

CHAPTER 2

MOFFAT CREEK WATERSHED

2.0 MOFFAT CREEK WATERSHED

2.1 WATERSHED DESCRIPTION

The Moffat Creek Watershed encompasses a drainage area of approximately 1,914 ha (4,730 acres) within the Grand River Watershed. Moffat Creek extends approximately 9.5 km (5.9 miles) from its source in the Township of North Dumfries near Gore Road to its confluence with the Grand River in the City of Cambridge. Map 2.1 shows the location of the Moffat Creek Watershed within the Grand River Watershed.

The upper reaches of the Watershed east of the Cambridge City limits, and an area of 130 ha (321 acres) south of the City of Cambridge limits, are within the Township of North Dumfries. These areas encompass 38% of the total Watershed area and are likely to remain rural and/or agricultural.

The urbanized portion of the Watershed located within the City of Cambridge downstream of Highway 8 comprises approximately 35% of the total Watershed area. The watercourse through this section is characterized by a straight flowing engineered channel that has gradients of 0.75% to 1.00%.

The remaining portion of the Watershed which lies within the City of Cambridge is identified for future urbanization and comprises approximately 27% of the total Watershed area. The watercourse through this area is extremely flat (<0.02%) and in places the channel disappears into marsh areas. At Regional Road 97 the Creek becomes a roadside ditch that conveys flows from the culvert beneath Regional Road 97 to the downstream reach of Moffat Creek.

The Moffat Creek Watershed study area is illustrated on Map 2.2.

2.2 WATERSHED HISTORY

Historically, the Grand River was a route linking Huronia, centred on Georgian Bay, to the Iroquois nations south of Lake Erie. The Watershed was extensively used for hunting and fishing as well as agriculture. The outwash plain at the mouth of Moffat Creek was used for growing maize for at least 500 years (Bell, 1968). A village in this location was uncovered in 1990 during development of the Southview subdivision.

This subdivision is located south of Myers Road and West of Christopher Drive to the south City limits.

Following the fall of Huronia in 1648, the Grand River Watershed became part of the domain of the Mississauga First Nation. The Watershed was acquired by the crown from the Mississauga in May 1784, and was granted to the Loyalist Mohawk Nation led by Joseph Brant Thayendangea. The authorization and permission to settle covered an area of land six miles deep from each side of the river beginning at Lake Erie and extending to the head waters of the river. A total of 259,781 ha (641,910 acres) from the mouth of the Grand River to a point near Fergus were surveyed and conveyed to the Six Nations.

Although it was the clear intention of the Crown that the Grand Valley would be reserved for the pursuit of a traditional native lifestyle, Brant felt that it was necessary to be involved in the commercial economy and proposed to sell part of the land grant. After considerable debate between the Six Nations and the Crown about the legality of the sale of land, more than half of the Indian lands were divided into subdivision blocks and offered for sale.

Block 1 (38,165 ha or 94,305 acres) extended from Paris to just above Galt (Dumfries Township) and was sold to Philip Stedman on March 2, 1795 for L.S.8841. In 1816, William Dickson, a lawyer for Mennonites settling Waterloo Township from the Niagara area, recognized the potential value of the tract and bought the land which was still unsettled. Shortly after, the Shades Mill town site was established at the mouth of Mill Creek as a service centre to assist in the marketing of Dumfries Township farms.

With construction of the village underway, layout of the farms of Dumfries began in 1816 under the direction of Mr. Adrian Marlett, the Deputy Provincial Surveyor from Ancaster. The plan called for twelve concessions each 12 miles from east to west and one mile in depth. A lot width of 25 chains with the mile length made each lot 200 acres in area. As work progressed it was found that the Twelfth Concession had more than a mile left over. Lots in this concession were given less than 25 chains in width to maintain the equal 200 acre area of the farms.

The survey provided for a public highway one chain in width (20 m. or 66 ft.) between each concession and after each sixth lot, but made no reservation for boundary roads or the Grand River. Subdivision lots to the Grand were created by amendment in 1822. The original field notes of Mr. Marlett's survey are in the Provincial archives. These notes describe the positions of the road allowances and lot

lines, the character of the land, the names and direction of flow of the creeks, forest cover, swamps, meadows, etc.

