Ellsworth - Stormwater Action Plan

Runoff Basics

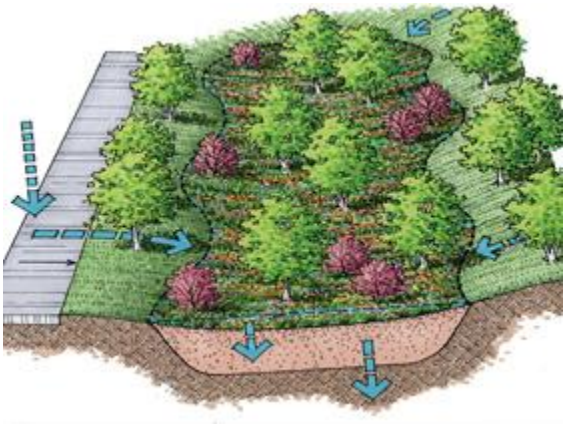
One of the major pathways by which many types of pollutants get to lakes and streams is through stormwater runoff. Stormwater runoff results when drops of rain fall to the ground, or snow melts, and the resulting water that does not infiltrate into the ground flows over the surface of the land. This 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, and Suttons Bay 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 instances of runoff can result in a massive amount of pollution entering Grand Traverse Bay and our inland lakes and waterways. Most often the pollution is at its worst during heavy rain and snowmelt events.

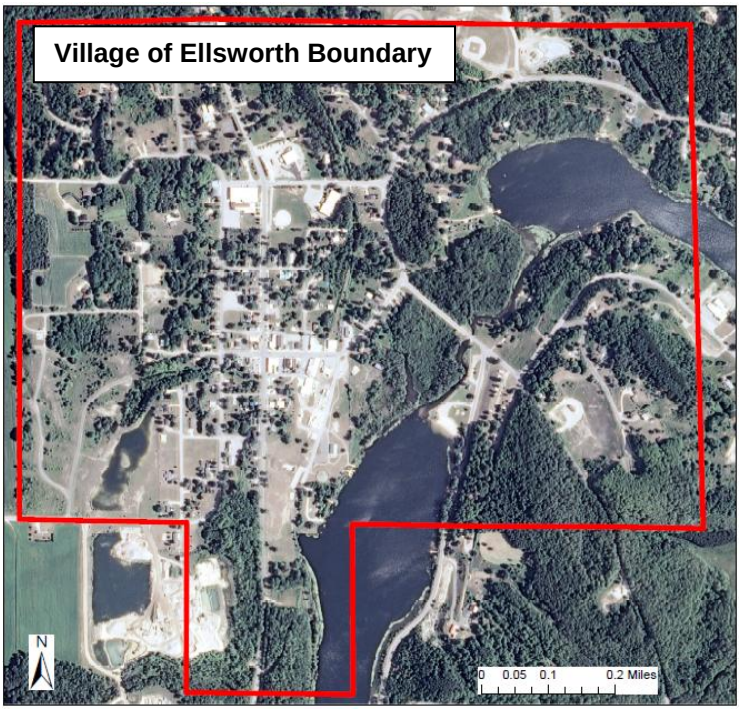
Dealing With Runoff

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 2013 and 2014 staff from The Watershed Center Grand Traverse Bay and the Antrim Conservation District conducted initial stormwater runoff assessments for six communities in Antrim and Kalkaska Counties - Elk Rapids, Ellsworth, Central Lake, Bellaire, Alden and the Village of Kalkaska. The purpose was to help local governments in Antrim and Kalkaska Counties begin to address pollution stemming from stormwater runoff in their communities to protect water quality and our Up North quality of life.

The following 'Action Plan' and accompanying pictures identify major points of runoff generated in the Village of Ellsworth that enters Saint Clair and Ellsworth Lakes as well as the channel that connects them (boundaries shown in Map A). The Plan also includes recommendations for ways to reduce stormwater runoff into surface water. In this way we can best utilize limited funds to make improvements where they would have the most effect.

