

1 Overview: The Rideau River Landscape

The Rideau River is located in southeastern Ontario, and flows in a north-easterly direction from its headwaters in Lower Rideau Lake for approximately 100 kilometres, joining the Ottawa River at Ottawa (Figure 1). The Rideau River drains an area of approximately 3,830 square kilometres. The Rideau River watershed includes areas of both Precambrian bedrock (the Frontenac Axis, a southern extension of the Canadian Shield), and more recent Palaeozoic sedimentary bedrock. This bedrock is overlain by sediments deposited while the Champlain Sea covered the area following the last ice age, or since it receded about 10,000 years ago.

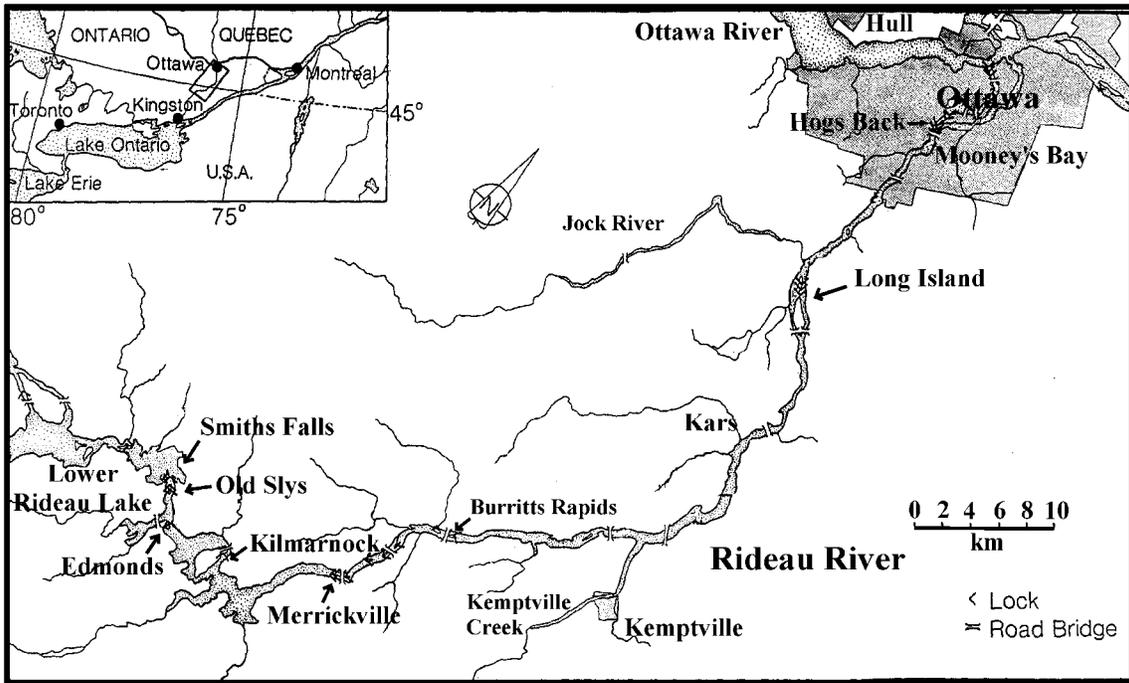


Figure 1 The Rideau River. Source: Canadian Museum of Nature

Between Smiths Falls and Merrickville, the Rideau River flows through the Smiths Falls Limestone Plain, a mainly flat region of exposed limestone and shallow soils. Much of the shoreline in this region is undeveloped, and composed of several extensive wetlands. Between Merrickville and Ottawa, the Rideau River flows through the Ottawa Clay Plain, a flat fertile area, with a mixture of agricultural and intensive residential shoreline development. The Rideau River is mainly lake-fed. The two main tributaries, Kemptville Creek and the Jock River, contribute approximately 10% of the total discharge of the Rideau.

The Rideau River forms part of the Rideau Canal, a Canadian Heritage River and Historic Canal operated by Parks Canada, extending between Kingston and Ottawa. The southern portion of the Rideau Canal flows southwards from Upper Rideau Lake, the high point of the system, through the Cataraqui River to Kingston. The Rideau River, which forms the northerly part of the Rideau Canal, drops approximately 83 metres, through 31

locks, between Smiths Falls and the Ottawa River. These locks, along with a series of dams, were built to bypass rapids and waterfalls along the River. In some cases, several locks are joined together to create the necessary change in water level. Water levels along the River are regulated by Parks Canada to ensure that a minimum water depth of 1.5 m is maintained in the navigation channel.

The average annual discharge of the Rideau River at Ottawa is approximately 40 cubic metres per second. Discharge varies through the year, with peak flows occurring between February and May, and relatively low flow rates throughout the remainder of the year (Figure 2). During the summer when average discharge is around 10 cubic metres per second, it takes approximately 15 days for water to travel through the main channel from Lower Rideau Lake to Ottawa. However, as much as 70% of the area of the Rideau River is composed of shallow areas (less than 2 metres in depth), with very low flow.

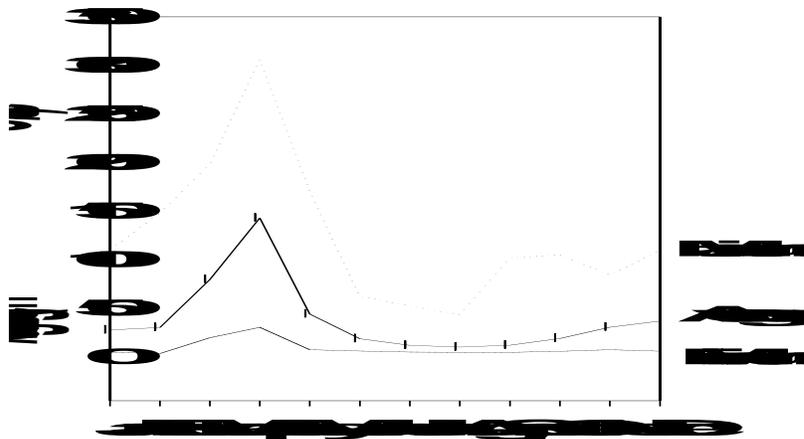


Figure 2 Average monthly discharge of the Rideau River at Ottawa, 1933-2000.
Source: Water Survey of Canada, 1990

The Rideau River flows through a mixture of rural and urban communities, as well as wetlands, parks and conservation areas. Eighteen municipalities are located (wholly or partially) within the Rideau watershed, and 5 of these municipalities (Smiths Falls, Montague, Merrickville-Wolford, North Grenville and Ottawa) border the Rideau River as it flows between Smiths Falls and the Ottawa River (Figure 3). There are no major industries located along the Rideau River, and the River is primarily used for recreation and water supply.

Figure 3 The Rideau River Watershed.