Lot 8, Concession 10 was granted to Thomas Moffat from Dumfrieshire/Lanarkshire, Scotland in about 1820. The Creek was named after him. At the time of initial settlement, the forests surrounding the Moffat Creek swamps contained a mixture of oak, pine, basswood, beech, and maple. On wetter ground, cedar and elm predominated. Early reports speak of trees being over 125 feet tall with trunks 5-6 feet in diameter.

The beginning of urban growth in Shades Mill resulted from John Galt's decision in 1827 to use the village as a base for the construction of Highway 24. This Highway connected Shades Mill to the Upper Canada Land Company holdings in the now Guelph and Guelph Township area which he wished to open up to Scottish settlement and as a town site. In anticipation of the wealth and economic activity that would flow from this decision, Shades Mill was renamed Galt in 1827.

Settlement of the Canada Land Company lands also led to a big increase in milling. Wheat grown from Stratford to Guelph was milled in Galt and shipped down the Great Road to Dundas. In 1851 two grist mills in Galt produced 32,765 barrels of flour from 255,000 bushels of wheat. The increase in coach and mill traffic led to the macadamization of Dundas Street in 1836. The construction of the Park Hill dam on the Grand River in 1837 led to the establishment of a series of industries through the 1840's. By its formal incorporation as a village in 1850, the population of Galt increased to over 2,000.

In 1851, the Galt business community syndicated a guarantee for the construction of a Great Western Railroad spur from Hamilton. This line was extended to Preston, Hespeler, and Guelph in 1855. Railway expansion coincided with residential and industrial expansion along the east side of the Grand River. In 1857, Galt received its incorporation as a Town and built the present City Hall. The fine stone core buildings of Galt are the result of successive fires in 1851 and 1856 which demonstrated to property owners the merit of stone construction.

The 1860 Census of Agriculture reports a cheese factory operated by Angus McBain in the vicinity of Cheese Factory Road (Elgin Street) on Moffat Creek as being an important source of income to pig farmers of the district who brought their pigs to partake of swill at the factory. The Creek also supported a brewery and a woodworking mill near its mouth according to Snider in 1918. Moffat's flats were a popular playground by 1880. These flats subsequently became Churchill Park.

The steady expansion of Galt led to the installation of sewer and water services commencing in the 1890's. Development north of Moffat Creek progressed from North to South entering the Moffat Creek Watershed about 1860. The Glenview Park subdivision on the south side of the Creek commenced after 1958 when Myers Road was paved and upgraded.

The area between Christopher Drive and Franklin Boulevard was progressively developed in the 1970's. Lands between Franklin and Dundas developed in the late 1980's. In 1973, the former Beverly Township area of the Watershed was added to North Dumfries Township.

Throughout the remaining part of the Watershed, the land was used for agriculture. Most of the Watershed was cleared by 1840 often using slash and burn techniques. This initial clearing probably represents the maximum degree of clearing in the Watershed. Since that time, agricultural use of marginal lands and wet pockets has decreased, particularly with the onset of mechanization and the increased focus on corn as a cash crop. Retirement of land from agriculture within the Moffat Creek Watershed has accelerated since 1950. Without maintenance of drainage works, much of the immediate valley system of Moffat Creek has been recolonized as wetland. This is particularly evident upstream of Highway 8, in the area of Regional Road 97, and in the Clyde district.

2.3 LAND USE

The Moffat Creek Watershed lies almost entirely within the Regional Municipality of Waterloo (Region). Moffat Creek flows through two of the Regions' seven area municipalities (City of Cambridge and Township of North Dumfries). In this report section, both designated land uses and existing land uses within the Watershed will be summarized.

Official Plan Land Use Designations

The Region completed a Regional Official Policies Plan in October, 1994 which was subsequently revised in October 1995 to be consistent with Bill 163 This Plan and the Official Plans of the City of Cambridge and Township of North Dumfries (including amendments) have been considered in this document.

