Multiple Values in Floodplain Protection for Conservation

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Abstract

Three case studies of development in London, Ontario illustrate 1) the past, present and future implications of the 1988 Flood Plain Planning Policy Statement *two-zone concept for the loss of flood plain, and 2) the growing engineered face of the river. Past decisions have allowed housing below the 250 year hazard limit along the Thames River – a recent Ontario Municipal Board ruling approved new housing in the flood fringe adjacent to a river-edge park and new development is planned for the Dingman Creek, a tributary of the Thames River. Language such as* "will generally be directed to areas outside of hazardous lands adjacent to river and stream systems" *is an invitation to bequeath a heritage of armour stone and gabion. The solution is a more prescriptive and more conservative one-zone flood protection policy that has the potential to meet the multiple use objectives of flood protection, and natural and cultural heritage values.*

Introduction

London is a city of 330,000 and is centrally located in southwestern Ontario in Site Region 7E in the Great Lakes Lowland Deciduous Forest Belt commonly known as the Carolinian Canada life zone. The dominant physiographic features of London are the North and Middle Branches of the Thames River that meet at the Forks of the Thames in downtown London. Other notable features on the landscape are the Arva and Brescia Moraines in the north and northwest that influence the Medway Creek, as well as the Westminster and Ingersoll Moraines bracketing Dingman Creek across the southern tier of the City.

This paper reviews three case studies to illustrate the implications of the two-zone concept of the *Flood Plain Planning Policy Statement*, (OMNR, 1988). The scenarios describe development in the floodplain and are ordered as the past (1988), the present (2003) and the future (2004 and beyond). Each scenario relies on partitioning the floodplain into the floodway and the flood fringe (below and above the 100-year flood line, respectively). The examples of residential development described here go beyond the "conditional" development language of the 1988 *Policy Statement*. The decisions to apply this methodology and consequently to permit development in the floodplain are made independent of other planning matters such as multiple use open space objectives and ecosystem integrity. Engineering solutions for flood hazard management are made at the cost to the natural heritage system. The perception of a hierarchy of authority contributes to the preference of the flood plain policy as being paramount in the approval process to the exclusion of natural heritage system values.

Flood plain management in Ontario has evolved since the time of European settlement to the 1988 *Flood Plain Policy* (MNR, 1988). Sometimes the river and its floodplain were protected from development (London, 1878; Coleman, 1995) while at other times housing or other economic activity took place in the floodplain. In cases where the power of the Thames in flood was ignored, people suffered the loss of lives, property or both as in the floods of 1883 and 1937. Although there have been 132 flood events in London between 1792 and 1950 the *"policy of public forgetting"* (McEachern, 2002) continues to allow development and to mis-measure the risks and benefits. Following the severe flood of 1937 people in this area participated with others to create what would become the watershed-based conservation authorities throughout the province.

In 1988, the *Flood Plain Policy Statement* for Ontario was issued in which the two-zone concept of floodplain and flood fringe were defined further to their introduction in the 1983 *Flood Plain Criteria Policy Statement* (OMNR, 1988). Prior to 1988, a one-zone concept was the norm for the Province although the two-zone concept was allowed for certain types of development such as essential municipal services. *The City of London Official Plan* Chapter 15.6 describes conditions where either the one or two-zone concept apply and the City delegates its authority for development approval in the floodplain to the Upper Thames River Conservation Authority (UTRCA) (London, 2001a). The UTRCA, in turn, relies on the application of the two-zone policy and the determination of the floodway/floodfringe zones by floodline mapping and/or hydraulic floodway analysis for consent to fill and build in the floodplain.

