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The Thames River Watershed:

A Background Study for Nomination under the Canadian Heritage Rivers System

1998

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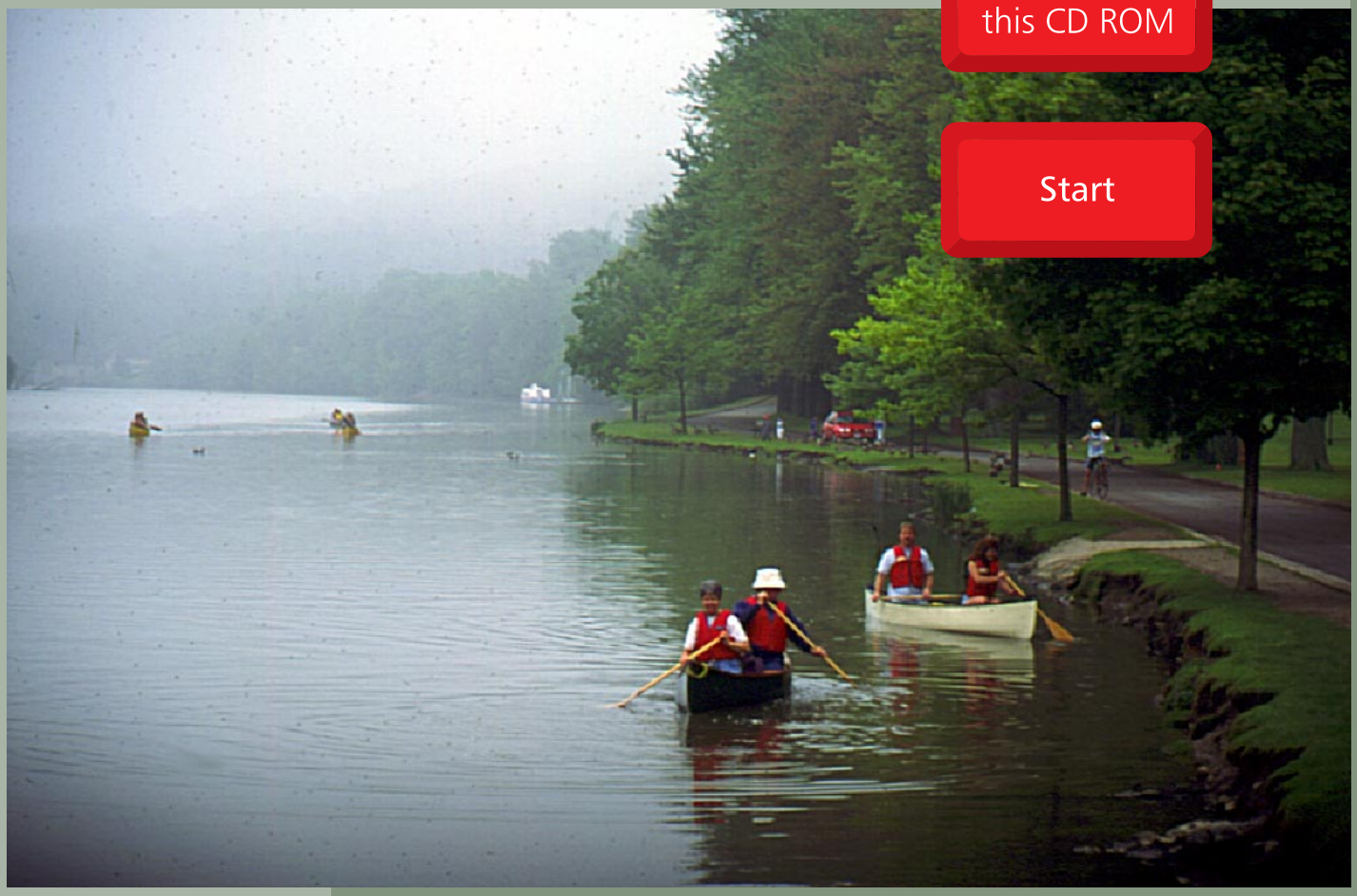

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Written by the
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Chapter 1

Ontario's Thames River, one of the most southern Canadian water courses, has exerted a strong influence on both the natural features and the settled landscape within its watershed. The Thames contains unique natural heritage, human heritage, and recreation values making it worthy of consideration as a Canadian Heritage River (CHR).

The Thames is a relatively small river on a Canadian scale but has unique natural heritage features. The Thames was one of the first rivers to form following the retreat of the Wisconsinan Glacier from Ontario and the upper reaches still flow through these ancient spillways. The lower river reach, with its shallower gradient, emerged after thousands of years as a glacial lake.

The Thames is the only major river in Canada with the majority of its watershed within the Carolinian Life Zone. This region is recognized as one of the most biologically significant and diverse regions in Canada with more than 2200 species of vascular plants identified including the only two locations of the Wood Poppy in Canada. With its many habitats, nutrient rich waters and connection with the Great Lakes, the Thames also contains the largest diversity of clams, the threatened Eastern Spiny Softshell Turtle and one of the most diverse fish communities in Canada. Despite the long period of human occupation and development in the watershed, there are more species of plants and animals present today than in the past, although, protection and restoration efforts are still required to help preserve this unique and vital area of Canadian natural history.

With respect to its human heritage, the Thames River has provided the setting for 11,000 years of significant Aboriginal and European settlement. The Thames, with its abundant fish and game, provided a focus for each group in the sequence of Aboriginal peoples, including those who were the first to practise agriculture in Canada between 500 and 1650 A.D. In the 1700s, the river attracted French fur traders and European settlers, as well as Aboriginal groups.

Following the role of the Thames valley as a major theatre in the War of 1812, which included many battles and Tecumseh's death in the Battle of the Thames at Moraviantown, pioneer settlement within the watershed developed into Canada's first successful commercial agrarian society based on wheat. In turn, many of the numerous watermill sites provided the basis for industrial and urban development, including the major riverine cities, notably the early river port and ship building centre of Chatham, as well as London, Stratford and Woodstock, and a number of smaller towns and villages. Agriculture flourished during this time and the watershed has continued as the most prosperous farming landscape in Canada.

During the American Civil War, the Thames served as the final avenue to freedom for blacks fleeing slavery through the Underground Railroad. Today, in remembrance, a tour leads visitors to many significant landmarks in the refugee slave settlements near the Thames River including the Buxton Historic Site and Museum, and the First Baptist Church in Chatham.

London links Governor Simcoe's 200 year old vision of the key site at 'the Forks' with a vibrant modern city. As well, the Thames watershed, specifically London, hosted events and discussions leading to the formation of conservation authorities in Ontario. Here, the recent year-long 'Celebrate the Thames' events focused attention on the river as a chief element in the city and region's cultural heritage.

Many names are linked to the Thames River including Tecumseh, Thomas Talbot, John Carling, John Labatt, Amelia Harris, Paul Peel, Adam Beck, and Arthur Meighen. More recently, Tom Patterson of the Stratford Festival on the banks of the Avon, and Silken Laumann, Marnie McBean, and Kathleen Heddle at the National High Performance Rowing Centre on Fanshawe Lake are nationally significant names.

From Mitchell and Tavistock to Lake St. Clair, the Thames provided the framework for,

and still links, the rural and urban elements of one of Canada's most prosperous and distinctive landscapes.

The Thames River also supports a large range of outdoor recreation activities. It is this diversity of recreational activities, combined with national calibre attractions such as the Stratford Festival and the National High Performance Rowing Centre at Fanshawe Lake, which makes the Thames unique. Examples of this recreational diversity include: all forms of boating from canoeing and kayaking to sailing, power-boating and yachting, high performance rowing on the Thames and at Fanshawe Lake, the London Canoe Club (the largest canoe club in North America), the Tornado City Boardsailing Club at Pittock Lake (the oldest boardsailing club in Canada), fishing and hunting, hiking trails (the Thames Valley Trail and Avon Trail both link to provincial trail networks including the Bruce), multi-use urban trails for walking, cycling, roller-blading, horse-back riding and cross-country skiing, naturalist clubs and research opportunities within the unique Carolinian Life Zone, heritage appreciation including an Iroquoian Village (Ska-Nah-Doht), a pioneer settlement (Fanshawe) and military reenactments, and tourist attractions including pow-wows, local festivals and fairs. Not only does the Thames attract the half million people who reside in the watershed, it provides opportunities for national and international visitors as well.

The recognition of these intrinsic values of the Thames River by various individuals, community groups and agencies within the watershed has led to the following Background Study in support of the nomination of the Thames as a Canadian Heritage River. Designation as a CHR would, in one comprehensive program, promote the Thames locally and internationally, unite agencies and individuals in a common vision for the river, and ensure the future protection of natural heritage, human heritage and recreational values of the river.

The following report highlights three major themes related to the Thames River watershed: Natural Heritage Values (Chapters 1-7), Human Heritage Values, including First Nations (Chapters 8-20) and Recreational Values (Chapters 21-28). Within each of these three themes, research methods, specific valued features and a summary of significance are described. The report concludes with a summary of significant river features and values and a recommendation to proceed with formal nomination of the Thames as a Canadian Heritage River.

1.1 Description of the Thames River

The Thames River originates northeast of London and flows southwesterly to Lake St. Clair. The river is comprised of three distinct branches. The North Thames River starts north of Mitchell and includes drainage from the Ellice Swamp before flowing through St. Marys. The Middle Thames River begins southwest of Tavistock and flows through Thamesford before joining the South Thames River between Woodstock and Dorchester. The South Thames River starts to the west of Tavistock and passes through Woodstock.

The North and South Thames Rivers meet in London at the Forks of the Thames, historically the city's most important landmark. From this point the river flows parallel to Lake Erie toward Lake St. Clair passing through Delaware, Wardsville, Thamesville and Chatham as well as the Chippewa, Oneida, Munsee-Delaware and Moravian First Nation Communities. The Thames finally joins Lake St. Clair at Lighthouse Cove.

Major Thames River tributaries include the Avon River, Trout Creek, Medway Creek, Indian McGregor Creek and Jeanettes Creek. Major reservoirs within the system include Wildwood, Fanshawe and Pittock Dams. Figure 1.1 illustrates the location of the Thames River within Canada and southern Ontario. Figure 1.2 illustrates the Thames River watershed, its major tributaries and urban centres. The municipal boundaries within the Thames River watershed are illustrated in Figure 1.3

Figure 1.1 Location of the Thames River

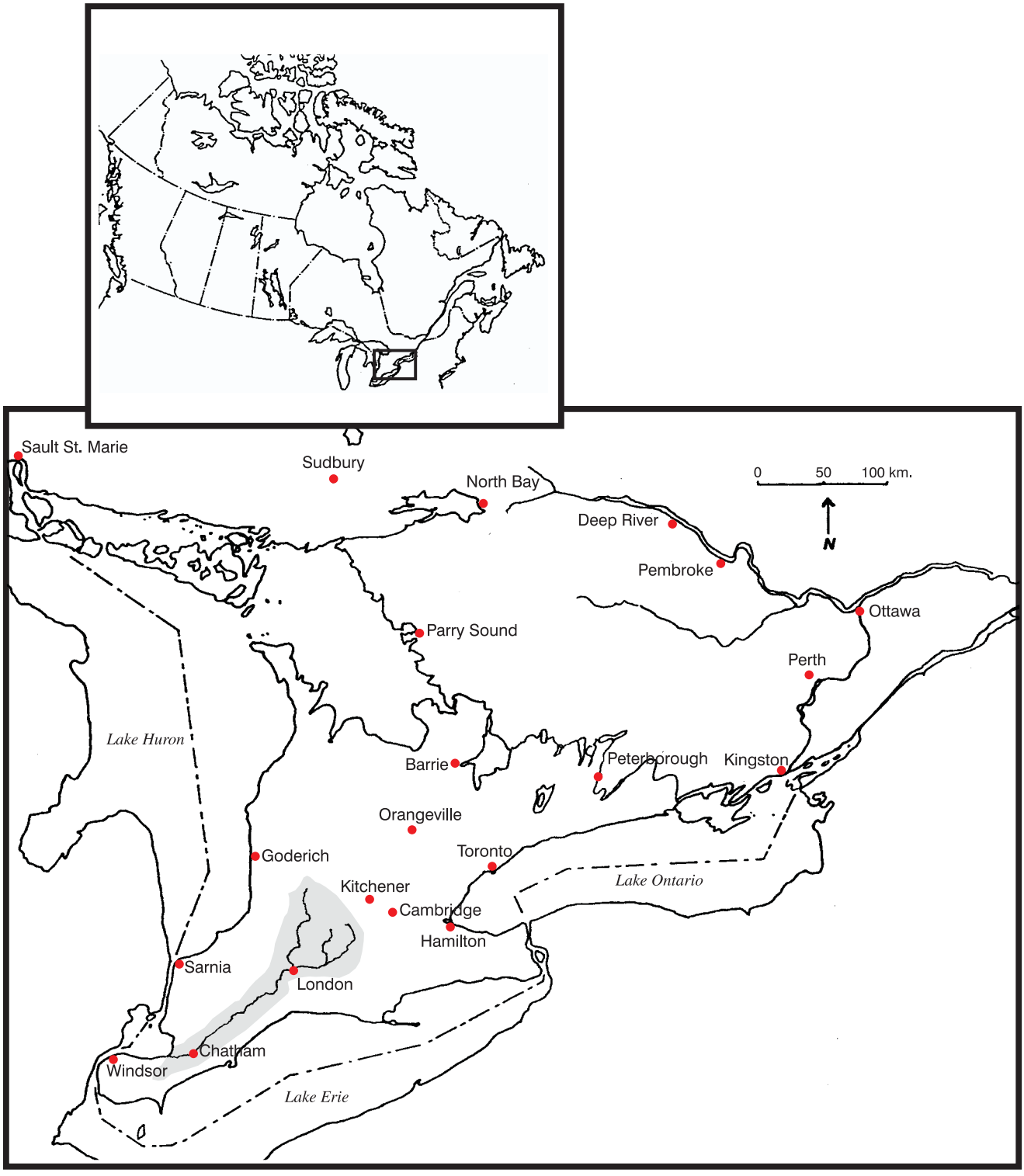


Figure 1.2 Thames River Watershed

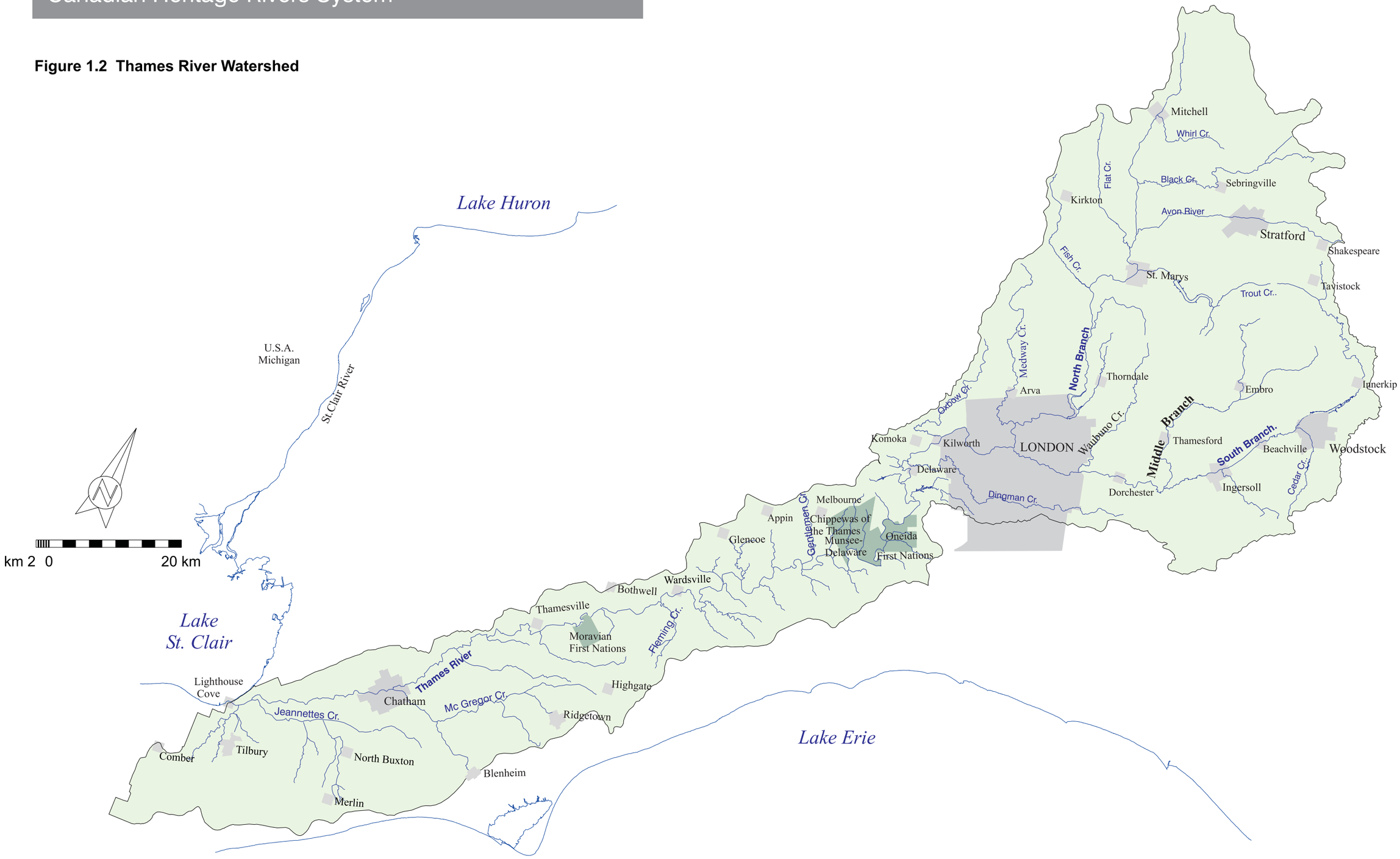
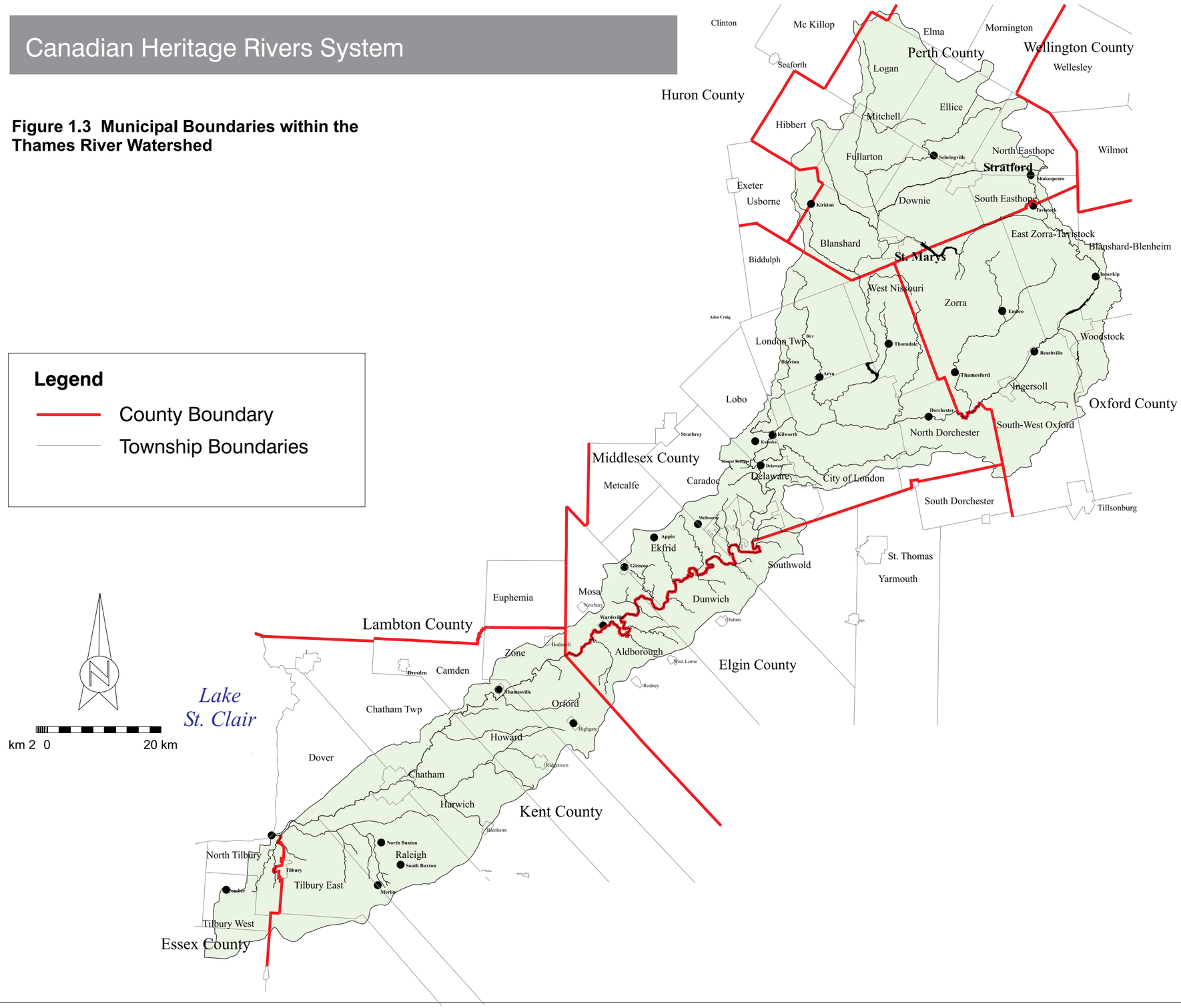


Figure 1.3 Municipal Boundaries within the Thames River Watershed



1.2 Structure

The Thames River Background Study is the product of a volunteer network of non-profit groups, agencies, educational institutions and individuals in the Thames River watershed. Representatives include the Upper Thames River and Lower Thames Valley Conservation Authorities (watershed based resource management agencies), the University of Western Ontario, King's College, Fanshawe College, First Nations, Celebrate the Thames, the Ontario Ministry of Natural Resources, the Ontario Federation of Anglers and Hunters, and the cities of London, Chatham, and Stratford. Collectively, this group has established the Thames River Coordinating Committee (TRCC), a Background Studies Subcommittee, Communications and Fundraising subcommittees, and three additional subcommittees, one for each of the three themes. A technical writing team was contracted to complete the final report. A complete list of participants is included in Table 25 of the Appendix. Administrative support has been provided by the Upper Thames River Conservation Authority, the Lower Thames Valley Conservation Authority, and the University of Western Ontario.

1.3 Scope

The Thames River Background Study considers values associated with the four main sections of the Thames: the North Branch, South Branch, Middle Thames and the main channel from London to Lighthouse Cove. Values of the major tributaries (i.e., Avon River, Trout Creek, Medway Creek, Indian McGregor Creek, Jeanettes Creek) are also discussed. While background research has focused on these primary river channels, they are presented as representative of the watershed as a whole. This adheres to the Thames River Coordinating Committee's philosophy of nominating the Thames River for CHR status within a watershed context. Given the importance of the Thames River to wildlife, the evolution of settlements, commercial activities (industrial and agricultural), transportation and recreational pursuits in Southern Ontario, it is impossible to restrict the river's influences and values to only its main corridor. The influence of the river extends far beyond the valley slope and, as such, justifies a watershed context when assessing the values of the Thames.

1.4 Benefits of CHR Designation

The TRCC has worked hard to ensure community groups within the watershed understand and support the Thames River nomination effort. Identifying and communicating possible benefits has been an important part of this work. Benefits emphasized include:

Coordination: There are currently 54 municipalities, two conservation authorities, two Ministry of Natural Resources Offices, the University of Western Ontario and affiliated agencies, naturalist groups, recreation associations, historical societies and concerned individuals with either a mandate or strong interest in managing activities related to the Thames River. A common vision, goal, and commitment to action and reduced duplication will be developed in the management strategy stage of the CHRS designation and will more effectively and efficiently protect the many values associated with the Thames River.

Tourism: Tourism is important to communities in the Thames River watershed especially London, Stratford, St. Marys, Chatham and Lighthouse Cove. Tourism is an obvious benefit resulting from civic pride in the river and its heritage. As awareness and appreciation for the Thames River grows through the nomination and designation phases, there will be an increased opportunity to share values in the river through tourism.

Conservation: Resource planning through the management strategy phase of the CHRS designation process provides a unique opportunity to protect a range of valued features within the watershed. While several individual efforts may currently be in place to protect significant natural areas, water quality, archaeological sites, heritage structures or recreational opportunities, the CHRS provides a context to unite and strengthen these individual efforts for the benefit of the river. Ultimately, this will translate into benefits including improved water

quality, greater protection of cultural heritage artifacts and sites, and enhanced recreation opportunities.

Communications: The CHRS process generates a forum for agencies, groups and individuals interested in the Thames River to work collectively toward its nomination and ultimate designation. Despite common interests in the river, there has not been an opportunity for so many groups to collectively discuss the importance and future of the river since the Thames River Basin Study in the late 1970s. Communications among these various groups and individuals has improved since the nomination effort started and this is expected to continue.

Economics: Ultimately, all of the above benefits can be translated into economic benefits. Increased tourism, improved conservation measures and more focused and effective communications will either reduce current expenditures or generate new revenue. Local businesses, the government and individuals will all potentially realize these economic benefits.

1.5 Feasibility of Managing the Thames as a CHR

The Thames River is, for the most part, a managed river. One flood control dam (Fanshawe) and two flood control/flow augmentation dams (Wildwood and Pittock), dykes, municipal drainage schemes, sewage treatment facilities, flood and fill line regulations, provincial and conservation authority water quality monitoring programs, fish stocking programs, designated heritage sites and bridges, and planned riverfront parklands and marinas all point toward efforts to manage and protect a variety of values associated with the Thames River.

Letters of support received to date from many of the groups responsible for management of the Thames indicate strong support for CHR designation. This support is based, in part, on the assumption that designation will improve management and protection of the river's values through a watershed wide perspective rather than municipal or conservation authority boundary limitations currently in place. Both conservation authorities and 46 of 54 Municipalities have currently signed letters of support for the management of the Thames as a CHR.

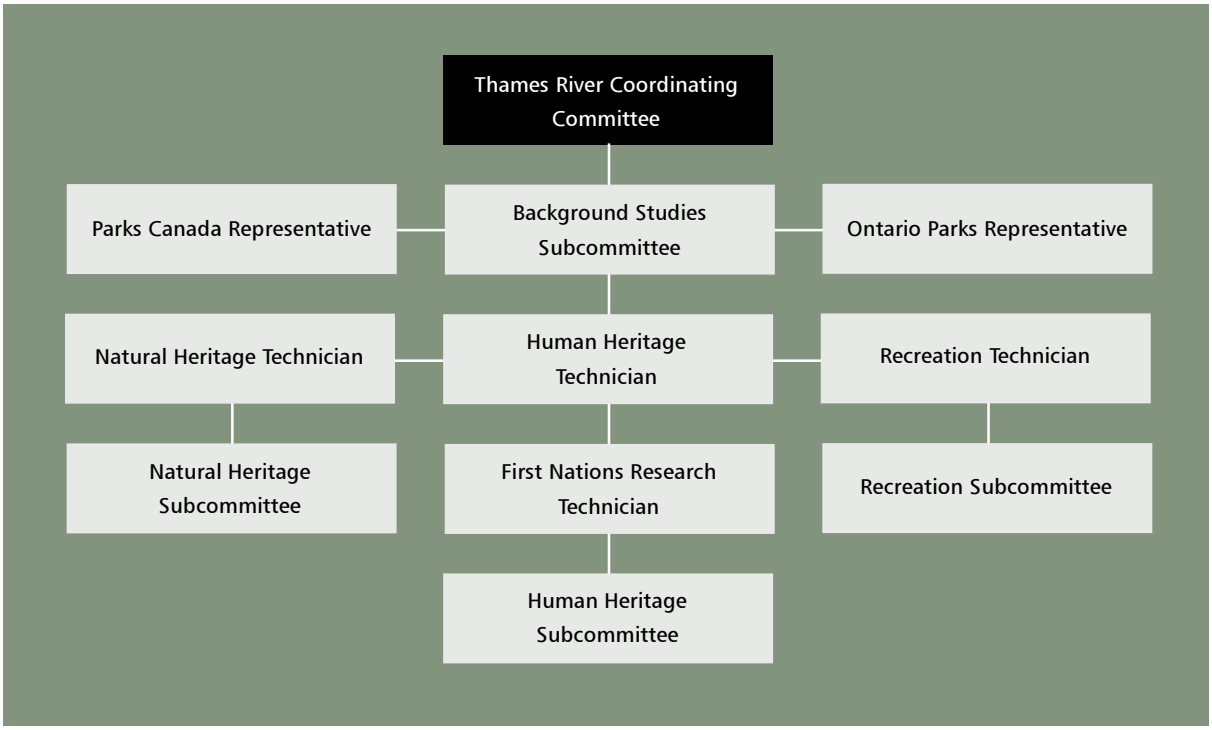
The two conservation authorities, in particular, will benefit from designation and management of the river as a CHR. The Thames is the only river in Ontario with two conservation authorities sharing responsibility for one river. While management principles are similar between the Upper Thames River and Lower Thames Valley Conservation Authorities, decisions and plans for the river occur independently for the two river reaches. CHR designation provides an opportunity for the two conservation authorities to generate an integrated planning and management process for the river.

1.6 Methodology

The Thames River Coordinating Committee was formed in May 1996 to oversee nomination of the river through the Canadian Heritage Rivers System. Following funding approval by the Canadian Heritage River Board (CHRB) for background studies, the TRCC established a Background Studies Subcommittee in January 1997. The subcommittee continued the philosophy of strong grassroots involvement established by the TRCC in its approach to the Background Study. Rather than retain professional consulting services to develop the background studies report, the subcommittee opted to use a network of volunteer experts from within the watershed and hired four staff to coordinate the collection of information and writing of the report. The Upper Thames River Conservation Authority provided supervisory responsibility for staff and administrative support while Ontario Parks and Parks Canada provided consultative advice and technical assistance. Figure 1.4 illustrates in flow chart form, the staff and committees set up to oversee the Background Study.

This community based approach was selected for two reasons: the large number of participants would allow a great deal of information to be collected, reviewed and synthesized in a relatively short time and at little cost; secondly, participation would generate support and 'ownership' of the product and commitment to proceed toward designation.

Figure 1.4 Organizational Structure / flow chart



Criteria developed for collecting values information included direct association with the Thames River or one of its tributaries, application within the natural and cultural frameworks as provided by the Canadian Heritage Rivers Board, previous recognition as a regionally, provincially or nationally significant feature and, consensus by the Background Studies Subcommittee. Specific research methods will be described more fully at the beginning of each of the summary sections for natural heritage, human heritage and recreation values.

1.7 Assumptions and Limitations

Stakeholders involved in nominating the Thames as a CHR have assumed the river is worthy of designation. This assumption has been based upon information supplied by various experts in the watershed and is now further supported by the findings in the following Background Study.

Several limitations were recognized as work proceeded on the Background Study:

- Research information was extracted from studies with broader interests than the river itself. Natural heritage information in particular is often summarized on a county basis making information exclusive to the Thames difficult to tabulate.

- Gathering background research has been a very large task due to the wealth of information available for the Thames River basin and has been completed on a very short time line. Primary research was therefore limited and most attention focused on secondary research summaries.

- The natural heritage and cultural heritage frameworks provided by the CHRB required information which did not necessarily support the nomination. While this may be informative, it tends to detract attention from features promoted for their significance.

There has been an assumption that management agencies such as conservation authorities, provincial ministries and municipalities will implement management plan recommendations following designation. This has been somewhat tempered by the realization that municipal structures are about to drastically change and that reduced provincial transfer payments could influence the ability of these traditional management agencies to continue with their roles as currently provided. To the extent possible, these changes will be recognized and addressed as part of the Management Plan for the Thames River.

1.8 Community Support

Community interest and support for the features and values of the Thames River has always been strong. Volunteer organizations such as Celebrate the Thames Committee and the McIlwraith Field Naturalists, workshops including "Focus on the Thames", "Blueprint for the Thames" and a recent Elderhostel devoted to the values of the Thames, as well as events such as Celebrate the Avon in Stratford and Heritage Days in Chatham speak to this level of interest and support.

Following several information gathering meetings and open houses during the winter of 1996, the various community interests from across the watershed agreed the Thames qualified for consideration as a CHR. Since the CHRS Board meeting in January, 1997, when approval was given to proceed with Background Studies and the preparation of a formal Nomination Document, efforts have been ongoing to develop widespread community involvement and support for nomination of the Thames. Target audiences have included the general public through newspaper articles and community events as well as specific organizations such as Chambers of Commerce, Naturalist Clubs, Historical Societies and Recreational Clubs. Political support has also been targeted at the Municipal, Provincial and Federal levels. From the beginning, widespread community involvement has been recognized as necessary to successfully promote and protect the values of the river.

Letters of support have been requested and received from many government and non-government agencies within the watershed. Letters received to date include:

Table 1.1 Letters of Support Received to Date

Members of Provincial Parliament

Bert Johnson,	Perth
Ernie Hardeman,	Oxford
Peter North,	Elgin
Bruce Smith,	Middlesex
Diane Cunningham,	London North
Marion Boyd,	London Centre
Bob Wood ,	London South
Jack Carroll,	Chatham-Kent
Pat Hoy,	Essex-Kent

Members of Parliament

John Richardson,	Perth-Middlesex
John Finlay,	Oxford
Gar Knutson,	Elgin-Middlesex-London
Patrick O'Brien,	London-Fanshawe
Joe Fontana,	London-North-Centre
Sue Barnes,	London West
Rose-Marie Ur,	Lambton-Kent-Middlesex
Jerry Pickard,	Kent-Essex

Municipalities

Perth County
Stratford
St. Marys
Mitchell
Logan Township
Ellice Township
Fullarton Township
Downie Township
North Easthope Township
South Easthope Township
Blanshard Township
Perth County Council

Oxford County
Woodstock
Ingersoll
East Zorra-Tavistock Township
Zorra Township
South-West Oxford Township
Norwich Township
Oxford County Council

Middlesex County
London
North Dorchester Township
London Township
Lobo Township
Delaware Township
Glencoe
Caradoc Township
Mosa Township
West Nissouri Township
Middlesex County Council

Municipalities

Essex County
North Tilbury Township

Kent County
Chatham
Bothwell
Ridgetown
Tilbury
Highgate
Thamesville
Wardsville
Zone Township
Camden Township
Howard Township
Harwich Township
Dover Township
Raliegh Township
Tilbury East Township
Kent County Council

Elgin County
Dunwich Township
Southwold Township

County Stewardship Councils

- Perth Stewardship Network
- Resources Improvement Oxford
- Middlesex Stewardship Committee
- Elgin Stewardship Program
- Stewardship Kent

Chambers of Commerce

- Stratford and District
- Lighthouse Cove

Others

- Upper Thames River Conservation Authority
- Lower Thames Valley Conservation Authority
- Carolinian Canada
- The University of Western Ontario (UWO)
- Dr. E.G. Pleva, Professor Emeritus, (UWO)
- National Water Research Inst., Aquatic Ecosystem Protection Branch
- Ontario Ministry of Economic Development, Trade and Tourism
- London Advisory Committee on Heritage
- London Environmental and Ecological Planning Advisory Committee
- London Museum of Indian Archeology
- Fanshawe Pioneer Village
- Fairfield Museum
- Chatham-Kent Museum
- Wildwood Nature Club
- Woodstock Field Naturalists
- Ingersoll Nature Club
- McIlwraith Field Naturalists
- West Elgin Nature Club
- London Canoe Club
- London Rowing Club
- University of Western Ontario Rowing Club
- Oxford Sailing Club
- Fanshawe Yacht Club
- Thames Valley Trail Association
- London and Area Council of Women
- Friends of Stoney Creek
- Stratford Chamber of Commerce

First Nations (meetings held)

- Chief Phillip Snake - Delaware of Moraviantown
- Chief Leroy Dolson - Delaware-Munsee
- Chief Kelly Reilly - Chippewa
- Chief Kevin Doxtator - Oneida
- Dean George (serves as a member of TRCC) - Oneida

The following Community Events were scheduled in 1997. Display panels, fact sheets and staff were available at each event to promote the Thames River nomination.

Table 1.2 Heritage River Display Tour

Event	Date
Green Watersheds Day, Woodstock	Saturday, May 3, 1997
Celebrate the Avon, Stratford	Sunday, May 11, 1997
Celebrate the Thames Closing Ceremonies and CHRS Launch Event, London	Sunday, June 1, 1997
Grand Trunk Trail Event, St. Marys	Saturday, July 12, 1997
Night Walk with the Spirits, Longwoods Conservation Area	August 16, 1997
Gathering of Friends, Sharon Creek Conservation Area	August 23, 1997
Community Picnic, Longwoods Conservation Area	August 24, 1997
Melbourne Fall Fair, Melbourne	August 29-31, 1997
Ontario Western Fair	September 6-12, 1997
UTCRA 50th Anniversary Commemorative Event	September 13, 1997
Glencoe Fair, Glencoe	September 19-21, 1997
Heritage Days, Chatham	October 3-5, 1997
A Taste of Fall, Longwoods, CA Event	October 19, 1997

1.9 Fundraising

Early on it was realized that funds would be needed to do a quality job. Proposals were written by members of the Coordinating Committee and sent to various local foundations. Table 1.3 summerizes the generous financial contributions which were received.

Table 1.3 List of Financial Contributions

Canadian Heritage Rivers Board	$15,000 to support Background Studies
Richard Ivey Foundation:	$16,000 to support Background Studies $24,000 to support the Management Plan (pending nomination approval)
Richard and Jean Ivey Fund:	$15,000 to support First Nations research and community involvement activities
London Community Foundation:	$3,000 to develop display panels and for general support
Human Resources Development Canada:	$35,500 for technical staff wages
Total:	**$108,500**

1.10 Post-Nomination Public Consultation

The success of a management plan will be dependent on maintaining the widespread support already demonstrated for nomination of the Thames as a Canadian Heritage River. MPP's and MP's, Municipal Councils, Stewardship Councils, "Grassroots Groups" and landowners throughout the watershed will be invited to participate in a consensus based decision making process to determine key management issues, management options and recommendations for the future of the river. Other stakeholders will also participate through review of technical materials and products of the management plan. The general public will be kept apprised of progress through general mailings, the media and open houses. This three tiered community involvement strategy proposed for the management planning phase of the CHR process is described in Table 1.4.

Table 1.4 Proposed Levels of Community Involvement for the Management Plan

Level	Who	What
Stakeholder	- any interested party - no limit, no specific structure	- 'information out' through general mailing, fast facts, notice of events, etc.
Partner	- people with specific interest but no time for meetings - no limit, no specific structure	- 'information out' through general mailing, fast facts, notice of events, etc. - 'information in' regarding background data, issues through questionnaire - opportunity to comment on final draft
Technical Committee	- selected individuals - specific sectors required - max 15-18	- 'information out' through general mailings, fast facts, events, display boards, tours, committee meetings - 'information in' through interviews, committee meetings - negotiate 'trade-offs' as partners in development of management options and selection criteria - review all drafts of management plan

Canadian Heritage Rivers System

Part 1 - Natural Heritage: Thames River Watershed

Principal Author:
Cathy Quinlan, B.Sc., M.A.

Natural Heritage

The natural heritage values of the Thames River have provided the basis for the development of human/cultural heritage values and recreational opportunities. The water, soil, and geological materials, and rich plant and animal resources have all played a significant role in the settlement and enjoyment of the Thames and its watershed.

The abiotic and biotic features of the river are described in seven chapters, as laid out in the Natural Heritage Framework of the Canadian Heritage River System (CHRS): Hydrology, Physiography, Morphology, Flora, Fauna, Aquatic Ecosystems and Landscapes. Together, these chapters describe the natural values of the river, providing an understanding of how the river formed and functions in comparison with other Canadian rivers.

The Thames has many interesting physical features. The Thames was one of the first rivers formed following the retreat of the last glacier in Ontario. The upper reaches of the Thames still flow through the ancient spillways. The lower river flows through flat plains of clay and sand, the result of thousands of years under glacial lakes. The channel has an interesting sinuous form, with both straight and meandering sections.

The Thames is the only major river in Canada where the majority of its watershed lies within the Carolinian Zone. This region is widely recognized as one of the most biologically significant and diverse regions in Canada with more than 2200 species of vascular plants. The only Canadian site for the endangered Wood Poppy is in the floodplain of the Thames River. The fauna is also extremely diverse in the watershed. The Thames contains the largest number of Eastern Spiny Softshell Turtles in Canada and is critical to the survival of this endangered species. Owing to its many habitats, nutrient rich waters, long growing season, and connection with the Great Lakes, the Thames River sustains one of the most diverse fish and freshwater mussel communities in Canada.

Methodology

To describe the many natural heritage features, several sources were used: published and unpublished reports and articles, staff from various resources agencies (e.g. UTRCA, LTVCA, OMNR, OMOEE), naturalists, and professors. Field work was also conducted including canoeing, hiking and photographing the river and its valley.

Chapter 2

Hydrology

The amount of water flowing down a river, the velocity at which it travels, the fluctuations over time and the quality tell a great deal about how the river functions, the impact it has on its valley and floodplain ecosystems, and the humans who interact with it. Hydrology also allows one to compare rivers across Canada in a quantitative way.

Hydrological parameters of the Thames River have been measured for many years. Early European settlers recorded flood events as far back as 1792. In 1916, the first Water Survey of Canada Gauge Station on the Thames was installed at Byron, slightly downstream of the Forks. Today, there are 21 automated stations continuously collecting information on the Thames and its major tributaries (Environment Canada, 1992). A complete list of stations and their years of operation is included in Table 1 of the Appendix. This report uses hydrological data from 1956-1990, which represents the longest and most complete period of published data.

Because of the flat gradient in the lower Thames River, Lake St. Clair levels often dictate water levels in the Thames, especially during low flows. High lake levels can actually generate a reverse flow upriver (Dept. of Energy and Resources Management, 1966), making it very difficult to calibrate discharge rates. Thus for the purpose of this report, flows at the mouth are based on stream flow measurements taken at Thamesville, which is the most representative station, plus a calculated 'extra' that represents the additional volume which would enter the river downstream of Thamesville.

2.1 Discharge Volume

When describing a river, the first question to be answered is "how big is it?". The size of a river is measured by the amount of *discharge*, which is the volume of water flowing through a cross section of the stream channel per unit time. Discharge is measured in cubic meters per second (cms).

The Canadian Heritage Rivers System (CHRS) defines five flow volume classes using the *average low flow at the river mouth* to compare discharge rates (Table 2.1). In the Thames River, low flow or base flow conditions occur roughly from May to October. The average discharge rate at the mouth over these months is estimated to be *30.8 cms* (24.5 cms at Thamesville). According to Table 2.1, the Thames is a fifth tier/order river in terms of size. Although small on a Canada-wide basis, the Thames is the largest river tributary to Lake St. Clair and the second largest river in southwestern Ontario.

Table 2.1 Low Flow Volume Classes of Canadian Rivers

Tier/ Order	Class Range (cms)	Example Rivers
V	<500	Thames, Margaree, Restigouche, Grand
IV	500 - <1,000	Kazan, Thelon, Seal
III	1,000 - <2,000	Churchill, N. Saskatchewan
II	2,000 - <4,000	Peace, Fraser, Ottawa, Yukon
I	>4,000	Mackenzie, Saint Lawrence

Source: CHRS (1997)

There are many factors which influence the amount of water a river carries including: climate, watershed area, drainage pattern, slope, landuse and soil type. On average, the Thames carries 40% of the precipitation which falls on the watershed each year to Lake St. Clair. The other 60% evaporates, is evapotranspirated by plants or stored in ponds, wetlands or as groundwater. These percentages vary seasonally; there is less runoff in the summer owing to the large amount of evaporation and evapotranspiration. The heavy soils which predominate in the watershed also influence the amount of discharge. The clays and silts absorb water very slowly (low infiltration rate) and thus a large percentage of rainfall runs off the land and into the watercourses instead of percolating down to the groundwater.

In the Thames, base flow discharge rates have been artificially influenced by human activity over time, probably creating a net gain. For example:

- Wildwood and Pittock Reservoirs augment flow in the summer whereas Fanshawe Reservoir creates a slight loss due to evaporation (reservoirs operating since 1963, 1966 and 1952, respectively).
- The City of London's sewage system augments flow as drinking water is drawn from Lake Huron and discharged as treated sewage to the Thames (about 15,000 m^3 /day). The pipeline was installed in 1966/67 (see Human Heritage 9.3.2 and 15.2.1). Other urban centres such as Chatham also contribute sewage loadings.
- Water is drawn from the Thames for irrigation and industrial uses.
- Stormwater runoff from London, Chatham and other urban areas increases discharge.
- Much of the watershed has been tile drained and woodlands cleared creating peaks in discharge rates, instead of a steady rate of infiltration and recharge.

2.2 Velocity

Stream velocity or speed is measured in metres per second (m/sec) and varies over time and space in the Thames River. Velocity is affected by discharge volume, stream gradient, and small differences in channel width and depth. Table 2.2 summarizes the mean channel velocity readings at various stations along the the Thames River in low and high flow conditions.

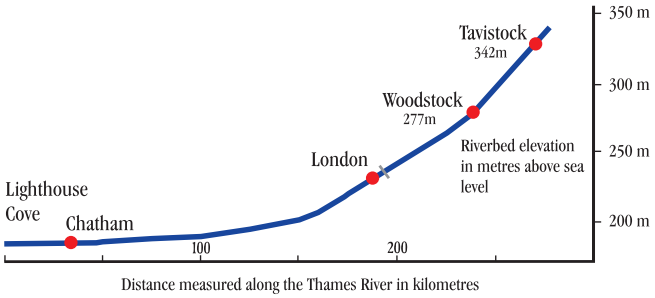
Table 2.2. Summary of Stream Velocity and Travel Times at Selected Thames River Stations

Station (upstream to downstream)	Distance from Tavistock (km)	Low Flow Velocity (m/sec)	Low Flow Travel Time from Tavistock (days)	High Flow Velocity (m/sec)	High Flow Travel Time from Tavistock (days)
Tavistock	0	0.36	---	0.70	---
Ealing/London	80	0.69	2.0	1.05	1.0
Byron	96	0.75	2.3	1.70	1.2
Thamesville	212	0.30	5.4	0.78	1.9
Mouth	273	<0.30	7 - 10	< 0.78	3 - 4

Source: estimated from Otthymo Model (UTRCA), and LTVCA (internal data).

As the water travels downstream from the headwaters, it generally picks up speed and volume. During low flow conditions, it reaches its maximum velocity of 0.75 m/sec near Byron just below the Forks but, by the time it reaches Thamesville, it has slowed down considerably to only 0.30 m/sec. The change is largely due to the drop in gradient as illustrated in the profile in Figure 2.1. The elevation of the river falls at a moderate rate from the headwaters near Tavistock to Delaware (1.9 m/km), but flattens out considerably between Delaware and the mouth (< 0.2 m/km). The ditches which drain the farmland in the Chatham area are often pumped to their outlets since there is limited flow by gravity over the flat terrain.

Figure 2.1 Profile of the Thames River



In general, it takes 7-10 days for water to travel from Tavistock to Lake St. Clair (273 km) during the summer and only 3-4 days during the spring freshet. Flood velocities are approximately 50-160% faster than base flow (Goldt, 1997).

The CHRS defines five Low Flow Velocity Classes as seen in Table 2.3. Because the velocity in the Thames varies, it is difficult to place the river in a specific Velocity Class. The faster sections in the mid to upper part of the river could be classified as having moderate to moderately-fast velocities - Tier 4. However, the area near the mouth falls under the *low velocity river* category - 2nd Tier.

Table 2. 3. Low Flow Velocity Classes (CHRS, 1997)

Tier	Velocity (m/sec)	Thames River Locations
1	< 0.15	
2	0.15 - 0.30	Chatham to Mouth
3	0.30 - 0.60	Tavistock, Thamesville
4	0.60 - 1.50	Byron
5	> 1.50	

2.3 Discharge Regimes

The CHRS classifies Canadian Rivers by ten Discharge Regimes as shown in Table 2.4. The Thames is a Category 1 River, displaying *extreme annual flow variations* with *pronounced discharge peaks.* These flow characteristics are typical of rivers throughout southern Ontario and central Canada. Instead of the peaks occurring in May to June, the Thames experiences its peak flow period much earlier in March and April owing to its southerly latitude. In addition, it rarely completely freezes over.

The hydrograph in Figure 2.2 illustrates the fluctuations in mean monthly discharge rates. The peak discharge in March (140 cms) is seven times higher than the low which occurs in July and August (20 cms). Climate has the largest impact on the seasonal fluctuations in river flow.

The Thames River basin lies within the Great Lakes-St. Lawrence Climatic Region which has a continental climate although it is markedly modified by the Great Lakes (Hare and Thomas, 1974). Figure 2.3 illustrates the long term normals for precipitation and temperature for the London area.

In London, about 1 metre (95.5 cm) of precipitation falls annually and is fairly uniform throughout the seasons. Air temperature follows a bell-shaped curve. The summers in this area are usually longer and warmer than summers in any other part of the country. Evaporation and evapotranspiration are at their maximum in June, July and August, which means less water runs off the land to the river. Conversely, in March and April, runoff rates are very high due to the fact that the ground is still frozen or saturated; both melting snow (which is the accumulated precipitation from the winter months) and spring rainfall end up in the river.

Figure 2.2 Hydrograph of the Thames River at Thamesville, 1956-1990.

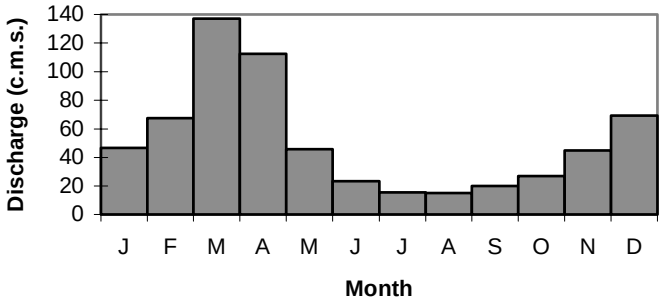


Figure 2.3 Temperature and Precipitation Normals, London Airport, 1961-1990.

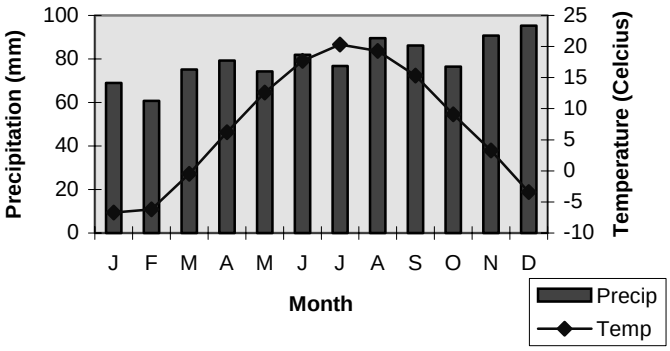


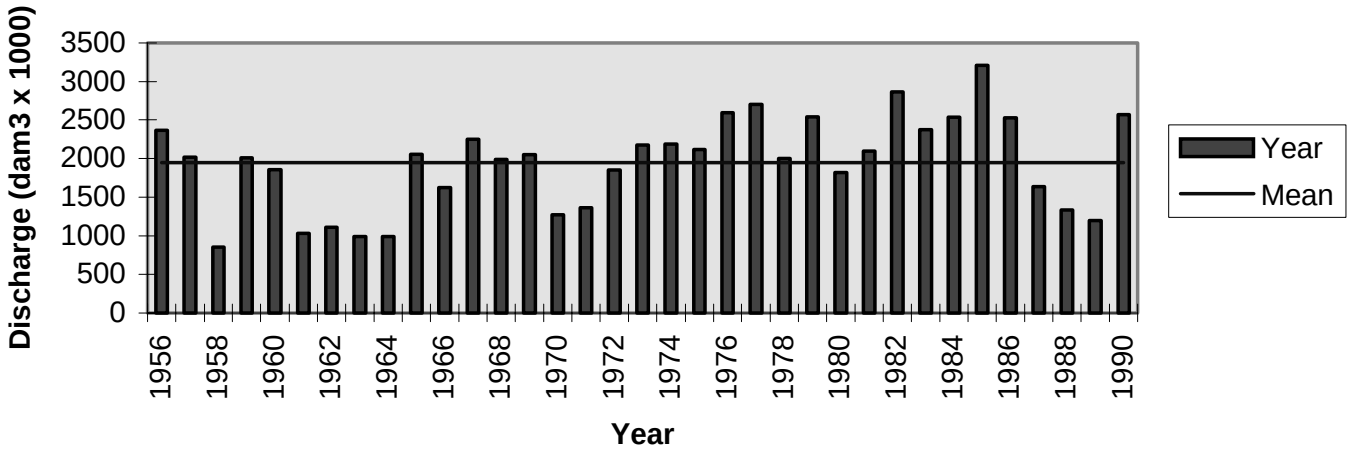
Table 2.4 Classification of Discharge Regimes in Canada

Typical Annual Regime	Peak Flow Period	Year-to-Year Variation	Regional Characteristics	Example Rivers
1) Extreme annual flow variation, pronounced discharge peak	May - Jun.	Major	Southern and central Canada	Grand, Trent, Severn, Bloodvein
1b) as above	***Mar - Apr***	***Major***	***Southwestern Ontario***	**Thames**
2) Extreme annual flow variation, pronounced discharge peak	Jun - Jul	Moderate	Northern Prairies and Territories	Porcupine, Arctic Red, Yukon
3) Extreme annual flow variation with very low flow period	Jun	Major	Mostly southern Prairie rivers	Milk, Souris
4) Moderated flow variation due to summer precipitation or glacier melting	Jun - Aug	Moderate	Mostly Cordilleran and Atlantic rivers	Fraser, North Saskatchewan, Thompson, Margaree
5) Minor flow variations due primarily to extensive lake holdings	Variable	Minor	Mostly in southern Canada or linked to northern lake systems	St. Lawrence, Boundary Waters, St. Mary's (On), Churchill
6) Minor flow variations due primarily to large watersheds	Variable	Major	Mid-continent rivers, Hudson's Bay watershed	Assiniboine, Saskatchewan, Thelon, Kazan
7) Low - zero flow during winter	Jul	Major	Smaller northern rivers	Thomsen, Back
8) Strong flow variation; peak discharge in spring, with second peak in fall	May - Jun & Aug - Sep	Major	Cordilleran rivers affected by snowmelt and summer rain	Stikine, Adams
9) Minor to moderate flow variation; peak discharge in spring, with a secondary peak in fall	May - Jun & Aug - Sep	Moderate	Quebec and eastern Canada	Saint-Maurice
10) Peak flow in winter	Dec - Jan	Major	West coast	San Juan

Source (CHRS, 1997). 1b - was added to further refine the conditions in the Thames

Year to year variation is also significant. From 1956-1990, total annual discharge at the river mouth fluctuated widely from a low of 700,000 cubic decametres (dam^3) in 1958 to a high of 2,700,000 dam^3 in 1985. This is illustrated in Figure 2.4. Flows fluctuated 43 % to 165% around the mean of 1,640,000 dam^3. Again, this is largely a reflection of climatic variation.

Figure 2.4 Yearly Fluctuations in Total Annual Discharge at the Thames River Mouth



There has been a long history of flooding on the Thames River (see Human Heritage, 15.1). Flooding occurs for several reasons in different stretches of the river. For example, there is very little storage in the channel in the lower Thames near Chatham, thus, large flows can readily inundate the flat valley beyond the shallow banks. Dykes have been constructed along the Thames to hold in some of the floodwaters. The dykes extend from the mouth east, on both sides of the river, into Dover Township on the north bank and Raleigh township on the south bank. Ice jamming near the mouth is another cause of spring flooding; the snow melts in the watershed before the ice in Lake St. Clair melts and opens up the outlet.

In the upper reaches, flooding can occur for a number of other reasons:

- The natural absorption and retention abilities of the land have been reduced due to the clearing of the forest and wetlands, the installation of tile drains on farmland, and the paving of urban areas. Precipitation is directed to the watercourses immediately, instead of percolating down into the soil or pooling at the surface;
- There can be fairly rapid melting of the snow in the late winter or spring when the soil is frozen or saturated, and most of the meltwater runs off into the river;
- Heavy, intense rainfall over a short period and over a large area can overload the watercourses, especially in the summer (e.g. the severe flood of 1883 was in July);
- There is very little natural water storage in terms of ponds and lakes; collectively, the three dams operated by the UTRCA greatly reduce flooding in downstream locations.

2.4 Water Properties

The CHRS compares the water quality of rivers using four parameters: clarity (turbidity), acidity, nutrients, and temperature. Bacteria is also discussed here. These properties can strongly affect the biological productivity and appearance of a river as well as its usage by humans. Water sample data is available for many stations along the Thames River and its tributaries from 1975 to 1991 (Ontario Ministry of the Environment and Energy (OMOEE), 1997). Through the Provincial Water Quality Monitoring Network, water samples were collected monthly by Conservation Authority staff and analysed by the OMOEE.

Turbidity is related to the water's clarity and is measured by the amount of light that can pass through a sample of water. Table 2.5 lists the three turbidity classes that, for the purposes of this study, have been grouped into three categories: high, medium and low. The *upper branches of the Thames are moderately turbid*, while the *lower Thames is highly turbid*. This is visible, especially in the summer when the suspended sediments give the water a brownish colour. Soil conservation education and incentive programs have been successful in the watershed, but it is evident that much work is still needed in the lower valley where there are large regions of sand (which is highly erodible) and clay (which stays in suspension).

Table 2.5. Turbidity Classes (CHRS, 1997).

Class	Jackson Turbidity Units	Thames River Levels (Formazin Units)
High	> 20.0	Lower Thames (69.5)
Medium	5.1 - 20.0	Upper Thames (9.4-13.2)
Low	0 - 5.0	

* Jackson Turbidity Units and Formazin Units are comparable.

Nutrients such as nitrates and phosphates are common elements in watercourses that receive runoff from agricultural and urban areas. For example, nitrogen and phosphorus are key components in many organic (manure) and commercial fertilizers. Sewage also contains high levels of these elements. The Thames is *nutrient-rich* in comparison to other rivers across Canada. At all three stations, nitrate levels average 3-5 mg/L and soluble phosphorus is approximately 0.2-0.4 mg/L, which is moderate. Excessive plant growth in rivers and streams does not occur when total phosphorus concentrations are below 0.3 mg/L (OMOEE, 1984). The large reservoirs occasionally experience algae growth in the summer due the lack of circulation, but the river itself rarely does.

The relative *acidity or alkalinity* of surface waters is measured by pH. The CHRS categorizes pH as high (alkaline), neutral or low (acidic) using the values illustrated in Table 2.6. The waters of the Thames are *alkaline* with a pH range of 8.0-8.5. The alkalinity of the water reflects the alkalinity of the soil, which originated from the sedimentary bedrock (e.g. limestone) of the area (see Section 3.2). Although acid rain falls in the region, the water bodies do not become acidified as they do in Northern Ontario, owing to the buffering action of the soil. A more detailed look at pH using chemical parameters such as dissolved calcium and manganese is not possible here, because these elements are not routinely analysed.

Table 2.6. pH Classes (CHRS, 1997)

Class	pH	Thames
High-Alkaline	> 7.3	8.0 - 8.5
Neutral	6.6 - 7.3	
Low - Acidic	< 6.3	

Water temperatures in the Thames River fluctuate over the year, closely following the bell-shaped curve of the air temperature. Water temperatures range from freezing in the winter to 22 °C in July. The Thames is largely fed by warm water streams and warm runoff from the land. There are, however, several cold water streams which are sustained by groundwater discharges. The lower Thames is, on average, 2° C warmer than the upper Thames reflecting the air temperature differences over this fairly large distance.

The CHRS classifies rivers according to the length of their *ice-free period*, instead of the actual water temperature (see Table 2.7). The Thames starts to freeze in December and is usually ice-free by the end of March, a *Class 2* river.

Table 2.7. Classification of Ice-free Periods

Class	Year	No. of Months	Examples
1	Year round	12	West coast, S.W. Nova Scotia
2	Apr. - Nov.	8	Thames, S. Ontario, Atlantic Canada, British Columbia.
3.	May - Nov.	7	S. Quebec, C. Ontario, S. Prairies
4	Jun. - Oct.	5	N. Prairies, Quebec & Ontario
5	Jul. - Sep.	3	N.W. Territories

Source: CHRS (1997)

Bacteria from human and animal wastes are commonly found in natural waters and are a concern from a public health perspective. Swimmers can experience skin irritation, ear and eye infections, and, if swallowed, intestinal disorders. Public swimming beaches such as those located at the reservoirs, are routinely sampled by the local health units in the summer months. On average, the three reservoirs operated by the UTRCA experience elevated levels of bacteria for a few weeks each summer (eg. >100 E.coli bacteria per 100 ml water). Manure runoff, faulty septic systems, large gull and goose populations are the main sources of the bacteria. Programs to alleviate this problem have been on-going for many years and are described in Human Heritage 15.2.4.

Chapter 3

Physiography

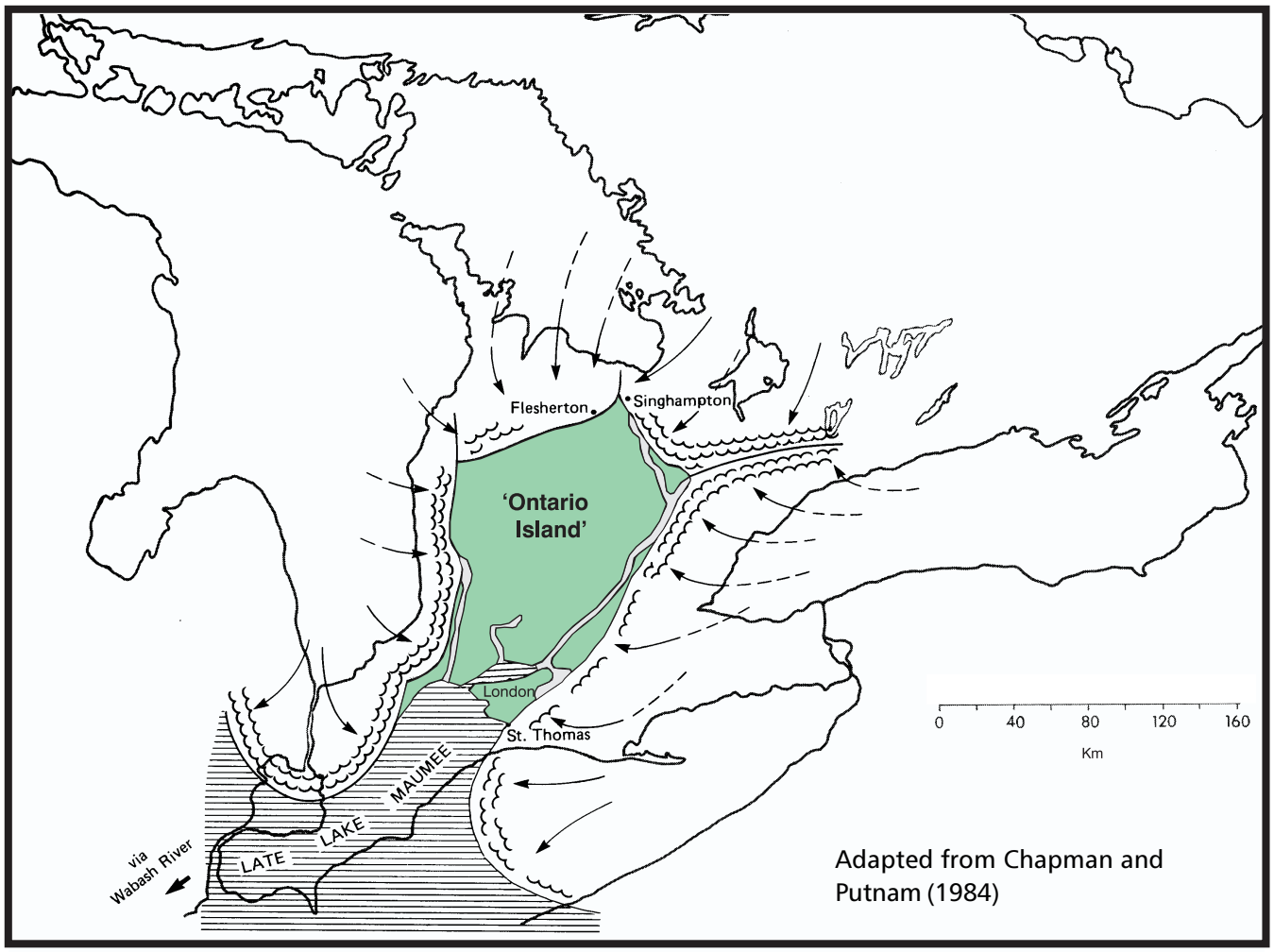
This chapter describes the physical characteristics of the Thames River valley and its watershed using shape of the valley, drainage pattern, geological materials and soils, adjacent landforms, and the processes of erosion and sedimentation. A glossary is provided at the end of Part I.

3.1 Glacial History

The last glacier to cover southern Ontario, the Wisconsinan, started its retreat about 14,000 years ago. It was responsible for depositing the soil materials and creating the landforms that exist today. The first piece of land in Ontario to be free of glacial ice ("Ontario Island") is thought to have appeared to the northeast of the present Forks of the Thames in London (Chapman and Putnam, 1984). The Thames was the first major river to develop in Ontario; at its earliest stage, the great Thames spillway drained watersheds of the present Saugeen, Maitland and Grand Rivers and carried the meltwater southwest towards the Mississippi River. As melting progressed, extensive lowland areas south of London were submerged in glacial lakes as illustrated in Figure 3.1. Glacial Lakes Maumee, Whittlesey, Warren and Lundy all covered this area and were the predecessors of Lakes Erie and Huron. Eroded sediments were deposited on the beds of these glacial lakes and today these areas are the flat clay and sand plains of southwestern Ontario.

The glacier's retreat was spasmodic, interrupted by temporary re-advances and standstills (Chapman and Putnam, 1984). An advance produced long narrow ridges of unsorted material, called moraines, through bulldozing and dumping, while a retreat deposited plains of till (sand and gravel) by gravity and from meltwater (Lorimer, 1995). The spillways often followed the edges of the moraines or cut through them, creating the drainage pattern in the upper Thames.

Figure 3.1 Early Stages of Glacial Retreat in Ontario



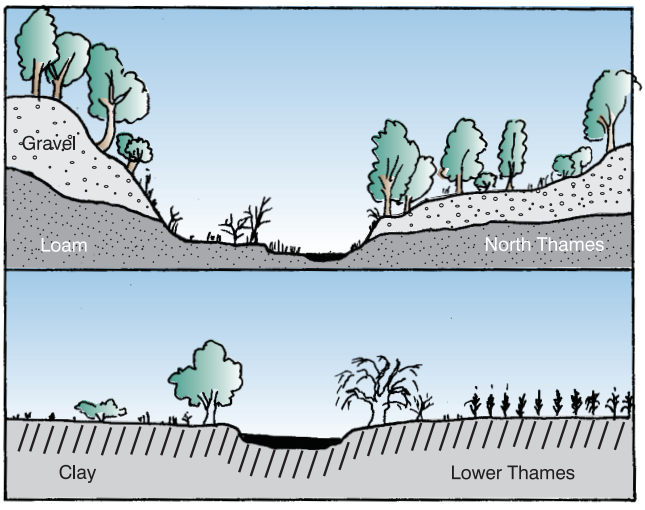
3.2 Valley Configuration

The valley of the Thames River, like most river valleys in southern Ontario, can be classified as *fluvial.* Fluvial valleys are slightly entrenched in a gentle landscape made up of glacial till and clay and sand plains. They flow through materials deposited by the meltwater of a glacier, not the river's own alluvial deposits, which is more commonly found.

Above the Forks, the North, Middle and South Branches of the Thames occupy former glacial spillways. Today they are termed *misfit* or *underfit* streams which means the modern watercourse is too small to have cut the valley it currently occupies. Reynolds and Trout Creek are also former spillways. The lower Thames, on the other hand, occupies a "small valley of its own making" (Chapman and Putnam, 1984, 93).

The difference between the upper and lower river valley is illustrated in Figure 3.2. Above the Forks, the Thames River spillway is about 1 to 1.3 km wide and up to 33 metres deep. The river is confined by its valley; there are steep valley slopes or bluffs on at least one side, often in the direction of the associated moraine, and more gentle terracing on the other bank. Below the Forks, to the Kent County line, the valley is about the same width but its depth is generally less than 23 metres. Further downstream, the river is generally not confined by its flat valley (see Figure 3.2); in fact, the river is so shallowly entrenched below the old lake plain downstream of Chatham, that dykes have been constructed to control flooding of the adjacent lands (see Human Heritage, 15.1). The level of the river is higher than the surrounding land at the mouth.

Figure 3.2. Generalized cross-sections of the upper and lower Thames River Valleys.



In general, the Thames River and all of its associated tributaries and streams follow a *dendritic drainage pattern.* In its idealized form, this is the pattern which forms on an absolutely flat surface of homogeneous rock/soil, with the drainage net forming at random and the streamflow equal in all directions like the branches of a tree (Morisawa, 1968). Rivers flowing over bedrock or faults or in confined valleys will display more linear, rectangular or trellised patterns.

The upper watershed is nearly spherical in shape and the soil fairly uniform and flat which likely set the stage for the dendritic pattern to form. The Thames' history as a glacial spillway, however, does not lend itself to a classic example of dendritic formation. Here, the drainage network evolved piecemeal as various sections of land were freed from glacial ice or lakes. In addition, channels formed along the edges of moraines and glaciers, instead of randomly. The lower watershed is narrow (confined by Lakes Erie and Huron) and thus the tributaries here tend to be short (< 10 km long) and run parallel to each other with limited branching. McGregor and Jeannettes Creeks are the longest tributaries in the lower watershed at around 30 km each. A list of the major tributaries of the Thames is given in Table 2 of the Appendix.

Below the confluence of the South and Middle Branches near Dorchester, the Thames River is a *6th order stream.* This was determined using 1:10 000 Base Maps (Schwindt, 1997). Many first and second order streams are private or municipal drains, as a result of the intensive agriculture in the headwater areas, and some are buried tiles. However, when using 1:50 000 topographic maps, the Thames is a 5th order stream below the Forks in London. Most 'large' rivers are at least order 6 as determined on 1:50,000 maps (Kellerhals and Church, 1989). See the glossary for a description of *stream ordering*.

3.3 Geological Materials

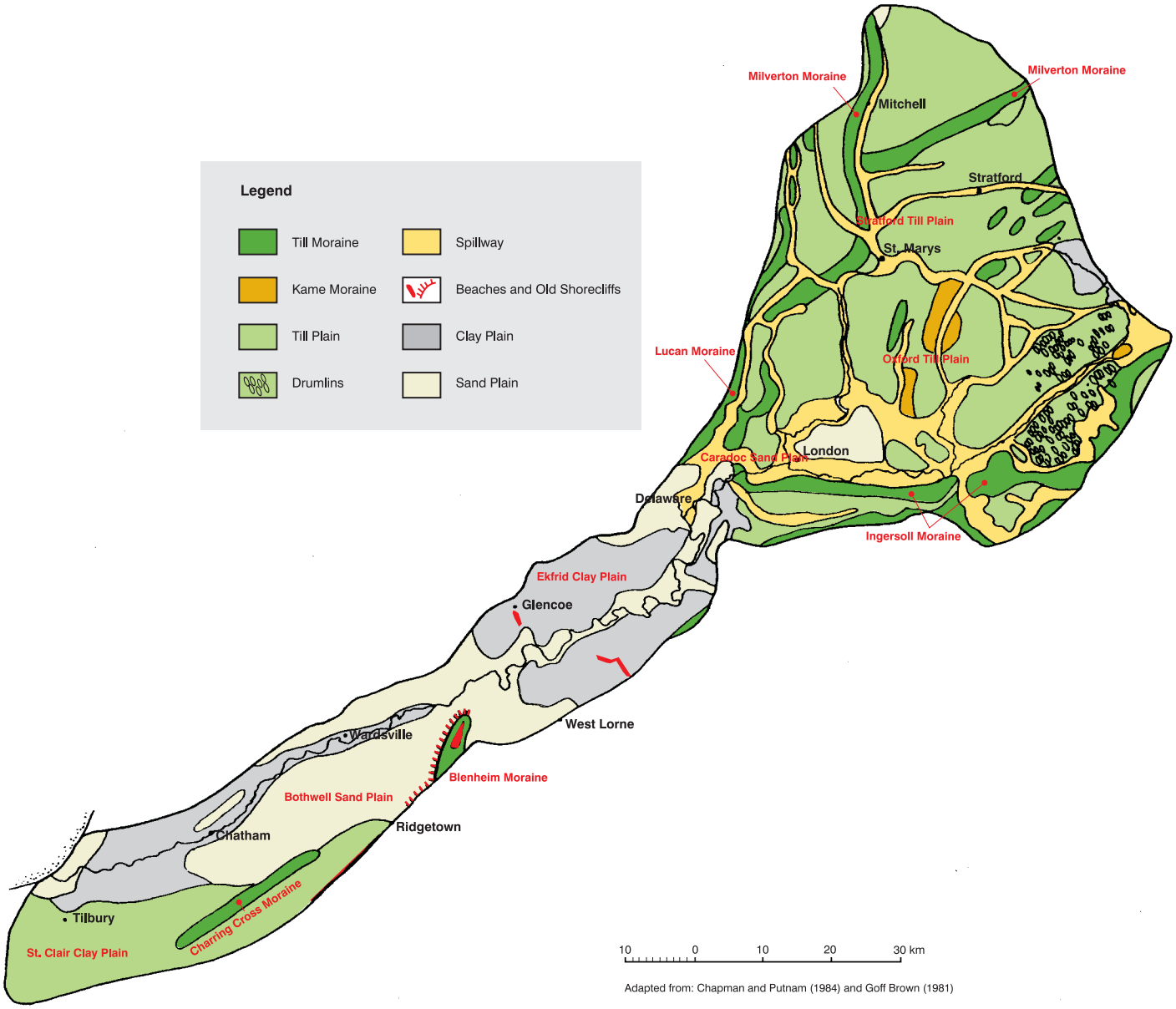
The ancient granitic Precambrian bedrock of the Canadian Shield is buried under about 1500 metres of younger sedimentary bedrock and another 30 metres of overburden (till). Owing to its great depth, the granite is not exposed at the surface in extreme southwestern Ontario. The sedimentary bedrock is from the Upper and Middle Devonian Periods — the most recent periods of the Paleozoic Era. It consists of black shale, grey shale and sandstone, limestone, and some dolomite. The only location in the Thames River watershed where the sedimentary bedrock has been exposed by nature (eg. the scouring actions of the river) is at Beachville near Woodstock. Active quarries exist at Beachville and St. Marys where good quality brown limestone is found from the Lucas, Dundee and Amherstburg Formations (see Human Heritage 9.2.3). While it is not visible at the surface, this sedimentary bedrock determines the altitude and general slope of the land.

The relatively soft sedimentary rock was easily eroded by the glaciers. As described earlier, these materials were mixed and milled by the ice and later deposited in mounds (e.g. moraines) or in more gentle plains. This overburden of

unconsolidated glacial material (till), both sorted and unsorted, is between 23 and 31 meters thick in most of southern Ontario, but increases to 40 metres in London.

Figure 3.3 illustrates the physiography of the Thames River basin. The silt and clay tills of the Stratford and Oxford Till Plains cover a large part of the upper basin. These plains are broken by several large terminal moraines and by the river valleys, most of which contain sands and gravels deposited by glacial meltwaters. Downstream from London, these sand and gravel deposits widen into the Caradoc Sand Plain, which formed as a delta in glacial Lake Whittlesey. The sands are highly sorted here. Further west, the Ekfrid Clay Plain dominates the landscape, with its stratified clays that were deposited in the deeper waters of Lake Whittlesey (Goff and Brown, 1981). The Bothwell Sand Plain was the ancient delta of the Thames River where it met glacial Lake Warren. Its thin sand deposits overlie clays for some 1743 km^2. To the south and west are tills of the St. Clair Clay Plain, which is broken only by the Blenheim and Charing Cross moraines (Goff and Brown, 1981).

Figure 3.3 Some Important Physiographic Features of the Thames River Basin



Adapted from: Chapman and Putnam (1984) and Goff Brown (1981)

Soils are grouped into orders on the basis of their major horizons (layers) which reflect differences in climate, vegetation and parent material. In Canada there are nine orders of soils, seven of which occur in Ontario. Six soil orders are found in the Thames River watershed: Podzolic, Luvisolic, Brunisolic, Gleysolic, Regosolic, and Organic. Table 3.1 gives a brief description of each. Luvisolic soils predominate the mid- to upper watershed with Gleysolic soils in the Chatham to Lake St. Clair area (Hoffman, 1989).

