

Alden - 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.

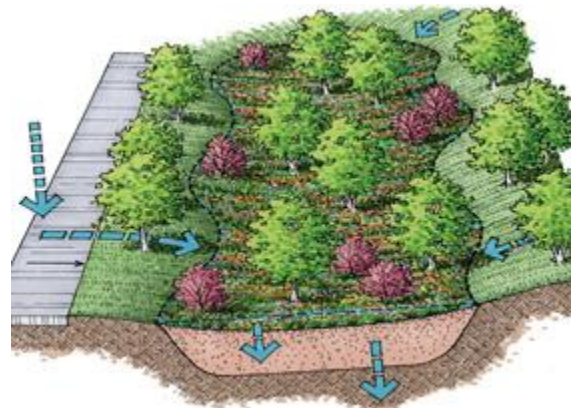


Road and roof runoff are two sources of stormwater.

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 entry from Alden (boundaries shown at right) into Torch Lake, as well as priority sites for improvement. For most locations, LID techniques have been proposed to help maximize stormwater retention and minimize pollution resulting from impervious surfaces. In this way we can best utilize limited funds to make improvements where they would have the most effect.



The immediate area of Alden along CO 593 and SE Torch Lake Dr has a lot of impervious area to generate runoff to Torch Lake. Using aerial imagery, this area is about 35% impervious (see above). This includes sidewalks, parking lots, and roads.

Proposed sites for potential improvement outlined in the following pages were placed onto an overall map of the village and are shown in Appendix A.

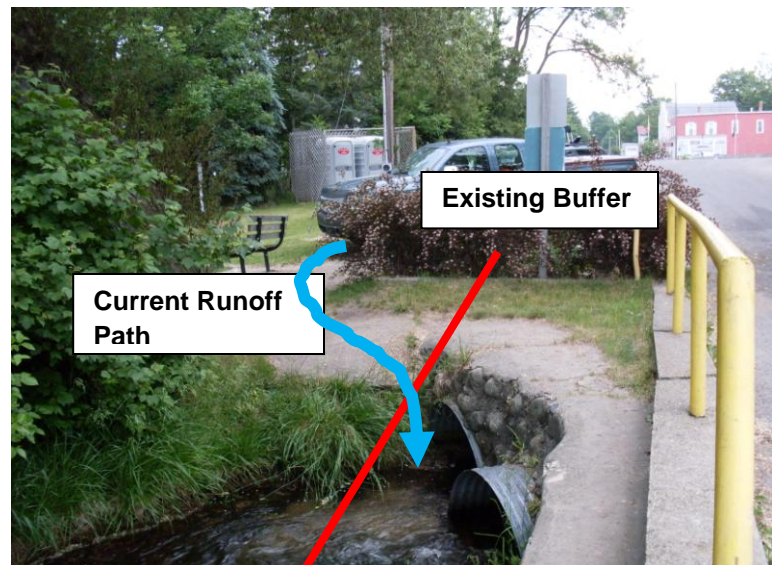
Findings/Recommendations

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 bank lots), installing infiltration islands to direct runoff into