The Regional Official Policies Plan (R.O.P.P.) recognizes and designates Provincially Significant Wetlands within the Moffat Creek Watershed (Map 1 of the R.O.P.P.). No other natural habitat network areas or features have been identified within the

Watershed. The Olivers Bog Environmentally Sensitive Policy Area (#68 in the R.O.P.P.) which lies within the Fairchild Creek Watershed is in close proximity to the Moffat Creek Watershed boundary. On Map 3 of the R.O.P.P., Agricultural Resource Area - Land Classifications, all lands within the City of Cambridge have been shown as "urban areas" while the lands within North Dumfries have been mapped as "non-prime agricultural lands and other." A few small pockets of "prime agricultural land" are mapped south of Myers Road between Elgin Street and Branchton Road. The Settlement Map in the R.O.P.P. (Map No. 6) shows the entire City of Cambridge as "city urban area". The rest of the Watershed has been designated as an "agricultural resource area". Within this resource area, two "rural settlement areas" and one "industrial/commercial area" have been designated.

The major Transit Corridors Map of the R.O.P.P. (Map No. 8) identifies Hespeler Road, Franklin Boulevard south to Main Street, Dundas Street and Main Street east to Franklin Boulevard as existing major transit corridors. One potential central corridor for the Region would enter the Watershed from the north and end at Main Street.

More than half of the Moffat Creek Watershed lies within the City of Cambridge. The lands within this area have been designated in the City of Cambridge Official Plan largely as residential class 1 (urban) and industrial class 2 (general). Along Moffat Creek the land use designation is open space class 1 (conservation). There are some smaller pockets of residential class 2 (suburban), commercial class 3 (neighbourhood), foodland and industrial class 1 (corridor). Amendments Number 72 (area southeast of Myers Road and Highway 24) and Number 74 (area along Regional Road 97 east of Franklin and area east of Dundas Street on north side of Moffat Creek), if granted Regional and Provincial approval, will change the land use designations from industrial to residential. The rest of the Moffat Creek Watershed lies within the Township of North Dumfries.

The Township of North Dumfries has been divided into two sections referred to as the Beverly North Area and the Beverly South Area. All of the Moffat Creek Watershed in North Dumfries falls within the Beverly North Area. In this area, non-farm-related residential lots may be created without a hydrogeological study being undertaken in compliance with the Region's Guidelines for Hydrogeological Studies for Privately Serviced Developments as approved by the Regional Commissioner of Engineering.

Land use designations described in the Official Plans are shown on Map 2.3.

Existing (Current) Use of The Lands

Land use changes, within the Moffat Creek Watershed, include the expansion of urban development within the City limits below Highway 8, a reduction in agricultural use, in the remaining portions of the Watershed to the northeast and south, as marginal land is abandoned. At the present time, the primary land uses within the Watershed include residential, commercial, institutional, industrial, park/open space forested/wetland, and vacant/agricultural.

In general terms, there are three land use areas within the Watershed.

1. Existing urban area within the City of Cambridge west of Highway 8;
2. Area proposed for development between Highway 8 and the Municipal boundary, which includes South East Galt. This is the area where most future land use change will take place; and
3. Rural agricultural areas within the Township of North Dumfries both upstream and south of the City of Cambridge.

Map 2.4 shows the land uses presently found in the Watershed and Table 2.1 summarizes those uses by area.

The existing urban area, described above, covers a land area of approximately 772 ha (1,908 ac). Within this built area of the Watershed, residential uses predominate (48% of area), vacant or agricultural uses occupy 30%, park/open spaces occupy approximately 10% and other land uses such as institutional, industrial and commercial make up the remaining land uses.

The developing area between Dundas Street and the Municipal boundary occupies 670 ha (1,655 ac) of land within the Watershed. Currently, vacant or agricultural uses predominate (54% of the area), while forest/wetlands occupy approximately 33% of these lands. Other land uses of significance to the Watershed include the Regional Landfill site on Clyde Road, some institutional land use along Main Street, and the Cambridge Auto Wreckers yard south of Main Street. An additional 65 ha (160 ac) of land, adjacent to the Moffat Creek Watershed but within the Fairchild Creek system, completes the land area designated for development in this section of the City of Cambridge. These lands are primarily used for agricultural purposes.