Much of the soil in the Thames River basin is well suited to agriculture, especially with tile drainage and, as a result, the area has been intensively farmed for over 200 years.

Table 3.1 Soil Orders found within the Thames River Watershed

Soil Order	Description
Luvisolic	- well drained and imperfectly drained soils that have developed under deciduous or mixed forest cover in moderate to cool climates. - they are most common in southern Ontario (and Thames watershed) where the parent materials are generally neutral to alkaline (limestone).
Brunisolic	- well drained to imperfectly drained soils that have developed under forest conditions or tundra-like vegetation. - relatively young (eg. alluvium floodplain soils and eolian sands). - most common near Owen Sound area and eastern Ontario.
Gleysolic	- poorly drained soils that are saturated through part or most of the year. - they make up a large part of Essex and Kent counties including the lower Thames River basin.
Regosolic	- localized on severe eroded slopes, colluvial depressions and alluvial floodplains.
Podsolic	- well drained and imperfectly drained soils that have developed under coniferous and mixed forest vegetation. - most extensive in northern and central Ontario, originating from the granitic rocks of the Precambrian Shield.
Organic	- saturated soils that have developed from the accumulations of organic materials such as grasses, reeds, mosses, etc. - localized in Thames watershed under large swamps.

Source: Hagerty and Kingston (1992), Hoffman (1989) and Webber (n.d.)

3.4 Neighbouring Structures

Because of the depth of the soils in this part of Ontario, there are very few geomorphological processes which have a discernable impact on river flow. There are no major faults or dislocations due to breaking of the Paleozoic bedrock (Chapman and Putnam, 1984). There are no examples of folding, sedimentary layers, cross bedding, ripple marks, sills, dykes or lava flows.

3.5 Ongoing Geological Processes

As in the section above, the Thames is not particularly effective at illustrating geological phenomena due to the great depth of the bedrock and the gentle nature of the landscape. Glacial rebound, for example, is negligible in southern Ontario. Volcanism is not present. There are examples of mass wasting, erosion and sedimentation along the bluffs and meanders of the river, but these occur on a small scale, and always within the soil layer. These are described in detail in Section 4.2.

3.6 Glaciers and Permafrost

Glaciers and permafrost are not present in southern Ontario.

Chapter 4

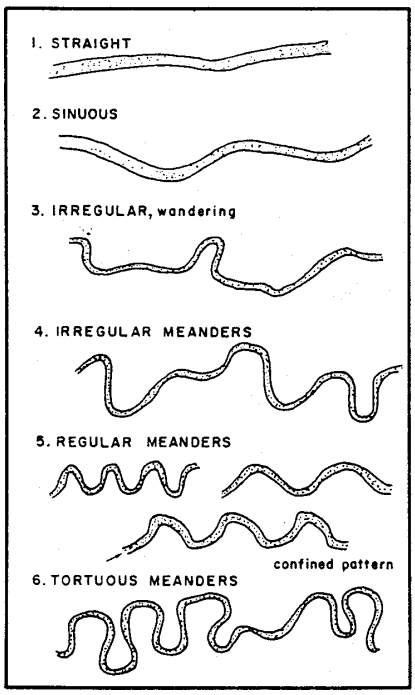
River Morphology

This chapter discusses the morphology, or form and structure, of the Thames River by exploring the channel pattern, erosional and depositional forms, adjacent landforms, rapids, lakes and ponds.

4.1 Channel Pattern

As rivers and streams flow along seeking the path of least resistance, they develop different channel patterns in response to the physiography of the area. The channel pattern or map view of a river is usually described as either *straight*, *meandering* or *braided*, although there are variations of each. These categories are not exclusive, as meandering streams can contain braided and straight reaches. Various methods are in use to classify rivers (e.g. Rosgen, 1994, Mollard 1973, and Leopolde & Wolman 1957). The system used by Kellerhals *et al* (1976) is quite descriptive of rivers in this region. This system describes six channel patterns (Figure 4.1): straight, sinuous, irregular (wandering), irregular meanders, regular meanders, and tortuous meanders. Braided rivers are not considered a channel pattern but, instead, the associated bars and islands are viewed as features of a river.

Figure 4.1 Channel Patterns
(Modified after Kellerhals et al, 1976).



The Thames River takes on several channel patterns, but overall is best described as having a *sinuous channel pattern* or *irregular meanders* (Ashmore, pers. comm.). There are, however, stretches where the meandering is more regular such as near Wardsville and Dorchester (see Figure 4.2). and reaches where the river is fairly straight, especially downstream of Chatham. Human alteration of the river channel is not considered here.

Figure 4.2. Aerial view of a meander near Dorchester on the South Branch of the Thames River

Source: UTRCA

Typical of large rivers in southern Ontario, the Thames has developed on glaciofluvial deposits, and not on alluvium. Thus, it does not fit the classic definition of a meandering river where the meanders tend to slowly migrate laterally over their alluvium, leaving meander scars or scrolls. There has been no significant shifting of the Thames River channel in the last century. This is likely due to the fact that this underfit channel does not have enough continuous power to erode its fluvial valley.

There are, however, a few oxbows which suggest some limited or localized shifting in channel pattern. For example, there is a large oxbow known as the Coves, located downstream of the Forks in London. This classic example of a cut-off meander became disconnected from the river sometime in the late 1800s. It is still filled with water and is artificially connected to the Thames *via* drainage pipes. Upstream of Delaware, there is a stretch of river where the valley does contain significant amounts of alluvial material and meander scars and oxbows are relatively recent. The alluvial material may have been deposited when an obstruction in the river caused flooding upstream (Ashmore, pers. comm.). There are also a few small oxbows between Thamesville and Chatham which are now wetlands (and are listed in Table 15 of the Appendix (e.g. Thamesville Oxbow, Kent Bridge and Thames River Oxbow Wetlands).

4.2 Erosional and Depositional Forms

A variety of erosional and depositional forms can be found along the Thames River including b*ank erosion, slumping, gullies, pools and riffles, and bars and islands.*

Bank erosion is visible at many of the outside meanders but is most dramatic in areas where there are steep bluffs such as at the Kilworth Bridge (see Figure 4.3). The vertical movement of earth material down hill is termed *mass wasting.* In the Thames, it can either occur by *slide* (fast) as evidenced by steep-sided unvegetated banks, or by *creep* (slow) where trees grow with curved trunks, adjusting their angle to the sun as they slip further downhill. Some banks, especially in the Komoka area, show *rotational slips,* where

Figure 4.3 Eroding Bluff near Delaware

Source: Michelle Fletcher

material from the top of the bank slides down leaving a concave shaped bank. The stretch of river from Delaware to the Kent County line, "exhibits many excellent examples of slip-off slopes, undercut bluffs, and abandoned channels" (Chapman and Putnam, 1984). Erosion rates are not steady and there may not be any change in a bank for many years until a single large discharge passes through and scours the bank with enormous energy.

Gullies are also quite evident in the Delaware to Kent County stretch, especially through the Munsee/Delaware First Nation. Here, the tributary streams cut through the sandy soil down to the base level of the river, creating steep-sided narrow *gulches* along their lower courses.

Pool and riffle formations are common in straight and meandering rivers and the Thames contains many excellent examples. This alternating of deep (pool) and shallow (riffle) areas tends to be more or less evenly spaced along the bed of the river. A study of a 2 km stretch of the Thames near London found the average distance from pool-to-pool and riffle-to-riffle was 580 metres (McCalla, 1973). In an unregulated river in dynamic equilibrium, the pool-to-pool spacing is about 5-7 times the width of the channel (bankfull stage). These pools and riffles provide excellent conditions for fish (see section 6.1).

Bars and islands are also quite common, especially in the mid- and upper Thames. Islands are less common than bars. Many of the bars and islands are made up of pebbles, stones and boulders. The smaller materials are renewed frequently, whereas the larger materials were likely deposited during the glacial period when the river had greater

Figure 4.4 Large Point Bar near Delaware (spring)

Source: Cathy Quinlan

power. The vegetation growing on some islands is quite mature, suggesting these formations have not been significantly altered in recent times. Point bars are common at the inside turn of a meander and are made up of finer sediments such as coarse sand and pebbles; they are ephemeral in nature, shifting and changing with the discharge. Many of these bars provide excellent turtle nesting sites.

Levees are another depositional feature prevalent in the Thames River system. Each spring alluvium (sand and silt) is deposited by floodwaters on the land adjacent to the river. Over time this area becomes raised. In the "Chatham Flats" area, this alluvium has a reddish cast that contrasts with the grey clay of the surrounding landscape which originated under glacial Lake Whittlesey (Chapman and Putnam, 1984).

4.3 Adjacent Landforms

There are several interesting landforms located adjacent to the Thames River. These include *moraines, terraces, oxbows, wetlands and drumlins.*

Several *moraines* are strongly associated with the river as seen in Figure 4.3. The North Thames River, a former glacial spillway, formed along the eastern edge of the Mitchell Moraine, a single strand of heavy till. It follows the moraine for about 50 km from its headwaters, past St. Marys to the confluence of Fish Creek, which cuts through the moraine from the north. Medway Creek, another former spillway, formed along the eastern edge of a lobe of the Lucan Moraine from Birr to Arva (3 km long). The Ingersoll Moraine loosely flanks the Thames in a west-east direction through London, but is several hundred metres to

the south. Reynolds Creek follows a circuitous route in the spillway fronting the St. Thomas Moraine.

As described in Section 3.2, the valley configuration in much of the upper Thames is defined by steep slopes or bluffs on one side and more gentle terracing on the other. Although well vegetated, these *broad gravel terraces* are quite evident as the land rises to the top of bank in a series of steps.

The few *oxbows* which are still evident along the Thames have been described in Section 4.1. There are about 20 *swamps* and *marshes* located in the floodplain of the Thames, and these are described in greater detail in Section 7.4.

The South Branch of the Thames flows through a *drumlin field* located roughly between Ingersoll and Innerkip. Several of these low hills are located less than 500 metres from the river but are more evident from maps and photos than from the ground or river.

4.4 Waterfalls and Rapids

There are no waterfalls along any of the main branches or large tributaries of the Thames, although some small tributaries may fall a few feet over the bank as they enter the Thames, especially in the Delaware area.

Many boulder rapids occur along the Thames and its tributaries. These boulders were transported during the glacial period and are common in the former spillways. The 1:50,000 Topographic Maps show about 85 rapids along the North Branch, 13 on the Avon River and 10 on the Middle Thames. Although there are no markings for rapids downstream of the forks on these maps, paddlers are familiar with the many protruding rocks and boulders downstream to Delaware (see Figure 4.5). These rapids would fall into the lowest order of difficulty. Flat water conditions prevail in the lower Thames where the bed is soft and the gradient is very low.

Figure 4.5 Protruding boulders on the Thames near London

Source: Cathy Quinlan

4.5 Lakes and Ponds

There are *very few lakes and ponds* which naturally occur within the channel of the Thames River and its major tributaries and which regulate its flow. Several reservoirs have been constructed on various branches of the river to regulate flow; these are described in Section 7.2.

Chapter 5

Flora

The flora or vegetation of the Thames River basin is extremely rich and diverse. Primarily, this is because it spans two species-rich floristic zones: the Carolinian and Great Lakes-St. Lawrence. The plants that grow in the river, along its banks, and within the floodplain and valley reflect these floristic affiliations and are described in this chapter.

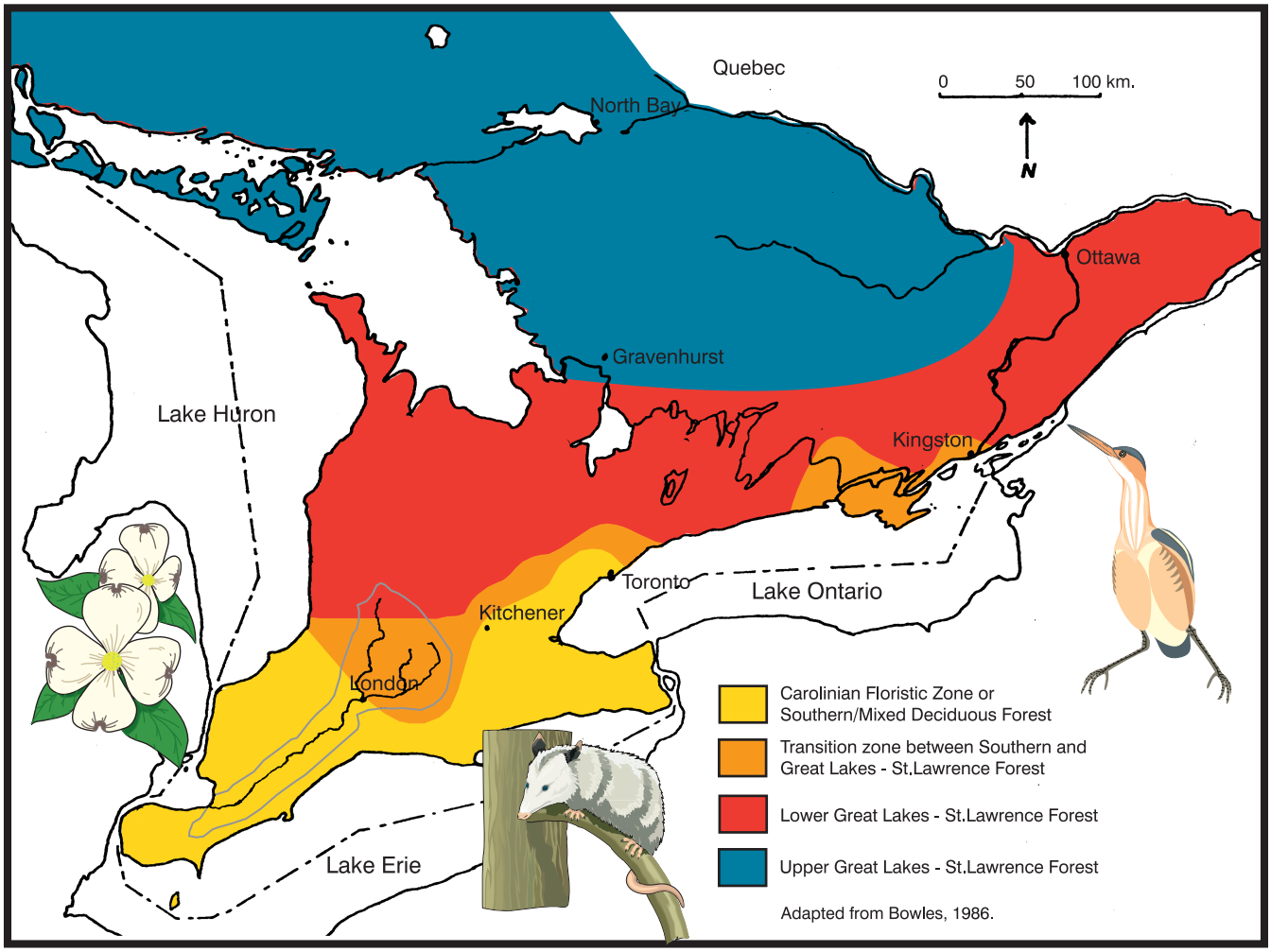
5.1 The Carolinian Forest Region

In a country dominated by boreal (evergreen) forests, the Thames River has the distinct and somewhat enviable reputation of being located within a small region known as Carolinian Canada or the Carolinian Zone. It is called "Carolinian" because many of the plants and animals found here are also found in the Carolinas as well as the Ohio Valley, Virginia, Tennessee and non-mountainous regions of east-central United States. Broad leaved, deciduous trees characterize the Carolinian Forest Region. It is widely recognized as one of the most biologically significant and diverse regions in Canada; it is home to more than 2200 species of vascular plants including 70 species of trees (Love, 1985). A short list of some of the better known and representative Carolinian trees and shrubs is provided in Table 5.1.

Table 5.1 Some Representative Plants of the Carolinian Floristic Region

Trees	Shrubs	Plants
American Chestnut	Poison Sumac	American Ginseng
Tulip Tree	Trumpet Creeper	Showy Goldenrod
Black Gum	Hazelnut	Broad Beech Fern
Pin Oak	Moonseed	Green Dragon
Black Walnut	Spicebush	Cup Plant
Shagbark Hickory	Shining Sumach	Sweet Joe-pye-weed
Pignut Hickory	Wild Yam	Wood Poppy
Blue Ash	Burning Bush	Michigan Lily
Sassafras		Wild Lupine
Flowering Dogwood		Golden Seal

Figure 5.1. Forest Regions of Southern Ontario



It is also home to a wide variety of animals, many of which are found nowhere else in Canada including: 27 species of reptiles, 20 species of amphibians, over 200 species of nesting birds, 17 kinds of spiders, 12 butterflies and moths, 7 dragonflies, 6 damselflies, 4 crickets and grasshoppers, 3 wasps and ants, and 2 ticks (Love, 1985). More than 40% of Canada's endangered species occur here, along with more than 25% of the country's population (Bowles, 1994).

> Most of the Carolinian forests are gone from Ontario now, the result of an unfortunate coincidence of their location on some of Canada's richest agricultural land and most benign climate. What is left is some of the best of what there was, a fortunate coincidence of their location on floodplains and in swamps that could not be easily converted to farmlands. (Theberge, 1989b, 259).

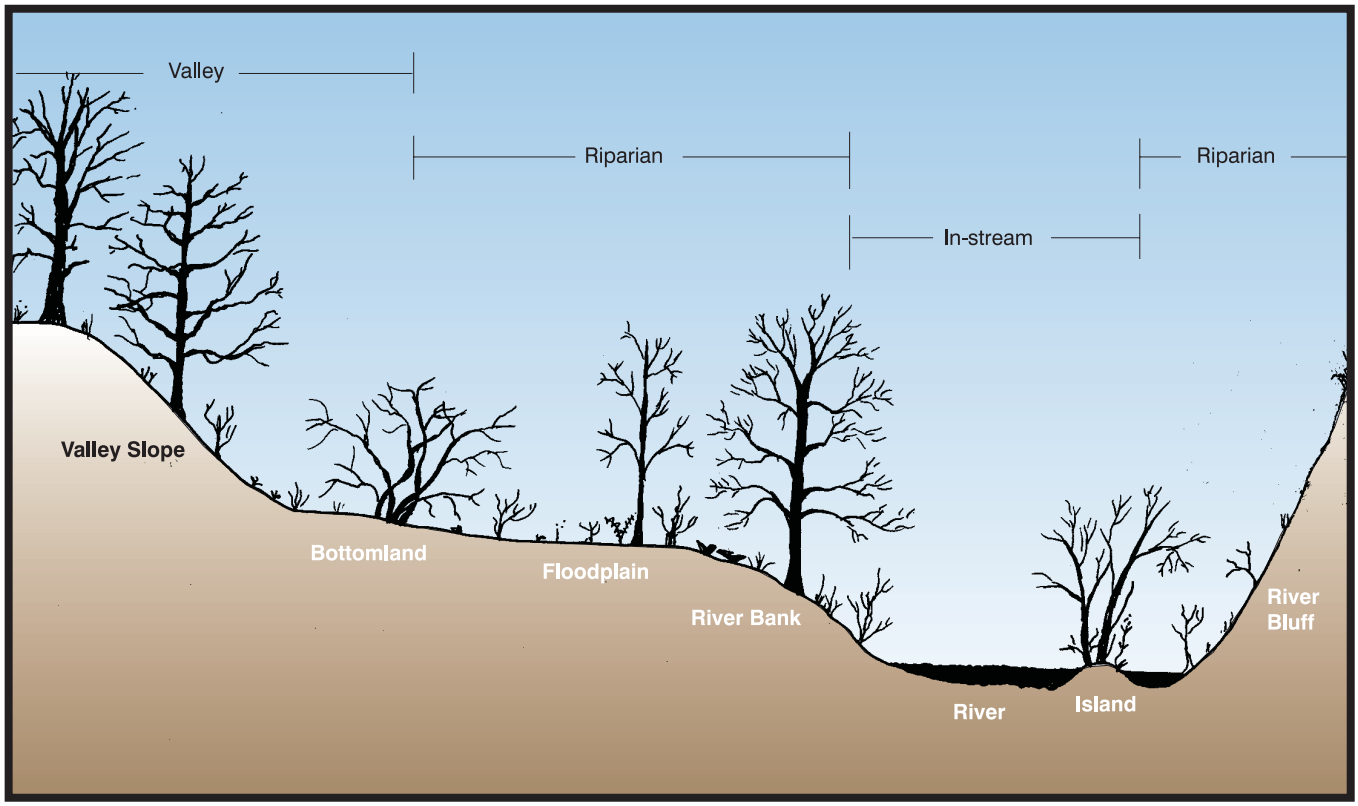
This forest region, also known as the Mixed or Southern Deciduous Forest, reaches its northern limit in southern Ontario and forms a narrow strip along Lake Erie's north shore roughly between Windsor and Toronto and pockets along Lake Ontario's north shore. Figure 5.1 illustrates the location of the forest regions in southern Ontario. The Thames is the *only major* river in Canada with the majority of its watershed (over 90%) within the Carolinian Zone. About 22-24% of the Carolinian Zone lies within the Thames Watershed. The North Branch arises in the Lower Great Lakes-St. Lawrence Forest Region. The two forest regions do not meet at a defined boundary, but instead form a transitional zone which roughly falls between London and St. Marys.

Trees that are common in the Carolinian Floristic Zone include Sugar Maple, American Beech, Red Oak, Basswood and White Ash. There are also many less common species such as Black Walnut, Butternut, Sassafras, Sycamore, Hackberry, Tulip Tree and Black Oak which survive here because of the long growing season (see Section 2.3). These trees rarely dominate the canopy, but instead are present in smaller numbers, often establishing themselves after a disturbance. Coniferous trees are few, but include Eastern Hemlock, White Pine and White Cedar. Interesting vines and shrubs can be found such as the Moonseed, Burning Bush and Spicebush. Numerous species of wildflowers, ferns and sedges occupy the forest floor. Some of the more showy herbaceous plants include American Ginseng, Green Dragon, and Prairie White-fringed Orchid.

5.2 Cross-sectional Zones

When a river is viewed in cross-section, one sees several zones including the river itself and its associated islands and bars, the river bank or land-water edge, the floodplain, and the valley. Figure 5.2 illustrates the three zones which are discussed in this chapter.

Figure 5.2. Generalized profile of the Thames River Valley Showing the Location of the In-stream, Riparian and Valley Zones.



5.2.1 In-stream Vegetation

Only a small percentage of the Thames River bed is occupied by rooted aquatic plants. The scouring action of the water and ice in the spring generally eliminates many plants which may have germinated the previous summer. In the lower watershed, rooted plants are fewer since the water tends to be deeper and more turbid which prevents sunlight from penetrating.

The plants that do persist tend to be located away from the strong flows, such as in the tributary streams, in deeper pools, or under bridges. The pretty arrowheads (*Sagittaria* spp.) and colourful Yellow Water Lilies (*Nuphar variegatum*) are found in small patches, often in shallow water close to the bank. Lizard's Tail, a Carolinian species, also grows thickly along the North Branch of the Thames.

Less noticeable submergent plants include Watercress (*Nasturtium officinale*), Water Plantains (*Alisma* spp.), Canada Waterweed (*Elodea canadensis*) and pondweeds (Potomogeton spp.) which are shown in Figure 5.3. Algae grows on some rocks and sections of the bed, but is not profuse. A list of species common in the Thames River channel is given in Table 3 of the Appendix. Many species are non-native, and most are widespread in Canada. Thus, the Thames has no particular significance for in-stream vegetation.

Figure 5.3 Pondweeds growing in the North Thames near Thamesford

Source: Cathy Quinlan

5.2.2 Riparian Vegetation

As illustrated in Figure 5.2, the riparian zone includes the islands, banks and floodplain regions of the river. The islands, steep banks and bluffs experience much more disturbance than areas further inland and so are colonized by different species. The trees, shrubs and herbaceous plants which grow here include species which can tolerate flooding, scouring from moving water and ice and other disturbances. Many trees are bent and damaged, or crooked from growing along slipping slopes. The disturbance means there is always a process of re-building and re-growth occurring.

The few trees which can tolerate this upheaval include the sun-loving Manitoba Maple, Basswood, hawthorns and poplars. Many pioneering shrubs can be found including Sandbar Willow, Pussy Willow, and Ninebark. Vines such as Virgin's Bower, Riverbank Grape, and Moonseed are also common. The plants in the ground layer include Blue-jointed Grass, Emory's Sedge, Wild Rye as well as colourful flowering plants such as Canada Goldenrod, Pale-leaved Sunflower, Sweet Joe-pye-weed, (see Figure 5.4) and Swamp Milkweed. A list of species characteristic of the disturbed riparian habitat is included in Table 4 of the Appendix.

Figure 5.4 Sweet Joe-pye-weed and Poplars growing along the North Thames River in London

Source: Cathy Quinlan

The study does not provide a comprehensive list of plants in the watershed or in any particular zone due to the fact that the list of vascular plants in this area is extremely large and inventory work tends to occur at specific sites (e.g. Environmentally Sensitive Areas) and these are too numerous to compile.

The floodplain and bottomlands are located just inland of the river's edge or slightly away from the above disturbances. While they escape much of the scouring action of the river, they still must contend with regular to occasional flooding. In compensation, the floodplain receives rich alluvial soil transported by the floodwaters. The width of the floodplain varies from a narrow strip to wide bottomland flats depending on the meandering of the Thames. Sugar Maple, Hackberry, White Ash, Sycamore, Eastern Cottonwood, Willows and Manitoba Maple are just a few that can be found. A list of characteristic plants of the Thames River riparian zone is included in Table 5 of the Appendix.

Many trees of the riparian zone are found only in southern Ontario and are considered Carolinian. One such tree is the Sycamore with its distinctive mottled bark and maple-like leaves (see Figure 5.5). Black Walnut is another southern species commonly found along the Thames, with its dark trunk and long compound leaves.

Figure 5.5 Sycamores growing along the Thames River

Source: Jane Bowles

Below the tree canopy, several shrubs can be found. These include Silky Dogwood, Red Osier Dogwood, and Ninebark. Many vines, taking advantage of the light along the river, tolerate the unpredictable environment. Riverbank Grape, Moonseed, and Virgin's Bower are commonly seen draped over and climbing up trees.

The herbaceous community along the Thames River includes many alien species, due to the fact that these plants prefer disturbed habitats and have few, if any, natural competitors. Purple Loosestrife, Reed Canary Grass, Garlic Mustard and Dames Rocket are common invaders. However, there are several native species including Swamp Milkweed, Sweet Joe-Pye-Weed, Green Dragon and *Carex amorii*. An array of colourful composites such as the False Sunflower, Wingstem and the rare Cup Plant, bloom in late summer along the rivers' edge and in clearings in the floodplain.

Figure 5.6. Wingstem and Tall Coneflower along the Bank near Chatham

Source: Cathy Quinlan

5.2.3 Valley Vegetation

The native vegetation of the river valley includes species which have an affinity for the rich silty soils and relatively undisturbed conditions which prevail. A list of representative plants which grow in the Thames River valley is given in Table 6 of the Appendix. A typical forest stand may contain ten or more canopy tree species and is seldom dominated by one type. American Beech, Ironwood, Black Cherry, Basswood and Bitternut Hickory can be found. The shrub layer is equally interesting with the late blooming Witch Hazel, the graceful Alternate-leaved Dogwood and the aromatic Spicebush. A large number of wildflowers grow under the mature forest canopy including Red Baneberry, Small Jack-in-the-Pulpit, Canada May Flower, Bloodroot, Wake Robin or Red Trillium and Ontario's provincial flower, the Large-flowered Trillium (see Figure 4.7).

Although the valleys do not experience the natural disturbances of the floodplains, human activities and clearing has made the process of succession quite evident. Bitternut Hickory and White Ash are pioneer tree species in valley environments. Many hiking trails wind their way through the valley and riparian zones, providing immense opportunities to experience and learn about these native plants (see Recreation, 26).

Figure 5.7 Large-flowered Trillium

Source: Cathy Quinlan

Tallgrass Prairie

Deciduous forests covered much of the southern Ontario landscape before human settlement, but there were also extensive areas of tallgrass prairie, especially in Essex and Kent Counties. In 1791 surveyor Patrick McNiff described the area near Lake St. Clair and the Thames River: "Extensive natural meadows and dry in most places with a thin black soil....These meadows are from four to six miles in depth...and to the north of the river, the meadows are much wider" (Kent Historical Society, 1939).

Here large open, meadow-like areas existed, some without trees and some in conjunction with sparse tree growth (e.g. Oak Savannah). These were some of the first lands to be cleared for agriculture and, as a result, they are some of the most endangered communities in North America. Today, small pockets of tallgrass prairie are found along the Thames River banks and within its valley in suitable habitat. A list of representative species is given in Table 7 of the Appendix. Some of the sun-loving and colourful flowering plants which can be found here include Butterfly Weed, Bush Clover, Wild Bergamot and Black-eyed Susan. Slender grasses with deep roots are equally numerous and include Canada Wild Rye, Indian Grass, Little Blue Stem and Needle Grass.

Figure 5.8 Wood Poppy

Source: Jane Bowles

5.3 Rare Plant Species

Because of the size of the plant list, it is impossible to say how many rare plants are found in and along the Thames River. A partial list of 29 species is given in Table 6 of the Appendix. Some of the better known plants include Green Dragon, Blue Ash, Golden Seal, Black-gum and Wood Poppy. The Wood Poppy, in fact, is only found in 2 locations in Canada, both of which are floodplains of the Thames. More Blue Ash are found in the valley of the Thames than anywhere else in mainland Canada. Most of the species are Carolinian and thus have a small range within Canada. The clearing and fragmentation of the native plant communities has limited their numbers and so the remaining habitats, many of which are in the floodplain, are crucial. Suffice it to say, the natural areas along the Thames River play a significant role in preserving this province's and country's rare plant life.

Chapter 6

Fauna

The Thames River and its associated watershed are home to numerous species of wildlife. The Carolinian influence contributes to this richness with southerly species mixing with more northerly ones. Some species have a very strong relationship with the river and rely on it for the majority of their life cycle (e.g. fish, clams, some reptiles). Others have broader habitat ranges and use the river only occassionaly or as a migration corridor (e.g. birds and mammals). This chapter describes the abundance and distribution of fish, mammals, birds, amphibians, reptiles, freshwater clams, dragonflies, damselflies, and crayfish in the Thames River and its watershed.

6.1 Fish

The Thames River sustains one of the most diverse fish communities in Canada (Schraeder, 1996). The river's complex system of interconnected springs, swales, ravines, streams and rivers provides a broad range of habitats for some 88 fish species from 19 families. Ten hybrids have been recorded as well. This is a large representation of the approximately 150 fish species reported in Ontario. A complete list of the fish of the Thames is included in Table 9 of the Appendix along with a description of their rarity, local population and distribution.

It is difficult to determine the exact number of fish species in a waterbody at any given time due to the dynamic nature of the fish community: fish migrate seasonally, extinctions or extirpations can happen within a short lifetime (e.g. the Gravel Chub is now gone), and exotics and introductions can establish themselves equally quickly (e.g. the Round Goby is expanding its range). The Royal Ontario Museum Fish Distribution Database lists 91 species including hybrids, while the files from the Ontario Ministry of Natural Resources (OMNR) show 98 species and hybrids for the Thames River system. The latter has been used to compile the species list in the Appendix.

The diversity of the fish community in the Thames and its tributaries is not surprising when one considers the following facts:

- The Thames is a "gateway" watershed; it is located in the southernmost part of Canada, directly linked to the Great Lakes and thus the Atlantic Ocean. It was previously connected to the headwaters of the Mississippi River during the recession of the Wisconsinan glacier;
- There is a long growing season in the "deep south" of Canada. Thus, there is a good "crop" of aquatic foods such as algae, phytoplankton, zooplankton, and insect larvae which are the basis of the fish food chain;
- The dynamic physical nature of the Thames (e.g. fluctuating water levels, erosional and depositional features, pools and riffles, high nutrient levels in the water) creates a variety of habitat opportunities for fish in space and time (see Chapters 2-4)
- There are both warm water and cold water streams;
- Cultural influences such as human introductions (deliberate and inadvertent) also add to the list of fish species in the river.

Like all living organisms, fish have evolved specific habitat preferences which help them avoid competition with other fish species. As a result, not all of the 88 species can be found in every section of the Thames at any given time. Approximately 25-30 species persist in the main branch of the Thames River (even during the lowest flow summer period); the other 58-63 species have a high affinity for tributary streams, but may travel to other sections to spawn (Schraeder, pers. comm.). Ten species including the Walleye, Mooneye and Rainbow Trout, are migratory, spending their summers in Lake St. Clair and moving up the Thames to spawn. Some fish such as the Longnose Gar (see Figure 6.1) and Northern Pike are active in the river in the spring where they are easily seen at Fanshawe Dam. Some species such as the Chinook Salmon are active in the fall and are often seen at Springbank Dam.

Figure 6.1 Longnose Gar

The Thames supports a commercial bait fishery which, in turn, supports the local recreational fishery described in Chapter 22.

Nine species of fish found in the Thames River system are considered at risk by COSEWIC (Committee on the Status of Endangered Wildlife in Canada). Table 6.1 lists these species. Others may be designated in the future depending on the results of current studies (e.g. Longear Sunfish). Thus the Thames River provides an important role in the sustenance of these fish.

The fish of the Thames are part of the Great Lakes/St. Lawrence/Atlantic Ocean sub-basin. There are a few species, however, that have been inadvertently or deliberately introduced which originate from other basins. For example, Brown Trout and Carp are from the European side of the Atlantic while Rainbow Trout is actually a Pacific Salmon.

Table 6.1 Fish Species at Risk in the Thames River

Vulnerable	Threatened
N. Brook Lamprey	Black Redhorse
Bigmouth Buffalo	E. Sand Darter
Lake Chubsucker	
Spotted Sucker	
Pugnose Minnow	
Silver Shiner	
Central Stoneroller	
Brindled Madtom	
Greenside Darter	(NHIC, 1994)

There are no truly endemic species to the Thames. This is due to the fact that in this part of Ontario, headwater streams can be connected to other rivers *via* man-made ditches and drains. Thus, any new species entering the river can migrate to other rivers through these channels and is no longer endemic to the initial river.

There are undoubtedly more species of fish in the Thames River today than in the past due not only to the introduction of alien and exotic species as mentioned above, but also to habitat alteration. These changes are an advantage to some species and a disadvantage to others. Some of the habitat changes include the construction of dams and reservoirs (dams restrict migration but the reservoirs attract lake-loving species), dikes (separate the river from its floodplain), and the warming of the water.

The following section highlights a few interesting species and describes how recent changes have affected them:

The *Greenside Darter* is a colourful relative of the Walleye and is considered "vulnerable" by COSEWIC (Dalton, 1991) and is illustrated in Figure 6.2. However, within the Thames, it is locally abundant with most tributaries sustaining populations of this showy fish. Their continued existence is dependent upon a good food supply of benthic insect larvae, low turbidity and low siltation. Recent reports indicate that it is expanding its range (E. Holm, pers. comm.).

Figure 6.2 The Greenside Darter

Source: Royal Ontario Museum

The *Eastern Sand Darter* is a cousin of the Greenside Darter and a member of the perch family, but is more likely to be found in the main branch of the Thames than its tributaries. It is considered "threatened" by COSEWIC. The number of individuals has declined over the decades, likely as a result of siltation covering the sandy bottom that the Eastern Sand Darter prefers. Soil erosion problems are improving in the watershed, but it is unlikely that significant in-roads will be made in a short time.

The *Central Stoneroller* is a member of the minnow family and is classified as "vulnerable" by COSEWIC. The first record in Canada of the species came from the North Thames River in 1972, but it has since spread to other rivers in southern Ontario, probably *via* bait buckets (Holm, 1997). It is not widely distributed in Ontario, but still has a strong concentration in the Thames as illustrated in Figure 6.3. This small fish is unique in that it is one of the few Canadian species that feeds on filamentous algae or on periphyton (the plankton attached to organic and inorganic substrate). It is also the only representative of its genus in Canada (McAllister, 1983). It tolerates a range of water quality conditions, but does require a good supply of food and a clean gravel bottom for spawning.

Figure 6.3 Distribution of the Central Stoneroller

(Source: Mandrak and Crossman, 1992)

Walleye or *Yellow Pickerel* is one of the prize catches of Thames River anglers and is illustrated in Figure 6.4. "Consistently ranked as the premier game fish in Ontario, this species accounts for a sizable amount of change circu-

lating in the provincial economy" (Schraeder, 1996, pg. 14). However, the St. Clair/Thames population is at risk, not because of pollution or land use problems in the Thames watershed, but because of Zebra Mussels in Lake St. Clair. The lake is the summer home of about 80% of the Walleye that swim up the Thames each spring to spawn. The mussel population has drastically altered the trophic status of the lake, eating the microscopic plants and animals which used to be eaten by small fish which, in turn, were eaten by top predators like the walleye. Thus, as the lake Walleye disappear, so too will the Thames' population, except for a smaller number that reside in the Thames year round.

Figure 6.4 Walleye

Source: Royal Ontario Museum

The Northern Madtom is a threatened species and very little is known about it at this time. It has been reported in the Lake St. Clair to Detroit River area and in inland rivers of the United States. In 1991, one specimen was recorded in the lower Thames River and in 1997 a juvenile was found in the same general area, which suggests the species is establishing itself.

6.2 Mammals

The Thames River watershed supports a diverse mammal population. Since the 1970s, 36 species of mammals have been recorded within the watershed including 4 species of shrews and moles, 6 species of bats, 2 rabbits and hares, 14 rodents (including 2 exotics), 8 carnivores, 1 deer, and the Virginia Opposum (Dobbyn, 1994 and Martin, 1997, pers. comm). An additional 8 species of mammals were present in the past, but there are no recent records. A complete list of these mammals along with a description of their distribution status is included in Table 10 of the Appendix. The Thames watershed contains 45% of the 75 native mammals which occur in Ontario (excluding sea-mammals and exotics).

Only a handful of mammals in southern Ontario are adapted to life in aquatic environments. In this area only the Beaver and Mink (see Figure 6.5) are found primarily in the Thames River and, secondarily, in other water bodies such as ponds and marshes. The Beaver is common throughout Ontario, except in the southwest due to lack of suitable water habitat (Dobbyn, 1994). The most southerly record of the Beaver, according to the *Atlas of the Mammals of Ontario*, is at the mouth of the Thames River. Their population is thought to be increasing in the watershed and in southwestern Ontario.

Figure 6.5 Mink

Source: The Audubon Society Pocket Guide

The Mink is widespread throughout Ontario and is a highly adaptable animal. The Star-nosed Mole, Muskrat (see Figure 6.6), Long-tailed Weasel, and the Raccoon, are also commonly found along the Thames, but use other wet habitats equally. The River Otter was once present in the Thames but is now considered extirpated. The Muskrat population is highest in southwestern Ontario and there is a strong trapping tradition here (see Recreation 22.4).

Figure 6.6 Muskrat

Source: The Audubon Society Pocket Guide

The Carolinian influence is also reflected in the mammal community of the Thames. For example, the Southern Flying Squirrel, Virginia Opossum and Woodland Vole are all Carolinian Species at the northern edge of their ranges in Ontario.

Many species, especially those with southern distributions, are at risk in Canada due to their limited range or because of habitat loss. Two species which occur in the

watershed, the Southern Flying Squirrel and American Badger, have been designated as Vulnerable by COSEWIC. The Small-footed Bat, Northern Long-eared Bat and Woodland Vole are also rare to uncommon in the province and, with further study, may be designated by COSEWIC in the future.

Many mammals are adapted to a wide range of habitats. Large Carolinian woodlots and swamps such as Skunk's Misery near Newbury are known to contain many of the less common species such as shrews and Southern Flying Squirrels. However, this habitat is in short supply in southwestern Ontario, and so too are the animals which rely on it. The Thames River flows through many diverse habitats including Carolinian woods, fields and urban areas and likely acts as a dispersion corridor for many mammals. Thus, almost any species listed in Table 10 of the Appendix can be found within a short distance of the river and, most probably, in the floodplain woods.

The settlement and clearing of southern Ontario, including the Thames watershed, has caused a wholesale shift in the composition of mammal species. Species requiring large tracts of wilderness such as the Gray Wolf and Black Bear have been replaced by 'farm game' such as Woodchucks and Eastern Cottontails (Theberge, 1989a). White-tailed Deer have fared particularly well in this area, sheltering in small woodlots and feeding on the highly nutritious agricultural crops which surround them. They are often seen walking or drinking by the river. The shift actually began with the period of Aboriginal agriculture (1600-1700 A.D.) and intensified with European settlement and agriculture (1800 onwards) (see Human Heritage, 11.0).

6.3 Birds

The Thames River watershed provides breeding habitat for 157 species of birds according to records collected for the *Atlas of the Breeding Birds of Ontario, 1984-1987*. Another 6 species may be breeding in the area but the information is not confirmed. These 157-163 birds represent almost 70% of the 235 bird species which breed in southern Ontario and 58% of the 286 birds which breed in all of Ontario (267 native breeding birds). In addition to these resident birds, another 86 species regularly migrate through the area and another 79 are rare or accidental migrants. In total, some 332 species of birds including two hybrids have been seen in the watershed. A complete list of the birds and their status is included in Table 11 of the Appendix.

Because birds are visible and easy to monitor there is substantial data on the bird species of the Thames region. Fortunately, birders, especially those associated with local field naturalist clubs, have turned their recreational pastime into an important data collection and monitoring activity (see Recreation, 26). Government agencies rarely have the funds to do this kind of broad-reaching inventory work.

As with other groups of wildlife, there is a mixture of southern and northern bird species residing in the Thames watershed. Many bird species which are common in their United States range, manage to breed here, but often in low numbers. In fact, 11 species which nest in the watershed are considered representative of the Carolinian Life Zone (see Table 6.2). Names such as the Louisiana Waterthrush and Carolina Wren attest to their southern affinities.

Table 6.2 Representative Birds of the Carolinian Life Zone

Least Bittern	Tufted Titmouse
Yellow-breasted Chat	White-eyed Vireo
Acadian Flycatcher	Hooded Warbler
Northern Mockingbird	Louisiana Waterthrush
Orchard Oriole	Carolina Wren
Red-bellied Woodpecker	

Peter Read, the Migration Secretary for the McIlwraith Field Naturalists of London, wrote the following about the importance of the Thames River to birds:

> Since the (Thames) river corridor contains a fairly continuous band of trees and vegetative cover and is an important visual feature, especially from the air, many birds find comfort and shelter as they forage and fly along it during migration. They can also navigate, using the river as a leading line. In fact, the general direction of the river flow for much of its length is a convenient north-east to south-west (Read, 1996, 17).

Birding is best in the Thames region during the annual spring migration of eastern North American birds. Waterfowl, loons, grebes, rails, sandpipers, plovers and others are seen in mid- to late March, while the songbirds such as warblers, sparrows and vireos show up in mid- to late May. Many stay to nest in the area, while others continue north.

Most species of birds can be seen in and around the river at some point throughout the year, but there are several which make particular use of the river and its floodplain habitats. In total, approximately 65 different species frequently or occasionally use the river corridor and these are listed in Table 6.3. The general public is probably most familiar with the Great Blue Heron (see Figure 6.7), Canada Goose, Mallard, Belted Kingfisher and the many swallows which are seen swimming and feeding along the river. River-side trail users are probably most likely to encounter the Gray Catbird, Yellow Warbler, Red-winged Blackbird and, perhaps, the Great Horned Owl.

Figure 6.7 Great Blue Heron

Source: Michelle Fletcher

Table 6.3 Birds with strong ties to the Thames River and Floodplain

Bird Species often seen on the Thames River	Bird Species sometimes seen on the Thames River	Bird Species often seen in the Floodplain	Bird Species sometimes seen in the Floodplain
Great Blue Heron	Common Loon	Canada Goose	Blue-winged Teal
Green Heron	Pied-billed Grebe	Wood Duck	Eastern Screech owl
Canada Goose	Double-crested Cormorant	Mallard	Great Horned Owl
Wood Duck	Great Egret	Broad-winged Hawk	Northern Saw-whet Owl
American Black Duck	Black-crowned Night-Heron	Ring-necked Pheasant	Ted-tailed Hawk
Mallard	Green-winged Teal	Common Snipe	
Ring-necked Duck	Northern Pintail	American Woodcock	
Common Goldeneye	Blue-winged Teal	Red-headed Woodpecker	
Bufflehead	Northern Shoveler	Willow Flycatcher	
Hooded Merganser	Gadwall	Gray Catbird	
Common Merganser	American Wigeon	Warbling Vireo	
Osprey	Greater Scaup	Yellow Warbler	
Bald Eagle	Lesser Scaup	Northern Waterthrush	
Solitary Sandpiper	Oldsquaw	Louisiana Waterthrush	
Spotted Sandpiper	Peregrine Falcon	Common Yellowthroat	
Ring-billed Gull	Virginia Rail	Fox Sparrow	
Herring Gull	Sora	Red-winged Blackbird	
Belted Kingfisher	Greater Yellowlegs		
Purple Martin	Lesser Yellowlegs		
Tree Swallow	Least Sandpiper		
N. Rough-winged Swallow	Great Black-backed Gull		
Bank Swallow			
Cliff Swallow			
Barn Swallow			

Source: (Martin, pers. comm.)

Bird Species at Risk

Thirteen of the breeding birds in the watershed have been ranked by COSEWIC as endangered, threatened or vulnerable and are listed in Table 6.4. These species are protected under Ontario's Endangered Species Act; other species have been ranked by the Natural Heritage Information Centre (NHIC) based on their populations within the province. Thirty-six of the breeding birds found in the Thames watershed fall within the Extremely Rare to Uncommon categories of the NHIC.

Table 6.4 Birds at Risk in the Thames Watershed

Endangered	**Vulnerable**
Peregrine Falcon	Short-Eared Owl
Northern Bobwhite	Yellow-Breasted Chat
Eastern Bluebird	Least Bittern
Loggerhead Shrike	Prairie Warbler
	Louisiana Waterthrush
Threatened	Cerulean Warbler
Hooded Warbler	Red-shouldered Hawk
	Cooper's Hawk

Source: NHIC 1994

One success story recently played out in the City of London. The Peregrine Falcon, (see Figure 6.8) an endangered species, had not been found in the Thames watershed for many decades. However, in 1995, a territorial pair were seen in the area but did not reproduce. In 1996, the same or another pair nested on the ledge of a high-rise building in the downtown core. The pair successfully fledged their three chicks under the watchful eyes of many Londoners and area birders. The parents were seen feeding along the Thames River near the Forks, just a short flight away. In 1997, a pair nested for the second year and produced two more chicks with one successful fledge.

Figure 6.8 Peregrine Falcon with 3 chicks, London, 1996.

Source: Hal Shraeder

There are likely more species of birds living along the Thames now than in previous times (Read, 1996). Many species of birds have taken advantage of the human created niches in the watershed as in the rest of southern Ontario. The shift from forest to field provided tremendous opportunities for birds such as Bobolink, Eastern Meadowlark and Upland Sandpiper that nest in open country. Field Sparrows, which were once restricted to clearings, beaver meadows and fen edges, are now common in old-field habitats throughout the watershed. The extensive amount of open water, corn and soybean stubble on nearby croplands, and free handouts have also contributed to the over-wintering of huge numbers of Canada Geese. Conversely, forest dwelling raptors like Red-shouldered Hawk and Broad-winged Hawks have been replaced by American Kestrel and Red-tailed Hawk which are common in the agricultural countryside. Forest-interior birds such as the Acadian Flycatcher, Hooded Warbler, Scarlet Tanager, and Wood Thrush are either absent or restricted to the few remaining large forest tracts (Austen, 1991).

6.4 Reptiles and Amphibians - Herpetofauna

There are 29 species of reptiles and amphibians found in the Thames River and its watershed. This consists of 4 species of salamanders, 8 species of frogs and toads, 6 turtles, 1 skink and 10 snakes. Another 7 species have been recorded in the past and may still exist in the area, but there are no recent records. These are difficult animals to inventory due to their secretive and often nocturnal nature. A complete list is given in Table 12 of the Appendix along with descriptions of their rarity, local population and distribution status. The 30-37 herpetiles found here represent 61-75% of the 49 species which occur in the province. Ontario has more amphibians and reptiles than any other province (91 species in Canada).

Many of the herpetofaunal species found in the Thames region are widespread and can be found across Ontario. However, several are found mostly in the extreme southern part of Ontario. These representatives of the Carolinian Life Zone include the Eastern Fox Snake, Eastern Hognose Snake, Queen Snake, Black Rat Snake, Eastern Spiny Softshell Turtle and Spotted Turtle.

Most herpetiles (e.g. frogs, toads, turtles) require water for part or all of their life cycle, but are not necessarily dependent on flowing water such as in the Thames and its tributaries. Ponds, wetlands (especially swamps), and moist woods are critical habitat for most amphibians and reptiles. Salamanders, for example, prefer moist woodlands or swamps like Skunk's Misery, a large swamp complex just north of the Thames River near Newbury. Frogs, toads and snakes are generalists and can utilize disturbed, grassy, or wooded habitats. The Thames River corridor has representatives of all of these habitat types, and so most species which can be found in the watershed are also likely to be found close to the river. Many may be reliant on the Thames as over-wintering habitat as they require deep or flowing rivers.

Four species of herpetofauna live exclusively in or adjacent to the Thames River (see Table 6.5). The Eastern Spiny Softshell Turtle and Queen Snake are rare in Ontario and are described in greater detail below. The mudpuppy, an aquatic salamander, may be locally common in the Thames, but is under-reported. The Map Turtle does not have a large population in Ontario, but is locally common in stretches of the Thames and its tributaries.

Table 6.5 Reptiles and Amphibians dependent on the Thames River

- Mudpuppy
- Common Map Turtle
- Eastern Spiny Softshell Turtle
- Queen Snake

Most users of the Thames and its floodplain nature trails (see Recreation, 26) can expect to see or hear a variety of herpetofauna, especially the more common species. Green Frogs, Northern Leopard Frogs and American Toads are commonly seen along the shores. Spring Peepers and Chorus Frogs are often heard on warm spring evenings. Turtles such as the Midland Painted and Eastern Spiny Softshell bask on logs or the bank on sunny days. Only the Eastern Garter Snake is common in the Thames, yet the Brown, Eastern Hognose and Eastern Fox Snakes have also been sighted near the river. Generally only those hikers who take the time to turn over logs and rocks will encounter salamanders.

The Eastern Spiny Softshell Turtle and the Queen Snake illustrated in Figures 6.9 and 6.10 are both extremely significant species in the Thames River. The following section describes their life history.

Figure 6.9 The Eastern Spiny Softshell Turtle

Source: Michelle Fletcher

The range of the Eastern Spiny Softshell Turtle in Canada has declined drastically in the last 100 years due, primarily, to habitat alteration. Five years ago, very little was known about this unusual-looking turtle, except that it appeared to be on the decline. In 1989, an Eastern Spiny Softshell Turtle Recovery Team was formed. In 1994, summer students, working with the team, conducted surveys of the Thames and Sydenham Rivers and found what appeared to be a relatively healthy population of at least 250 turtles. Since then, study teams have delved further into the life history and needs of this species, concentrating primarily in the Thames River. The turtle can travel for several kilometres and prefers non-vegetated banks for nesting.

Hand-in-hand with the Softshell study, researchers are examining the population and distribution of another rare reptile, the Queen Snake**.** Again, the Thames appears to be one of its last strongholds. Healthy populations have recently been discovered in the London area (Fletcher, pers. comm.). The snakes seem to be dependant on rivers with good populations of crayfish, their favoured food (see Section 6.5.3).

Figure 6.10 Queen Snake

Source: M. Oldham

The biggest threat to our herpetofauna is loss of habitat; as wetlands continue to disappear in southwestern Ontario, so do these creatures (Oldham, 1992). These animals have probably declined more dramatically than any other group of animal. Loss of habitat, water pollution from pesticides and other chemicals and harvesting/persecution by humans are probably the main causes of their decline. Fortunately, the Thames still offers suitable habitat for some of our rare and endangered species.

6.5 Invertebrates

Freshwater Clams, Dragonflies and Damselflies, and Crayfish are three groups of invertebrates which have a particular association or connection with the Thames River and are described below.

6.5.1 Freshwater Mussels

The Thames River is one of the richest rivers in Canada for clams (Stewart, 1992 and Morris, 1996). "A diverse and abundant mussel fauna is part of the natural heritage of the Thames River, with a total of 32 species reported from the system since 1894 when the earliest museum records were

kept" (Metcalfe-Smith, 1997, letter). Since 1967, 26 species from three subfamilies have been recorded (Metcalfe-Smith, *et al*, 1997). The species list given in Table 13 of the Appendix.

These mussels or clams have been given whimsical, yet descriptive common names such as Warty-back, False Pig-Toe, White Heel-Splitter and Pocket-Book.

A dense and diverse mussel bed is a good indicator of a healthy aquatic environment (Clarke, 1981). Freshwater clams require calcium-rich waters to build their shells, and therefore, are most plentiful in southwestern Ontario due to the high concentration of dissolved limestone in the river waters (see Chapter 3).

Many clams in this region belong to the family Unionidae which has suffered dramatic declines in southern Ontario and throughout North America. Causes for these declines include pollution, siltation and the damming of rivers. "River systems that once supported numerous species characteristic of a wide variety of habitats are now dominated by fewer silt and pollution tolerant species of the subfamily Anodontinae" (Metcalf-Smith *et al*, 1997). Zebra Mussels may pose a future threat. Many freshwater clam species are rare, threatened or endangered, and a few have even become extinct (Oldham, 1994). In Ontario, information about the status and distribution of clams is incomplete.

Figure 6.11 Clam Shells on Point Bar beach near Delaware.

Source: Cathy Quinlan

Empty clam shells are often found in considerable numbers on sand and gravel bars, and scattered along lake and river shores, indicating predators such as racoons and muskrats have been feasting. There are more clams in the main channels of the Thames River than in the associated streams and tributaries (Stewart, 1992). In addition, species richness (number of species per site) tends to increase as one travels downstream along the Thames (Morris, 1996). The colourful history of the button-shell industry which took place on the Thames earlier this century is described in Human Heritage, 9.2.1.

6.5.2 Dragonflies and Damselflies

Dragonflies and damselflies (Ondata) are common insects associated with rivers, ponds and marshes. There has never been an inventory of the Thames River *per se*, but it has been examined as part of other studies in the vicinity. For example, the City of London and the County of Middlesex were inventoried in the 1950s and 1960s by W.W. Judd. More recent work was conducted in 1989-1992 by Stewart and Carmichael (1993) in Elgin County. A complete species list for the two counties is given in Table 14 of the Appendix.

In total, 34 species of dragonflies and 34 species of damselflies have been found in Middlesex and Elgin Counties. However, many species are habitat specific and might not be found within the watershed border or directly associated with the river. The marshes near the mouth of the Thames have not been inventoried, but would undoubtedly provide excellent habitat for additional species of dragonflies and damselfies.

Like other plant and animal communities, the dragonfly fauna of the watershed is a rich mixture of both northern and southern species (Stewart, 1995). The species of predominantly northern distribution find suitable habitat in the London area in the sphagnum bogs (Sifton Bog), kettle lakes (Westminster Ponds Complex) and coldwater streams as well as the Thames River. The Thames is also an avenue of north-south transportation (Stewart, 1995).

In spite of the extensive agricultural development in the Thames watershed, many favourable habitats persist. Many isolated, weedy, clear-water farm ponds provide excellent habitat for some species as do the larger wetlands and forest tracts. The Thames River, with its calcium rich waters, provides favourable habitat for species of both northern and southern distribution.

6.5.3 Crayfish

Crayfish are another important component of our aquatic ecosystem and provide a vital link in the food web. For example, the Queen Snake, as described earlier, is relient on them as a food source. There is scant research on these animals in this region but a wide-reaching survey of 63 sites on the Thames River system was conducted in 1965 by Dr.

Judd of UWO (Judd, 1968). He found four species of crayfish which are listed in Table 6.6. Although this is not a large number, it represents about half of the species native to Ontario based on the number of crayfish species licenced by OMNR for propagation (Schraeder, pers. comm.).

Judd (1968) found *Orconectes propinquus* to be the most common variey of crayfish in the London area and, in fact, the only species found at the sites along the broad reaches of the North and South Branches of the Thames River (from roughly St. Marys to the Munsee-Delware First Nations). It prefers sites where running water passes over mud and gravel bottoms, free of vegetation.

Figure 6.12 Crayfish

Orconectes immunis was the second most common species and it was found predominantly in the upper reaches of streams where the water is shallow, slow and filled with aquatic plants. *Cambrarus fodiens* was found near swamps and marshes or along the banks of creeks. *Cambarus bartonis robustus* was found only in a couple of sites on tributaries of the North Thames.

Table 6.6 Crayfish found in the Thames River System (Judd, 1968)

Scientific Name	No. Found	No. Sites
Orconectes propinquus	391	47
Orconectes immunis	160	32
Cambarus fodiens	44	11
Cambarus bartoni robustus	6	2

Perhaps more important than numbers of species, is the fact that the Thames contains a large population crayfish which, in turn, support a great many other animals through the food chain.

Chapter 7

Aquatic Ecosystems

This chapter describes the aquatic ecosystems associated with the Thames River including lakes and wetlands.

7.1 Riverine Systems

Rivers can be divided into three zones, namely, the headwater stream zone, middle-order zone, and lowland zone. The entire length of the Thames River (over 270 kms from Tavistock to Lake St. Clair) is considered in this Background Study. Thus, all three zones are included. The Thames fits many of the characteristics of these zones as shown in Table 7.1.

Table. 7.2 Lake Classification

Category	Productivity	Description
Oligotrophic	low	hypolimnion is not depleted of oxygen in summer
Mesotrophic	moderate	have adequate nutrients and minerals for green plant growth
Eutrophic	high	hypolimnion becomes depleted of oxygen in summer by decay of organic matter sinking from epilimnion

If one were to classify these man-made lakes according to their trophic status, they would fall under the *eutrophic* category. River water feeds these reservoirs and, because the river is nutrient rich (see section 2.4), the reservoirs are as well.

Table 7.1 Riverine Zones

Zone	Sediment and Channel Substrate	Water Temperature and Discharges	Biological Community
Headwater Stream Zone	- sediment production - coarse channel substrate	- low seasonal water temperature	- low species diversity - primary invertebrates include shredders and collectors
Mid-dle-order Zone	- sediment transport	- variable discharge - broad seasonal temperature regime	- common invertebrates comprised of collectors and grazers
Lowland Zone	- sediment deposition - fine sediment substrate	- stable discharges	- high species diversity

Source: CHRS, 1997

7.2 Lacustrine (Lake) Systems

The trophic status of water bodies, particularly lakes, are described as either oligotrophic, mesotrophic or eutrophic based primarily on their productivity. Table 7.2 describes these categories. The Thames River does not have any significant natural lakes associated with it (see Section 4.5), but it does have three large reservoirs.

These reservoirs are relatively shallow (4-6 metres on average) and so there is no thermal stratification. There is less than 1°C difference from the top to the bottom of the reservoirs in the summer (Nethercott, pers. comm.). Oxygen levels, however, are stratified with much lower levels at the bottom (hypolimnion) than on top (epilimnion) (Nethercott, pers. comm.). Thus, Fanshawe, Wildwood and Pittock Reservoirs (see Figure 7.1), bear many of the characteristics of a natural eutrophic lake.

Figure 7.1 Aerial View of Pittock Reservoir

7.3 Estuarine Systems

There are no estuaries within the Thames River basin. The river discharges into Lake St. Clair which is a freshwater system.

7.4 Palustrine (Wetland) Systems

Wetlands, like rivers, are environments where land and water meet; thus, they are often associated with each other. Very few wetlands are situated on the main channels of the Thames, although several are found in association with the floodplains or within oxbows. Hundreds of wetlands are scattered throughout the watershed and often form the headwaters of tributary streams. The majority of wetlands in the Thames basin have been evaluated under the Ontario Wetland Evaluation System (Ministry of Natural Resources, 1984 and 1993) and therefore there is a great deal of information on them. A list of these evaluated wetlands is included in Tables 15 and 16 in the Appendix. Wetlands were once extensive in southern Ontario, but today exist as remnants in the agricultural and urban landscape.

There are five wetland types: bogs, fens, swamps, marshes and shallow open waters. In the upper Thames River watershed, *deciduous swamps* as illustrated in Figure7.2, are the dominant form. Silver Maple, Black Ash, Black Willow and Swamp White Oak are common trees in these wetlands, with Red-osier Dogwood, Buttonbush and Water Willow making up the shrub layer. The Carolinian influence is reflected here as well.

As stated above, there are very few wetlands within the main channel of the Thames, primarily due to the steep banks. More commonly, swamps are found within the floodplain. Three good examples include Meadowlily Woods in London, Medway Valley Heritage Forest in London, and the Thames River Floodplain ANSI (Area of Natural and Scientific Interest) downstream of the Munsee-Delaware Reserve. The large swamp/forest complexes of Skunk's Misery and Moraviantown (about halfway between London and Chatham) are known for their species diversity, but only small sections remain close to the river; the bulk of the sites are a few kilometres inland.

Most of the swamps in the watershed are scattered throughout, but many are found at the headwaters of tributary streams. Zorra Swamp, for example, is a long swamp which forms the headwaters of both the Thames and Trout Creek (they drain in different directions). Another swamp, known as Mud Creek Banks, is located at the headwaters of the Middle Thames. Ellice Swamp is the largest wetland in the watershed and is located at the northern edge of the basin at the headwaters of Black Creek.

Although swamps are the dominant wetland form, a few bogs are found in the area, some associated with kettle lakes. Sifton Bog is a local treasure in London and is situated some 1000 metres from the Thames. Typical bog plants flourish here including Black Spruce and Pitcher Plants, remnants of boreal vegetation which existed thousands of years ago.

Freshwater marshes were once extensive in the flat, low land around the mouth of the Thames and around the eastern shore of Lake St. Clair; today, only a few patches remain. Cattail marshes can still be found along the Thames at the confluence of both the Baptise and Jeannette's Creeks (see Figure 7.3). The St. Clair National Wildlife Area is an internationally renowned marsh located along Lake St. Clair near the mouth of the Thames. Smaller marshes such as Recess Club Marsh and the Thames River Mouth Complex, are located quite close to the river, but most are dyked and controlled by hunting clubs.

Figure 7.2 Deciduous Swamp near Middlemiss

Source: Cathy Quinlan

Figure 7.3 Marsh near Jeannette's Creek

Source: Cathy Quinlan

Chapter 8

Landscapes

The view or perception of a river and its valley is quite different when seen from the river itself, as opposed to nearby roads or trails. The water-level view-point allows a closer inspection and appreciation of the water, its colour and flow, the riverbank trees and flowers, the birds and wildlife, the bluffs, and the changing skyline. These observations shape our impression of the river and contribute to our enjoyment of it. This chapter describes the landscape as seen from the Thames River according to visible distance and landforms, vista composition, vegetation composition and visible wildlife.

8.1 Visible Distance

When paddling down the Thames River, there is a feeling of closeness and containment. In many sections, large deciduous trees and steep banks limit the visible distance. When looking side to side, or bank to bank, one can see to the edge of the valley or top of bank. The valley is 1 to 1.3 km wide, on average (see Chapter 3). The sinuous meanders of the river also limit the distance one can see up or down river. In the tighter meanders, the view is limited to less than 1 km, but in straighter reaches one can see up to 3 kms ahead.

Paddlers describe the Thames from Delaware to Chatham as "canoeing in a trench" since one can only see up to the steep banks and nothing beyond (Buwalda, pers. comm). This opinion was shared by early French-Canadian explorers who first called the river "La Tranche" because of its wide ditch-like appearance (see Human Heritage 14.0). This separation from the surrounding countryside appeals to many. In London, for example, canoeists can scarcely believe they are in a large city, since the riverbank vegetation hides everything but the tallest building. Even in the rural agricultural areas, there is a wilderness look to the river.

There are a couple of locations in the upper river where one can see tall hills several kilometres beyond the valley: Reservoir Hill from Springbank Park in west London, and the Mitchell Moraine upstream of St. Marys (see section 3.2).

"At some point we are within 200 yards of Highway 2, but the sound of the traffic is muffled and more often silent than not. With each stroke of the paddle our awareness of the Thames grows strongly, so that the highway's presence is diminished. We are not 10 miles east of Chatham, yet we are an eternity away from the city"
Shreve and Epp, (1997).

"At some point west of Louisville the banks of the Thames River tend to become lower, until we are able to glimpse farmhouses and cornfields. The river also becomes wider..." (Shreve and Epp, 1997). In the lower Thames, the horizon is flatter and one can see several kilometres ahead, especially near the mouth. However, the earthen dykes/berms on either side curtail much of the side-to-side view.

8.2 Vista Composition

"Vistas can be considered as the most appealing view seen from a river whether exceptional or typical" (CHRS, 1997). They are an important component in assessing the scenic beauty of a river and include the subcomponents of variety, depth, colour and structure. One can rank the number of highly rated vistas seen along a river as: few or none, moderate number, or abundant (CHRS, 1997).

The Thames River has a *moderate number of vistas*. There are approximately three different vistas along the Thames. In other words, the river can be broken down into three sections where the overall appearance of the river and its valley is quite different from the other sections. These are the upper, middle, and lower river.

The upper river, especially the North Branch between Hwy. 7 and Fanshawe Reservoir, is favoured by many paddlers for its beauty (Buwalda, pers. comm.). Here, the clear water gurgles over boulder rapids. The banks are asymmetrical with unexpectedly tall, steep banks on one side and lower, terraced hills on the other. Sometimes it is the west bank which is steep, other times it is the east, depending on the meander of the river. There is a mixture of colours in the vegetation too: clumps of olive-green willow, mid-green Manitoba Maples and Sycamores, and patches of dark hemlocks and cedars in shady steep locations. Only the occasional farm or home is visible.

Figure 8.1 North Thames near Thorndale

Source: Cathy Quinlan

The mid-river area, between Delaware and Chatham, has a different, trench-like appearance (see Figure 8.2). Steep grey and brown clay banks are topped with Carolinian trees and shrubs. There are very few evergreens, but colourful wildflowers are common in late summer and fall, especially the sunny-yellow coneflowers. The water is more turbid and slow with very few boulder rapids.

Figure 8.2 Thames River near Thamesville

Source: Cathy Quinlan

The lower-river, downstream of Chatham, is very different from its upper reaches. Here, the horizon is broad and flat, the river wide and straight, and the riverbank trees few (see Figure 8.3). To some, the vista is prairie-like – a broad, open river flowing through a flat landscape of wheat, corn and soybeans.

Figure 8.3 Thames River near Prairie Siding

Source: Cathy Quinlan

8.3 Vegetation Character

Rivers can be rated on the degree of diversity in the vegetation: very diverse, moderately diverse, or not diverse (CHRS, 1997). As described in Chapter 5, the Thames basin is located within the Carolinian and Great Lakes Deciduous Forest Regions, each of which is renowned for their species richness. Thus, the Thames falls under the *very diverse vegetation category*. There are about 25 tree species which are commonly found in the Thames River riparian zone. Most of the valley is well vegetated and lush, except the upper headwater streams and lower river downstream of Chatham. In these areas, agricultural fields and dykes have displaced the natural tree cover.

There are many characteristics which make the vegetation unique and interesting. There is a mixture of medium to tall trees. For example, many of the maples, oaks and elms grow up to 18 metres, but the Sycamore can grow to 46 metres. The predominance of broad-leaved, deciduous trees is a unique feature in a country dominated by needle-leaved, evergreen trees. The deciduous trees have broad, round crowns, which contrast with the conical shaped coniferous trees. The leaves bear many forms: simple, compound, narrow and broad. "Characteristic of Carolinian forests is laciness – the delicate leaflets of black walnut, butternut, locust, hickory, and ash that fine-filter the light through their canopies and soften the shadows below" (Theberge, 1989b, 259).

Each season brings its own form of beauty to the river. In the spring, trees leaf out in succession, with the more northerly trees opening up first. The colours are delicate – the lime green of poplars (see Figure 8.4), followed by the muted reds and yellows of maples and oaks. Toothwort, trilliums, and yellow trout lily can be seen on the forest

Figure 8.4 Poplars Leafing Out in the Spring

Source: Cathy Quinlan

floor before the trees, vines and shrubs leaf out and conceal them. In mid-summer, there is green everywhere, sometimes punctuated by the darker needles of the conifers in the upper watershed. "But mostly, there is a pastel quality about the Carolinian. Its greens are not harsh, its high-canopy forest are sunlit, not sombre..." (Theberge, 1989b, 260).

In the late summer, composites such as False Sunflower, Black-eyed Susans and White Avens add contrast and are found along sunny riverbanks. In the fall, individual trees can be differentiated by their colour: brilliant red sumacs on the steeper bluffs, lemony yellow sugar maples, dull purple White Ashes, and subtle yellow-brown Red Oaks and Black Walnuts. (see Figure 8.5).

Figure 8.5. Fall Colours along the North Thames

Source: Cathy Quinlan

8.4 Visible Wildlife

Opportunities to view wildlife from or near a river can be ranked as outstanding, moderate, or limited (CHRS, 1997). Overall, the Thames has *limited opportunities to view wildlife*, with a few exceptions.

> "...I've been struck — maybe for the first time in my 10 years in London — by how beautiful and placid our Thames River is. There are places right in the middle of the city where I've spent early summer mornings secretly watching a pair of beavers eating leaves and playing in the water. I've seen muskrats and blue herons and more variety of wild flowers that I thought existed in Ontario."
> (Bill McLeod 1997)

The only large animals that live in or beside the river are Beaver, Mink and Muskrat and these are seen occasionally. Most paddlers can expect to see at least one, and often more, Great Blue Herons per outing. Certain sections of the river have large, resident populations of Mallards and Canada Geese such as at the Forks in London. The reservoirs are also "hot spots" for bird viewing, especially during migration. Closer to the mouth of the river, gulls, terns, Double-crested Cormorants and other lake-associated birds are commonly sighted (see Figure 8.6). In the spring and summer Bank Swallows are numerous, especially along the low, exposed banks near Delaware, and on the bluffs of the Medway River.

Figure 8.6 Double-crested cormorant and gull on logs in Thames near Prairie Siding

Source: Cathy Quinlan

The Thames River is the best place in Canada to see the endangered Eastern Spiny Softshell Turtle (Martin, pers. comm). Numerous nesting and basking sites are situated along the mid-sections of the river which provide excellent opportunities to see this unique turtle (see Figure 8.7). These turtles can also be seen in abundance at the dam spillway at Fanshawe Conservation Area.

Figure 8.7 Eastern Spiny Softshell Turtle basking on a rock in the North Thames

Source: Cathy Quinlan

Glossary for Natural Heritage

Alluvium - Recent deposits, highly variable in texture, deposited by modern rivers and streams.

Bar - Lobate river bedform, typically constructed of gravel, often regularly spaced, and forming a riffle or shallow section.

Point bar - a low crescentic shoal on the convex side (inside) of a river bend, consisting of material that has been eroded from an outside bend either opposite or upstream. Point bar deposits consist of relatively coarse materials.

Bog - Peat-covered or peat-filled depressions with a high water table and a surface carpet of mosses, chiefly *Sphagnum*.

Dendritic Drainage Pattern - A drainage pattern resembling that made by the branches of a tree or veins in a leaf, which may develop on homogenous rock or soil.

Epilimnion - The upper, warm, circulating water in a thermally stratified lake in summer.

Fen - Peatlands characterized by surface layers of poorly to moderately decomposed peat, often with well-decomposed peat near the base. They are dominted by sedges, although grasses and reeds may occur in local pools.

Fluvium, - Silt, sand and gravel deposited by running water, often meltwater from a glacier.

Glacial Lake - A lake dammed by a glacier and fed by its meltwater.

Hypolimnion - The lower, cooler, non-circulating water in a thermally-stratified lake in summer.

Lacustrine - Of or relating to lakes. From the Latin *lacus* meaning lake.

Marshes - Wet areas periodically inundated with standing or slowly moving water, and/or permanently inundated areas characterized by robust emergents and, to a lesser extent, anchored floating plants and submergents.

Meander - The curve of a river where it is flowing sluggishly with many twists and bends. It is sometimes quantitatively defined (e.g. the sinuous trace of a stream channel whose length is normally equal to or greater than 1.5 times the down-valley or straight-line distance).

Meander Migration - The process of sideways movement involving the deposition of point bars on the inner sides of bends and erosion on the outer, and limited to a tract of floodplain called the meander belt.

Misfit or Underfit Stream - A stream that is too small to have cut the valley it currently occupies.

Moraine - A knobby ridge of either (a) boulder clay built by a thrust of a glacier or (b) gravel and sand deposited at the edge of a glacier by escaping meltwater.

Oxbow- A former meander loop of a river which has been abandoned as the river cut a straighter course.

Palustrine - Of or relating to marshes. From the Latin *palus* meaning 'marsh'.

Pool and Riffle - Pools are sections of the river bed which are at least 1 metre deeper than the adjacent area. Riffles are shallower areas, often 0.6 metres deep or less.

Sedimentary Rock - Originated as marine sediments of marl, clay and sand and are the oldest rocks to contain the petrified remains of saltwater organisms (fossils). Over time, these sediments were cemented under pressure to form solid rock.

Sinuosity - The ratio of channel length along the centre line of the channel to the length of the valley measured along the centre of the meander belt or centre of the valley.

Spillway - Channel created by flowing glacial meltwater.

Stream Order - Strahler's system uses a method whereby fingertip tributaries at the head of a stream system are designated as first-order streams. Two first-order streams join to form a second order stream segment; two second-order streams join, forming a third-order, and so on.

Swamp - Wooded wetland with 25% or more cover of trees or tall shrubs.

Till - A mixture of clay, sand, pebbles, and boulders deposited by a glacier. It often occurs in layers that reflect the history of the glacier.

Wetland - Lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants.

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Canadian Heritage Rivers System

Part 2a - Human/Cultural Heritage: Thames River Watershed

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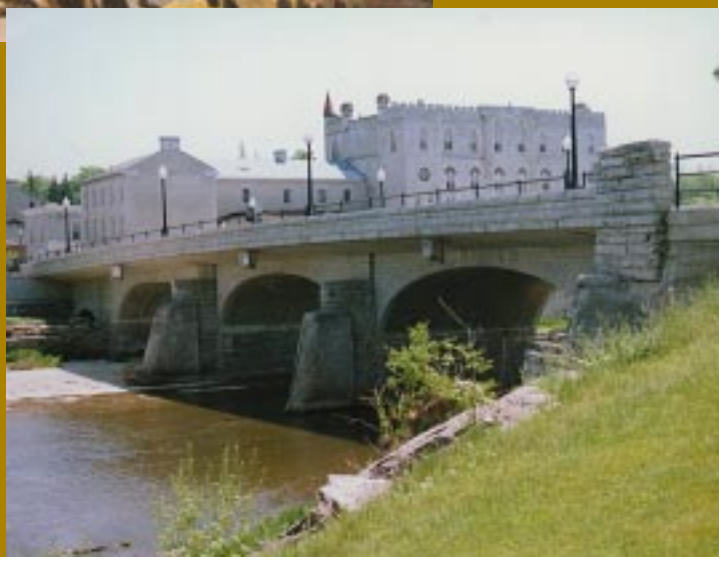


Human Heritage

In compiling the material for the *Background Study*, and using that material to construct a *Nomination Document* to support nomination of the Thames as a Canadian Heritage River, one is attempting to uncover and record the essence of what was special about the human activity along the Thames River, and within the watershed, during the periods of past occupancy, and how it contributed to its identifiable heritage in a current context. This *Introduction* provides an over-view to juxtapose with the detailed *Cultural Framework for Canadian Heritage Rivers* document developed by the Canadian Heritage Rivers' Board (CHRB), according to which the *Human Heritage Background Study for the Thames River* material has been organized.

What is it that makes the Thames River unique, significant in national and regional terms, and worthy of Heritage River status? Two comprehensive and related characteristics can be identified; first, a river and its adjacent landscape that have been an important cultural region of what is now Canada, for as long as 11,000 years, and which link Canadian Aboriginal/First Nation and European cultural heritages in a unique fashion; second, and in more contemporary terms, the Thames and its watershed represent in a microcosm, the richest and most highly integrated human (rural and urban) landscape created by 200 years of Canadian settlement and development. Southern Ontario is a critical part of the Canadian regional mosaic, and no area better typifies the character and success of the processes that created this part of Canada than the human landscape of the Thames watershed.

Aboriginal occupancy of southwestern Ontario dates back over 11,000 years, from the post-glacial emergence of this area, including the creation of the Thames River, to the present day through four distinct First Nations. Virtually all the pre-historic Aboriginal cultures of Eastern Canada have been present in the watershed and have used the Thames and its tributaries in conjunction with their settlements and livelihood. The latter phases of occupancy were of particular significance, because this region saw the first examples in Canada of agriculture or horticultural cultivation, which had gradually diffused through North America from the Meso-American "Culture Hearth". The shift from a purely hunting and gathering to a partially crop-based regime took place in "Canada" in the Thames watershed between 500 and 1000 A.D.

