

**Planning for Nature in the City: A Temporal Analysis of Landscape Change
at the Mouth of the Don River in Toronto, Canada**

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Abstract

This paper critically examines the relationship between nature and the city at the mouth of the Don River in Toronto, Canada, through current and historical waterfront planning analysis at the site. An investigation of the patterns and processes restricting responsible planning of natural systems and the resulting changes to the landscape is central to this analysis, from the infilling of marshland in Ashbridge's Bay at the beginning of the 20th century, to the proposed Don Mouth Naturalization Plan (DMNP) currently in development. While historical accounts of Toronto's waterfront detail the river mouth's alteration over time, omitted from the literature is an analysis that encapsulates how the current naturalization efforts align with trends of the site's history, and what this infers about the value and management of natural systems as part of a modern-day urban waterfront. In a comparison of different time scales, this paper reflects on anthropogenic alteration at the river mouth and discusses how natural systems at the site are particularly influenced by interrelated factors of competition and economic prosperity, governance, stakeholder priorities, environmental threats, and port "functionality". The methodology used to complete this analysis consists of a literature review of urban and landscape ecology theory, an evaluation of waterfront planning history at the site, and ethnographic interviews to link historical narratives together in the context of urban-natural systems. This research reflects the realities associated with implementing naturalization within a functional urban landscape, with implications for other waterfront cities experiencing similar transitions as post-industrial landscapes.

Foreword

My area of concentration is *Urban Ecology and Sustainable Planning*, which focuses on the restoration and inclusion of natural processes in urban space as part of a sustainable planning methodology. As defined through my area of concentration, sustainable planning aims to reduce the ecological footprint of urban frameworks and the citizens within them, while also improving the function of natural systems. This research paper synthesizes my area of concentration through the study of an urban ecology planning framework (the Don Mouth Naturalization Plan) in practise, and explores elements of each learning component in my Plan of Study.

Understanding and valuing urban ecological systems as a necessary aspect of city planning serves as the foundational lens to this paper, beginning with development of urban ecology theory in Chapter 1. The remaining chapters examine the valuation of nature in the city through planning trends and processes, and discuss how these trends resulted in the creation of the Don Mouth Naturalization Plan. As one of North America's largest naturalization plans within Canada's most populous city, the Don Mouth Naturalization Plan provides the ideal project to explore themes related to my area of concentration. The first learning component in my Plan of Study is *Ecological Planning in Urban Areas*, which involves the protection and enhancement of natural processes and systems in cities. As defined in my Plan of Study, natural systems include regional ecological processes such as riparian and watershed networks, air quality, and natural cover systems and linkages. Through the analysis of naturalization at the mouth of the Don River as an opportunity to restore ecological function to the Don River Valley, I contributed to my knowledge in this learning component. Understanding the constraints and opportunities of the Don Mouth Naturalization Plan within a functional urban landscape also contributed to my

understanding of this learning component. My second learning component is *Water Quality Enhancement and Restoration in Large Urban Areas*, which addresses how hydrological systems are affected by urban landscapes and also investigates the ways that ecological design can improve hydraulic quality and function in cities. Understanding the evolution and role of the conservation authority in addressing environmental problems within Toronto's watershed as part of this major research paper further developed this learning component. Reflecting on the transformation of the landscape from an alluvial marsh to a derelict industrial zone to a re-naturalized river mouth as an urban estuary was also helpful in developing my knowledge of this learning component. My third learning component is *Climate Change Mitigation and Adaptation Planning*, which examines how anthropogenic contributions to climate change can be limited through techniques such as city cooling and air quality improvements, while adaptation techniques respond to environmental changes to the landscape. The study of planning practise at the river mouth over time reveals nuances in environmental awareness movements and exemplifies how environmental preparedness in Toronto has changed, particularly in terms of flood risk planning. While Toronto is not on an oceanic coast, an increase in stronger storms and rising flood waters of the Don River led to strict policy change after Hurricane Hazel affected the area in 1954. Despite the existence of this regulatory flood benchmark, even higher flood design and engineering standards for the Don Mouth Naturalization Plan were put in place to accommodate expected changes in precipitation and waterflow levels from Lake Ontario as a result of climate change. This shift in flood adaptation policy and design is indicative of how climate change is changing the way cities plan, namely through the accommodation of resilient environmental systems. While detailed building designs and their potential to reduce climatic impacts are not part of the development plans associated with the naturalization in its present

stage, the expected green space implementation and floodwater accommodation of this project is representative of climate-resilient landscapes.