The North Dumfries rural area is located northeast and southwest of the Cambridge city limits and totals 470 ha (1,161 ac). Vacant or agricultural land uses predominate (53%) with scattered rural settlement areas (Mackie and Clyde) and non-farm related residential lots. The Moffat Creek wetland and associated forested areas encompass

TABLE 2.1
EXISTING LAND USE

Existing Land Use	Area within the City of Cambridge excluding South East Galt		City of Cambridge Proposed Development Area		North Dumfries		Total Watershed	
	ha	%	ha	%	ha	%	ha	%
Residential	370	48%	18	3%	15	3%	403	21%
Commercial	9	1%	21	3%	0	0%	30	2%
Industrial	0	0%	34	5%	0	0%	34	2%
Institutional	35	5%	11	2%	0	0%	46	2%
Parkland/ Open Space	80	10%	0	0%	47	10%	127	7%
Forested/ Wetland	50	6%	223	33%	161	34%	434	23%
Vacant/ Agricultural	228	30%	363	54%	247	53%	838	44%
Total	772	100%	670	100%	470	100%	1912	100%

161 ha (398 acres) of land. The Cambridge Golf and Country Club is the only specialized land use in this area.

Presently, 27% of the Watershed is built (residential, commercial, industrial, institutional) with residential predominating (21% of the total Watershed). The forests and wetland occupy 23% of the total area. An additional 27 ha (7%) is parkland/open space. Some of these lands are part of the Moffat Creek wetlands. Vacant/agricultural land uses still occupy 44% of the Watershed.

2.4 KEY WATERSHED ISSUES

Initial concerns and issues were identified through a visual reconnaissance of Moffat Creek and the surrounding lands, and through discussions with local agencies and Watershed residents. The issues identified helped to focus the efforts of the study team and guided the study approach. A number of issues were identified that arise as a function of the existing Watershed conditions, however, most of the concerns and issues are related to impending urban development in the central portion of the Watershed and increased non-farm residential growth in the upper Watershed. The key Watershed issues are as follows:

Flooding

Under existing conditions, several structures within the urbanized area may be flood susceptible during major storm events. This study will determine the potential impacts of upstream development on existing flood levels and identify opportunities to reduce the existing flood risk. Flooding could be an issue in the area proposed to be developed.

Erosion

Erosion and sedimentation are presently occurring within the Watershed. The locations of existing erosion and sedimentation should be identified. Consideration should be given to the potential impact of upstream development as well as possible mitigation measures. Erosion and sedimentation should be minimized throughout the Watershed.

Groundwater

The principal groundwater concern relates to the potential impact of development on the shallow groundwater system and the effect on wetland ecosystems as development

takes place. Consideration should be given to water quality relative to both public and private water wells.

Wetlands

The Moffat Creek Watershed encompasses a Provincially Significant (Class 1) Wetland which should be protected from intrusion and loss of function. If this wetland and/or other wetlands within the Moffat Creek Watershed are in a degraded state, then this study should consider restoration and rehabilitation of these areas. Wetland boundary revisions should also be considered.

Surface Water Quantity and Quality

This Watershed Plan will provide guidelines to minimize alterations in surface water quantity as a result of development and to maintain or improve surface water quality within the Watershed.

Aquatic Resources

Moffat Creek is a warmwater stream with some existing fish habitat and the potential to support healthy warm water fishery. This habitat should be maintained or improved.

Wildlife Habitat and Corridor Functions

Wildlife habitat and corridor functions should be maintained or enhanced.

Development Opportunities and Servicing Requirements

The lands within the City of Cambridge occupied by the Moffat Creek Watershed represent some of the last unplanned residential land remaining in the City. Therefore, these lands can be expected to face significant urban pressures.

Trunk sanitary services, water mains and storm sewers should be designed to minimize impacts to the environment. New roads and crossings of Moffat Creek should also be designed to minimize environmental impacts.

Recreation

The degree of public access into natural areas should be governed by the potential for environmental degradation. Appropriate mitigation including involvement of

community groups in education and litter patrol will be defined in this Watershed Plan.