Although this region was temporally deserted for some decades due to inter-tribal conflict in the 17th century, there were contacts between Aboriginal communities and early European explorers and settlers, first French then British, which included interaction and exchange between the cultures. First Nations established on reserve lands within the Thames valley between the 1780s and 1840s have maintained a strong Aboriginal presence along the river.

European contact and settlement in the Thames valley, which began as early as 1650 but was most active after 1790, was an amalgam of many of the elements that have contributed to the national picture. Early French traders, British military groups, United Empire Loyalists, and then the mass influx of peoples from the British Isles (English, Scots, Irish) and the United States have all contributed to the region's cultural diversity.

The area was opened up to settlement by pioneer surveyors and colonization schemes. It was part of the most active pre-Confederation frontier of settlement and exemplifies the processes that made that settlement successful. The river was influential as a means of access and for export of early trade items. As well, it contributed to the development of the staple economy based on timber and wheat. In particular, the river and its tributaries offered numerous mill sites, which became the foci of settlement, and facilitated expansion of other entrepreneurial activities which were the basis of the economic development of the cities and towns along the river.

The links between the riverine settlement and the watershed hinterland are of great importance. The Thames watershed was a naturally fertile and productive landscape; its deciduous forests provided the initial staples of potash and timber for export and local building material, while its rich soils supported the development of agriculture. Based first on the wheat economy, by Confederation, this had become the most prosperous agricultural region of Canada, an economic advantage it has never relinquished. Thereafter, even as wheat declined, the area pioneered the shift to a dairy and livestock economy and was famous for its cheese. In the twentieth century, agriculture has become even more intensive through adoption of hybrid corn and soybeans; the Thames River wateshed remains the most varied and productive agricultural region in Canada.

This productivity and prosperity quickly translated into local agriculturally-based industries which characterized the cities, towns and villages along the Thames. And, although other industries and activities have been added, agricultural products set the development in motion and continue to occupy a strong place. Recognition of the need to manage the soil and water resources are exemplified in the watershed as the site of the first major Conservation Authority initiatives in the 1940s and 1950s.

While the Thames watershed has seen some specific episodes of national importance, especially during the War of 1812, its overall significance lies as the site of the gradual creation and subsequent maintenance of one of Canada's unique cultural landscapes, in which prosperous and ever-modernizing farming is served by a network of rural small towns, villages, and hamlets, tied into the urban structure of the four cities of Chatham, London, Stratford, and Woodstock, each situated on the Thames and owing much to that location.

Methodology

Much of the research for the section on Human Heritage was obtained from both primary and secondary sources available at the D.B. Weldon Library, University of Western Ontario, and more specifically the J.J. Talman Regional Collection, UWO, and the Serge A. Sauer Map Library, UWO. As well, a Ministry of Natural Resources data-base library, located at the Lake St. Clair unit, proved beneficial in terms of primary research. A great deal of information was also available from many staff members at both the Upper Thames River and the Lower Thames Valley Conservation Authorities. Likewise, members of local historical associations provided information for the study. Finally, information was also derived through travel to numerous museums, archives, and historic sites within the upper and lower watersheds.

Chapter 9

Resource Harvesting

This chapter deals with a selection of riverine resources and their exploitation (*Resource Harvesting*) by successive human populations. It deals specifically with *Fishing for Domestic Consumption* (9.1.1) and for *Commercial* purposes (9.1.2), and *Gathering of Clams* (9.2.1) and various vegetative items (9.2.2). However, it does not deal with timber harvesting (either for potash, whole logs, or lumber) along the river or within the watershed, or the use of the river in conjunction with wheat, the other major pioneer and nineteenth century staple which was harvested throughout the watershed and transported as grain or flour. It does note the *Quarrying of Stone* (9.2.3) in proximity to the river, but not the working of aggregates (sand and gravel) in the spillway/floodplain (see Natural Heritage, 3.3). Finally, under *Water Extraction* (9.3) both *Small Scale Domestic Use* (9.3.1) and *Municipal Water Supplies* (9.3.2) are noted, but not water taken from the river or its tributaries for irrigation or other industrial uses (e.g. wool processing or brewing).

The availability of harvestable riverine resources was important in both pre-historic and post-contact periods and attracted both Aboriginal occupants and Europeans, the latter primarily during the nineteenth century. Resource harvesting opportunities played an important role in the significance of the Thames watershed for Aboriginal settlement, on both a seasonal and more permanent basis, and contributed to its attraction for *Riparian Settlement* (section 11.0), both Aboriginal and European. This initial attraction led to several types of early economic activity (especially fishing and the manufacture of lime) and contributed to the development of several nucleated places (e.g. Chatham, St. Marys, and Beachville). This places riverine resource harvesting alongside the establishment of mill and power sites (section 12.1) as important settlement location factors.

9.1 Fishing

9.1.1 Domestic Consumption

As today, centuries ago, the Thames River provided an abundance of fish encompassing a multitude of species (see Natural Heritage, 6.1) that were suitable for food. Recognizing the potential of harvesting this resource, early pioneers established settlements along the river's shores. Although few records exist which depict domestic fishing along the Thames River in pioneer times, historians can piece together part of the story through such resources as early literature, diaries, and journals written by original European settlers along the river.

Figure 9.1 Early Fishing Hooks and Spikes

(Location: Fairfield Museum, 1997)

Small-mouth Bass was the chief species mentioned by pioneers along the Thames River. As well, trout were commonly found in small brooks and rivulets. Early settlers also recorded that during the spring run, large amounts of suckers, whitefish, pickerel, mullet, bass, pike, sturgeon, and maskinonge were caught on the Thames.

Figure 9.1 illustrates several of the fishing tools used by early pioneers. Settlers often caught fish with a gaff or spear as the fish swam slowly up the current. Edward Allen Talbot recorded his adventure of fishing for sturgeon along the Thames River: "as soon as they are stricken, they whirl themselves round, and dart, with astonishing swiftness, down the stream, carrying the spear or gaff along with them, until becoming exhausted through loss of blood, they are easily dragged on shore" (Talbot, 1824, 269). Another method of harvesting this resource was "seine netting." This began on the Thames River in the early 1800s and lasted throughout the century. In fact, in the early 1880s, William Judson noted that Cashmere was the site of the lowest dam and was the head of net fishing on the Thames River. At this location, large quantities of fish were taken with the seine. Judson also recorded that "for miles below the village, every eddy and every angle of the river was occupied by an enormous dip net..." (Judson, 1881, 90).

The large variety and quantity of fish in the Thames was one element encouraging settlement in this region. As settlement and commerce increased in the watershed, domestic fishing became less of a survival tool and more of a recreational pursuit (see Recreation, 22). The abundance and variety of fish in the river also stimulated the growth of the commercial fishing industry.

9.1.2 Commercial Fishing

It is not surprising that with the abundance of fish in the Thames River (see Natural Heritage, 6.1), the commercial fishing industry became a profitable venture for Thames River inhabitants. This is significant in the history of the watershed because it was one basis of early economic activity. In turn, this contributed to the development of local settlements and onshore services along the lower Thames

(see section 10.2).

Fish salting was reported at Chatham by 1819. This provided settlers with a method of preserving fish for commercial export. Salt fish was exported from the Western District to the United States as early as 1826. By 1845, hundreds of barrels of fish were cured in Chatham and the surrounding area.

In 1877, Peter McCann was inspector of the fishery district from London to Lake St. Clair. His annual report revealed that 33 boats, carrying 122 men, were fishing commercially along this stretch of the Thames (Brock, 1972, 617). The season's catch amounted to 412 barrels of pickerel, 343 barrels of coarse fish, 33 barrels of bass, and 9 barrels of pike. The total, 797 barrels, was less than that of the two previous years.

The importance of the Thames River fishery was still evident in 1884 as four overseers were assigned to monitor and report on fishing activity. T. McQueen monitored the area from the river's mouth to Louisville. He reported that 21 grounds were fished with 168 people employed. Angus Brady oversaw the area from Louisville to Cashmere. He noted that although river conditions prevented access to the best runs, fishing was better than the year before. Peter McCann monitored the area from Cashmere to London. He related that the fishing was only fair and that the fish were more coarse (Bennett, 1971, 1).

By the early 1900s, there were 19 seine nets and 32 commercial dip nets operating near Chatham. In 1912, overseer, J. Crotty, reported that 80% of the fish taken from the river was consumed locally; whereas, the remaining 20% was sent to other Ontario cities (Bennett, 1971, 8).

The Thames River fishery benefitted the local economy and thus aided with the social and financial development of the area. Although the commercial significance of the Thames River fishery declined over time, sport fishing has gained importance in recent decades. Today, anglers continue to boast of the Thames River as a prime fishing ground (see Recreation, 22).

9.2 Resource Gathering

9.2.1 Gathering Clams

A 30 km stretch of the Thames riverbed between London and the Oneida and Muncey First Nations Communities, is one of the richest clamshell beds in Canada (see Natural Heritage, 6.3.1) (Neely, 1). Between 1920 and 1940, several parties in Delaware Township took advantage of this resource and harvested the shells for the manufacturing of pearl buttons. This venture provided substantial employment for Thames River inhabitants (European and First Nations). The economic significance is also revealed in that both Canadian and American industrial markets were supplied with clam shells harvested from the Thames.

> The following rules pertained to those who wished to lease land in order to harvest clams: clams could be harvested only between two specified points in the river, no mechanical devises could be used to gather clams, only Canadian citizens could work on the project, and a royalty of five dollars per ton was payable to the government at the time of shipment (Neely, 3).

In the 1920s, two men from the Oneida First Nations Community shipped small amounts of shells from the river to button factories in Kitchener, Ontario. Ten years later, Charlie Skinner from Dorchester leased the river from the Games and Fisheries Department so that he could harvest clam shells for shipment to button factories in Kitchener. Skinner ceased operations prior to 1936. One year later, George Franklin Neely from Dorchester took out a lease from the Games and Fisheries Department to harvest clamshells from Putnam (on the south branch of the Thames River) to Middlemiss.

Manufacturers in the United States made Neely a lucrative offer for the clamshells because Japan, their previous supplier, discontinued its service with the threat of war looming ahead. So, in 1939, as well as shipping truck loads of clams to the Mitchell Button Factory in Kitchener, a railway car with 55 to 60 tons of clams was sent to the American Pearl Button Company of Muscatine, Iowa (Neely, 3). When the war broke out, it limited the time and resources Neely needed for harvesting, so the operation paused until 1946. At this time, the markets resumed and the supply of workers increased. Again, several truck loads of clamshells were shipped to Kitchener and two 55 to 60 ton carloads were transported to the United States.

> The best varieties of clams for buttons were pointed sand shell, black sand shell, fat mucket, mucket, and squaw foot. At times, the shells were so thick in the Thames that the yield was six to ten clams per square foot (Neely, 1). The workers received $ 0.25 per bushel in the warmer months and $ 0.75 per bushel in the fall when the water was cold (Neely, 4). The men also watched for pearl formations which were sold to exporters for $15.00 an ounce.

By the end of 1946, casein, a by-product of milk, was used to make inexpensive and attractive buttons. Therefore, Neely turned to other interests and ended the clamshell industry on the Thames River.

9.2.2 Collection of Seeds, Roots, and Other Medicinal Products.

Neutral tribes were proficient in the use of herbs, bark, roots, crushed stone, and other natural remedies (Jury, 1982,

15). Owing to the abundance of these resources in the Thames watershed (see Natural Heritage, 5.0), Aboriginal root doctors who believed in the curative properties of herbs, shrubs, and bark settled along the river. Learning from native inhabitants, Europeans also benefitted from these resources.

In his journal, Lieutenant-Governor Simcoe noted that an "Indian" used a root or decoction to heel the wounds on a dog injured by a porcupine (Page, 1878, 5). Talbot reported that snake root and White Ash bark boiled in milk aided with recovery from snake bites (Talbot, 1824, 266). Dr. J.J. Brown, an early pioneer from Woodstock used ginseng, which grew on his property, for various remedies (Evans, pamphlet).

Petroleum from the springs near Fairfield was also widely used for its medicinal properties. It was taken both internally (for the stomach) and externally (for rheumatism). The Moravians, the first to boil the spring water to extract the oil, also benefitted from the product's many uses. Judson noted that Aboriginals regarded this "precious stuff" as valuable and powerful (Judson, 1881, 92). Accordingly, they sold the oil claiming that it could do anything from curing one's feet to protecting one who was struck by an enemy's arrow. The oil was also sold to Europeans for lamps, grease, and so on.

From the water's surface, several quarts of mineral oil could be collected daily. In order to recover the oil, Aboriginals placed hair blankets over the bubbles. As the oil arose, it was absorbed into the fibre of the cloth (Historical Series, 91). The blanket was then wrung dry and the oil was placed in vessels.

Oil springs, herbs, shrubs, bark, and stone were plentiful along the Thames River and thus provided inhabitants with the means for producing a variety of natural cures. With little access to traditional European medicine, the earliest pioneers depended on these local resources. Chapters 17-20 explore the medicinal uses of plants by four First Nations.

9.2.3 Quarrying Stone

Along the shores of various sections of the upper Thames River, the earliest European settlers found limestone. The economic significance of this resource was quickly recognized and attracted many settlers to the region, specifically to St. Marys and Beachville.

Today, St. Marys is the home of a major cement company which uses locally quarried limestone. In fact, an initial attraction to St. Marys was the abundance of limestone found in the river (Wilson, 1981, 12). From the mid-1840s until the mid-1850s, dozens of small quarries along the Thames River provided the town with an important export. St. Marys became a source of lime for many miles; loads were either hauled to Stratford by cart, or were shipped farther away by rail. The stone was also used locally in the construction of homes and other buildings (see Figure, 9.2).

In the 1850s, many St. Marys' stonemasons owned and operated their own quarries. By 1880, three major quarries consolidated to form what became the nationally known "Thames Quarry" that was run by the Sinclair family (Wilson, 1981, 12). Fifty years later, the company ceased operations and the quarries filled with water and became popular for swimming (see Recreation, 23.4).

Figure 9.2 The McIntosh Stone Cottage, St. Marys

(Source: Moffat, 1984, 74)

In the 19th century, large commercial blocks and the principal residences in St. Marys were built of local limestone. In fact, even the craftsmen's modest one-storey houses were built of St. Marys' stone. This small scale stone construction is still visible today in the charming cottages that line St. Marys' streets.

Today there are many remnants of the former quarry. From the water's edge in St. Marys, one can still see layers of smooth limestone in the river. Close to the north end of where the Thames Quarry once stood, one can view the remains of six crumbling concrete pillars which reveal where the storage bins for the crushed stone were located (The Stonetown, pamphlet, 1997). Likewise, large portions of rubble from the concrete silos continue to sit on the quarry bank. Finally, the tunnel joining the two quarries remains under the road and the swimming hole (The Stonetown, pamphlet, 1997).

Numerous old quarry holes can also be viewed along the South Branch of the Thames River east of Beachville. Limestone from the Beachville quarry was used mainly for building purposes until 1929. At this time, the Cyanamid Company was interested in using the limestone for agricultural purposes (The Limestone, pamphlet). They used the limestone to create a new compound called calcium cyanamid. From this idea, sprouted a whole array of useful chemicals. Beachville was a good source of high quality calcium carbonate. Scientists later found that calcium carbide was useful for the extraction of gold and silver from ore. Lime is also used in the making of steel because of its ability to absorb impurities when added to coke and iron ore in blast

furnaces.

Today, the Beachville quarries are the largest open faced quarries in Canada. The limestone deposit is 98% calcium carbonate (The Limestone, pamphlet). This is the purest, deepest, and most uniform deposit in the country.

9.3 Water Extraction

9.3.1 Small Scale Domestic Use

Before water supply systems were established in Canada, residents obtained fresh water from local wells or nearby ponds, creeks, or rivers (Anderson, 1988, 195). The pioneer settlers along the Thames and the Avon were among those who relied upon river water for domestic use. For many decades, such easy access to fresh drinking water and ice aided with the development of communities in the Thames valley.

The Thames and the Avon were the main sources for local ice boxes. For instance, in the 1920s, John Karn and some local boys from Thamesford often took a team of horses and sleigh to the frozen river where they sawed large blocks of ice from the Thames. After the blocks were loaded onto the sleigh, Karn delivered them to several ice-houses around the village. Here, the ice was covered in sawdust until it was sold to customers for their iceboxes at home. Local businesses also bought the ice to keep merchandise cool (Wallace, 1994, 229).

9.3.2 Municipal Water Supplies

As Canadian communities grew, houses were constructed farther away from rivers and denied those settlers convenient access to river water. In addition, as riparian populations increased, rivers were in danger of becoming highly polluted (Anderson, 1988, 200). Both situations took place along the Thames River and resulted in the need for municipal storage reservoirs. One such example occurred in the City of London.

By the 1860s, Londoners needed a better water supply than the artesian wells which were previously used. At this time, a large supply of water was discovered at the springs located in the area which eventually became known as Springbank Park (see Recreation, 22.0).

When the Springbank Park waterworks proposal was passed in 1877, a system was developed which included a reservoir of over six million gallons capacity, 31 miles of mains, 180 hydrants, valves, a dam, a pump house, machinery, a road, and more (Brock, 1972, 275). The water was turned on in January 1879. In 1882, steam pumping machinery of a capacity of two million gallons (imperial) was put in. The original works were designed by William Robinson, City Engineer.

When John Carling wrote the first annual report of the Board of Water Commissioners in 1879, he stated that: "...in no town or city on this continent is there to be found a supply of purer and more wholesome water" (Morden, 1988, 13). This source of water remained adequate until the 1900s. At this point in time, the Thames River did not provide water for drinking or culinary purposes (see section 15.2.1). Since 1967, the City of London has been served with water from Lake Huron and, more recently, Lake Erie.

Summary

The greatest significance attached to *Resource Harvesting* relates to the intrinsic richness of the Thames vis-a-vis fish species, both quantitative and qualitative. This is well-documented in terms of the quantity of fish that was available to the Aboriginal and early European settlers, and the fact that the Thames is home to a very large proportion of all the species native to eastern Canada (see Natural Heritage, 6.1) and which today provide a rich basis for sport fishing (see Recreation, 22).

Chapter 10

Water Transport

This chapter examines the role of the Thames as a water route and the characteristics that developed in relation to a transportation function. *Water Transport* (10.0) here includes *River Navigation* (10.1), *Onshore Services* (10.2) and *Surface Bulk Transportation* (10.4); whereas, Aboriginal use of the river and its role in the War of 1812 (14.2.1) are reviewed elsewhere. The role of transport was similar to *Resource Harvesting* (9.0) in stimulating settlement. This chapter includes reference to key uses of the river that were dominant in the early period, especially the use of the Thames by pioneer European settlers prior to the existence of reliable land transportation. *Water Transport*, mostly in the lower Thames, was an important impetus to *Riparian Settlement* (11.0).

Although the Thames is a river of modest size and flow, its lower reaches in particular provided opportunity for various types of early shipping which are reviewed under *River Navigation* (10.1) and more specifically the *Navigable Channel* (10.1.1) and *Human/Wind-Powered* (10.1.2) and *Powered Freight and Passenger Transport* (10.1.3). A considerable fleet of vessels, developed early in conjunction with various *Navigable Improvements* (10.3), transported a variety of human and other *Cargos* (10.1.4). This activity, gave rise to *Onshore Services* (10.2) including *Places for Construction of Craft* (10.2.1), *Facilities for Loading, Unloading, and Storing of Cargo and Passengers* (10.2.2) and *Places for Provisioning Passengers and Crew* (10.2.3). The formation of *Onshore Services* was particularly significant in the development of the City of Chatham as a river port and an important commercial centre (see 10.2, 10.4, and 12.0). Other smaller settlements also originated as trans-shipment points on the river transport system.

Navigation by vessels of any size was limited to the Thames below London, but a larger extent of the river was used for *Surface Bulk Transportation* (9.4) in the form of *Log Running*, thus contributing to the early economic development associated with timber as the first extensive staple. Timber running, in turn, is linked to the development of saw milling (12.1).

Whereas *Water Transport* gave way to rail and road, navigation on the river, especially in its lower reaches, is an increasingly popular recreational opportunity, leading to the re-establishment of onshore facilities, (e.g. docks and marinas) and to increased need for *Navigation Improvement* (10.3) and *Water Flow Regulation and Monitoring* (Natural Heritage, 2).

10.1 River Navigation

10.1.1 Navigable Channel

River navigation was once the primary method of transportation in Canada. In a land of dense forests and sparse settlements, such rivers as the Thames provided natural throughways for Canada's earliest inhabitants. Owing to the navigability of the lower Thames in particular, the shipping industry and onshore services in that area were quite profitable. As the ability to export goods increased, so too did logging, agriculture, milling, and so on. This led to the development of settlement patterns and economic growth. The upper Thames, although not navigable for large craft, provided a picturesque locale for recreational boating with canoes and other small craft (see Recreation, 21).

One of the first reports relating to navigation on the Thames River was written by Patrick McNiff, Deputy Surveyor, when he was instructed to survey the river upstream beginning from the mouth at Lake St. Clair. In May 1793, he reported that travel to the upper forks at London would be possible with the development of one or two locks. However, Lord Dorchester did not approve of the scheme.

Prior to European settlement, Woodstock was the highest point of navigation for canoes (Cropp, 1973, 6). This area was the western end of the northern portage trail which connected the Thames River with the Grand River. The ability to use canoes on the river was important to early Aboriginal settlement which, in turn, prompted European exploration in the watershed. When Simcoe arrived at the Thames, the navigability of the river allowed only small boats and rafts to travel down river from what is now Woodstock to London. As a result of the precarious nature of the water levels on the Thames River, navigability in the upper watershed varied depending on the season and the nature of floods (see section 15.1.1). Therefore, Europeans who travelled the upper reaches of the Thames did so with much expense of time and trouble.

Lieutenant Governor John Graves Simcoe proposed plans for improving navigation along the Thames because he believed the river was an excellent inland water route that could connect Lakes St. Clair, Erie, Huron, and Superior. To the north, Simcoe proposed a portage joining the Thames to rivers flowing into Lake Huron. Similarly, to the southeast, he wanted a portage to link the river to Lake Ontario. By establishing a better system of navigation and developing the land along the Thames, Simcoe hoped to establish a strong British presence in this region of Upper Canada.

From London to Louisville, the Thames River was navigable for canoes, small craft, boats, and barges. The depth of the Thames along this stretch allowed for log running which became a major development in the economic

history of the watershed (see section 10.4). As well, the shipping industry expanded, yet not on the grand scale as that of Chatham and area (see section 10.2), and transported staples to local businesses and mills (see section 12.1). Over time, pleasure cruises ran between ports along this stretch of the Thames as locals began to appreciate the navigable nature of the river in terms of its ability to support early recreational boating (see Recreation, 21.1).

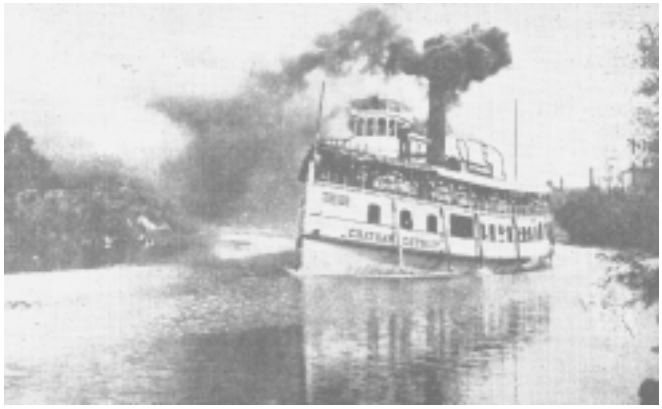
Figure 10.1 Fugitive slaves arriving at the farm of Levi and Catherine Coffin. Three thousand refugees were sheltered here before they were sent to Canada.

(Source: Hill, 1981, 60)

The majority of fugitive slaves came to Canada via the underground railroad. Forming a portion of the "tracks", the Thames River provided a route to freedom for those who crossed at Detroit. Settling in river front communities including London, Woodstock, and Chatham, many black immigrants adapted well to life along the river. For instance, by 1846, 1/3 of Chatham Township's population of 1,200 was black: many were from Ohio and the Mississippi region and were therefore skilled in such river related occupations as poling barges up the Thames — a talent not inherent to the Scottish or Irish members of the community (Ullman, 1969, 77). Section 11.3.2 covers the Elgin Settlement and reveals the role of the Thames River in the establishment of local black communities.

The stretch of the river from Louisville downstream to the mouth at Lake St. Clair was navigable for the largest lake craft in the late 1700s. Here, the average depth was recorded at sixteen feet (Belden, 1880, 45). However, in some areas, the depth was greater than that of Lake St. Clair. Lieutenant-Governor Simcoe recognized the military significance of the navigable water in the lower Thames when he suggested that a naval shipyard and military post be erected at Chatham (see section 10.2.1). Owing to its navigability, this stretch of the Thames later led to the development of Chatham as a significant inland port which allowed for the shipment of goods and people to and from the watershed. The navigability of this portion of the river was also conducive to the growth of a major shipbuilding industry at Chatham and surrounding area (see section 10.2).

Figure 10.2 Large Vessel on the Thames near Chatham, 1912.



(Source: Lauriston, 1952, 196)

It was apparent in the early history of Upper Canada that natural waterways were depended on for travel and communications. The Thames River was one such waterway as it provided a route linking early Canadian communities with the world beyond. The success of the Thames, especially the lower portion of the river, as a navigable route led to the development of early settlements, industry, and recreational pursuits.

10.1.2 Human or Wind-powered Commercial Freight and Passenger Transport

The number of sailing vessels on Canadian lakes and rivers increased along with settlement, industry, and agriculture (Glazebrook, 1964, 66). These vessels carried passengers, lumber, grain, and other freight between Canadian, or Canadian and American, ports (Glazebrook, 1964, 66). Since the late 1700s, sailing vessels were important fixtures in the lives of Thames valley pioneers. As vessels travelled to and from outside ports, the shipping industry facilitated the economic and cultural development of the area.

Once European settlement began along the shores of the Thames River, wind-powered vessels could be seen as far up the river as Fairfield. Schooners, scows, small sailboats, and the like, transported passengers and goods on the Thames. The following table (Table 10.1) lists some of the vessels which operated on the river, although many of these boats were burned and sunk by Procter's army during its retreat in the War of 1812 (see section 14.2.1).

Table 10.1 Human or Wind-powered Commercial Freight and Passenger Transport

Name and Type of Vessel	Date of Construction	Owner and/or Captain	Use
Annette, sloop	c. 1798	John Askin, Cpt. Timothy Grummet	Transported grain until wrecked at Long Point.
Surprise, ship with a 28' keel and a 16' beam	c. 1800	John Askin	Transported wheat for the McGregors of Sandwich.
Ranger, 12.5 ton coaster schooner	unknown	Cpt. Harrow	Transported goods.
Small sailboat	c. 1795	Abiah Parke	unknown
Wilkinson, schooner	1797	Cpt. James Robinson	Transported goods. By 1802, sailing the Great Lakes.
Thames, schooner	c. 1797	Northwest Company until 1801 when sold to the McGregors. Cpt. Gilkinson	Transported goods to and from Dolsen's on the Thames.
Hunter, 40 ton sloop	c.1800	Cpt. Rough	Transported goods.
Sans Pareil, 50 ton sailing vessel	1830 *First Chatham built merchant vessel.	Stephen Brooks, later sold to William and Walter Eberts.	Transported goods.
Belle, schooner	unknown	Cpt. David Patten	Transported goods. Carried tea from NY to Chatham in 1848.
John Dougall, brigantine	c. 1839	J&J Dougall of Windsor	Transported goods. Rates $0.25 more for freight to or from the Thames River.
Dawn, schooner	c. 1839	J&J Dougall of Windsor	Transported goods. Rates $0.25 more for freight to or from the Thames River.
Amherstburg, schooner	unknown	Dougalls of Windsor	Transported wheat and agricultural products to British market in 1841.
Sarah Taylor, schooner	unknown	Dougalls of Windsor	Transported wheat and agricultural products to British market in 1841.

10.1.3 Powered Commercial Freight and Passenger Transport

Steamships were first used in Upper Canada in the early 19th Century. Before long, steamers became an "efficient and adaptable" means of transportation (Glazebrook, 1964, 66). As these powered ships traversed the Thames River, they carried government supplies, commercial freight, and passengers. The first steamboat ascended the Thames River in 1828 (Lauriston, 1952, 118).

Duncan McGregor and Henry Van Allen were the principal owners of the Thames Navigation Company which built two of the Thames' steamboats that are worthy of note for their military uses. The *Thames* and the *Cynthia* were constructed in 1833 at Chatham. McGregor claimed that he built the *Thames* "because he felt the necessity for opening that portion of the country by means of a cheap and speedy mode of conveyance" (Hamil, 1951, 146). The ship ran between Chatham, Buffalo, and various other ports until she was put into service during the 1837 Rebellion. The use of the steamer at this time was crucial as a means for transporting military supplies. The *Cynthia* was also fitted to transport men, arms, and government supplies during the 1837 Rebellion. She ran between Chatham and Amherstburg until October 1838 when she caught fire and ran ashore. In 1839, the engine and hull of the *Cynthia* were re-built for the steamer, the *Western*. Captain Thomas McCrae commanded this ship which local inhabitants hoped would drive the "Yankee boats from Canadian waters" (Hamil, 1951, 265). The ship was destroyed by fire in 1842 incurring a loss of $ 5000.

Beginning in 1838, the Thames was put into government service. In November she was sent to Amherstburg to retrieve provisions and blankets for the militia. Hence, she had to break a passage through the ice all the way from Chatham to the mouth of the river. The steamer eventually made it to Chatham, but

could not re-enter the Thames River, so she returned to Windsor for the winter. Unfortunately, viewing this ship as government property, the Patriots destroyed it. The only owner of the ship at that time was Duncan McGregor. He was supported by several of the leading inhabitants of Chatham when he claimed L4000 for compensation because many believed that if McGregor was not fairly compensated, others would not risk capital on this route for fear of a similar loss (Hamil, 1951, 238).

The *Illustrated Historical Atlas of the Counties of Essex and Kent* noted that the Thames River "ranks first among the inland rivers of Ontario in respect of commercial importance" (Belden, 1880, 45). In 1839, the Canada Company's steamer, the *Goderich*, often carried goods between Chatham and Sandwich until it sank in Lake Erie. Another steamboat that travelled the Thames for commercial purposes was the American steamboat, the *General Brady*. When local inhabitants began to express their rage at having an "old condemned Yankee steamboat" in their waters, a columnist from the local newspaper begged people not to burn the boat in revenge because the prosperity of the town depended on having steamers plying there regularly (Hamil, 1951, 265). One other example of commercial steamers on the Thames is the *Kent*. This steamer was built in 1841 at McGregor's shipyard near Chatham (see section 10.2.1), and was designed to run between Chatham and Chippawa, on the Niagara River. Yet, in 1842, the *Kent* was used on the Port Stanley and Buffalo run. Three years later, she was lost on Lake Erie.

The Thames was also a significant waterway for passenger transport. Numerous steamers carrying immigrants and travelers (and their wagons) left Chatham three times a week for Sandwich (Hamil, 1951, 148). Passengers preferred the steamboat to a stage-coach as a mode of travel, due to the extremely poor road conditions. As great numbers of steamboats called at Chatham, travellers were introduced to the area and were encouraged to settle there. This led to the increased prosperity of the town.

An exceptionally profitable venture was said to have been established in 1840 when the 150 ton *Brothers* began regular runs between Chatham and Detroit. The steamer was commanded by Captain Walter Eberts. It was built on McGregor's Creek and advertised that it had large comfortable cabins and a saloon serving the choicest wines (Hamil, 1951, 265). When a new engine was added in 1841, owners of the ship boasted that it was as fast as any American ship. The following year, the captain said he was adding more comforts to make the ship equal to any of its class on the western waters. The *Brothers* was a truly profitable venture that placed the Eberts' firm among the top ranking companies in the Western District.

In the following poem, A.S. Holmes reveals that Chatham residents were proud of Captain Walter Eberts' ship:

Don't you see the dashing foam,
The spray of one returning home,
So long before the others?
How swiftly she the waters walks,
How crowded are the Chatham docks!
To welcome home the Brothers!
(Hamil, 1951, 266)

Steamers also travelled along the Avon River. When William Jeffrey and W.R. Marshall formed the Stratford Navigation Company, they bought a new steamer, the *City of Stratford*, and constructed wharfs along the river. However, when the Waterloo Street Bridge was constructed in Stratford, the ship's smokestack was too high to pass under. The owners of the steamer managed to convince city officials that the boat was an asset to the community, so Council spent $222 to raise the bridge. Another *City of Stratford* was launched on the river the following year. The yacht, *Stella*, traversed the river one year later and may have been the last steam craft to run along the Avon (Leitch, 1980, 124).

The *Owen*, built by Daniel William Crow on his farm in Raleigh Township in 1883, also played a key role in the shipping history of the area. The ship laid the first cable for the telephone line from the mainland to Pelee Island and carried the stone for both the Colchester Reef Lighthouse and the Morpeth Piers projects. She also towed schooners to and from Chatham on the Thames River (Rhodes, 1987, 27).

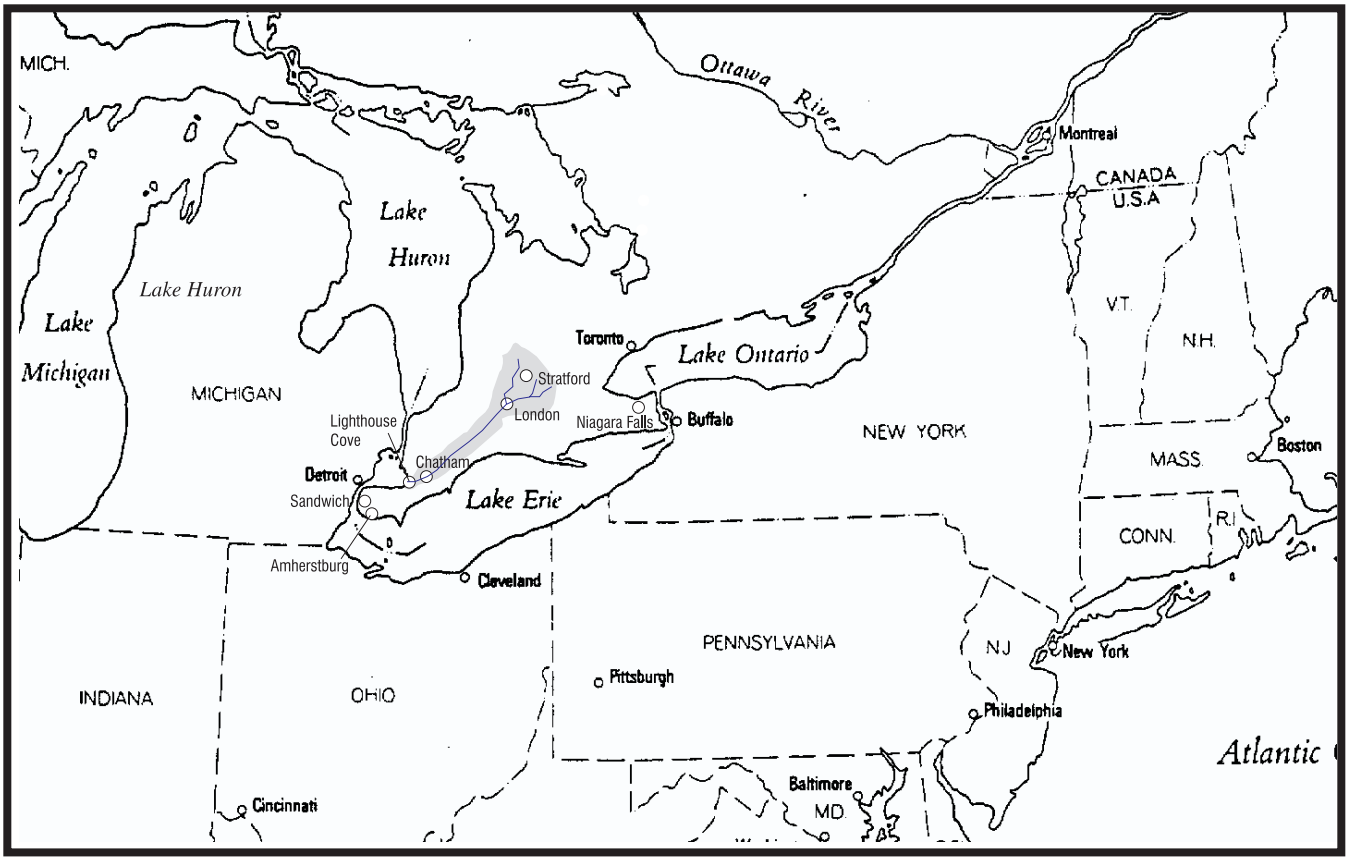
Steamboats were the pride of the Thames River inhabitants and, more specifically, Chatham settlers. As the shipbuilding industry advanced, increased numbers of vessels travelled on the Thames River. Whether carrying passengers, commercial freight, or government supplies, the Thames River steamboats played an important role in the history of the watershed.

10.1.4 Cargos

The variety of cargos shipped down the Thames illustrates how the river aided with the early economic development of the watershed. As goods were shipped to Thames River settlements, inhabitants were supplied with raw materials, textiles, food, and drink — goods necessary to fulfill basic needs. However, as communities developed, cargos matured and the river was used to connect early industrialists with national and international markets. This sequence began in the early 1800s along the lower Thames. It was then repeated, to a lesser extent, in the 1840s and 1850s as settlement expanded in the upper reaches of the watershed. This pattern is representative of the development of industry in much of southwestern Ontario.

In the earliest days of settlement, traders from the De-

Figure 10.3 Southwestern Ontario and surrounding area



troit region rode up the Thames River to trade with Aboriginals at Fairfield. The Moravian missionary, David Zeisberger, later noted in his diary that French fur traders consistently travelled along the Thames trading rum for such goods as wheat and textile products (Zeisberger, 1885, 289).

Figure 10.4 Farming in Kent County, c.1880

(Source: Belden, 1880, 70)

Wheat was one of the main exports shipped from the Thames River area. It was the first major crop that settlers along the Thames River watershed grew beyond their own needs because they knew that it could be used in exchange for other goods or for cash sales. As the Thames River shipping industry provided greater access to markets, it helped to establish the economic prosperity in the watershed.

In 1841, Chatham had exported 40 718 bushels of wheat worth L15 521 (Hamil, 1951, 268). That year, the town also recorded shipping 1 620 bushels of blue peas, 143 barrels of flour, 70 barrels of pork, 220 000 feet of standard staves, and furs worth L2490. Two years later, exports from Chatham included wheat, furs, skins, flour, peas, pot and pearl ashes, barley, oats, corn, potatoes, cranberries, timothy seed, lard, butter, and standard staves.

Logs were also shipped from Chatham after they were floated down from the upper reaches of the river (see section 10.4). The immense quantity and variety of lumber (see Natural Heritage 5.0) in the watershed provided for a lucrative industry along the Thames River.

Tobacco originated in the Thames watershed as an Aboriginal crop. As early as 1790, Lieutenant-Governor Simcoe recommended that tobacco be produced by European pioneers in the Thames River watershed. From 1819 to 1820, runaway slaves introduced new tobacco growing methods to the countryside along the Thames. Knowing that this cargo could be shipped down the Thames to markets outside of the region, settlers began to produce the goods in large quantities. The first tobacco shipments left the watershed for Montreal in the early 1820s. The success of exporting tobacco from the Thames watershed is evident as approximately 500 000 pounds were produced and

shipped to Montreal and England in 1827 (Dept. of Energy, 1966, 9).

Once sawmills were established along the river (see section 12.1), staves became another major cargo item. It was estimated that more than half a million staves were shipped during the spring of 1842 from the Thames and Sydenham Rivers. Of these, more than 100 000 staves left from Chatham ports in schooners and other river vessels. The navigability of the Thames in relation to this resource (see section 10.1.1) is significant in that it linked suppliers with large markets both in and out of Canada. As well as contributing to the general economy, this provided specific employment for Thames River inhabitants working within lumber camps or the shipping industry. It also instigated the development of barrel, furniture, and carriage manufacturing enterprises within the Thames valley.

Prior to the initiation of railway lines in the mid-1800s, the Thames River was the most efficient transportation route for cargo. As a result, the Thames facilitated the development of trade and commerce in the watershed, especially below London.

10.2 Onshore Services

The growing shipping industry on the lower Thames gave rise to various on-shore services which facilitated the growth of Chatham as a significant inland port. Chatham and the surrounding area quickly grew in importance as a place for the construction of craft, a facility for unloading, loading, and storing cargo and passengers, and a destination for the provisioning of passengers and crews. Figure 10.6 maps the landings and and inns mentioned in this chapter.

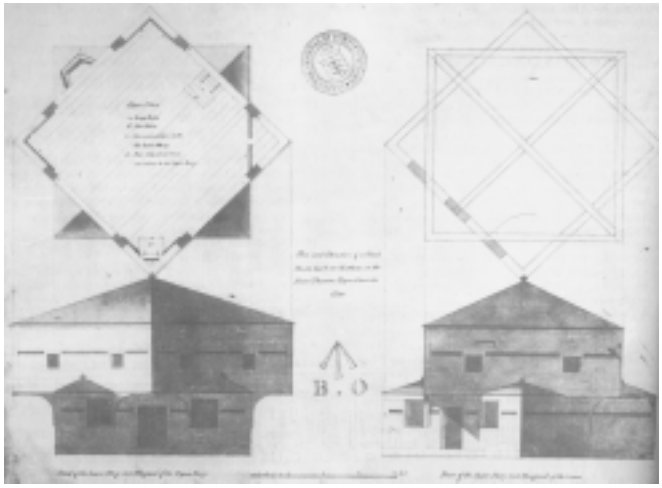
10.2.1 Places of Construction of Craft

Lieutenant-Governor Simcoe was the first to choose Chatham as the location for shipbuilding on the Thames River when he decided that the area was strategically positioned to become a naval arsenal for the building of gunboats. As well as providing a safe and convenient harbour for vessels in the river below, Chatham would become a military post. Therefore, in the fall of 1794, William Baker of the Detroit shipyard was assigned to build a blockhouse, storehouse, and six gunboats at Chatham. The plan for the blockhouse is depicted in Figure 10.5. Once the ground between McGregor's Creek and the Thames was cleared, temporary huts and sheds were constructed and saw pits were set up on the river flats to facilitate the skidding of the hand-sawn ship timbers.

The process of shipbuilding was extremely expensive: from December 25, 1794 to March 24, 1795, some twenty-three employees received wages totaling L379 6s 9d from the deputy paymaster general for "sundry works carried on at Chatham on the river Thames"(Lauriston, 1952, 45). The payroll lists eleven carpenters, seven blacksmiths, and two labourers. Most of the workers were squatters or settlers from the lower Thames.

By March 1795, the blockhouse was completed. The log building housed a storeroom, sleeping accommodations, and two small cannons which faced the river in case the structure had to be used as a fort in times of attack. At this time, two gunboats were also constructed and two more boats were near completion. Each of the boats carried a twelve pound cannon and was rowed by twenty oars (Hamil, 1951, 25). Only two or three of the gunboats were actually launched.

Figure 10.5 Blockhouse Built at Chatham, 1794



(Source: Stott, 1985)

After three years existence, the post was abandoned due to a lack of financial backing from Simcoe's superiors who believed that the military post was too far away from the more central areas of Upper Canada. In 1797, the boathouse collapsed, damaging one of the boats (Hamil, 1951, 25). Thereafter, the unfinished gunboats were left to rot on the river flat. Some were eventually burned by settlers as they attempted to recover iron, a scarce commodity at the time.

The location of the naval arsenal reveals the initial emphasis placed on the strategic military importance of Chatham. In the future, the town continued to play a role in naval and military pursuits (see sections 10.1.3 and 14.2.2).

The Chatham shipyard was also significant because it represented one of the first industrial activities in Chatham. Today, a historical plaque marks the location of the shipyard in the area that is now known as Tecumseh Park (see Recreation, 26.3, 27.4; for a list of provincial and national historic sites within the watershed, see Tables 17 through 20 of the Appendix).

Approximately thirty years after Baker's shipyard fell, the Chatham shipbuilding trade was rejuvenated (see sec-

tion 10.1.3). Duncan McGregor produced the first Chatham steamboat in 1832 when he converted his schooner, the *Rob Roy*, into a 60 ton, 25 horsepower steamboat named the *Little Western* (Hamil, 1951, 146). This passenger boat ran along the Thames and the Detroit Rivers. It also travelled to various ports along the Great Lakes. Although many settlers ventured to build ships for navigation along the Thames, as one industrial historian wrote, "the era of the 1830s belonged to the shipbuilding activities of Duncan McGregor" (Rhodes, 1987, 5). McGregor's shipyards were located on the south riverbank just east of Chatham. The *Illustrated Historical Atlas of the Counties of Essex and Kent* refers to the *Tecumseh*, *Ontario*, and *Quebec* when discussing the most prominent ships built in Chatham in the mid-1800s (Belden, 1880, 53). These are only a few of the boats representing the lucrative and extensive trade in Chatham shipbuilding which fuelled the development of the local economy for close to a century.

10.2.2 Facilities for Loading, Unloading, and Storing Cargo and Passengers

With growing numbers of vessels using the lower Thames River as a transportation route, it was necessary to establish facilities for loading, unloading, and storing cargo and passengers. As Chatham's place as a shipping centre increased, many landings were built at this location to deal with increasing trade and travel. The significance of these facilities is clearly revealed as pioneers, taking advantage of the convenience and economic benefits associated with the landings, established their homes and businesses in Chatham and surrounding area.

As commerce developed in the watershed, Matthew Dolsen's landing in Dover Township provided a secure port for many of the larger ships which sailed up the river (see figure 10.6). By 1797, Dolsen ran a tavern and store at this location (2 or 3 miles below the forks at Chatham). This soon became the centre of commercial life on the Thames River and the business quickly evolved into a large mercantile and manufacturing establishment (Hamil, 1951, 164). As well, the landing quickly became the focus of a new area of settlement (see section 11.4.6).

In the early 1830s, Chatham's population increased dramatically when a new stagecoach, providing transport from Niagara to Detroit, used the landing at Chatham as a transfer point from land to steam ferry (Charles, 1979, 1). Likewise, as early as 1832, Beachville had a regular stage service on the route from Queenston to Chatham (Hanlon, 1977, 27). At Chatham, the stage coaches connected with the steamers which provided links with Kingston and New York. Through the transfer of passengers at Chatham, Thames River steamship and stagecoach industries spurred the development of other onshore services which in turn benefitted the economy and stimulated settlement.

By the mid-1800s, Chatham was rapidly developing as a port and trading centre. The Eberts' Block, constructed in 1855 by Chatham's first commercially prominent family, was used as a facility for loading and unloading cargo from schooners travelling the Thames River. The structure was unique in that it had two "basements" (one directly above the other). When goods were off-loaded from schooners, they were sorted in the lower basement, and then moved to the upper level for storage until they were placed on the street level for re-sale. The back, or north end, of the building was used to store grain (Charles, 1979, 15). For over a century, this was the foremost commercial building in town where doctors, lawyers, and municipal officials all rented space. Unfortunately the structure was seriously damaged by fire in 1986.

> The Eberts' Block deserved a great deal of architectural merit. The block was rare because it was constructed of substantial materials and techniques compared to the contemporary wood and clap board shops of mid-19C King Street in Chatham. As well, the building was located on the river's edge, and therefore needed massive stone footings to support the masonry walls. The intricate system of fireplace heating that was built into the structure also distinguished the building from others (Charles, 1979, 15).

10.2.3 Places for Provisioning Passengers and Crews

As travel and trade developed in response to the Thames' use as a transportation route, establishments sprouted up in areas where vessels could potentially land. This was a major impetus to the economic and social growth of the area. People traveling long distances through Upper Canada needed places where they could stop for rest and nourishment. Recognizing this need, hotel owners built numerous establishments along the Thames River in the Chatham area (see figures 10.6 and 11.3). Although these structures ranged from rickety shacks to grand hotels, they all had the same effect of stimulating development in the Thames River region. As travelers made stop-overs on the Thames, they contributed to the local economy. As well, having an opportunity to see the potential of the region, many made the watershed their permanent home.

Many inns developed along the Thames as a necessary result of the shipping industry. For example, for many years, beginning in the early 1830s, John Dauphin and, later, his son Narcisse, operated an inn along the Thames River in Tilbury East. Records indicate that steamboats often stopped at Dauphin's landing to take on or discharge passengers (Hamil, 1951, 165).

Passengers from the *Brothers* likely sought accommodation at the "Farmer's Exchange," a steamboat landing originally known as the "Cross Keys Tavern" when it was started by Israel Evans in 1837 (Hamil, 1951, 273). Management of the hotel became the responsibility of William Dolsen, Evans' son-in-law, in 1841. One year later, Dolsen

Figure 10.6 Thames River Human Heritage Values

Landings and Inns

1 Dauphin's Landing/Inn
2 British North American Hotel
3 Chatham Arms
4 Mathew Dolsen's Landing
5 Royal Exchange
6 Chatham Steamboat Landing
7 Farmers Exchange
8 Ebert's Block
(See insert 2 for Details)

Archaeological Sites

Areas Revealing Amerindian Presence

Significant Riparian Homes

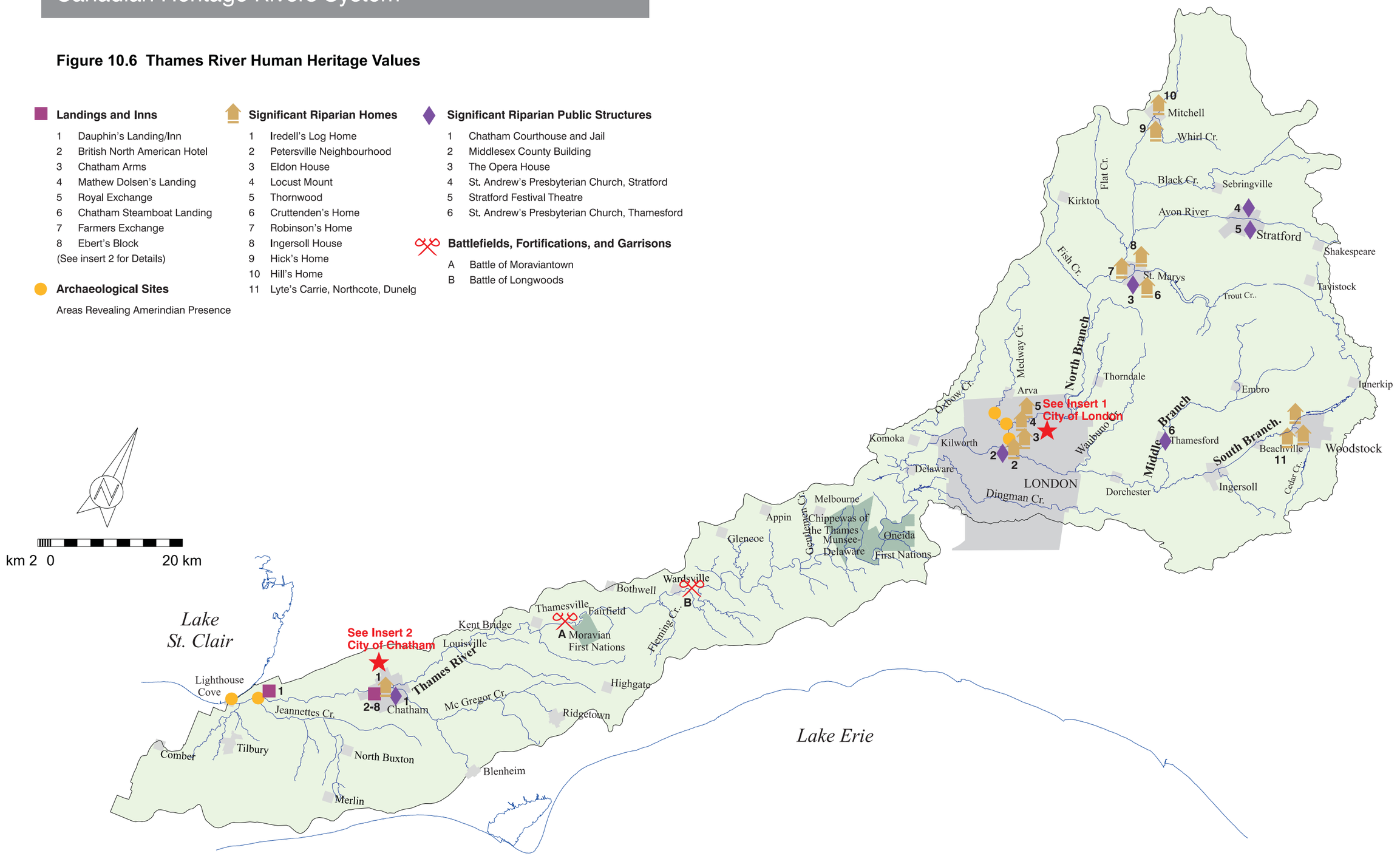
1 Iredell's Log Home
2 Petersville Neighbourhood
3 Eldon House
4 Locust Mount
5 Thornwood
6 Cruttenden's Home
7 Robinson's Home
8 Ingersoll House
9 Hick's Home
10 Hill's Home
11 Lyte's Carrie, Northcote, Dunelg

Significant Riparian Public Structures

1 Chatham Courthouse and Jail
2 Middlesex County Building
3 The Opera House
4 St. Andrew's Presbyterian Church, Stratford
5 Stratford Festival Theatre
6 St. Andrew's Presbyterian Church, Thamesford

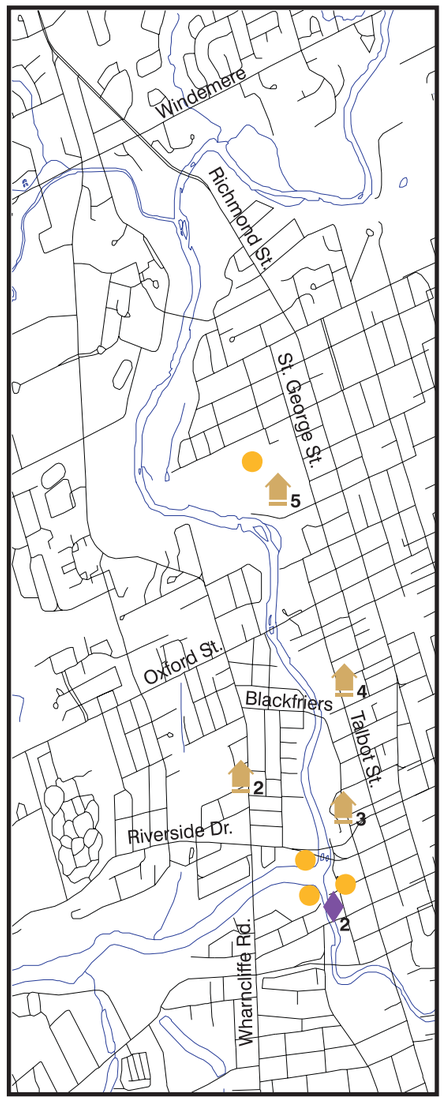
Battlefields, Fortifications, and Garrisons

A Battle of Moraviantown
B Battle of Longwoods



Thames River Human Heritage Values Insert Map to Figure 10.6

Insert 1 - The Forks (City of London



Refer to Legend on Thames River Human Heritage Map

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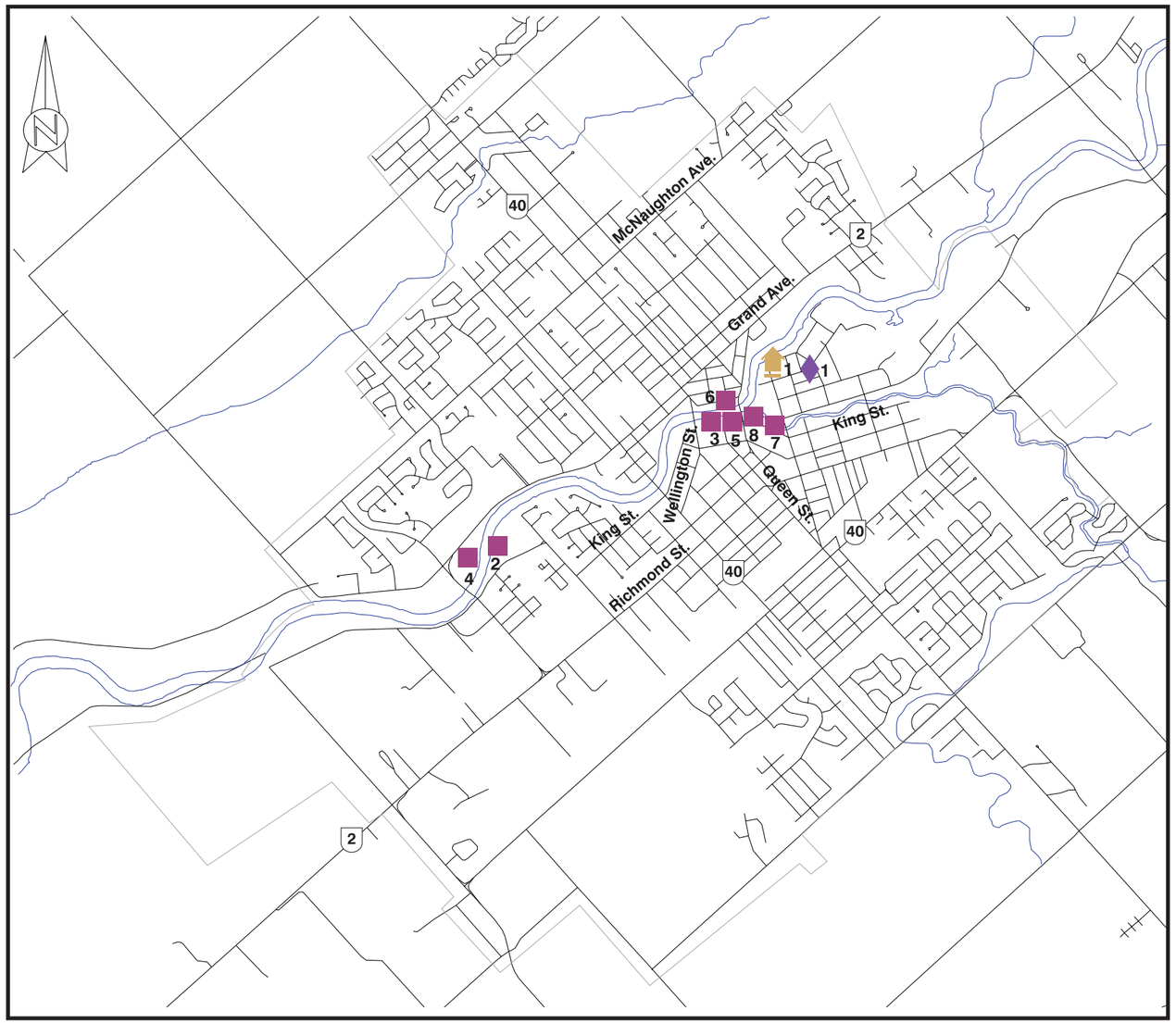
Insert 2 - City of Chatham



Refer to Legend on Thames River Human Heritage Map

Base mapping is based on information taken from the National Topographic System map sheet 40p/3,40/i14 8 1995. Her Majesty the Queen in Right of Canada with permission of Natural resources Canada.

built an addition to cope with the success of the inn. He sold the establishment in 1855.

In 1839, the Royal Exchange, situated at the corner of King and Fifth Streets in Chatham, was operated by Joseph Northwood. The following year, he sold it to the Eberts brothers. This was the largest hotel in the Western District (and supposedly the best west of Hamilton). It was a three-storey building with five large sitting rooms, twenty-five bedrooms, a bar-room, a large billiard room, and grand stables and outhouses. In 1842, John H. Carter rented the hotel, investing a great deal of money into furnishing and fitting up the apartments. People commented that the service at the hotel was very good and that the rooms were clean. As well, the meals were large and inexpensive (Hamil, 1951, 272). By the following February, the Eberts were again managing the hotel. Since their steamboat landed on the opposite shore, the hotel operated as the stage house where passengers applied for seats on coaches going east and west. In 1848, the Eberts leased the hotel to F. Larned who renovated it thoroughly. Two years later, Eli Stephenson operated the hotel.

Figure 10.7 King St. W, Chatham, 1860

(Source: Hamil, 1951, 292)

1 Royal Exchange
2 A. D. McLean property
3 J. N. W. McKeough, hardware
4 Robert Cooper's bookstore
5 R. O. Miller, dry goods
6 Postoffice
7 Thomas Stone, dry goods
8 Rankin House
9 Fourth Street
10 Northwood, grocer
11 Ebert's brick block
12 W. E. Rispin, Grand Trunk ticket office
13 Stephen Backus
14 Music Hall

The British North American Hotel was located slightly below the steamboat landing in Chatham. In 1841, Elias Dauphin operated the two-storey wooden frame building that was constructed of wood recycled from the old inn of George Henry. The hotel was described as a "vast, rambling, rickety, wooden concern" with the usual pole and swinging sign in front (Hamil, 1951, 274). When Elias died in 1841, his wife rented the building and its contents to Charles Smith who ran it until 1846. After this lease expired, Thomas Forsyth managed the business. Timothy Partridge stayed at the hotel one evening and reported that "two darned great bed bugs got hold of me night before last and they came so near carrying me off they pulled me out of bed!"(Hamil, 1951, 274).

In 1849, Joshua Biles operated the Chatham Arms which was located in a brick building on the corner of King and Forsyth Streets in Chatham. For no extra charge, a porter conveyed passengers to and from boats on the Thames River (Hamil, 1951, 275).

The establishment of so many hotels along the Thames River reveals the importance of the waterway as a transportation route. It was apparent from the beginning that the river was depended on for communications as most people used the water route for their journeys. Travelers preferred to take the short land route through Canada, which enabled them to embark at Chatham and then sail to Michigan, rather than make the long trip south of Lake Erie (Hamil, 1951, 275). This was profitable for Chatham's shipping industry. As well, Canadians profited from immigrants who passed through the country. From as early as 1793, Chatham was recognized for its potential as a significant inland port. The development of the shipbuilding industry and the extensive onshore services increased Chatham's importance. This was instrumental to the development of settlement and the economy in the area.

10.3 Navigational Improvements — Lighthouse

By the time of Confederation, the Canadian government was maintaining 120 lighthouses. Seeing the importance of navigational aids, the government had spent over one million dollars on lighthouse construction and repair (Passfield, 1988, 124). The Thames River lighthouse is located in a hamlet, Lighthouse Cove, at the mouth of the Thames River at Lake St. Clair.

At nearly 200 years of age, the Thames River Lighthouse is one of the three oldest lighthouses on the Great Lakes. Unfortunately, the original wooden frame structure that was constructed around the late 1700s by the Cartier family was destroyed by fire during the War of 1812. The current structure was erected in 1818 from limestone quarried in Amherstburg. At the time of Confederation, the height was increased to its present level.

The Cartier family cared for the lighthouse for close to 130 years. When William "Dick" Cartier died in 1950, he was succeeded by C.W. Riberdy who was an experienced river-man with great knowledge of the "moods and vagaries" of the Thames River and surrounding waters (Vandeweghe, 1973, 2).

In 1966, the lighthouse was deemed unsafe by the Department of Transportation. The structure shifted due to the infiltration of water in the unstable, sandy, marshy soil. Wind, rains, and repeated flooding also had a negative effect on the lighthouse. Therefore, a modern steel structure housing an automatic light was constructed near the old lighthouse and now performs the duty of ushering in sailors from the lake.

Figure 10.8 Thames River Lighthouse

(Source: Quinlan, 1997)

By 1972, the original lighthouse leaned to the east at a fifteen degree angle and the walls were cracked (Vandeweghe, 1973, 3). In 1973, the Lower Thames Valley Conservation Authority acquired the lighthouse, moved it slightly, and rebuilt it stone by stone. The restored lighthouse is a monument to the ingenuity and spirit of Kent County pioneers. The Thames River features many sites such as the lighthouse which are preserved and celebrated by area residents (see Tables 17 through 20 of the Appendix for a list of the provincial and national historic sites located within the watershed).

10.4 Surface Bulk Transportation — Log Running

In the 1780s, pioneers began to clear the vast forest of the Thames region (see Natural Heritage, 5.1) in order to ready it for settlement. Throughout the watershed, this lumber supplied settlers with raw materials for building local houses, barns, mills, and other places of business. Not only did this assist with the development of local settlements but, forest products also played a major role in Canada's economic history (Head, 1975, 78). Owing to the navigability of the Thames (see section 10.1.1), log running became a lucrative activity, especially in the upper reaches of the watershed. Soon, timber harvested from the Thames River watershed was suppling local settlers, the British, and Americans.

In 1795, the Surveyor-General wrote to Deputy Surveyor, Abraham Iredell, that certain settlers on the Thames were planning to become employed at the pinery. Yet, he believed that there was already too much waste of white pine (which was reserved to the Crown). Thus he had Iredell announce that rafts of pine logs, staves, shingles, or lumber in any form, were not allowed to pass Chatham for export from the river. This had little effect as many rafts of pine lumber and timber travelled down the Thames from the pinery between 1797 and 1798.

Early settlers, such as Matthew Dolson, recognized the potential in the lumber trade as early as 1780. At this time, Dolson was one of few who sold lumber to men from Sandwich and the St. Clair River region. Ten years later, it was a common sight to see pine timber floating down from the forest above Delaware.

David Zeisberger described the process of log running when he wrote about a "party of white's" who went up to the pinery to send the timber rafts down near the end of March, 1798. One month later, he wrote that the rafts had passed the Moravian mission (Zeisberger, 1885, 521). Forty years later, Anna Jameson revealed in her diary that rafts still travelled the Thames River when she wrote: "I saw today a large timber raft floating down the stream, containing many thousand feet of timber" (Dept. Of Planning, 1952, 6).

Within the first few decades of the 19th Century, timber cutting became one of the most important domestic businesses in southwestern Ontario. Lumber was a significant article of trade on the lower Thames by 1835. It was quite common for southwestern Ontario sawmills to utilize relatively local resources (Head, 1975, 88). Thus it is not surprising that in his *Tour of the Thames*, Judson wrote that logs were floated down the river for use in local mills (Judson, 1881, 112) (see section 12.1). As well, the shipbuilding industry in Chatham required a great supply of timber from the upper Thames region (see section 10.2.1). The mast and spar export to Britain was thriving in the 1830s and 1840s, yet, by 1855, it decreased dramatically. This was likely a result of fewer trees suitable for masts and spars.

The Reciprocity Treaty with the United States which secured "the free exchange of the natural products between Canada and the United States, including timber and lumber of all kinds" resulted in the shipment of most of the wood

to the United States (for use in sawmills) rather than Britain (Dept. of Planning, 1952, 7). In addition, more lumber went to the United States because, unlike most eastern watersheds, in order for the lumber to reach the seaport, it had to make the costly journey westward down the Thames and then eastward through the Great Lakes.

> By 1845, large quantities of white oak and black walnut staves floated down from the upper part of the Thames River. As well, substantial amounts of oak staves and walnut lumber were exported from the Thames at this time. Walnut and cherry boards sold at ten dollars per thousand feet; poplar and whitewood sold at eight dollars per thousand feet (Hamil, 1951, 134).

Log running on the Thames River supplied local inhabitants with the resources necessary for basic survival. Once settlement developed in the area, the businesses of milling and shipbuilding benefitted from the supply of local timber. As well, the economic and social development of the watershed expanded due to the lumbering export trade to Britain and the United States.

Summary

The major significance of *Water Transport* lies in its invaluable contribution to the movement of goods and people in the period of Early European Settlement. From the late 1700s to the 1840s, the Lower Thames was very much part of the shipping world of the lower Great Lakes, centred on Lake Erie. Ships built beside and operated along the Thames were part of an important system of water transport that played a key role in European Settlement.

Chapter 11

Riparian Settlement

It is arguable that *Riparian Settlement* may be the key integrating Human Heritage element of the Thames River. If, as suggested in the *Introduction*, the Thames watershed represents a microcosm of settlement in what became eastern Canada, then *Riparian Settlement*, especially the series of settlement nodes along the major tributaries, has been and remains of great significance. Virtually all the major and minor nucleated settlements have grown up on the river and owe something to it from a location standpoint. Many factors associated with *Resource Harvesting* (9.0), *Water Transport* (10.0), *Hydraulic Power Generation* (12.0), and *Jurisdictional Use* (14.0), have combined to create the settlement pattern.

Archaeological Evidence of Shoreline Aboriginal Settlement (11.1) is the first section in the chapter, *Riparian Settlement*. The continuity between prehistoric Aboriginal settlements and First Nation territories is also compared in the First Nations section of this report.

Siting of Dwellings in Respect of Floods and Accessible Only by the River (11.2) emphasizes the importance of the river in determining early points of European access and activity (see also, section 10.2). *Patterns of Settlement Affected by Surveys and River Oriented Baselines* (11.3) and *Community Adaptations to the River* (11.4) both take a broader look at the river's role in influencing settlement. The later section reveals that European settlement was often reinforced by transportation routes and the juxtaposition of a mill site (11.4). Although these do not necessarily reflect the actual reasons for the initial location of settlements, they include features that remain among the most enduring elements of the built *Human Heritage*.

11.1 Archaeological Evidence of Shoreline Aboriginal Settlements

Aboriginals came to Canada by crossing the Bering Ice Bridge from Asia. When the glaciers retreated and the tundra-like environment evolved, around 9000 B.C., the first human inhabitants arrived in southwestern Ontario. Archaeologists have discovered that the Amerindian presence in the Thames River watershed dates back at least 11 000 years. During the Middle Woodland Period (300 B.C. to 800 A.D.), many large groups occupied seasonal sites along the Thames River in the spring and summer months. Owing to the appearance of corn in southern Ontario, which gradually became a substantial part of the Aboriginal diet, permanent settlements were established on the fertile valley soil of the Thames. During the Prehistoric Neutral Period (1400 to 1500 A.D.), villages along the Thames decreased in size and were well fortified for defense. This period ended with the abandonment of the area due to increasing warfare. The Neutral tribe returned to the region between the early and mid-1600s to use the shores of the Thames for crop cultivation, fishing, and hunting. An examination of some of the many archaeological sites uncovered along the Thames and its tributaries reveals the importance of the river to its original inhabitants. (see also, figure 16.1 and First Nations, 16).

In 1626, Daillion, a Franciscan Father, visited the Attawandaron who lived along the Thames River. He counted 28 towns, villages, and boroughs. Fourteen years later, Father Brebeuf estimated approximately 40 towns inhabited by no more than 12 000 people (Jury, 3).

Patrick McNiff, Deputy Surveyor, recorded evidence of a site near Jeanette's Creek when he wrote the following notation on a 1790 map: "In the side of this knoll there are great quantities of human bones"(Hamil, 1951, 6). Three years later, when Lieutenant-Governor John Graves Simcoe and his party left Niagara for Detroit, they passed a site in the same area, near Baptiste Creek, where they found skeletons among the ruins of several bark wigwams (Lauriston, 1952, 18). Once Edmund Bassett Jones, the City Engineer of Chatham, excavated the site after 1850, he determined it was an Attawandaron village that had been destroyed by the Iroquois.

In the late 1880s and early 1890s, Edmund Bassett Jones located two Aboriginal sites near Chatham on McGregor Creek. Jones wrote of the sites in the *Chatham Evening Banner*:

> The south village near Wilson's Bridge appears to have been partly surrounded with a palisade, beginning at the bank of the creek at the west boundary of the village, and enclosing a semi-circular piece of land of about three acres, and ending on the creek bank to the east. ...It is comparatively easy to locate the position of several lodges within the enclosure by the debris left on certain spots, such as arrow points, fragments of flint, stone hammers and fragments of broken bone (Lauriston, 1952, 17).

Jones noted that this was a Neutral site. Since its discovery, many believe that this site may have been St. Joseph of the Jesuit missionaries (Lauriston, 1952, 17; see also, Hamil, 1951, 5).

Archaeologists have uncovered a number of base camps on the Thames River within London. Evidence reveals that these sites were used extensively. A large

Iroquoian camp was discovered on the grounds of the Thornwood estate near Gibbons Park. The Iroquois chose this location because the sandy soil was favorable for growing corn. As well, setting up camp in this area placed the Aboriginals near prime spawn fishing (Adams, 1996, 3).

Approximately 1500 A.D., a Prehistoric Neutral village occupied what is now known as the Lawson Site. Located next to the Museum of Indian Archaeology (see Recreation, 27.1) on the edge of Medway Creek in northwest London, the Iroquois village is two hectares in size, slightly larger than the average Iroquoian village (Pearce, 1993, 1). Although in the late 1800s, the northern quarter of the site was cleared for cultivation and was used as a farm field until 1975, the southern 3/4 of the site has been somewhat preserved under a woodlot of mostly maple and beech trees for the past 500 years. The first professional excavation at Lawson began in 1921. Based on archaeological discoveries, historic records, and information from other sites, the village has been reconstructed to show the palisade, long house, and so on. The Lawson site is considered to be the cornerstone in our current understanding of Ontario prehistory and has been deemed a historic site by the Ontario Heritage Foundation (for a list of provincial and national historic sites located within the watershed, see Tables 17 through 20 in the Appendix).

Archaeological evidence of shoreline Aboriginal settlements reveals the importance of the Thames River in terms of travel, trade, communications, and resource harvesting. The river affected many facets of the lives of its original inhabitants.

11.2 Siting of European Dwellings Situated in Respect of Floods and Accessible Only by River*

As Europeans emigrated to regions in Upper Canada, they chose areas conducive to agriculture, industry, trade, and travel. As a result, the earliest settlements in the Thames valley were situated on the flood plains bordering the Thames River.

The fact that most of the land west of Chatham was not much higher than lake level led to the slow and difficult development of what became the County of Kent. Without artificial drainage, except for a narrow strip of fairly high land adjoining the lower Thames on either side, most of the land for several miles back was so wet that it was practically useless. Therefore, dwellings were first established on river front lots.

The wetlands in the lower part of Raleigh, Dover East, Tilbury East, and Dover West Townships were settled early on by the French from the Detroit River area because these families preferred the floodplains to the heavily forested lands upriver. Flooding on the lower part of the Thames River was beneficial in a sense because it kept the area clear and provided natural meadows for pasture. Settlers also used the floodplains to grow such crops as wheat, corn, peas, and tobacco (see section 10.1.4).

> During the summer and winter months, cattle once wandered through the land on the south side of the lower Thames. When Judson journeyed down the Thames, he noticed cattle "cooling their feet in the shallow marge of the stream" at the Kensington flats (Judson, 1881, 4). Down river, he enquired, "why do you pasture your cattle across the stream, when you have so much bush pasture here?" The settler replied, "Oh, cattle all'ays crosses the river if they can. Stonefishes' cattle comes over here to paster, an' mine goes over to his place; they all'ays do it" (Judson, 1881, 59).

Mostly those who settled in the area first were United Empire Loyalists from the eastern United States who built homes along the river after the establishment of American Independence. This was a popular area for settlement. Records of the Land Board indicate that there were many requests for land on the Thames River long before official surveys were conducted (Kent Historical, 1939, 34).

As Patrick McNiff began to survey townships along the river in 1791, he noted that twenty-eight families had already settled along the water, mainly on the south side of the river. Some had made considerable improvements to their land. As he travelled up the river, McNiff noted that six houses were empty. As well, he passed homes belonging to Richard Surplex, Richard Merry, John Peck Jr., St. Carty, Richard Peck, Eliza Peck, John Peck Sr., Daniel Fields, Samuel Newkirk, Thomas Williams, Chas. McCormick, and Isaac Dolsen (Kent Historical, 1939, 33). On the north side of the Thames, McNiff found two empty houses. As well, he travelled past the homes of Thomas Holmes, Meldrum and Park, Arthur McCormick, Sarah Wilson, Mathew Dolsen, Thomas Clarke, and "a black man"(Kent Historical, 1939, 33). This indicated to McNiff that the settlers had lived there since sometime between 1775 and 1780 (McGeorge, 10). Many of the original houses still exist along the river. For example, in the upper portion, McCrea's, Dolsen's, and Newkirk's homes can still be viewed on the Thames' shores.

