**Humber Valley**

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The lower Humber valley from Etienne Brulé Park, just north of Bloor Street, south to Lake Ontario features wild floodplain land within urban Toronto. Twenty-five-metre-high bedrock cliffs of 450-million-year-old Ordovician marine shale define the 300 m wide valley. In postglacial but prehistoric time, the river flowed in a sinuous course to erode meanders in the bedrock cliffs; later the river assumed a straighter course down the valley. On alternate sides of the modern river, marshes grew in these old meander sites (Figures 17.32, 17.33), but in the past two centuries these marshes have mostly disappeared under a cover of mineral soil. This soil is either landfill rubble used to create parkland or flood-deposited sediment that now supports forested levees enclosing clay-bottomed ponds (see Figures 17.34 and 17.35).

The most interesting part of this section of the valley is Pond 7, which can easily be reached from the southeast end of the Bloor Street bridge by following the path down the cliff to the floodplain and its pond. Beavers episodically colonize this pond and fell cottonwood and white ash trees. Water birds such as blue heron and duck are also common. Occasionally large introduced fish can be seen – carp in the pond and Pacific salmon in the river. The floodplain forest is dominated by alien Manitoba maple, tree willow, and Norway maple in addition to the native cottonwood, white ash, and white elm. Wild grape vines hang from the trees in this lush forest. Weedy herbs cover the forest floor, including the
native giant ragweed, the alien and attractive Himalayan balsam, and the not so attractive garlic mustard.

These aliens and weeds thrive in this seasonally disturbed floodplain environment. In spring, during snowmelt, the river rises, carrying ice blocks downstream. When the blocks run aground at a bend in the river, an ice block dam forms across the river, causing water to rise and spread over the floodplain. Ice blocks floating downstream strike and scar floodplain trees up to 3 m above normal water level. This flood water also carries suspended sediment; sand is deposited on the levees along the channel, and the finer silt and clay in the backswamp and pond where the current is slower. There is also local erosion on the levee surface, especially near tree trunks where there is local turbulence during floods. This deposition and erosion encourages the growth of weedy herbs that, after the flood subsides, develop quickly on the fertile soil beneath the forest canopy. On the other hand, the perennial floodplain trees must tolerate periods of waterlogged soil, which accounts for the absence of upland trees such as oak, sugar maple, and beech.

The lower Humber valley has also been a special place in human history. From Lake Ontario upstream to Bloor Street, where the rapids begin, the river is navigable; it forms the southern end of the early historic Toronto Portage to the Upper Great Lakes. Until the late eighteenth century, canoes from windy Lake Ontario entered
the relatively calm river mouth to be unloaded for the portage northward over the Oak Ridges Moraine to the Holland River. At this point, canoeing began again down river, across Lake Simcoe and along the Severn River to Georgian Bay. Just above the rapids on Baby Point, there was a seventeenth-century Seneca Indian village, Teiatagon, as was discussed in Chapter 4. Near this place, the French built a trading post in 1720, the first European settlement in the greater Toronto region (Robinson 1965). This place was also a crossroad, because it was located at the most convenient ford on the Humber River for people walking along the shore of Lake Ontario. For these early people, the floodplain also provided fertile soil for growing corn, and the river itself was a fishery for Atlantic salmon.

In response to a growing interest in the area, in 1750 the French erected Fort Toronto to the east of the mouth of the river. After 1760, the fort was succeeded by a trading post, which persisted for the rest of the century. In 1793, Lieutenant Governor John Graves Simcoe built a sawmill on the abandoned site of a French sawmill just below the rapids on the site of what is now the Old Mill, a ruin that dates from 1850 (Figure 17.36). Here a dam was built and water was diverted to power a sawmill and later, after road building, a gristmill. For these reasons, the first European settlement in the greater Toronto region was along the lower reach of the Humber River. However, Simcoe rejected the Humber Portage as the route to Georgian Bay and opened Yonge Street to replace it.

What then were the geological events that produced these landforms that made the valley so attractive for human travel and settlement? A good place to begin is around 13,000 BC, when the continental glacier melted out of the Lake Ontario basin but persisted in the St. Lawrence valley. With the valley plugged with ice, glacial Lake Iroquois filled the Ontario basin to an elevation of 150 m above modern sea level at Toronto, well above the present Lake Ontario level of 75 m. This lake, which had its shoreline near Lawrence Avenue, deposited sand over the lower Humber valley region (Sharpe 1980). When the ice melted from the St. Lawrence valley about 12,500 BC, Lake Iroquois drained to the low level of early Lake Ontario. A valley offshore from the Humber River indicates that the prehistoric river eroded the bedrock to 115 m below the modern level of Lake Ontario (Lewis et al. 1995), which was probably the surface of early Lake Ontario. However, the lake still drained to the sea because the sea was 40 to 50 m lower than today. Since then, Lake Ontario has risen to its present level because of postglacial crustal rebound (see Chapter 1). This rebound caused flooding, which formed still-water...
estuaries and embayments that serve as harbours for towns such as Port Credit and for the former commercial fishing boats and now the modern pleasure craft marina on the lower Humber River.