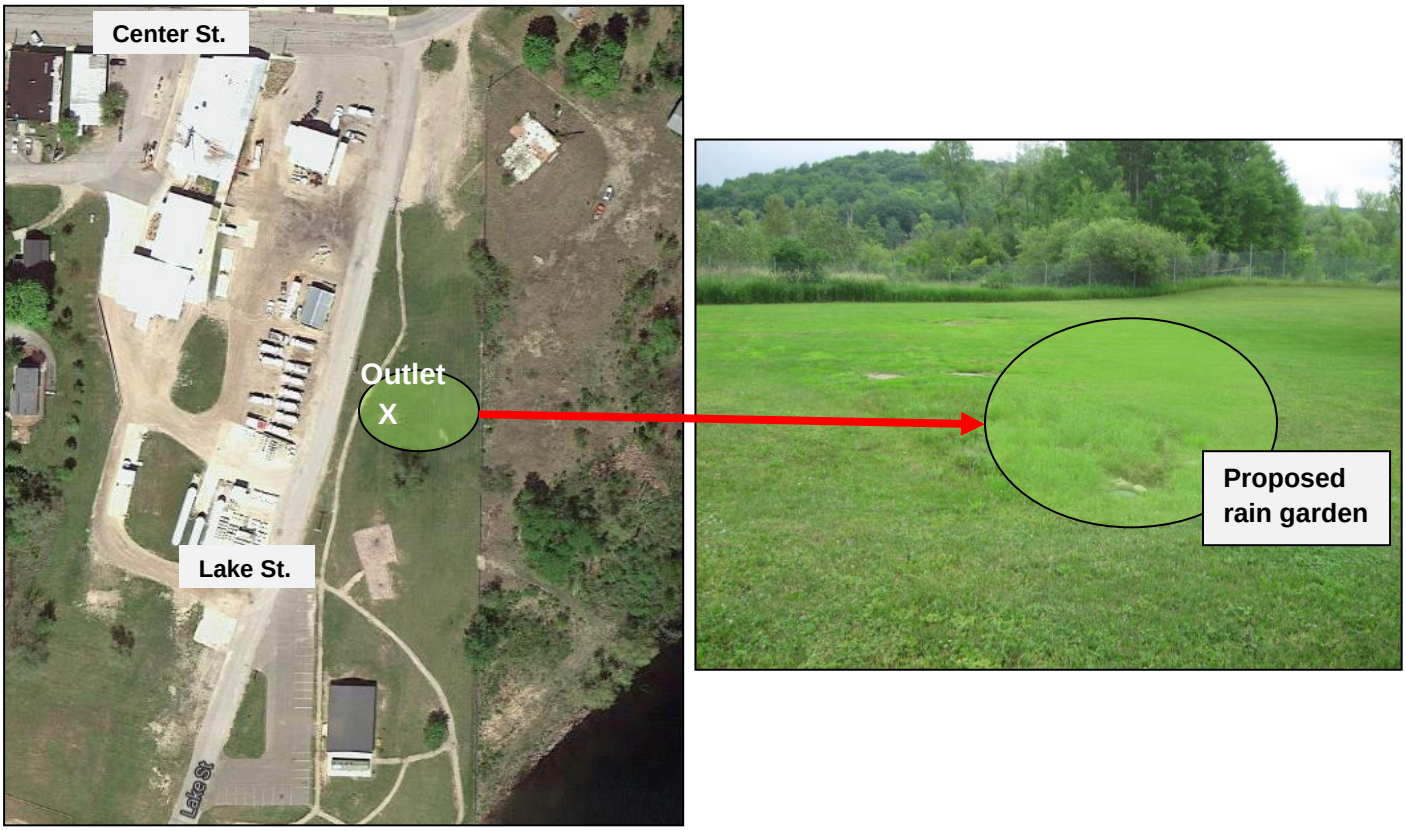
A simple impervious assessment for the Village using aerial imagery shows that nearly 12% of the area within the Village of Ellsworth limits are impervious and may generate stormwater runoff (Appendix A). This includes sidewalks, parking lots, and roads. While this percentage does not seem like much, the large expanses of land that are undeveloped within the village boundary make up 32% of the land area, and surface water makes another 8.7% (Appendix B). In taking these land types out of the overall area within the Village boundary, then approximately 21% of the surfaces within the main village area are impervious.

