

UTRCA Regulated Areas

Protecting People and Property



Ontario's municipalities and conservation authorities work to protect people and property against the risk of natural hazards, including flood and erosion hazards, watercourses, and valleys, as well as wetlands and the area surrounding them.

The Upper Thames River Conservation Authority (UTRCA) reviews and regulates development in or near these natural hazards under the Conservation Authorities Act and Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits. Proposed development in regulated areas needs to be reviewed and approved by the UTRCA.

What is a Regulated Area?

A regulated area is any area within the UTRCA watershed where development, construction, and site alteration activities may be restricted under the Conservation Authorities Act due to the presence of a natural hazard.

Examples of Regulated Areas



Watercourses

A watercourse is a river, stream, creek, or open drainage channel. Altering a watercourse in any way can significantly impact its ability to convey water and may cause erosion.



Steep or Unstable Slopes

Slopes can erode and collapse for a variety of reasons including increased weight on or near the slope, changes in grading or drainage, loss of vegetation, and erosion of the slope bottom.



Floodplains

Flooding occurs when a watercourse overflows its banks and spills into low-lying areas, which are known as floodplains. These areas act as a natural extension of the watercourse during times of high flow to transport and store excess water.

Development or fill in a floodplain can alter the flow of water and cause or worsen flooding elsewhere. Similarly, allowing more people to live in floodplains increases the risk to life and property as well as public costs due to emergency response and cleanup.



Valleys

River and stream valleys are regulated to protect their role in storing and conveying floodwaters and to prevent development on or near steep or unstable slopes.



Wetlands

Wetlands and the area surrounding them (30 metre buffer) are regulated due to their critical role in flood management as they store water and reduce downstream flows. Wetlands may also pose a risk to development due to the presence of a high water table or unstable soils.

Hazardous Sites

Hazardous sites are lands that could be unsafe for development and site alteration due to unstable soils (e.g., organic soils, sensitive marine clays) or unstable bedrock (e.g., karst topography).

Regulated Area Maps

The UTRCA develops maps to flag properties that may contain natural hazards. The regulated area depicted on the maps is approximate and based on the best available information at the time of map production. A property may contain natural hazards that are not identified on the current regulated area maps but would still be subject to regulation. You can view these maps at **maps.thamesriver.on.ca**.

Who Uses Regulated Area Maps?

UTRCA staff reference regulated area maps when reviewing development applications to determine if a property may contain hazards and if a permit is required under the Conservation Authorities Act. The UTRCA's member municipalities use the regulated area maps when reviewing development proposals under the Planning Act and Building Code, updating Official Plans and Zoning By-law schedules, and undertaking infrastructure and emergency management planning.

Anyone can view these maps to determine if the property they own or want to purchase contains natural hazards and if a conservation authority permit may be required for any development or activities.

Why Update Regulated Area Maps?

The UTRCA is undertaking a comprehensive review and upgrade of its regulated area maps. Updating these maps is an important and ongoing process that enables the conservation authority and its municipal partners to use the most current information to identify hazards, assess risk, and guide land use decisions.

To begin the complex process of upgrading hazard information for the entire watershed, the UTRCA needed new, more detailed data, which came from:

- new high-resolution remote sensing (digital elevation) data,
- updated aerial photography,
- improved modelling hardware and software,
- field surveys of watercourses, bridges, and culverts.

The new data has greatly increased the accuracy of hazard identification. Advances in computer technology and software have also improved our ability to model and map hazard areas, especially flood and erosion hazards.

How are Regulated Area Maps Created?

UTRCA staff determine the location and boundaries of individual hazards, such as floodplains or steep slopes, through extensive data collection, statistical analysis, modelling, and various mapping techniques. Throughout this process, staff follow technical guidelines prepared by the Ministry of Natural Resources and Conservation Ontario.



Using a Geographic Information System (GIS), the map layers showing each hazard are overlain to produce the regulated area. The approximate regulated area shown on the map incorporates all the hazards in an area, including safety allowances as set out in provincial regulations.



Changes to regulated area maps might occur for a number of reasons, such as when new information is incorporated into the models or there are physical changes in the watershed. For example, new or expanded development or new or replaced infrastructure like bridges or culverts can alter the size of a regulated area. This means properties previously located outside of the regulated area could now be within it and vice versa.

Once draft maps of the regulated area are completed for a portion of the watershed, a peer review by experienced professionals is initiated to ensure the maps meet industry and regulatory standards. Municipal partners, watershed residents, and interested parties are provided with an opportunity to review the draft maps.

How is Each Map Layer Created?

Watercourse Layer

The watercourse layer is updated every five years when the UTRCA receives new air photo imagery for the watershed. Using photo interpretation, the centre line of each watercourse is adjusted to reflect any changes.

Erosion Layer

Using GIS technology, UTRCA staff identify and map visible features including rivers, streams, and the top and bottom of valley slopes on aerial photographs and topographic maps. A combination of manual and automated mapping techniques is then used to estimate the long-term extent of the river or stream valley.

To determine the approximate location of the erosion hazard, several considerations are applied including a slope stability allowance, erosion access allowance, and the 100-year erosion rate. The shape and type of river or stream valley also determines how this process is completed.

Wetland Layer

The location of wetlands in the Upper Thames River watershed is determined using various information sources. This includes field evaluations by qualified professionals using provincially recognized criteria as well as manually mapped areas that indicate where a wetland may be present. Wetland indicators include vegetation inventories, soil information, surface elevations, groundwater data, and air photo interpretation.

Flood Layer

To produce the flood map layer, a science-based method of field surveys and computer modelling is completed. Field surveys provide detailed information and elevation data about riverbeds, riverbanks, bridges, and culverts. This information improves the accuracy of flood models by defining the physical characteristics of each watercourse and determining the impact that bridges and culverts may have on flood flows.

To calculate flood flows, engineers undertake statistical analysis on long-term stream flow data. If an area does not have long-term stream flow data or is experiencing rapid land-use change (most urban areas), a hydrologic model is built to estimate flows during storm events to represent how much water would drain off the landscape. Flood flows are then entered into a hydraulic model to determine flood levels by simulating how water moves through a watercourse.



Staff compile the following data to build the hydrologic and hydraulic computer models:

- Digital elevation data (remote sensing, air photo interpretation),
- Land use and land cover (air photo interpretation),
- Surface geology and soil data,
- Impervious surfaces (where water cannot soak into the ground),
- Observed precipitation and stream flow data records,
- Watercourse cross-sections, profiles, and features (field survey),
- Size and description of culverts and bridges (field survey), and
- High water mark data collected during previous flood events.

Flood water levels generated by the hydraulic model are merged with topographic data to create maps that illustrate regulated flood hazard areas. All modelling and mapping use the Thames River flood event standard of a 250-year flood event, which has a 0.4 percent chance of occurring in any given year. This standard is based on an actual flood that occurred in the Thames River watershed in April 1937.

We can help!

Pre-consultation with the UTRCA is an important early step in any development. Contact us before starting any construction or alterations on your property. UTRCA staff will work with you to understand your proposed project and determine if a conservation authority permit is required.

Questions? Call UTRCA at 519-451-2800.