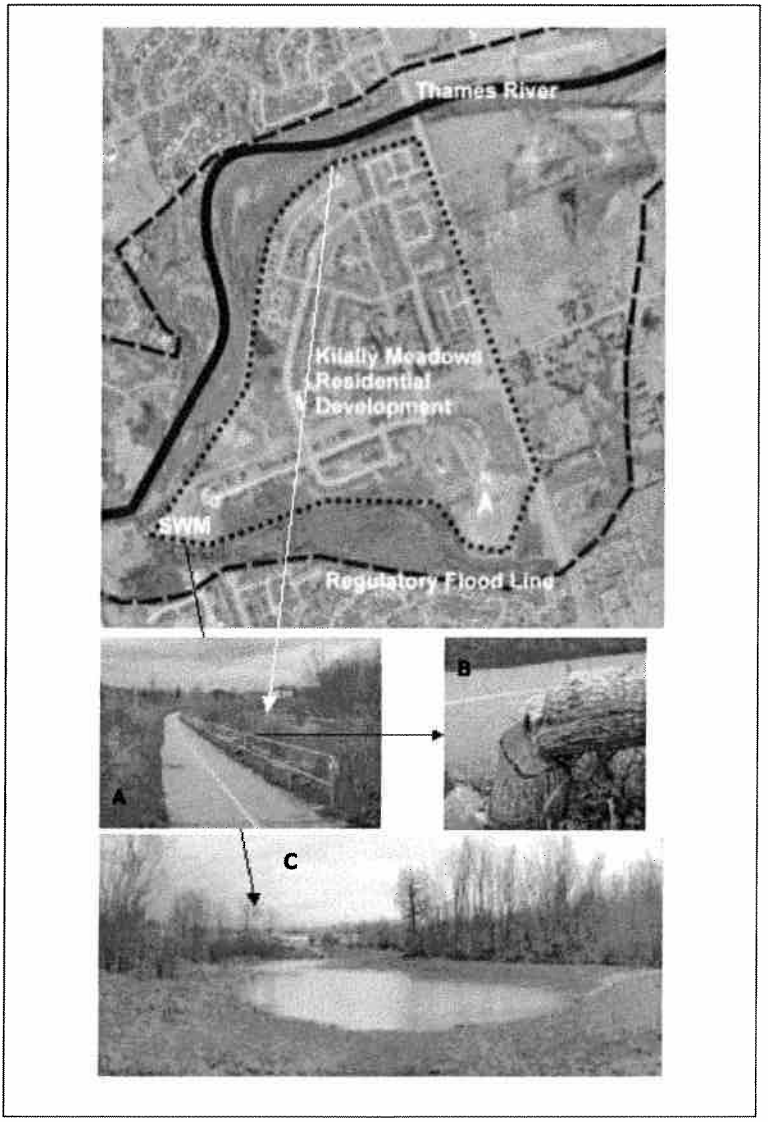
The Past

Kilally Meadows was proposed in the 1980s and was in the process of review at the City of London Planning Department. In 1988 an unapproved gabion wall was installed along the south face of the Thames River. Several years later the development was approved and the fill was approved and residential development ensued.

Figure 1 is an aerial photo that shows the residential streetscape wholly within the floodplain (London, 2001b). The inset photograph A shows the placement of the gabion wall adjacent to the river and the embankment of fill and houses above. The rip-rap retaining wall has been colonized by poplar in the fifteen years since it was installed. The toppled tree at the fifth fence post of the guard rail had been recently cut by beaver at the time of Photograph B, April 2003. The inset photograph C shows the stormwater management pond in the floodplain. The naturalized riparian corridor is effectively limited to the north side of the Thames River. This development has resulted in a direct loss of riparian habitat along the river as well as along the now rip-rapped watercourse, ironically named Meander Creek, that now serves as the outlet of the stormwater management pond. The significant woodland is subject to increased edge effects as it is pinched between the development and the berm of the stormwater management pond. The stormwater management controls result in a reduction in aquatic habitat and a direct loss of floodplain habitat. Backyard swimming pools are situated within the drip-line of the black maple (*Acer nigrum*) trees that the chain link fence surrounding it will be inadequate to protect. Edge effects are increased and the wet conditions that supported the black maple forest

are not maintained.

Figure 1. *Kilally Meadows, North Branch Thames River, London ON. River in thick black, Regulatory Flood Line, dashed, residential development within floodplain dotted outline (London 2001b). Photo A. Gabion, rip rap and fill. Photo B. Evidence of recent beaver activity. Photo C. Stormwater management pond and berm adjacent to significant woodland of Black Maple forest.*



The Kilally development was pushed ahead by the aggressive behaviour of the proponent and the ineffective behaviour of the municipality and the Conservation Authority.