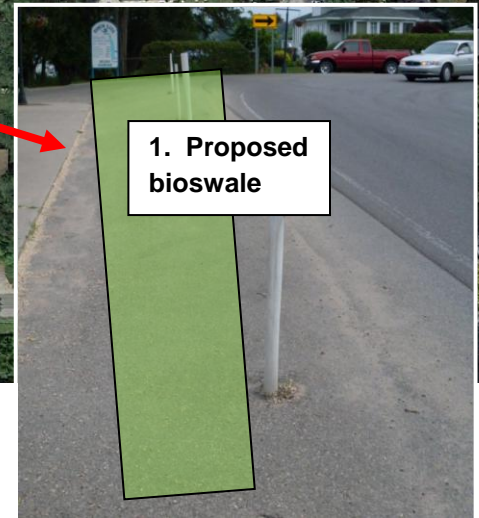
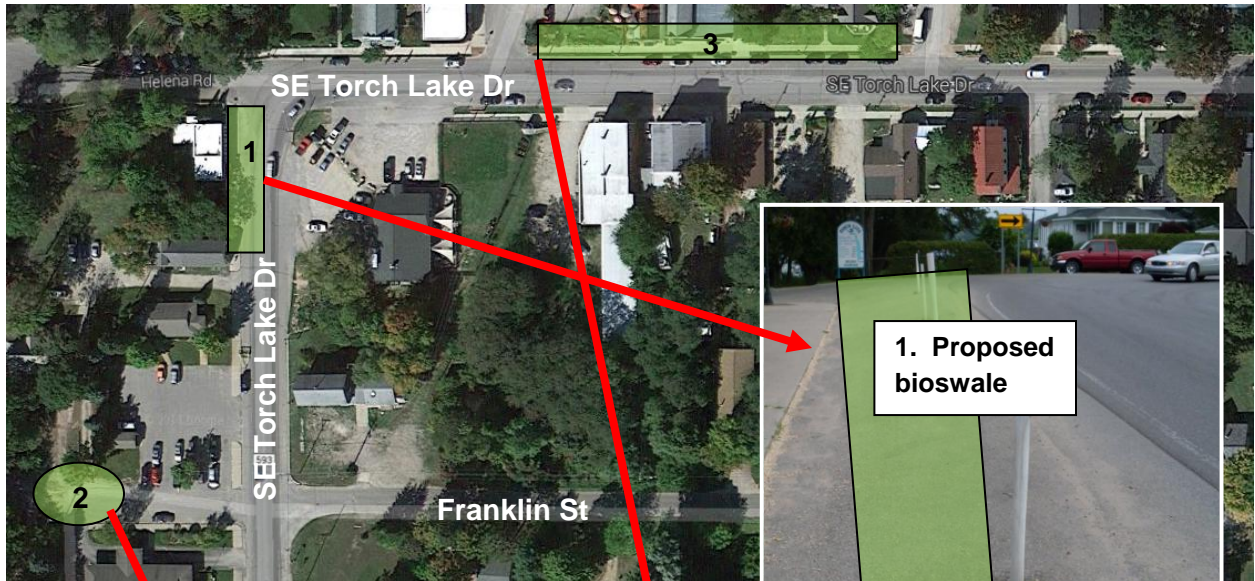
A. Marina/Boat Launch Access

- *Findings:*
 - Existing buffer was installed in 2009 to help with erosion and stormwater runoff
 - Road runoff goes around existing buffer and into stream, or continues to flow to the boat launch and directly into the marina
- *Recommendations:*
 - Add berm along North side of existing buffer or expand to capture more runoff
 - Install a rain garden on South side of road; Install a speed bump in road to direct stormwater towards rain gardens



B. Road runoff -

- *Findings:* Variety of areas throughout Alden where road runoff could be directed to bioswales, rain gardens, or other LID techniques
- *Recommendations:*
 1. South of marina/boat launch entrance: Bioswale could be installed on strip of concrete between road and sidewalk
 2. Alden State Bank and Franklin Street - Install rain garden at the public road end
 3. Grassy area between SE Torch Lake Dr. and sidewalk could made into a bioswale, or installed with tree box planters



C. Spencer Creek Rain Garden -

- *Findings:* Rain Garden not deep enough to retain a significant amount of runoff and berm near road impedes road runoff from entering
- *Recommendations:* Excavate rain garden and replant; Create deeper routes for water to enter rain garden

