

# Bluff Conservation



# Gullies

About 200 ravines, or gullies, have formed along the Huron County coastline of Lake Huron, some that have occurred naturally, and others that have formed in an attempt to manage stormwater. The human-related gully development began in the 1800s with the deforestation of the region for agriculture. The lack of vegetation to regulate surface water flow meant that water was draining off the landscape more quickly. With the faster surface water flowing off the land, soil erosion has been accelerated. As water flowed over the lake bluff, channels cut into the clay soil, forming gullies.

In more recent times, field tile drainage, increased drainage through municipal drains, and urbanized development has all contributed to increased erosion of shoreline gullies.

Once created, they provide avenues for easy downslope movement of water from storms. The flowing water erodes soil from the sides and floor of each gully, making it wider and deeper.

Landslides, slumps, and related processes on the gully sides also contribute to the removal of slope materials. The top, or head, of the gully advances upslope, enlarging the gully system.

Ravines, or gullies, cutting into the clay soils of Huron County's coastline. Surface runoff accelerates through these gullies, eroding the soils. Gully slopes are prone to slumping, just as bluffs are.





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For information related to

- Development setbacks
- Stormwater control options
- Information on regulated areas

#### References

Burkard, M. and Kostaschuk, R., 1997. "Patterns and Controls of Gully Growth along the Shoreline of Lake Huron", in *Journal of Earth Surface Processes and Landforms*, vol. 22.

Howell, E.T., et al., 2009. "The Influence of a Small Watershed on Water Quality in the Nearshore of South Eastern Lake Huron," Technical Memorandum, Ontario Ministry of the Environment.

Luinstra, B., 2009. "Climate Trends and Impacts in the Maitland Valley Conservation Authority Jurisdiction," unpublished draft report.

#### Water Quality:

Stormwater runoff from agricultural fields can convey excess nutrients like nitrogen and phosphorus to Lake Huron. Water quality is also affected significantly by soil erosion. Increased levels of nitrogen and phosphorus, along with higher sediment loads, are the leading contributors to reduced water quality. Nitrogen and phosphorus move from fields to surface water when sediment is transported through runoff and soil erosion. As a result of the nitrogen and phosphorus enriched sediments, eutrophication—the growth of algae and other aquatic plants—occurs, sometimes fouling local beaches.

#### Current Trends:

Recent research by the Maitland Valley Conservation Authority has identified that the intensity of precipitation has been increasing throughout the watershed, particularly in fall, winter and spring. The research noted "that small streams and gullies which drain directly into Lake Huron may be particularly vulnerable, due to their actively eroding gullies, less competent geology and clay-rich soils. These areas also tend to be extensively drained, further accentuating any potential erosion issues by increasing total runoff." Recent slope failures following heavy precipitation events are a symptom of this changing climate regime.

#### Some Practical Tips:

- **Slow down water:** too much water is artificially directed into the ravines. Stormwater runoff from tiled farm fields, roads, driveways and downspouts, and more impervious surface (concrete, asphalt) funnel water into the ravines in great torrents when it rains, accelerating erosion. You may need to consult a professional to address serious drainage problems.
- **Don't throw yard waste into ravines,** as it smothers the native plants and retains water (adding weight, de-stabilizing the slope). Use a composter located well away from slopes.
- **Create or maintain a buffer area of natural vegetation along the shoreline:** A buffer of native plants prevents coastal erosion by stabilizing and holding the soil in place more effectively than lawns that have shallow root systems and are more prone to erosion.
- **Do not "clean up" your shoreline area by cutting back existing plants:** Erosion can be magnified by indiscriminately removing shoreline vegetation by increasing the speed of stormwater. This increased runoff can quickly create gullies and washouts, undermine other landscaped areas and generally create more problems than you had when you started. *If you do not want to lose your land, do not remove coastal plants.*



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