Overall, the residential development below the meander terrace at this section of the Thames River transformed a dynamic riparian habitat to a hardened river edge that is constrained by gabion, asphalt and a grassed embankment. The development impairs aquatic habitat, reduces riparian habitat, interrupts a river corridor, threatens the viability of an upland woodland and diminishes the recreational experience for naturalists. This example demonstrates land-use planning without regard to the natural heritage.

The Present

Residential development in the flood fringe opposite Gibbons Park in London, known as 1 Beaufort Street, was proposed in 2001, and the application was rejected by the City of London. Reasons for the rejection of the proposed Beaufort development included inadequacies of the Environmental Impact Statement and issues concerning corridor protection, river valley integrity, presence of a significant woodland, recreational appreciation and flood hazard potential. Responsibility for the latter fell to the approval of the UTRCA.

Upstream of the proposed development are three other developments in the floodplain. Figure 2 is from an aerial photograph (London, 2001b) and the labels indicate a) a residential development of single family homes dating from the 1920s and apartment buildings from the 1960s; b) single family homes upon engineered fill below the meander cusp built in the 1980s; and, c) the University of Western Ontario TD Waterhouse Stadium constructed for the 2001 Canada Games. Promises of politicians and planners assured the public that this would not become a precedent for further development in the floodplain. Naturally, the proponent for 1 Beaufort cited the stadium as the rationale for why the townhouse project should be allowed in the flood fringe only about 1 km to the south.

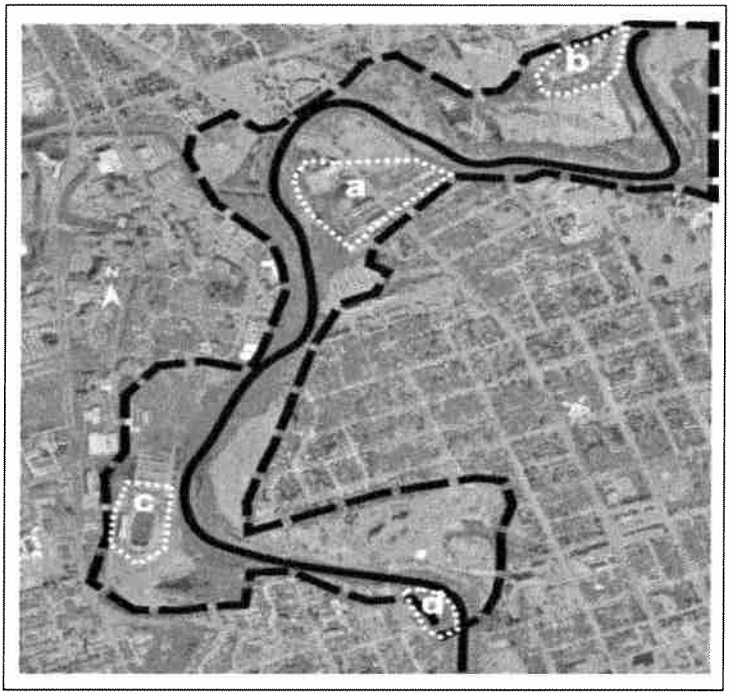
An eleven-day Ontario Municipal Board hearing was held to hear the appeal of the proponent and to determine the appropriateness of the development application. The Beaufort development was approved by an Ontario Municipal Board decision (OMB, 2002) in spite of sound reasoning and well-documented evidence to the contrary from the City of London (Bergsma, 2002). In order to address the risks of natural hazards the proposed townhouse development will be built upon about two metres of fill some of which will extend into the floodway beyond the 100-year floodline. Questions remain about the need for hardening of the river edge to protect the development and to guard against the theoretical possibility of riverbank slippage. This case example demonstrates a weakness of municipal policy and an absence of comparative evaluation of overriding provincial policy.

The Future

The Dingman Creek sub-watershed has experienced some development including light industrial and residential areas. Although most of its 30 km length remains agricultural, it is threatened by expanding urban growth that has accelerated since annexation following the *London-Middlesex Act* (1992). Estate lots, residential sub-divisions, light indus-

trial zones and mega-scale agri-business are examples of present and future threats to the Dingman Creek Corridor. The case to be made for the Dingman is the application of the precautionary principle for conservation. The Environmental Commissioner of Ontario argues for municipalities to protect corridors and to guard against the continued fragmentation of the ecosystem (Wilkinson, 2002).