The first European dwellings in Upper Canada, a land of dense forests, were accessible only by water. Although Aboriginal trails often passed by these areas, Europeans feared using these "treacherous" paths (Lauriston, 1952, 25). Because the Thames River was the only access route to this portion of Upper Canada, the first European settlers naturally constructed homesteads on its shores. Many of

**For information regarding water access and water extraction, see sections 9.3, & 10.1*

these men invested in such economic pursuits as milling (see section 12.1), log running (see section 10.4), shipbuilding (see section 10.2), and so on. As well, through the fulfillment of their settlement duties, our founding fathers also contributed to the development of such public works as road and bridge building (see section 11.4). As a result of these efforts, increasing numbers of immigrants were drawn to the Thames River watershed. They too helped the social and economic development of the region.

As settlements formed away from the Thames River and methods of transportation evolved (see section 11.4.1), the river lost its importance as the only means of gaining access to early homesteads. For instance, Aboriginal paths were widened to allow for the passage of stagecoaches carrying people and goods. Eventually these trails were developed into roads which were often extended to link communities established back from the river. As well, the advent of the railway in the 1850s provided access to settlements established away from Ontario rivers. As was often the case in Ontario's history, all of this development began along the shores of the river.

11.3 Patterns of Settlement

11.3.1 Settlement Affected by Surveys and River Oriented Baselines

Throughout the history of Upper Canada, rivers determined how land was divided up in major surveys. A study of the communications between the District Land Board and surveyors, and of early maps of Upper Canada, reveals that the Thames River played a role in the design of townships and counties in the watershed (see figures 11.1 and 11.2) .

In 1789, the Land Board for the District of Hesse had Deputy Surveyor, Patrick McNiff, lay out townships on the edge of the Thames River. McNiff was instructed to follow the river's course for thirty miles from the mouth at Lake St. Clair (see section 14.1.2). The surveyor laid out lots fronting the Thames River in what are now Dover East, Chatham, Raleigh, Harwich, and parts of Howard and Camden Townships. From the mouth of the river to the Tilbury East/Raleigh township line, the land was deemed too wet for settlement (see section 11.2). As McNiff began surveying Howard and Camden Townships, he realized that the Thames was taking a much more southerly direction than he anticipated. Yet the Land Board did not want to change the direction of the side lines (Hamil, 1951, 17).

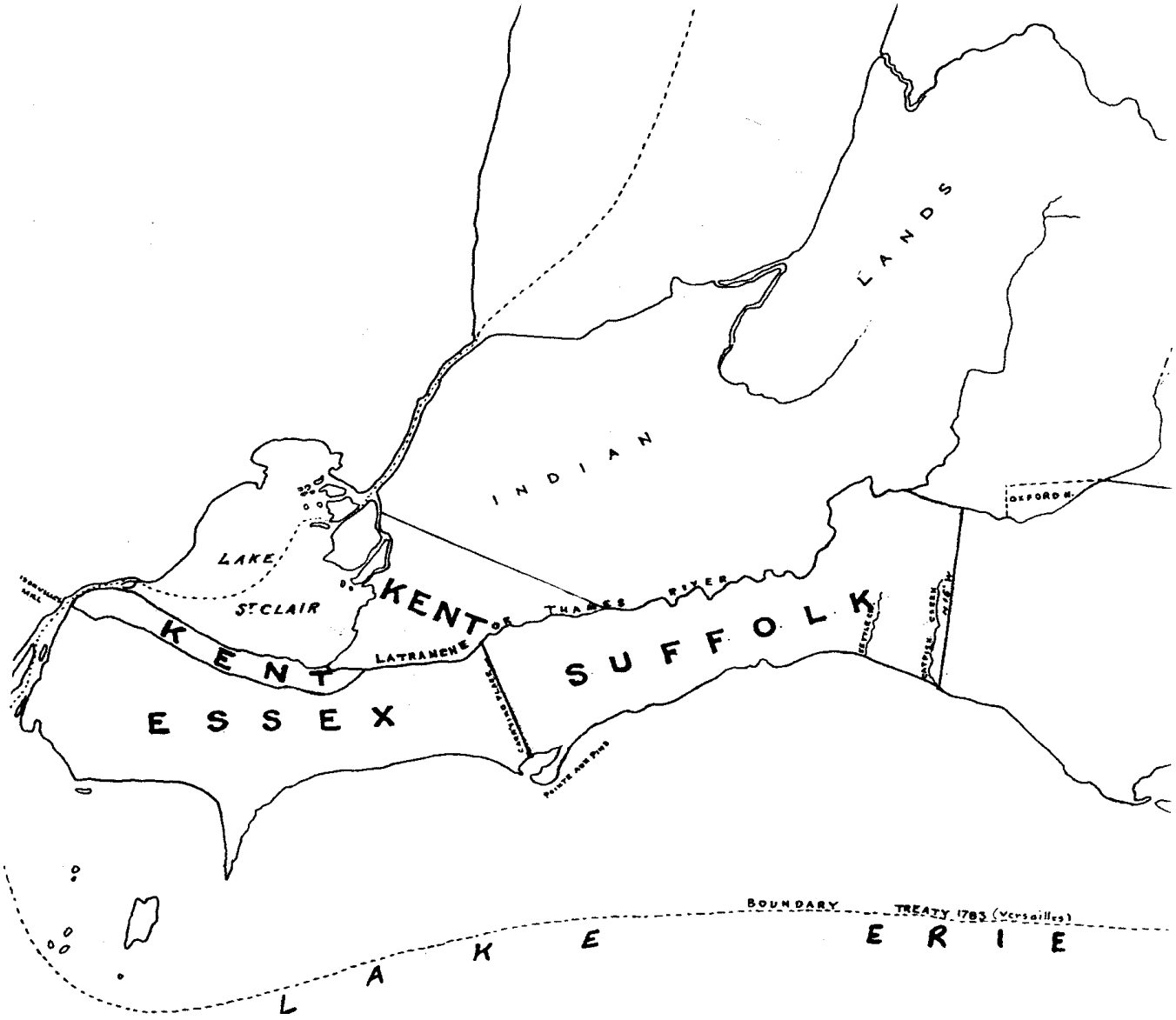
When assigning lots fronting on navigable waters, officials referred to the "Chequered Plan." This meant that in each township, only two lots in each of the first two concessions were to be granted to settlers. Crown reserves were then interspersed among the settlers' lots. Unfortunately, this kept settlers from lands near the water. McNiff protested against this plan by writing to the Land Committee of the Executive Council. He claimed that settlers would not want to live in back concessions separated from the river by vast, dense woodlands. As well, those who received lands fronting on the Thames would be separated from their neighbors. This would prove harmful in the event of an attack. McNiff was also concerned with respecting the claims of squatters. McNiff's protests, along with those of the Land Board of Hesse and other districts, impressed the Land Committee (Hamil, 1951, 17). Thus it recommended to Council that all front lots in townships situated on navigable waters be granted to settlers. These recommendations were never followed because in the summer of 1791, the Canada Act outlined that land equal in amount and value to one seventh of the land granted for other purposes must be reserved for the support of a Protestant clergy. Therefore, two sevenths of the land was reserved for Crown and Clergy. On February 7, 1792, Governor Simcoe, issued a proclamation embodying these land rules; the Chequered System was in effect.

Back in 1789, the Land Board had received a number of petitions for land grants. Ex-soldiers, Loyalists, and squatters all wanted to settle along the Thames River. Discontent was mounting as delays prevented officials from assigning lots. In March of 1791, on orders from Lord Dorchester, the distribution of lots to the Loyalists finally began. Yet, complaints continued to surface that the system was poorly conducted (Hamil, 1951, 20). The Land Board was not successful in attempts to checkerboard the river front with Crown reserves because they did not want to oust the squatters. This upset Loyalists who felt that they were promised these lands in Upper Canada.

In April 1792, the Board had difficulty assigning ten lots fronting on the Thames River because they did not know if the land ought to go to those who petitioned for the lots or those who made improvements as squatters. In most cases, if the squatter settled before 1790, he was assigned the lot on which he made improvements (Hamil, 1951, 20). In July, 1792, the decision was made that anyone established on the river front before the existence of the Board (1789) could keep two hundred acres of their improvements. Regarding this matter, Smith wrote the following to McNiff's successor, Iredell:

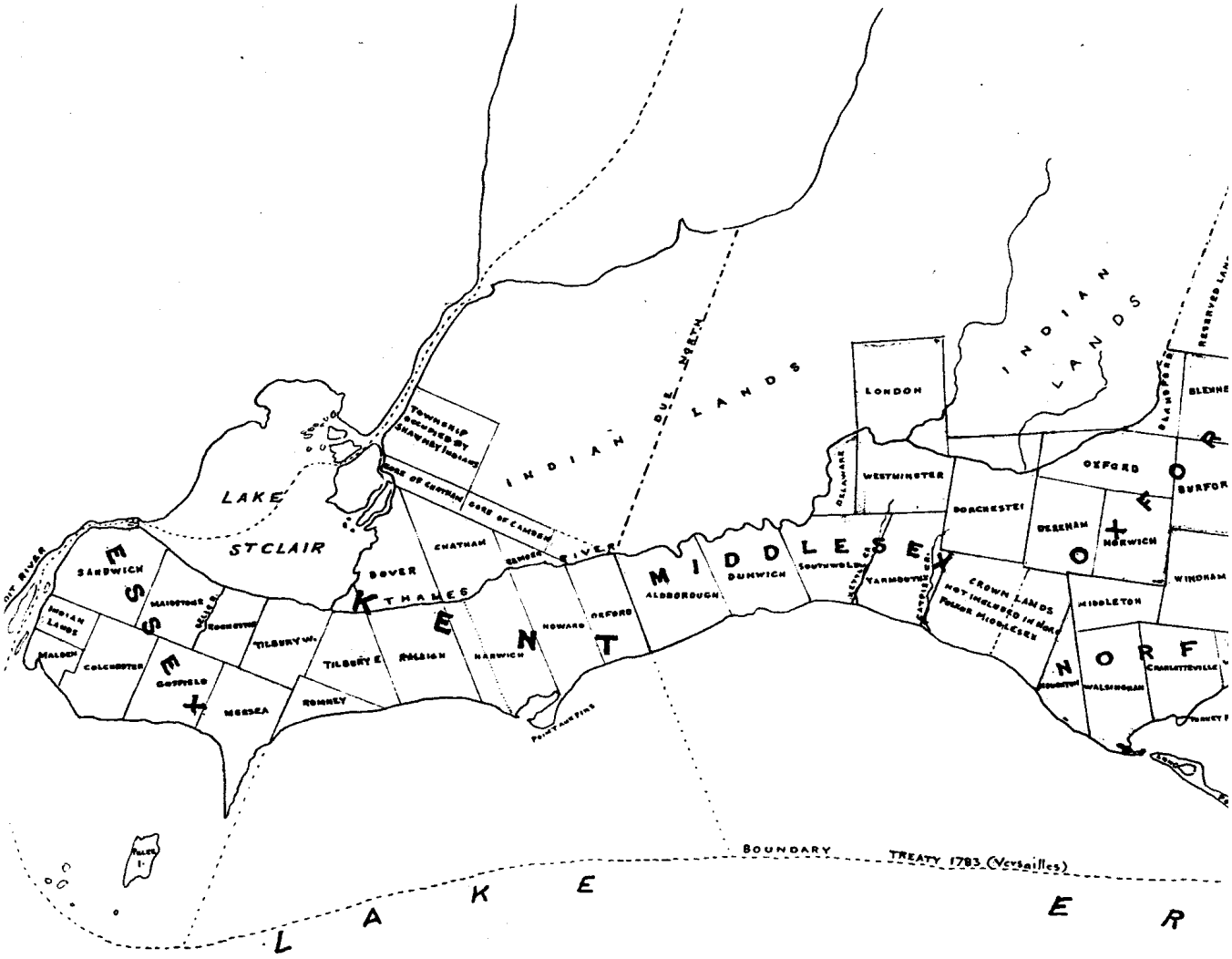
> ...the fronts and rears of the lots are to be at right angles to their side lines which are all parallel on the Thames. The concession lines of each township, however, will not, I apprehend, coincide, nor is it necessary. You must take care that no lot in front has less than two hundred acres, some will have more by reason of the bends in the river (McGeorge, 16).

Figure 11.1 The Thames River, 1792 (Adapted from "Map of Part of the Province of Upper Canada Showing Districts and Counties, 1792"; Source: Serge A. Sauer Map Library, UWO)



Early maps of Upper Canada, dated 1792 and 1798 (see figures 11.1 and 11.2), clearly reveal that the counties and townships situated in the watershed were surveyed in relation to the Thames. In 1792, Lieutenant-Governor Simcoe divided the province of Upper Canada into 19 counties, four of which bordered on the Thames (Hamil, 1952, 20). At this time, Essex County covered the land south of the Thames as far east as Chatham. East of this, again bordering on the Thames, was the short-lived County of Suffolk. Kent County then included the land north of the river which did not belong to Aboriginals. After the districts were re-named, and the District of Hesse became the Western District, Kent County expanded and Middlesex and Oxford counties were surveyed on the south side of the Thames baseline (Hamil, 1952, 20). The Thames River also affected how townships were surveyed. Other than a small portion of Tilbury East, at the mouth of the Thames, no other township crossed the lower portion of the river.

Figure 11.2 The Thames River, 1798 (Adapted from "Map of Part of the Province of Upper Canada Showing Districts and Counties, 1798"; Source: Serge A. Sauer Map Library, UWO)



There was great interest in the land along the Thames River. Lots quickly filled as McNiff surveyed the area. By the winter of 1793, McNiff was ordered to re-survey the side lines of many of the lots because settlers were complaining that a number of the marks had been removed. Unfortunately, McNiff's expedition was halted by a boating accident.

From 1795 to 1800, Iredell was the surveyor along the Thames River. While re-marking the lots, he noticed that many varied in width. Likely the stakes had been moved by the settlers to suit themselves (Hamil, 1951, 29). Adding to the confusion, Iredell noticed that his lines differed from those of McNiff's original survey (Lauriston, 1952, 28). By this point, it was impossible to satisfy everyone, and lawsuits abounded on the Thames for years to come.

By November, 1794, the Lands Board ceased operations. Thereafter, qualified settlers were assigned land based on the recommendation of a county magistrate. Settlement along the Thames River increased rapidly. Until 1830, most of the settlement along the Thames River was confined to the first three concessions on either side of the Thames. However, once the river front was settled, people moved into the back concessions.

11.3.2 Elgin Settlement/Buxton Mission

In 1848, Reverend William King, a Minister of the Presbyterian Church, began the fight to establish a refuge in Raleigh Township for blacks entering Canada.

This particular location, bounded on the north by the Thames River (which was instrumental as an underground railway; see section 10.1.1) and on the south by Lake Erie, was chosen for its close proximity to markets in such urban centres as Chatham, London, Windsor, and Detroit which were all easily accessible by water (see section 10.1.1). As well, King noted the economic potential of the abundant timber resource in this region (see section 10.4) (Hill, 1981, 77). The soil in this area was also the most fertile in Kent County; settlers were soon producing fine vegetables, fruits, and crops including wheat, hemp, and tobacco (see section 10.1.4). Believing that his plan would succeed if

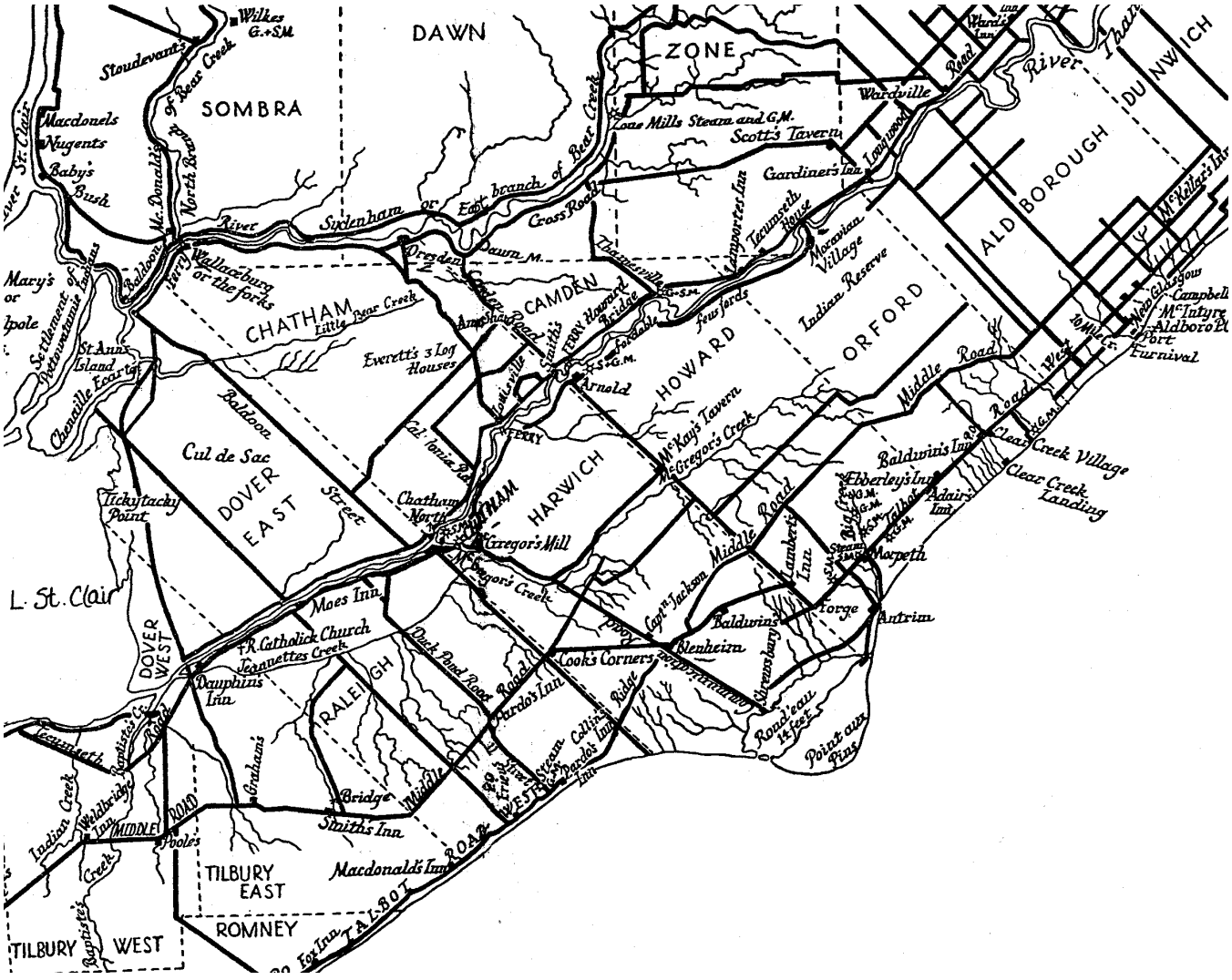
blacks could own land, gain education, and master the skills of farming, King persuaded the Synod (not without opposition from some members of the community) to assist him in finding and financing a settlement. On November 28, 1849, William King and fifteen former slaves moved into the Elgin Settlement which was surveyed and divided into 20-hectare lots served by seven concession roads.

> I believed that it was necessary to provide them with homes where the parents could support themselves by their own industry and their children with the blessings of a Christian education. Three things were necessary for that end: land to place the families upon; a church where they could assemble on Sabbath and hear the gospel; and a day school where the children could receive a good education. — Reverend William King (Hill, 1981, 72)

To receive a deed and clear title to the land, each family paid $4.50 per hectare in twelve annual installments (Hill, 1981, 80). In an attempt to sustain the black community, King wrote a clause into the deeds which prevented the landowners, for ten years, from transferring their land to white settlers. Similarly, the land could not be rented or sharecropped until it was paid for.

By the mid-1850s, citizens of Elgin cultivated over 480 hectares on which they grew a variety of crops for market throughout southwestern Ontario. They owned over 200 head of cattle, 80 oxen, 300 hogs, 52 horses, sheep, and other livestock (Hill, 1981, 85). As well, they established successful industries (sawmill, grist mill, brickyard, and so on), secondary businesses, churches, and schools.

Figure 11.3 The Thames River, 1850 (Adapted from Rottenburg Set — Transportation, 1850; Source: Serge A. Sauer Map Library, UWO)



Clearly, King was more than successful in his attempt to establish Canada's only self-supporting all-Black community. As one historian wrote:

> Whatever else may be said, it is a fact that by educating hundreds of Blacks and by developing among them a group of leaders, Elgin lit a strong beacon of hope during a critical time in the history of a people struggling from slavery to freedom (Hill, 1981, 89).

11.4 Community Adaptations to Rivers

11.4.1 Roads — Position Dictated by River

The Thames River was the key to entering the interior of the province from the Detroit area. As Aboriginal paths followed the river, they allowed for valuable and quick routes which promoted settlement, commerce, military defense, and communication.

The earliest roads in the Western District followed Aboriginal trails along lakes and streams and overland between bodies of water (see figure 11.3). The Thames River Road was no exception. This road bordered the south bank of the Thames River from the mouth at Lake St. Clair to Arnold's Mills. Here it crossed the river and continued on the north side. Up to the Moravian mission at Fairfield, trees and stumps were removed from the trail to allow for the passage of wagons. Corduroy roads, logs laid cross-wise and covered with dirt, were constructed across the swamps. During the winter months, travel improved as sleighs transported people along the snow-covered trail. When the snow was too deep for travel, sleighs were pulled along the frozen river (Hamil, 1951, 161). Above Moraviantown, a blazed trail enabled settlers to reach Delaware through the "long woods." There were no bridges in this section, and thus for many years, the trail was passable only by foot or horseback.

Until 1809, the only roads open in the Western District followed the Thames River Road or linked the Thames to Lake Erie. For example, Arnold's Mill Road opened in the early 1800s and crossed the Thames River from the north side near the centre of Lot 3, River Range, Camden. The road passed the mill and then travelled south (Lauriston, 1952, 64). Soon after, Longwoods Road (see figure 11.3) ran north along the Thames River. It was surveyed by Burwell in 1820. Many roads traveling east and west were developed alongside the Thames River. These roads were seldom used for local traffic; rather, they facilitated the movement of military men and supplies, and goods to and from market.

Dundas Street (see figure 11.4), Oxford County's first surveyed road, was designed as a military road with a garrison town at each end. The purpose of the road was to transport military supplies to Lake St. Clair via the Thames River. Originally laid out by Simcoe in 1793 as part of his quest to link York with Detroit, the road was cleared by the Queen's Rangers Regiment. It took one month to run an 80 mile line from Burlington Bay to the forks. Due to the political situation, development of the road was halted for some time. Therefore, in jest, locals named the road "Governor's Road" (Wallace, 1994, 219; see also, Dawe, 1980, 8). As was the case with other road developments, Dundas Street originated by widening an old Aboriginal trail that followed the course of the Thames River. In the 1920s, the road became part of Highway 2; it continues to unite thousands of people in southwestern Ontario.

Thames Valley Road - by James Sinclair

Long gone with the past are the pioneer days
When the riverside was only a blaze,
While the ox team went lolling along the way,
But the ox team and red and birch bark abode
Are passed like a dream from the Thames Valley Road.

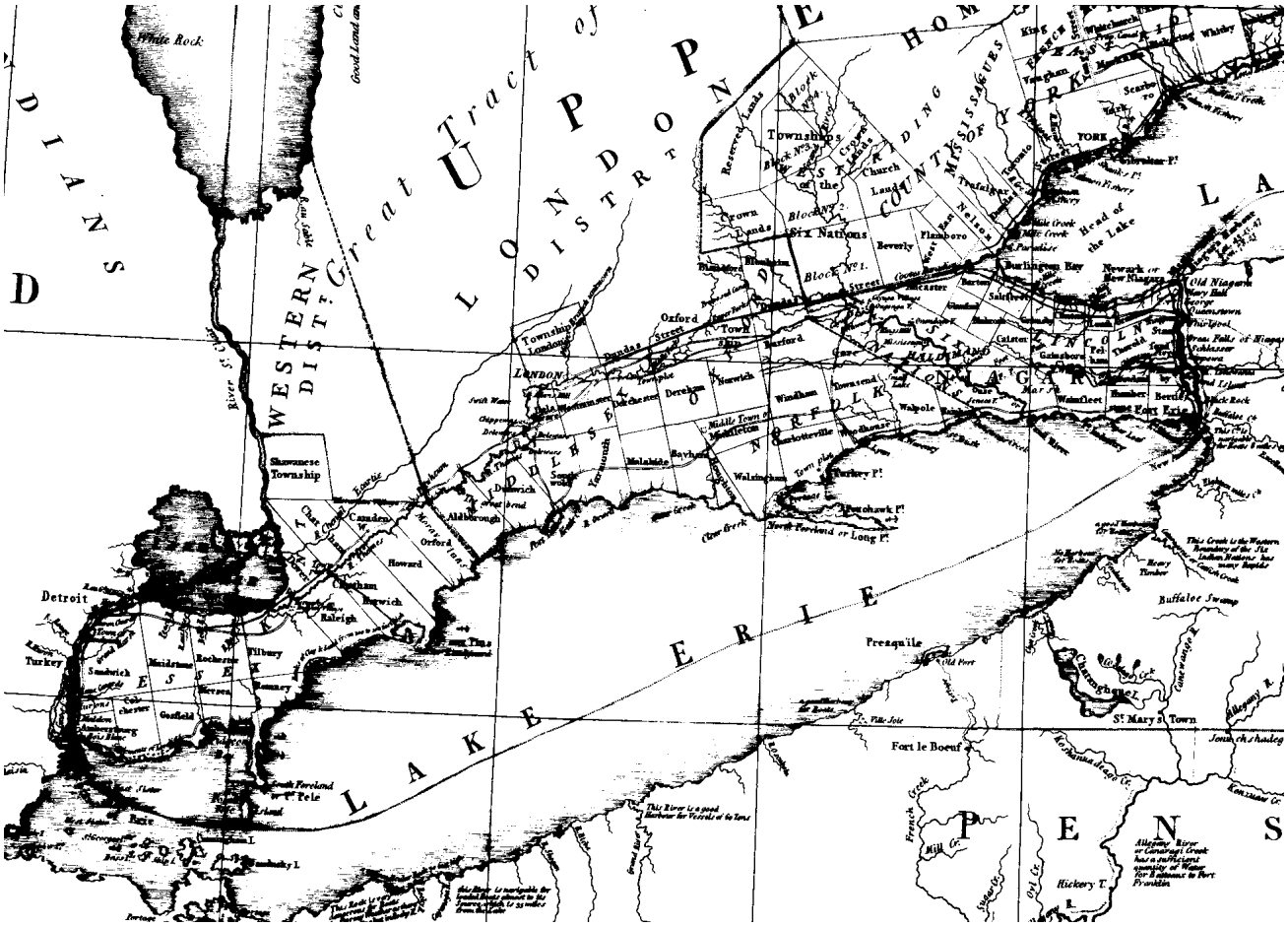
Then came the stage coach with rumble and din,
Full bulging with passengers outside and in,
All fresh from the Motherland over the sea
In search of new homes in the Land of the Free.
They chopped and they cleared, they plowed and they sowed
And passed in their turn from the Thames Valley Road.

The railway came next and thus ended the age
Of the Pioneer inn, the toll gate and stage
And the landlord, that soul of mirth and good will
Long since with the stage driver, sleeps in the hill
All gone after doing the duty they owed
Old Mother in toil by the Thames Valley Road.

The valley now echoes with whistles on wheels
Of railways and from cars and automobiles.
A merciless mercantile serve me and go
Days coming and going with no after glow
A money-mad, pleasure bound, top-heavy load
Profaner the dream scenes of the Thames Valley Road.

Could we but turn back a few pages of time
And see these hills in their primitive prime!
But, past locks the door upon all that has been
The future is something no mortal has seen
Today its our duty to lighten the load

Figure 11.4 "A Map of the Province of Upper Canada — 1800," by David William Smyth, Surveyor General (Source: Serge A. Sauer Map Library, UWO)



Old Stage Coach Road (see figure 11.4) ran from Burlington Bay to the forks at London. The original path was made by Aboriginals and trappers. In 1793, Thomas Ingersoll was guided along the trail by Brant's natives. He found the trip very rough, so he spent the next two years cutting a ten foot road from Burford to Oxford (now the town of Ingersoll). With the notion of increasing settlement and opening up the surrounding area, Ingersoll extended this path to link it with Dundas Street. Originally the road was in such poor condition that a stage could travel only three miles an hour. The section of the road that ran through Ingersoll was called King Street and became the main street of the village. Elisha Putnam extended the road to the west as far as Allan's Township. From here, Ebenezer Allan took it to Moraviantown. The Aboriginals then extended the road to McGregor's landing at Chatham. By this time, a military road was already constructed from Chatham to Fort Malden. Over the years, the road has been known by several names: Old Stage Coach Road and the Detroit Path top the list. By the 1830s, the road disappeared owing to wear and tear and erosion. Thus, Tecumseh Road (see figure 11.3) was built in 1840. Its solid surface better handled the marshy sections along the river. For some years, both roads were in use: pioneers named them Old Stage Road and the New Back Road (Tecumseh Road).

Not only did the main highways in the Western District follow the curves of the Thames River, but local roads within small towns were also designed with the Thames in mind. One great example is the main street in Chatham (see figure 11.5) which developed as industries were established along the river. The road did not follow the design of most perpendicular streets that were developed in typical Ontario towns. As was noted in the *Illustrated Historical Atlas of the Counties of Essex and Kent*, "The tortuous course pursued by the river and creek through the town has precluded the possibility of following a very attractive plan of street location near their respective margins, where right angles are rare, and those of acute or obtuse character much too frequent to admit of even moderate uniformity" (Belden, 1880, 53). Although people appreciate the look of Chatham's main street today, the atlas noted that "the beauty of King Street is somewhat impaired by a curve in its course at the Garner House, a defect attributable to the direction of the streams whose banks it skirts" (Belden, 1880, 53).

Figure 11.5 Main Street, Chatham, 1918

(Source: Charles, 1979)

Although the Thames acted as an effective transportation route for most of the year, during the winter months when the river was frozen, alternative methods of transportation were needed. In addition, larger vessels could not travel the entire length of the Thames due to the lower water levels north of London (see Natural Heritage, 2.0). Therefore, following the established trade route, roads were eventually constructed parallel to the Thames. These roads gained importance as they assisted with such military pursuits as the War of 1812 (see section 14.2.1). As well, the roads acted as important trade routes and allowed for increased settlement back from the river.

11.4.2 Fords

The earliest methods of crossing the Thames River involved hopping from stump to stump when water levels were at their lowest. Stepping stones also aided settlers with their passage across the river. Without having access to ferry services or bridges, settlers were known to ford the Thames and its tributaries at popular locations.

Prior to the construction of Howard's Bridge in 1826, settlers forded the river at many crossings above Arnold's Mills (see figure 11.3). For example, at Kent Bridge, American troops forded the Thames on October 5, 1813 as they pursued the British under Proctor. Thamesford was another place that was known for its suitability in terms of fording the Thames River. The town was originally named St. Andrews, but had to change its name in the 1850s because another St. Andrews existed near Ottawa. The importance of the town as a crossing site is apparent in its new name (Wallace, 1994, 17).

An individual on foot or horseback was able to ford the Thames at various points. However, as settlement increased along the Thames River, pioneers needed to transport carriages, goods, and numerous passengers across the river system. Recognizing this need, many settlers established ferry services on the Thames.

11.4.3 Ferries

As travel increased along Upper Canadian waterways, the business of ferrying people across rivers was quite profitable. During the spring season, when water levels were high on the Thames River, settlers were unable to ford at the usual places. Ferry services gave the pioneers access to markets, local services, and neighboring communities.

Maps from the mid-1800s reveal the location of popular ferry crossings (see figure 11.3). One crossing operated at Louisville. Another, Smith's ferry, was located slightly down river from Arnold's Mills. In Chatham, John Eberts controlled the ferrying trade (Belden, 1880, 52). Originally, all of the river crossings at Chatham were made by ferry. Similarly, in 1819, in London, a log house near the foot of York Street was inhabited by an American squatter, named Miller, who ferried people across the Thames River (Page, 1878, 8). Around 1830, Christopher Gee ran a ferry at the location that later became known as Kent's Bridge. In fact, for a couple of decades, the place was known as Gee's Ferry (Kent, 1939, 63).

The success of these ferry services reveals the important role they played in the lives of Thames River pioneers as they allowed for the movement of people and goods throughout the watershed. Once the construction of bridges began in Upper Canada, ferrying operations gradually ceased. As the art of constructing bridges evolved, bridges became a convenient and practical method of crossing rivers.

11.4.4 Road Bridges: Wooden, Steel, and Concrete

When discussing the importance of studying the history of Canadian bridges, one historian wrote: "From the humblest county or rural structure to the largest internationally known symbols of Canada, they represent responses to change and change is fundamental to both life and history" (Rose, 1988, 28). The history of bridges in Canada focuses on a vast array of styles constructed with a variety of materials (Rose, 1988, 7). Early bridges were often built of wood because trees, skilled axemen, and carpenters were abundant. Yet, over time, these bridges aged and their loads increased. Therefore, it was necessary to create new, stronger structures. When the price of iron decreased as a result of new technology, engineers began constructing iron bridges. The history of iron bridges in Canada lasted from 1850 until 1890 when foundries were unable to create the required casting lengths (Rose, 1988, 12). Eventually, steel replaced wrought iron. The evolution of Canadian bridge building is clearly revealed by many of the structures crossing the Thames River. The following section focuses chronologically on those bridges which were constructed as a func-

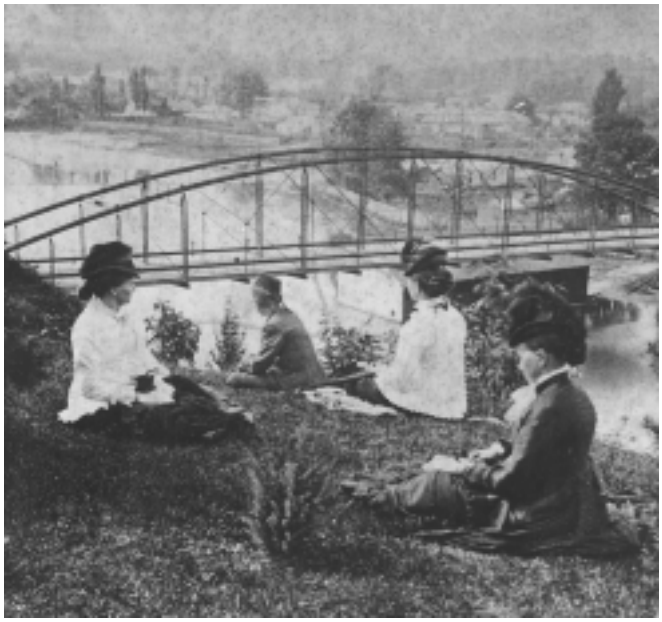
tional need of riparian settlers and which are historically significant because of their status as the first bridges in the watershed, their unique structures, or their military uses.

> In the early 1800s, Thames River settlers did not have much time to focus on bridge building. Yet, as makeshift roads were devised, the felled trees provided raw material for simple bridges. Thus along the lower Thames, primitive log bridges were devised over Baptiste and Jeanette's Creeks. They were constructed by placing two logs across the river, and then placing more logs on top at right angles. The cracks were then filled with gravel and earth. Similarly, in Chatham, there was a log bridge over McGregor Creek near the point. Another bridge was located upriver at the mill (Hamil, 1951, 158).

London's first bridge crossing the Thames River was the Westminster Bridge which was built at the foot of York Street in 1826 by Levi Merrick. To avoid damage from the spring floods that were typical in London, the bridge was chained to immense butternut trees situated on the riverbank. The bridge was re-built with iron in 1881. It did not undergo extensive reconstruction until 1977. As the bridge linked the new site of London to Westminster Township south and west of the Forks, it allowed for the continuation of transport of people and goods along the watershed. The bridge is significant from a military standpoint because of its role in the 1837 Rebellion. This was the only bridge over the Thames in London at the time and therefore, was guarded by the British army. Yet, Charles Duncombe, disguised as a woman, escaped across the bridge.

London's second bridge, Blackfriar's Bridge, (illustrated in figure 11.6) joined the north end of Ridout Street to London West in London Township. As settlement developed in the area later known as Petersville (see section 13.2), local residents needed a way to access industries on the opposite side of the river. Therefore, in 1831, Blackfriar's Bridge was constructed. The cost of the bridge, 250 pounds, was acquired by a district grant and private subscriptions. Several times, Blackfriar's Bridge was washed away by spring freshets. Therefore, in the 1870s, the Board of Works convinced the city to re-build the bridge with iron. The Wrought Iron Bridge Company of Canton, Ohio was commissioned for the job. They provided prefabricated bridges through a mail order company. The iron spans were shipped by rail and were generally accompanied by an engineer who oversaw construction. After strenuous testing (ten teams of oxen pulled forty tons of gravel back and forth across the bridge), the bridge was accepted as stable (Celebrate, 1997). Blackfriar's Bridge officially opened on September 27, 1875. It was the first iron bridge to span the Thames River in London. The bridge ranks among Canada's most significant surviving 19th century engineering structures and is one of the few rainbow bridges left standing in Canada (Lutman, 1979, 60). Blackfriar's Bridge has been officially designated as a historic site by the Province of Ontario (see Tables 17 through 20 in the Appendix for a list of provincial and national historic sites within the watershed).

Figure 11.6 Blackfriar's Bridge, London



(Source: J.J. Talman Collection, D.B. Weldon Library, UWO)

In 1834, the government constructed one of the first bridges to cross the Thames River in Kent County. It was a mud sill structure located near the eastern limits of Chatham between McGregor's sawmill and Ebert's farm (Lauriston, 1952, 118). It stood only a few years before it was washed away by flood waters. Using the timbers from the original structure, William D. Eberts built a floating bridge at this location. His goals were not entirely altruistic; the bridge benefitted Ebert as it brought customers from the south side of the river to his store. Meanwhile, the government spent $8000 constructing a new bridge at the foot of William Street. Henry Larned was the contractor for the bridge. The structure was built of wood and did not have a cover or separate foot and carriage-ways. Resting on eight piers, the total length of the bridge was 294 feet and the breadth was 24 feet. The toll bridge did not impede or obstruct the navigation of the river to any part of the town that was potentially commercially significant (Hamil, 1951, 163). James Read, Joseph Woods, and Francis Drake were the Commissioners responsible for the care of the bridge. The bridge is also significant in that it connected Chatham to a town plot that was about to be laid out across the river.

Figure 11.7 Water St., Wellington St., and Church St. Bridges, St. Marys

(Source: C. Rogers, 1997)

St. Marys is also the home of the Water Street Bridge. This steel truss bridge, erected in 1898, was designed by local architect, Joseph Humphreys. The Stratford Bridge Company got the contract and local stonemason, John Elliott, was responsible for the abutments. Money for the $2000 bridge was raised by the town on debentures over a ten year period (The Stonetown, 1997, 27). An important quality of the bridge is that the vistas are uninterrupted and framed by the shape of the bridge itself (The Stonetown, 1997, 22).

Figure 11.8 Victoria Street Bridge, St. Marys

(Source: C. Rogers, 1997)

In 1839, the Canada Company chose the spot where Trout Creek flows into the Thames River as a promising locale for the town that is now known as St. Marys. When settlers arrived in the 1840s, they needed bridges to cross the river and the creek. Originally, a wooden structure was designed for this location. Money for the bridge was raised by means of a levy of 6/8 of a penny per pound on all the property in the township (Wilson, 1981, 21). William Noble got the contract for 150 pounds. Unfortunately, the bridge needed replacement or repairs after every flood. Therefore, in 1864, Alexander McDonald, a local stonemason, was contracted by town council to build a stone bridge across the Thames River. The stone was supplied by McDonald from his quarry on Water Street South. Victoria Bridge (illustrated in figure 11.8) was completed on September 1, 1865 at a cost of $4,500 (Wilson, 1981, 21). Building a stone bridge was a unique undertaking for Canadians because it demanded a great deal of time and money (Rose, 1988, 8). The bridge is now one of Ontario's six surviving 19th century stone bridges (Wilson, 1981, 21).

Prior to the construction of bridges in Stratford, pioneers were forced to hop from stump to stump across the Avon River (Leitch, 1980, 125). At its lowest level, the river allowed settlers to step across stones. The Huron Road Bridge began in Stratford as a log bridge. It was later reconstructed into a wooden bridge. In 1885, stone from the St. Marys quarry was used to rebuild the structure. Alex Hepburn designed the new bridge and it was built by John Corrie for $11,400 (Leitch, 1980, 125).

Many of the early bridges spanning the Thames River were constructed as a functional need of the original settlers. The bridges improved transportation, communication, and economic development in the watershed. It is also significant that the variety of styles crossing the Thames were constructed of a number of materials. The timber, wrought iron, stone, steel, and concrete structures parallel the evolution of bridges in Canadian history.

11.4.5 Rail Bridges

Canadian bridges were first designed by the same master craftsmen who built mills and factories. With the advent of railways, erecting strong, sturdy bridges was a great concern of early engineers. Over time, it became obvious that traditional timber structures tended to ignite when sparks flew from the train's engine or wheels. Therefore, iron and stone bridges were constructed across the Thames River.

Today, the oldest bridges in St. Marys are the railway viaducts that run over the river valleys (The Stonetown, 1997). They were built with the advent of the Grand Trunk Railway in the 1850s. London also laid tracks for the Great Western, London and Port Stanley, and Grand Trunk railways at this time. Beginning in 1854, three iron railway bridges were built over the Thames River at the South Branch near the Forks, across the Main Branch at the Coves Bridge, and on the South Branch west of Adelaide Street (Celebrate, 1997). In Thamesford in the 1870s, a wooden trestle bridge was constructed over the Thames to allow for the passage of the railway. This was later replaced by a metal support structure (Wallace, 1994, 226).

Train transport was extremely important to the development of the economy in the Thames watershed. Not only did it bring passengers into the area (who then supported the local economy), but it transported goods to market at record speed. Once a source of community pride, the

Thames River rail viaducts played a significant role in the development of local towns and villages.

11.4.6 Communities Developed Around Historic Bridges or Mill Sites

Settlers immigrating to the Thames River watershed naturally chose to live near areas where development had already occurred. Cleared areas, economic prosperity, and such public works as roads and bridges allowed for a smoother adjustment for new inhabitants. The significance of historic bridges and mill sites is revealed as a variety of communities were established around these sites.

Howard Bridge, a small town upriver from Chatham, received its name from the first rudely constructed bridge to cross the Thames River (Hamil, 1951, 159). The Howard Bridge was built with a legislative grant of L300. An additional L350 was raised from subscriptions of local inhabitants. Samuel Osborn, Christopher Arnold, and William McCrae commissioned the building of the bridge, and M. Lewis of the Grand River was contracted to build the structure. The bridge was warranted to stand for one year after its date of completion on January 20, 1827. The importance of the area increased when John Williams built a tavern at the bridge in 1828. This served as a stage house for coaches crossing the river as they travelled from Niagara to Sandwich. However, once the government built the first crude bridge across the Thames at Chatham, Howard Bridge lost its importance. As well, when a section of the road from London to Sandwich was straightened, it ran north of Howard Bridge. Thus a new bridge was constructed four miles east at Thamesville.

Kent Bridge is a small town situated on the lower Thames River. The town was originally named Kelley's Corners until a bridge was built in 1854 (Hamil, 1951, 304). The four townships of Camden, Chatham, Harwich, and Howard meet at Kent Bridge. When referring to Kent Bridge, the *Illustrated Historical Atlas of the Counties of Essex and Kent* lists the "fine iron bridge spanning the Thames" as the town's major attraction (Belden, 1880, 56).

Communities along the Thames River often developed around mill sites as well. As the first European settlers moved into Kent County, Matthew Dolsen's enterprise in Dover Township became the commercial centre of the county. In all but name, it was the capital (Lauriston, 1952, 58). As settlement stretched along the river, people went to Dolsen's to barter, trade, and so on. Along with his mill, his store, tavern, and blacksmith shop were extremely successful. Oftentimes, overland traffic traveling from Burlington to Sandwich stopped at "Dolsen's Landing" for the night.

Similarly, a small community grew around another mill-seat, Arnold's Mills, in Howard Township. Likewise, farther upriver, in what is now St. Marys, a community developed around Cruttenden and Nicol's establishment (see section 12.1). An 1868 map of St. Marys shows that Cruttenden and Nicol divided the area into streets and town lots (Wilson, 1981, 8). They were likely hoping that settlement would extend from Water Street, the business core, down to their mill. As section 12.1 indicates, mill sites were the raison d'etre for virtually every settlement on the Thames and its tributaries.

The economic prosperity of early settlers on the Thames depended on access to resources, mills, and markets and so it follows that settlements grew around bridges and mill seats. The names of these bridges and mills were particularly familiar to early settlers; therefore, it is not surprising that communities were eventually known by the names of nearby bridges, landings, or mills.

Summary

The significance of *Riparian Settlement* in the development of the Human Heritage of the Thames cannot be overstated. The Thames watershed is the site of a highly integrated settlement system including both its dispersed (mainly farm) and nucleated elements. The latter, the cities, towns, and villages, are almost all located on the Thames, including its major tributaries. Riparian settlement was the product of the combination of basic requirements and of the opportunities offered for residential, commercial, and manufacturing activities, reinforced by river access and crossing points. Each of the cities of Chatham, London, Stratford, and Woodstock owe much to the river, as do the towns of Ingersoll, Mitchell, St. Marys, and Tavistock, and many of the villages including Beachville, Delaware, Embro, Thamesford, and Thamesville.

Chapter 12

Hydraulic Power Generation

Use of the river as a power source was of key significance to the development of human activity in the Thames watershed, notably the means whereby a pioneer subsistence existence was rapidly transformed into a commercial economy and landscape. The key was the ability to process the basic regional staples, first wood and then wheat, using hydraulic power in a large number of local water mills. These mills utilized a technology developed in Europe which had also powered an earlier "revolution." Beginning in the late 18th century, water was used sequentially, first as a direct source of energy, and then, by the mid-19th century, in the conversion to steam power. As noted earlier, the mill sites were a key location focus, and many contributed to the siting of nucleated settlement (see Riparian Settlement 11).

Under *Hydraulic Power Generation* (12.0), the main attention is to *Direct-Drive Water Power* (12.1), which examines the establishment and operation of the large number of sawmills and grist mills as the initial basic application of water power. Other mills include single woollen mills, usually established later and using steam power. Depending on the site and the level of capitalization, mills could exist either separately, or as joint operations, or as part of mill complexes. Their owners were key members of the new entrepreneurial class and the local agents in the establishment of a rural, and then urban, capitalist economy. The availability of saw mills meant that instead of burning trees for potash or exporting raw logs, lumber could be manufactured. This was especially important as the building material for both farm and non-farm structures. Likewise, the grist mill added flour to wheat grain both for export and as the basic food staple of a growing population. The manufacture of wool (and flax for linen) were important to the development of a local textile industry based on agricultural items. In each case, milling represented a significant contribution to development through capital accumulation. Figure 12.1 depicts the many mill sites that flourished in the Thames watershed. While most operated in the 19th century, others persisted well into the 20th and a few are still visible as relic features today.

Although not treated under a separate heading, it is noted that several other important local industries were located close to the river as a water source, both for energy and for use of water in the processing functions. Most important were the many local breweries (of which Labatt and Carling were the most famous), local tanneries, and initially some early foundries.

12.1 Direct-Drive Water Power — Saw Mills, Grist Mills, Woollen Mills, and Mill Complexes

Milling was the most technologically advanced industry of early 19th century Ontario. Until the 1850s, virtually all mills in southern Ontario were water-powered. Therefore, mill buildings were constructed on rivers' shores. Table 21 of the Appendix is a represenative list of the early mills established on the Thames River.

By the mid-1800s, there were slightly more saw mills than grist mills established along the Thames River. In a newly settled region, sawmills were constructed first because they were used to cut the timber for the building of mill complexes, local businesses, barns, homes, and so on.

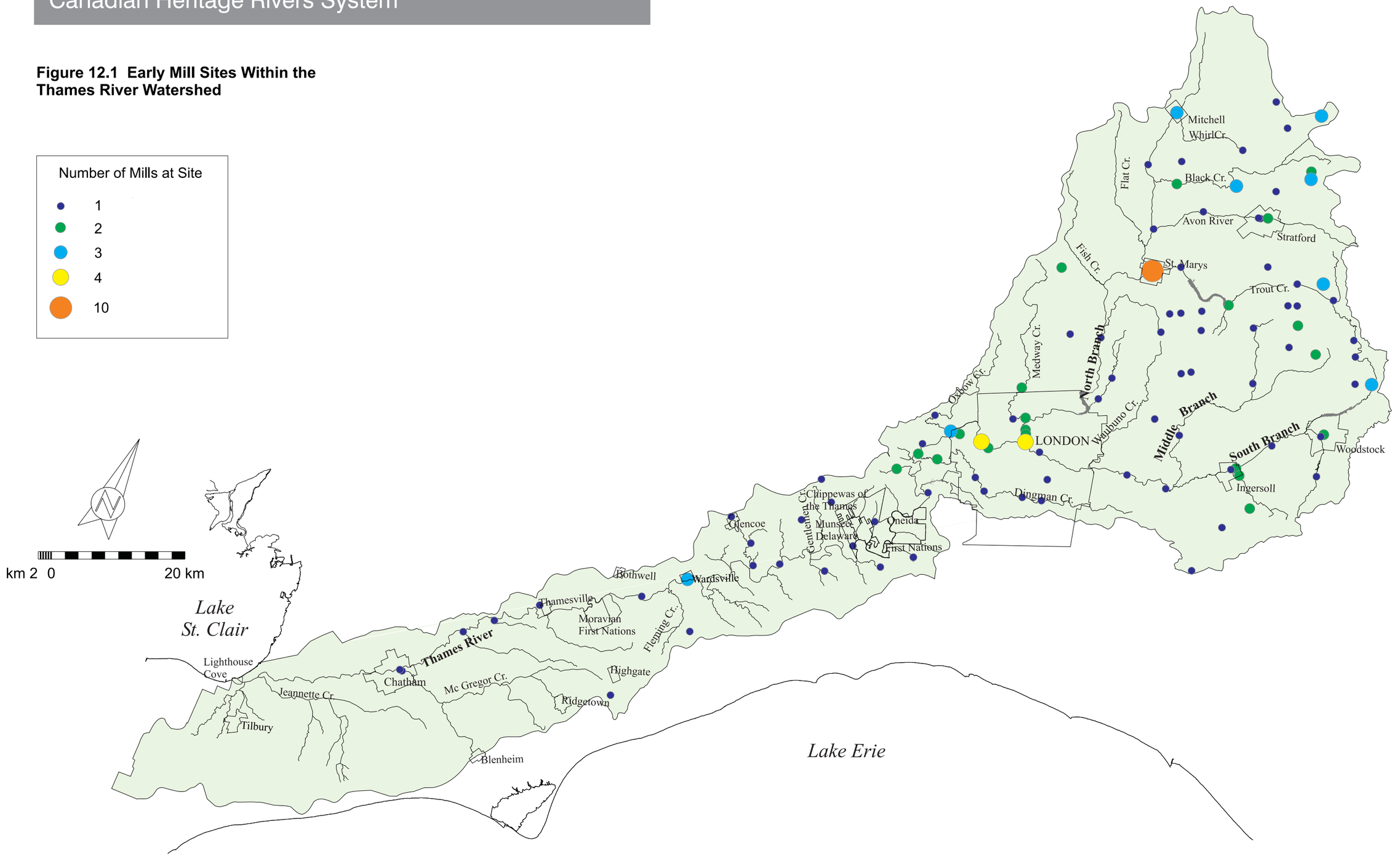
The government of Upper Canada played a prominent role in the history of milling on the Thames River. Under the provisions of the seigneurial system, the government built the first mills in Ontario and supplied the United Empire Loyalists with mills. At this point, the government played the role of seigneur. By the time the Constitutional Act was formed and the province of Upper Canada was created, the government had a number of mills in key locations. Even though there was a policy of freehold tenure, the government reserved mill sites with special leasehold provisions because Simcoe wanted important mill sites to be leased to those who could be expected to develop and operate mills (Mika, 1987, 10).

Sawmills are also linked to logging on the Thames (see section 10.4). Logs from the upper stretches of the river were run to mills where they were cut into such products as staves for barrels, or masts and spars for shipbuilding. This supported the economic growth of the region as products were exported to Britain and the United States (see section 10.1.4).

Oftentimes Thames River sawmills expanded into larger enterprises. For example, Thomas Orr's sawmill, located in Stratford, quickly developed into a furniture factory. This was the first furniture factory to have significant nationwide sales. It was also the first to compete in

One of the first sawmills on the Thames River below London was built by Ebenezer Allan between 1797 and 1807. It was located at the junction of Dingman Creek and the main river. Allan chose the site based on Patrick McNiff's maps. Here the banks of the river were well cleared due to flooding and early native settlement. As well, the high ridge on both sides of the river valley

Figure 12.1 Early Mill Sites Within the Thames River Watershed



created a good drop for a mill race. As was the case with many early mills on the Thames, it was rather poorly constructed. During his visit in 1804, Lord Selkirk described the mill as the worst looking mill he had ever seen.

European markets. The company was eventually absorbed by Canada Furniture Manufacturers Limited (Leitch, 1980, 89). The furniture industry became an important element of Stratford's economic growth.

As technology advanced by 1867, half of the sawmills along the watershed were powered by steam. Almost all water sawmills closed by 1900 as efforts turned towards steam-powered milling techniques. Yet, water-powered saw milling was a lucrative business for early Thames River settlers. In fact, many successful mills expanded into larger complexes housing saw, grist, and woolen mills at one location.

Thomas Clarke's grist mill is often considered to be Chatham's first industry. Clarke began building his mill at the south bank of McGregor Creek just off of the forks in 1788. After the area was surveyed, he applied for permission to build a mill, house, and other improvements on three farm lots on the north side of the river. The lands were within the reserve, so the Lands Board could not grant Clarke's request. Yet, once Clarke entered into a partnership with Meldrum and Park of Detroit in 1792, they went ahead with the construction of the mill (Hamil, 1951, 59). After two years, the mill was only half completed. It was then swept away by the spring floods. Meldrum and Park refused to advance further funds and wanted payment from Clarke for his share. Having spent L1,800 on the mill, Meldrum and Park complained that Clarke was not a millwright and had not worked on the building for months. They petitioned for a grant on the mill site in 1795. Council rejected the petition. Instead, sympathetic to Clarke, they granted him the farm lot where the mill stood. He also received lot 8 in Dover East as compensation for the loss of his farm lands north of the river. John McGregor then loaned Clarke the money to pay his debt to Meldrum and Park. The finished mill was poorly constructed. Apparently, the quality of the product was not much better. Unable to pay off his debt to McGregor, Clarke was imprisoned (Belden, 1880, 51). The terms of the release stated that Clarke give all of the property, including the mill, to McGregor. Therefore, McGregor ran the mill from 1810 until 1812 when it was burned during the war. With his son, Duncan, McGregor later rebuilt the mill. Duncan ran the mill for many years after his father's death in 1828.

Grist mills were erected as soon as areas were settled and the land was planted with grain. Often as an adjunct to sawmills, gristmills were constructed along the entire length of the Thames River. Not only did grist mills provide flour and oatmeal for local consumption, but they spurred economic development by suppling flour for export.

Arnold received wheat for his grist mill from George Jacob, the proprietor of a store on the Thames in the lower part of Raleigh Township (Hamil, 1951, 63). Jacob collected wheat and corn from settlers as payment for their debts to Mackintosh, the local agent for the North West Company. Early in 1802, farmers who were indebted to Mackintosh were told to take their wheat to Arnold's Mill. To save on transportation costs, Jacob suggested that settlers go to Clarke's grist mill, but Mackintosh disagreed because he believed the quality of flour to be much higher at Arnold's Mill (Hamil, 1951, 63).

Woollen mills proved beneficial as they supplied Thames River inhabitants with much needed textiles. As well, the success of the mills enhanced the economic development of the area. The Thames River woollen mills were known across the country for providing quality yarns. For example, Ingersoll's Woollen Mills Knitting Factory established a successful business in the sale of woollen goods. Their new line of untearable tweeds was in great demand. Employing approximately 15 people, the mill was equipped with the best machinery to produce the highest grade of product at a low cost. The Stratford Woollen Mill also established an enviable reputation in the Canadian textile industry.

Many of these complexes formed the nucleus of small pioneering settlements along the river (see section 11.4.6). The owners and operators of the mills were extremely influential members of the community. When they were originally granted the land, these men were expected to increase settlement and develop the area. For example, when Ebenezer Allan petitioned Simcoe for a township, he instead received 2,200 acres of land where he was instructed to build a saw mill, grist mill, and protestant church within seven years (Stott, 1). Allan, like many other mill owners, also invested in the development of such public works as roads and bridges (see section 11.4.1). Likewise, the Canada Company sold land to Thomas Ingersoll on the condition that he erect a grist mill and sawmill to attract and serve settlers.

Mill owners along the Thames tended to take on many of the responsibilities of a newly formed community. For example, when John Cory Wilson Daly, a Canada Company agent and the second man to settle in Stratford, bought the Canada Company's Mills, he was or quickly became the local medical authority, local banker, officer of militia, postmaster, and justice of the peace (Leitch, 1980, 35).

When the Canada Company sold lots along the Avon River, they kept the right to raise or lower the mill pond at will. The deeds that they issued disclaimed liability for damages to inundated lands at Avon Mills (Leitch, 1980, 34). However, the Company paid seven shillings for each flooded acre in the Township of Ellice. Similarly, they paid eight shillings per flooded acre in the Township of North Easthope (Leitch, 1980, 34).

Local mill complexes often acted as community centres because they were the one place everyone was likely to visit on a regular basis. For this reason, the Beachville Mill was used as a post office (Cropp, 1973, 16). It is interesting to note that Zeisberger's diary indicates that at Cornwall's Mill, Senseman preached what was likely the first sermon in the District of Thamesville.

Some of the original mills established along the Thames exist today. The Thamesford Feed Mill and the Arva Mill are two examples. Still using power from Medway Creek, the Arva Mill produces unbleached white flour, 100% whole wheat flour, spelt flour, pastry flour, gluten flour, and specialty flours. The mill also sells whole grain products, beans and rices, baking supplies, pastas, and animal feed (Arva, pamphlet).

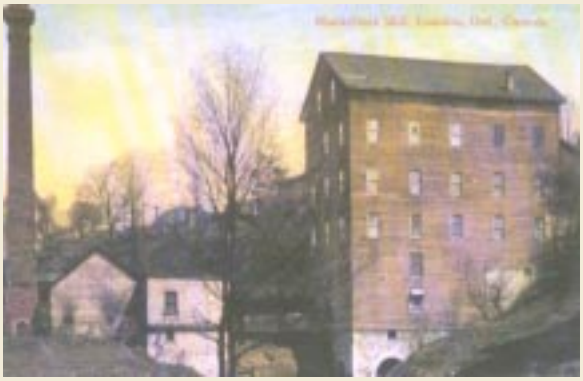
Fires destroyed many of the early mills established along the Thames River. Although some owners were able to repair the damage, others were unable to continue operations. For example, fires struck E.T. Dufton's Stratford Woollen Mills twice. The first fire occurred on April 4, 1910. The second fire, on July 28, 1922, ended the business. At the time of the fire, the plant was extremely busy and staff was working overtime. Thus large stocks of raw material and partially finished goods were on hand when the fire struck. The loss was estimated at $157,000 (Leitch, 1980, 90).

Evidence of other mill sites is revealed in the form of remains. The old mill race from the Cornwall Mill can still be viewed by passersby. As well, the remains of the ovens still exist. An outline of the mill race from the McIntosh Woollen Mill is visible in the spring before the lush vegetation starts to grow (The Stonetown, 1997, 30). The old smoke stack from the Stratford Woollen Mills was the only part of the original mill left standing after a terrible fire in 1922. The 65 foot chimney now houses a birdhouse located in the Shakespearean Garden planted at the original site of the mill. At the south end of the Thomas Orr dam, a millstone from the Avon Mills marks the site of the first sawmill and grist mill in Stratford. Mill stones, from Arnold's Mills, that survived the War of 1812 are now safely housed at the Fairfield Museum near Thamesville (see Recreation, 27.3). The street scape of the old opera house which stored grain for the St. Marys' Gristmill has been restored and now houses offices. The mill race was altered many times, yet a portion has been preserved and runs along the flood wall north of Queen Street. Table 21 of the Appendix is a representative list of some of the early mill sites which existed along the Thames River in times of early settlement.

Figure 12.2 Early Mill Sites in the Thames River Watershed

(Source: Armstrong, 1986)

Saunby's Mill, London



(Source: Miller, 1992)

Blackfriar's Mill, London

(Figure 12.2 con't)

(Source: C. Rogers, 1997)

Mill Race, St. Marys

(Source: C. Rogers, 1997)

Shakespearean Garden, Stratford

Canada's industrial heritage is significant because it is linked to almost all facets of our nation's history. As mills developed along the watershed, settlement patterns were devised. Early grist, saw, and woollen mills provided the means for food, shelter, and clothing in times of early settlement. Therefore, the presence of a mill attracted settlers to its vicinity. Eventually, mill sites also affected the patterns of roads; today, many back roads follow the path of the river and pass old mill sites. As technology improved, mills were able to serve internal and external trade in flour, lumber, and textiles. Thus, mills played a major role in the economy of Upper Canada (Mika, 1987, 9). By establishing a mill site along the river, one could also ensure that transportation needs would be met. The Thames River provided a route that allowed for the movement of goods to and from the mills. Water powered mill sites located on the Thames River are directly connected with the social, economic, and political development of the nation. From these endeavors, developed such industrial activities as distilleries, breweries, foundries, and so on.

Summary

The significance of *Water Power* lies in its contribution to the ability of early settlers to transform the landscape, develop staple products, and become part of the rapid shift to a commercial economy and, eventually, an urban industrial society. Although applied in situ, hydraulic technology represents the local application of a process that has been traced back to Medieval Europe as a precursor of the Industrial Revolution. Southwestern Ontario is the site of its most successful applications in Canada.

Chapter 13

Culture and Recreation

The Thames River has played a significant role in cultural and recreational terms at local, provincial, and national levels. This chapter includes sections on *Artistic Expression* (13.1) and *Architectural Responses to River Location* (13.2).

European attachment to the Thames has been generally utilitarian, as an adjunct to the settlement process. *Artistic Expression* (13.1), on the other hand, is evident in a significant body of early literature (13.1.1), early paintings and sketches of the Thames River, and works by important 19th and 20th century Canadian artists (13.1.2).

A riverine location was a prized residential site (13.2.1). The identification of bluffs overlooking the river as prime sites emphasizes the early recognition of the river's amenity values. In a broader context, such sites have also given rise to *Architectural Responses to the Thames River Location* including both public buildings and open-space layouts, with notable examples in Stratford and London (13.2.2). In the recent period, the use of the Avon in Stratford as the setting for the Festival, as well as re-development and extension of parklands along the Thames in London and Chatham, reflect a rediscovery of important cultural and recreational values (see Recreation, 26.3).

Please note that each chapter in the Recreation framework begins with an overview of the history of early or pioneering recreation on the Thames River. This provides an historical frame-of-reference to current recreational activity and opportunity.

13.1 Artistic Expression

13.1.1 Literary Works — Human/River Relations, Value of Thames River, and Accounts of Canoe Travel

As Europeans immigrated to Upper Canada, many recorded stories of their new adventures in books that were published and later distributed throughout Europe. Their tales encompass descriptions of the aesthetic nature of their new home and stories of daily life in the new world. Many of these authors wrote about experiences which involved the Thames River. The following sample of pioneering works reveals early perceptions of the Thames.

In his *Journal of a Journey: From Sandwich to York in the Summer of 1806*, Charles Aikins recorded his adventures of traveling alongside the Thames River. Aikins wrote about the condition of the roads he travelled and recorded the numerous points where he was able to ford the river on horseback. He also described the many mills, settlements, and businesses he passed on his journey. This work presents historians with an opportunity to immerse themselves in the past as they imagine the physical and social condition of the Thames River watershed in the early 1800s.

John Howison published *Sketches of Upper Canada* in 1821 in which he wrote about his journey through the Thames watershed. Stories describing Aboriginal use of the river as a transportation route and hunting ground, and European use in terms of mills, roads, and bridges reveal how the river valley developed. Tales of pioneers also depict early settlement patterns and the importance of the Thames as a valuable resource.

In 1824, E.A. Talbot wrote about the natural habitat he encountered along the Thames. Stories about flora, wildlife, and fish species found in the Thames River and surrounding area form much of *Five Years Residence In Upper Canada*. From this source, historians can piece together various components of the watershed's natural and human heritage.

Anna Jameson is another early writer who described the cultural and social development occurring along the Thames River. In her book, *Winter Studies, Summer Rambles In Canada*, she described the sites and people she came into contact with during her 1837 visit to Canada. Stories about London, Chatham, and a trip to Lake St. Clair form several chapters of the book. Through a discussion of mill sites, bridges, roads, and so on, Jameson revealed early European (albeit elite) views regarding the physical development of the new world in relation to the Thames River. She also discussed the aesthetic nature of the river, thereby showing the emphasis placed on the beauty of the Thames.

After William Lee Judson made a canoe trip from London to Lake St. Clair in the summer of 1880, he wrote *Kuhleborn, a Tour of the Thames, Written and Illustrated by Professor Blot*. This work was published in 1881 in London, Ontario. The work is not entirely fact as romantic escapades and humour add color to the tale. Yet, for the most part it provides historians with a glimpse of life on the Thames in the late 1800s. Judson, a distinguished Canadian landscape painter, also provided sketches of the scenes he viewed during his travels (see section 13.1.2).

The *Diary of a Moravian Missionary Among the Indians of Ohio, vol II*, written by David Zeisberger in 1885, also details life along the Thames River in the late 1800s. Ample stories about trading, log running, canoeing, fishing, and so on, can be found in this work.

Other pioneering works relating to the Thames River are in the form of poetry. Many locals also wrote poems about the Thames as they expressed their appreciation for its aesthetic beauty, commercial potential, and transportation uses (see sections 10.1.3 and 11.4.1).

The literary works of pioneers on the Thames River provide a picture of the watershed's early history. The tales reveal what settlers deemed significant in terms of their sur-

roundings. Early works indicate that settlers viewed the Thames as an important element of survival which supplied harvestable resources, a transportation route, power for industrial endeavours, and a beautiful locale for leisure (see Recreation).

13.1.2 Paintings of the Thames River

The Thames River and its tributaries have been a source of inspiration for artists since the river was first travelled (Table 22 of the Appendix is a representative list of 42 artists who have depicted the Thames River in their work). Artists have been attracted to the river for various reasons; some chose to record the topography of the area, some documented the river's natural heritage, some were commissioned to paint riverside views or to depict disasters, and some painted the Thames simply for personal satisfaction. The variety of artistic works relating to the Thames River depicts the changing views that Canadians have had in terms of the river.

Figure 13.1 Military Map of the Forks at London, 1839, by Major Eyre

(Source: Armstrong, 1986, 90)

During the 19th century, many artists in the region were military topographers from the local British garrison which was established in London after the 1837 Rebellion. These soldiers were instructed in map and elevation plan drafting because military surveys of southwestern Ontario were deemed essential for future military and administrative planning in the colony. The earliest extant view from the period of military occupation in London shows the southwestern bank of the Thames looking toward Westminster Bridge (Adams, 1995, 8). This sketch was drawn in 1839 on the corner of a map drafted by Major Eyre of the 73rd Regiment (see figure 13.1).

Figure 13.2 George Russell Dartnell, "St. Marys On the Thames" 1842

(Source: de Pencier, 1987, 16)

George Russell Dartnell painted several watercolors of the Thames River valley. For example, he drew inspiration from the St. Marys area. This is revealed in his work above which shows the process of building the piers for the original Victoria Bridge. As well, the town grist mill and the log house constructed by Thomas and James Ingersoll are revealed in the work (de Pencier, 1987, 71). In 1842, Dartnell also completed "View of the Thames at London," and "On the Thames Near Delaware" (de Pencier, 1987, 66).

In works created for their personal enjoyment, soldiers also recorded the picturesque element of such areas as the Forks in London. At this time, many paintings also revealed the changing perception of the river in relation to social development. For instance, the Thames was often portrayed as a natural barrier that needed to be bridged "for the improvement of regional communications and transportation" (London Regional, 1993, 4; see also, figure 13.2). A number of public and private collections now represent the work of these men (London Regional, 1993, 4).

By mid-19th century, local artists were working for commissions. Accordingly, they created such commemorative pieces as William Armstrong's *View of London, Canada West*, which depicted the establishment of the Great West Railway in London. Others painted works which memorialized specific events; the Victoria Day Disaster (see Recreation, 21.1) is one such example. Documentary works were also prevalent at this time. For instance, William Judson recorded many scenes from his canoe trip along the Thames River (see section 13.1.1).

The famous Canadian artist, Paul Peel, has also portrayed the Thames River several times in his work as he created a series of sketches of a violent summer flood along the Thames River. As well, "Springbank Park," one of several early oil paintings of the Thames River, was completed c.1880. It was said to be a companion piece to "Three Boys Fishing at the Coves" (London Regional, 1993, 4).

Figure 13.3 Mary Healey, "Forks of the Thames", c.1920

(Source: Smart, 1990, 55)

The Forks of the Thames River at London is one of the oldest sketching sites on the Thames (London Regional, 1993, 3). The area has attracted attention since John Graves Simcoe's trip in 1793. Such famous artists as James Hamilton, James Chapman, Mary Healey, Albert Templar, Jack Chambers, Claude Breeze, Doug Mitchell, Eric Atkinson, Bernice Bincent, and Johnnene Maddison have depicted the beauty of this area (London Regional, 1993, 3).

Around the turn of the century, such artists as Mary Healey, also documented picturesque scenes of the Thames. Works of old mill sites and riparian residences, painted by artists like Albert Templar, reveal the river's influence on settlement and the industrial heritage of the region. The river's recreational attributes were also portrayed during the 1900s.

After World War II, the Thames was revitalized from its polluted and industrially blighted state. Accordingly, artists renewed their focus on the beauty of the Thames. The Thames in relation to the cities developed on its shores was another major focus in the mid-1900s. Environmental concerns and protection of the waterway were of interest to such artists as Tom Benner who created the multi-media landscape, *The Coves* (London Regional, 1993, 6).

Artistic views pertaining to the Thames River have changed with time. Shown for its resource potential, military benefits, transportation uses, commercial advantages, and recreational attributes, the evolving role of the Thames River in the eyes of local artists is clearly revealed.

13.2 Architectural Responses to the Thames River Location

13.2.1 Significant Riparian Residences

Iredell thought so much of Chatham when he surveyed it in 1795, that five years later, he built a log home on lot 17 at the southeast corner of William and Water Streets (Lauriston, 1952, 46). Of course, it had an excellent view of the river. At this location, which he received in part payment for his services, he also planted an apple orchard (Lauriston, 1952, 46).

As settlement began in the Thames watershed, houses were constructed along the shore of the river because it allowed for resource harvesting, the development of agriculture, access to transportation routes, and a source of power for industrial enterprises (see 10.0, 11.0, and 12.0). Judson wrote the following commentary which reveals how early Canadian architecture evolved: "...American cottages of the first generation are seldom either pretty or picturesque, except in decay. The plank shapes everything.... ...the man who builds a house of logs or planks in America expects to own a better one in a year or two... With increasing wealth, he becomes able to gratify his long repressed cravings for the beautiful" (Judson, 1881, 49). Well after initial settlement, Victorians who were able to build substantial houses preferred such prominent settings as those overlooking the spectacular view of the Thames River valley. Others who settled on the river's edge, did so because of its close proximity to their workplace.

In 1860, John Robinson, the civil engineer responsible for the Grand Trunk Railway viaduct across the Thames River, purchased three lots in St. Marys on Emily Street above the bend in the Thames River. The view from this property was incredible: upstream the valley opened out into broad meadows; downstream, Robinson was provided with a view of his own buildings. He constructed his summer house with white brick that was imported from London. At this time, it was uncommon to build residentially with the brick. The house still stands today. As the countryside has changed very little since the nineteenth century, the vista from the house is just as incredible as in Robinson's day (Wilson, 1981, 18).

Figure 13.4 Eldon House, London, Ontario

(Source: Armstrong, 1986, 38)

Eldon House, built in 1834 by Captain John Harris, R.N., is London's oldest remaining house. Located on eleven acres of land just off of Ridout Street, the home overlooks the Thames River. The building was designed in the form of a Canadian regency farmhouse. As well, the broad verandah reveals the house's Canadian heritage (Honey, 1972, 2). Four generations of the Harris family hailed from Eldon House for over 125 years. Over the decades, the house was the centre of the cultural and social life of Londoners. In 1960, the Harris family donated the house and land to the City of London for use as a park and museum. The home has since been recognized by the Province of Ontario as an historic site (see Table 17 - Appendix).

When discussing the architectural development of the Chatham area, the *Illustrated Historical Atlas of the Counties of Essex and Kent* noted that "the river banks both above and below the business centre, also display many large and highly ornate residences, bespeaking the wealth, taste, and liberty of their residents" (Belden, 1880, 53). Many mansions were built along the Thames River in times of early European settlement (Figure 10.6 illustrates the approximate locations of riparian residences and public buildings mentioned in this chapter). For example, Eldon House, Thornwood, and Locust Mount are three of many London estates which are situated with a picturesque view of the Thames River (see figures 13.4 and 13.5). In St. Marys, the Ingersoll House, Lauriston Cruttenden's home, and John Robinson's estate represent some of the mansions established on the North Branch.

Another significant riparian residence located in St. Marys is the estate built by Lauriston Cruttenden in 1857. After he moved his family from Beachville in the late 1850s, Cruttenden became a major figure in the development of St. Marys' economy. The salmon-pink home, located at 36 Ontario Street North, was one of the earliest homes built in the west ward. It was also likely the first brick house constructed in the village. Situated on the brow of the west ward hill, the home once had an amazing view of the entire river valley (The Stonetown, 1997, 35).

Likewise, the Hick's Home, and the Hill's estate in Mitchell are constructed high above the North Branch overlooking the river valley. Within Stratford, many mansions are near the Avon River's shore. On the South Branch near Woodstock, Lyte's Carrie and Northcote once stood. In this area, another mansion, Dunelg, remains on a hill overlooking the Thames. This brief look at some of the numerous Victorian mansions established along the Thames River reveals the growing importance that settlers attributed to the aesthetic nature of the river.

The Ingersoll House overlooks the falls at the junction of the Thames River and Trout Creek in St. Marys. The house, built in 1843, was constructed with limestone quarried from the Thames riverbed. Today, part of the original Ingersoll home forms the back section of the Hawk-Ridge Hollow Guesthouse (The Stonetown, 1997, 37). The home has been designated as a historic site.

Not all homes in the Thames watershed were mansions. Petersville, now a large area of London West that stretches along the Thames River, contained an interesting array of styles reflecting the small scale construction that was prevalent in the mid-19th century (Adams, 1996, 29). Unlike London North which contained many of the town's largest homes, Petersville, a flood-prone area (see section 15.1) contained modest dwellings indicative of the working-class nature of the area. The homes ranged from gothic revival cottages to post-war victory housing. The simplicity of the buildings characterized the area. Over time, construction of newer, larger homes has slightly altered the original architectural landscape of the community.

Figure 13.5 Thornwood and Locust Mount Estates, London, Ontario

(Source: Miller, 1988, 73)

Thornwood, located at 329 St. George Street, also overlooks the Thames. Built in 1845, it is the oldest of four estates north of Oxford Street in London. Henry Corry Rowley Becher, a prominent London lawyer, was the original owner of the home. It was said that Becher wanted the home to exceed the elaborate design of Eldon House (Honey, 1972, 5). Thornwood was the first London home constructed of brick. It contained twenty-eight rooms. In both the winter and spring of 1852, the estate was damaged by fire. Therefore, Becher began reconstruction which resulted in the existing structure (Adams, 1996, 37-8). The home's unique charm, simplicity, and uniform architectural treatment was not typical of early London homes. A verandah was added in 1856. Three years later, a stable/coach house was built. When Becher died, his son, Henry (who later became the Mayor of London) inherited the estate. Six generations of Bechers have owned and renovated the structure (Adams, 1996, 37-8). As was the case with Eldon House, Thornwood housed many social events for Londoners. The e state has welcomed such prominent guests as the Prince of Wales, Prince Arthur, and Sir John A. MacDonald. When Winston Churchill visited in 1900, he planted a birch tree in the backyard. In 1926, Mrs. Ronald Harris purchased sixty-four acres of the estate land from the Becher family. She then donated the land to the City of London for use as a park in the memory of her father Sir George Gibbons.