Crustal rebound was not the only factor in flooding: distant stream capture also contributed to a relatively brief episode of shoreline flooding, which has left its imprint on the Humber valley. Until about 4000 BC, the upper three Great Lakes (Lakes Superior, Michigan, and Huron) discharged to the sea via the Ottawa River. Southward crustal rebound tilted their basins so that there were also outlets at Sarnia and Chicago, and flow through the North Bay outlet to the Ottawa River diminished. By 2000 BC, all of the Great Lakes discharged through Lake Ontario as they do today. Because the Lake Ontario outlet to the St. Lawrence River was not adapted to this larger discharge, Lake Ontario rapidly rose about 15 m to perhaps 2 m above its present level and formed estuaries along the shore. This event, known as the Nipissing Flood, which began 4,000 years ago, helps to explain the valley landforms.

The lower Humber valley displays two stages of postglacial development. Before 2000 BC, the river-eroded meander loops into alternate sides of the valley. Since then these loops have been abandoned, and the river now flows in a relatively straight channel. The timing and cause of this channel change has been worked out by studying the sediment beneath the floodplain ponds (Weninger and McAndrews 1989). Sediment cores lifted from beneath meander ponds 3, 5, and 7 (Figure 17.32) penetrate to river channel gravel and contain sediments deposited since 2000 BC.

In the meander pond of site 7, beneath 50 cm of water, we lifted a 590 cm long core of soft sediment before being stopped by hitting the channel gravel (Figure 17.37). Overlying the gravel, which dates to just before 1700 BC, is silt deposited in an estuary formed during the 1,400 years of high water that marks the Nipissing Flood. In this silt, fossil pollen and seeds are both sparse and poorly preserved, indicating seasonal drying. About 100 BC, this mud-flat silt was replaced by organic mud containing well-preserved fossil pollen and

![Fossil pollen and seeds diagram](image-url)

**FIGURE 17.37** Fossil pollen and seed diagram from sediments beneath pond of site 7. The 590 cm long core was lifted from beneath 50 cm of water. The chronology is based on calibrated radiocarbon dates. Pollen percentages are calculated on counts of 200 tree pollen; only selected pollen types are shown. Note that pollen of floodplain trees is historic. The seeds of selected wetland plants show that a sterile mud flat, deposited during the Nipissing Flood, was succeeded by a marshy pond and marsh after the flood had receded. In the nineteenth century, the succession to the cattail and wild rice marsh was probably due to increased mineral sedimentation.
seeds of pond and marsh plants, indicating that a river levee had formed isolating a pond surrounded by marsh. This new environment was a response to the waning of the Nipissing Flood in Lake Ontario; the river extended south in a relatively straight course through the mud flat. The new floodplain slowly accumulated sediment to keep pace with the renewed rise of Lake Ontario due to crustal rebound.

About AD 800, the pond filled in to become a marsh. This marsh persisted until the nineteenth century, when deforestation of the river catchment caused increased flood frequency and intensity; these flood waters carried soil eroded from newly tilled fields. Over-bank flooding was intensified, especially in spring, when the farm fields were deeply frozen. Sand levees were enhanced and clay began to encroach on the marshes, causing the dominance of cattails. Since the early twentieth century, the marshes have disappeared under a deposit of sand and clay, probably the result of intense soil erosion during road and building construction. Fossil pollen indicates that elm, willow, cottonwood, and Manitoba maple then invaded these newly enhanced levees on the sites of former marshes to form the modern floodplain forest and pond that beaver have come to inhabit.

To a casual visitor the Humber valley appears to be a benign landscape. However, in October 1954, Hurricane Hazel caused a record flood that peaked 6 m above normal water levels. The turbulent water swept away homes and caused loss of life (Kennedy 1979), but there is only a little evidence of landscape change from this tragic event. In the clay-bottomed ponds, this flood deposited a layer of coarse sand; on the levee, white ash tree rings are relatively narrow for the five years after the flood, indicating diminished growth perhaps due to flood erosion that exposed and killed roots.

The future of the Humber marshes is both certain and uncertain. In the longer term, Lake Ontario will certainly continue to rise at a rate of about 20 cm per 100 years, and the lower valley will again become flooded from wall to wall. By the middle of the third millennium, the estuary will broaden and expand upstream, forming new levees and marshes as it drowns them downstream. Further public demand for ball fields, marinas, and rowing courses, however, may entomb the marshes beneath earth fill and cause the river to be channelized further. On the other hand, public appreciation of the surviving marshes may cause them to be preserved or even expanded with their cottonwood trees, cattail, heron, salmon, beaver, and deer.