Figure 2. *Beaufort Development, North Branch Thames River, London. River in thick black, Regulatory Flood Line, dashed, residential development within floodplain dotted outline (London, 2001b). a) residential, 1960s; b) Residential on elevated fill below meander terrace; c) Stadium, University of Western Ontario; d) Proposed residential in flood fringe.*



The Dingman Creek floodplain is the last east-west corridor in the city as so much of the north and middle branches of the Thames River have been developed. The vision for a viable natural heritage system that could provide habitat and corridor function between the Dorchester Swamp, a Provincially Significant Wetland on the east, and Komoka Provincial Park, an Area of Scientific and Natural Interest (ANSI) on the west is reliant upon the protection, maintenance and enhancement of the Dingman Creek corridor.

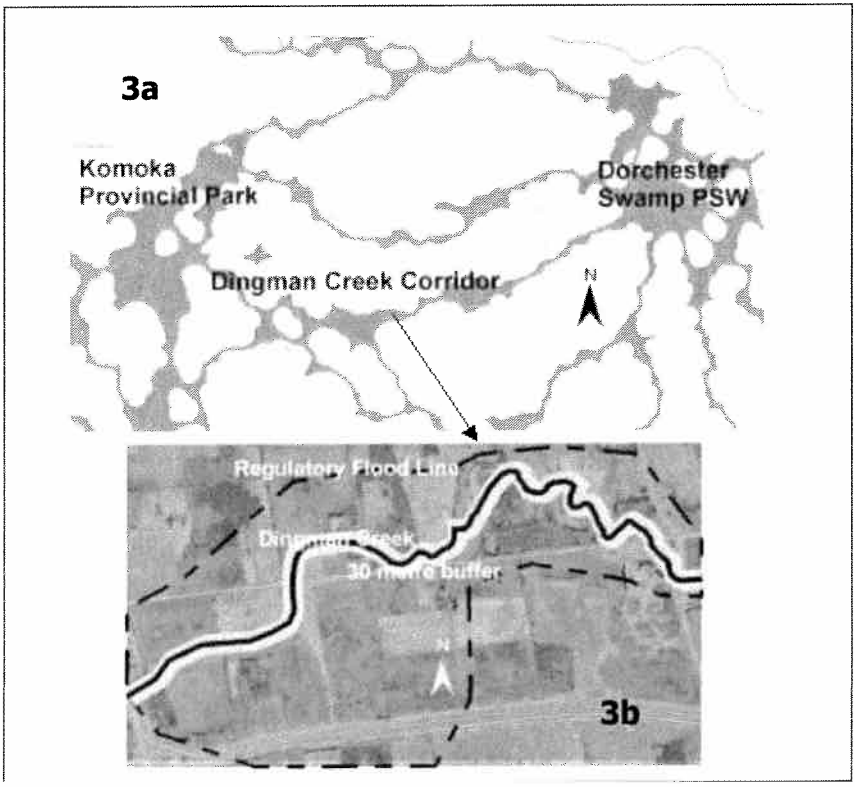
This vision for managing growth and development is known as *The Big Picture for Conservation Planning in Carolinian Canada.* It is based on a methodology that seeks the best possible cores and corridors with the least economic or built constraints (Jalava *et al.,* 1999). Figures 3a and 3b illustrate both the potential and the present at a proposed core in the Big Picture along the floodplain of Dingman Creek. The outline around the

creek in 3b suggests the best case scenario for a 30 m riparian corridor assuming present practice in the City of London. To achieve the potential of establishing a core and viable corridor habitat will require that the present features and functions of the natural heritage system be maintained, protected and enhanced.

Multiple Planning Objectives

The record of the past documents the dramatic alteration of the landscape and the increasing likelihood of building in the floodplain. Effects of hardening the edge of the river include increased water discharge rate and decreased flood storage capacity. The homogenization of the river edge limits biodiversity and diminishes the enjoyment of natural habitat. Present understanding of landscape ecology suggests that we need to find a better way to plan our uses of the land in order to achieve sustainable biodiversity. Policies that are more prescriptive and decisions that are more conservative are required. Conservation thinking is needed in order to meet environmental management objectives for a healthy, sustainable ecosystem that satisfies community values for healthy living, and the values of the natural world, including its intrinsic merit of habitat and its extrinsic outcomes of clean air and clean water.