Locust Mount is another London home which has been selected by the municipal government (LACAC) as a historic site. It is located on the river's edge at 661 Talbot Street. The home was built between 1853 and 1854 by Elijah Leonard, London's third Mayor, and later a Canadian Senator. Leonard was also the founder of the E. Leonard and Sons foundry. The two-storey, grey stucco

(Source: C. Quinlan, 1997)

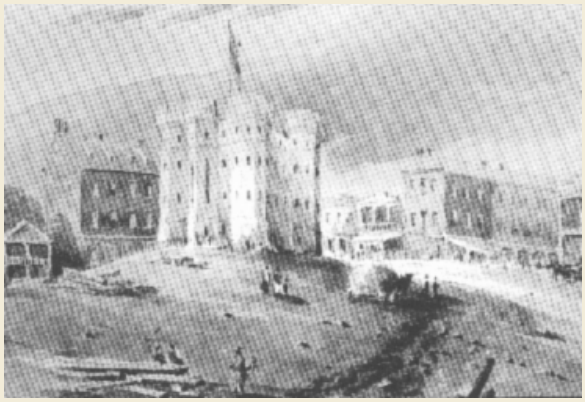
(resembling stone), slate roofed home was built on an old mill site. Locust Mount resembles an elegant type of town house. The name for the estate was chosen because of the black locust trees which originally surrounded the house. The trees were a gift from John Harris of Eldon House.

Many small cottages were also constructed along the river in St. Marys. These structures housed weavers, carders, and dyers who were employed at the woollen mill. Unfortunately, most of the cottages were demolished when the railway tracks were laid out in 1908. However, Gilbet McIntosh's cottage survived (see figure 9.2) and has been moved to the end of St. Maria Street where it has been beautifully restored by a recent owner (The Stonetown, 1997, 31). The small cottages and modest dwellings constructed on the shores of the Thames housed those employed in various local industries established along the river. This highlights the river's continued role in industry and commerce.

13.2.2 Significant Riparian Public Structures

When Iredell designated church plots, green spaces, a market square, and a town hall in his 1795 survey of the District of Kent, the site for each public institution was chosen to give it prominence in the community and symbolic importance in relation to the total urban scheme (Charles, 1979, 3). River front properties served as impressive and prominent settings. Therefore, the course along the Thames River provided an excellent location for government buildings, churches, lodges, and theatres.

Figure 13.6 George Russell Dartnell, "Gaol and Courthouse at London," c. 1843



(Source: de Pencier, 1987, 76)

Appearing in the gothic style, the architectural style of the building received much scrutiny. Legend states that the original courthouse was designed to imitate Colonial Talbot's Irish ancestral home, Malahide Castle (London: An Architectural, pamphlet). Construction of the courthouse was completed by 1831. Three years later, a gaol was added. The main block was then extended in 1878. In the 1970s, construction of a new courthouse and jail left the original building empty until 1979 when the county began renovations. The structure is now known as the Middlesex County Building.

Mahlon Burwell chose to locate the District Courthouse on the knoll overlooking the Thames River at the Forks in London (see figure 13.6). In its original design, the front of the building faced the river. In the mid-1950s, the federal government officially recognized the building as a national historic site. Tables 17 through 20 of the Appendix list the provincial and national historic sites located within the watershed. The courthouse was a focal point for justice, with many significant trials and hangings. Yet it was also instrumental in terms of politics and the development of municipal government. As well, such famous personalities as Talbot, John Matthews, Judge Wilson, the Donnellys, and the Harris family are linked to this site. Finally, the military presence and the commerce centre are also tied to this area along the banks of the Thames.

The Chatham courthouse and jail, built in 1849, is also located on the river. It is interesting to note that on the construction site was a journeyman mason named Alexander McKenzie, who later became Canada's second Prime Minister. The Perth County courthouse, constructed in Stratford in 1887, was also situated by the river. The prominence of these buildings was not to be forgotten. Accordingly, they were erected on impressive river front property.

Figure 13.7 St. Andrew's Presbyterian Church, Stratford

(Source: Stratford Strolls)

Throughout the Thames watershed, numerous churches were built on the river's edge. Before the advent of churches in Stratford, Reverend William Rintoul gathered Presbyterians on the hillside above the Avon River to baptize children and celebrate communion (Leitch, 1980, 224). Other preachers, such as Reverend Donald MacKenzie, also preached on the shores of the Avon. Later, the Canada Company, in an attempt to develop the Huron Tract, gave land to congregations when they were ready to erect churches. The first in Stratford, St. Andrew's Church, received 1 1/4 acres in 1837. The church, a log building with a steeple, was erected by 1840 on the same site on the bluff above the Avon where Reverend Rintoul first preached. As the congregation grew, so too did the church; it was renovated several times over the years. Today, the church remains situated above the Avon River.

Development of churches was also encouraged by local politicians. For example, when Issac Buchanan, a member of Parliament from Hamilton, offered one hundred dollars to each of the first five parishes to build churches in the Western District, the Thamesford parish was the first to take up his offer (Wallace, 1994, 142). St. Andrews Presbyterian Church was built in 1847 on the east hill overlooking the river. Viewing the river as a spiritual place, congregations chose to worship on its shores.

The Opera House in St. Marys, built in 1878 by the Imperial Order of Oddfellows, was prominently located on the shores of the Thames River (The Stonetown, 1997, 29). The structure was intended to serve as impressive lodge headquarters. It also generated revenue for the organization as shops on the ground floor and the theatre/auditorium on the second floor were rented (see section 12.1). From the

beginning, the lodge was very popular and became the cultural centre for the large surrounding area. It was the venue for parties, balls, political speeches, plays, operas, and moving picture shows. Today, the exterior has been preserved and the interior converted into retail space and modern apartments.

Four years after the Stratford Festival began in 1953, the Festival Theatre was constructed by the river's edge in Upper Queen's Park (see Recreation, 25.2). Owing to the festival's success, the Tom Patterson Theatre was later erected along the Avon as well. Taking advantage of the city's beautiful park system, patrons continue to revel in the splendor of the settings.

The symbolic importance of the Thames River is revealed in the use of high riverbanks for positioning prominent government buildings and churches. In addition, as lodges and theatres were constructed along the Thames, it was evident that people believed the waterfront possessed an aesthetic quality which allowed for rest, rejuvenation, and pleasure.

Summary

The significance of the cultural and recreational aspects of Human Heritage in the Thames watershed reflects the ongoing aesthetic attraction offered by the river, which has been re-discovered by successive generations and which is an important context for both current use and future opportunity.

Chapter 14

Jurisdictional Use

From the point of view of the history of European settlement, jurisdiction could be seen as an important beginning. Like much of Canada, the Thames watershed was explored and surveyed either prior to or in conjunction with the earliest settlement activity. This phase is dealt with under *Exploration and Route Surveys* (14.1).

Early exploration of the Thames watershed was part of a 17th century westward move by the French. Thereafter, exploration of the watershed was a major element in the process of the expansion of British North America, following the transfer of Quebec and the opening up of territory that became Ontario, and in the aftermath of American Independence. In the late 18th century this was a key frontier area which attracted *Official Exploring Parties* (14.1.1) and *Surveying Parties* (14.1.2), leading to official parties claiming land, notably the series of Indian Treaties (see First Nations).

Of particular historic significance is the role of the Thames in the military events of the early 19th century, especially in the War of 1812. The section *Military Uses* (14.2) includes (European) *Military Expeditions and Invasion Routes* (14.2.1) and *River-side Fortifications* (14.2.2). In the case of the Thames, the area was part of Aboriginal territory which extended on both sides of what was to become the Canada-United States border and over which various tribal conflicts had been fought. As American expansion westward after 1780 impinged on their territory, Aboriginal groups formed alliances with British forces.

The lower Thames valley was one of the major theatres of the War of 1812. During the Fall of 1813, U.S. forces drove up the valley defeating the British at the Battle of Moraviantown, which also resulted in the death of famous Aboriginal leader, Tecumseh (see First Nations). In the late winter of 1814 a futher battle was fought at Longwoods.

In the decades after the war, *Fortifications* (14.2.2) and military garrisons were established in such areas as Chatham, London, and Woodstock. Members of these garrisons played a substantial role in the development of those places throughout the 19th century.

14.1 Exploration and Route Surveys

14.1.1 Official Exploring Parties

In 1615, Etienne Brule was likely the first European to see the Little Forks (now the town of Woodstock). For twenty-two years, he lived among the Hurons of the Georgian Bay district. During this time, he explored the Thames as far as Lake St. Clair (Cropp, 1973, 6).

By the early 1700s, the French had explored the Thames River and named it “La Tranche” because it had the appearance of a trench or ditch cutting through the vast forests. Cartographer Monsieur Bellin produced the first map of the Thames River in 1755. The 21" by 25" map is described as a “worn, slightly dog-eared square of hand-made paper bearing a royal fleur-de-lis watermark” (Historical Series, 94). On the map, Bellin referred to the Thames as: “the unknown river to all the geographers and which goes up 80 leagues without any rapids...” (Historical Series, 94). Although the map does not show the Thames River in great detail, it is considered to be one of the most detailed and accurate maps of the age. The map is now in the possession of the University of Western Ontario in London, Ontario.

March 2, 1793:

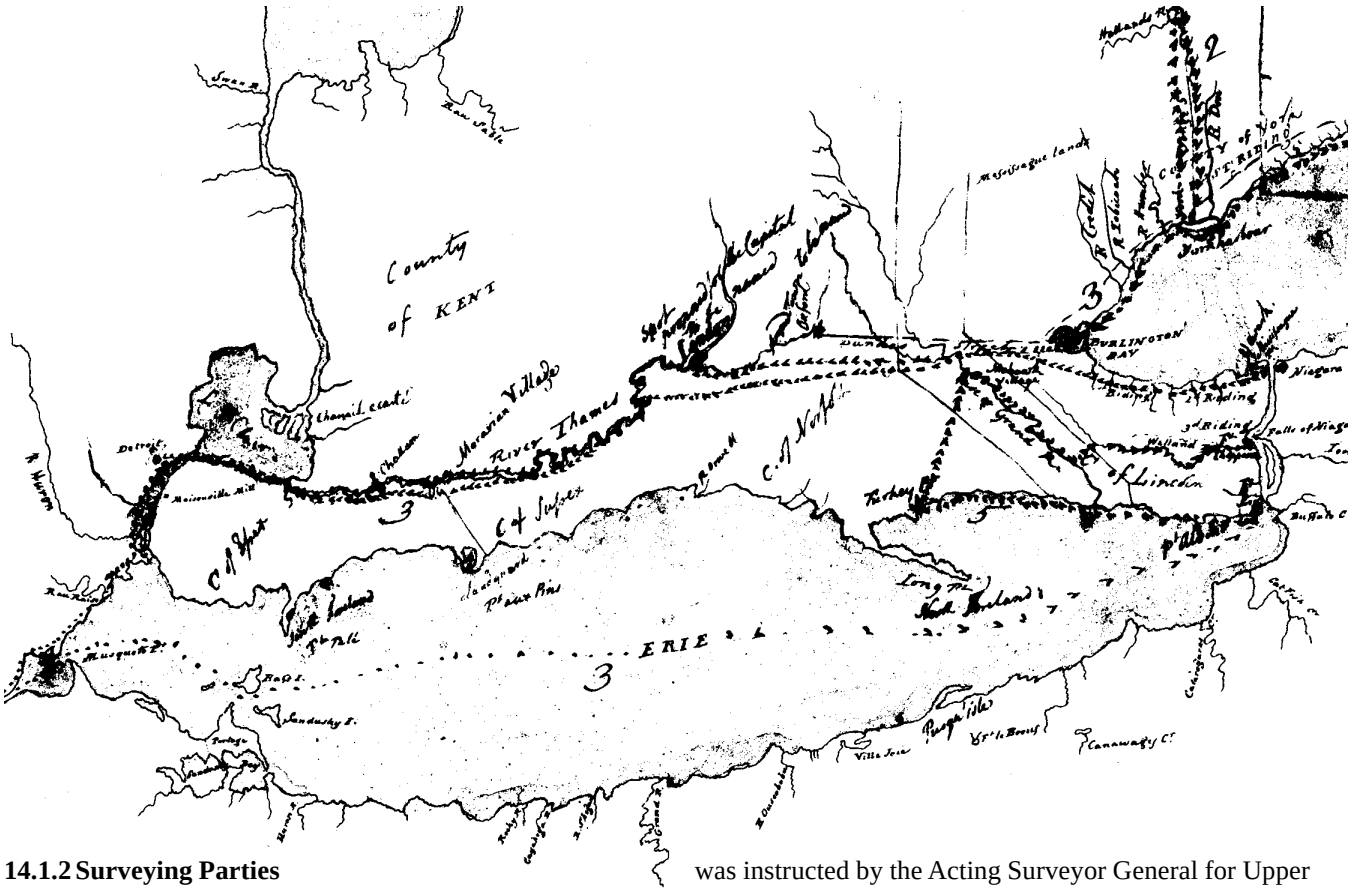
“We struck the Thames at one end of a low flat Island enveloped with shrubs and trees; the rapidity and strength of the current were such as to have forced a channel through the main land, being a peninsula, and to have formed the island. We walked over a rich meadow, and at its extremity came to the forks of the river. The Governor wished to examine this situation and its environs; and we therefore remained here all day” (Littlehales, 1889).

When John Graves Simcoe was named the Lieutenant-Governor of Upper Canada, his first concern was settling the area. Simcoe left Niagara for Detroit on February 4, 1793 and reached the Thames River by February 15. The Lieutenant-Governor saw the potential of the land along the Thames, especially once he and his party explored the area. The first point that they reached on the Thames River was located in the centre of the future Township of Oxford. From here, they followed a path that eventually crossed to the northern banks of the river. After they reached the area that is now Beachville, the group travelled for several miles before crossing the river again. Simcoe and his men then continued along the south bank of the Thames in the direction of Detroit. The routes of Lietenant Govenor Simcoe between 1792 and 1795 are illustrated in Figure 14.1. As he explored the region along the Thames River, Simcoe devised grand plans for settlement (see section 11.3). He envisioned the provincial capital situated in the easily protected heart of the region at the Forks in London. Further down river, the town of Chatham would be established as a ship-building centre (see section 10.2). The town of Oxford (now Woodstock) would benefit from a location where the Aboriginal path first joined the Thames. Major Littlehales accompanied Simcoe on the trip. His diary pro-

vides an historic record of the excursion. As well, Assistant-Surveyor-General D.W. Smyth kept a detailed diary of the trip.

As historians study the records of those who first explored a particular region, they can determine what these people viewed as significant to the area. Those who first travelled the Thames River highlighted its importance as a transportation route, and a military and political centre (see sections 10.1, 10.2.1, and 14.2). From these ideas grew the notions of developing settlements and industry throughout the watershed (see sections 11 and 12).

Figure 14.1 Sketch Map of Upper Canada, showing the routes Lt. Governor Simcoe took on trips between March 1792 and Sept. 1795. Attributed to Mrs. J. Simcoe. (Source: Serge A. Sauer Map Library, UWO)



14.1.2 Surveying Parties

In 1790, Patrick McNiff was the pioneer surveyor of the region along the Thames River (see section 11.3). Beginning at the mouth of the river at Lake St. Clair, McNiff travelled for six miles past extensive meadows and marshes. In his field notes, McNiff recorded that on the left side of the Thames (Dover Township), marshes and meadows appeared to extend infinitely in a NNE direction (Kent, 1939, 25). On the right side of the river, there was far less marsh and meadow land. From Chatham up to the end of the survey about halfway across Howard Township to a point opposite Thamesville, McNiff recorded that the riverbanks were eighteen to twenty feet high, the land was of good quality, and the timber was Black Walnut, cherry, Sugar Maple, and hickory.

During the 1790 to 1791 survey, McNiff laid out the lots fronting on the Thames in the Townships of Dover East, Chatham, Raleigh, Harwich, and parts of Howard and Camden. For a second survey beginning in 1793, McNiff was instructed by the Acting Surveyor General for Upper Canada, D.W. Smyth, to record the course of the river in most minute detail. Smith also gave McNiff the following instructions: “Your attention will be drawn also to the quality of the land over which you pass, the nature of the soil, and the growth and species of its timber; and you will be particular in noting the direction of any Indian paths which you may cross or come near on your way...” (Kent, 1939, 28). McNiff no longer surveyed the river after 1794.

In 1795, Abraham Iredell laid out part of Chatham Township on the Thames. In December, 1803, Iredell was instructed to complete the surveys of Chatham and Dover Townships. After the War of 1812, Mahlon Burwell surveyed regions along the upper portions of the Thames.

The accounts of those who initially surveyed the Thames watershed provide insight into the region’s natural heritage prior to the time when official settlement began. As well, their notes describe the state of settlement patterns before the watershed was officially opened by the govern-

ment (see section 11.3). Finally, these records reveal why the land was divided into the particular townships and counties that exist on either side of the river today.

14.2 Military Uses

14.2.1 Military Battlefields

The Battle of Moraviantown

The Battle of Moraviantown took place along the shores of the Thames River near Thamesville. Although this was not a critical battle in terms of defending Canada during the War of 1812, it was significant as an Aboriginal battle because this was the fight that led to the death of Tecumseh, the Shawnee Chief.

Figure 14.2 The Tecumseh Monument

(Source: D. Bocking, 1997)

In the 1790s, Tecumseh became the co-leader of a movement to restore and preserve traditional Aboriginal values. He believed that a union of western tribes could drive back European settlement. Viewing the Americans as a serious threat, Tecumseh allied with the British in 1812. After the Americans won the Battle of Lake Erie in September, 1813, the British leader, Proctor, and his allies, the Delaware, Ojibway, Chippewa, and Shawnee, were forced to retreat from Fort Malden up the Thames River.

With the Americans closing in on his men, Proctor decided to make his stand on the north side of the Thames River at Moraviantown. This position was good for defense because the elevation behind the village was protected by a broad ravine that passed across its front from the river to a road on the far flank. Unfortunately, thinking that the Americans were very close, Proctor stopped his men before they reached the proper destination. This less advantageous position proved detrimental for the tired, hungry, and discouraged men of the 41st Regiment.

The British lines fought an intense and bitter battle. Fights took place in the swamps, woods, and clearings along the Thames River (Allen, 1994, 31). Unfortunately, the British stood for only a short time before the Americans overran them. Then, the Aboriginal allies fought against overwhelming odds for another hour. They stopped when they heard Tecumseh's war cry as the Shawnee Chief was killed during the battle.

What happened to his body after the battle? Several accounts suggest that a group of Aboriginals returned to the battle field that night, and retrieved the warrior's body (Allen, 1994, 32). However, his final burial place remains unknown.

Figure 14.3 Monument at Battle Hill

(Source: C. Rogers, 1997)

The Battle of Longwoods

The Battle of Longwoods took place on March 4, 1814. Under the command of Captain Basden, a British garrison was protecting a convoy of wagons and army stores in Longwoods (approximately 6 km east of the present village of Wardsville). At "Battle Hill" they were attacked by American sharpshooters who erected a log barricade across Longwoods Road. The Americans were posted in a very advantageous position on the summit near the river. They were also superior in numbers.

Captain Basden attacked the enemy in front with the flank companies of the Royal Scots, while the light company of the 89th and the detachment of Kent militia made a

flank movement to the right. A small band of Aboriginal allies then moved to the left. After repeated attempts to dislodge the enemy, the fight ended after one and a half hours. The British troops reluctantly withdrew after having suffered severely.

The enemy retreated during the evening and left the field in the possession of the British. Sixteen men, two of whom were officers, were killed. As well, 3 officers and 46 non-commissioned officers and men were wounded (Page, 1878, 6).

14.2.2 Riverside Fortifications

When Lieutenant-Governor John Graves Simcoe planned for settlements along the Thames in 1793, he hoped to establish forts along the river in order to provide a safe inland route between Lake Ontario and Detroit. Simcoe recognized the significance of the Thames River line as a natural entry point for invaders and defenders and so he proposed forts in several areas on the Thames.

In the late 1790s, the Lieutenant-Governor suggested that a fort and settlement be created approximately five miles east of Beachville. Although Oxford (now Woodstock) was little more than a clearing in the forest, it was used for military drills. Simcoe was positive that the Americans would attack so, in 1798, the Oxford Militia was created.

Similarly, under a Governor's Order in Council, 600 acres were set aside as a town plot and military reserve in Chatham in 1795 (see section 10.2.1). Yet, it was not until the early 1820s that Major General Sir James C. Smith recommended that a fort be erected in Chatham to check the advance of an enemy. This was necessary due to Chatham's development as an important commercial shipping area (see section 10.2). As well, this was the only area that commanded a road to Burlington and York, which would need protection. An 1827 map of Smith's plan shows an elaborate fortification between McGregor Creek and the Thames River which extends far east of the military reserve and touches the Thames at a point in the northern corner of the reserve (Hamil, 1951, 140).

The first military construction was established at Chatham between 1838 and 1843. Many people feared an attack by water, and therefore, the need for the huge frame barracks was evident during the 1837 Rebellion. What is now Tecumseh Park was then a military garrison where a star-shaped fort housing a two-storey barracks was constructed (Rhodes,1987, 3). The fort remained in the park until 1879 when it was disassembled and moved to the opposite side of the river. Although the building was condemned and removed in 1955, the park remains the property of the federal government and in the time of war, reverts to military use (Rhodes, 1987, 3).

The strategic value of the Thames River was recognized by the government as it positioned many garrisons in towns and cities along the river. These garrisons, located in such cities as London, Chatham, and Woodstock, housed hundreds of men who in turn prompted the economic, social, and cultural development of the area.

Summary

The significance of the Thames in respect of *Jurisdictional Use* is that of a major route within a frontier region prior to any road development, and as a significant landscape feature affecting the layout of surveyed settlements and the boundaries of municipal units.

The association between the Thames and the War of 1812 is perhaps the most significant historical event to have occurred in the watershed. It is of national significance due to the fact that the war was a major event in the preservation of a separate British North America. In present day terms, its sites and re-enactments are an important tourist focus (see Recreation, 27.2).

Chapter 15

Environmental Regulation

The section on *Environmental Regulation* (15.0) deals with a number of considerations. These include *Early Flood Control Structures* (15.1)*, some of which could be considered in conjunction with *Water Transport* (10.0) and *Riparian Settlement* (11.0), notably *Dykes and Levees* (15.1.1). The sub-sections of *Flood Control Dams* (15.1.2) and *Structures Reflecting Flood Control Legislation* (15.1.3) deal with the role of the Thames in the development of Ontario's Conservation Authorities.

Other *Environmental Regulation* specifies *Pioneering Improvements to Water Quality* (15.2) in which the primary concerns relate to water quality (15.2.1., 15.2.2. and 15.2.4), and use for recreation (15.2.3). Likewise, *Pioneering Improvements in Aquatic Ecosystems* (15.3) relates primarily to provision and improvement of fish habitat and to sports fishing which relate to chapters 6 and 7 of the Natural Heritage framework and chapter 22 of the Recreation framework.

A final section on *Pioneering Access and Use Regulation* (15.4) includes the topic of *Different Types of Riparian Rights* (15.4.1). *Aboriginal Rights and Land Claims* are dealt with under First Nations. For information regarding *Protected Areas*, see the Recreation framework.

15.1 Early Flood Control Structures

15.1.1 Dykes and Levees

Although spring freshets were a regular occurrence on the Thames (see Natural Heritage, 2.3), growing settlements changed the landscape along the river and, thus, increased the severity of flooding. Table 23 of the Appendix lists 120 floods recorded on the Thames River since 1792. As the desire for flood control increased, early settlers constructed dykes along the Thames. Originally, the dykes were maintained under the Provincial Drainage Act passed in 1872. Typically, these structures were beneficial yet, during severe storms, they provided little protection.

Due to heavy floods that occurred in the early 1900s, dykes along the Thames were improved. In 1904, an ice jam at St. Marys broke, causing water to flood many areas including London, Thamesville, and Chatham. Although the breakwater protecting West London was patrolled all night and was strengthened with sacks of sand, this did not prevent the water from flooding over the dykes. As a result of such severe floods, the London dykes were lengthened and rebuilt in 1905. Citizens of South London were discouraged to find that the dykes did not prevent the Thames River from inundating the southern flats in 1913. However, the improved dykes enabled West London to escape flooding for the next twenty-five years (Dept. of Planning, 1952, 142).

April 26, 1937 was known as "Black Monday" by those who survived one of the worst floods to strike southwestern Ontario. The torrents of water produced the highest flood line ever recorded on the Thames River. The entire watershed was severely affected by the flood and damages totaled nearly 2 million dollars.

As heavy rains began to fall in April, 1937, water levels on the Thames rose. Citizens of London were told not to worry, yet many continued to prepare sandbags for the dykes (Adams, 1996, 53). The 1937 flood overtopped the West London dykes and spread over a wider area than any other flood. After the waters receded, the dykes along the river were rebuilt and strengthened. Citizens immediately demanded increased flood control, yet politicians were not receptive as their attention focused on the war which loomed ahead.

Figure 15.1 Strengthening Flood Dykes, East of the Town of Ingersoll

(Source: Dept. of Planning, 1952)

As time passed, Thames River settlers began to forget about the threat of severe flooding. Yet ten years later, when they were hit by another serious flood, the cry for flood control was heard again. The 1947 flood seriously inundated the

*Please note that a brief history of Water Flow Monitoring Stations is included in Chapter 2, Hydrology, in the Natural Heritage Section, and in Table 1 of the Appendix.

area near the mouth of the Thames River. When dykes in this area were breached, flooding spread rapidly through the flat lands of Dover and Raleigh Townships. For example, by March 30, 1947, 5000 acres were flooded in Dover Township (Dept. of Planning, 1952, 148). Waters were also high in Chatham. Upriver at the Village of Thamesville, the river was twenty feet above its average height. In the upper watershed, the 1947 flood affected London, Delaware, St. Marys, and Stratford. West London was temporarily evacuated as dykes were reinforced with sandbags. Flooding on the south branch was much worse. As a result of this flood, the City of London spent $86,069 to improve the existing dykes and to build new ones (Dept. of Planning, 1952, 148). Likewise, some attempt was made to dyke the area south of the railway bridge west of Thamesville, but this was a low area that inevitably provided a channel for the water (Dept. of Energy, 1966, 58).

By the early 1970s, it was clear that agricultural flood protection was needed along the lower Thames and the Lake St. Clair shoreline in Essex and Kent Counties. Hence, a Federal/Provincial program began on March 26, 1974 whereby funds were provided for a flood protection program for the low-lying lands of Tilbury East, Raleigh, Dover, and Chatham Townships. The project was administered by the Lower Thames Valley (see section 15.1.4) and St. Clair Region Conservation Authorities. The dyking program was cost-shared; the Government of Canada and the Province of Ontario each paid for 45% of the cost while the benefitting municipalities contributed the remaining 10%. By 1979, approximately 58 km of dykes were constructed at four different project areas (along Baptiste Creek, Jeanettes Creek, the Thames River, and the Dover lakeshore) in the western end of the Thames watershed. Dyking projects (see Table 15.1) along the lower Thames amounted to approximately 10 million dollars (LTVCA, 1997, “Flood”, 1).

As far back as 1952, the Upper Thames River Conservation Authority noted that dykes and channels were aids, not the solution, to a flood problem (Dept. of Planning, 1952, 160). The benefit was local as flood waters rushed past the protected area to aggravate the flood situation down stream. Therefore, the 1952 Report strongly suggested the need for dyking and channel work in conjunction with reservoir control.

15.1.2 Flood Control Dams and Diversions

Although flooding on the Thames River is not a modern phenomenon, it has increased significantly since the time of settlement. Table 23 of the Appendix lists 120 floods recorded on the Thames River since 1792. As communities spread and forests were cleared, the severity of flooding became more pronounced. To protect riparian lands, homes, and businesses, early settlers soon began constructing dams and diversions.

Residents of the upper Thames began creating dams in the early 1900s. For example, in Mitchell, the southerly flow of the river was controlled by dams. The first was a wooden structure that broke in 1912 due to the draining of swamps upstream which produced too much water for the dam to hold. The second dam lasted until 1963.

Diversion Channels

The Ingersoll Diversion Channel, completed in 1949, was the first flood control project and one of the first channel improvements attempted by a conservation authority (see section 15.4) (Richardson, 1974, 34). The need for a diversion channel was evident when, in 1937, a section of the river was diverted to the south to allow quarrying to take place. This diversion was then extended downstream to increase the excavation area. The Upper Thames River Conservation Authority foresaw the need to extend the channel through Ingersoll and beyond to provide an alternate route for flood waters. It is interesting to note that the project was not funded with rural or urban residents’ tax dollars. Rather, industries in the valley contributed 25% of the cost, and the Province of Ontario provided a grant for the remaining 75% (Johnson, 1964, 34). Although the actual cost was over the estimate by 70%, the project went ahead. Over the years, the channel has proven itself in flood protection.

The success of diversion channels within the watershed is also evident along the lower Thames. For example, in 1991, the Lower Thames Valley Conservation Authority (see section 15.4) completed a 3.3 km diversion channel (costing 11.1 million dollars) along the eastern boundary of the City of Chatham (LTVCA, Information, 3). The structure redirects almost all of McGregor Creek’s flow through high land, upstream of the flood prone area. When the gates in the inlet structure close, runoff water from McGregor Creek is forced down the diversion channel. Along with the diversion channel, the Indian/McGregor Creek Flood Control Project included the construction of a Backwater Control Dam and Pumping Station. With the project in place, the area is estimated to experience over $30 million worth of benefits (LTVCA, Information, 4).

Table 15.1 Federal/Provincial Dyking Projects — LTVCA

Name	Length (ft)	Cost (Can. $)	Completion Date	Item
PROJECT P1 (Jeanettes Creek within Tilbury East)				
P1-A	52,650	500,000	Feb. 1975	Stone supply
P1-B	52,650	513,000	May 1975	Filter supply
P1-C	52,650	490,000	Dec. 1975	Earth works
P1-D	52,650	520,000	Dec. 1975	Rip-rap placement
PROJECT P2 (Thames River)				
P2-B	6,960	886,000	Dec. 1975	Rip-rap revetment
P2-C	2,746	497,000	Aug. 1975	Grout-filled revetment
P2-D	2,355	300,000	Dec. 1975	Grout-filled revetment
P2-E	8,910	1,500,000	Dec. 1975	Rip-rap revetment
P2-F	6,250	335,000	Dec. 1975	Rip-rap revetment
P2-H	5,650	568,000	Jan. 1977	Grout-filled revetment
P2-L1	5,340	442,000	Dec. 1976	Rip-rap revetment
P2-M/P	5,899	457,500	Aug. 1977	Rip-rap revetment
P2-L2/0	4,850	190,000	Sept. 1978	Rip-rap revetment
P2-N	3,730	500,000	Sept. 1978	Rip-rap revetment
PROJECT P3 (Dover Township Lakeshore)				
P3-A1	28,000	881,000	Dec. 1977	Rip-rap revetment
P3-D	24,300	540,000	Aug. 1978	Rip-rap revetment
PROJECT P6 (Baptiste Creek within Tilbury East)				
P6-A	32,700	162,000	Feb. 1977	Stone supply
P6-B	32,700	166,000	Jan. 1977	Filter supply
P6-C	32,700	508,000	Nov. 1977	Rip-rap placement
Total:	**9,955,500**			

Note: P2-G and P2-K were removed from schedule due to lack of funding
Only Federal/Provincial projects within LTVCA jurisdiction are included in chart

(Source: LTVCA, "Flood Control" 1997)

Flood Control Dams

The Fanshawe Dam was the first flood control structure built by a conservation authority. The dam was built by the Upper Thames River Conservation Authority (see section 15.4) on the North Thames River 5 miles upstream from the City of London. A cost sharing arrangement was assumed for the 5.3 million dollar construction fee. The dam is one of the largest flood control structures in Ontario; the storage capacity of the lake, located directly behind the dam, and reservoir is 38,880 acre-feet (Richardson, 1974, 42). Since Fanshawe Dam opened on September 28, 1953, it has successfully carried out its main purpose of protecting London from flooding. The project is also noteworthy because the community was brought into the early stages of planning; naturalists, hunters, anglers, junior farmers, and others were all involved (Johnson, 1964, 36). The UTRCA's Fanshawe Dam is of particular significance, insofar as its construction not only controlled a major problem of periodic flooding in London, but was the first example in Canada of a dam whose impoundment was designed to encourage recreational activity (see Recreation, 25.0). This ideal was followed by many subsequent Authority structures and led to the expansion of their mandate.

Table 15.2 Flood Control Dams in the Thames River Watershed

Dam	Yr. of Completion	Location
Fanshawe	1952	5 miles from London, North Branch
Wildwood	1965	Trout Creek, SE of St. Marys, North Branch
Gordon Pittock	1965	Woodstock, South Branch

Since early settlers began constructing dams along the Thames River, the technology has increased dramatically allowing for the development of substantial flood protection. After the construction of the Fanshawe Dam and the Ingersoll Diversion Channel, the UTRCA established a number of other structures to control freshets in the watershed (see Table 15.2). Over the years, these structures have proven themselves in terms of flood protection.

15.1.3 Structures Reflecting Flood Control Legislation — Conservation Authorities

The Thames has played an important role in the development of conservation in Ontario, especially to the development of Conservation Authorities, which have national and even international significance, as a model of multipurpose watershed management.

The conservation movement began in the early 1930s when such groups as the Ontario Conservation and Reforestation Association and the Federation of Ontario Naturalists were formed. Three years after members from these groups met at the Guelph Conference in 1941, the provincial government created a Conservation Branch . In 1946, the Conservation Authorities Act was passed to create terms of reference and guidelines for the authorities (Hammond, 1994, 35).

The major force behind the creation of conservation authorities in the Thames River watershed was driven by the desire for increased flood control. After the 1947 flood, municipalities along the entire stretch of the Thames met in London to discuss the formation of a Thames authority to monitor flood control. The vote for the creation of an authority did not receive a 2/3 majority. Delegates from the upper Thames in Middlesex, Oxford, and Perth counties voted for the proposal, whereas, all but three from Kent and Elgin in the lower Thames opposed the idea of forming a conservation authority (Hammond, 1994, 37). Therefore, the government was petitioned to form an Upper Thames Valley Conservation Authority (now the Upper Thames River Conservation Authority). Created in October 1947, this was the sixth authority formed under the Conservation Authority Act of 1946.

After Hurricane Hazel devasted parts of southern Ontario in 1954, the public viewed the damage that occurred from the flooding. This prompted citizens to push for increased flood control. Preventative programs were launched on the upper Thames, Ausable, and Toronto area rivers.

The Upper Thames River Conservation Authority submitted a brief on flood control and water conservation which called for a ten year plan. The estimated total cost of the construction of dams and riverbed channel improvements was 9.64 million dollars (Richardson, 1974, 37). The conservation authority suggested that the cost be shared on a 37.5:37.5:25% formula. Both the provincial and federal governments approved the plan.

Due to the need for serious flood control on the lower Thames, the Lower Thames Valley Conservation Authority was organized in 1961. The LTVCA viewed the acquisition of flood prone lands and valley lands, as well as wetlands and forests as a priority. In addition, it recognized the importance of water control structures. The authority soon began a system of extensive dyking along the lower Thames River (see section 15.1). Under a special federal-provincial dyking program, 58 km of dykes were constructed in the lower Thames watershed. The authority also carried out river and stream channel improvements to reduce the impact of flood flows.

15.2 Pioneering Improvements to Water Quality

15.2.1 Municipal Sanitary and Storm Sewage Disposal Systems

Power generated by the Thames River was one of the initial reasons for settlement on its shores (see sections 12.0 and 11.4.6). As mill sites, distilleries, foundries, breweries, tanneries, and oil refineries spread along the banks of the Thames and its tributaries, the river was used as a drainage system for residential and industrial waste. This was common throughout southwestern Ontario because it was once believed that effluent, mixed with fresh water, would be purified by natural chemical actions. Therefore, sewers drained into the closest body of water (Baldwin, 1988, 225). However, this merely transferred the pollution problem from land to local water systems. In time, the Thames River was unable to satisfactorily maintain its function as the recipient of waste water for cities and towns in the watershed.

Within the city of London, sewage disposal was viewed as a problem once public health became a concern. By 1881, three large brick sewers on Richmond, King, and Wellington Streets drained human waste, bath water, and other waste, from hospitals, the London Asylum, and households, directly into the Thames River. Although at this time Londoners obtained drinking water from springs located in Springbank Park (see section 9.3.2), they used river water

for other domestic activities such as laundry, cleaning, and watering lawns. As well, the river was a primary source of recreation including fishing, swimming, and boating (see Recreation, 21.0). The conflict over the river's various uses raised health concerns for Londoners.

On September 14, 1888, the case of the Queen vs. the City of London ruled that the "emptying of the sewage into the river had rendered the waters of it less fit for domestic use" (LaPalme, 1992, 32). The City of London was directed to pay a fine "sufficient in amount to secure the abatement of the nuisance" (LaPalme, 1992, 32). The approximate cost of a full-scale sewage system was estimated at $200,000 (LaPalme, 1992, 32). London became the first city in Ontario which was required to implement a proper sewerage system.

By 1886, citizens of Downie Township were complaining to the provincial government about the pollution of the Avon River. W.E. Bean, a Downie farmer, instructed the surrogate court clerk to issue writs against the Corporation of the City of Stratford, the Collegiate Institute Board, E.T. Dufton (woollen mill operator), George McLagan (furniture manufacturer), William Gordon (hotel owner), Perth County Council, F.J. Scholz (tanner), and Alex Smith (factory owner) for polluting the river. The city had no defense; it was responsible. An injunction restraining the city from polluting the river was granted. Having little information on the subject of sewage disposal systems, the early Stratford Council researched facilities at Canadian, American, and British cities. Although, the town of Stratford began laying out sewer pipes in 1885, by 1898, a disposal plant had yet to be created, so the eight miles of pipe carried the sewage into the Avon River (Leitch, 1980, 277). A sewage plant was finally in operation by June 1900.

Although most Canadian cities and towns constructed sewers before 1914 (Baldwin, 1988, 225), by 1950, no municipality on the upper Thames watershed possessed adequate sewage disposal facilities. None of the smaller towns of Mitchell, St Marys, Embro, Beachville, Dorchester, or Tavistock possessed sewage disposal systems. Although London, Stratford, Woodstock, and Ingersoll operated disposal plants, they were overloaded and in need of repair.

The Ingersoll plant was one of the most modern and efficient disposal plants in Canada, but it was not designed to take wastes from creameries, cheese factories, and other industrial plants. By 1950, the chief sources of pollution of the Thames River were milk wastes, cattle droppings, sewage, and various industrial wastes. During this time, the South Branch of the Thames River was seriously affected by sewage.

Downstream at London, effluent from residential septic tanks, not yet connected to the municipal system, was reaching the river in the 1950s. As well, a number of suburban establishments were not connected with the existing disposal facilities. The *1952 Upper Thames Valley Conservation Authority Annual Report* stated that "so long as some municipalities and other public bodies ignore the provincial legislation against stream pollution, no one can expect industrial companies to improve their conditions" (Dept. of Planning, 1952, 58). The UTRCA claimed that London was in a good tactical position to get other municipalities on the Thames to follow an example of proper sewage disposal.

The Stratford sewage plant was upgraded at various times, but still did not reach appropriate standards. When, in 1957, the Ontario Water Resources Commission was designed to aid municipalities in constructing or upgrading water pollution control plants, Stratford became the first municipality in the province to initiate a program under the Commission (Leitch, 1980, 277). They built a new plant that was described as the most modern and effective type of plant in existence. Yet, in 1964, the Avon was again contaminated by sewage above safe levels. As a result, Council installed expensive chlorination equipment. The emerging water was so clear, one could safely drink it. This was viewed as one of the best plants in North America.

Like other rivers, the Thames has suffered from the misuse of a growing industrial, agricultural, and residential population. For over a century, communities have attempted to clean up their pollution problems using the best technologies of the time. Fortunately, there has been significant advancement in the last thirty years regarding the storage and treatment of waste. Today, the OMOEE monitors and regulates most of the STPs across Ontario to ensure they meet strict guidelines. All of the large cities in the watershed have tertiary treatment facilities and are now rarely a main source of pollution in the Thames.

15.2.2 River Reclamation Projects

By the early 1900s, it was clear that structures and waste on the shores of the Avon were polluting the river. Fortunately, in 1904, Dr. Edward Henry Eidt, a local conservationist, began the process of reversing these effects by establishing Stratford's Board of Park Management under the Ontario Parks Act. The first river front property purchased by the new board was the Post Office Square (Leitch, 1980, 134). First, rotting stumps were dynamited and hauled away. Then the board worked their way downstream from the dam as workers hauled fill to level the river front slope. Flower beds were later created along this newly designed area. As the Parks Board continued to purchase land along the river for use as parklands, the condition of the Avon improved significantly. Today, Stratford is highly acclaimed for the beautiful parklands which stretch along the Avon River (see Recreation, 26.3).

After the City of London's annexation in 1912, the consequences of urbanization became apparent as the beauty of the river decreased and its use became limited. The river's condition slowly began to improve when the

city adopted a 25 year riverbank acquisition plan in 1945. Over the next two decades, factories and other commercial buildings along the river's shore were purchased and cleared by the city. In the mid-1970s, London joined with the UTRCA to begin another major floodplain acquisition program. By 1986, London owned 800 acres of parkland along the river (see Recreation, 26.3). Today, Londoners boast of their beautiful riverside parklands, natural areas, and hiking and bike trails.

15.2.3 River Sections Subject to Recreational Use Restrictions

Since the early 1800s, boating on the Thames River was a favourite pastime of Londoners (see Recreation, 21). Canoes, rowboats, paddle boats, and other human-powered craft could regularly be seen using the river from the Forks south to Springbank Dam. Traditionally, power boats entering this area voluntarily reduced their speed to five miles per hour. As the use of power boats increased in the mid-1970s, it became clear that regulations were needed as many power boats were not slowing down. Originally, the Public Utilities Commission proposed to ban power boats from certain areas depending on the weight, size, and horse power of the craft. Police and emergency vessels, and commercial boats were not subject to the proposed ban. Fortunately, a compromise was reached which called for a speed limit rather than a ban on boats. According to *Boating Regulations and Information, 1991*, published by the Ministry of Natural Resources, there is a speed limit of 8 km/hr on the Thames River east of Springbank Dam to the Hutton/Wonderland Road Bridge crossing (MNR, 1991, 21). Similarly, the 8 km/hr limit applies in the Chatham area from the Thames River junction with McGregor Creek to the mouth at Lake St. Clair.

During high water periods when the water level is at an elevation of 226.5 m G.D.C or higher at the Byron Gauge (see Table 1 of the Appendix), all types of vessels are prohibited from the following sections of the Thames River within the City of London: from Fanshawe Dam on the North Branch and the Hamilton Road Bridge on the South Branch to downstream beyond the junction of the North and South Branches to the Delaware Bridge on Highway 2 (MNR, 1991, 21).

15.2.4 Water Quality Studies

Water quality in the Thames River system has been studied and monitored for many years, both independently (locally driven) and as part of larger-scale programs. The impact of land use on water quality and quantity was examined as far back as 1952 when the *Upper Thames Valley Conservation Authority Report* was written by the Department of Planning and Development. Ontario's conservation authorities were, in fact, formed to manage water quality as well as water quantity. The Wildwood and Pittock reservoirs were constructed both for flood control and flow augmentation, that is, to dilute downstream sewage discharges in cities such as London.

In the mid-1970s, the International Joint Commission initiated a study called PLUARG (Pollution from Land Use Activities Research Group) in the Great Lakes Basin. From 1974 to 1977 field work was undertaken and water samples were collected in 11 small agricultural watersheds, including the Avon River. The main conclusion was that excessive phosphorus loads were leading to the eutrophication of the Great Lakes. This set the stage for many future studies.

The Stratford/Avon River Environmental Management Project (SAREMP) was one product of the PLUARG study. The project was groundbreaking for soil conservation, providing excellent techniques for farmers including cover crops, conservation tillage and berms. The results of SAREMP led to provincial grant programs such as OSCEPAP (Ontario Soil and Crop Enhancement and Protection Assistance Program) and Land Stewardship, targeted at the farming community.

The *Lower Thames Valley Conservation Report* of 1966 examined water quality concerns in this part of the watershed. Other studies in the UTRCA watershed included the Thames River Basin Study of 1975 which looked at pollution in the entire watershed. In the late 1970s and early 1980s, the Thames River Implementation Committee (TRIC) was established to address soil and water conservation in rural and urban areas, with a focus on soil conservation and phosphorus reduction.

By the 1970s, the reservoirs at conservation areas had become popular swimming areas for the public (see Recreation). Local health units began to sample them routinely for bacteria levels. By the late 1970s and especially in the mid-1980s, Pittock, Fanshawe, and Wildwood reservoirs were experiencing routine beach closures due to poor water quality primarily from elevated bacteria levels. This was a common scenario across southern Ontario in rural areas.

In 1985, the Ontario Ministry of the Environment (OMOE) responded to the situation by creating and funding a Provincial Rural Beaches Strategy Program. The UTRCA was one of the few agencies involved from the outset. UTRCA staff spent three years collecting and compiling survey data, and conducting field studies and literature reviews. This information was the basis for a model which assessed the impact of pollution sources at the beaches. In 1991, once the problems associated with rural water quality were fairly well understood, the Ontario Ministry of the Environment and Energy (OMOEE) announced the creation of the Clean Up Rural Beaches (CURB) Program across Ontario. The UTRCA was among the first authorities to offer this grant program to rural landowners in their watershed to address problems on their farms and properties which were causing water pollution. In 1993, the LTVCA joined in, though on a smaller scale. The program ran until 1995

when provincial budget cutbacks forced the cancellation of the program. Subwatershed studies are still carried out with emphasis on grassroots partnerships and finding new solutions.

Figure 15.2 Water Sampling Along the Thames

Source: UTRCA

In addition to the studies described above, the OMOEE funded a provincial water sampling program (PWQMN) which lasted from the 1970s until 1995. The Ministry, working in partnership with the Conservation Authorities, sampled designated rivers and creeks on a monthly basis. A variety of pollutants were analyzed including heavy metals, phosphorus, nitrogen, bacteria (fecal coliform), oxygen, and turbidity. There were 34 sampling stations along the Thames River. The program ended in 1995 due to funding cutbacks, but this database provides excellent long-term information on the quality of the Thames River and its tributaries.

In 1992, the UTRCA and the University of Western Ontario teamed up to establish a Benthic Monitoring Program. Approximately 80 stations in the upper Thames watershed have been sampled. Benthic organisms include a variety of invertebrates which live on the bed of a stream or river, such as mayfly nymphs and worms. Since each species has a preference for good or poor water quality, this is a good indication of stream health. Sampling takes place once a year instead of weekly or monthly as is the case for water samples.

In the last decade, the LTVCA and the UTRCA have had strong water and pollution conservation programs, many of which were quite innovative. A summary of projects is given in Table 24 of the Appendix. The following is a sample of a few projects that the UTRCA has undertaken:

- septic system study to monitor four alternative designs to better protect surface and ground water,
- constructed wetlands as a low-cost alternative to control manure runoff,
- erosion control projects to protect water quality,
- paired watershed studies showing improvement in rural subwatersheds.

In summary, the quality of the Thames River has suffered due to its long history of land use development, but significant improvements have been made. Partnerships between government, academia, industry, and local communities have been forged; working together, they will continue the important work of finding solutions to water quality problems.

15.3 Pioneering Improvements In Aquatic Ecosystems

The early pioneers of Ontario falsely believed in the inexhaustible abundance of wildlife and fish resources. It was not until 1821 that the first Game Acts and Fisheries Acts were written (Lambert, 1967, 447). Yet, without an efficient means of enforcing these Acts, they failed to protect local fisheries. Historians have noted that the "first twenty-five years after Confederation saw little but paper legislation and (in the case of fish) constitutional wrangling over jurisdiction" (Lambert, 1967, 449).

The decrease in the fish population in the Thames was attributed to deforestation (see section 10.4), the loss of fish habitat, disease, destructive fishing, illegal fishing (i.e. out of season), and loss of spawning grounds (Bennett, 1971, 3).

An 1892 Royal Commission Report on Game and Fish revealed that "the closed seasons for game and fish [were] not generally respected throughout the Province, the laws being broken by all classes of the community, principally however by settlers, Indians, boys, and pot-hunters" (Lambert, 1967, 450). Following this report, Ontario's fish laws were re-written to protect and regulate the commercial fisheries. At this time, non-residents were required to purchase licences (for five dollars), angling seasons were passed for

1892 Angling Seasons

Walleye	April 15 - May 15 (closed)
Bass and Muskey	April 15 - June 15
Suggested Sturgeon	May 1 - June 15

certain species of game, creel limits were imposed, the taking of speckled trout, bass, pickerel, and maskinonge was restricted to angling, and spawning fish or beds were not to be molested.

In his letter dated 1893 to William Smith, Deputy Minister of Marine and Fisheries in Ottawa, William Wakeham reported that three kinds of nets were licensed for use in the Thames River: seine-nets were allowed in the lower part of the river, and dip and scow nets were permitted in the upper reaches of the Thames (Wakeham, 1893, 2). Wakeham sug-

gested the following recommendations be considered in relation to the Thames:

> ...as far as the upper river is concerned I do not think it has been over fished, or that we can ever expect to see it regain its former abundance of fish life, and I would allow a limited number of dip nets and small seines to be used as was formerly done, with a close season extending from the 15th April to the 15th June. The later date here is of no real consequence as no fishing is done in the warm season. I would not allow scow nets to be used, they are per se no more hurtful than dip nets, but as their owners rove about the river they are apt to poach on the preserves of the stationary dip net fishermen and cause trouble (Wakeham, 1893, 6).

As mills developed along the shores of the Thames (see section 12.1), the number of dams, used for storing water to power the mills, increased substantially. When William Wakeham was instructed to study the condition of the fisheries in the Thames in 1893, he reported to the Deputy Minister of Marine and Fisheries in Ottawa that there were at least seven dams on the North Branch, at least five dams on the South Branch, and three dams below London (Wakeham, 1893, 1). Wakeham noted that all of these dams were equipped with fish ladders.

In 1907, the fish and game authorities were amalgamated under the title of Game and Fisheries Department. For the next 39 years, the Department made progress in improving and enforcing conservation laws (Lambert, 1967, 451). During this time, attention focused on restocking Ontario's waters. In fact, as early as 1901, records indicate that the Thames was stocked with 1,196 Smallmouth Bass (Bennett, 1971, 10). In 1924, the Thames was stocked with 100,000 Walleye and, one year later, another 400,000 Walleye (Bennett, 1971, 10). Once the Fish Culture Branch was established, approximately 20 hatcheries and fish-rearing ponds were acquired.

In 1926, the Fish Culture Branch of the Ontario Department of Game and Fisheries also began studying pollution in various areas of Ontario. Back in the late 1800s, residents along the Thames had already recognized the need for pollution control in the river (see section 15.2.1), yet early efforts were unable to control this problem. In 1952, the *Upper Thames Valley Conservation Report* noted that over-loaded sewage plants were harming the fish habitat in the Thames (Dept. of Planning, 1952, 186). Five years later, a fisheries study concluded that:

> Due to the heavy pollution entering the Thames River in the north and south branches in the City of London and the City of London Sewage Disposal Plant dumping into the river below the forks, the pollution has become so bad that fish are unable to come up stream. Sewage in solid form from the disposal plant was continually filling up the net and aquatic growth kept covering the wire mesh... (Beck, 1957, 37).

When, in 1957, the Ontario Water Resources Commission took on the responsibility for investigating and controlling pollution, the Thames River became part of their focus as well (see section 15.2.1). As water quality studies continued (see section 15.2.4), the condition of the Thames improved significantly.

Today, much attention continues to focus on managing game fishing in the Thames River (see Recreation, 22.0). Such groups as the London Sport Fishery Association (formed in 1989) work to improve urban fishing opportunities by "promoting local fishing clubs, encouraging fishing by people who represent the broad social and cultural diversity of the population, promoting year round fishing, addressing issues relating to the quality of fishing, and initiating fisheries enhancement projects in partnership with the Ministry of Natural Resources" (London Sport Fishery Guide, pamphlet).

15.4 Pioneering Access and Use Regulation*

15.4.1 Different Types of Riparian Rights

Throughout history, river front property has been highly valued (see section 13.2). As such, individuals, building contractors, land developers, and institutions have all encroached on the Thames River floodplain. Once the UTRCA and later the LTVCA were formed, they were able to protect their watersheds through the Conservation Authorities Act, passed in 1946 (see section 15.1.4).

"The placement of fill and the construction of buildings within a flood plain can reduce the natural storage area of a watercourse and increase its potential flood levels which may lead to property damage and loss of life. This may also represent a source of pollution through increased erosion and sedimentation of the water course" (UTRCA, 1982).

At first the authorities were primarily concerned with flooding; because land use regulations minimize flood hazards, restrictions limiting use within the flood line were emphasized by both authorities. A 1956 amendment to the Conservation Authorities Act enabled conservation authorities to prohibit or regulate the dumping of any kind of fill below the high water mark of any river, creek, or stream. These powers were strengthened in 1960 (Mitchell, 1992, 192). Revisions to the Act also regulated the construction of buildings or structures in or on ponds, swamps, or floodplains. As well, the authorities were able to monitor the modification or alteration of existing channels of watercourses.

One of the first actions of the LTVCA when it was created in 1961 (see section 15.1.4) was to implement *Fill, Construction, and Alteration of Waterways Regulations* (Ontario Regulation 170/90) under Section 28(1) of the Conservation Authorities Act. The *Fill Regulation* "applies to the area adjacent the Thames River in Chatham and downstream of the city and the area adjacent the McGregor Creek in Chatham" (LTVCA, 1995, 3). Similarly, within the UTRCA watershed, *Fill Regulations* apply to specific areas detailed in fill line maps which are based on such considerations as the surrounding floodplain, wetlands, and valley slopes susceptible to flooding. Within each watershed, the *Construction Regulation* applies to all areas prone to general flooding. Finally, the *Alteration of Waterways Regulation* applies to all watercourses within the jurisdiction of each authority.

Summary

The significance of the application of elements of *Environmental Regulation* within the Thames watershed lies chiefly in its role in the development and application of approaches to flood control and land and water management, which led directly to the passage of the Conservation Authorities Act (1946), the creation of the first Conservation Authorities, and the construction of the first multipurpose conservation area in association with the Fanshawe Dam.

*Please see the First Nations section for information regarding *Aboriginal Rights and Claim Settlements Affecting Water Use Rights and Entitlements.* Information relating to *Protected Areas* is covered in the Recreation section.

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Canadian Heritage Rivers System

Part 2b - Human Heritage/First Nations: Thames River Watershed

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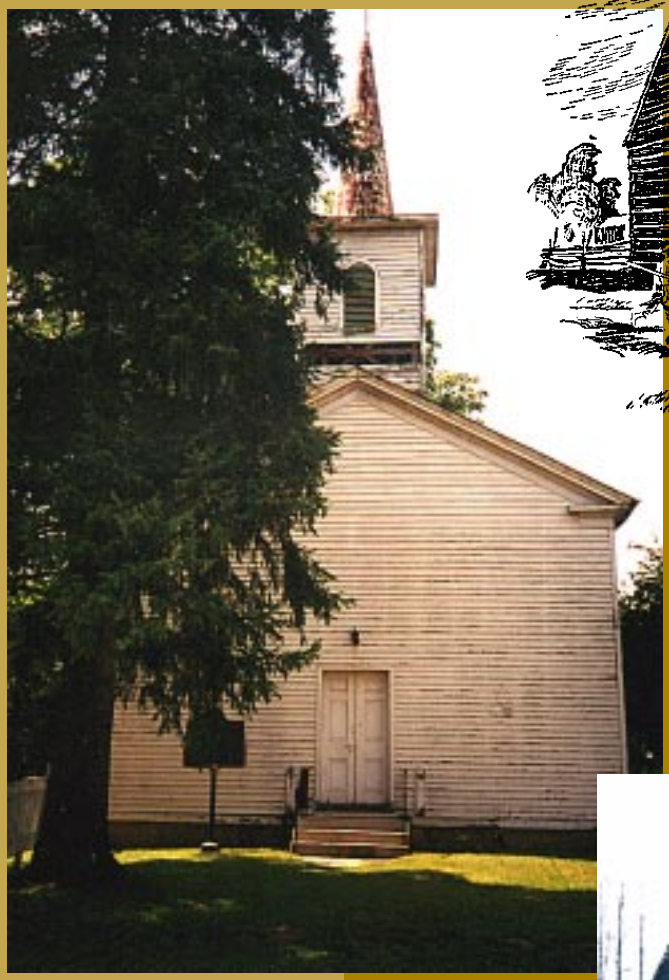


First Nation Heritage

For thousands of years, Aboriginal peoples have lived along the Thames River. In the past 400 years, four distinct First Nations have settled permanently along the banks of the river. They were attracted to the Thames because it offered an excellent means of transportation. As well, the surrounding area was largely uninhabited by Europeans and offered excellent hunting and fishing. Each nation is distinct in terms of culture, language, religion and history, not only to southwestern Ontario but to Canada as a whole. The four First Nations include the Chippewa of the Thames (Deshkan-Ziibi), the Oneida settlement (Onyota' a:ka), the Moraviantown Delaware and the Munsee Delaware. Figures 17.3 and 18.4 illustrate the historical and present locations of each First Nation along the Thames.

The First Nations that settled along the Thames are unique to Canada in terms of cultural and historical identity. The Chippewa people of the Thames are representative of the cultural group known as the Aniishnaabe, a group which has influenced Southwestern Ontario history since the dispersal of the Huron people in the 1650s. The Chippewa people have lived along the Thames longer than the other First Nations. The Chippewa culture and language is different from the other Nations. The Oneida settlement is the largest concentration of Oneida people in Canada. Members of the Iroquois Confederacy, the people of Onyota' a:ka are significantly different from other Nations on the Thames in terms of culture, religion and language. The two Delaware Nations, Moraviantown and Munsee, are the only Delaware people in Canada, except for a few hundred residing on Six Nations near Brantford, Ontario. The Delaware, or Lenne Lenape, possess a distinct culture and language from the other Nations. The Moraviantown settlement was initiated by Moravian missionaries in the late 1700s, making it one of the earliest communities in Southwestern Ontario and one of the few Moravian missions in Canada.

Methodology

Regarding the First Nations component of Human Heritage, information was obtained through various resources. Significant information was detailed through personal conversation. These conversations supported the material which was obtained from secondary sources. Primary or secondary sources were useful but many older non native accounts were discarded in favour of First Nations or modern historical accounts. Information from area First Nations support organizations and Band offices proved immensely helpful in completing this component.

Chapter 16

Pre-contact Aboriginals and First Nations Peoples

This chapter presents a summary of the pre-European (pre-contact) human heritage of the Thames which preceded the arrival of the present day First Nations (Chapters 17-20). The Thames is unique among major rivers in Eastern Canada in terms of the length and continuity of pre-contact Aboriginal cultures. These date back over 11,000 years to the Palaeo Indian cultures, and were followed by cultures belonging to the Archaic, Initial and Terminal Woodland periods (see Table 16.1).

Table 16.1 Chronological Chart of Ontario Prehistory

Years Ago	Period	Southern Ontario
250	Terminal Woodland	Ontario Iroquois and St. Lawrence Iroquois Cultures
1000		
2000	Initial Woodland	Princess Point Culture Saugeen-Point Penninsula - Meadowood Cultures
3000		
4000		
5000		
6000	Archaic	Laurentian Culture
7000		
8000		
9000	Palaeo - Indian	Plano Culture
10,000		
11,000		Clovis Culture

Occupance was continuous until about 1650 A.D., and included the first agricultural activity in what became Canada. Each culture used the Thames for a number of purposes, including hunting, gathering, fishing and transportation, and left evidence of their occupance and activity in a large number of archaeological sites along the main branches and tributaries of the river and within the interfluves (see Figure 16.1). This makes the Thames watershed one of the most significant archaeological areas in Canada. The rest of this chapter reviews some of the more important aspects of this Aboriginal cultural heritage.

16.1 The Palaeo Indian Period (9,000 - 5,000 B.C.)

Up until about 14,000 B.C. almost all of southern Ontario was covered by the ice sheet of the last continental Wisconsin glaciation. Between 14,000 and 11,300 B.C. portions of what is now southwestern Ontario began to emerge. While the ice did not leave the whole of southern Ontario until about 8,500 B.C., the southwest was ice-free by 11,000 B.C. and gradually assumed its current landscape, including the Thames River. The latter developed first draining the Interlobate ice fronts into an earlier Lake Erie during the Holocene. As the ice retreated, climate gradually warmed and the area underwent a sequence of vegetation types: first tundra, then predominantly spruce and pine (boreal) forest, and then finally giving way to the mixed hardwoods by about 7000 B.C..

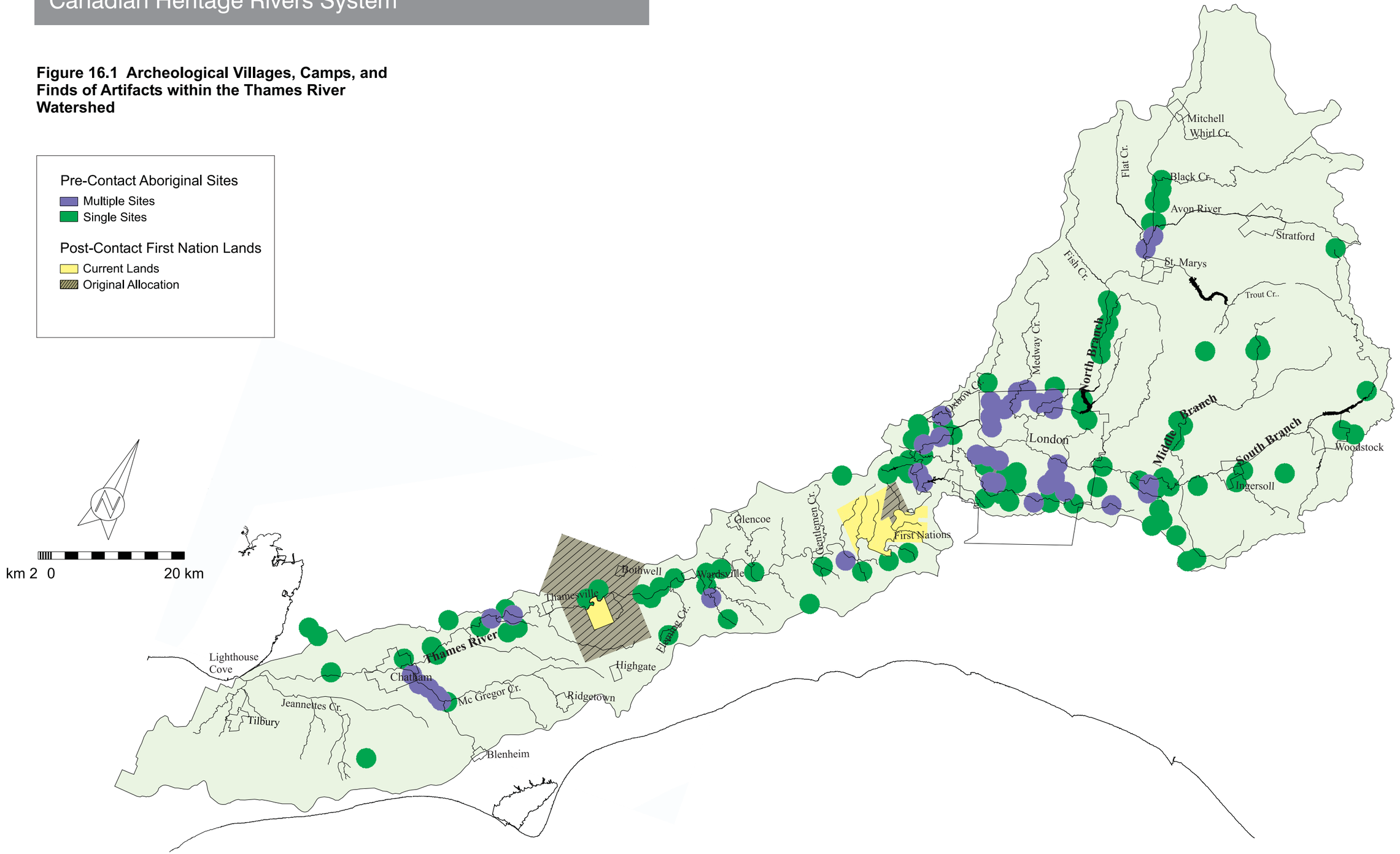
As the landscape emerged and was vegetated, it was occupied by Palaeo Indian hunters of the Clovis culture. These people were part of those Aboriginal migrants who invaded North America *via* the Bering land bridge and spread rapidly south. They were hunters of large mammals, including now extinct mammoths and mastodons. By 9,000 B.C. they had entered the Thames watershed. Evidence of remains of the mammoths and mastodons have been identified, as well as numerous locations with quantities of the characteristic fluted stone dart heads the hunters used. Sites include finds from both the Early and Late Palaeo Indian periods. These peoples were nomadic, but the wealth of evidence suggests that they were constantly in the Thames watershed for between 3,000 and 4,000 years. The evidence allows archaeologists to note the gradual transition in terms of tools and techniques which evolved into those of the Archaic period.

16.2 The Archaic Period, 6,000 - 1,000 B.C.

By 6,000 B.C., both climate and vegetation were beginning to assume their present-day characteristics. Boreal forest had given way to mixed hardwood (Carolinian) forest and the remaining large game (caribou) had migrated northwards. In their place were deer and smaller game, including birds such as turkeys. The peoples who hunted in the watershed also engaged in fishing in the rich waters of the Thames.

The Early Archaic period overlapped with the Palaeo Indian period and both peoples had similar lifestyles. However, archaeological evidence from the Middle Archaic

Figure 16.1 Archeological Villages, Camps, and Finds of Artifacts within the Thames River Watershed



period includes new tools such as grooved axes and the use of rocks as fish net sinkers. The earliest evidence of fish weirs dates back to 3,000 B.C.. The Later Archaic culture also includes ritualistic burial in cemeteries, and the use of pipes.

Sites from the Late Archaic are particularly prominent in the Thames watershed. Early Archaic occupance also coincided with lower lake levels such that shoreline sites are now inundated. From the Middle Archaic period (3,500 B.C.) there is evidence of increasing population which produced larger and more permanent sites. This trend coincided with a warming period which extended the summer, and is most marked in the Late Archaic period. The latter period sees a great emphasis on grave goods which include items of copper and conch shells, evidence of trade extending from southwestern Ontario as far as Lake Superior and the Gulf of Mexico.

Although much remains to be determined about the Archaic cultures, there is no doubt that the Thames watershed contains significant evidence of continuous occupance and is among the areas upon which further archaeological investigations will focus. In addition, it may be a significant area in which to unravel the relationships between the Algonquian and Iroquoian speaking peoples.

16.3 The Woodland Period, 1,000 B.C. - 1650 A.D.

The most recent pre-contact era is termed the Woodland Period. The key distinction between Archaic and Woodland cultures is the adoption of pottery by the latter. Pottery was introduced from the south and became part of south-western Ontario culture between 700 and 1,000 B.C.. The Woodland period can be divided into three parts: the Early and Middle (together termed the Initial Woodland), and the Late or Terminal Woodland periods. The Early Woodland is the last period in which the Aboriginal inhabitants relied solely on hunting, gathering and fishing. The particular variant established in the Thames watershed has been called the Saugeen Culture or more recently the Meadowood (900-400 B.C.).

Numerous evidences along the Thames, and other streams emptying into Lake Erie, attest to the importance of fish in the diet. Large finds of sturgeon and drum bones suggest that the Thames was of major importance during the spring spawning runs. Fishing sites were occupied by large groups during spring and summer and have left the first substantial remains of the typical long houses. In the absence of a stored staple (e.g. corn) however, the houses were abandoned for more dispersed winter hunting camps.

About 500 A.D. the Meadowood culture was pushed north by migrant groups who entered along the Lake Erie shore and occupied the Thames. This transition to the Middle Woodland period is known as the Princess Point culture, which in turn was a locally developed example of the Hopewell culture that is distinguished by its cord-malleated pottery. Most important, however, was the fact that the Princess Point culture marked the introduction of corn to southern Ontario (and Canada). Therefore, the Middle Woodland period is transitional as it marks the key shift from a non-agricultural to an agricultural regime based on the classic Meso-American maize (corn) culture. The latter was initiated with the domestication of corn about 6,000 B.C. in Mexico, but took over 6,000 years to spread this far north. Not only was this area of southern Ontario closest to the source, but was one of the few areas in Canada where the climate was suitable.

Figure 16.2 The Late Woodland Period -- Life Along the Thames River

(source: Finlayson, 1990)

Although corn was a valuable addition to the diet and led to a partially more sedentary lifestyle and larger villages, the Princess Point culture still relied heavily on fish and game. Gradually, however, there evolved a new culture which has been termed the Western Basin and which was to become that of the Ontario Iroquois. The Western Basin period is synonymous with the Terminal Woodland period (900 - 1600 A.D.). From about 900 A.D., a recognizable Iroquois culture began to emerge based on corn and supplemented by fish and game. Among its features were large palisaded villages with several longhouses, and bundle burials combined with ossuaries.

The Thames and its watershed emerged to occupy a prominent place in the evolving sequence of Iroquoian people. Initially the Princess Point gave way to the Glen Meyer culture, which was related to but separate from the Pickering culture, with whom there was periodic fighting. By 1300 A.D., the Glen Meyer culture was overrun by a branch of the Pickering. From this latter group there evolved the Neutral-Erie branch of the Iroquoian peoples. Several sub-stages are found in the Thames area, including

the Uren and Middleport. But, finally, around 1400 A.D. the group split and the Neutrals emerged as the independent tribal group that occupied the southwest. At this time, such elements of American agriculture as beans and squash made their appearance to provide a more complete agricultural food base which, in turn, allowed for larger concentrations of people in semi-permanent villages.

The archaeological evidence is most abundant from this late pre-contact era, and includes a number of village sites in the Thames watershed, including that at Lawson. These last centuries before and immediately after the European contacts in the early 17th century were, however, very tumultuous. Inter-tribal warfare and cannibalism were common and then, following contact with the French, came involvement in the fur trade, which finally led to warfare in which the Ontario Iroquois (Neutral, Erie, Petun and Huron) were defeated, dispersed or absorbed by the Iroquois League of Five Nations between 1649 and 1654. From 1654 until 1750, the Thames valley was greatly de-populated, but gradually became an integral part of the Indian territory centred in the Ohio Valley. Finally, in the 1790s the first of the groups who are the ancestors of the present First Nations along the Thames, the Moravian and Munsee Delawares, came to settle. Their history and cultural heritage is described in Chapters 17-20.

Summary

The significance of the pre-contact Aboriginal occupance of southwestern Ontario and especially the Thames valley and its watershed is fourfold, namely:

- **Occupance of a continuous nature over approximately 11,000 years, representing the first and longest sequence of Aboriginal occupance in Eastern Canada.**

- **The longterm accumulation of the archaeological record which allows archaeologists and historians to use the Thames and its watershed to document a continuously evolving pattern of cultures and their critical artifacts.**

- **Evidence of the long-term importance of the river Thames as a major source of fish and other food items, as well as an important pre-historic route for the key transition to an agricultural way-of-life.**

- **An extension of the human record and a link to both present-day First Nations and European occupants of the Thames watershed, who can increasingly appreciate that their contemporary occupance is only the latest stage in a very long history of human cultural heritage.**

Chapter 17

Delaware of Moraviantown

17.1 Origins of The Delaware People

When European explorers and settlers first reached North America, the Lenne Lenape or Delaware First Nation peoples were settled principally in what are now the states of New Jersey, New York, Pennsylvania, Delaware and Maryland. The Lenne Lenape were known as the Grandfather tribe by other First Nations, a term of respect (Welsager, 8). Three divisions of Delaware people existed, primarily according to geographical location. The Delaware of Moraviantown are descendants of the Unami Delaware, or the "people down the river" (Weslager, 47). The Unami Delaware lived near the mouth of the Delaware River. These people were primarily of the turtle clan and spoke a slightly different dialect than the other two groups.

17.2 Relocation to the Thames River

Between first contact with the Europeans and the creation of a Delaware settlement on the Thames in 1792, the Delaware people were pushed from their original homelands by English settlers. Moravian missionaries from Germany began to convert the Delaware people to Christianity in the early 1700s. Driven from their homelands, the "Moravian Delaware" settled in what is now Ohio. Under Moravian influence, this group of Delaware neither took part in the Seven Years War (1756-1763) between the English and the French, nor did they actively participate in the American Revolution (1776-1783). Unfortunately in the latter conflict, the Americans viewed most First Nations as loyal to the British Crown. In 1781, an American army marched on Gnaddenhutten, a large Moravian Delaware settlement near Sandusky Ohio. One hundred Delaware were executed (Weslager, 316). After the massacre, the Moravian Delaware settled close to the British military post at Detroit.

In 1792, the Moravians recieved permission to establish a mission post on the Thames River (Weslager, 46) from the Indian Department (Akwesasne, 82). In late 1792, the community of Fairfield was established with one hundred and fifty Christian Delaware inhabitants (see Figure 17.3) (Zeisberger, Dec 1792). The town was described as the "first European style town in southwestern Ontario" (Stonefish, 7). The site was chosen because the land was suitable for crops and there was abundant spring water and trees to build canoes (Stonefish, 6). The Moravian Delaware traded extensively with settlements in Amherstberg and Detroit and the Thames River provided an excellent transport route in a region with few roads.

