Architects	Professional
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- Rain Gardens/Biodetention Basins -

Numerous areas were found collecting stormwater where a rain garden/biodetention basin would be beneficial - some of these areas already have depressions to collect stormwater and could be improved by adding vegetation. Rain gardens and biodetention basins are designed to receive runoff in order to infiltrate it into the ground rather than piping it through a stormdrain to a body of water. By planting these basins with native vegetation not only will the aesthetic appeal increase, but the treatment of water (by filtering of plant roots) will increase as well. The following are locations where a rain garden could be installed to treat stormwater or an existing basin could be vegetated.

- In front of West Bay Covenant Church
- In front of Tuscan Bistro
- Between M-22 and Elmwood Township Marina parking lot to reduce runoff that is directed into Brewery Creek
- Corner of M-22 and Grandview Rd, and behind the Speedway Gas Station
- In front of Superbrokers
- In front of the Westport development, where a drain inputs to that location
- Portside and other condos
- In front of the Harrington's By the Bay (old Freshwater Lodge)



Front of Tuscan Bistro



Front of Portside Condos



Speedway Gas Station at corner of M-22 and Grandview Rd



- Direct Runoff to Creeks and GT Bay -

- Some parking lot runoff from the Brewery Creek Development goes directly into the Creek - this should be routed to a rain garden or bioretention basin if possible

- A channel is forming from parking lot stormwater runoff on the Northern side of One-up-web - this should be stabilized and routed to a rain garden or bioretention basin if possible



Drainage from Brewery Creek development into Brewery Creek

- Grand Traverse Yacht Club's boat launch provides a direct input of stormwater from the parking lot into Grand Traverse Bay - options to minimize stormwater runoff should be explored at this location, such as an infiltration strip along the top of the launch to capture runoff from the upper ramp and/or parking lot.



Boat launch at GT Yacht Club  
**Right:** Approach to launch



- Other Concerns -

- At the Grandview entrance to the Brewery Creek Development, the culvert is beginning to cave in
- What is believed to be a storm drain outlet was located South of Apache Trout Grill leading into Grand Traverse Bay