Figure 3a and 3b. *3a) Dingman corridor part of "Big Picture Cores and Corridors" (Jalava 1999); 3b) Dingman Creek, London ON. Stream in thick black, Regulatory Flood Line, dashed. (London, 2001b).*



Commitment to principles of intergenerational equity and sustainability require assertive behaviour of decision makers to realize the Provincial Interest of a natural heritage system (Figure 1). *The Provincial Policy Statement* is a good start when it is read in its entirety. Allowing one policy to override others and engineering a floodplain to permit development to the neglect and detriment of other aspects of the natural heritage system is not good planning and is contrary to the implementation provision of the PPS 1995.

Table 1. *A hierarchy of conservation planning for a natural heritage system.*

A HIERARCHY OF CONSERVATION PLANNING FOR A NATURAL HERITAGE SYSTEM

PPS	Feature	Development Setbacks
2.3.3	Corridor	
2.3.1a	Wetland	100 m Ecological Buffer
2.3.1b	Woodland	100 m Ecological Buffer
2.3.1b	Habitat	x m habitat specific Ecolo gical Buffer
3.1.1b	Hazard	Maximum un-engineered flood hazard limit
3.1.3c	Hazard	Maximum un-engineered slope hazard limit
2.5	Cultural	100 m visual aesthetic Buffer

The natural hazards policy of 3.1 of the PPS was not designed to, nor should be, relied upon to protect the natural heritage values of the floodplain. Land-use designation and zoning to restrict development in the floodplain that integrates the multiple layers of land-uses will provide better certainty for protecting natural heritage values from development in flood hazard lands. Every municipality may show leadership and have regard to Provincial interest while managing at a level above and beyond the minimum standard for the protection of ecologically important features and functions.

Summary

The natural heritage system, like all systems, comprises many sub-systems that are coupled in ways that yield emergent properties. Upland woodlands and riparian woodlands provide habitat and corridor linkages that support the movement and life cycle stages of many animals. The key in land-use planning is to use all the tools that are available and never to measure a component of the system independently of the larger system.

References

Bergsma, Bonnie. 2002. *Expert Witness Statement, 1 Beaufort Street, Appeal to the Ontario Municipal Board.* 12p, 6 Appendices.

Coleman, S. 1995. *Lands reserved to the Crown.* Letter to City of London re: the bed of the Coves, Thames River. Ontario Ministry of Natural Resources (OMNR): Aylmer, ON.

Jalava, Jarmo V., B. Sorrill and J. Peter. 1999. *The Big Picture: Cores and Connections in Canada's Carolinian Zone.* Natural Heritage Information Centre, Ontario

Ministry of Natural Resources (OMNR): Peterborough, ON.

London. 1878. *City of London By-Law 313 In the Protection of Great Talbot Street along the Thames River and for other purposes.* City of London: London, ON.

London. 1992. *London-Middlesex Act.* City of London: London, ON.

London. 2001a. *City of London Official Plan Consolidation, January 1, 2001.* The Corporation of the City of London: London, ON.

London. 2001b. *City of London Air Photo Mosaic, April 2001.* [SIDWorld, electronic file]. [LONDON40_01.SID]. 1:10,000. University of Western Ontario Serge A. Sauer Map Library: London, ON.

McEachern. 2002. Miramichi: *Settlements, Forest Fires and the Policy of Public Forgetting.* Department of History public lecture, April 2002. University of Western Ontario: London, ON.

OMB (Ontario Municipal Board). 2002. *[Ontario Municipal Board PL020107] Decision/Order No. 1696.* Decision Delivered by J. de P. Seaborn, December 12, 2002. Toronto, ON.

OMNR (Ontario Ministry of Natural Resources). 1988. *Flood Plain Planning Policy Statement Implementation Guidelines.* Queen's Printer for Ontario: Toronto, ON.

Wilkinson, Christopher. 2001. Environmental Commissioner of Ontario. Linking Ontario's Fragmented Ecosystem: Using Corridors in Environmental Planning. *Ontario Planning Journal,* 16 (5): 26-28.