17.3 Riparian Settlement

The first Moravian mission at Fairfield existed from October 1792 until October 1813. This original mission was

Figure 17.1 New Fairfield: Church

(source: Ian McCallum, 1997)

Figure 17.2 New Fairfield: Mission House

(source: Ian McCallum, 1997)

Figure 17.3 Historical and Present locations of the Delaware of Moraviantown First Nation

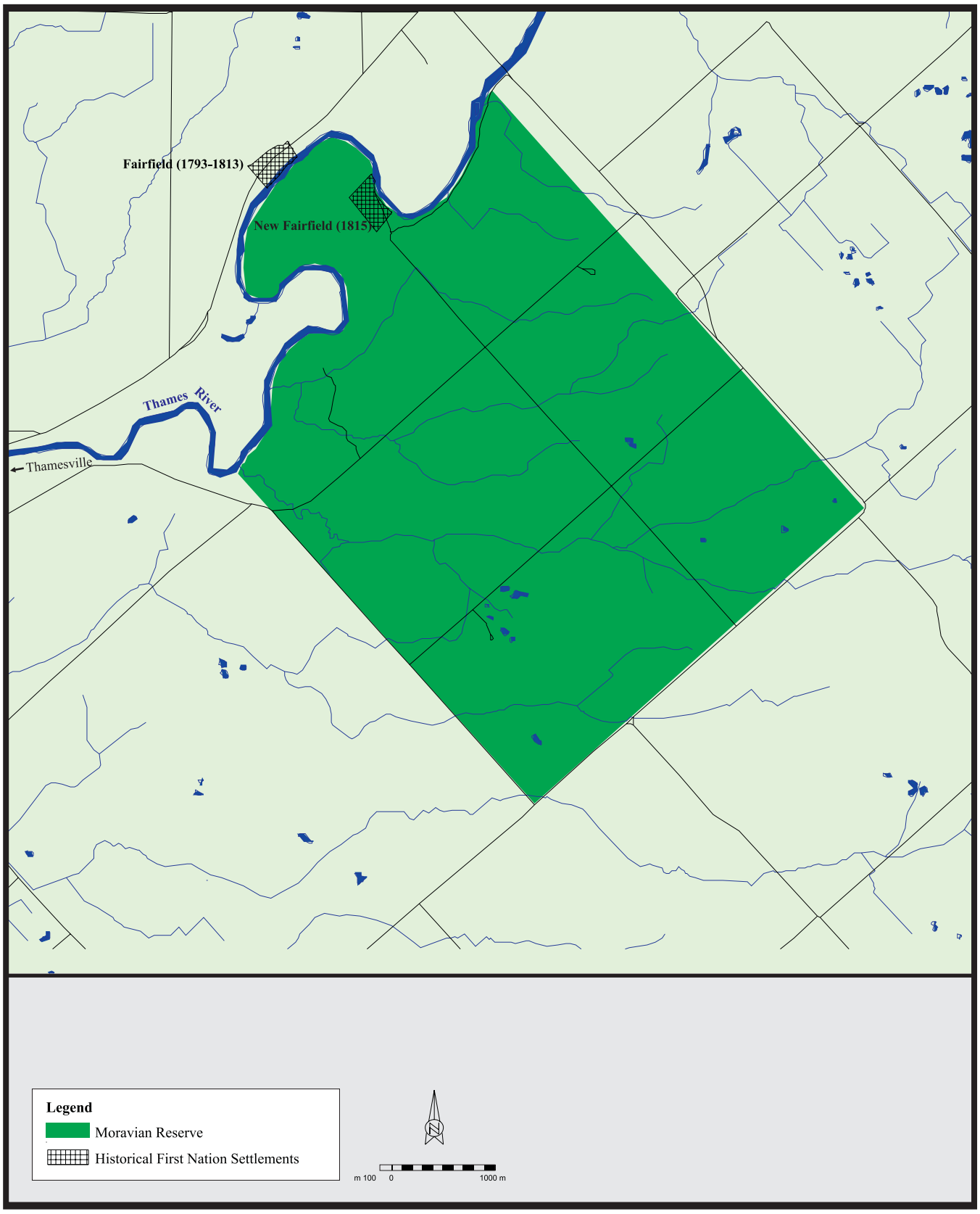
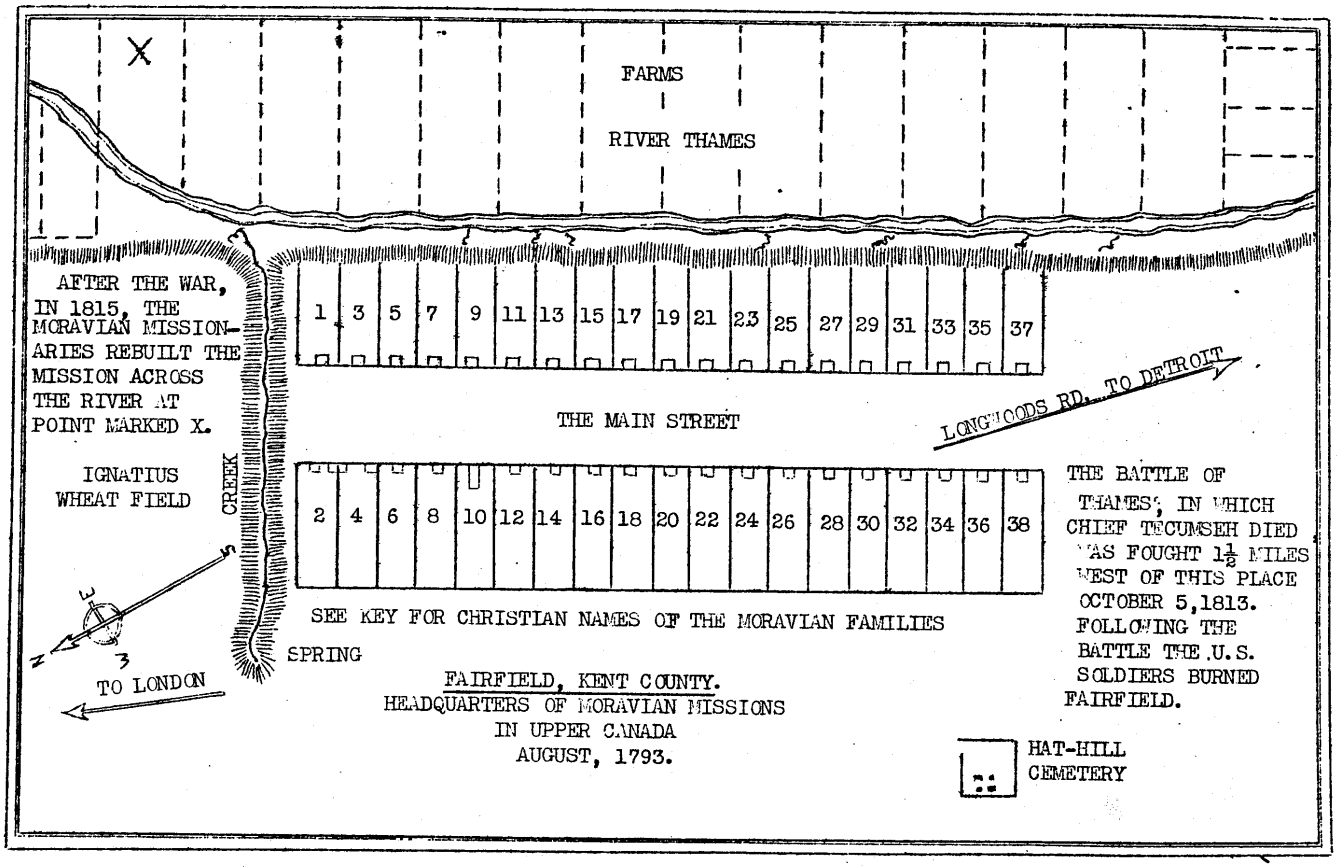


Figure 17.4 Fairfield, 1793
(Source: W. Jury, *Fairfield on the Thames*)



destroyed by an American army during the War of 1812. A subsequent mission was constructed opposite this site in 1815 and named New Fairfield. Considerable archaeological study was conducted in the 1940s by Dr. Wilfred Jury on the original Fairfield site.

Between 1942 and 1946, Jury made four excavations on the site and determined the location of the houses of the missionaries and the Delaware. They were aided by Patrick McNiff's survey which was completed in 1795. The cellars of the buildings were excavated and the physical size of the buildings was ascertained. Jury concluded that Fairfield was a planned settlement (Jury, 14) with buildings located on the north and south side of the Longwoods Road.

In September 1943, archaeologists further excavated the Fairfield site. The homes of two Moravian missionaries, Brother Sensman and Brother Jung were distinguished from the McNiff survey and also from artefacts from the site. German coins, the remains of a clerical coat and broken dishes (Jury, 21) distinguished these homes from the homes of the Delaware. Archeologists concluded that the Delaware homes were built of logs and had fireplaces in the centre. The Delaware homes were devoid of fancy European items but yielded earthen pottery, iron pots and axe heads (Jury, 28). The cemetery in which Delaware converts and Moravian missionaries were buried was also rediscovered.

The last two excavations on the Fairfield site in 1945 and 1946 determined the location of the bridge which connected the village with the Longwoods Road to the east. It was built in July/August 1797 (Zeisberger, journal) and was a major trade link for the mission and surrounding settlers. The position of the church was also discovered as were old corn fields which existed on both sides of the river (see Figure, 17.4). Interesting items found during the excavations included a pair of oil burning betty lamps (Jury, 5). This suggested that the Moravians may have been burning domestic oil that may have been found on the Delaware territory (Gray, 299).

New Fairfield was established in 1815 directly across the river from the old village. The new mission was located on the south bank of the river flats. The church and the mission house of this village still exist (see Figures 17.1 & 17.2). The church and the mission house were built in 1848 to replace older structures (see Figure 17.5). The pattern of the village was most likely similar to that of the original mission as noted in a water colour of the site as it appeared in 1838 (see Figure 17.6). The Delaware were forced to move south of the river as Moravian lands north of the Thames were surrendered in October 1836. The Delaware gradually moved from the central village to other parts of the reserve. The church, cemetery and mission

house, are three visible remains of New Fairfield. The current settlement incorporates 1266 hectares (Akwesasne, 82).

17.4 Religion

The Delaware of Moraviantown have, since their arrival in Canada, followed two forms of religion. Throughout the 1700s Moravian or German missionaries converted many of the Delaware nation to a Protestant form of Christianity. Other Delaware followed the traditional teaching and religion of the people.

The Moraviantown settlement on the Thames followed Protestant preachings. Until 1902 when the mission was sold to the Methodist church, the Moraviantown people to some degree, practised the Moravian faith that was taught by the missionaries. With the close proximity to the Munsee people, many people of Moraviantown practised the First Nations religion of their kinsfolk, albeit in secret (Stonefish, 7). Moravian teachings stressed spiritual unity, daily meetings and daily prayer. The Moravian missionaries held various feasts throughout the year, the most notable being the "love feast" which occurred after baptisms. The Moravian mission was fairly unique to southern Ontario and Canada. No other Moravian missions existed in Canada except for those on the Atlantic coast of Labrador (Nain, 1771).

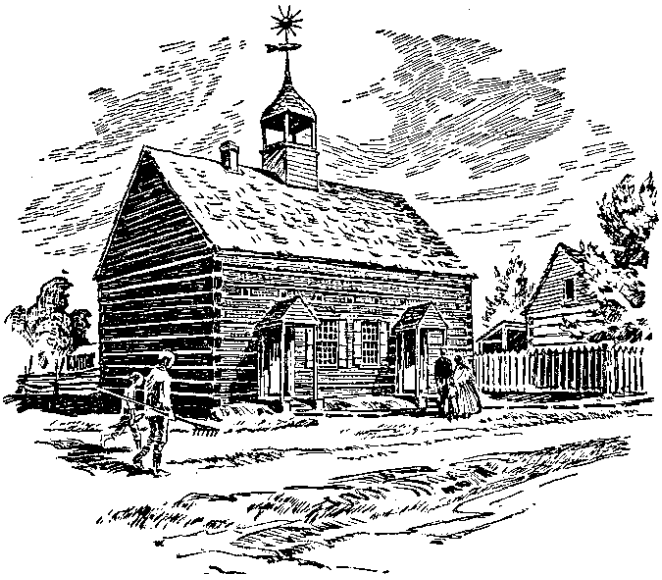
Delaware religion was practised by both the Moraviantown and the Munsee people. In traditional Delaware religion there is a Great Spirit often referred to as the Creator (Weslager, 66). There are lesser spirits which are present in the different forms of nature. These spirits controlled everything that occurred in the Delaware world. Response to prayer to these spirits is "seen in the sunrise and sunset, the stars, the winds, the snows and in the spring rains that nourished the corn" (Weslager, 66). The Creator gave power to four spirits known as the Grandfathers. They take care of the four regions of the earth, cause the wind to blow in different directions and determine the weather (Weslager, 67).

Other aspects of Delaware religion include the importance of visions and the existence of guardian spirits. The guardian spirit would appear to a Delaware person in a dream. These visions may come at all stages in life. The guardian spirit took interest in the personal affairs of the individual, comforting the person in times of trouble (Weslager, 68). Dreams came to those who were chosen to prepare and administer medicine (Tantaquidgeon, 8). Usually the dreams came to chosen individuals when they attained maturity and were considered by the spirit forces to be "spiritually and morally pure" (Tantaquidgeon, 8).

Different ceremonies were held throughout the year, usually accompanied by feasting and dancing. Many of these ceremonies were for social purposes as contrary to the belief of "missionaries who tended to consider all Indian ceremonies as pagan worship" (Weslager, 68). Other ceremonies were preformed in honour of the spirits and to ask for help or protection. Any traditional ceremonies or forms of religion were practised far from view of the missionaries.

Delaware people have practised the use of sweat lodges for centuries. Heated rocks were placed inside small lodges with cold water poured over the rocks. Individuals or people entered the sweat lodge for hours, sometimes days. This was and still is practised in order to prevent ailments and as a religious purification rite (Weslager, 51).

Figure 17.5 Sketch of Original Church and Mission House (built in 1827) in New Fairfield. By L.F. Kampmann, 1842.



(source: Gray, 1956)

Figure 17.6 Watercolour of Fairfield, 1838. By P. J. Bainbrigge

(source: Gray, 1956)

17.5 Resource Harvesting

Every spring on the Thames River, the pickerel return from the lakes to spawn. The pickerel and other fish species have provided the Delaware with a food source for the past 200 years. The pickerel run in spring remains an important food resource for the Moraviantown people. In the past, Delaware people built fish weirs across the river in order to catch pickerel (Weslager, 60). These weirs were described as "stone dams laid across the Thames in the shape of a V with an opening in the middle" (Weslager, 60). Men and boys waded into the river and drove the fish to the dam where other people speared them or caught them in nets made of plaited grass (Weslager, 60). The Delaware people today use "dip nets and roll nets" (Stonefish, 68). Besides pickerel, the Delaware caught pike, catfish, Broad Mullet and Black Bass (Jury, 31).

To supplement the diet of fish, the Delaware people ate turtles (Zeisberger, 6) as well as a variety of wild game. Archaeological excavations at the Fairfield site found the bones of several animals and fowl including deer, crows, ducks, cranes, partridge, woodcock and quail (Jury, 31). Other animals that were hunted include raccoons, squirrels, muskrats, wild turkey, ground hogs and bears (Stonefish, 67). Clams were used as food and as pot scrapers (Jury, 31).

Wild fruit, nuts and plants also supplemented the Delaware diet. Women picked and dried wild berries (Hamil, 37). Archaeological evidence suggests that the Delaware ate butternuts, chestnuts, hazelnuts, hickory nuts, beechnuts, apples, plums and cherries (Jury, 31). They also made maple sugar in the spring, tapping the trees and boiling the sap to sugar (Jury, 31). Sugar maples were and still are an abundant species on the Delaware reserve.

Oil and salt were other resources which were used by the Moravians and the Delaware alike. The 1945 excavation of Fairfield unearthed two oil burning lamps (Jury, 5). Oil was known to exist in the area before 1800. Major oil recovery began in the 1860s so it may be possible that the people used oil as early as 1792. A salt spring was located on the bank of the river approximately ½ kilometre from the site of old Fairfield (Hamil, 34). The discovery of these two resources provided some independence in terms of these two commodities.

The Delaware at Moraviantown and Munsee used various indigenous tree species for herbal and medicinal purposes. For example, white pine twigs were used in a medicine for the kidneys, and the pitch was used to reduce pain. Sumac berries were used to treat diarrhea. Ironwood, juniper, white oak, wild cherry and hickory were used for various tonics (Tantaquidgeon, 108). Bark from both the red oak and elm tree was used in a tea for coughs. Bark from the sycamore was used in a tea for sore throats and the dogwood was used for body pains (Tantaquidgeon, 107).

Many plant species found along the Thames were also used for medicinal purposes. The root, the stem leaves or the whole plant were often used. There were specific times to pick the plant or root. The golden aster was used in a tea as a tonic for sick infants. Wild Carrot or Queen Anne's Lace was used for diabetics. Burdock and Blue Flag were used for rheumatism and as a blood purifier. Bloodroot was used for "general debility", blood purifier and face paint (Tantaquidgeon, 107). The various species of milkweed were used to cure epileptic fits and the jack-in-the-pulpit formed a liniment. Cattails were used in a tea to dissolve kidney stones and skunk cabbage was used to cure whooping cough and as a pain reliever (Tantaquidgeon, 108).

17.6 Conflict

The Delaware as a whole did not join the other First Nations in conflicts although the Chippewa and Munsees often attempted to coerce them into joining the battle against the Americans (Weslager, 345). Throughout the War of 1812, twenty-two warriors from Moraviantown fought in various battles on the Detroit and Niagara frontiers (Stonefish, 36), and British troops were garrisoned at Moraviantown (Weslager, 345). The town was strategic because "it was the only sizeable community between Niagara and Amherstberg and it guarded the main road (Longwoods Road)" (Weslager, 346). The Moravian schoolhouse served as a British hospital. After the Battle of the Thames on October 5, 1813, victorious American infantry burned the Moravian mission forcing the Delaware converts and the missionaries to flee to Burlington Heights where they lived for the balance of the war under British protection (Weslager, 22).

Chapter 18

Munsee Delaware

18.1 Origins of the Munsee Delaware People

Like the people from Moraviantown, the Munsee people lived primarily in southern New York state and northern New Jersey. They were known as the people of the stoney country (Weslager, 46). The Munsees were also part of the Lenne Lenape. They differed from the people at Moraviantown because their principal clans were wolf and turkey. The language spoken by the Munsees differed slightly from that spoken by the Moraviantown Delaware.

18.2 Relocation to the Thames River

The Munsee people arrived on the Thames River in 1782. Much like the Moravian Delaware, the Munsees were pushed west by increasing white settlement. Prior to settling on the Thames, this group of Munsees had settled near Buffalo and at the Six Nations reserve near Brantford (Miskokomon, 4). The Munsees settled near the Chippewa people, already living on the Thames. Much like at Six Nations, the Munsees were only to be "overnight guests" (Riley, 10). Land settlements were promised by the Indian Department in the 1790s to the Munsee people. David Zeisberger records that "the Munceys went to see the Indian agent in Detroit to get assistance. The Chippewa claim that the Munsees are living on land which is not theirs and keep telling them to move on" (Zeisberger). The Munsee people were attracted to the Thames river area because of water transportation, plentiful game, and the region was largely devoid of white settlement.

18.3 Riparian Settlement

The Munsee people originally lived close to the Thames River (see Figure 18.4). They had villages on either side of the river as is substantiated by the survey of the area by Patrick McNiff in 1793 (see Figure 18.1) and Mahlon

Figure 18.1 Delaware Settlement in 1793
(McNiff Survey, 1793)

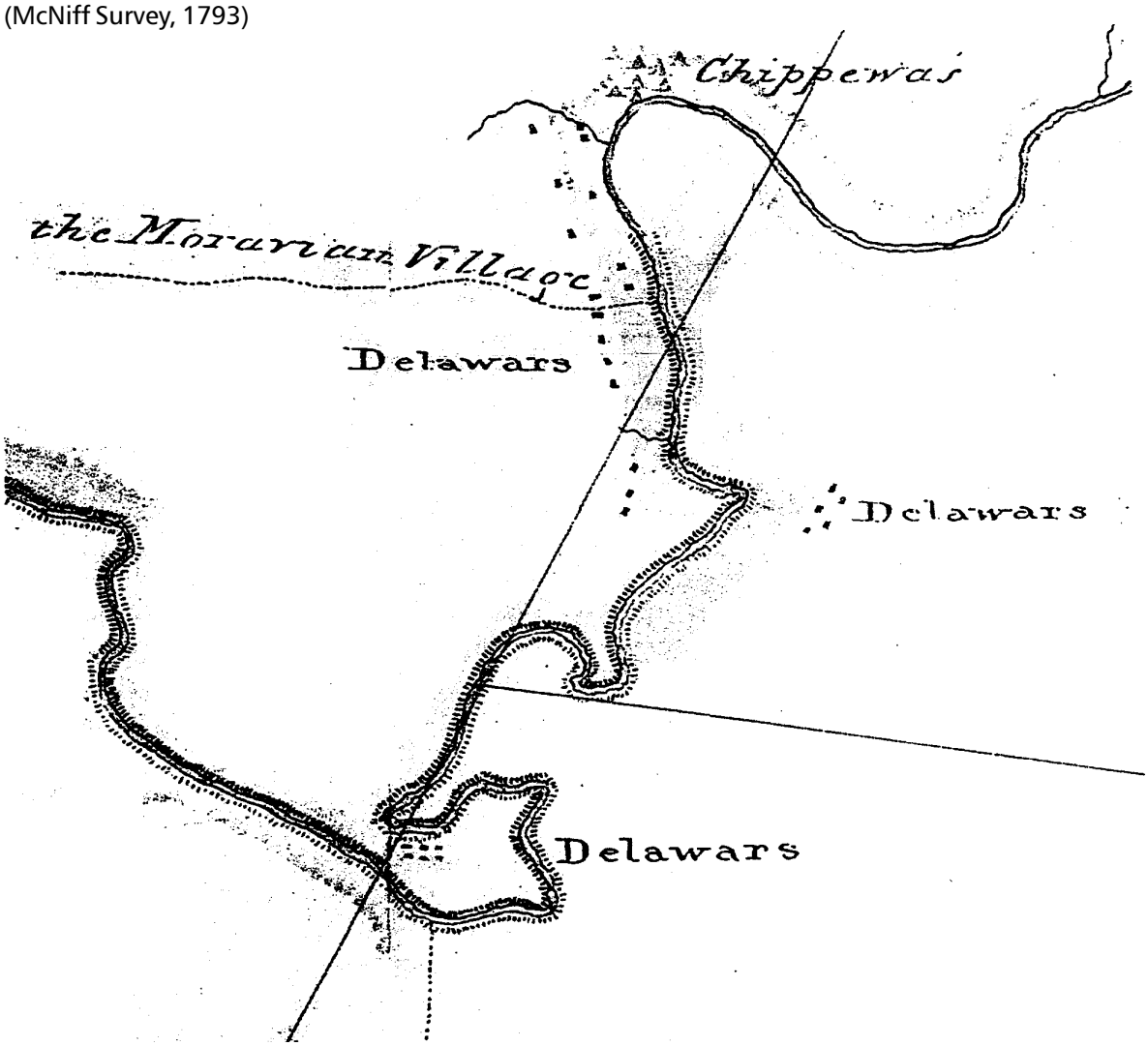
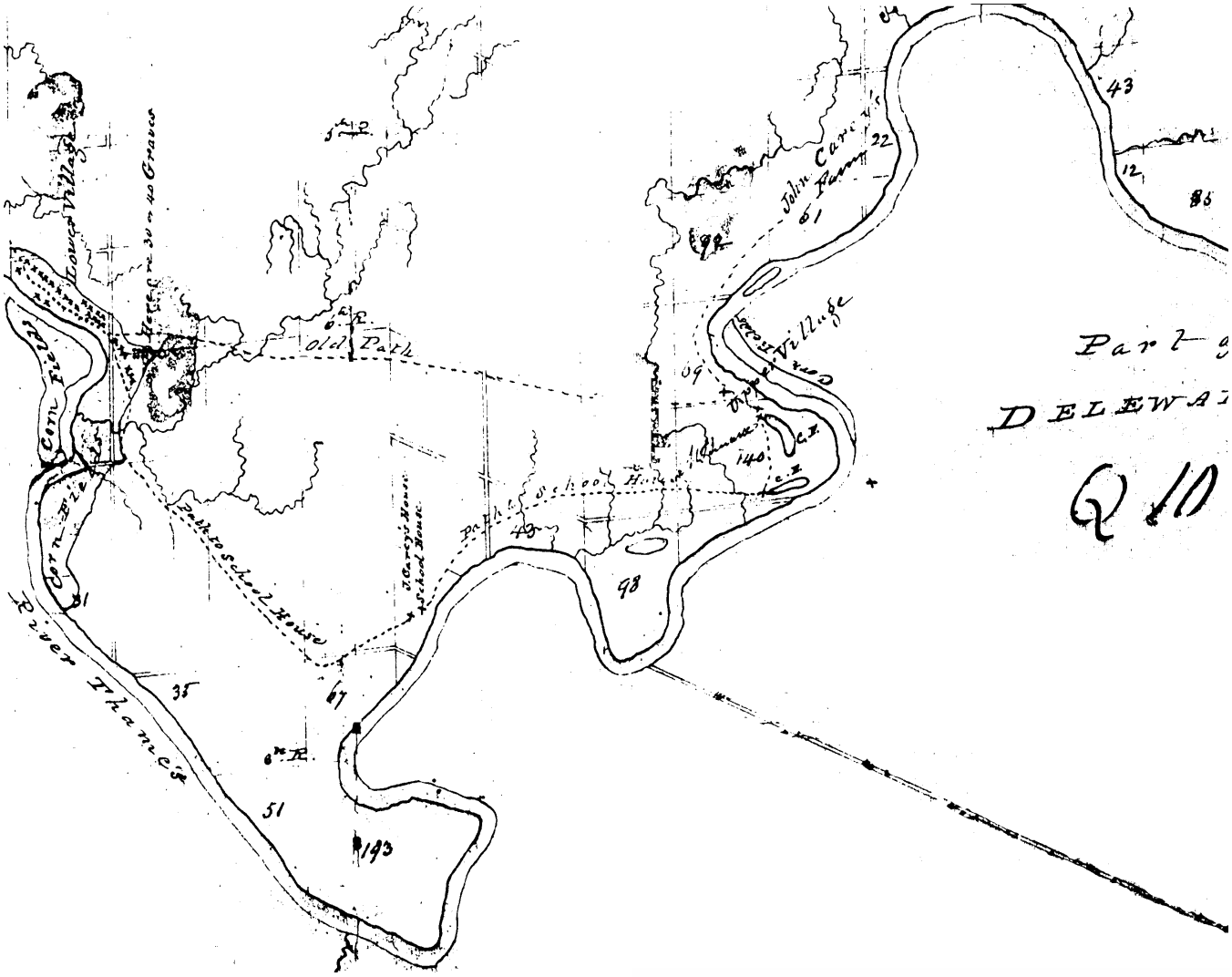


Figure 18.2 Munsee Settlement, 1826
(Source: Burwell Seerum)



Burwell's survey in 1826 (see Figure 18.2). Crops primarily were grown on the floodplain on both sides of the river. Because the Munsees were unconverted to Christianity, it can be assumed that they lived much differently than the Moravian in their planned village. Prior to 1820, the Munsee people probably lived in one room bark huts (Weslager, 50). These huts had a "gaping hole in the roof which served as a chimney" (Weslager, 50). There were no windows in the hut, only a door which would have been covered by animal skins. Beds consisted of platforms above the floor of the hut (Weslager, 51). The central fire provided for both heat and for cooking. Most likely a large extended family of ten to fifteen people lived in one hut.

After about 1840, the Munsee people had obtained their own land. For the most part, the people moved away from the river into parts of the newly created reserve. Subsequently, the Munsees began living in log cabins, a design typical to the other area reserves (see Figure 18.3). The cabins are one and a half story in size. The main floor of

Figure 18.3 Munsee Log Cabin

the cabin would have been where cooking and daily activities occured. The upper floor would have been sleeping quarters. Many of these log cabins were still in use in the 1950s.

18.4 Religion, Visions, Burial Sites

Up until the late 1850s, the Munsee people practised native religious ceremonies. The Delaware people practised the Big House religion. This was fairly unique to Canada as only the Delaware at Six Nations practised it other than the Munsees on the Thames. The Big House Ceremony was held each fall for a twelve day period. The ceremony took place inside a large building. All aspects of the building or the "Big House" represented important aspects in Delaware religion and culture. The floor of the Big House represented the tortoise, upon whose back
the earth was created. The Big House ceremony lasted for twelve days and twelve nights, symbolizing the transit of a year. In 1798, missionaries en route to Moraviantown noted disapprovingly of the "heathen ritual" (Weslager, 23). The Big House was located somewhere close to the present day village of Muncey (Weslager, 23). The Big House was still standing in 1846 but was taken down some time after.

At several times in the 1800s, several Christian churches were established on or near the reserve. The Moravians attempted to convert the Munsee people but failed in their efforts. The Methodist church and the Anglican church were established on the reserve in the mid 1800s. These churches continued with modest membership until the 1970s.

18.5 Resource Harvesting

The Munsee people used many resources similar to the Moraviantown people. Like the Delaware at Moraviantown, the Munsee people relied on the pickerel as a major food source. Every spring, the Munsees built fish dams similar to those built in Moraviantown. These dams were made of logs and large rocks in the shape of a "V" (Weslager, 60). Fish were speared or caught with bare hands. Maple sugar supplemented the Munsee diet. Today, Munsees continue to make maple sugar.

18.6 Conflict

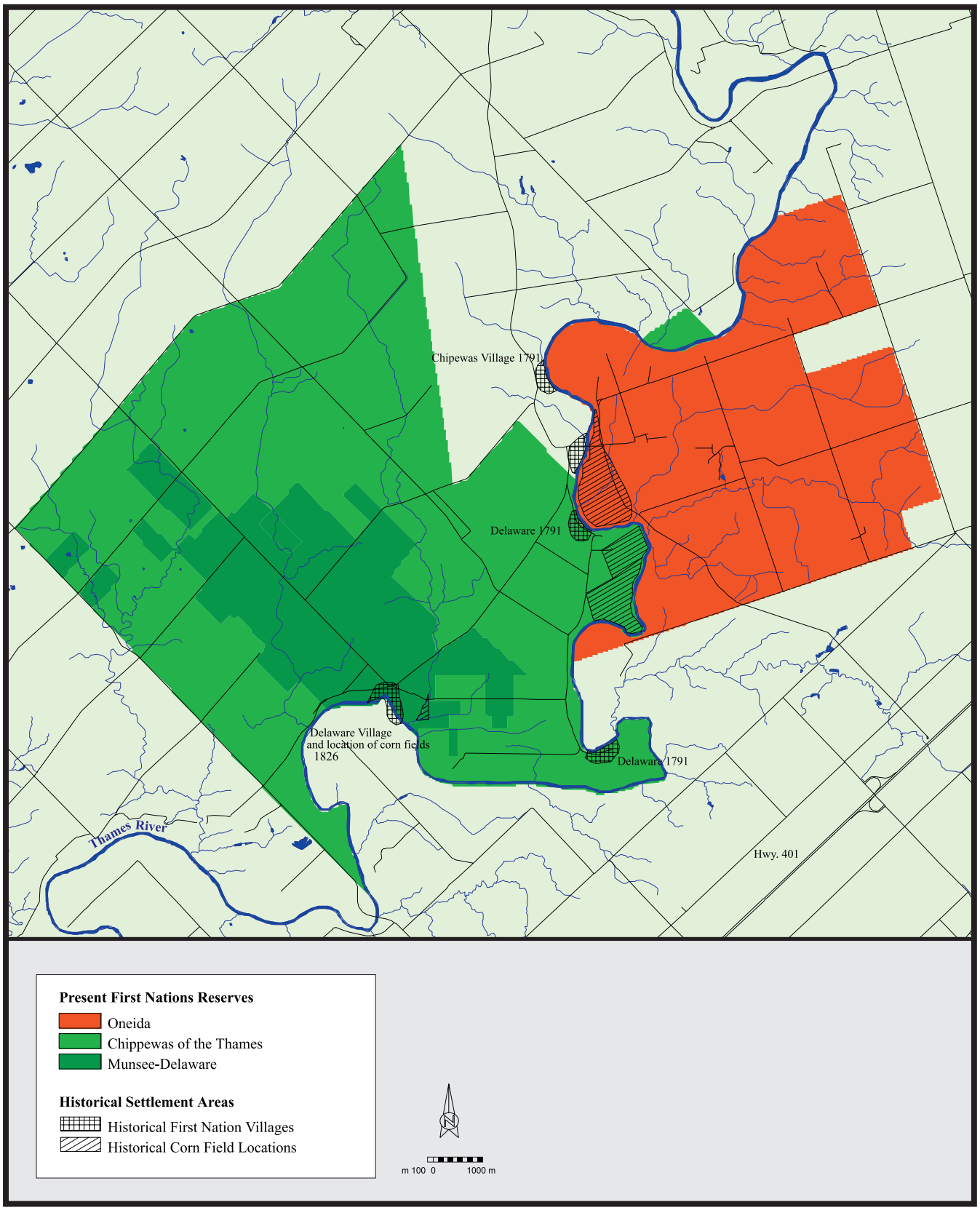
The Munsee Delaware most likely accompanied the Chippewa warriors in the battles with the Americans in Ohio in the 1790s. During the War of 1812, Munsees took part in the British siege of Detroit as well as several skirmishes leading up to the fall of Detroit. A regular soldier in the British army recorded that at the formal surrender of Detroit "Munsees were present" (Casselman, 72). Munsee warriors were also present at the Battle of Moraviantown. Private John Richardson, of the British 41st regiment, noted that many Delaware protected the flanks of the British army during the battle (Casselman, 209 and Berton, 201). Munsee warriors took part in many battles during the war, many of which were in defence of the western part of the province.

18.7 Land Claims

The present Munsee reserve was created in 1840 when the Chippewas "allotted them a tract of 1,000 acres." The reserve is encompassed by the Chippewa reserve and totals 1,054 hectares (Akwesasne, 148). However, disputes between the Munsee and the Chippewa over land have occurred since 1782, when the Munsee first arrived. These disputes were taken before Indian agents at Detroit in the 1790s. The Chippewa people contended that the Munsees were simply overnight guests and had no right to the land. Discussions between the two parties continued into the 1840s with delegations from both reserves going to England to present their cases to the crown.

Current research suggests that land settlements may have been agreed upon in 1793 and that the Munsee people were granted a large tract of land on the south side of the Thames River, opposite the present reserve. This was in accordance with British policy of the time as they sought to secure loyal allies against the United States.

Figure 18.4 Historical and Present locations of the Oneida and Chippewas of the Thames, Munsee-Delaware, First Nations



(sources: McNiff Survey, 1791)

Chapter 19

Oneida of the Thames
(Onyota a:ka)

19.1 Origins of the Oneida of the Thames

The Oneida homelands were originally in New York state, in the Finger Lakes District. They inhabited the eastern part of the Finger Lakes near Utica. The Oneida along with the Mohawk, Tuscarora, Cayuga, Seneca and Onondaga are members of the Iroquois Confederacy. The Oneida people have similar customs and language with the other Iroquian Nations.

19.2 Relocation to the Thames River.

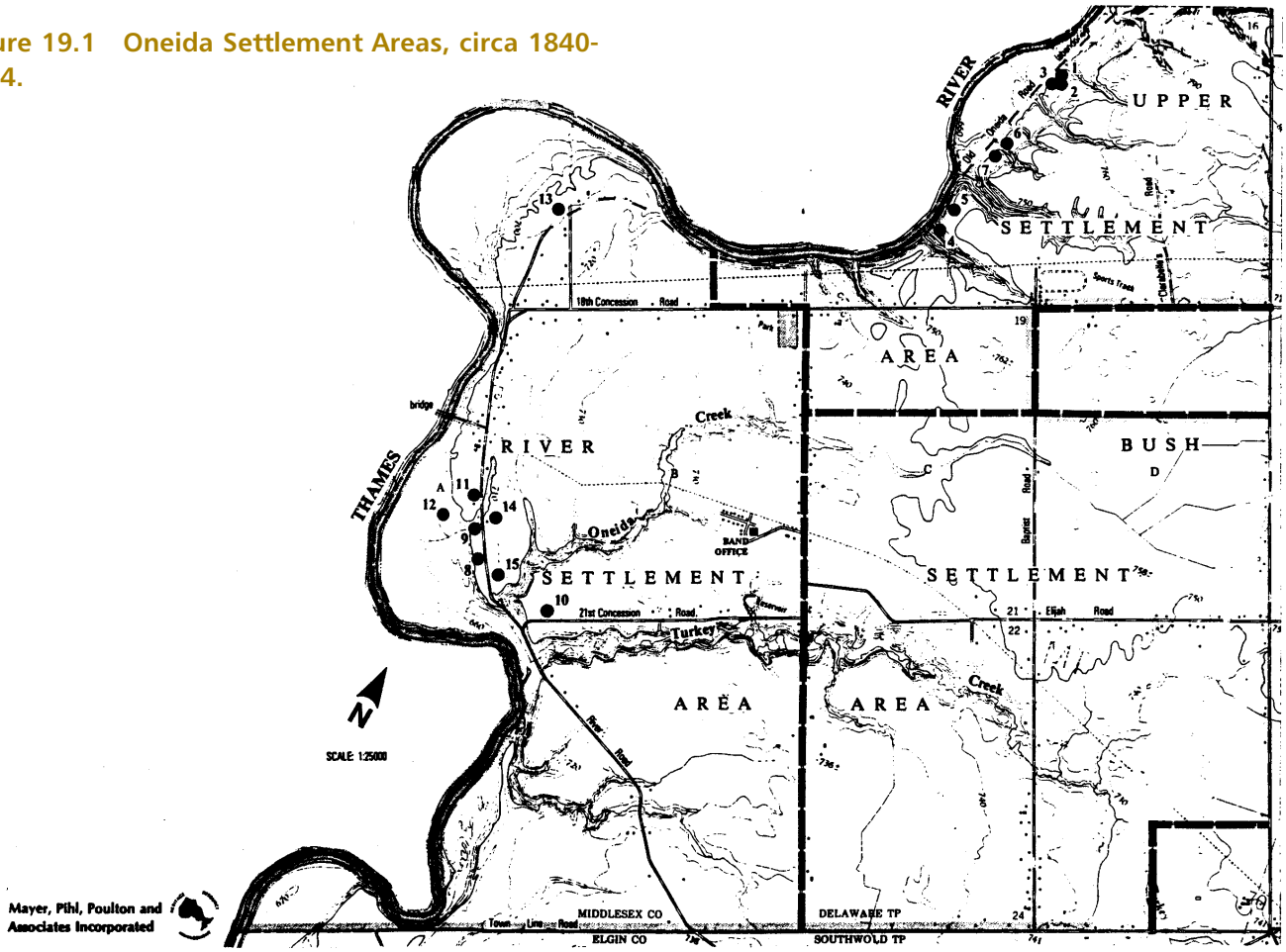
In 1840, a large group of Oneida left their homelands in Upper New York State and settled along the Thames River. The Oneida people purchased 5200 acres from the Baby family having failed to purchase land from the Chippewa or Munsee people. In late 1840, 241 people arrived, crossing Lake Erie, landing near Port Stanley and then on to the present location. Other groups arrived in 1841 (120 people) and 1845 (30 people) (Secretariat, 1).

There were several reasons as to the movement of the Oneida people to Canada. Having served the American cause in the American Revolution, the Oneida were promised land concessions (London Archaeology, 5). These promises were not kept and the Oneida were pressured to leave by the approaching white settlement. Religious differences among the Oneida caused the nation to split into three parties (Secretariat, 2). As a result, two groups went in search of land while a third maintained the traditional homelands. In 1839, Chief Moses Schuyler and August Cornelius purchased the land along the Thames for $15,000.00 (Lawrence, 36). This purchase was unique in that it is one of the few territories that were bought rather than set aside specifically as a reserve. The Oneida were primarily attracted to the Thames because it offered water transportation, fishing and excellent farm land (Campisi, 267).

19.3 Riparian Settlement

When the Oneida people arrived in late 1840, three principal settlements were established according to their religion (see Figure 19.1). The river area was settled first, primarily

Figure 19.1 Oneida Settlement Areas, circa 1840-1844.



by people who followed the Methodist faith (Campisi, 267). The "Upper settlement" was established by people who were Episcopalian (Campisi, 267). The Bush settlement was settled by people who did not follow either one of the two religions. The territory had to be cleared of virgin forest cover (Campisi, 288). In 1844, a government report stated that there were six frame and 48 log houses and a total of 335 acres under cultivation (Campisi, 267). The Oneida people were living in log homes similar to those found on the other reserves (see figure 18.3). Like those found on Munsee or Chippewa, these houses were one and a half storey.

In 1985, an archaeological survey was completed of several small areas of the Oneida reserve. Initial conclusions concerning artifacts found on the sites stated that the Oneida people maintained a "material culture which was very similar to that of neighbouring rural communities" (Archaeological Survey, 52). The Oneida settlement was "established with houses facing roads in a linear pattern in the three separate areas" (Archaeological Survey, 9). The people owned small lots, no more than 10 to 15 acres (Campisi, 268).

19.4 Religion, Visions

Many of the Oneida people who came to Canada in the 1840s had been converted to Christianity. As previously mentioned, the settlement along the Thames reflected the various religious beliefs. While in New York State, many Oneida people were converted to the Methodist or Episcopalian faith (Archaeological Survey, 9). Those who practised the Iroquoian religions lived primarily in the bush settlement. In 1904, the traditional Longhouse religion was revived by "a segment of Oneida society who believed that cultural traditions were being forsaken in favour of white practices" (Archaeological Survey, 9).

In traditional Oneida religion, the world was created "through the fall of Sky Woman from the Sky World" (Campisi, 283). In the world, there is a precarious balance between good and evil. The Great Spirit or the Creator sends a messenger to maintain the balance if it is disrupted. There are two societies in Oneida culture which are called upon to cure ailments, the False Face and Little Water societies. Ailments are classified in three categories: natural, witchcraft and mind (Campisi, 53). People go to "seeers" or "dreamers" who determine the cause of specific ailments and refer them to the appropriate society for healing.

Traditional Oneida ceremonies were held at various times of the year: Mid winter (January-February), Strawberry (June), Green Corn (September), Thanksgiving and the Death Feast. These ceremonies are part of the Longhouse religion. These ceremonies were performed "emphasizing two themes; giving thanks and the promotion of physical and spiritual well being" (Campisi, 284).

19.5 Resource Harvesting

Resources used by the Oneida people were similar to those of the other nations. Deer were the principal game as well as bear, rabbit and porcupine (London Archaeology, 4). Turkeys, Canada geese and grouse were also hunted (London Archaeology, 4). Nets were strung between trees to trap passenger pigeons and other birds (Campisi, 37). Fish were either caught with nets or speared. The most prized fish species were pike, walleye, pickerel, and sturgeon (London Arch., 4).

19.6 Conflict

The Oneida people of the Thames arrived too late to take part in the War of 1812. During the war the Oneida people lived in New York state and large numbers fought on the American side. This placed them in suspicion with the Munsee and Chippewa people who fought for the British. (London Archaeology, 8).

19.7 Land Claims

The Oneida reserve today encompasses 2 134 hectares of land (Akwesasne, 176) and is shown in Figure 17.2. Most land claims by the Oneida people involve land in the State of New York.

Chapter 20

Chippewa of the Thames (Deskan-Ziibi)

20.1 Origins of the Chippewa of the Thames

According to Oral History, the Chippewa people originally lived on the Atlantic seaboard (IEC, 1). The Chippewa are Algonkian peoples and they share similar language structures and customs with other Algonkian people. A nomadic people, the Chippewas arrived in southern Ontario after a long period of migrations (IEC, 1).

20.2 Relocation to the Thames

The Chippewa settled at the present location on the Thames sometime prior to 1700 (IEC, 1). They settled the area that had previously been occupied by the Neutral and Petun peoples. These people were dispersed by the Iroquois in the 1650s leaving southwestern Ontario open to Chippewa settlement. They came primarily from Michigan and Western Ontario. The "abundance of game and fish along the Thames river" (IEC, 1) was one of the main reasons for settlement. Chippewa lifestyle, by the 1700s, included agriculture indicating that good farming land was also a factor in settlement (Riley, 3).

20.3 Riparian Settlement

The Chippewa people settled on both sides of the Thames river near the present village of Muncey. Because the Chippewa people moved to various hunting grounds in southern Ontario, their lodging was probably non permanent. They likely used wigwams until the late 1700's. British policy towards the tribes in the 1820s and 30s reflected a need to establish the Indian nations with a permanent land base. Once their nomadic lifestyle curtailed, the Chippewa people lived in log houses similar to those found on Munsee and Oneida (see figure 18.3). The village of Muncey was established on the reserve and provided several services to the area First Nations such as a general store and post office. With the reserve established in 1832, the people moved to all parts of the land. When the Bear Creek people were forced to move to the Thames reserve in 1832, they settled the western part of the land. This area is still known as Bear Creek.

20.4 Religion, Vision Sites

In Chippewa or Anishinaabe religion, there is a Great Spirit which is often referred to as Manitou. There are four spirits which care for the four directions. They are known as the Grandfathers. Lesser spirits exist in the various forms of nature. Feasting is important in the Chippewa religion as it is a means of giving thanks to Manitou and the other spirits. Fasting as also important as it provides the clarity and insight so that a person can obtain answers.

Like the Delaware, Chippewa people use the sweat lodge ritual as a method of maintaining spiritual, mental, physical and emotional balance. Sweat lodges are constructed mainly of willow and use rocks heated up to provide the warmth inside the lodge. Before European contact, sweats occurred periodically throughout the year but now occur very commonly in modern Aniishnaabe culture. There are healing societies in Chippewa culture known as the midewewan. There are eight levels of midewewan. Healers in the midewewan society are obligated to help their people as they have been entrusted with secret traditional methods.

20.5 Resource Harvesting

The Chippewa people hunted and fished for similar resources as the other nations (see resources- Moraviantown Delaware). Spring pickerel run was and still is an important food resource.

The Chippewa people use various plants and trees, found along the Thames for herbal, medicinal and food purposes. Like the Munsees, the Chippewa people historically made maple syrup every spring. The needles of the cedar tree were used to make tea for colds and to clean the body. Butternut bark is used to help the skin stay healthy and willow bark can be used to induce vomiting.

Plants that are important to the Chippewa include wild ginger or wiikenh which is used to help breathing and the heart. Milkweed is used to cure warts and sumac is used to remedy colds. Yarrow is used to help against rheumatism and joint pain. Queen Anne's Lace and goldenrod are also important in various medicines

20.6 Conflict

The Chippewa people of the Thames have been established along the river for more than 300 years. Accordingly, they have been involved in the most conflict concerning southern Ontario and the Thames River. In the 1600s, Chippewa warriors fought against the Iroquois Confederacy for control of southern Ontario. In 1793, Lietenant-Governor John Graves Simcoe noted descriptions of these battle sites in his journal: "We went to the mouth of the Thames and, about twelve miles on, we saw the remains of a considerable town...where it is reported that a desperate battle was fought

between the Chippewas and the Senecas, the latter were totally vanquished and abandoned their dominions to the conquerors" (Schmalz, 23). Simcoe also noted that "human bones were scattered in abundance" (Schmalz, 23).

In the 1700s, the Chippewa of the Thames were allied with the French. This alliance was constructed mostly for the benefit of the fur trade. As a result, the Chippewa became embroiled in the various wars between the French and English. Chippewa warriors fought with the French during the Seven Years War. The majority of their involvement centred on the Detroit frontier (Schmalz, 91). After the French were defeated in North America, First Nations people continued to fight the British. In 1763, warriors from Chippewa led by Chief Sekahos "strongly assisted in the movement against the British" during Pontiac's War (Schmalz, 91). They participated in the siege of Detroit and captured traders at the mouth of the Grand River (Schmalz, 72). Although the war was finally won by the British, Chippewa warriors succeeded in disrupting communication and were a considerable force throughout the war.

In the late 1790s, the Chippewa people again became embroiled in conflict. An American army entered the Ohio valley with the sole purpose of driving the First Nations out and to open the land to settlers. The Ohio valley was considered the "extended hunting grounds of the Chippewa of the Thames" (Riley,7). Chippewa warriors fought alongside other First Nations defeating an American army under General St. Clair in 1791. The Americans succeeded in defeating the First Nations at the decisive battle at Fallen Timbers in 1794.

Chippewa warriors allied with Tecumseh in the War of 1812 in an attempt to protect the territory on the Thames. This alliance placed the Chippewa on the British side. Chippewa warriors contributed to British victories around Detroit at the battles of Brownstown (Aug 5, 1812), Magauaga (Aug 9, 1812) and Detroit (Aug 16, 1812) (Schmalz, 111). They also fought at several battles in Ohio (Ft. Meigs, Sandusky). Chippewa warriors were present in the defence of the Thames River at the Battle of Moraviantown in October 1813 (Riley, 8). With the death of Tecumseh during the battle, the hope of a united First Nations Confederacy was gone. First Nations involvement from the Thames in the war was sporadic after Moraviantown.

20.7 Land Claims

Over the two centuries of European contact in southern Ontario, the Chippewa people lost large proportions of land through treaty negotiations. The first treaty was signed in 1790 and 1796 in which several First Nations including the Chippewa sold over 2 million acres of land in southern Ontario (IEC, 1). In 1812 and 1819, two treaties were signed which created the present reserve (Riley, 9). These agreements created two reserves, one at the present location (15, 360 acres) and one at Bear Creek (5,120 acres). In 1819, the Chippewa of the Thames sold 552, 000 acres to the British government. In 1832, the Bear Creek Chippewa were moved to the present reserve. This was part of the "Colborne Plan", an attempt by the British to "civilize and permanently settle the nomadic Chippewa" (IEC, 1). A people based on agriculture would require less land than nomadic people (Riley, 9). The Bear Creek land was sold in 1837 and much of the money was used fraudulently by the Indian agent (Riley, 10). In 1834, a further 3,000 acres was sold to the government. Between 1834 and 1885, various smaller parts of the reserve were either "ceded, sold or leased." Present research into land claims involves the Bear Creek surrender and land sold by the Indian agent. The present reserve encompasses 3,334 hectares (Akwesasne, 70).

Conclusion to Human Heritage, Parts A & B

The preceding chapters within Part Two have documented the numerous elements that are part of the Human Heritage of the Thames River. In the process, however, of seeking to address each section in the *Human/Cultural Heritage Framework* provided by the Canadian Heritage Rivers Board, the detail tends to obscure the overall picture of the Thames and its watershed. The objective of this *Conclusion* is to sketch the composite Human/Cultural landscapes that derive from the many details and which are the essence of the Thames' Heritage.

A temporal sequence of three landscapes can be identified within the Thames watershed, each with a strong riverine focus. The first, the Aboriginal, is present today through relic features plus the cultural identity of the First Nations. The second and third are two European landscapes, one rural and agricultural and the other urban, which overlap to create today's rich composite.

The Thames River formed the main avenues in the Aboriginal landscape which emerged with the post-glacial landforms and came to be dominated by the dense deciduous forest. Within this landscape, which gradually evolved in response to changes in climate and lake water levels, there lived representatives of each stage in the sequence of Aboriginal peoples and cultures who occupied Eastern Canada between 11,000 B.P. and European contact. For each group the river and its tributaries provided food, shelter, and routes for travel and exchange. Food included the rich fishing resources of the river, as well as game, while the well-watered terrain offered sites for both permanent villages and temporary or seasonal camps. Water travel was an important means of contact and integration, including trade. For most of the time, the economy was that of hunting, gathering and fishing. Evidence of this economy is sufficient to attest to the Thames as an important locus of settlement over many millenia.

The evidence from the last stages of pre-European Aboriginal occupance is the most abundant and, in many ways, the most culturally significant. Around 500 A.D. the hunting and gathering economy was modified by the introduction of corn (maize) based agriculture (or horticulture) which had finally reached this area from its roots in Meso (Central) America by way of the Ohio valley. The significance is twofold: first, farming based on corn (and later squash, beans, sunflowers, and tobacco) provided for a more sedentary lifestyle and supported larger numbers of the region's Iroquoian peoples, who, in turn, created the large villages that form the majority of present day aboriginal sites; second, the native agricultural crops grown in this area were joined by the array of European crop and livestock transfers in the 18th and 19th centuries, contributing to the most diverse agricultural landscape in Canada.

In consequence, the Thames River was the heart of one of the most significant pre-historic landscapes in Canada, providing evidence not only of the long sequence of early forest dwellers, but of the first Canadian farmers and the initiation of a predominantly farm economy stretching back nearly 1500 years. The continued presence of four First Nations located on the Thames provides for cultural continuity and an important contrast to the present European dominated landscape.

The second landscape is that created by the first European settlers and enhanced by successive generations of farmers and village dwellers. This is the predominantly agricultural rural landscape or countryside of southern Ontario, of which the Thames watershed offers the most varied, yet typical, example. This landscape, with the Thames as its arteries, has evolved continuously while retaining key elements from each period of its 170-200 year history. While the earliest settlers included trappers and traders who relied on the river for fish and game, the flow soon became that of pioneer farmers, moving up the stream and creating early nucleations including Chatham, where the first ships were built and the first saw and grist mills were constructed. On the other hand, by 1810 surveyed settlement along roads and within townships already began to create the main framework for land takeup.

Although the survey was somewhat independent of all but the main branch of the river, within it, the major economic and social foci were the sites of the numerous water-powered mills. Hydraulic power had been the basis of European agricultural and industrial expansion from as early as the 11th century. Here the technology was applied to the new frontier and supported the rapid development of the land and its staple-based industries. The saw mills facilitated the conversion of the forest into timber for both local construction of houses, barns, and ships, and as an early export via the river. The grist (flour and feed) mills recreated the agricultural revolution of Europe, supporting production of the wheat staple for domestic use and as the first commercial farm export. In addition, distilling and brewing, and early textile manufacture (wool and flax) were often found at the same mill site.

The War of 1812 provided a brief hiatus, including the destruction of many early mills. However, both their destruction and their subsequent rapid rebuilding and proliferation attested to their importance. After 1820, a major influx of settlers created an agrarian landscape throughout the watershed. The combination of wheat production and processing allowed early capital accumulation which gave Ontario a commercial advantage that it has never relin quished. Although the number of saw mills declined as the majority of the land was cleared before Confederation, grist and textile mills continued to operate well into the 20th century, using water power directly or for steam.

The evolution of the rural countryside throughout the

Thames watershed has taken place within the surveyed landscape created by early surveyors (e.g. Burwell), and retains the mixture of thousands of dispersed family farmsteads and the nucleated villages and hamlets that have serviced agriculture. Over time, the farms have become fewer and larger, but the region has maintained itself as the pre-eminent commercial farming region of Eastern Canada and, in relative terms, the most productive in Canada. Despite many innovations involving mechanization and capitalization, farms retain much of the character that developed in the 19th century. This includes the vernacular built-heritage of numerous neo-gothic and Queen Anne brick farmhouses and substantial wooden barns.

One of the most significant factors underlying the continued prosperity has been the intricate farm and township drainage systems which began to be constructed in the 1880s. These systems link virtually every farm to the Thames and its tributaries. The integrated drainage system has enhanced the productivity of the prime farmlands that dominate the watershed. Management of these lands through watershed-based institutions which began locally, notably the Upper and Lower Thames Conservation Authorities, attest to the symbiotic relationships between the land and water systems in this rural landscape.

The villages and small towns also retain much of the built-heritage of commercial prosperity established in the late 19th century from their riverine mill-site beginnings. To these beginnings, after Confederation, were added other activities linked to the farm hinterland, including butter and cheese production and early farm implement manufacturing. Today, many linkages remain, both economic and social. In places such as the mill-villages of Thamesville, Wardsville, Thamesford, Embro, and Tavistock, one may view examples of how the juxtaposition of the mill-site and the fertile hinterland created classic rural settlements.

While the rural-agricultural landscape was the first to be generally established, it was soon joined by the third, urban landscape, building initially on the raw materials and commercial activity of the farming hinterland. Within the watershed there emerged a series of towns and cities, all located on the Thames and using the location and resources to good advantage. Other non-river related activity and industry may now support the majority of inhabitants, yet each of the urban places retains a riverine focus. Although river transport has long since given way to rail and road, the early development also owed much to sites being strategic river crossings and/or transhipment points.

Chatham has the distinction of being the first major centre to develop on the Thames. Close to the points of entry at the river mouth and accessible by both the lake and river vessels of the day, it became an important destination for goods and people (the success of the Thames as an underground railway cannot be overstated), and developed a significant ship building industry. Improvements to navigation in the Lower Thames supported these functions. Chatham's unique heritage is that of an important river port within the water-based transportation system of the 19th century. Today, the river is still a major focus and supports important tourist traffic.

Several other medium-sized towns and cities also capitalized on the river focus. In the case of Woodstock this led to the considerable importance of textile manufacturing. Stratford was an important mill site (saw, grist, woollen) which was then enhanced by the addition of the railway. Today the Avon River is a key attraction of the city as the setting for Canada's premier Shakespearean Festival. Several towns along the South Branch also owe much to the river, including Ingersoll which was an early mill site and later a centre of cheese manufacturing. Likewise, the development of both St. Marys and Mitchell on the North Branch was heavily influenced by the opportunities afforded by the river; in the case of St. Marys the combination of mill sites and the quarrying of the limestone bedrock have provided for a unique built-heritage.

Finally, London, as the major city on the Thames, can trace its origins to Lieutenant-Governor Simcoe's identification of "the Forks" as a prime site at which to establish a city, and to the initial realization of the administrative function, aided by Thomas Talbot's courthouse building. London's early industrial development focussed on the several mill sites along both the north and south branches of the river, with the availability of water and water power contributing not only to grist mills but to the establishment of brewing which provided the basis of what remains a major local industry and a nationally significant company. The Thames has remained a key element in London from a recreational point of view; river floods have been both major events and, finally, a catalyst for the development of Conservation Authorities and the multipurpose Fanshawe Dam and reservoir. Over the last year, through the community-based "Celebrate the Thames" events, London has reaffirmed its links with the river and the river's importance to the city.

While each town and city is unique, they are all tied together by their riverine origins. Each is in the process of rediscovering these common roots, including a new focus on redeveloping the river lands to realize and enhance the amenity values afforded by the river.

Human and cultural heritage is a many faceted concept, and the reality is just as complex. The Human Heritage of the Thames and its watershed is epitomized by the composite human landscapes created in close relation to the river and in which the river is inextricably a major part.

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Canadian Heritage Rivers System

Part 3 - Recreation:
Thames River Watershed

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Recreation

The Thames River system supports a great diversity of recreational activities. Through either direct or indirect associations with the river, recreational experiences are enhanced. This section of the study describes the outstanding recreational values of the Thames River system under the general guidelines prescribed by the Canadian Heritage Rivers Board.

The diversity of recreational activities along the Thames is, in itself, a significant feature. The provision of "something for everyone" is a notable quality. Opportunities for those interested in history, nature, hiking, angling, boating, canoeing, camping and picnicking are available along the Thames River and its major tributaries. This diversity of activities highlights the strong connection between recreation and the natural and human heritage values of the Thames River.

The natural features of the river, its valley, and wildlife, greatly add to the enjoyment of recreational activities. The reservoirs, designed primarily for flood control, provide additional opportunities for recreation. There is also an exciting historical element to recreation in the watershed. The sporting and leisure pursuits of early settlers have formed strong roots for many of today's clubs and facilities. There is also a strong interest in the cultural/human history of the watershed as demonstrated by numerous military re-enactments and recreated villages. Historical sites, plaques and museums provide other avenues to explore the human heritage of the Thames.

Methodology

A Recreation Background Studies Subcommittee was formed to develop a recreation framework and to assist in the research. The seven themes that evolved are: Boating, Fishing and Hunting, Other Sports, Trails and Corridors, Parklands and Campgrounds, Nature Appreciation, and Human Heritage Appreciation.

Data for this study were collected from a number of sources including published and unpublished works. Trail guides, pamphlets, university theses, and personal interviews with local enthusiasts contributed a significant amount of information.

Chapter 21

Boating

The most significant recreational opportunity directly related to the Thames River is boating. Although not entirely navigable, long stretches of the river have been utilized for boating since the time of the earliest Aboriginal settlements. No longer relied upon solely for transportation, river travellers of today take to their watercraft for the recreational opportunities the river and reservoirs provide. Some of the most popular forms of boating on the Thames River include rowing, canoeing and kayaking, cruising, sailing and windsurfing. This chapter describes boating activities on the Thames River system from an historical and modern perspective.

21.1 History

Recreational boating became popular in the mid-1800s, coinciding with an increase in leisure time. A "frenzy" of boating activity was occurring along the entire length of the Thames River at this time (Day, 1977, 129). Rowing, canoeing and steamship touring were the most common forms of recreational boating. Hundreds of people would routinely board steamships to enjoy a leisurely journey along the meandering river.

Londoners were particularly fond of rowing; men and women alike took part in rowing and rowing competitions. These were extremely popular, providing an exciting spectacle for countless spectators who lined the banks. (Day, 1977, 246). The London Rowing Club, established in 1870, brought together some of the area's most competitive rowing athletes. World class oarsman Ned Hanlan made appearances in communities along the Thames River and provided demonstrations of his rowing prowess. Hanlan's presence did much to bolster community pride and fuel the interest in rowing (Day, 1977, 369). Canoeing was also experiencing a rise in popularity and would gain the attention of a number of would-be rowers. Regattas held on the Avon River in Stratford were enjoyed by men and women of all ages (see Figure 21.1). In fact, the shift from rowing to canoeing was so great that in Chatham the near disappearance of rowing is attributed to the rise in popularity of canoeing (Day, 1977, 438).

Figure 21.1 Regatta in Stratford, 1865.

Source: Lennon, 1985, 24

By the turn of the century, the popularity of steamship travel had faded due, in part, to competition with stage coaches and railway trolleys. A number of accidents on the waters of the Thames also contributed to the disappearance of steamships. London's "Victoria Day Disaster" of 1881 took the lives of close to 150 passengers on the steamship Victoria. It is believed that passengers on board the overcrowded Victoria all shifted to one side to watch a passing sculler then, as the boat tipped, rushed back to the other side in an effort to level the ship. The ship capsized into the Thames and the boiler came crashing down. A plaque now stands along the bike path in Greenway Park in London, commemorating the event.

21.2 Rowing

There is a long, strong tradition of rowing on the Thames River, especially in London. Rowers from the University of Western Ontario gained national recognition for their impressive display at the Olympic trials in 1968. By the early 1970s, Western's rowing team had taken up permanent residence at Fanshawe Lake. A second centre, the Joe McManus Canoeing and Rowing Facility, was constructed along the Thames just upstream of Springbank Dam in 1973. It continues to be a very popular rowing centre for the community.

In 1986, Rowing Canada Aviron announced that London would be the site of the women's High Performance Rowing Centre, one of only two training centres in Canada for national and Olympic athletes. Gold medalists Marnie McBean, Kathleen Heddle, and Silken Laumann trained at this facility. The High Performance Rowing Centres in London and Victoria, British Columbia, are credited with

changing the face of rowing in Canada (Murphy, pers. comm.). The growing achievements of the Canadian rowing team have raised the sport to a level unequalled since the 1880s.

The rowing centres host numerous university, local, provincial, national and international competitions (see Figure 21.2). One such event was the Commonwealth Rowing Championships, held in 1994, and the Ontario Rowing Championships in 1997; both attracted international attention and thousands of spectators. In addition, the London High Performance Rowing Centre has several future events scheduled, including the Canada Summer Games for the year 2001 (Murphy, pers. comm.).

Figure 21.2 Rowing Regatta at Fanshawe Lake

Photo: UTRCA

In Woodstock, rowing activity is centred on Pittock Lake, where the club house and launching facilities are located. The club provides instruction, organizes competition and equips rowers with the skills necessary to advance to higher levels of competition (Goodall, pers. comm.).

21.3 Canoeing and Kayaking

"One of the greatest gifts of the Native people was the canoe" (Zeigler, 1988, 224). Since the time when Aboriginal settlers made their homes along the Thames, the canoe has been a much relied upon means of travel. It opened up new worlds and became a fixture on the Thames River.

Canoe travel has since evolved into a recreational pastime. The Thames River provides an excellent opportunity for canoeists and kayakers alike, offering more than 300 km of navigable river. From St. Marys along the North Branch and Woodstock along the South Branch, to the mouth of the river at Lake St. Clair, the Thames provides a scenic journey through a diverse landscape of forests and fields. Above Delaware, there are a number of boulder rapids which create exciting paddling conditions, especially in the spring (see Figure 21.3). In contrast, the lower portion of the Thames is quite flat with few obstacles.

Figure 21.3 Canoeing the rapids on the South Branch

Photo: Henry Leparskas

Due to the extreme flow variations, especially in the upper river (see Natural Heritage 2.4), most of the paddling on the Thames River occurs in the spring and fall. However, a small dam at Springbank Park in London enables canoeists from the nearby London Canoe Club (Joe McManus Canoeing and Rowing Facility) to enjoy paddling throughout the summer. The reservoirs at all of the conservation areas also provide excellent paddling conditions throughout most of the year. The lower river generally has more water and can be paddled from spring to fall.

Canoeists and kayakers often paddle specific routes or stretches of the river. These stretches are described and mapped in pamphlets entitled The Upper Thames River Canoe Routes and Paddling Portraits of Nature: Canoe the Lower Thames River. Some of the popular routes are described in Table 21.1. Depending on flow and the number of boulders, paddling the Thames can be quite easy and relaxing (see Figure 21.4) or quite challenging. Numerous access points along the river enable canoeists to choose any length of trip.

Table 21.1 Some of the Popular Canoe Routes on the Thames River and its branches

Route	Watercourse	Distance	Description
St. Marys to Fanshawe Lake	North Branch	30 km	- very scenic, tree-lined, rolling valley - some shallow rapids (water can be very low in summer)
Fanshawe Dam to London Canoe Club (or Springbank Dam)	North Branch and Thames	21 km	- mostly tree-lined through the city - several river-side parks for breaks and picnicking - sets of rapids encountered
Springbank Dam to Delaware	Thames River	19 km	- river meanders through forest and sandy bluffs - water flow is usually good, making paddling easy (see Figure 21.4) but there are several shallow rapids
Pittock Dam to Putnam	South Branch	20 km	- river is narrow and tree-lined, often with fallen willows - glimpses of farm fields - several boulder rapids, best travelled in spring
Putnam to Dorchester	South Branch	7 km	as above
Delaware to Lake St. Clair	Thames River	174 km in 15-20 km stretches	- 6-8 days to canoe entire route - often paddled in 15-20 km stretches (bridges cross the river every 6-10 km) - upper portion has steep banks and is tree-lined with pools, shoals and occasional rapids - lower portion of river is broad flat and dyked

Figure 21.4 Easy paddling on the North Branch

Photo: Henry Leparskas

Due to the wide appeal of canoeing, canoe clubs have formed in Stratford, Woodstock, London and Chatham. The London Canoe Club is the largest canoe club in North America with approximately 1500 individual members. These clubs, many of which have been in existence for a number of decades, provide outdoor enthusiasts with the skills necessary to enjoy their paddling experience, whether it be in a canoe or kayak. They also organize several guided outings on the Thames and beyond, host a variety of canoe races and take an active role in many of the festivities along the river (e.g. canoe ballet demonstration at the Canada Day celebrations in Harris Park, London). Voyageur canoe races are becoming increasingly popular. The Chatham and London clubs have built their own North Canoes and participate in events throughout southern Ontario and Michigan.

21.4 Dragon Boat Festivals

Dragon Boat Festivals have been held in Stratford and London since the early 1990s. The festival is centred around an ancient myth about a man seeking the attention of his king (Shaw, pers. comm.). Celebrated around the world, the feature attraction of these festivals are the Dragon Boat Races. Amateur local teams compete with others from communities all over southern Ontario. More competitive teams also race. The festivals held in London and Stratford have been an overwhelming success. In an effort to accommodate the rising popularity, the 1997 Festival in London was moved from Greenway Park on the Thames to Fanshawe Lake (see Figure 21.5) and Stratford organizers have extended the event from one day to two days.

Figure 21.5 Dragon Boat Festival, 1997, Fanshawe Conservation Area

Photo: Cathy Quinlan

21.5 Cruising

Many types of boats cruise the waters of the Thames River including passenger cruise lines, pleasure craft, power boats, yachts, and sailboats.

In Stratford, a line of cruising vessels, named the Juliet, have been cruising up and down the Avon River since 1916. Today, the Juliet III offers passenger cruises from May to late September. The vessel, which can carry 20 passengers at a time, cruises approximately 1.5 kilometres up river past the Tom Patterson and Festival Theatres. Approximately 5,000 to 6,000 passengers board the Juliet III each year, many of them are visitors to the Stratford Festival or residents of nearby communities.

In London, passengers board The London Princess at the docks in Springbank Park. With room for up to 40 passengers, the vessel cruises a couple of kilometres up river to Greenway Park. The season, from late May to early October, is dependent on the operation of the Springbank Dam which raises water levels. Located within the most visited park in the city, The London Princess carries hundreds of passengers each season for a scenic cruise of the river (Crispin, pers. comm.).

Numerous private vessels travel from the mouth of the river to the serviced docks in the heart of Chatham (see Figure 21.6). Chatham has constructed nearly 915 metres of docking, providing ample room along the banks of the Thames River for both power boats and sailing vessels (Chatham City Docks - Pamphlet). The 30 km section of river from Chatham to Lighthouse Cove on Lake St. Clair has been a significant passageway for travel since the 1830s (Day, 1977, 128). Today this lower portion of the river is used almost exclusively by the thousands of recreational boaters who travel up the Thames River each year from as far away as Michigan and other American states which border the Great Lakes. There are several large marinas at Lighthouse Cove that cater to the boating public.

Sailing is another popular form of boating in this region. A number of sailing and yacht clubs have developed including the Fanshawe Yacht Club at Fanshawe Conservation Area and the Oxford Sailing Club at Pittock Conservation Area, where the reservoirs provide the consistent water depth needed. These clubs provide docking facilities and instruction, and host local regattas.

Figure 21.6 Dockside in Chatham

Photo: Andrea Quenneville

21.6 Windsurfing

The Tornado Windsurfing Club, established in 1977 at Pittock Lake, is the oldest boardsailing club in Canada (Coyle, pers. comm.). The club provides lessons and often hosts local regattas. Wildwood reservoir is also an extremely popular body of water for windsurfers. Fanshawe reservoir is somewhat less popular due to the inconsistent wind conditions. On a blustery summer day one can see dozens of colourful sails cruising on the reservoirs (see Figure 21.7).

Figure 21.7 Windsurfing at Wildwood Reservoir

Photo: London Free Press

Summary

The Thames River system is recognized for the significant recreational opportunities it has provided for boaters for more than a century. The Thames has developed a reputation as a national centre for rowing and a very popular venue for canoeing, cruising, sailing and windsurfing. It is home to one of Canada's largest canoe clubs and the oldest windsurfing club.

Chapter 22

Fishing and Hunting

The Thames River system provides diverse habitats for a wide variety of fish and game animals (see Natural Heritage 6.0). As a result, the river is a year round centre of activity for both anglers and hunters. This chapter discusses the significant opportunities for anglers and hunters along the Thames River system.

22.1 History

The abundance of fish and prey animals along the Thames was a critical factor in drawing early settlement to the area. Realizing the wealth of natural resources the Thames could provide, many Aboriginal people settled close to the river (see First Nations 17.0 - 20.0).

Increased hunting and fishing pressure from the influx of European settlers resulted in the need for regulation (Day, 1977, 91-2). In order to maintain the quality and the quantity of the fish and game population, a number of restrictions were legislated. This was an attempt to guarantee the future of fishing and hunting along the Thames.

In the mid-1800s, industrialization and improvements in farming decreased the reliance on fish and game for sustenance. However, fishing and hunting traditions remained strong and today they are favourite recreational pastimes for many.

22.2 Fishing

Fishing is a very popular recreational activity throughout Ontario and the Thames River is no exception. Unlike the remote fishing communities of northern Ontario, the Thames River is easily accessible to thousands of local residents. The Canada Land Inventory has identified opportunities for angling or viewing sport fish along the entire length of the river.

Anglers enjoy the beauty of the river valley and the accessibility to favourite fishing spots (see Figure 22.1). Public access platforms have been constructed at Greenway and Harris Parks in London. Thames River anglers frequently report “good” fishing, in terms of the number and species of fish caught (Wilson and Pfaff, 1991, 64). Migratory patterns, changes in water levels, pools and riffles, and the deeper areas at the base of dams provide a number of angling opportunities along the river.

Figure 22.1 Fishing on the North Branch

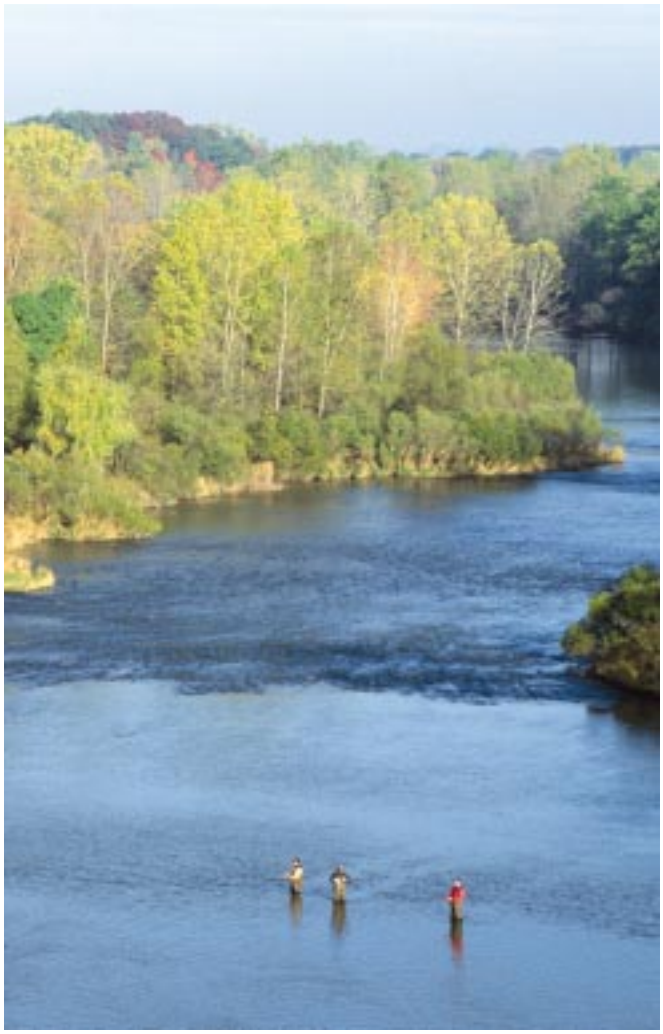


Photo: UTRCA

Thames River anglers are as diverse as the many species found within the system. Individual interests, customs and abilities dictate the species most frequently sought. Table 22.1 lists 12 of the commonly sought fish. Ice fishing, especially for Walleye, is also popular amongst Thames River anglers (Fairburn, pers. comm.). Favourite locations include the mouth of the Thames and the reservoirs at Wildwood, Fanshawe and Pittock Conservation Areas.

Table 22.1 - Fish Commonly Sought By Thames River Anglers

- Largemouth Bass
- Smallmouth Bass
- Rock Bass
- Yellow Perch
- Northern Pike
- Trout
- Pumpkinseed
- Carp
- White Sucker
- Walleye
- Bullhead
- Black Crappie

22.21 Fish Habitat Protection, Maintenance and Development

Many Thames River anglers are interested in the protection, maintenance and development of the fishery. As a result, a number of local clubs have formed to address issues such as access development, fish habitat restoration and fisheries enhancement. These clubs play a very important role in maintaining the quality of angling experiences along the Thames, and fundraising for appropriate projects. Their mandates focus on raising public awareness, particularly among the youth, in regards to the fishing opportunities throughout the Thames River system. Many of these organizations work in partnership with the Ministry of Natural Resources and the local conservation authorities.

Several projects have been initiated to protect and enhance the sport fishery. For example, in 1988-90, prespawning Walleye were transferred from the Thames River near Jeannettes Creek to the North Branch upstream of Fanshawe Dam. Tracking results indicate that the transferred Walleye are abundant and growing quite well, proving that the Thames River still provides suitable habitat for Walleye. It also helped dispel some of the concerns related to water quality, particularly in the Fanshawe Reservoir.

There are a number of on-going habitat improvement projects as well. For example, on-going maintenance and rehabilitation work is occurring along the Dorchester Swamp Creek. This project involved clearing the spawning bed for Brook Trout. The population of the trout have increased as a result of this work (Fairburn, pers. comm.). Also, Rainbow Trout have been maintained in the river by the hatchery at Komoka Creek.

22.3 Hunting

Hunting and trapping take place, to a limited degree, within the Thames River watershed in woodlots, ravines and floodplains, primarily on privately owned land. Some of the most commonly sought birds and mammals are listed in Table 22.2. They provide satisfying hunting experiences for many residents of the Thames River watershed (Fairburn, pers. comm.).

In general, hunting is not permitted on public lands, but controlled deer hunts do occur at specific location under the regulations of the Ministry of Natural Resources. At Wildwood Conservation Area, for example, White-tailed Deer are hunted during specified times to control their numbers.

Table 22.2 Commonly Sought Game within the Thames River Watershed

BIRDS	MAMMALS
• Ring-Necked Pheasant	• Raccoon
• Wild Turkey	• Striped Skunk
• Ruffed Grouse	• Muskrat
• American Woodcock	• Red Fox
• Variety of Waterfowl	• Coyote
	• Eastern Cottontail
	• White-tailed Deer

22.3.1 Hunting: Habitat Protection, Maintenance and Development

Wild Turkey is being successfully re-introduced to a number of areas within the Thames River watershed. After disappearing from the Ontario landscape in the early 1900s, this upland game bird is once again sustaining itself. The efforts of the Ministry of Natural Resources, in partnership with the Ontario Federation of Anglers and Hunters (OFAH), have been key to the success of this re-introduction program.

Progress is also underway in the planned re-introduction of the Bobwhite. Although this quail has not disappeared completely from the landscape, the numbers are presently too low to sustain hunting (Fairburn, pers. comm.).

Summary

The Thames River has supported a strong fishing culture dating back to the time of the earliest human settlements. Its accessibility and species richness draw many anglers to the river today. Hunting also has a long history, and is still practised at a moderate level on private lands. Fishing and hunting clubs have rallied to protect and enhance this resource in the watershed.

Chapter 23

Other Sports

The Thames River system has long been a gathering place for recreation. A number of sports take place in close proximity to the river or within the floodplain including baseball, swimming, cross country skiing, lawn bowling, and golfing. This chapter highlights the numerous sports which have been and are currently played within the floodplain of the Thames River system.

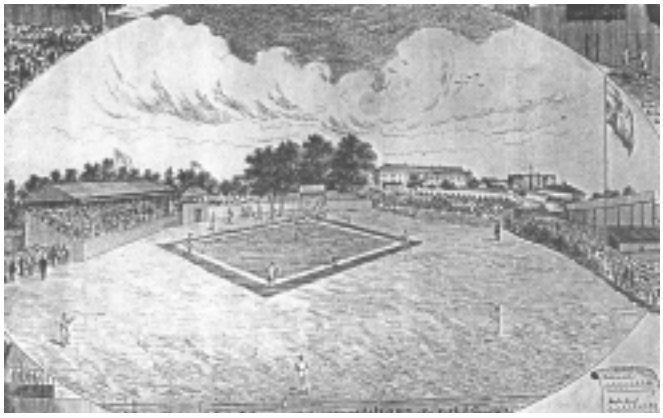
23.1 History

From a sports perspective, the Thames River was many things to many people. It provided a travel route for teams, water for irrigating manicured fairways, an ice surface for skating and curling, and a beautiful backdrop for many other activities.

It is believed that the first game of baseball was played in 1838 next to the South Branch in the Village of Beachville. It was part of the festivities held to commemorate the government's victory in the Upper Canada Rebellion of 1837 (Armstrong, 1986). From here, baseball's popularity grew and spread across North America.