Findings/Recommendations

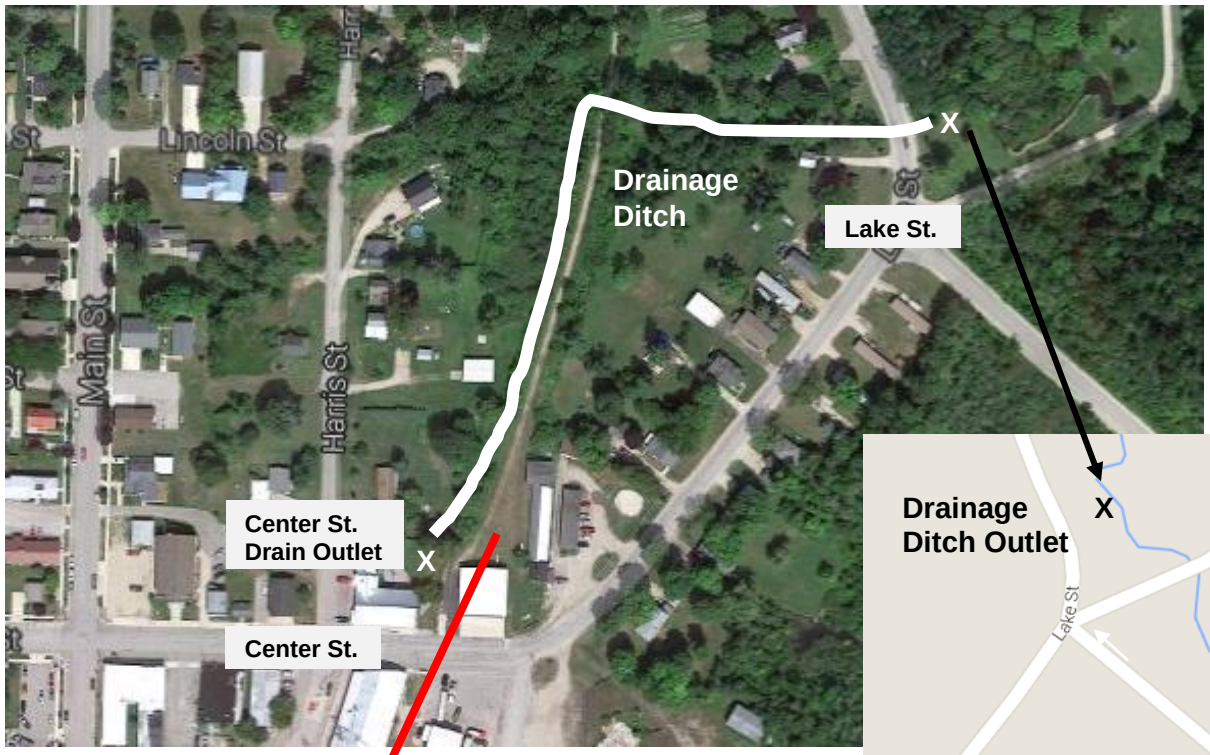
- General management -
  - Use Phosphorus-free fertilizers on public property (on areas currently fertilized)
  - Install porous pavement where possible: paver stones, porous concrete
  - Consider, for large parking areas (i.e. church and government office lots), installing infiltration islands to direct runoff into
  - Along residential streets, consider planting ditches with native plants to reduce the amount of stormwater reaching stormdrains
  - Routinely remove sediment from catch basins

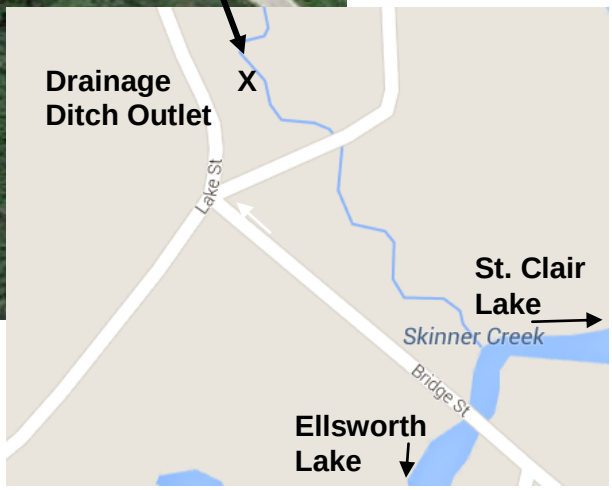
- Drain at Elm Street Road End -
  - *Findings:* Storm drain outlet capturing runoff from some of Main and Elm Streets causing erosion at Ellsworth Community Park
  - *Recommendation:* Create a rain garden or bio swale to contain and treat stormwater as well as fix erosion issue