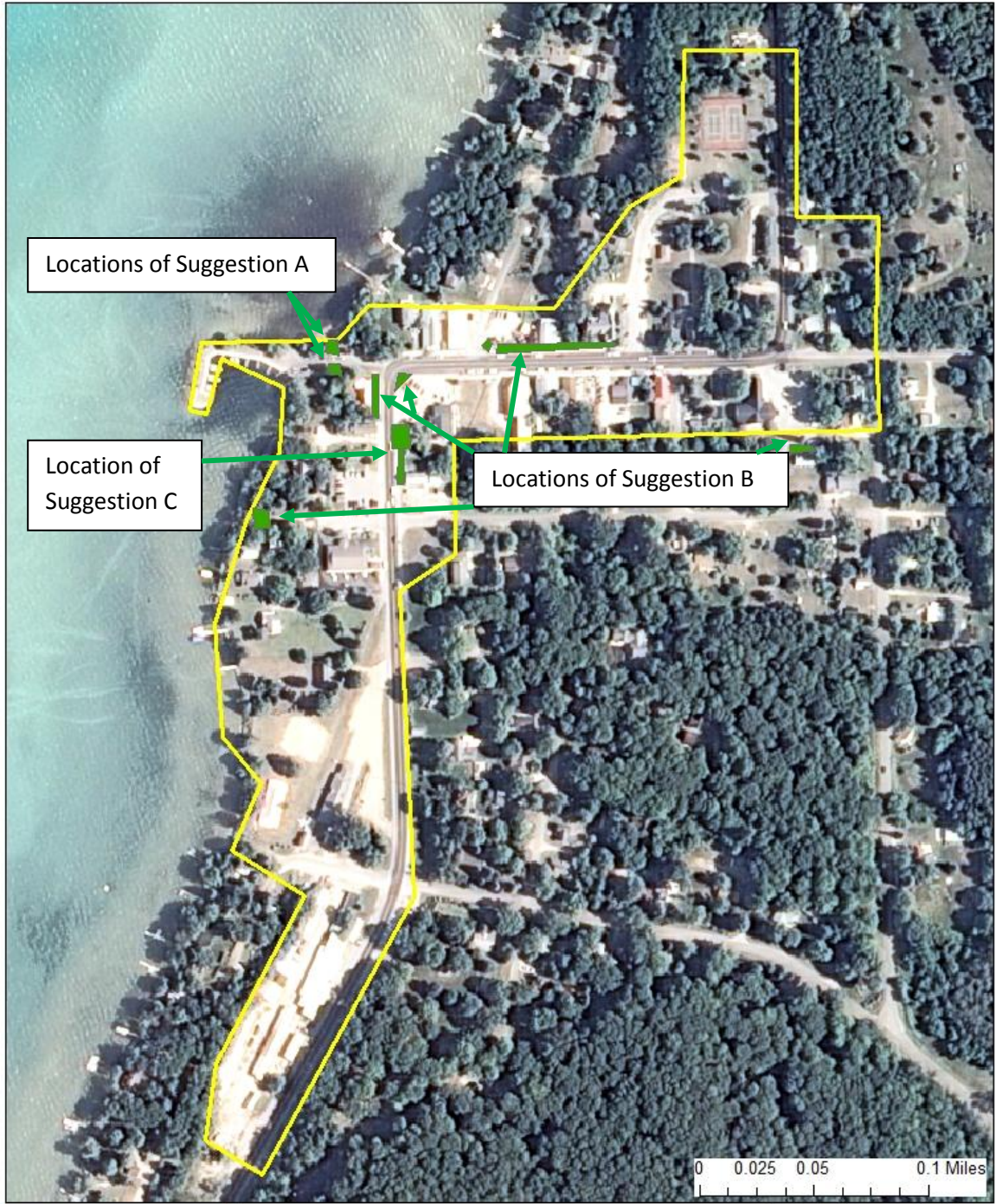
Minimal depth in rain garden



Berm inhibiting flow into rain

Appendix A

Alden Low Impact Development Techniques



■ LID Techniques
□ Alden

Alden Total Area: 28 Acres
Total Impervious Surfaces: 9.787 Acres

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Data Sources:
Michigan Geographic Data Library