

Environmental Reserve Research and Technology Park Functional Study and Preliminary Design

PLANNING CONTEXT

The Environmental Reserve lands have long been an important planning and research component of the University of Waterloo.

Columbia Lake, the most predominant feature in the reserve, was originally constructed as a component of the Laurel Creek flood control system. The lake still serves that purpose and is emptied each fall. The seasonal drawdown operation of some of Columbia Lake is also done to pass the high sediment and nutrient loads during the spring melt period. The trail system that winds through the reserve has also served the community for some time. The trail system was upgraded to a gravel and crushed stone trail in 1992.

Westmount Road

Columbia Street



Trail System

View of Columbia Lake Looking South



View of Brubacher House

The dominant historical feature of the North Campus and Environmental Reserve study area is its agricultural past. The historical agricultural land use has been incorporated into the development plans of the R&T Park and will be reflected in the Environmental Reserve design initiatives. The former farmhouse owned by the Brubacher family and remnant agricultural landscape features (hedgerows, dam, and pond) have been preserved and incorporated into the R&T Park development context.

Columbia Street



View of Study Area Looking North

The urban elements that form the built context of the North Campus include institutional buildings and facilities, utility corridors (hydro, gas, watermain) and the flood control aspect of Columbia Lake. A majority of the urban elements, with the exception of the sports fields, the hydro corridor and the flood control facility, are situated outside the Environmental Reserve study area. The institutional buildings and facilities are concentrated along Columbia Street and include additional recreational sports fields, an informal golf course, Columbia Icefield Arena, Optometry Building, Hildegard Marsden Nursery, Klemmer Day Care, Brubacher House, Columbia Greenhouses, and Bauer Warehouse.

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HYDROLOGY AND HYDRAULICS



Columbia Lake Outflow Weir

Inflow and outflow records and level measurements at the inlet and outlet structures of Columbia Lake and Laurel Creek Reservoir are being reviewed to evaluate openings and level settings.

The hydrologic and hydraulic system in the vicinity of the Environmental Reserve includes Laurel Creek Reservoir, Laurel Creek between the reservoir and Columbia Lake, Columbia Lake, and Silver Lake, which is further downstream. Laurel Creek Reservoir was constructed in 1966 for flood control and low-flow maintenance during the summer months. The reservoir can attenuate peak flow by more than 40 percent. It is located just downstream of Laurel Creek reservoir. Inflow to Columbia Lake is primarily controlled by Laurel Creek Reservoir. The reservoir is used for recreational activities and it offers some peak flow attenuation during rain events.



Laurel Creek Reservoir Discharge Weir



Laurel Creek Reservoir in Early Spring

The reservoir levels are regulated so that they are high during the summer months and low during the winter months. The reservoir is emptied during the winter months as storage is zero during the winter months. The seasonal drawdown is done to pass the sediment and nutrient loads during the spring melt period.

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AQUATIC ECOLOGY

In general, the literature review indicates that the fish community within the study area appears to be dominated by warmwater fish species, consisting of:

- Common cyprinids such as:
 - creek chub (*Semotilus atromaculatus*)
 - common shiners (*Luxilus cornutus*)
 - fathead minnow (*Pimephales promelas*)
 - carp (*Cyprinus carpio*)
- Percids such as:
 - rainbow darter (*Etheostoma caeruleum*)
- Catostomids such as:
 - white sucker (*Catostomus commersoni*)
- Ictalurids such as:
 - brown bullhead (*Ameiurus nebulosus*)

(Laurel Creek Watershed Study, 1992).

Habitat for centrarchids appears to be limited within the creek system with only young of the year smallmouth bass (*Micropterus dolomieu*) reported on occasion. However, rock bass (*Ambloplites rupestris*), pumpkinseed (*Lepomis gibbosus*), and smallmouth bass have been reported in Columbia Lake.



Laurel Creek



Riffle Section in Laurel Creek



Erosion site on Laurel Creek



Pool Area in Laurel Creek



Fish Habitat Area in Laurel Creek



Columbia Lake