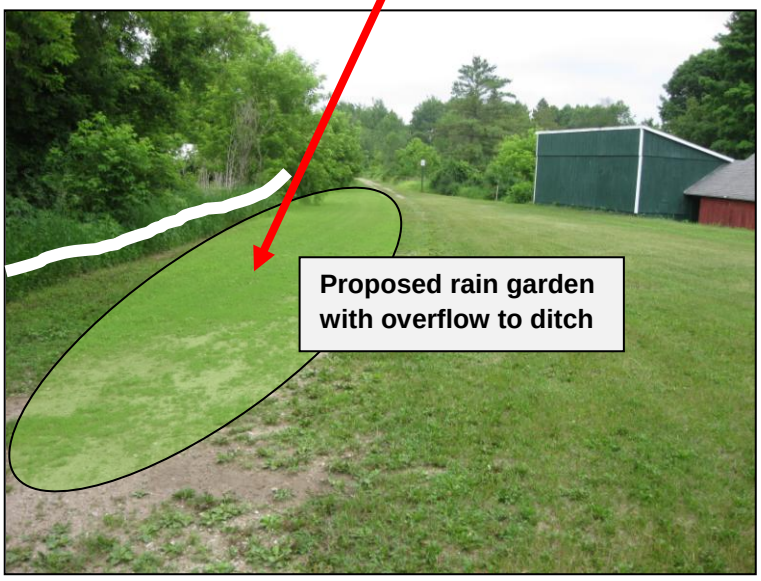
- Lake Street Drain -
  - *Findings:* Storm drain outlet capturing runoff from Lake Street and industrial area on corner of Lake and Center Streets outlets into Ellsworth Community Park
  - *Recommendation:* Create a rain garden to contain and improve treatment of stormwater



- <u>Center Street Drain -</u>
  - *Findings:* Storm drain outlet from Center Street capturing runoff from many catch basins through town outlets into a drainage ditch (see below), then into Skinner Creek and ultimately into the channel connecting St. Clair and Ellsworth Lakes (see inset map below). Most land area along drainage ditch is publicly owned.
  - *Recommendations:*
    1. Install rain garden with overflow to drainage ditch at Center Street Drain Outlet.
    2. Turn existing drainage ditch into bioswale by adding plant material in the bottom.
    3. If possible, install rain garden at drainage ditch outlet to creek with rip rap overflow to creek (to reduce sedimentation and erosive forces)