The London Tecumseh's ball team, established in 1868, fuelled the interest in London. These North American minor league professional champions of 1877 hosted teams in the newly constructed Tecumseh Park (see Figure 23.1). Renamed Labatt Park in 1936, it is London's oldest existing sports facility and is believed to be the oldest baseball grounds in continuous use in North America. The close proximity to the river allowed teams and spectators to travel to London to be a part of the action. Often, rowing competitions were held prior to ball games, thereby increasing the popularity of both sports (Murphy, pers. comm.). Baseball continues to thrive in London due, in part, to its strong heritage.

Figure 23.1 Sketch of Championship Baseball Game in Tecumseh Park (Labatt Park) in 1877



Source: Armstrong, 1986

Lawn bowling was another popular form of recreation centred on the river-side lands. Elitist groups from communities such as Stratford, Mitchell, London, and Chatham formed lawn bowling clubs. Lawn bowling had a certain appeal because of the low level of physical exertion required (Day, 1977, 464).

Swimming was also popular in the 19th century. Public swimming holes, such as the Old Grove in Stratford, were a centre for activity that resulted in the construction of a number of bath houses (see Figure 23.2). By the 1920s, increased restrictions on bathing activities as well as deteriorating water quality led to a reduction in the popularity of swimming in the river (Leitch, 1980, 140).

Figure 23.2 Swimmers at bath house, Avon River, Stratford

Source: Lennon, 1985, 20

23.2 Winter Sports

In winter, the frozen river provided people with new opportunities for recreation. The influence of the Scottish immigrants resulted in the rising popularity of curling on the river (Wilson, 1981, 45). The first curling match in western

Figure 23.3 Skating on the Avon River

Source: Lennon, 1985, 4

Ontario is believed to have taken place on the South Branch near the present location of the Pittock Dam in Woodstock (A Walk A Day, Pamphlet).

Skating on the river was also a fashionable recreational pastime before the advent of artificial ice surfaces. When the river froze everyone took advantage of the opportunity to spend long days skating on the river and its tributaries (see Figure 23.3). In Stratford, skaters would take shelter from the cold in the numerous bath houses along the banks of the Avon River (Leitch, 1980, 140).

Today, the river seldom freezes deep enough for skating or curling. Cross country skiing, snowshoeing and snowmobiling are now popular activities which take place on the lands near the river.

In many Conservation Areas and parks, hiking trails and dirt roads are transformed into cross country ski trails for the winter. Wildwood and Fanshawe Conservation Areas are popular skiing destinations, as people are drawn by the long network of groomed, rolling trails and the warm-up visitor centres. Many river-side golf courses permit skiing as well. Table 23.1 lists some of the most frequently visited areas for cross country skiing near the Thames River. There are fewer opportunities in the lower watershed since there is seldom reliable snow cover in the "banana belt".

When snowfall permits, snowmobiling along the river environs is another popular winter pastime. Much of this activity occurs on private land, as motorized vehicles are often prohibited on public property.

Table 23.1 - Popular Areas for Cross Country Skiing

- Wildwood Conservation Area
- Fanshawe Conservation Area
- Pittock Conservation Area
- Longwoods Conservation Area
- Thames Grove Conservation Area (Chatham)
- Avon Trail
- Thames Valley Trail
- Nordic Ski Touring Centre - Delaware
- Komoka Provincial Park
- T.J. Dolan Natural Area (Stratford)

23.3 Swimming

Unlike the popular swimming activities which took place along the river near the turn of the century, there are limited opportunities today. This is due, in part, to water quality concerns resulting from pollution from farming, industry and inadequate septic systems (see Human Heritage 15.2.4).

Today, swimming is centred primarily around the reservoirs at Wildwood, Fanshawe and Pittock Conservation Areas. They are popular destinations for many people seeking the beach-setting that the reservoirs provide. Fanshawe reservoir contains an experimental ultra-violet light disinfection system. A swimming zone is curtained off from the rest of the reservoir and the water within is pumped into a chamber where it passes under UV lights which kill bacteria and other organisms. It has proven quite successful and the beach is rarely closed.

23.4 Shoreline Activities

Conservation authority regulations limit many types of development within the floodplain. However, recreational facilities such as golf courses and parks are permitted since they generally do not include buildings. Golf courses are drawn to the floodplain because of the scenic value of the river, the rolling nature of the valley and banks, and the availability of water for irrigation. There about 15 golf courses along the Thames River and its tributaries, including eight in London alone (see Table 23.2).

Many of the historic activities described earlier, such as lawn bowling and baseball, still go on today. There are also a number of river-side parks which provide facilities for tennis and soccer.

Table 23.2 Golf Courses Along the Thames River System

LONDON:

- North London Golf Centre
- Sunningdale Country Club
- Forest City National Golf Club
- Fanshawe Golf Club
- Thames Valley Golf Course
- London Hunt and Country Club
- East Park Golf Gardens
- River Road Golf Course

OTHERS:

- Dorchester Golf and Country Club
- Ingersoll Golf and Country Club
- Stratford Country Club Golf Course
- Mitchell Golf Course
- St. Marys Golf Course
- River Valley Colf Course (Thorndale)
- Maple City Golf and Country Club (Chatham)
- Indian Creek Golf Course (Chatham)

Summary

The Thames River system has supported and continues to support a wide variety of sporting activities. The floodplain is heavily used for cross-country skiing, golf, lawn bowling, baseball, tennis, and soccer.

Chapter 24

Trails and Corridors

The diverse landscape surrounding the Thames River has created an ideal setting for the development of trails and corridors. Trails through wooded uplands and wetlands, urban centres and parklands appeal to fitness and nature enthusiasts alike. This chapter describes the significant opportunity for hiking on the trails and corridors within the watershed.

24.1 The Avon Trail

Land clearing for the Avon Trail was completed in 1976. The trail is about 100 km long and connects with the Thames Valley Trail in St. Marys and the Grand Valley Trail in Conestogo (see Figure 24.1).

The Avon Trail originates in St. Marys and travels in an eastward direction to Conestogo. Although not entirely located along the banks of the Avon River, the Avon Trail weaves through woodlands, rolling hills and, at times, follows the path of small rivers and streams (Avon Trail Guide). The agricultural landscape is a dominant feature as a large portion of the trail crosses privately owned farm land (Avon Trail Guide).

Southeast of the Town of St. Marys, the trail crosses Wildwood Conservation Area where it follows a portion of an 18 km loop trail maintained by the Conservation Area. Approximately 40 km from its origin, the trail crosses over the Avon River, following it for approximately 4 km before heading northeast to Conestogo. At the Avon River crossing, a side trail leads hikers into the heart of Stratford, past a number of landmarks. It borders the Avon River and passes through the extensive park system and the T.J. Dolan Natural Area (Fisher, pers. comm.). Unfortunately there are no records kept on the number of users.

24.2 Thames Valley Trail

The Thames Valley Trail (TVT) is the longest continuous trail in the watershed. The clearing and construction of trails began in the early 1970s and by 1976 the trail extended from London to St. Marys, along the North Branch River (see Figure 24.1). In 1995, the Elgin Trail was linked to the Thames Valley Trail making it possible to hike from Port Stanley on Lake Erie, through London to St. Marys, and then onto the Grand Valley Trail via the Avon Trail (see Figure 24.1). The success of this effort was, in part, due to the "community-minded landowners" who allowed trail development to occur on their riverfront properties without forfeiting their ownership (Thames Valley Trail Association, 1996, 3). Approximately one third of the land that the TVT crosses is privately owned. Efforts to establish partnerships with private landowners continue in an attempt to increase the network of trails (Stenhouse, pers. comm.).

Developed primarily along the south bank of the Thames River, the Thames Valley Trail extends 109 km from the Middlesex-Elgin County line in the west, to St. Marys on the North Branch. The TVT travels through deciduous forests (see Figure 24.2), along agricultural fields and, occasionally, along rural roads. The northern portion of the trail traverses deeply carved river valleys and little bridges have been built to keep hikers out of the streams (Thames Valley Trail Association, 1996, 4). The trail passes through Fanshawe Conservation Area, where there are beautiful vistas of Fanshawe Lake from atop the steep banks. In the City of London, the TVT merges with paved, multi-use pathways that flank the river. Downstream of London, the trail passes through Komoka Provincial Park where hikers can walk within a few feet from the river on the floodplain or get spectacular views from atop the steep bluffs. The southerly part of the trail passes through low lying agricultural lands towards Delaware.

Figure 24.2 Hikers on the Thames Valley Trail

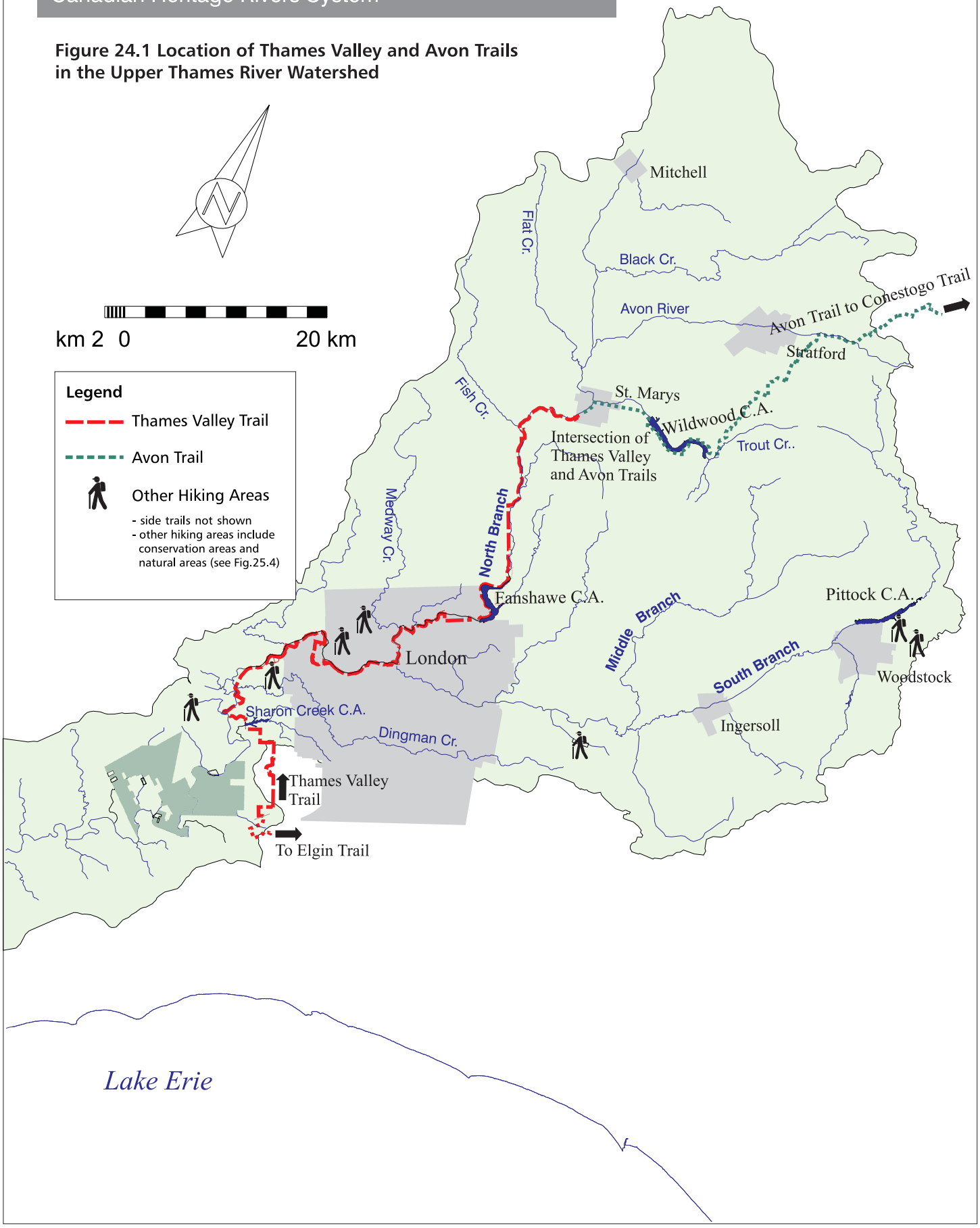
Photo: UTRCA

A number of side trails have also been cleared. Totalling close to 26 km, these "loop trails" allow hikers to deviate from the main trail without having to retrace their steps en route to the main trail (Thames Valley Trail Association, 1996,1). In addition, a number of sections of the Thames Valley Trail pass through and connect with existing trails in parklands and natural areas along the river. For example, the TVT merges with the Medway Valley Heritage Forest trail in northwest London.

24.3 Trail Associations

Dedicated to protecting, maintaining and developing trails along the Thames and Avon Rivers, local trail users have

Figure 24.1 Location of Thames Valley and Avon Trails in the Upper Thames River Watershed



united. The Avon Trail, (the collective organization is not an Association) established in 1975, and the Thames Valley Trail Association, established in 1972, work in conjunction with ecologists, city planners and land owners to acquire and develop the network of trails along the Thames River system.

Through scheduled outings, education programs and community events, the hiking clubs attempt to raise public awareness and stress the importance of caring for our natural resources for recreation. Members frequently monitor the trails and re-route or close them if there are signs of over-use. Both the Avon Trail and the Thames Valley Trail Association play an important role in maintaining the integrity of these river-side trails.

24.4 Park Trails

Trails have been developed in a number of parklands along the Thames River system. Some of the trails are paved multi-use pathways while others are only a roughly cleared footpath through dense vegetation. These trails provide a significant opportunity for recreation for many local residents.

The trails within the conservation areas (CAs) along the Thames River system provide hiking opportunities for people with a wide range of abilities and interests in all seasons. Bicycles are also permitted in part of Pittock CA where the 40 km Chesney Ride leads cyclists around the reservoir, utilizing both trails and roads.

Some park trails are suitable for cyclists, rollerbladers, runners and walkers. London has developed an extensive multi-use paved trail system both upstream and downstream of the Forks totalling some 20 km. Multi-use walkways have also been developed along the river in Stratford (see Figure 24.3), Mitchell, St. Marys, and Chatham.

Figure 24.3 Multi-use Trail in Stratford along the Avon River

Photo: Tourism Stratford

A number of loop trails have been cleared through the five Environmentally Sensitive Areas (ESAs) within London. To protect the integrity of the plant and animal life, use of these trails is limited to hikers. Komoka Provincial Park, a non-serviced park along the southern shore of the Thames River, contains three loop trails and the Thames Valley Trail. The TVT is limited to hikers only but the loop trails are used for hikers, cyclists, horse back riders and cross country skiers.

> "In the last few years, with railroad companies abandoning thousands of kilometres of uneconomic track, interest has grown in the concept of converting abandoned railway rights of way into recreational trails. Once the ties are removed the trail is well suited to activities such as bird watching, walking, hiking and cycling" (Thames Valley Trail Association, 1996, 14).

The Town of St. Marys has developed 1.5 km of trail along the former Canadian Pacific (CP) lines. There are plans underway for an additional 3 km along former Grand Trunk rail lines (Barnes, pers. comm.). Now called the Riverview Walkway, it passes through parkland along the river, stretching along the eastern bank of the Thames River past some of the town's historical landmarks (The Stonetown, Pamphlet).

Summary

The several hundred kilometres of trail along the Thames River system provide a significant opportunity for hiking and other forms of recreation including biking, rollerblading, jogging and walking. Whether along the Avon Trail, the Thames Valley Trail or the many shorter trails in conservation areas and riverside municipal parklands trail users are able to experience a wide variety of terrain, appealing to a wide variety of abilities and pursuits.

Chapter 25

Parklands and Campgrounds

There are dozens of parks and conservation areas along the Thames River and its tributaries that offer numerous recreational and leisure activities such as picnicking and camping. This chapter highlights a number of the significant sites which have been used historically and today.

25.1 Historical Use of Parklands

In the industrial age, as leisure time increased so too did social gatherings and picnicking. It was considered very fashionable, by Victorian standards, to prepare a feast and dine along the shore of the river. For example, Queen Victoria Park, on the banks of the Avon River in Stratford was considered a very fashionable location for picnickers in the 1880s (Lennon, 1985, 113). This park has since become a landmark in Stratford especially with the erection of the Stratford Shakespearean Theatre on the park grounds in 1953.

London's Springbank Park was also a very popular place to spend leisure time. Hundreds of people would gather in the park, to be entertained, dance, picnic and enjoy the scenery (Miller, 1988, 127). Wonderland Gardens was a very popular attraction in the early part of this century, especially during the Big Band Era. Parties, balls, and other large functions are still held in the ballroom. The adjoining restaurant, with its river-side patio tables, has an excellent reputation in London.

Fairmount Park near Beachville was a very popular summer gathering place in the 1990s. The streetcar Estelle carried crowds of people to this river-side park where they were entertained with theatrical and musical performances held under the pavilion.

Figure 25.1. Strollers in Springbank Park, circa 1916.

Courtesy Alan Noon

25.2 Parklands

Parklands are green spaces within an urban centre. They frequently consist of treed areas with manicured lawns, playground equipment, sporting facilities and flower beds. Many have been developed along the banks of the river to take advantage of the scenic potential and to utilize land which cannot be developed due to flooding. These parks provide an outdoor experience for many urban dwellers. For over a hundred years these parklands have served as a place for social gatherings and community events. A list of the more popular municipal parks along the Thames River is given in Table 25.1.

Stratford

Stratford is known for the beauty of its parklands. In 1997, Stratford was the recipient of the "Nations in Bloom Award" for cities with a population of 20,000-50,000. This international award, announced in Madrid, Spain, recognizes the city for its beautiful parklands, environmental action and community involvement.

However, the picturesque setting of the Avon River was nearly destroyed in 1913 when a railway line was proposed along the north banks of the river (Wright, 1983, 165). Strong opposition to this movement was led by R. Thomas Orr and construction never began. Orr also had the foresight to attempt to connect the parks located at opposite ends of the Avon, creating an area that would be dedicated primarily to recreation (Stafford, 1972, 41). Today, the city boasts a string of parklands that fulfill the vision of Mr. Orr. Stretching from one end of the river to the other (see Figure 25.2), the parks encompass approximately 344 hectares of land (Leitch, 1980, 149).

Figure 25.2 Tom Patterson Theatre and Parklands along the Avon River, Stratford

Photo: Tourism Stratford

The Shakespearean Gardens, with its formal English style gardens, borders the Avon and is the most visited area along the river. Once a mill site, it was acquired by the city in 1925 (Stafford, 1972, 46-7).

With the close proximity to the theatres, picnicking along the Avon River has become a tradition for the thousands of tourists that visit Stratford each year (see Figure 25.3). In fact, it has become so popular in recent years that a number of businesses catering specifically to the needs of picnickers have developed.

A star attraction of Stratford's river-side parks are the graceful Mute Swans which were introduced in 1918. Although the swans are treated like royalty today, they had nearly disappeared in 1949 (Leitch, 1980, 141). Their numbers were restored through the efforts of the Parks Board (Leitch, 1980,142). Today, they are synonymous with Stratford and the Shakespearean Festival.

Table 25.1 Popular Municipal Parks along the Thames River System

London
- Springbank Park
- Greenway Park
- Cavendish Park
- Harris Park
- Gibbons Park
- Thames Park
- Ivey Park/Peace Gardens
- London South Branch Parks
- Stoneybrook Park
- Adelaide St. Wells Park
- Ross Park

Stratford
- Avondale Park
- Queen's Park
- Shakespearean Gardens
- Confederation Park

Chatham
- Tecumseh Park
- Collins Park
- Legion Park
- Water Street Park
- Riverview Park

St. Marys
- McGiveron Parkway
- The Flats
- Kin Park
- Particapark
- Riverview Walkway Park

Mitchell
- Lions Park
- Centennial Park
- Morenz Memorial Park

Beachville
- Two unnamed parks

Ingersoll
- Centennial Park
- Victoria Park
- John Lawson Park

Figure 25.3 Avon River, Stratford

Photo: Richard Bain

London

The City of London has developed some of its largest parklands within the floodplain of the Thames River and its tributaries. Encompassing close to 1150 hectares of land, these parks offer a vast array of uses. Most are used for walking and picnicking, and many contain playground equipment, sport fields, tennis courts and the like. A few of the parks have been left in a natural state, but most contain manicured lawns.

For over a century, Springbank Park is one of the most heavily used parks in the city. This parkland, presently 140 hectares in size, was a recreational hot spot during the time when passenger steamships dominated the waters of the Thames. Londoners boarded the ships at the Forks of the river and travelled to Springbank for the day.

Currently, Springbank Park features beautiful formal gardens, Storybook Gardens (a children's tourist attraction), Wonderland Gardens, the Guy Lombardo Museum, docking for the London Princess Cruise Line, boat houses and docking for the Joe McManus Canoeing and Rowing Facility, and plenty of open green space for picnicking and other

recreational activities. A variety of trees, numerous waterfowl and other small birds attract visitors to this parkland. A paved multi-use trail links Springbank with other river-side parks in the city (see Figure 25.4). In fact, it is possible to cycle from Springbank Park in west London to the University of Western Ontario in the north and Meadowlily Woods in east London along the river-side trail/park system.

Figure 25.4 Biking in Springbank Park, London

Photo: Richard Bain

Chatham

One of the most visited parklands in the City of Chatham is the centrally located Tecumseh Park. It was named after the great Shawnee Chief who was killed in the Battle of the Thames, a short distance away. The park hosts numerous community events and festivals. It is located on the former grounds of a military garrison, established along the banks of the Thames River in the late 1830s (see Human Heritage 17.2.4). It also served as a dock for steamers to unload passengers. Today, Tecumseh Park features a bandshell, formal gardens, a lawn bowling club, a network of pathways and access to the river in the shadow of the armouries. It is also a popular spot for picnicking, walking, or just sitting and watching the river slowly slip by.

Other Towns

The Town of Mitchell has been developing its parklands since the 1940s (Mitchell Centennial, 114). Currently, the town boasts "one of the best park systems for a town of its size" (Heritage Walking Tour of Mitchell - Pamphlet). St. Marys features numerous parklands along the banks of the North Branch of the Thames River and Trout Creek which meet in the town. Parks such as the Flats, Particapark and Riverview Walkway Park are popular with picnickers and walkers.

25.3 Camping

As travel costs continue to rise, an increasing number of people are choosing camping as an inexpensive holiday alternative (Burgess, 1986, 25). People are also in search of the "natural experience" available at campgrounds. Campgrounds along the Thames River system provide many of the basic amenities within close proximity to major urban centres, while preserving the beauty of the natural surroundings.

There are about 18 private campgrounds situated close to the Thames River and its tributaries. Together they offer hundreds of camping sites and facilities for the public. Four children's camps are also situated close to the river. These private campgrounds/camps are listed in Table 25.2 and mapped in Figure 25.5.

Table 25.2 Some of the Private Campgrounds within the Thames River Watershed

1 Woodland Lake Park, Bornholm
2 Windmill Park, Fullarton
3 Science Hill, St. Marys
4 Camp Bimini (Children's Camp), Stratford
5 Stratford Fairgrounds Tourist Camp, Stratford
6 Prospect Hill, Granton
7 Happy Hills Park, Embro
8 Lakeside Summer Resort, Lakeside
9 Hidden Valley Park, Woodstock
10 Maple Grove Christian Retreat Centre, Thamesford
11 KOA Kampground (Hwy 401)
12 Cove Mobile Home Park, London
13 Woodeden Children's Camp, Kilworth
14 Oriole Park Resort, Komoka
15 Fernwood Campground, Komoka
16 Valley View Campground, Wardsville
17 Lighthouse Cove Campground

Six conservation areas offer camping as well and these are listed in Table 25.3. The largest campgrounds in the watershed are contained within Wildwood, Fanshawe and Pittock Conservation Areas. Together, they offer over 1300 campsites. All of the conservation area campgrounds offer a full range of services from electricity, water, firewood, hiking trails, swimming in the nearby reservoirs or pools, fishing docks, activities and events, pavilions and camp stores.

Table 25.3 Conservation Areas which offer Camping Along the Thames River System

Conservation Area	No. Of Camping Sites
Wildwood (UTRCA)	450
Fanshawe (UTRCA)	650
Pittock (UTRCA)	250
Sharon Creek (LTVCA)	groups only
Longwoods (LTVCA)	groups only
Big Bend (LTVCA)	26

UTRCA (Upper Thames River Conservation Authority)
LTVCA (Lower Thames Valley Conservation Authority)

Fanshawe attracts over 100,000 campers a year (see Figure 25.6), while Wildwood and Pittock attract over 79,000 and 41,000, respectively (UTRCA, 1996). The seasonal campers at these three conservation areas have formed campers associations. Members volunteer their time organizing dances, bingos, tournaments and fundraising for park equipment and facilities. These campgrounds, operated by the Upper Thames River Conservation Authority (UTRCA), attract tourists from about a 100 km radius (Sauder, pers. comm.). Wildwood draws tourists from the furthest away (e.g. Michigan), especially those attending the Stratford Festival. The private campgrounds likely have a similar draw.

Figure 25.6 Camping at Fanshawe CA

Photo: UTRCA

There are several conservation areas (C.A.s) operated by the Lower Thames Valley Conservation Authority (LTVCA) which offer limited camping facilities (see Table 25.3). Sharon Creek and Longwoods Conservation Areas, near Delaware, offer group camping. Longwoods C.A. provides three group camping areas that can accommodate a total of 600 campers and Big Bend C.A., near Wardsville, has 26 individual campsites.

There are also a number of small clearings along the banks of the river for "wilderness" camping. Very rustic in nature, these clearings are most often used by paddlers canoeing the Thames or hikers walking the Thames Valley Trail. Paddlers can also camp at the many river-side campgrounds, both privately or authority owned.

Summary

Local residents and tourists have enormous opportunities to spend time near the Thames River in the numerous parklands, campgrounds and conservation areas in the region. These areas provide a diversity of facilities which appeal to people seeking a range of outdoor pursuits.

Figure 25.5 Campgrounds, Natural Areas, and other Recreational Features within the Thames River Watershed

Conservation Areas with Campgrounds

1 Wildwood C.A.
2 Fanshawe C.A.
3 Pittock C.A.
4 Longwoods C.A.
5 Sharon Creek C.A.
6 Big Bend C.A.

Private Campgrounds

1 Woodland Lake Park
2 Windmill Park
3 Science Hill
4 Camp Bimini
5 Stratford Fairgrounds Tourist Camp
6 Prospect Hill
7 Happy Hills Park
8 Lakeside Summer Resort
9 Hidden Valley Park
10 Maple Grove
11 KOA
12 Cove Mobile Home Park
13 Woodeden Children's Camp
14 Oriole Park Resort
15 Fernwood Campground
16 Valley View Campground
17 Lighthouse Cove Campground

Marinas

1 Chatham City Docks
2 Lighthouse Cove

Natural Areas (Public Access Permitted)

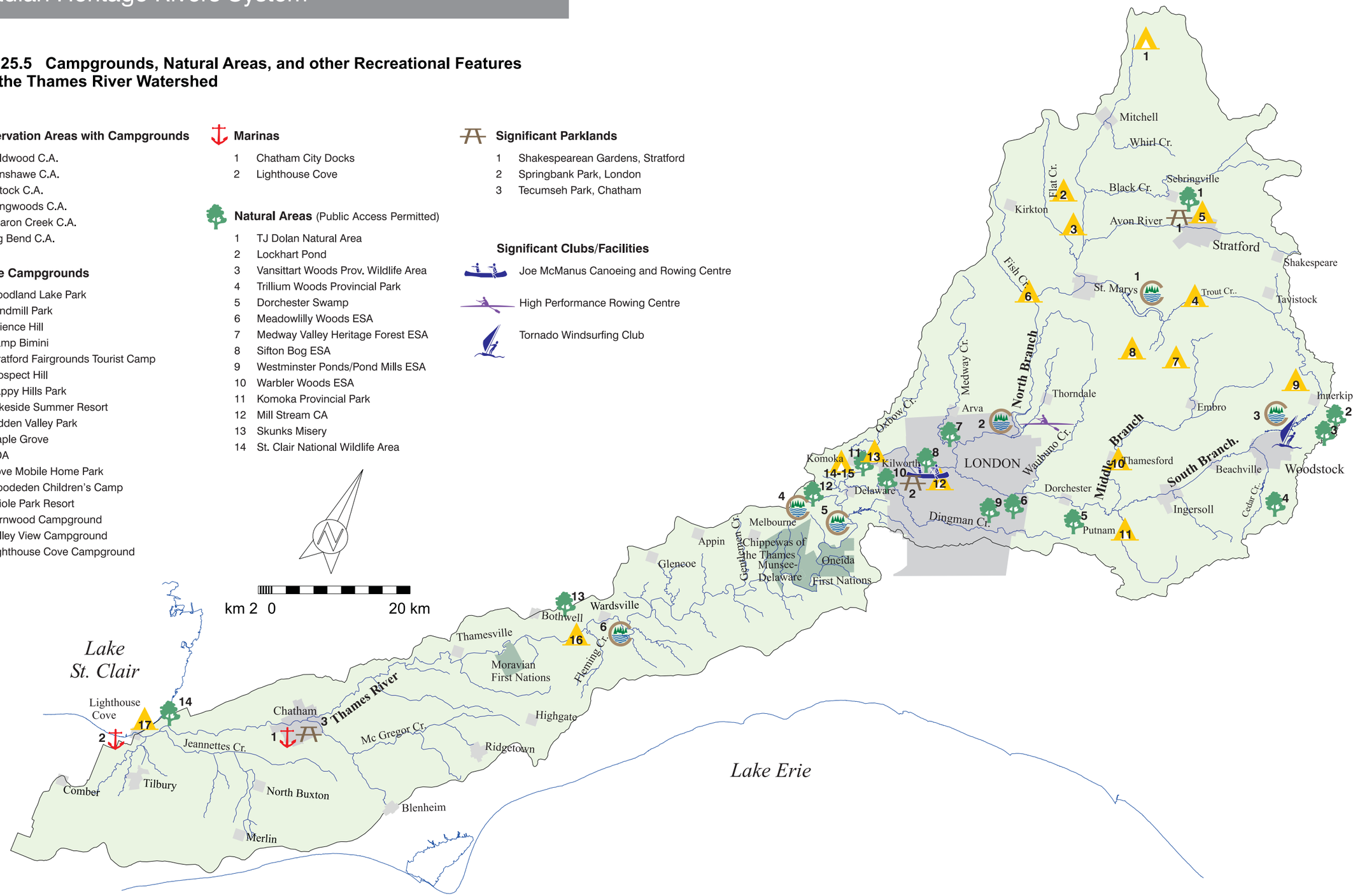
1 TJ Dolan Natural Area
2 Lockhart Pond
3 Vansittart Woods Prov. Wildlife Area
4 Trillium Woods Provincial Park
5 Dorchester Swamp
6 Meadowlilly Woods ESA
7 Medway Valley Heritage Forest ESA
8 Sifton Bog ESA
9 Westminster Ponds/Pond Mills ESA
10 Warbler Woods ESA
11 Komoka Provincial Park
12 Mill Stream CA
13 Skunks Misery
14 St. Clair National Wildlife Area

Significant Parklands

1 Shakespearean Gardens, Stratford
2 Springbank Park, London
3 Tecumseh Park, Chatham

Significant Clubs/Facilities

Joe McManus Canoeing and Rowing Centre
High Performance Rowing Centre
Tornado Windsurfing Club



Chapter 26

Nature Appreciation

This section examines the many natural areas located along the Thames River system. Used by a growing number of people for nature appreciation, these areas sustain many unique species of plant and animal life not to be found elsewhere in Canada. Although much has been lost, a wide variety of significant natural areas remains along the river for naturalists and others to enjoy.

26.1 Natural Areas

Southwestern Ontario has lost much of its original forest cover to agriculture and urban development. The natural areas which remain, however, are treasured. A natural area is a parcel of land that is dominated by native vegetation and, though it may contain trails, does not have the sports equipment and manicured lawns of city parks. Some of the natural areas have been preserved because they are inaccessible, unfarmable, located on flood-prone land, or have been specifically set aside due to their unique qualities or the presence of rare species. As a result, natural areas are concentrated near the Thames River and its tributaries rather than in upland locations in the watershed.

Nature appreciation takes many forms for many people. Some common forms include: viewing spring wildflowers and fall colours, spring and fall birding, plant identification, insect identification, animal tracking and year round hiking. Since most of the Thames River watershed lies within the biologically diverse Carolinian Floristic Region (see Natural Heritage 5.0), nature enthusiasts are able to view an unusually large variety of plants, birds, mammals, reptiles, amphibians and invertebrates.

Some of the natural areas contain mature forests while others, such as Fanshawe Conservation Area, contain young forests, the result of renaturalization projects over the last 30-40 years. The City of London and the UTRCA own and manage five Environmentally Significant Areas (ESAs) within the city limits (see Figure 26.1). The diverse nature of the swamps, meadows, marshes and woodlands contained in these areas are enjoyed by thousands of Londoners. Many other woodlots along the Thames River are privately owned and, thus, access is limited. The First Nations reserves also contain significant amounts of woodland and natural vegetation.

Table 26.1 lists 25 sites which contain significant amounts of natural vegetation and are open to the public. Descriptions of the area's location, size, ownership, dominant vegetation, trails, and special features are also summarized in this table. The sites are mapped in Figure 25.5

Table 26.1 Natural Areas With Public Access Within the Thames River Watershed

Natural Area	Location	Size (ha)	Status	Dominant Vegetation type	Trails	Features
T.J. Dolan Natural Area	Stratford (2)	25	Municipal Park	Floodplain woods with reforested areas	✓	Wide variety of tree species and birds
Wildwood Conservation Area	E of St. Marys (2)	1200	Conservation Area and Ducks Unlimited Site	Floodplain and upland woods with reforested areas	✓	Excellent viewing of waterfowl and shorebirds
Fanshawe Conservation Area	NE London (1)	1250	Conservation Area	Floodplain and upland woods with reforested areas	✓	Eastern Spiny Softshell Turtle below dam; excellent waterfowl viewing, songbirds
Lockhart Pond Provincial Wildlife Area	NE of Woodstock (3)	35	Provincial Wildlife Area	Bog and upland woods	✓	Unique bog flora, floating mat of Sphagnum mosses
Vansittart Woods Provincial Wildlife Area	NE of Woodstock (3)	80	Provincial Wildlife Area and Class 2 Wetland	Swamp and upland woods	✓	Wood Duck nesting site
Pittock Conservation Area	NE of Woodstock (1)	800	Class 1 Wetland	Floodplain and upland woods with reforested areas	✓	Migratory stopover for ducks, geese and swans

Table 26.1 Natural Areas With Public Access Within the Thames River Watershed

Natural Area	Location	Size (ha)	Status	Dominant Vegetation type	Trails	Features
Trillium Woods Provincial Nature Reserve	E of Woodstock (3)	10	Provincial Nature Reserve	Upland woods	√	Display of variegated trilliums and birds in spring
Dorchester Swamp	SE of Dorchester (3)	548	Carolinian Canada Site and Class 1 Wetland	Mature deciduous swamp	√*	Large area with many uncommon, northern plants; also a significant water storage area
Meadowlily Woods	London (1)	135	E.S.A. and Class 3 Wetland	Floodplain and ravine forest	√	Diverse bird life and rare plant species
Medway Valley Heritage Forest	London (2)	300	E.S.A.	Floodplain forest, mature and secondary growth	√	Uncommon species of trees, shrubs and flowers
Sifton Bog	London (3)	28	E.S.A. and Class 2 Wetland	Bog	√	Unique boreal/bog vegetation (largely intact)
Westminster Ponds/ Pond Mills Complex	London (3)	__	E.S.A. and Class __ Wetland	Mature woods with kettle ponds	√	Carolinian trees and shrubs such; bog plants line the pond shores
Warbler Woods	London (3)	___	E.S.A.	Mature woods on rolling moraine	√	Large Carolinian Trees (American Chestnut)
Komoka Provincial Park	S of Kilworth (1)	200	Provincial Nature Reserve	Floodplain and upland with ravines	√	woods More than 24 different plant communities and uncommon winter birds
Millstream Conservation Area	SW of Delaware (3)	10	Conservation Area	Deciduous Forest		Spring season features a wide variety of blooms. A variety of birds also nest in the area
Sharon Creek Conservation Area	SE of Delaware (2)	36	Conservation Area	Upland woods	√	Steep wooded banks around the lake as well as numerous cedars
Longwoods Conservation Area	SW of Delaware (3)	63	Conservation Area	Deciduous forest, meadows and stream valleys	√	Habitat for unique species of birds
Big Bend Conservation Area	E of Wardsville (1)	16	Conservation Area	Deciduous forest	√*	Uncommon Carolinian flora and Map and Midland Painted Turtles
Skunk's Misery	SE of Bothwell (3)	1200	Carolinian Canada Site and Class 1 Wetland	Deciduous swamp and forest	√*	Huge area with rare Carolinian species, significant bird habitat and uncommon reptiles
Sinclair's Bush	SE of Blenheim (3)	46	Carolinian Canada Site	Deciduous forest		Carolinian species and spring wildflowers
St. Clair National Wildlife Area	N of mouth of Thames on Lake St. Clair (3)	244	Carolinian Canada Site and Class 1 Wetland	Cattail marsh and wet prairie	√	Rare species of plants and numerous water birds

Location: (1) = along Thames River; (2) = along major tributary of Thames; (3) = within watershed
Trails: * = limited trail system
Primary Source: Lorimer (1996)

Figure 26.1 Meadowlily Woods E.S.A., London

Photo: Cathy Quinlan

26.2 Naturalist Groups

Interest in nature and, in particular, the rich and interesting Carolinian plants and animals that exist within the Thames River watershed, has led many people within the watershed to form naturalist groups or clubs to share their interest.

The McIlwraith Field Naturalists of London, one of the oldest naturalist clubs in Canada, formed in 1864 as an entomological club. During the Victorian era, it was not uncommon to occupy leisure time collecting and examining insects. Due to its popularity among Londoners the club served as a forerunner in entomological studies in Canada (Wake, pers. comm.). Over the years, interests changed and members began to study plants, birds and fossils. Today, the clubs's emphasis is on education, science, conservation and nature appreciation. Nature walks, slide shows, lectures, and bird counts are popular activities (see Figure 26.2). Members have been actively involved in numerous political activities in the London area including the struggle to protect the five Environmentally Significant Areas (ESAs) described in the previous section. The "birding wing" of the club is very active and compiles and publishes information on the birds of Middlesex County annually (see Natural Heritage 6.0).

A number of other nature appreciation organizations have taken root in communities along the Thames River including the Stratford Field Naturalists (established 1967), West Elgin Nature Club, Woodstock Field Naturalists (established 1934), and the Ingersoll Nature Club (established in the early 1950's). Scheduled outings frequently include portions of the Thames River system. Nature walks, canoe trips, and bird counts are some of the favourite activities. Through their work, these organizations are also responsible for helping to educate others within the community about the fragile state of nature.

Naturalist clubs often work with city planners and conservation authorities and other like-minded groups to preserve and restore local natural areas. Their continued efforts will ensure the vitality of natural areas along the Thames River system for appreciation and recreation in the years to come.

Figure 26.2 Naturalists in Sifton Bog

Photo: UTRCA

Summary

Numerous natural areas exist along the Thames River and within the watershed. These remnant woodlots and wetlands contain many unique Carolinian species and are appreciated by thousands of nature enthusiasts. The five naturalist clubs in the watershed take special interest and pride in these natural areas, often defending their preservation.

Chapter 27

Human Heritage Appreciation

Numerous communities along the Thames River pride themselves on the depth of their human heritage and its close association with the river. Special events, festivals, structural landmarks and museums pay homage to this history. This chapter describes a number of the popular events and monuments that reflect human heritage along the Thames River.

27.1 Re-created Villages

There are three villages in the watershed which re-create life in historic times including Fanshawe Pioneer Village, Lawson Prehistoric Indian Village (London Museum of Archaeology) and the Ska-Nah-Doht Iroquoian Village. All are open to the public and provide visitors with an opportunity to re-live daily customs of a time gone by.

Fanshawe Pioneer Village is located within Fanshawe Conservation Area. The village depicts life in a rural community in the 1800s and early 1900s (see Figure 27.1). The village contains 25 structures including a log school house, blacksmith's shop, church, and general store. There are demonstrations of a printing press, bread baking over an open hearth, and tool making by a blacksmith. Numerous volunteers, dressed in period costume, bring the demonstrations to life (Fanshawe Pioneer Village - Pamphlet). There are ongoing efforts to acquire old structures and re-locate them to the village. The village is extremely popular with local residents and tourists, hosting approximately 40,000 visitors a year (Ollivier, pers. comm.).

Figure 27.1 Fanshawe Pioneer Village

Photo: UTRCA

The London Museum of Archaeology located along Medway Creek in northwest London, contains a re-created Attawandaron village. The village has been re-created on the grounds of a former settlement. A striking palisade, made up of tall branches and logs, surrounds part of the village. A longhouse has been reconstructed based upon on-site excavations and descriptions gathered by First Nation peoples (see Figure 27.2). Portions of the village are still being excavated (Discover Ontario - Pamphlet). This historic site "is Canada's only ongoing excavation and reconstruction of a prehistoric site, retracing the lives of the Neutral Indians who inhabited the five acre site 500 years ago" (Armstrong, 1986, 14). A museum is also located on-site.

Figure 27.2 Longhouse at the London Museum of Archaeology

Photo: Cathy Quinlan

The Ska-Nah-Doht Iroquoian Village, located within Longwoods Road Conservation Area, features a village reflective of the Native settlements found along the river close to 1000 years ago. This village, created with the information gathered by archaeologists and First Nation peoples, offers tours, workshops and an opportunity to see how Iroquois people once lived (Longwoods Conservation Area - Pamphlet). It is also a popular attraction for local residents and tourists alike. About 28,000 people visited the Iroquoian Village and Conservation Area in 1996 (Carey, pers. comm.).

27.2 Re-enactments

Historically, the Thames River and its banks were the site of a number of skirmishes (see Cultural Heritage, 14.2). In memory of the battles fought and the lives lost, these conflicts are re-enacted.

The Kent Military Re-enactment Society's re-enactment of the Battle of Longwoods is an annual event that has taken place every year since 1990. About 200 volunteers, dressed in period costume, depict the battle scene for the hundreds of spectators who turn out annually.

The Battle of the Thames, where the great Shawnee

Chief Tecumseh was killed, is re-enacted at the annual Heritage Days held at Thamesgrove Conservation Area in Chatham. Skirmishes on the Thames River are also held (see Figure 27.3). This "Faire at the Forks" is a huge event which features a voyageur village, blacksmith's tent, military encampment, and shops, circa 1813. Visitors can carouse with John McGregor, listen to a minstrel, or relax at the village tavern and enjoy period food (Heritage Days - Pamphlet).

Figure 27.3 Re-enactment, Heritage Days, Chatham

Photo: Cathy Quinlan

The Upper Thames Military Re-enactment Society also plays an active role in the recreation of a number of military displays in this part of the watershed. The annual Heritage Days celebration in the Town of Ingersoll, features a display reflective of a time gone by. Under the direction of the Norfolk Militia, a military encampment is set up on the grounds of Centennial Park, along Halls Creek. Ongoing demonstrations and mock battles are among the features of this annual celebration (Lovell, pers. comm.).

In addition to the military re-enactments, Chatham and London also host Voyageur Canoe Races. The Chatham races are accompanied by a voyageur encampment which depicts life in the times of the voyageurs and fur-traders (see Section 21.8).

27.3 Museums

Many of the museums in Thames River communities are housed within structural landmarks or located on a particular site because of its value in terms of the historical development of the area.

The Ingersoll Cheese Factory Museum, located along Halls Creek in Ingersoll was established about 20 years ago. The museum depicts a mid-nineteenth century cheese factory operation, a focal point in the development of Ingersoll (see Figure 27.4).

Figure 27.4 Ingersoll Cheese Factory Museum

The Beachville District Museum is located in the backyard of a functional limestone quarry. The museum occupies the home of a former quarry owner and operator, Mr. Downing. The Downing family home, built in 1851 along the south banks of the river, houses some of Beachville's long history. Tourists to the area may examine the various displays and artifacts from the Lime Capitol of Canada. Many date back to the 1800s, including a model of the first game of baseball reportedly played in Beachville (Beachville District Museum - Pamphlet).

The London Museum of Archaeology, located along the Medway Creek in London, is a prized museum for local residents, tourists, and school groups. A tour through the Museum Gallery illustrates the existence of Nomadic Hunters (9000-7000 B.C.), Hunters, Fishers and Foragers (7500-1000 B.C.), Traders and Potters (1000 B.C.-500 A.D.), Early Farmers (800-1550 A.D.), and Contact and Conflict (1550-1650 A.D). Models, artifacts, carvings and paintings bring this ancient and evolving time period to life (Discover Ontario's - Pamphlet).

Eldon House, built along the North Branch in 1834 by the prominent Harris family is the oldest surviving residence in London (see Human Heritage 13.2.1). It houses many of the Harris family heirlooms and treasures. The home has been maintained as it was near the turn of the century. The beautiful home and the idyllic location of the property near the river, make it a popular destination for Londoners and visitors.

The Fairfield Museum, located near Wardsville, commemorates the former Village of Fairfield, now known as Moraviantown (see First Nations, 17.0). The Delaware people settled this land as far back as 1792. The village of Fairfield was destroyed by the invading Americans following the Battle of the Thames. Following the Peace of 1814, the Delaware tribe re-established their settlement on the south bank of the Thames in Moraviantown. A replica of an original homestead has been erected on the museum grounds. The village burying ground can also be visited. A viewing platform allows one to see across the Thames to the settlement established after 1814.

The Buxton Historic Site and Museum in North

Buxton, houses many artifacts and structures relating to the town's role in the Underground Railroad. The town, originally known as the Elgin Settlement, was a landmark for freedom for the fleeing African American slaves in 1849. Under the guidance of Rev. William King, a Black settlement flourished here of some 1200 to 2000 persons. Many of their ancestors still reside in the village today. Many original structures remain standing including the second school house which now functions as part of the museum (see Figure 27.5) The history of the black people and their journey up the Thames and Sydenham Rivers is housed in the museum (An African-Canadian Heritage Tour - Pamphlet).

Figure 27.5. Students, teacher and schoolhouse, North Buxton, c. 1910

Source: Hill, 1981.

Museums in St. Marys, Stratford, Woodstock and Chatham also house some of the artifacts and details related to settlement and development along the Thames.

27.4 Special Events

Summer Festivals and Fall Fairs along the entire length of the Thames River are popular events for showcasing local culture. Among many of the feature attractions there is a close association to the river.

Pow Wows are held annually at the First Nation Reserves of Munsee Delaware, Chippewa, and Moraviantown. Members of the First Nation communities perform customary dance rituals in traditional costumes (see Figure 26.3). The dances are symbolic movements tied to the spiritual beliefs of the people. The Pow-Wows are open to the public and provide a significant opportunity to learn about and appreciate the culture of the First Nations peoples who live along the Thames River.

Figure 27.6 Traditional Dance at Pow Wow

Photo: Chatham Daily News, May 31/97

In Chatham, a display of Scottish tradition is held at the Annual Championship Supreme Highland Games. The presence of Scottish influence on recreation in Chatham can be traced back to 1817, when a touring minstrel made note of the area's activities as being of "Scottish influence" (Day, 1977, 72). Approximately 4000-5000 spectators come from miles around to Tecumseh Park on the Thames to witness such competitions as the hammer throw, the farmers walk, the caber toss and the stone throw. This family affair is one of only two in the area offering such authentic Scottish tradition. The proximity to the water is also appealing to boaters who are drawn to the event by the sound of the bag pipes echoing across the city (Colquhoun, pers. comm.).

Tecumseh Park is also the location of the annual Festival of Nations which is held on the July 1st long weekend. The event celebrates Canada's multicultural heritage. The Festival of Nations showcases a parade, ethnic food, dancing, canoe races, a fishing derby and nightly entertainment. It is estimated that 120,000 people enjoyed the 1996 Festival of Nations (Logan, pers. comm.).

27.5 Historical Tours

Old mills, bridges and homes along the entire length of the river are evidence of the rich cultural heritage. Since a number of structures remain intact, communities organize tours to showcase their heritage and educate visitors and residents.

Stratford features a number of historical sites near the heart of the city. A variety of walking tours guide visitors through a passage in time. Tour highlights include the site of a former Indian encampment, the Festival Square, the Shakespearean Gardens and a number of architectural masterpieces.

The Heritage Walking Tour of Mitchell showcases many heritage homes, churches and a hotel that played a significant role in the development of this river-side town. Tours along the banks of Cedar Creek, in Woodstock, provide an exciting opportunity to view some of the local culture.

The City of London also features a variety of walking tours. Some of the tours focus on the history of the area, while others look more closely at the architectural features of the many structures still standing. Since early settlement in London was centred along the river, so too are a number of the tours. The homes of prominent citizens, the old courthouse and the location of some of the earliest London merchants are featured along the tours.

Growing in popularity with citizens of the Chatham area is the Spirit Walk. This exciting adventure takes visitors on a lantern guided tour of an historic district near the river. Along the journey, locals in costume portray historical characters that had an impact on the development of the city (Luscio, pers. comm.).

The African-Canadian Heritage Tour directs participants to several sites in Kent and Lambton Counties which played a role in the Underground Railway and provided homesteads for fleeing slaves. The tour visits such landmarks as the Buxton Historic Site and Museum, the First Baptist Church in Chatham and Uncle Tom's Cabin in Dresden. The First Baptist Church was founded by refugee slaves in 1841 and "stands as a symbol of everlasting spiritual freedom" (An African-Canadian Heritage Tour - Pamphlet).

Summary

The Thames River valley and the communities along the shore have a long, rich cultural heritage. This section has pointed to some of the most significant opportunities for human heritage appreciation. The recreated villages, special events, museums and tours reflect the strong appreciation for the history of the area and attract both local residents and tourists.

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Culver, Luke - Chatham Power Squadron
Crispin, George - London Princess Cruise Lines
Feulgen, Udo - London Canoe Club
Gene, Ken - Stratford Canoe Club
Goodall, Greg - Woodstock Rowing
Haggeman, Rudy - Marina at Lighthouse Cove
Hawkins, Gary - Chatham Canoe Club
Herr, Frank - Owner/Operator Juliet III Cruising Line
McClatchie, Jack - Historian of Yacht Clubs
McTaggert, Ken - Boating History in London
Murphy, Dr. Michael - London Rowing
Shaw, Noreen - Chinese Canadian National Council, London, Dragon Boat Racing
Speller, Earl - Chatham Power Squadron
Vincent, Bob - London Canoe Club

Fishing and Hunting

Fairburn, Don - Ontario Federation of Anglers and Hunters
Howey, Les - Thames River Anglers, London
Hector, Don - Ministry of Natural Resources, Chatham
Piper, Russ - Ontario Federation of Anglers and Hunters
Riehl, Jim - London Sport Fishery Association
Schraeder, Hal - Ministry of Natural Resources, Alymer
Williams, Glyn - English Style Carp Derbies, London

Trails and Corridors

Barnes, Sharon - Director of Recreation, St. Marys
Cockset, Bill - Manager of Operations, Parks and Forestry, London
Fisher, Jim - President of the Avon Trail Association
Law, Jean - Hike Ontario
Stenhouse, Carmen - President of the Thames Valley Trail Association

Parklands and Campgrounds

Sauder, Steve - Marketing Specialist, Upper Thames River Conservation Authority
Carey, Bonnie - Community Relations Supervisor, Longwoods Conservation Area

Nature Appreciation

Haggeman, John - St. Clair National Wildlife Area
King, Gail - Stratford Field Naturalists
Martin, Dan - Arborist, Stratford
Prieksaitis, Marjorie - West Elgin Nature Club
Wake, Winnie - McIlwraith Field Naturalists

Human Heritage Appreciation

Carey, Bonnie - Community Relations Supervisor, Longwoods Conservation Area
Colquhoun, Debbie - Highland Games, Chatham
Fletcher, Sue - Curator, Beachville Museum
Gilbert, Lisa and Jim - Heritage Days, Chatham
Johnson, Sheila - Curator, Woodstock Museum
Logan, Hugh - Director of Culture and Recreation, Chatham
Lovell, Shirley - Curator, Ingersoll Cheese Factory Museums
Luscio, Joe - Kent Military Re-enactment Society
Major, Dan - Director of Parks and Recreation, Woodstock
Ollivier, Luanne - Village Manager, Fanshawe Pioneer Village
Raynor, Laurie Ann - Historic Downtown Marketing Co-ordinator, Chatham
Riddick, Shirley - Curator, Beachville Museum
Sholtz, Karen - Festival Office, Stratford

Chapter 28

Conclusion

Community meetings were hosted early in 1996 to explore the feasibility of nominating the Thames as a CHR. The consensus from the participants at those early meetings was that the river was worthy of designation based upon its human heritage and recreation values; while most agreed natural heritage was of national significance as well, it was recognized the river could not be nominated on that basis because of impoundments.

The Thames River Background Study has confirmed these early assumptions. Natural heritage, human heritage and recreation values are of outstanding importance both locally and nationally and meet several of the CHRS Values Guidelines as defined in Canadian Heritage Rivers System: Objectives, Principles and Procedures. The following specific points support this conclusion:

Natural Heritage

- The Thames was one of the first rivers to form following the retreat of the last glacier from Ontario. The river's upper reaches still follow the ancient spillways while the lower reach emerged after thousands of years as a glacial lake.
- The Thames is the only major river in Canada with the majority of its watershed in the Carolinian Life Zone. The region is recognized nationally as one of the most biologically diverse areas with more than 2200 species of vascular plants.
- The watershed sustains the largest diversity of clams and one of the most diverse fish communities in Canada, as well as supporting the threatened Eastern Spiny Softshell Turtle.

Human Heritage

- The Thames has provided the setting for 11,000 years of Aboriginal and European settlement.
- The Thames watershed was a major theatre during the War of 1812 including the Battle of Longwoods, Tecumseh's death and the Battle of Moraviantown.
- The Thames watershed supported the first successful commercial agrarian society in Canada, based on the wheat staple.
- Watermill sites along the river became the focus for settlement in London, Chatham, Stratford, Woodstock as well as a network of other small towns and villages.
- London is the product of Lieutenant-Governor Simcoe's vision for 'the Forks' as the capital of Upper Canada.
- Individuals linked to the river include Tecumseh, Thomas Talbot, John Carling, John Labatt, Amelia Harris, Paul Peel, Adam Beck, Arthur Meighan and, more recently, Tom Patterson, Silken Laumann and Marnie McBean.

Recreation

- The diversity of boating opportunities is significant and includes such forms as canoeing, kayaking, sailing, power-boating, yachting and high performance rowing. The London Canoe Club is the largest canoe club in Canada, and the Tornado Boardsailing Club at Pittock Lake is the oldest boardsailing club in the nation.
- Sport fishing is carried out by thousands of local residents who enjoy the scenic value of the river valley, its accessibility, and the diversity of fish species.
- Such hiking trails as the Thames Valley Trail and the Avon Trail link to provincial trail networks including the Bruce. Other multi-use urban trials situated within the floodplain provide recreational opportunities for walkers, cyclers, roller-bladers and cross-country skiers.
- The Carolinian Life Zone provides a unique and diverse environment for naturalists and researchers. There are five naturalist clubs in the watershed and the McIlwraith Field Naturalists of London Incorporated is the oldest club in Canada.
- The Thames watershed provides many opportunities for heritage appreciation including Aboriginal villages (Ska-Nah-Doht), pioneer settlements (Fanshawe Pioneer Village), military re-enactments (Heritage Days, Chatham) and pow wows.
- Both the Stratford Shakespearean Festival and the National High Performance Rowing Centre at Fanshawe Lake are individual examples of nationally significant recreation attractions.

Assessment of Integrity Guidelines

Three Integrity Guidelines have been established as criteria for designation as a Canadian Heritage River. The Thames meets each of these values:

- As described through the presentation of natural heritage values, the river is of sufficient size and composition to demonstrate the key aspects of features and processes which give the Thames its outstanding values; its ability to sustain threatened and endangered species and its presence within the highly productive Carolinian Floristic Region support this conclusion.
- As described through the presentation of natural

heritage values, the river contains ecosystem components necessary for sustainability of the valued features; biotic diversity and the presence of endangered species within this highly settled and developed landscape suggest the watershed has an exceptional capacity to support ecosystem features and functions.

- Continual improvements in water quality during the past twenty years coupled with increasing community awareness and concern for the health of the aquatic system suggest water quality will support and enhance the valued features of the watershed.

Recommendation

The Thames River Background Study has documented natural heritage, human heritage and recreation values within the watershed. Based upon this weight of evidence, it is recommended that, with the concurrence and advice of Parks Ontario and Parks Canada, the TRCC proceed with the preparation of a formal nomination document so that the Province of Ontario might then be prepared to recommend to the CHRS Board in February 1998 that the Thames River be nominated as a Canadian Heritage River based upon its Human Heritage and Recreational values (Natural Heritage being excluded due to the presence of impoundments).

Canadian Heritage Rivers System

Background Study
Appendices

Table 1
Summary of All Stream Guage Stations
on the Thames River and its Major Tributaries

#	Station Location	Drainage Area (km2)	First Year of Record	No. of Years of Full Records *	Years of Full Records
Downstream of Forks					
1	Mouth **	--	**	**	--
2	Chatham **	--	**	**	--
3	Thamesville	4300	1938	35	1956-1990
4	Dutton	3760	1971	18	1972-1990
5	Byron	3110	1923	43	1923-1930,1956-1990
Upstream of Forks					
6	Ealing	1340	1915	74	1916-1990
7	Ingersoll	518	1957	33	1958-1990
8	Woodstock	254	1952	38	1953-1990
9	Innerkip	149	1978	12	1979-1990
10	Tavistock	34	1990	3	1988-1990
North Branch					
11	d/s of Fanshawe Dam	1450	1915	63	1916-1933,1936-1943,1954-1990
12	Thorndale	1340	1953	37	1954-1990
13	Mitchell	319	1953	36	1955-1990
Middle Branch					
14	Thamesford	306	1938	42	1949-1990
Tributaries					
15	Medway Creek near London	200	1945	27	1949-1955,1971-1990
16	Avon River, d/s Stratford	144	1964	26	1965-1990
17	Cedar Cree, Woodstock	93	1951	37	1952-1957, 1960-1990
18	McGregor Creek, Chatham	202	1977	13	1978-1990
19	Trout Creek u/s of St. Marys	140	1945	36	1954-1990
20	Trout Creek u/s of Fairview	36	1966	24	1967-1990
21	Dingman Creek near Lambeth	146	1965	23	1966-1984, 1987-1990
Disconnected Stations/Defunct					
	Univ. of Western Ontario	1700	1943	19	1944-1961
	St. Marys	1080	1938	39	1952-1990

Notes:

Source: Environment Canada, 1992.

* No of Years of Records extends only to 1990 (length of record covered in Environment Canada, 1992)

All stations with records up to 1990 are still operating (1997).

** There is no stream flow guage at these stations, only water level readings due to influence of lake water

d/s = downstream u/s = upstream

full records = readings for 12 months of the year

Table 2

Major Tributaries of the Thames River

North Thames	Length	South Thames	Length	Thames River	Length
Whirl Creek	22	Cedar Creek	15	Dingman Creek	47
Black Creek	35	Reynold's Creek	31	Sharon Creek	10
Avon River	35	Waubuno Creek	36	Turkey Creek	10
Flat Creek	23	Pottersburg Creek	21	Baird Creek	10
Trout Creek	28			Hog Creek	10
Fish Creek	29			Big Mundy Creek	10
Gregory Creek	19	**Middle Thames**	**Length**	Gentlemans Creek	15
Wye Creek	14	North Branch Creek	20	Newbigvin Creek	15
Stoney Creek	12	Mud Creek	22	Battle Hill Creek	15
Medway Creek	35			Flemming Creek	20
Oxbow Creek	32			McGregor Creek	30
				Jeannette Creek	35
				Big Creek	20
				Baptiste Creek	25
North Thames (Mitchell to the Forks in London)			77		
South Thames (Tavistock to the Forks in London)			86		
Middle Thames (headwaters to confluence)			26		
Thames River (Forks in London to Lake St. Clair)			187		

Notes:

- tributary lengths are in kilometres and are approximate
- tributaries are listed in order from upstream to downstream

Table 3
Characteristic Rooted Aquatic Plants of the Thames River System

Common Name	Scientific Name
Water Plantain	*Alisma plantago-aquatica*
Water Plantain	*Alisma subcordata*
Canada Waterweed	*Elodea canadensis*
River Horsetail	*Equisetum fluviatile*
Blue Flag Iris	*Iris versicolor*
Yellow Pond Lily	*Nuphar variegatum*
Lady's Thumb	*Polygonum amphibium*
Pondweed	*Potamogeton amplifolius*
Pondweed	*Potamogeton crispus*
Pondweed	*Potomogeton pectinatur*
Common Arrowhead	*Sagittaria latifolia*
Lizard's Tail	*Saururus cernuus*
Great Bur Reed	*Sparganium eurycarpum*

Source:
Bowles (1989), Bowles (1992), Bowles *et al* (1993),
Bowles *et al* (1994), Stephenson (1987) and Stephenson (1989).
and Bowles (personal communication).

Table 4
Characteristic Plants of Disturbed Riparian Habitats
(River Islands, Bluffs, Bars)

Trees in the Canopy and Understory	Shrubs and Vines in the Understory	Vascular Plants in the Ground Layer
Manitoba Maple	Red-osier Dogwood	Canada Anemone
Hawthorns	Virgin's Bower	Swamp Milkweed
Sycamore	Red-osier Dogwood	Blue-joint Grass
Basswood	Moonseed Vine	Emory's Sedge
	Ninebark	Red-based Spike-rush
	Trembling Aspen	Wild Rye
	Wild Red Raspberry	Spotted Joe-Pye Weed
	Bebb's Willow	Pale-leaved Sunflower
	Pussy Willow	Path Rush
	Willow	Wild Mint
	Sandbar Willow	Forget-me-not
	Riverbank Grape	Canada Goldenrod
		Tall Goldenrod

Sources:
Bowles (1989), Bowles (1992), Bowles *et al* (1993), Bowles *et al* (1994),
Bowles (1997, personal communication), Stephenson (1987), Stephenson (1989).

Table 5
Characteristic Plants of the Thames River Riparian Zone

Trees in the Canopy and Understory	Shrubs and Vines in the Understory	Vascular Plants in the Ground Layer
Black Maple	Altenate-leaved Dogwood	Wild Leek
Silver Maple	Running Strawberry Bush	Groundnut
Sugar Maple	Witch Hazel	Green Dragon
Blue Beech	Spicebush	Small Jack-in-the-pulpit
Bitternut Hickory	Virginia Creeper	Marsh Marigold
Shagbark Hickory	Chokecherry	Carey's Sedge
Hackberry	Poison Ivy	Jame's Sedge
White Ash	Wild Black Currant	Blue Cohosh
Black Ash	Prickly Gooseberry	Meadow Horsetail
Red Ash	Common Blackberry	White Trout Lily
Blue Ash	Black Raspberry	Yellow Trout Lily
Black Walnut	Bebb's Willow	Sweet Joe-Pye Weed
Ironwood	Sandbar Willow	Pale-leaved Sunflower
Sycamore	Elderberry	Canada Waterleaf
Bigtooth Aspen	American Bladdernut	Spotted Touch-me-not
Tembling Aspen	Maple-leaved Viburnum	Twin-leaf
Eastern Cottonwood	Nannyberry	Wood Nettle
Swamp White Oak	High-bush Cranberry	Michigan Lily
Bur Oak	Riverbank Grape	Fringed Loosestrife
Red Oak	Prickly Ash	False Solomon's Seal
Black Willow		Ostrich Fern
Hybrid Willow		Sweet Cicely
Basswood		Tall Coneflower
White Elm		Bloodroot
Slippery Elm		Blue-stemmed Goldenrod
		Zig Zag Goldenrod
		Skunk Cabbage
		Early Meadow-rue
		Wake-robin
		Blue Vervain
		Cream Violet

NOTES:

- if a species is considered a tree and a shrub, it has been placed in the tree column

Sources: Bowles (1989), Bowles (1992), Bowles *et al* (1993), Bowles *et al* (1994)
Bowles (1998, pers. comm), Stephenson (1987), and Stephenson (1989)

Table 6
Characteristic Plants of the Thames River Valley
(Floodplain and Bottomlands)

Trees in the Canopy and Understory	Shrubs and Vines in the Understory	Vascular Plants in the Ground Layer
Sugar Maple	Serviceberries	Red Baneberry
Blue Beech	Alternate-leaved Dogwood	Groundnut
Bitternut Hickory	Flowering Dogwood	Wild Columbine
Hackberry	Gray Dogwood	Wild Sarsaparilla
American Beech	Hazelnut	Small Jack-in-the-Pulpit
White Ash	Running Strawberry Bush	Lady Fern
Red Ash	Witch Hazel	Rattlesnake Fern
Ironwood	Spicebush	Blue Cohosh
Trembling Aspen	Virginia Creeper	Cut-leaved Toothwort
Black Cherry	Choke Cherry	Marginal Wood Fern
White Oak	Common Buckthorn	Wild Geranium
Red Oak	Poison Ivy	White Avens
Basswood	Wild Black Current	Virginia Waterleaf
Eastern Hemlock	Prickley Gooseberry	Tall Blue Lettuce
White Elm	Maple leaved Viburnum	Canada May Flower
	Downy Arrow-wood	Flase Solomon's Seal
		Sweet Cicely
		Mayapple
		Hairy Solomon's Seal
		Christmas Fern
		Bloodroot
		Long-fruited Snakeroot
		Blue-stemmed Goldenrod
		Zig Zag Goldenrod
		Large-flowered Trillium
		Bellwort

Sources:

Bowles (1989), Bowles (1992), Bowles *et al* (1993), Bowles *et al* (1994), Bowles (1997, pers. comm.), Stephenson (1987) and Stephenson (1989).

Table 7
Characteristic Plants of Tallgrass Prairie Remnants in the Thames River Valley

Grasses (Graminoides)	Flowering Plants (Forbs)
Canada Wild Rye	Butterfly-weed
Indian Grass	Robin's Plantain
Little Blue Stem	Bush Clover
Tall Ironweed	Wild Bergamot
Needle Grass	Grey-headed Coneflower
	Black-eyed Susan
	Wing Stem
	Feverwort (Wild Coffee)

Source:
Bowles *et al* (1994) and Bowles (1997, pers. comm.)

Table 8
Some of the Plant Species At Risk in the Thames River Valley and Riparian Zone

Common Name	Scientific Name	Status		Carolinian
		COSEWIC	NHIC	Dist'n
Small-flowered Agrimony	*Agrimonia parviflora*		3-4	
Green Dragon	*Arisaema dractontium*	VUL	3	✓
Purple Milkweed	*Asclepias purpurascens*		2	✓
Pawpaw	*Asimina triloba*		3	✓
Carey's Sedge	*Carex careyana*		2	
Emory's (Tussock) Sedge	*Carex emoryi*		3-4	
James's Sedge	*Carex jamesii*		3	✓
Red-rooted Cyperus	*Cyperus erythrorhizos*		3	✓
Creeping Fragile Fern	*Cystopteris protusa*		2	
Harbinger-of-spring	*Erigenia bulbosa*		3	✓
Sweet Joe-Pye Weed	*Eupatorium purpureum*		3	✓
Blue Ash	*Fraxinus quadrangulata*	THR	3	✓
Kentucky Coffee Tree	*Gymnocladus dioicus*	THR	2	✓
Golden Seal	*Hydrastis canadensis*	THR	2	✓
Violet Bush Clover	*Lespedeza violacea*		1	✓
American gromwell	*Lithospermum latifolium*		2-3	
Virginia Blue-bells	*Mertensia virginica*		3	✓
Winged Monkey Flower	*Mimulus alatus*		2	✓
Oswego Tea	*Monarda didyma*		3	✓
Black-gum	*Nyssa sylvatica*		3	✓
Meadow sundrops	*Oenothera pilosella*		2	✓
False Gromwell	*Onosmodium molle* var. *hispidussium*		2	✓
American Ginseng	*Panax quinquefolius*	THR	3	✓
Pin Oak	*Quercus palustris*		3	✓
Grey-headed Coneflower	*Ratibida pinnata*		2-3	✓
Cup-plant	*Silphium perfoliatum*		2	✓
Wood Poppy	*Stylophorum diphyllum*	END	1	✓
Wingstem	*Verbesina alternifola*		2	✓
Cream-coloured (Striped) Violet	*Viola striata*		3	✓

Notes:

COSEWIC Designations: END = Endangered, THR = Threatened, VUL = Vulnerable

NHIC Rankings: 1 = Extremely Rare, 2 = Very Rare, 3 = Rare to Uncommon, 4 = Common

Other Sources: Bowles (1989), Bowles (1992), Bowles *et al* (1993), Bowles *et al* (1994), Bowles (1997, pers. comm.), Stephenson (1987), and Stephenson (1989).

Carolinian Dist'n = The plant's range is limited to the Carolinian Floristic Zone

Table 9. Fish Species of the Thames River System

Family	Species	STATUS			Distribution in Thames	Migrant
		Canada COSEWIC	Province NHIC	Thames		
Lampreys	American Brook Lamprey		3	U	localized	
	Northern Brook Lamprey	VUL	2	R	localized	
Gars	Longnose Gar			C	widespread in spring	✓
Herrings	Alewife (exotic)			U		✓
	Gizzard Shad			C	localized	✓
Trouts	Chinook Salmon (exotic)			U	locally common in fall	✓
	Brook Trout			R	localized	
	Brown Trout (exotic)			U	localized	
	Rainbow Trout (exotic)			C	locally common in spring	✓
Pikes	Northern Pike			A	widespread	
Mudminnows	Central Mudminnow			A	widespread	
Mooneyes	Mooneye		3	C	locally common in spring	✓
Suckers	Bigmouth Buffalo	VUL	1	U		
	Lake Chubsucker	VUL	2	U		
	Northern Hog Sucker		3	A	widespread	
	Quillback			U	localized	
	Black Redhorse	THR	1	Unknown		
	Golden Redhorse		2	C	widespread	
	Greater Redhorse		3	U	localized	
	Shorthead Redhorse			U	widespread	
	Silver Redhorse			R	widespread	
	Spotted Sucker	VUL		Unknown		
	White Sucker			A	widespread	
Carps and	Common Carp (exotic)			A	widespread	
Minnows	Creek Chub			A	widespread	
	Horneyhead Chub			A	widespread	
	River Chub			C	widespread	
	Blacknose Dace			A	widespread	
	Longnose Dace			C	widespread	
	Northern Redbelly Dace			A	widespread	
	Pearl Dace			C	widespread	
	Goldfish (exotic)			U	localized	
	Bluntnose Minnow			A	widespread	
	Brassy Minnow			A	widespread	
	Fathead Minnow			A	widespread	
	Pugnose Minnow	VUL	2	Unknown		
	Blacknose Shiner			A	widespread	
	Common Shiner			A	widespread	
	Emerald Shiner			U	widespread	
	Ghost Shiner		2	R	localized	
	Golden Shiner			A	widespread	
	Mimic Shiner			C	widespread	
	Redfin Shiner		3	U	localized	
	Rosyface Shiner			A	widespread	
	Silver Shiner	VUL	3	Unknown		
	Spotfin Shiner			U	localized	
	Spottail Shiner			C	widespread	
	Striped Shiner		3	C	widespread	
	Central Stoneroller	VUL	2	Unknown		

... continued

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Family	Species	STATUS			Distribution in Thames	Migrant
		Canada	Province	Thames		
		COSEWIC	NHIC			
Bullhead	Black Bullhead		2	C	widespread	
Catfishes	Brown Bullhead			A	widespread	
	Yellow Bullhead			C	widespread	
	Channel Catfish			C	widespread in spring	✓
	Flathead Catfish (exotic)			R		
	Brindled Madtom	VUL	2	Unknown		
	Northern Madtom		1	R		
	Stonecat			C	localized	
Burbot	Burbot			U	localized	✓
Sticklebacks	Brook Stickleback			A	widespread	
Trout-perches	Trout-perch			U	localized	
Temperature	White Bass			U	localized	
Basses	White Perch (exotic)			R	localized	
Sunfishes	Largemouth Bass			C	widespread	
	Rock Bass			A	widespread	
	Smallmouth Bass		3	A	widespread	
	Bluegill			A	widespread	
	Black Crappie			C	localized	
	White Crappie			C	widespread	
	Pumpkinseed			A	widespread	
	Green Sunfish			C	localized	
	Longear Sunfish		3	R	localized	
Perches	Blackside Darter		3	C	widespread	
	Eastern Sand Darter	THR	2	Unknown		
	Fantail Darter			C	widespread	
	Greenside Darter	VUL	3	Unknown	possibly locally common	
	Iowa Darter			U	localized	
	Johnny Darter			A	widespread	
	Least Darter		3	C	widespread	
	Rainbow Darter			U	localized	
	River Darter		3	R		
	Logperch			U	localized	
	Yellow Perch			A	widespread	
	Sauger			R		✓
	Walleye			C	widespread; declining	✓
Silversides	Brook Silverside			R		
Drums	Freshwater Drum			U	locally common in spring	✓
Sculpins	Mottled Sculpin			U	localized	
	Slimy Sculpin			R	localized	

Total: 88 species from 19 families (hybrids not listed)

NOTES ON STATUS AND DISTRIBUTION:

COSEWIC Designations: VUL = Vulnerable, THR = Threatened, END = Endandered

NHIC Rankings: 1 = Extremely Rare, 2 = Very Rare, 3 = Rare to Uncommon

Thames: A = Abundant, C = Common, U = Uncommon, R = Rare, VR = Very Rare

Migrant = Spends the summer in Lake St. Clair , Exotic = Non Native Species

Other Sources: Ontario Ministry of natural Resources Fish Distribution Data Base, Mandrak and Crossman (1992) and Harald Schraeder (Area Biologist, Aylmer District, OMNR)

(only COSEWIC Designations are officially recognized)

Table 10
Mammals of the Thames River and Watershed

Common Name	STATUS Canada COSEWIC	STATUS Province NHIC	STATUS Thames Watershed	Distribution in the Thames Watershed
OPOSSUMS				
Virginia Opossum			C	Now widespread; rare before 1990
SHREWS AND MOLES				
Common (Masked) Shrew			U	Prefers damp woodlots
Smoky Shrew			Unknown	Only old records; prefers woodlots
Pygmy Shrew			Unknown	Only old records; prefers woodlots
Northern Short-tailed Shrew			A	Widespread
Hairy-tailed Mole			U	Prefers sandy soils
Star-nosed Mole			U	Prefers areas near water
BATS				
Small-footed Bat		2-3	VR	Only one record near Oneida I.R.
Little Brown Bat			A	Widespread
Northern Long-eared Bat		3	Unknown	Only one old record from London
Silver-haired Bat			R	A few scattered locations
Big Brown Bat			C	Common in urban areas
Eastern Red Bat			U	Scattered; 5-6 sites
Hoary Bat			R	Scattered records
RABBITS AND HARES				
Eastern Cottontail			A	Widespread
Snowshoe Hare			Unknown	Unconfirmed record near Stratford
European Hare (introduced)			U	Most common in fields with wooded borders
RODENTS				
Eastern Chipmunk			C	Widespread in wooded areas
Woodchuck			C	Widespread
Gray Squirrel			A	Widespread
Red Squirrel			U	Prefers conifer plantations: N end of watershed
Northern Flying Squirrel			Unknown	Only old records near Woodstock
Southern Flying Squirrel	VUL	3	VR	Few records (Bothwell, Komoka); woodlands
Beaver *			U	Increasing in numbers
White-footed Mouse			A	Common in forests; under-reported
Deer Mouse			C	Common in forests; under-reported
Meadow Vole			A	Widespread; under-reported
Woodland Vole		3	Unknown	Old records near London & Skunk's Misery; sandy soil
Muskrat			C	Widespread near water
Southern Bog Lemming			Unknown	Only old record near London
Norway Rat (introduced)			C	Widespread; urban areas and farmyards
House Mouse (introduced)			A	Widespread in urban areas
Meadow Jumping Mouse			U	Possibly under-reported
Woodland Jumping Mouse			Unknown	Only one old record near Delaware
Porcupine			VR	Oxford/Perth area; coniferous woods

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Common Name	STATUS Canada COSEWIC	Province NHIC	Thames Watershed	DISTRIBUTION IN THAMES WATERSHED
CARNIVORES				
Coyote			C	Widespread
Red Fox			C	Widespread
Raccoon			A	Widespread
Ermine (Short-tailed Weasel)			VR	Only 1 current record N of London
Long-tailed Weasel			U	Probably under-reported
Mink *			C	Common near water
American Badger	VUL	2-3	VR	Bothwell area and Komoka Park; under-reported
Striped Skunk			A	Widespread
DEER AND BISON				
White-tailed deer			C	Widespread
TOTAL of 44 species	2	5		

NOTES ON STATUS AND DISTRIBUTION:

COSEWIC Designations: VUL = Vulnerable, THR = Threatened, END = Endangered

NHIC Rankings: 1 = Extremely Rare, 2 = Very Rare, 3 = Rare to Uncommon

Thames: A = Abundant, C = Common, U = Uncommon, R = Rare, VR = Very Rare

Bold * Identifies those species which are most likely to be found in or depend on the Thames River and its valley for a significant portion of thir life cycle (breeding, migration, overwintering).

Other Sources: "Atlas of the Mammals of Ontario", and Dave Martin (Middlesex Mammal Atlas Coordinator)

(only COSEWIC designations are officially recognized)

Table 11

Migratory and Breeding Birds Found Within the Thames River Watershed

Page 1 of 5

Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
LOONS AND GREBES				
Red-throated Loon				VR
Common Loon				C
Pied-billed Grebe			VR	U
Horned Grebe				U
Red-necked Grebe				R
Eared Grebe				VR
PELICANS AND CORMORANTS				
American White Pelican				VR
Double-crested Cormorant				C
HERONS AND ALLIES				
American Bittern			VR	VR
Least Bittern	VUL	3	VR	VR
Great Blue Heron			U	C
Great Egret				R
Little Blue Heron				VR
Cattle Egret				VR
Green Heron			U	C
Black-crowned Night-Heron				R
Yellow-crowned Night-Heron				ACC
Glossy Ibis				ACC
Wood Stork				ACC
WATERFOWL				
Fulvous Whistling-Duck				ACC
Tundra Swan				C
Mute Swan (exotic)				R
Greater White-fronted Goose				VR
Snow Goose				U
Ross's Goose				VR
Brant				VR
Canada Goose			C	C
Wood Duck			C	C
Green-winged Teal				U
American Black Duck			R	C
Mallard			C	A
Northern Pintail				C
Blue-winged Teal			U	C
Cinnamon Teal				ACC
Northern Shoveler				U
Gadwall				U
Eurasian Wigeon				VR
American Wigeon				C
Canvasback				U
Redhead				U
Ring-necked Duck				C
Greater Scaup				U
Lesser Scaup				C

Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
King Eider				ACC
Harlequin Duck	END			ACC
Oldsquaw				R
Black Scoter				VR
Surf Scoter				R
White-winged Scoter				R
Common Goldeneye				C
Barrow's Goldeneye				ACC
Bufflehead				C
Hooded Merganser			R	U
Common Merganser				C
Red-breasted Merganser				R
Ruddy Duck		2B,3N	VR	C
VULTURES, HAWKS, FALCONS				
Turkey Vulture			C	C
Osprey				U
American Swallow-tailed Kite				ACC
Bald Eagle				R
Northern Harrier			U	C
Sharp-shinned Hawk			VR	C
Cooper's Hawk	VUL	2N	R	U
Northern Goshawk				VR
Red-shouldered Hawk	VUL			U
Broad-winged Hawk			VR	C
Swainson's Hawk				ACC
Red-tailed Hawk			C	C
Rough-legged hawk				U
Golden Eagle				VR
American Kestrel			C	C
Merlin				R
Peregrine Falcon	END	2	VR	R
Gyrfalcon				ACC
GALLINACEOUS BIRDS				
Gray Partridge (exotic)			VR	
Ring-necked Pheasant (exotic)			R	
Ruffed Grouse			U	
Wild Turkey			VR	
Northern Bobwhite	END	1-2	VR	
CRANES, RAILS, ALLIES				
Yellow Rail				VR
King Rail	END			VR
Virginia Rail			R	U
Sora			R	U
Common Moorhen				R
American Coot				U
Sandhill Crane				U

... continued

Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
PLOVERS, SANDPIPERS, ALLIES				
Black-bellied Plover				U
American Golden-Plover				U
Snowy Plover				ACC
Semipalmated Plover				U
Piping Plover	END			ACC
Killdeer			C	C
Black-necked Stilt				ACC
American Avocet				ACC
Greater Yellowlegs				U
Lesser Yellowlegs				C
Solitary Sandpiper				U
Willet				VR
Spotted Sandpiper			C	C
Upland Sandpiper			R	R
Whimbrel				VR
Hudsonian Godwit				VR
Marbled Godwit				VR
Ruddy Turnstone				R
Red Knot				VR
Sanderling				R
Semipalmated Sandpiper				C
Western Sandpiper				ACC
Least Sandpiper				C
White-rumped Sandpiper				R
Baird's Sandpiper				U
Pectoral Sandpiper				C
Dunlin				C
Stilt Sandpiper				U
Buff-breasted Sandpiper				R
Ruff				VR
Short-billed Dowitcher				C
Long-billed Dowitcher				VR
Common Snipe			R	C
American Woodcock		3B	C	C
Wilson's Phalarope				R
Red-necked Phalarope				VR
Red Phalarope				VR
GULLS AND TERNS				
Franklin's Gull				ACC
Little Gull				VR
Bonaparte's Gull				C
Ring-billed Gull				A
California Gull				ACC
Herring Gull			VR	C
Thayer's Gull				VR
Iceland Gull				R
Lesser Black-backed Gull				R
Glaucous Gull				R

Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
Great Black-backed Gull				U
Black-legged Kittiwake				ACC
Sabine's Gull				ACC
Ivory Gull	VUL			ACC
Caspian Tern	VUL			U
Common Tern				R
Forster's Tern				U
Black Tern				R
MURRES				
Thick-billed Murre				ACC
PIGEONS AND DOVES				
Rock Dove (exotic)			A	
Mourning Dove			A	
CUCKOOS				
Black-billed Cuckoo			R	R
Yellow-billed Cuckoo			VR	VR
OWLS				
Barn Owl	VUL			ACC
Eastern Screech-Owl			C	
Great Horned Owl			C	
Snowy Owl				R
Barred Owl				ACC
Great Gray Owl				ACC
Long-eared Owl			VR	R
Short-eared Owl	VUL			R
Boreal Owl				ACC
Northern Saw-whet Owl				VR
NIGHTJARS				
Common Nighthawk			R	U
Whip-poor-will			VR	VR
SWIFTS AND HUMMINGBIRDS				
Chimney Swift			U	U
Ruby-throated Hummingbird			C	C
KINGFISHERS				
Belted Kingfisher			C	U

... continued

Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
WOODPECKERS				
Red-headed Woodpecker	VUL	3	R	U
Red-bellied Woodpecker		3	U	R
Yellow-bellied Sapsucker			VR	U
Downy Woodpecker			C	
Hairy Woodpecker			U	
Three-toed Woodpecker				ACC
Black-backed Woodpecker				ACC
Northern Flicker			C	C
Pileated Woodpecker			R	
FLYCATCHERS				
Olive-sided Flycatcher				R
Eastern Wood-Pewee			C	C
Yellow-bellied Flycatcher				R
Acadian Flycatcher	END	2	VR	VR
Alder Flycatcher			R	U
Willow Flycatcher			C	C
Least Flycatcher			U	C
Eastern Phoebe			U	U
Say's Phoebe				ACC
Great Crested Flycatcher			C	C
Eastern Kingbird			C	C
LARKS				
Horned Lark			C	C
SWALLOWS				
Purple Martin			U	U
Tree Swallow			C	C
N. Rough-winged Swallow			U	U
Bank Swallow			C	A
Cliff Swallow			U	C
Barn Swallow			A	A
JAYS AND CROWS				
Gray Jay				ACC
Blue Jay			C	A
American Crow			C	A
Common Raven				ACC
CHICKADEES AND ALLIES				
Black-capped Chickadee			C	U
Boreal Chickadee				ACC
Tufted Titmouse		2	VR	VR
Red-breasted Nuthatch			R	U
White-breasted Nuthatch			U	
Brown Creeper			R	C

Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
WRENS				
Carolina Wren		3	R	R
Bewick's Wren				ACC
House Wren			C	C
Winter Wren			R	C
Sedge Wren			VR	VR
Marsh Wren			VR	R
KINGLETS AND GNATCATCHERS				
Golden-crowned Kinglet			VR	A
Ruby-crowned Kinglet				A
Blue-gray Gnatcatcher			R	R
THRUSHES				
Eastern Bluebird	VUL	2N	U	C
Mountain Bluebird				ACC
Townsend's Solitaire				ACC
Veery			U	C
Gray-cheeked Thrush				R
Swainson's Thrush				C
Hermit Thrush				C
Wood Thrush			C	C
American Robin			A	A
Varied Thrush				ACC
MIMICS				
Gray Catbird			C	C
Northern Mockingbird			VR	R
Brown Thrasher			U	U
PIPITS, SHRIKES, WAXWINGS				
American Pipit				C
Bohemian Waxwing				VR
Cedar Waxwing			C	C
Phainopepla				ACC
Northern Shrike				R
Loggerhead Shrike	END	2	VR	VR
STARLINGS				
European Starling (exotic)			A	A
VIREOS				
White-eyed Vireo		2	VR	VR
Solitary Vireo			VR	U
Yellow-throated Vireo			R	R
Warbling Vireo			C	C
Philadelphia Vireo				R
Red-eyed Vireo			C	C

... continued

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Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
WARBLERS				
Blue-winged Warbler			U	U
"Brewster's" Hybrid			VR	VR
"Lawrence's" Hybrid				VR
Golden-winged Warbler			R	R
Tennessee Warbler				C
Orange-crowned Warbler				R
Nashville Warbler			VR	C
Northern Parula			VR	R
Yellow Warbler			A	A
Chestnut-sided Warbler			U	C
Magnolia Warbler			VR	C
Cape May Warbler				U
Black-throated Blue Warbler				U
Yellow-rumped Warbler			VR	A
Black-throated Gray Warbler				ACC
Black-throated Green Warbler				U
Blackburnian Warbler			VR	C
Yellow-throated Warbler				ACC
Pine Warbler			R	U
Prairie Warbler	VUL	3	VR	VR
Palm Warbler				C
Bay-breasted Warbler				C
Blackpoll Warbler				U
Cerulean Warbler	VUL	3	R	VR
Black and-white Warbler			VR	R
American Redstart			U	C
Prothonotary Warbler	END			ACC
Worm-eating Warbler				ACC
Ovenbird			C	C
Northern Waterthrush			VR	U
Louisiana Waterthrush	VUL	3	VR	VR
Kentucky Warbler				ACC
Connecticut Warbler				VR
Mourning Warbler			U	U
Common Yellowthroat			C	C
Hooded Warbler	THR	3	R	VR
Wilson's Warbler				U
Canada Warbler			VR	U
Yellow-breasted Chat	VUL	2-3	VR	VR
TANAGERS				
Summer Tanager				VR
Scarlet Tanager			U	U

Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
GROSBEAKS AND BUNTINGS				
Northern Cardinal			C	
Rose-breasted Grosbeak			C	C
Black-headed Grosbeak				ACC
Blue-Grosbeak				ACC
Indigo Bunting			C	C
Painted Bunting				ACC
Dickcissel				VR
SPARROWS				
Green-tailed Towhee				ACC
E. (Rufous-sided) Towhee				U
American Tree Sparrow				C
Chipping Sparrow			C	C
Clay-coloured Sparrow			R	VR
Field Sparrow			C	U
Vesper Sparrow			C	U
Lark Sparrow				ACC
Lark Bunting				ACC
Savannah Sparrow			C	C
Grasshopper Sparrow			U	R
Henslow's Sparrow				VR
LeConte's Sparrow				VR
Nelson's Sharp-tailed Sparrow				ACC
Fox Sparrow				R
Song Sparrow			C	C
Lincoln's Sparrow				U
Swamp Sparrow			U	U
White-throated Sparrow			VR	A
Golden-crowned Sparrow				ACC
White-crowned Sparrow				C
Harris' Sparrow				ACC
Slate-coloured Junco				A
Oregon Junco				VR
Lapland Longspur				R
Snow Bunting				C
BLACKBIRDS AND MEADOWLARKS				
Bobolink			C	C
Red-winged Blackbird			A	A
Eastern Meadowlark			U	U
Western Meadowlark			VR	VR
Yellow-headed Blackbird				VR
Rusty Blackbird				C
Brewer's Blackbird				VR
Common Grackle			A	A
Brown-headed Cowbird			A	A

...continued

Common Name	STATUS			
	Canada	Province	Thames Basin	
	COSEWIC	NHIC	Br	Mig
ORIOLES				
Orchard Oriole		3B, ZN	VR	VR
Baltimore Oriole			C	C
Bullock's Oriole				ACC
"WINTER FINCHES"				
Brambling				ACC
Pine Grosbeak				VR
Purple Finch			VR	U
House Finch			A	A
Red Crossbill				VR
White-winged Crossbill			VR	VR
Common Redpoll				R
Hoary Redpoll				VR
Pine Siskin				R
American Goldfinch			C	A
Evening Grosbeak				R
WEAVERFINCHES				
House Sparrow (exotic)			A	

TOTALS	145 species of birds breed in the Thames River watershed, 6 of which are exotics.
	316 species of birds migrate through the watershed, of which 53 are accidental migrants.
	329 species of birds breed and/or migrate through the watershed.
	22 of the above species of birds are "at risk" in Canada and 20 are extremely rare to uncommon in Ontario.

NOTES ON STATUS AND DISTRIBUTION:

COSEWIC Designations: VUL = Vulnerable, THR = Threatened, END = Endangered

NHIC Rankings: 1 = Extremely Rare, 2 = Very Rare, 3 = Rare to Uncommon, N = Not Breeding, B = Breeding

(NHIC Rankings only given for birds which breed in Thames Watershed)

Thames: A = Abundant, C = Common, U = Uncommon, R = Rare, VR = Very Rare, ACC = Accidental Migrant

Br = Breeding Status in Watershed, Mig = Migratory Status in Watershed

Other Sources: Birding Checklist for Middlesex County, Atlas of the Breeding Birds of Ontario, Dave Martin (Atlas Coordinator for Middlesex)

Table 12

Reptiles and Amphibians of the Thames River and Watershed

Common Name	STATUS Canada COSEWIC	STATUS Province NHIC	STATUS Thames	Distribution
AMPHIBIANS				
Mudpuppy ★			R	Probably widespread or locally common; under reported
Red-spotted Newt			U	Widespread; probably only common locally in good habitat
Jefferson Salamander		2	Unknown	Potential only; no records due to identification difficulty
Spotted Salamander			U	Widespread; possibly locally common in woodlands/swamps
Four-Toed Salamander			Unknown	Potential only; needs Sphagnum swamps; under reported
Redback Salamander			U	Widespread
American Toad			A	Widespread
Spring Peeper			A	Widespread
Gray Treefrog			C	Widespread
(Western) Chorus Frog			C	Widespread; under reported
Wood Frog			C	Widespread; locally abundant in woodlands
Northern Leopard Frog			A	Widespread
Pickerel Frog			Unknown	Only 2 old records; Skunk's Misery and Byron
Green Frog			A	Widespread
Bullfrog			VR	Widespread but few locations - river mouth, Highgate, London
REPTILES				
Common Snapping Turtle			C	Widespread
Common Musk Turtle			Unknown	Potential only; prefers slowing moving streams, ponds
Midland Painted Turtle			A	Widespread
Common Map Turtle ★			U	Widespread; locally common - river mouth, Jeannettes Cr.
Blandings Turtle			R	Scattered records; Dorchester to Wardsville
Spotted Turtle	VUL	3	R	Only 2-3 records London to Wardsville area
E. Spiny Softshell Turtle ★	THR	3	R	Locally common London to Kent Bridge, and river mouth
Five-lined Skink			VR	Localized; mouth and old record from Skunk's Misery
Eastern Garter Snake			C	Widespread
Northern Ribbon Snake			Unknown	Unconfirmed record from Skunk's Misery
Butler's Garter Snake		2-3	VR	Only recent record from Skunk's Misery
Northern Water Snake			R	Widespread; handful of sites only
Queen Snake ★		2	R	Locally common on Thames in London area
Northern Redbelly Snake			R	Widespread; Tavistock to Thamesville; handful of sites
Brown Snake			U	Widespread
Smooth Green Snake			Unknown	Old record in London (1961)
Northern Ringneck Snake			Unknown	Unconfirmed record at Skunk's Misery/Bothwell area
Eastern Hognose Snake	VUL	3	R	Localized in sandy areas near Bothwell and Rodney
Black Rat Snake		3	VR	Only record at Skunk's Misery/Bothwell area
Eastern Fox Snake		3	R	Localized in lower watershed; Kent and Essex
Eastern Milk Snake			U	Widespread
Total	3	8	36	

NOTES ON STATUS/DISTRIBUTION:

COSEWIC Designations: VUL = Vulnerable, THR = Threatened, END = Endangered

NHIC Rankings: 1 = Extremely Rare, 2 = Very Rare, 3 = Rare to Uncommon

Thames: A = Abundant, C = Common, U = Uncommon, R = Rare, VR = Very Rare

Bold ★ Identifies those species which are most likely to be found in or depend on the Thames River and its valley for a significant significant portion of their life cycle (breeding, migration, overwintering)

Other Sources: "Ontario Herpetofaunal Summary", 1984, 1985 and 1986 and Dave Martin (Middlesex Herpetofaunal Atlas Coordinator)

Table 13

Freshwater Mussels Found in the Thames River System

SubFamily	Common Name	Scientific Name	NHIC Status
Button Shells	Threeridge	*Amblema plicata plicata*	3
(Ambleminae)	Purple Pimpleback	*Cyclonaias tuberculata*	1
	Spike	*Elliptio dilatata*	
	False Pigtoe	*Pleurobema coccineum*	2
	Wartyback	*Quadrula pustulosa pustulosa*	2
	Mapleleaf	*Quadrula quadrula*	2
Floater Mussels	Elktoe	*Alasmidonta marginata*	3
(Anodontinae)	Brook Wedge Mussel	*Alasmidonta viridis*	3
	Cylindrical Floater	*Anodontoides ferussacianus*	
	White Heelsplitter	*Lasmigona complanata complanata*	3
	Brook Lasmigona	*Lasmigona compressa*	
	Fluted Shell	*Lasmigona costata*	
	Common Floater*	*Pyganodon grandis*	
	Squawfoot	*Strophitus undulatus*	
Lamp Mussels	Mucket	*Actinonaias ligamentina*	2
(Lampsilinae)	Pigtoe	*Fusconaia flava*	3
	Pocketbook	*Lampsilis ovata*	
	Eastern Lampmussel	*Lampsilis radiata radiata*	
	Fat Mucket	*Lampsilis siliquiodea*	
	Fragile Papershell	*Leptodea fragilis*	
	Black Sandshell	*Ligumia recta*	3
	Round Hickorynut	*Obovaria subrotunda*	1
	Pink Heelsplitter	*Potamilus alatus*	3
	Kidneyshell	*Ptchobranchus fasciolaris*	1
	Deertoe	*Truncilla truncata*	1-2
	Rainbow Shell	*Villosa iris*	3

Total: 26 species from 3 SubFamilies, 16 of which are extremely rare to uncommon in Ontario.

Notes:

NHIC Rankings: 1 = Extremely Rare, 2 = Very Rare, 3 = Rare to uncommon.

Other Sources: Metcalfe-Smith *et al* (1997)

* only those species found since 1967 are listed above.

Table 14

Dragonflies and Damselflies of Elgin and Middlesex Counties

		ELGIN CO.		MIDDLESEX CO.
Common Name	**Scientific Name**	**Distribution**	**Status**	**Location**
Dragonflies (Anisoptera)				
Yellow-spotted Stream Damer	*Boyeria vinosa*	G *	S	Thames River
Hero Damer	*Epiaeschna heros*	G	S	
(no common name)	*Aeshna canadensis*			London
Eastern Paddletail	*Aeshna constricta*	L	F	Sifton Bog
Common Paddletail	*Aeshna u. umbrosa*	G	F	Sifton Bog
Green Darter	*Anax junius*	G	C	Sifton Bog
Brotherly Clubtail	*Gomphus f. fratemus*	G	S	
Common Clubtail	*Gomphus graslinellus*	G	S	
Spiked Clubtail	*Gomphus spicatus*	L		
Illinois River Skimmer	*Macromia illinoiensis*	G *	S	Wardsville
Royal Skimmer	*Epitheca princeps*	L	S	
Dog-tail Skimmer	*Epitheca cynosura*	G	F	
Dog's head Skimmer	*Epitheca canis*	L	S	
Elisa Spotted Skimmer	*Celithemis elisa*	G	S	
Green-jacket Skimmer	*Erythemis simplicicollis*	G	F	
(no common name)	*Leucorrhinia glacialis*			London
Common White-faced SKimmer	*Leucorrhinia intacta*	G	C	Sifton Bog
Widow Skimmer	*Libellula luctosa*	G	F	
Common White-taile Skimmer	*Libellula lydia*	G	C	Wardsville
Ten-spot Skimmer	*Libellula pulchella*	G	F	Sifton Bog
Four-spotted Skimmer	*Libellula quadrimaculata*	L	S	
(no common name)	*Libellula julia*			London
half-banded Skimmer	*Libellula semifasciata*	L	R	Sifton Bog
Blue Pirate	*Pachydiplax longipennis*	G	F	Sifton Bog
(no common name)	*Nannothemis bella*			London
Amber-Wing	*Perithemis tenera*	G	F	Saunders Pond
Corrupt Skimmer	*Sympetrum corruptum*	G	C	
Yellow-bordered Red SKimmer	*Sympetrum costiferum*	L		
Obtruded Red Skimmer	*Sympetrum obtrusum*	G	S	Sifton Bog
Common Red SKimmer	*Sympetrum rubicundulum*	G	F	Sifton Bog
Brown-winged Red SKimmer	*Sympetrum semicinctum*	L	S	Arva
Little Red Skimmer	*Sympetrum vicinum*	G	C	Sifton Bog
Saddlebag Skimmer	*Tramea lacerata*	G	F	
Brown-spotted Globe Skimmer	*Pantala hymenea*	L		
Damselflies (Zygoptera)				
Black-winged Damselfly	*Agrion maculatum*	G	F	Wardsville
(no common name)	*Agrion aequabile*			London
American Ruby-spot	*Hetaerina americana*	G *	F	Thames River
Little Spread-wing	*Lestes congener*	G	S	Sifton Bog
(no common name)	*Lestes d. disjunctus*			Medway Creek
Green Spread-wing	*Lestes dryas*	G	F	Sifton Bog
Yellow-winged Spread-wing	*Lestes eurinus*	L	R	Sifton Bog
Forcipate Spread-wing	*Lestes forcipatus*	G	F	

...continued

		ELGIN CO.		MIDDLESEX CO.
Common Name	**Scientific Name**	**Distribution**	**Status**	**Location**
(no common name)	*Lestes rectangularis*			Sifton Bog
(no common name)	*Lestes vigilax*			London
Common Spread-wing	*Lestes unguiculatus*	G	S	Sifton Bog
narrow-lined Dancer	*Argia apicalis*	G *	F	Thames River
Common Dancer	*Argia moesta*	L	R	Medway Creek
Eastern Dancer	*Argia tibialis*	L	S	
Violet Dancer	*Argia violacea*	L	F	Wardsville
Bicolored Bog-dancer	*Amphiagrion saucium*	G	HS	
Spear-tail	*Anomalagrion hastatum*	L	HS	
Variegated Damselfly	*Chromagrion conditum*	O	O	
Resolute Damsel	*Coenagrion resolutum*	L	R	London
Orange-faced Bluet	*Enallagma antennatum*	G	F	Wardsville
Sprinkled Bluet	*Enallagma aspersum*	G	F	Sifton Bog
Boreal Bluet	*Enallagma boreale*	G	S	Sifton Bog
Carunculate Bluet	*Enallagma carunculatum*	G	F	
Civil Bluet	*Enallagma civile*	G	C	
Cup-bearing Bluet	*Enallagma cyathigerum*	G	S	
Drunken Bluet	*Enallagma ebrium*	G	F	Sifton Bog
Stream Bluet	*Enallagma exsulans*	G	F	London
Twin-spot Bluet	*Enallagma geminatum*	G	F	
(no common name)	*Enallagma hageni*			Sifton Bog
Brown-bodied Bluet	*Enallagma signatum*	G	S	
(no common name)	*Enallagma vesperum*			Saunders Pond
Exclamation Fork-tail	*Ischnura posita*	G	F	Sifton Bog
Common Fork-tail	*Ischnura verticalis*	G	C	Sifton Bog
Common Green Damsel	*Nehalennia irene*	G	F	Sifton Bog

Notes:

Elgin Co. Distribution: G = General (Widespread) G * = found on Thames L = Local (Habitat Specific)

Elgin Co. Population or Numbers of Individuals: C = Common, F = Frequent, S = Scarce, R = Rare

Sources: Stewart and Carmichael (1993) and Stewart (1995).

Sifton Bog and Saunders Pond are located in the City of London (kettle lakes)

Table 15

Wetlands Located In Close Proximity to the Thames River

Code	Name	Class	County	Township
South Thames River				
ZT23A	Zorra Swamp	5	Oxford	E. Zorra-Tavistock
ZT1C BB7C	Pittock Reservoir Swamp/Marsh	1	Oxford	E. Zorra-Tavistock
SW5C	Five Points Woods *	1	Oxford	S.W. Oxford
ND29A	Putnam Tract	1	Middlesex	North Dorchester
ND11A	Dorchester Swamp, South *	1	Middlesex	North Dorchester
ND32E	No Name	7	Middlesex	North Dorchester
WE17A	Meadowlily Woods (floodplain)	3	City of London (formerly Westminster)	
Middle Thames River				
ZT24A	Mud Creek Banks	4	Oxford	E. Zorra-Tavistock
ZO48B	Banner Swamp	7	Oxford	Zorra
Thames River Downstream of the Forks in London				
LC2A	Sifton Bog	3	City of London (formerly Westminster)	
DE5B DE4B	Komoka Park Reserve	6	Middlesex	Delaware
LB2A	Komoka Creek Swamp *	1	Middlesex	Lobo
DE-1 (MNR 95)	Delaware Woodlot	3	Middlesex	Delaware
E-1 (MNR 94)	Thames River Floodplain ANSI	3	Middlesex	Ekfrid
DO-8 (MNR 18A)	Recess Club Marsh	1	Kent	Dover
CH-1 (MNR F)	Louisville Swamp	7	Kent	Chatham
CA-1 (MNR I)	Thamesville Oxbow	7	Kent	Camden
Z-1 (MNR O)	Thamesville Conservation Club		Kent	Zone
HO-1 (MNR H)	Kent Bridge Oxbow	7	Kent	Howard
HA-1 (MNR G)	Thames River Oxbow	6	Kent	Harwich
TE-2 (MNR O)	Thames River Mouth Complex	2	Kent	Tilbury East

Notes:

All wetlands evaluated under the OMNR Wetland Evaluation System (1984 and 1993)

Class: 1, 2, 3 = Provincially Significant; 4 -7 = Regionally or Locally Significant

"Close Proximity" = less than 1000 metres from the river's edge

* = only sections of the wetland lie close to the river, remainder is further away

Codes are used by the UTRCA, LTVCA and MNR

Table 16
Evaluated Wetlands within the Thames River Watershed, but not in Close Proximity to the River

Code	Name	County	Township	Class
A-9 (MNR 88)	North Rodney Woodlot	Elgin	Aldborough	3
A-10 (MNR 91)	Unnamed Wetland	Elgin	Aldborough	6
A-11 (MNR 89)	Unnamed	Elgin	Aldborough	7
A-12 (MNR 90)	Unnamed	Elgin	Aldborough	7
A-13 (MNR 92)	Tait's Bush	Elgin	Aldborough	6
A-14 (MNR 93)	Unnamed	Elgin	Aldborough	6
S-1 (MNR 29)	Unnamed	Elgin	Southwold	3
TN-2 (MNR S)	Tilbury North Complex	Essex	Tilbury North	
CA-1 (MNR I)	Thamesville Oxbow	Kent	Camden	7
CH-1 (MNR F)	Louisville Swamp	Kent	Chatham	7
DO-2 (MNR 12A)	St. Luke's Club Marsh I	Kent	Dover	1
DO-3 (MNR 13A)	St. Luke's Club Marsh II	Kent	Dover	1
DO-4 (MNR 14A)	St. Clair National Wildlife Area	Kent	Dover	1
DO-5 (MNR 15A)	Balmoral Club Marsh	Kent	Dover	1
DO-6 (MNR 16A)	Bradley Farms Marshes	Kent	Dover	1
DO-7 (MNR 17A)	Reaume Marshes	Kent	Dover	1
DO-8 (MNR 18A)	Recess Club Marsh	Kent	Dover	1
HA-1 (MNR G)	Thames River Oxbow	Kent	Harwich	6
HO-1 (MNR H)	Kent Bridge Oxbow	Kent	Howard	7
O-1 (MNR K)	Moraviantown Swamp	Kent	Orford	3
O-2 (MNR L)	Clark's Woodlot	Kent	Orford	6
RA-1 (MNR S)	Jeannette's Creek Woodlot	Kent	Raleigh	3
TE-1 (MNR R)	Jeannette's Creek	Kent	Tilbury East	1
TE-2 (MNR O)	Thames River Mouth Complex	Kent	Tilbury East	2
TE-3 (MNR P)	Martindale Marsh	Kent	Tilbury East	3
Z-1 (MNR O)	Thamesville Conservation Club	Kent	Zone	
Z-2 (MNR J)	Sloan's Woodlot	Kent	Zone	3
C-1 (MNR 96)	Longwoods	Middlesex	Caradoc	3
DE4B 5B	Komoka Park Reserve	Middlesex	Delaware	6
DE-1 (MNR 95)	Delaware Woodlot	Middlesex	Delaware	3
E-1 (MNR 94)	Thames River Floodplain ANSI	Middlesex	Ekfrid	3
E-2 (MNR 97)	Melbourne Marsh	Middlesex	Ekfrid	3
LD52A	Elginfield Swamp	Middlesex	London	6
LD50b	No Name	Middlesex	London	6
LD51B	Ballymote Wetland	Middlesex	London	7
LD33D	Maple Grove Swamp	Middlesex	London	7
M-1 (MNR 126)	Skunk's Misery	Middlesex	Mosa	2
M-2 (MNR 138)	Newbury North Woodlot	Middlesex	Mosa	5
ND14c	Hearns	Middlesex	North Dorcheser	3
ND29A	Putnam Track	Middlesex	North Dorchester	1
ND15A	Dingmand Cr/Dorchester Wetland	Middlesex	North Dorchester	1
ND6A	North Dorchester Swamp	Middlesex	North Dorchester	3
ND32E,S1E	No name	Middlesex	North Dorchester	7
ND27B,28C	North West Crampton Wetland	Middlesex	North Dorchester	7
WN2D	No Name	Middlesex	West Nissouri	6
WN10D	No Name	Middlesex	West Nissouri	7
WN11D	Airport Wetland	Middlesex	West Nissouri	7
WN18D	No Name	Middlesex	West Nissouri	7
BB5A BB6B	Trotters Lake, Vansittart Woods Complex	Oxford	Blandford-Blenheim	1

... continued

Code	Name	County	Township	Class
BB1C NO8D	Eastwood Wetland	Oxford	Blandford-Blenheim	6
BB2D	No Name	Oxford	Blandford-Blenheim	7
BB3c 4c	No Name	Oxford	Blandford-Blenheim	7
WC1C	Brick Wetlands	Oxford	City of Woodstock	2
ZT26B	No Name	Oxford	E. Zorra-Tavistock	7
NO6B 7E	Oxford Centre Swamp	Oxford	Norwich	3
NO5A	Cedar Creek Wetland	Oxford	Norwich	1
SW29E	Dereham Centre Wetlands	Oxford	S.W. Oxford	1
SW13B	Mud lake	Oxford	S.W. Oxford	2
SW14C	No Name	Oxford	S.W. Oxford	3
SW25B 23D	Foldens Swamp Complex	Oxford	S.W. Oxford	4
SW16D	Verschoyle Wetland	Oxford	S.W. Oxford	6
SW24E	Cedar Creek Source Complex	Oxford	S.W. Oxford	6
SW11B 12 D	Heslop Swamp	Oxford	S.W. Oxford	7
SW10C	Ingersol Wetland	Oxford	S.W. Oxford	7
ZO26B 27B 36C	Medina Bush	Oxford	Zorra	2
ZO28A	Kintore Swamp	Oxford	Zorra	2
ZO34Bh	DeBoer Wetlands	Oxford	Zorra	2
ZO34Ca	lakeside Dump	Oxford	Zorra	2
ZO37C	Unopened 12th Woodlot	Oxford	Zorra	2
ZO34Bc	Wetland SW of Uniondale	Oxford	Zorra	2
ZO32B	Brooksdale Forest	Oxford	Zorra	2
ZO33B	Matherson's Bush	Oxford	Zorra	2
ZO39B DO10B	Trout Creek Swamp	Oxford	Zorra	2
ZO38C	Wildwood Lake Wetland	Oxford	Zorra	2
ZO44A	Golspie Swamp	Oxford	Zorra	3
ZO47	Rayside Swamp	Oxford	Zorra	6
ZO31B	Youngsville Forest	Oxford	Zorra	7
DO13D 9B	Conroy Woods	Perth	Downie	3
DO12E	Sebringville Woods	Perth	Downie	5
DO5D	Stratford Complex	Perth	Downie	6
EL13A	Ellice Swamp	Perth	Ellice	2
EL15D	Kuyryville Complex	Perth	Ellice	6
EL11D	Seebach Hill Woods	Perth	Ellice	7
FU20E	Whirl Creek Woods	Perth	Fullarton	5
FU2D 14D	Motherwell Blue Heron Swamp	Perth	Fullarton	6
Hil84	McGrath Swamp	Perth	Hibbert	6
MO175	Brunner Complex	Perth	Mornington	6
NE5Aa	Gads Hill South	Perth	N.E. Hope	2
NE4D	Little Lakes Swamp Complex	Perth	N.E. Hope	3
NE5Ab	Gads Hill North	Perth	N.E. Hope	4
NE6Ac	Shakespear Hills/Avon Banks	Perth	N.E. Hope	5
NO3B	No Name	Perth	Norwich	6
lOO13	Dingman Wetland		City of London	3
LC3A LC5A WE14D	Westminster Ponds		City of London	1
LC4E	Highbury Wetland		City of London	7
WE18	Elliot-Laidlaw Wetland		City of London	7
WE9A	Regina Mundi		City of London	2
WE10A	Westminster Wetland		City of London	3
LD53A	Fanshawe Wetlands		City of London	3

Notes

Wetlands were inventoried under the Ontario Wetland Evaluation System (OMNR, 1984 and 1993)

Class 1-3 = Provincially Significant; Class 4-7 = Locally Significant

Table 17
Historic Sites, People, and Events within the Thames River Watershed Plaqued by the Ontario Heritage Foundation

Kent County	
Blenheim	The founding of Blenheim
Blenheim	Harry G.B. Miner, V.C. 1891-1918
Bothwell	The founding of Bothwell
Chatham	The Chatham Blockhouse, 1794
Chatham	John Brown's Convention, 1858
Chatham	Kent County Courthouse
Pain Court	The founding of Pain Court
Ridgetown	The founding of Ridgetown
South Buxton	The Buxton Settlement, 1849
Thamesville	New Fairfield, 1815
Tilbury	St. Peter's Roman Catholic Church

Oxford County	
Embro	Henry John Cody, 1868-1951
Ingersoll	The founders of Ingersoll
Ingersoll	Ingersoll Town Hall, 1856
Ingersoll	The Big Cheese, 1866
Norwich	The Norwich Quaker Settlement
Norwich	Emily Howard Jennings Stowe, M.D., 1831-1903
Woodstock	The Old Stage Road
Woodstock	Captain Andrew Drew, R.N., 1792-1878
Woodstock	St. Paul's Church
Woodstock	Woodstock College, 1857-1926
Woodstock	Reverend Newton Wolverton, 1846-1932
Woodstock	Thomas "Carbide" Willson, 1860-1915
Woodstock	Lieutenant-Colonel Joseph Whiteside Boyle, D.S.O., 1867-1923

Source: Ontario Heritage Foundation, 1996.

Middlesex County	
Delaware	Ebenezer Allan, 1752-1813
Delaware	Gideon Tiffany, 1774-1854
London	The founding of London
London	Eldon House
London	Reverend William Proudfoot
London	Josiah Blackburn
London	Richard Maurice Bucke, M.D., 1837-1902
London	Sir Adam Beck, 1857-1925
London	Paul Peel
London	St. Paul's Cathedral, 1846
London	St. Peter's Basilica
London	Right Reverend Isaac Hellmuth, 1817-1901
London	Huron College, 1863
London	The British Garrison in London
London	The Victoria Boat Disaster
London	Blackfriar's Bridge
London	The Lawson Site
London	The Tolpuddle Martyrs
Lucan	The Wilberforce Settlement, 1830

Perth County	
Kirkton	Timothy Eaton, 1834-1907
Mitchell	The founding of Mitchell
Mitchell	Howie Morenze, 1902-1937
St. Marys	The founding of St. Marys
Shakespeare	Fryfogel's Inn
Stratford	The founding of Stratford
Stratford	Sir John Cunningham McLennan, 1867-1935

Table 18
National Historic Sites of Canada
Located within the Thames River Watershed
Designated 1919-1993

National Historic Sites	Location	Year Designated or Plaqued	Highlights
Fairfield on the Themes	Bothwell area	1945/1948	Site of Delaware Mission; destroyed in 183
Middlesex County Courthouse	London	1955/1957	Castellated Gothic 1827-1831 Courthouse
Ridout Street Complex (Anderson Residence) (Bank of Upper Canada) (Gore Bank of Canada)	London	1966/1986	Important group of early commercial and residential buildings
Wolsely Barracks	London	1963/1970	Important early military training and residential facility
St. Marys Junction Railway Station (Grand Trunk)	St. Marys	1973	1850s Grand Trunk Railway Station
Stratford City Hall	Stratford	1976/1983	Picturesque late 19th century civic building
Battle Hill	Wardsville	1924/1929	Site of Battle of the Longwoods, 1814
Old Woodstock Town Hall	Woodstock	1955/1973	1851 classically-inspired civic structure

Source: Historic Sites and Monuments Board of Canada, 1995.

Table 19
Other Designations of National Historic Significance
within the Thames River Watershed
Designated 1919-1993

Designations	Location of Plaque	Year Designated	Highlights
First Cheese Factory	Ingersoll	1931	Co-operative Factory System, 1864; beginning of modern dairy industry
Lemuel Sherman Barn/Military Hospital	Thamesville	1954	1912-14 War; used as a military hospital by both sides
McKee's Purchase	Blenheim	1931	Treaty to obtain Crown Title to South Western Ontario, 1790.
Skirmish at McCrae's House	Chatham	1924	War of 1812; British capture of American troops, 1813.

Source: Historic Sites and Monuments Board of Canada, 1995.

Table 20
Persons of National Historic Significance within the Thames River Watershed Designated 1919-1993

Name	Location of Plaque	Year Designated	Highlights	Life Span
Beck, Sir Adam	London	1938	Regarded as the Father of Ontario Hydro	1957-1925
Black, Edward	London	1937	Ontario Premier (1871-72); noted Liberal leader and thinker	1833-1912
Blewett, Jean McKishnie	Chatham	1946	Popular early 20th Century poet and journalist	1862-1934
Carling, Sir John	London	1938	Brewer and Federal Minister of Agriculture (1885-92); established Dominion Experimental Farms	1875-1933
Currie, Sir Aurthur W.	London	1934	Commander of the Canadian Corps in 1914; first General in the Canadian Army	1875-1933
Hincks, Sir Francis	Woodstock	1969	Important Reform Politician 1840s; led the Government of the Province of Canada (1851-54)	1807-1885
Labatt, John	London	1971	Took over London Brewery in 1854; began financial empire	1803-1866
Macallum, Archibald Byron	London	1938	Pioneer in scientific medicine in the field of cellular microchemistry	1859-1934
McArthur, Peter	Appin	1946	Journalist, essayist, poet and farmer; writer of "In Pastures Green" (1915)	1866-1924
Mills, David	Chatham	1954	Canadian Minister of the Interio (1876-78) and Minister of Justice (1897-1902)	1831-1903
Peel, Paul	London	1937	Prominent Canadian painter of the French Academic School	1859-1892
Ross, Sir George William	London	1937	Premier of Ontario (1899-1905); Liberal leader in Senate (1911-14)	1841-1914
Saunders, Sir Charles Edward	London	1938	Developed the famous "Marquis" Wheat at Central Experimental Farm	1867-1937
Saunders, William	London	1952	Director of the Experimental Farms Branch of the Department of Agriculture (1886)	1836-1914
Shortt, Adam C.M.G.	London	1938	Historian, author, member of First Canadian Civil Service Commission (1908-18)	1859-1931
Tecumseh	Thamesville	1931	Shawnee Leader and organizer of Western Tribes' Alliance with the British in 1812	1768-1813

Source: Historic Sites and Monuments Board of Canada, 1995.

Table 21
Representative Sample of Early Mills Established along the Thames River and its Tributaries

Date	Mill Name	Owner(s)	Mill Type	Location
1788 (destroyed during War of 1812, later rebuilt)	Clarke's Mill McGregor's Mill	• Thomas Clarke; partnership with Meldrum and Park began in 1792 • 1810, John McGregor; partnership with Duncan • McGregor c.1812 1828, Duncan McGregor	Grist Mill	South bank of McGregor's Creek off forks of Thames in Chatham
c.1785/1791 (destroyed during War of 1812)	Beach's Mill	Abraham Beach	Grist Mill	Shores of Thames River in town now known as Beachville
c.1796 (destroyed during War of 1812)	Cornwall's Mill	Joshua Cornwall	Grist Mill	Lot 14, Camden Township, Kent Co.
c.1797/1807	Allen's Mill	Ebenezer Allen	Sawmill Grist Mill	The junction of Dingman Creek and the Thames River
1819/1820	Ingersoll Mill	James and Charles Ingersoll	Sawmill (1819) Grist Mill (1820)	Thames River, Ingersoll
c.1820s	Waters' Mill	Tom Waters James and Charles Grant	Grist Mill	Carlin's Creek just off the Thames River in London
1832-1881	Avon Mills	John Sebring & Canada Company John Corry Wilson Daly McCulloch Local Doctor Local Banks	Sawmill Grist Mill Woolen Mill	South side of Avon River, south of where the R. Thomas Orr dam now stands
1833	Blackfriar's Mills	Thomas Parke 1834, Dennis O'Brien George Phillips J.D. Saunby	Grist Mill	Banks of Thames River near the Forks in London
c.1840	Mitchell Mill	Canada Company (Mr. Small, Millwright)	Grist Mill	Thames River in Mitchell
1842 - present	The Arva Flour Mill	1842, Edward Matthews 1854, T. Scatcherd 1854, S.S. Pomeroy 1859, Scatcherd, Birrell & Adams 1870, Jacob Hawkins 1919, H. Templeman & C.W. Scott 1946, C.W. Scott and H.W. Scott 1967-present Arva Flour Mills	Flour Mill	North of London on the edge of Medway Creek in Arva
1843-1970	St. Marys Mill	Thomas Ingersoll 1846, William Veal Hutton 1854, Box and Somerville St. Marys Milling Co. Wolverton Milling Co. Great Star Flour Mills	Grist Mill Sawmill	East bank of Thames River south of Queen Street in St. Marys. When destroyed by fire in 1920, operations continued in converted Opera House.

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Table 21 (continued)

Date	Mill Name	Owners(s)	Mill Type	Location
1845-present	Thamesford Feed Mill	John Finkle 1852, Joel and Eleazer McCarty 1859, John Johns 1874, Joseph Cawthorpe 1917, George P. Hogg and Family 1971, Maple Leaf Mill Ltd. 1981, Sutherland, Mills, and Egan Thamesford Feed Mill	Grist Mill Sawmill (1859, steam added; 1898, struck by lightening and rebuilt of brick; 1970, electronic motors; 1971 feed mill and warehouse)	East bank of the Thames in Thamesford
1846-1968	Wollen Mills Knitting Factory	Mr. Park James Waterhouse & F. Bradbury 1940s, Penman's Textiles 1953, Shelby Knit	Woolen Mill	Charles St. E, north side of Thames, Ingersoll
1848 (lower mill site) 1856 (upper mill site)	Glengowan Mill	• Lauriston Cruttenden - original owner of lower mill site; 1850, partnership with Peter Murray Nicol • 1856, George Simpson purchased lower mill • 1866 John McKay and Charles Ruthig purchased mill at upper site	Grist Mill (lower site) Sawmill and Apple Butter Mill (added by Ruthig)	Lower mill site: one mile downstream of Ingersoll's Mill in St. Marys Upper mill site: three miles upstream of St. Marys at Glengown.
1850-1870	McIntosh Woolen Mill	Gilbert McIntosh	Woolen Mill	Thames River between Victoria and St. Maria Streets in St. Marys
1854	Saunby's Mills	Joseph Anderson James Smith 1862, Saunby and Hilliard bought property from Bank of Montreal	Grist Mill Woolen Mill	Thames River in London West
1862	The Commercial Flour Mill	William Keith	Flour Mill (supplied Union Army)	Mill Street, Ingersoll
c.1870	Argo's Mill	Adam Argo	Grist Mill	Water Street, Stratford
pre-1877	Stratford Woollen Mills	1877, Dufton's Ltd.	Woolen Mill	Shores of Avon River, Stratford

APPENDIX - TABLE 22

Catalogue List Produced for *Down By the Riverside*, June 19-August 29, 1993. (Source: London Regional Art and Historical Museums)

ALEXANDER, Eveline Marie
British: 1818-1906
Grand Military Steeplechase at London, Canada West, 9th May, 1843 (1846)
engraving on paper, 36.9 x 50.8 cm.
LRAHM (London Regional Art and Historical Museums), Hamilton King Meek Memorial Collection, 1940

ARMSTRONG, William
Canadian: 1822-1914
View of London, Canada West (c.1852)
lithograph on paper, 11.4 x 17.8 cm.
LRAHM, Anonymous gift, 1949

ARISS, Herb
Canadian: 1916-
On the Medway (1964)
pastel on paper, 48.3 x 106.7 cm.
Collection of the artist, London

ARISS, Herb
Canadian: 1916-
Jack Chambers Painting the Thames (c.1948)
oil on card, 40.6 x 50.8 cm.
Collection of the artist, London

ATKINSON, Erie
Canadian: 1928-
View from the Gallery Lounge (1988)
ink on paper, 35 x 62.2 cm.
Collection of the artist, London

ATKINSON, Erie
Canadian: 1928-
View of Dundas and Ridout North (1989)
ink on paper, 28.5 x 41.2 cm.
Collection of the artist, London

BENNER, Tom
Canadian: 1950-
The Coves (1960)
mixed media on paper mounted on wood, 140 x 79 cm.
LRAHM, General Purchase Fund, 1990

BICE, Clare
Canadian, 1908-1976
Hot Afternoon Near Thorndale (c.1974)
oil on canvas board
40.6 x 50.4 cm.
Collection of the University of Western Ontario, gift of Mrs. Marion Bice, London, 1982

BREEZE, Claude
Canadian: 1938-
Canadian Atlas: Position of London (1974)
acrylic on canvas, 170.2 x 260.4 cm.
The Government of Ontario Collection, Toronto

CADDY, John Herbert
Canadian: 1801-1883
Sketch of London, Canada West from Wortley Road Hill (c. 1845)
graphite on paper, 30 x 45.1 cm.
LRAHM, gift of Mrs. E.G. Pullen and Mrs. W. P. Fraser, Oakville, 1973

CADDY, John Herbert
Canadian: 1801-1883
Railway Bridge, London, Canada West (c.1852)
sepia wash on paper, 26.7 x 39.4 cm.
LRAHM, gift of Mrs. E.G. Pullen and Mrs. W. P. Fraser, Oakville, 1973

CADDY, John Herbert
Canadian: 1801-1883
London, Canada West (1850)
lithograph on paper, 31.4 x 43.3 cm.
LRAHM, purchased with funds from the Mitchell Bequest, 1977

CADDY, John Herbert
Canadian: 1801-1883
View of London, Canada West (1845)
watercolour, gouache and graphite on paper, 34 x 51.7 cm.
LRAHM, Bequest of Mr. Albert E. Templar, London, 1993

CHAMBERS, Jack
Canadian: 1931-1978
Meadow (1972-76)
oil on wood, 182.9 x 182.9 cm.
Estate of Jack Chambers

CHAMBERS, Jack
Canadian: 1931-1978
Gibbons Park (1976)
oil on wood, 61 x 61 cm.
Estate of Jack Chambers

CHAPMAN, Charles
Canadian: 1827-1887
The Thames River (1882)
oil on canvas, 59.8 X 120.8 cm.
LRAHM, gift of Mrs. Marjorie Blackburn, London, 1987

CLARKE, Silvia
Canadian: 1911-
Blackfriars (1993)
oil on cardboard, 35.6 x 45.7 cm.
Collection of the artist, London

COWLE, Ron
Canadian: 1948-
Landscape (1977)
oil on wood, 99.1 x 266.7 cm.
Collection of Mr. Stephen Joy, London

CURNOE, Greg Richard
Canadian: 1936-1992
View from the Most Northerly Window (1969)
acrylic on board with tape, tape recorder and speaker system, 226.1 x 256.5 x 20.3 cm.
LRAHM, Gift of Mr. J.H. Moore through the Ontario Heritage Foundation, 1980

DARTNELL, George Russell
British: 1798-1878
The Gaol and Courthouse, London (c. 1841)
watercolour on paper, 15.7 x 24.2 cm.
LRAHM, Art Fund, 1948

DAVIDSON, Stephen Kelso
Canadian: 1856-1926
The Coves (1905)
watercolour and graphite on paper
25.4 x 37.7 cm.
Collection of Mr. D.G. McLeod, London

DUNCAN, James
Canadian: 1806-1881
View of London (1849)
watercolour on paper, 20.9 x 31.8 cm.
LRAHM, gift of F.G. Ketcheson, Esq., Montreal, Quebec, 1942

GLEN, Edward R.
Canadian: 1887-1963
Dexter's Old Mill, Evening (1919)
oil on wood panel, 22.5 x 32.5 cm.
Collection of Mr. E. T. , Lamont, London

GOODDEN, Ted
Canadian: 1947-
Blackfriar's Bridge #23 (1984)
stained glass and lead, 65.5 x 65.5 cm
LRAHM, gift of Dr. and Mrs. Lorne Taylor, London, Ontario, 1990

GROSS, Peter A.
Canadian: active 1874-1875
Birds Eye View of Brigade Camp, Kensington, London, Ontario (1874)
colour lithograph on paper, 43 x 57 cm.
Private collection, London

HALLEWELL, Edmund G.
British: active 1839-1869
Waterloo Bridge, London, Canada West (1848)
watercolour on paper, 33 x 41.9 cm.
LRAHM, gift of Mrs. P.N. Stevens, England, 1958

HALLEWELL, Edmund G.
British active 1839-1869
London, Canada West (1849)
crayon and wash on paper, 18.4 x 27.9 cm.
LRAHM, gift of Mrs. P.N. Stevens, England, 1958

HALLEWELL, Edmund G.
British: active 1839-1869
London, Canada West (c.1850)
crayon and wash on paper, 24.2 x 28.5 cm.
LRAHM, gift of Mrs. P.N. Stevens, England, 1958

HAMILTON, James
Canadian: 1810-1896
Thames River Below Springbank (c.1860)
oil on paper mounted on board, 22.6 x 29.5 cm. Private collection, London

HAMILTON, James
Canadian: 1810-1896
Becher's Island, October (1883)
watercolour on paper, 15.2 x 25.4 cm.
LRAHM, General Purchase Fund, 1948

(TABLE 22 cont...)

HAMILTON, James
Canadian: 1810-1896
Behind Eldon House (n.d.)
oil on paper mounted on board, 27 x 19 cm.
Private collection, London

HAMILTON, James
Canadian: 1810-1896
Roger Smith's Mill, London, Canada West (c. 1848-49)
oil on card, 25.1 x 38.1 cm.
LRAHM, Anonymous gift, 1964

HAMILTON, James
Canadian: 1810-1896
The Flats, London, Canada West (1850)
oil on paper, 24.2 x 36.8 cm.
LRAHM, Art Fund, 1948

HAMILTON, James
Canadian: 1810-1896
The Clay Banks (c. 1860)
oil on paper, 24.2 x 35.6 cm.
LRAHM, Art Fund, 1948

HAMILTON, James
Canadian: 1810-1896
The Courthouse and Mechanics' Institute, London, Canada West (n.d.)
oil on wood, 40.6 x 53.3 cm.
LRAHM, gift of Dr. Fred Landon, London, 1956

HAMILTON, James
Canadian: 1810-1896
Forks of the Thames (n.d.)
oil on canvas, 61 x 71.1 cm
LRAHM, Anonymous gift, 1968

HEALEY, Mary
Canadian: 1885-1923
Forks of the Thames (c. 1920)
watercolour on paper, 27.3 x 33.7 cm.
LRAHM, gift of Mrs. E. Albright, London, 1979

HEALEY, Mary
Canadian: 1885-1923
King Street Footbridge (c. 1920)
watercolour on paper, 22.9 x 34.4 cm.
LRAHM, gift of Mrs. E. Albright, London, 1979

HEALEY, Mary
Canadian: 1885-1923
Landscape with River (n.d.)
watercolour on paper, 23.5 x 36.5 cm.
LRAHM, General Purchase Fund, 1992

HICKS, R.P.D.
Canadian: 1903-1973
Fanshawe Dam - March (1958)
watercolour on paper, 51.4 x 76.2 cm.
LRAHM, gift of the Western Art League, 1960

HICKS, R.P.D.
Canadian: 1903-1973
South Thames, October 30, 1968
watercolour on paper, 36.9 x 54.6 cm.
LRAHM, gift of Mr. J.H. Moore through the Ontario Heritage Foundation, 1980

HICKS, R.P.D.
Canadian: 1903-1973
After the Spring Flood (1972)
watercolour on paper, 54.6 x 74.3 cm.
LRAHM, gift of Mrs. R.P.D Hicks, London, 1973

HOLDSWORTH, Geoffrey
Canadian: 1952-
The Thames at Delaware (1979)
graphite on paper, 29 x 49.5 cm.
Collection of the Police Services Board, London

HUNT, John Powell
Canadian: 1854-1932
The Wishing Well (n.d.)
oil on canvas mounted on board, 20.8 x 30.5 cm. Collection of Mr. E.T. Lamont, London

HUNT, John Powell
Canadian: 1854-1932
The Thames Near Meadowlily Road (n.d.)
oil on canvas, 61.4 x 51 cm.
Collection of Mr. E.T. Lamont, London

HUNT, John Powell
Canadian: 1854-1932
The Coves Railway Bridge (1881)
oil on canvas, 44.4 x 66.4 cm.
Collection of Mr. John K. Woods, London

JACKSON, Barbara
Canadian: 1922-
Footbridge in Gibbons Park (1990)
watercolour on paper, 37 x 67 cm.
Private collection, London

JUDSON, William Lees
Canadian: 1842-1928
Snow Journey (1877)
oil on canvas mounted on masonite, 64.8 x 90.8 cm.
LRAHM, gift of the Estate of Miss Dorothy Gunn, London, 1982

JUDSON, William Lees
Canadian: 1842-1928
Near Hyde Park (n.d.)
oil on canvas, 39.5 x 65.1 cm.
LRAHM, gift of Mrs. Audre E. Walker, London, 1987

JUDSON, William Lees
Canadian: 1842-1928
The Wishing Well (n.d.)
oil on canvas, 50.5 x 87 cm.
LRAHM, gift of the late Jane Ashplant Stoll, a descendant of an early London family, 1992

JUDSON, William Lees
Canadian: 1842-1928
Kuhleborn: A Tour of the Thames (1881) ink on paper, 140 pages, each 20.3 x 14.0 cm.
The London Room, London Public Library Board

JUDSON, William Lees
Canadian: 1842-1928
Kilworth from **Kuhleborn: A Tour of the Thames** (1881)
lithograph on paper, 21.7 x 13.5 cm.
Collection of Mr. E.T. Lamont, London

JUDSON, William Lees
Canadian: 1842-1928
On Kensington Flats and Egg Island from **Kuhleborn: A Tour of the Thames** (1881)
lithograph on paper, 21.7 x 13.5 cm.
Collection of Mr. E.T. Lamont, London

JUDSON, William Lees
Canadian: 1842-1928
Hungerford Hill from **Kuhleborn: A Tour of the Thames** (1881)
lithograph on paper, 21.7 x 13.5 cm.
Collection of Mr. E.T. Lamont, London

JUDSON, William Lees
Canadian: 1842-1928
Near Delaware from **Kuhleborn: A Tour of the Thames** (1881)
lithograph on paper, 21.7 x 13.5 cm.
Collection of Mr. E.T. Lamont, London

JUDSON, William Lees
Canadian: 1842-1928
Below Delaware from **Kuhleborn: A Tour of the Thames** (1881)
lithograph on paper, 21.7 x 13.5 cm.
Collection of Mr. E.T. Lamont, London

JUDSON, William Lees
Canadian: 1842-1928
View of London (1877)
watercolour on paper, 29 x 59.5 cm.
John Labatt Limited Corporate Collection

deKERGOMMEAUX, Duncan
Canadian: 1927-
Distant Pastures #1 (1985-86)
oil on linen, 152.4 x 127.0 cm.
LRAHM, Purchased with matching funds from the Volunteer Committee and Wintario, 1986

deKERGOMMEAUX, Duncan
Canadian: 1927-
Distant Pastures #2 (1985-86)
oil on linen, 152.4 x 127.0 cm.
LRAHM, purchased with matching funds from the Volunteer Committee and Wintario, 1986

deKERGOMMEAUX, Duncan
Canadian: 1927-
Distant Pastures #3 (1985-86)
oil on linen, 152.4 x 127.0 cm.
LRAHM, Purchased with matching funds from the Volunteer Committee and Wintario, 1986

KIRKHAM, R.A.
Canadian: active 1883-1890
The Thames Valley Below Springbank Park (1885)
oil on canvas, 91.7 x 149.9 cm.
Collection of the University of Western Ontario, gift of Colonel F.A. Reid, London, 1954

LE TOUZEL, Robert
Canadian: 1871-1951
University Bridge, London, Ontario (n.d.)
Etching 1/75 on paper, 16.2 x 34.9 cm.
Private collection, London

MADDISON, Johnnene
Canadian: 1943-
Dundas Street Bridge (1992)
watercolour on paper, 26.5 x 35.5 cm.
Collection of the artist, London

(TABLE 22 cont...)

MANIGAULT, Edward Middleton
Canadian: 1887-1922
Poplars at Dawn (1906)
oil on canvas, 41 x 51 cm.
LRAHM, gift of Mrs. Rosemary Chunn, London, 1989

McEVOY, Henry Nesbitt
Canadian: 1828-1914
Springbank Park (1880)
oil on canvas, 55.9 x 92.7 cm.
LRAHM, gift of Mrs. Jessie Minhinnick, London, 1982

McEVOY, Henry Nesbitt
Canadian: 1828-1914
On the Thames (n.d.)
oil on card, 19.8 x 29 cm.
LRAHM, General Purchase Fund, 1992

McEVOY, Henry Nesbitt
Canadian: 1828-1914
River Landscape with Herons (n.d.)
oil on canvas, 33.2 x 57 cm.
Collection of Mr. E.T. Lamont, London

McEVOY, Henry Nesbitt
Canadian: 1828-1914
Near Gibbons Park (n.d.)
oil on canvas, 38 x 56 cm
Promised gift of Mrs. Yvonne Collyer, London

MITCHELL, Doug
Canadian: 1950-
Heartland (1978)
oil on masonite, 96.5 x 96 cm.
LRAHM, gift of Mr. and Mrs. J.H. Moore in memory of Alex Graydon, 1987

O'BRIEN, Paddy Gunn
Canadian, 1929-
Margin Series #4, Empty Bench, London, Ontario (1992)
oil on canvas, 50.8 x 61 cm.
LRAHM, general purchase fund, 1992

PARFREY, John J.
Canadian: active 1880-1890
The Cove Bridge from the Flats, Kensington, London, Ontario (n.d.)
watercolour on paper, 14.5 x 22.5 cm.
LRAHM, gift of Mr. and Mrs. William Heine, London, 1990

PARFREY, John J.
Canadian: active 1880-1890
In Second Cove, London, Ontario (1890)
watercolour on paper, 12.7 x 20.7 cm.
LRAHM gift of Mr. and Mrs. William Heine, London, 1990

PARFREY, John J.
Canadian: active 1880-1890
Second Cove, London, Ontario (1890)
watercolour on paper, 14.1 x 22.3 cm.
LRAHM, gift of Mr. and Mrs. William Heine, London, 1990

PARKINSON, Bonnie
Canadian: 1942-
Autumn - Tasha, Harley and Basil in Harris Park (1993)
oil on canvas, 91.4 x 121.9 cm.
Private collection, London

PARKINSON, Bonnie
Canadian: 1942-
Forks of the Thames in the Morning Fog (1991)
oil on canvas, 61 x 76.2 cm.
Private collection, London

PAS, Gerard
Canadian: 1955-
As I see it - As it is (1984-85)
watercolour on paper, colour photographic transparency mounted on light box; two sections, each 22 x 52 cm.
LRAHM, purchased with funds from the Somerville Bequest, 1986

PEEL, Paul
Canadian: 1860-1892
Springbank Park (c.1880)
oil on canvas, 46.0 x 61.2 cm.
Collection of the University of Western Ontario, gift of Mrs. Isabelle Benjamin, London

TEMPLAR, Albert
Canadian: 1897-1992
Comfort Place (1944)
oil on canvas, 71.1 x 91.4 cm.
LRAHM, gift of Mr. Albert Templar, London, 1989

TEMPLAR, Albert
Canadian: 1897-1992
Harris Park (n.d.)
oil on board, 40.6 x 53.3 cm.
Collection of Ms. D. Valassis, London

VARIOUS ARTISTS
Canadian
Series of River View Postcards (n.d.)
Lithograph of paper, 9 x 14.2 cm.
Private collection, London

VERBOOM, Klaas
Canadian: 1948-
Kilworth Bluffs (1987)
oil on paper, 26.3 x 37.3 cm.
Courtesy of Sandy Snelgrove Gallery, London

VERBOOM, Klaas
Canadian: 1948-
A Quiet Stream (1987)
oil on paper, 26.5 x 57.5 cm.
Courtesy of Sandy Snelgrove Gallery, London

VICARS, Hedley S.
Canadian: active circa 1926
The Bridge at Kilworth (n.d.)
watercolour on paper, 25 x 37.3 cm.
Collection of Mr. D.G. McLeod, London

VINCENT, Bernice
Canadian: 1934-
Junction (1988)
acrylic on board, 121.6 x 182.4 cm.
Collection of the artist, London

WHITEFIELD, Edwin
British: 1816-1892
London, Canada West (1855)
engraving on paper, 10.2 x 18.4 cm.
LRAHM, gift of Arthur Mould, Esq., London, 1955

WHITEFIELD, Edwim
British: 1816-1892
London, Canada West (1855)
photographic reproduction on paper, 1994 x 4265 cm.
LRAHM, gift of the Bank of Montreal, 1993

APPENDIX - TABLE 23

Recorded Floods and Freshets On the Thames 1792-1951 (Dept. of Planning, 1952, 44-49)

1792 April 28, 29 and May 1
Zeisberger's Diary

1792 May 17 and June 9
Zeisberger
Sharp freshets

1793 March 16-19
Zeisberger
Heavy flood

1793 November 6
Zeisberger
Sharp freshet

1794 March 11-14
Zeisberger
Sharp freshet

1795 March 25
Zeisberger
Sharp freshet

1795 October 11-18
Zeisberger
Severe flood

1797 March 16-17
Zeisberger
Sharp freshet

1798 March 27
Zeisberger
Sharp freshet

1798 March 30 - April 3
Zeisberger
Very severe flood

1800 April 3-9
Hambly's survey diary (Oxford and Dorchester Townships)
Severe

1804 September 13-18
Hambly's survey diary (below Chatham)
Severe

1830 Spring
Sharp freshet or heavy flood

1836 April 9
Proudfoot diaries
Bridge over "Rhodes" Mill Dam carried away

1837 Spring
Manuscript reports of Road Commissioners
Dam being built at Stratford damaged

1843 April 14-16
James Cull's Report on Bridges
Kilworth and Delaware bridges broken; Gardiner's Dam in Mosa broken; four people drowned

1846 March 13- April 4
Gunn Diaries
Severe

1847 January 2-12
Gunn Diaries
Heavy flood

1847 April 8-10
Gunn Diaries
Severe

1851 February 21-22
Canadian Free Press (London C.W.)
Bridges and dams broken

1852 March 14
Canadian Free Press (London)
Bridges and dams broken

1856 April 9-11
London Free Press and Daily Western Advertiser, Ingersoll Chronicle
$5,000 damage at Ingersoll, Clark's bridge damaged, and Hunt's mill dam destroyed at London

1857 February 6-7
London Free Press, Toronto Globe and Leader, St. Marys Weekly Argus, Chatham Planet
Severe

1858 March 16-17
St. Marys Weekly Argus
Heavy flood from Mitchell to St. Marys

1860 February 24
Toronto Leader
Sharp freshet. Dam destroyed at London

1861 March 1-2
London Free Press, Toronto Leader, St. Marys Argus, Sutherland Diaries
Severe

1865 March 17-20
London Prototype, Chatham Planet, Toronto Leader, Sutherland Diaries
Severe

1867 February 14-17
London Free Press
Severe

1868 March 13-17
Toronto Globe, North Middlesex Review
Very severe at Chatham

1869 March 29
Toronto Globe
Sharp freshet

1869 April 18-19
Toronto Globe
Heavy flood at Stratford

1869 July 25
Toronto Globe, Woodstock Times
Sharp freshet at Stratford and below St. Marys

1873 April 7-10
Toronto Globe, St. Marys Argus, Sutherland Diaries
Severe

1873 December 4
Toronto Globe
Severe

1874 January 22-23
Sutherland Diaries, Toronto Globe
Very severe

1875 March 31- April 2
Toronto Globe, Sutherland Diaries, St. Marys Argus
Heavy flood

1878 February 22
Toronto papers, Sutherland Diaries
Sharp freshet at London

1878 March 18
St. Marys Argus
Sharp freshet on North Branch and Trout Creek

1878 September 13
Toronto Globe
Sharp freshet at London

1881 February 12
Toronto papers
Sharp freshet with ice jams

1881 March 17-21
St. Marys Argus, Toronto Globe
Heavy flood at St. Marys and at Chatham

1881 April 8-12
St. Marys Argus
Sharp freshet on North Branch and Trout Creek

(TABLE 23 cont...)

1883 April 10-13
Toronto Daily Mail
Severe flood

1883 July 10-11
Toronto Globe, Toronto Daily Mail, London papers, Sutherland Diaries
Very Severe Flood in London district

1884 February 21 - March 21
Toronto Daily Mail, St. Marys Argus
Heavy flood on February 21. Ice jam on North Branch and below Forks till March 21

1885 April 7-8
Toronto Daily Mail
Heavy flood

1886 January 4-5
Toronto Daily Mail
Heavy flood

1886 March 20
St. Marys Argus
Sharp freshet

1887 January 20-26
St. Marys Argus
Heavy flood on the North Branch

1887 April 3
Toronto Globe
Sharp freshet at Ingersoll, four people drowned

1889 May 31
Toronto Globe
Heavy flood at London

1890 June 5-6
Toronto Mail
Sharp freshet

1891 February 18-20
London Free Press, Toronto Mail
Heavy floods

1893 December 26
Toronto Globe
Heavy flood

1898 March 15-16
London Free Press, Toronto Globe, St. Marys Argus
Very severe flood (especially at Chatham and below)

1899 February 26-27
London Free Press
Severe flood

1899 March 12
Toronto Globe
Heavy flood

1899 April 14
Toronto Globe
Sharp freshet at Chatham

1900 February 8-14
Toronto Globe and Mail
Heavy flood at Chatham; sharp freshet at London

1900 April 9
Toronto Globe and Mail
Sharp freshet at Chatham

1901 March 25-30
Toronto Globe and Mail
Heavy flood at London and Ingersoll

1901 December 14
Toronto Globe and Mail
Sharp freshet at London

1902 March 1
Toronto Globe
Heavy flood

1903 March 8-11
Toronto Globe
Sharp freshet

1904 February 6-7
Toronto Globe
Heavy flood

1904 March 24 - April 3
London papers, Toronto Globe
Very severe flood

1905 March 24-27
Toronto Globe
Severe flood

1906 January 21-23
Toronto Globe
Heavy flood

1906 February 28
Toronto Globe
Sharp freshet; two men drowned

1906 March 27-28
Toronto Globe
Heavy flood

1907 March 14
Toronto Globe
Sharp freshet

1909 February 23-24
Toronto Globe, Toronto Mail and Empire
Sharp freshet

1910 March 2-10
Toronto Globe
Severe flood

1910 March 21
Toronto Globe
Sharp freshet

1912 April 1-9
Toronto Globe
Severe floods below Louisville and in Perth County

1913 January 16-19
London Free Press, Toronto Globe
Heavy flood

1913 March 13
Toronto Globe
Heavy flood

1913 March 25-26
Toronto Globe
Severe flood

1913 April 23
Toronto Globe
Heavy flood near Woodstock

1916 March 28-30
Toronto Mail and Empire
Severe flood below Chatham (caused by an ice jam)

1918 February 15-20
London Free Press, Toronto Mail and Empire
Severe flood

1918 March 29
Toronto Mail and Empire
Heavy flood

1920 March 12-21
Toronto Globe
Severe flood below Chatham

1925 March 18-19
Toronto Globe
Severe flood at Woodstock

1926 March 22-23
Toronto Mail and Empire
Severe flood at Woodstock

1928 March 25
Toronto Mail and Empire
Sharp freshet

1929 January 18-19
Toronto Globe
Sharp freshet

1929 March 13-18
London Free Press, Toronto Globe
Severe flood on North Branch

1929 April 7
Toronto Mail and Empire
Sharp freshet

(TABLE 23 cont...)

1930 January 7-8
Toronto Globe
Heavy flood

1930 February 23-27
Toronto Globe
Heavy flood, Severe flood (especially at Thamesville and below)

1932 January 6
Toronto Globe
Sharp freshet

1932 December 27
Toronto Globe
Sharp freshet

1934 March 2-5
Toronto Globe
Sharp freshet

1936 March 13-15
Toronto Mail and Empire
Severe flood

1937 January 14
Toronto Globe and Mail
Sharp freshet

1937 January 25
Toronto Globe and Mail
Sharp freshet

1937 April 26-30
Toronto Globe and Mail
Very severe flood. London and Chatham flooded. Thamesville inaccessible except by boat.

1938 February 6-7
Toronto Globe and Mail
Severe flood

1938 April 18
Toronto Globe and Mail
Sharp freshet

1940 April 8
Toronto Globe and Mail
Severe flood

1942 March 18
Toronto Star
Sharp freshet

1943 March 16-17
Toronto Globe and Mail
Sharp freshet at London

1943 May 12-13
Toronto Globe and Mail
Sharp freshet at London

1943 June 28
Toronto Globe and Mail
Sharp freshet west of London

1945 May 18-19
Toronto Globe and Mail
Heavy flood

1946 March 7-8
Toronto Globe and Mail
Severe flood

1946 June 18-19
Toronto Globe and Mail
Severe flood

1947 March 25-30
Toronto Globe and Mail
Severe flood, especially below Chatham

1947 April 5-10
Toronto Globe and Mail, Toronto Telegram, Toronto Star, Chatham Daily News
Very severe flood

1947 June 2-3
Toronto Globe and Mail, Toronto Star
Sharp freshet

1948 March 16-21
Toronto Globe and Mail
Very severe

1949 March 14-16
Toronto Globe and Mail
Heavy flood

1949 December 22-23
Toronto Globe and Mail, Toronto Telegram
Heavy flood at St. Marys and London

1950 March 28-29
Toronto Globe and Mail
Sharp freshet at London

1950 April 4-5
Toronto Globe and Mail
Heavy flood

1951 January 8-10
Toronto Globe and Mail, Chatham Daily News
Very severe flood below Chatham

APPENDIX - TABLE 24
Recent Projects Undertaken by the UTRCA to Address Water Quality

Research

- Alternative septic system study to monitor four alternative septic systems designed to better protect surface and ground water
- Manure spreading study in partnership with Agriculture Canada to develop best management practices for spreading manure on agricultural land
- Ground water study in partnership with the University of Waterloo to determine farming practices which minimize contamination to rural ground water supplies
- Rural watershed study to determine the effect of various conservation tillage practices on water quality
- Constructed wetlands experimental systems to develop low-cost alternatives to control pollution from manure runoff

Conservation Services

- Erosion control projects which protect water quality (650 projects in past 10 years)
- Tree planting on private lands which protect water quality through stream buffer establishment and erosion control (360 projects in past 5 years)
- Conservation Tillage projects to prevent soil erosion (37 projects over past 5 years)
- Private sewage disposal program
- Subwatershed rehabilitation projects such as the Hall's Creek project in Ingersoll and Stoney Creek in London

Education

- Conservation clubs focused on improving river health such as the Avon River
- Conservation Club in Stratford and the Cedar Creek Project in Woodstock
- Education programs focused on water quality for students
- Newsletters and brochures for the public

Monitoring

- Environmental monitoring of water quality through the Upper Thames River watershed to target conservation measured and monitor environmental change
- Water quality monitoring of research projects and subwatershed projects
- Benthic and Invertebrate Monitoring Program (80 sites throughout UTRCA watershed)

Clean Up Rural Beaches Program (1991-1995)

- a total of 260 projects were completed, costing approximately $3 million, with over $1 million subsidized through CURB

Table 25 List of Participants in the Thames River Background Study

Coordinating Committee

Name (A) = Alternate	*Community*
Doug Bocking (Chair)	London
Charles Baldwin	Ridgetown
Tim Blackburn	Delaware
Ted Blowes	Stratford
Karen Burch	London
Jerry Campbell (A)	Chatham
Bonnie Carey	Mt. Brydges
Terry Chapman (A)	London
Rosemary Dickinson (A)	London
John Fisher	Peterborough
Nancy Fallis	London
Neil Garbe (A)	Chatham
Dean George	Southwold
Terry Grawey	London
Bryan Howard	North York
Janet Jones	Chatham
Gerald Killan	London
Dan Martin	Stratford
Don Pearson	London
Russ Piper	Burgessville
Edward Pleva	London
Doug Reycraft	Glencoe
Marcel Roelandt	Tilbury
Harald Schraeder	Aylmer
Dan Shrubsole	London
George Sims	Chatham
Michael Troughton	London
Bill Wachsmuth	Chatham
Valerie Welsh	Chatham
Timothy Whitehead	Chatham
Ian Wilcox	London

Background Studies Subcommittee

Gerald Killan (Chair)	London
Doug Bocking	London
Bonnie Carey	Mt. Brydges
Dave Martin	Belmonth
Jack McCallum	London
Ian McCallum	London
Karma McClenaghan	London
Andrea Quenneville	London
Cathy Quinlan	London
Cathy Rogers	Bayfield
Harald Schraeder	Aylmer
Dan Shrubsole	London
Glenn Stott	Arkona
Michael Troughton	London
Ian Wilcox	London

Funding Subcommittee

Don Pearson (Chair)	London
Ted Blowes	Stratford
Doug Reycraft	Glencoe

Human Heritage Subcommittee

Michael Troughton (Chair)	London
Mike Baker	London
Shirley Bain	Thamesville
Dan Brock	London
Andy Chisholm	London
Jim & Lisa Gilbert	Chatham
Marjorie Jackman	Thamesville
Gerald Killan	London
Archie McIntyre	Bothwell
Bob Pearce	London
Arthur P. Pegg	Blenheim
Joseph C. Reily	Mt. Brydges
Glenn Stott	Arkona
Jan Trimble	London
Timothy Whitehead	Chatham

Natural Heritage Subcommittee

Dave Martin (Chair)	Belmont
Jane Bowles	Thorndale
Key Dewdney	London
Vicki Hammond	London
Dave Hayman	London
Spencer Inch	London
Bob Miller	Stratford
Marcell Roelandt	Tilbury
Bill Wachsmuth	Chatham
Valerie Welsh	Chatham
Ian Wilcox	London

Communications Subcommittee

Bonnie Carey (Chair)	Mt. Brydges
Karen Burch	London
Ted Blowes	Stratford
Rosemary Dickinson	London
Steve Sauder	St. Marys

Recreation Subcommittee

Jack McCallum (Chair)	London
Allan Bailey	London
Georgina Bateman	Thamesville
Doug Bocking	London
William G. Chipperfield	London
Gary Hawkins	Chatham*
Jean Law	London
Karma McClenaghan	London
Archie McIntyre	Bothwell
Michael Murphy	London
Russ Piper	Burgesville
Jim Riehl	Lambeth