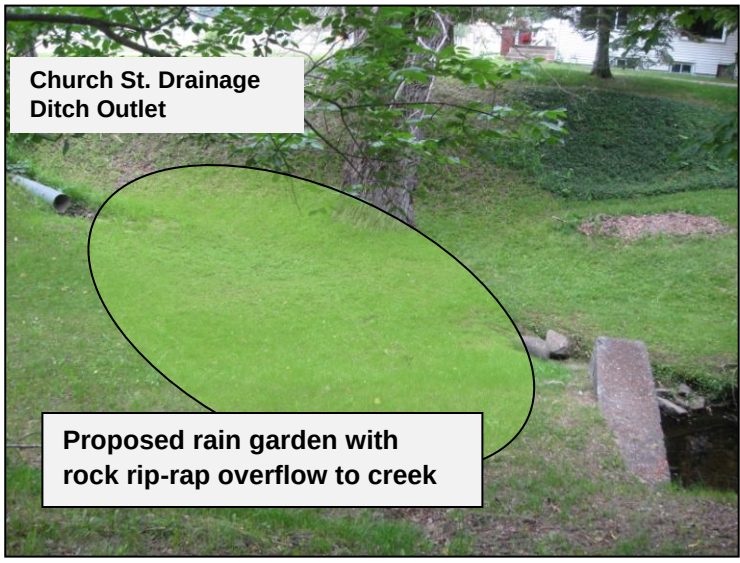






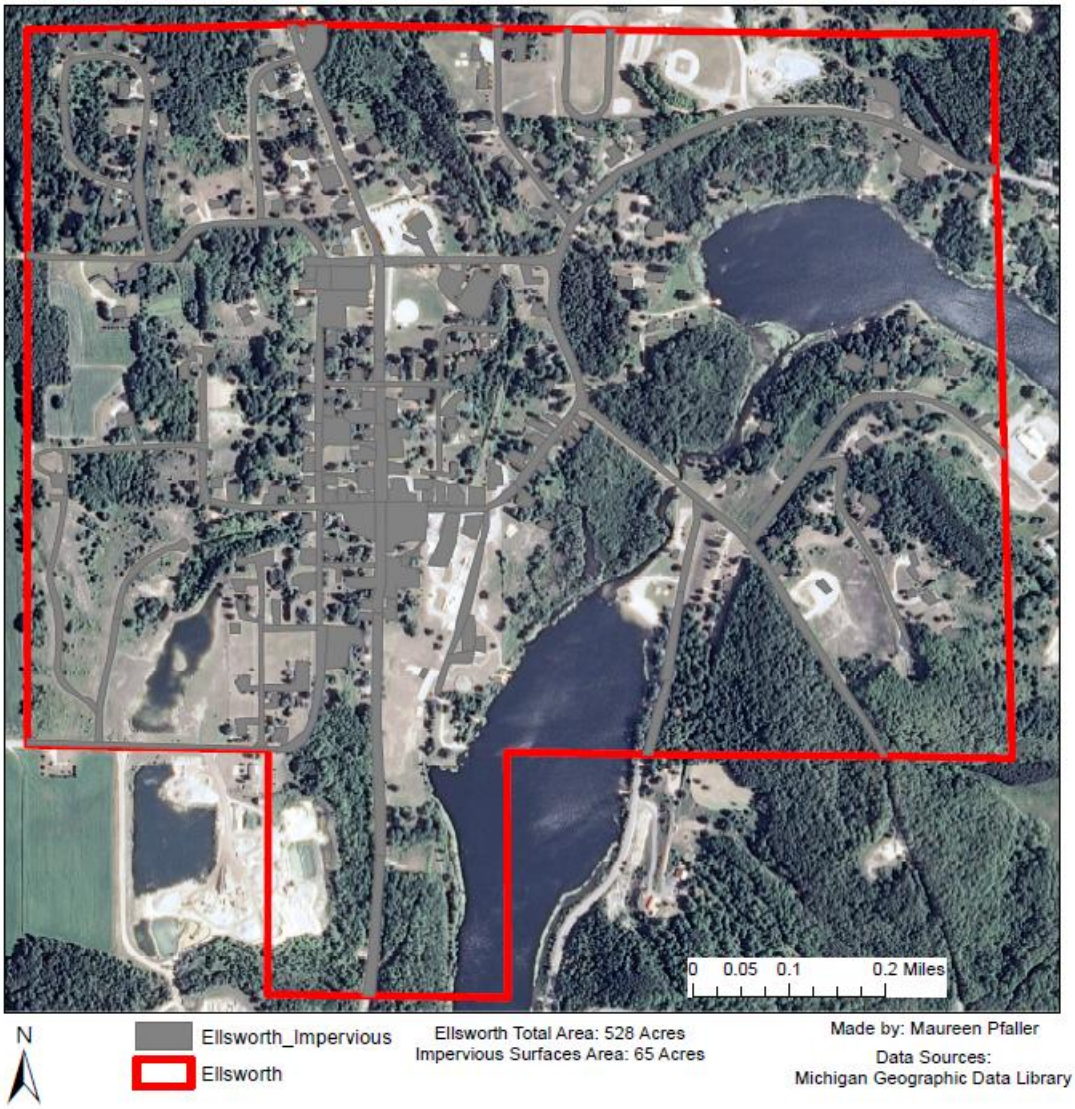
- Church Street Drain -
  - *Findings:* Storm drain outlet capturing runoff from a large area outlets into a drainage ditch, then into Skinner Creek and ultimately into St. Claire Lake (Figure 8)
  - *Recommendations:* Create a rain garden or bio swale to contain and treat stormwater by adding plants to ditches (Figure 9), and creating a bio-swale/rain garden where the runoff enters the creek (Figure 10)


Example of Drainage Ditch Along Church Street



Appendix A

Ellsworth Impervious Surfaces



Appendix B

Ellsworth Undeveloped, Farmland and Water