In the context of a naturalization plan that is designed to re-establish ecological systems among an urbanized landscape, this paper delves into an analysis of urban ecology in practise that incorporates all three learning components within my Plan of Study. Examining the trends of planning policy and landscape change that led to the realization of this plan provides valuable insight to the applicability of urban ecology principles, since many of the obstacles to incorporating natural systems in cities are discussed in the ultimate design of the Don Mouth Naturalization Plan.

Research Design and Methodology

In this paper I undertook a temporal analysis of landscape alteration which examined the changing valuations of nature at the mouth of the Don River. This was achieved through the analysis of a variety of primary and secondary research sources, revealing common themes between time periods, yet also discussing how the conception of nature has evolved in new ways that integrate urban and natural processes.

I examined this research topic with the epistemological approach of a social scientist, since I am interested in the socio-environmental and planning policy context at the site of the mouth of the Don River. Given the extent of historical analysis undertaken in this research paper, I am aware that the availability and credibility of information from earlier time periods limits the scope in which I can assess decision making and planning priorities at the site. Focused on ecological integration from a theoretical and practical planning perspective, this paper does not delve into the realm of cultural or social planning. Despite those relevant topics at the mouth of

the Don River deserving equal consideration, the scope of this paper is focused on nature in the city strictly from a planning context. Important elements of this analysis examine themes of naturalization in urban environments based on hydrology, fluvial geomorphology, vegetation, and flood risk. However, this paper will not delve into the specifics of environmental science or technical analysis of ecological effectiveness at the site. This paper is concerned with the planning perspectives and landscape changes at the site of the Don River mouth over time, and the circumstances surrounding how natural systems are planned in an urban context. Based on these concerns, the appropriate research methodology I employed uses a broader scope of analysis that examines planning documents and interviews to match the multi-dimensional history of landscape alteration at the site.

The information gathered for this paper was from both primary and secondary sources. Primary information was gathered from ethnographic interviews. The ethnographic interview enabled me to capture unique descriptions of the interviewee's experiences, to explore how concepts are actually understood, and to see how institutional, economic, social, environmental, and political relations play out in the planning processes at the site. When these interviews were combined with document analysis and historical research, more detailed patterns and processes related to natural systems integration were revealed. The four interviewees in my study were Eha Naylor (a consultant for a landscape design firm and former colleague of Michael Hough), Jennifer Bonnell (A history professor at York University and an expert on the history of the Don River Valley), John Wilson (former Task Force to Bring Back the Don Chair), and Cassidy Ritz (Project Manager in Future Planning at the City of Toronto for Port Lands). Secondary research began with a succinct literature review based on relevant theories and schools of thought within the field of urban ecology. This involved reading and analyzing a

variety of literary sources such as books and journal articles. Subsequent research involved historical analysis using books, archival reports, websites, and digital historical accounts. Planning documents and policies that were influential in shaping the landscape at the river mouth were integral for my research, including The Toronto Harbour Commission's Waterfront Plans of 1912 and 1967. This analysis extends to other planning documents that are shaping current and future land uses at the river mouth. These resources were found at the Toronto Reference Library, York University's Scott and Map Libraries, Toronto and Region Conservation Authority (TRCA), and through digital online resources. Many of these documents were provided or recommended by staff members at TRCA or from staff at York University. Despite the prevalence of substantial document and policy analysis as secondary research in this paper, a thorough text analysis was not used to analyze the content of waterfront plans. I used a broader study that led to the contextual analysis of planning policy and the factors that have shaped the landscape as a more appropriate method of analysis. The study of current land use at the site was used to frame the historical significance of the region as it transitions to a post-industrial landscape. Land use problems impacting the site such as the prevalence of flooding and conflicting stakeholder perspectives in the area are discussed in relation to the most recent land use plans in the area. Understanding these relationships within the context of current planning goals for the waterfront revealed the impetus for change as demonstrated by the Don Mouth Naturalization Plan. The Don Mouth Naturalization Plan Environmental Assessment and additional reports provided by the Toronto and Region Conservation Authority are also used to outline future changes to the site area. Serving as the backbone to land use direction in the Port Lands, the Don Mouth Naturalization Plan provides insight on future landscape changes at the site. The study of current planning initiatives at the

mouth of the Don River reveals a shift in planning priorities and decision making at the site compared to the city's waterfront planning priorities at the river mouth in the early 1900's. Further examination of current planning documents exemplifies the challenges of naturalizing a degraded river mouth in the context of a highly urbanized and functional waterfront.

Chapter 1: Introduction Within the Context of Literature

Chapter Introduction

My interest in studying the planning history at the mouth of the Don River is to better understand how ideologies of nature have changed over time. My perspectives on how nature should be planned and valued in the city are primarily influenced by Patrick Geddes, Ian McHarg, and Michael Hough, who developed theories of urban ecology. Urban ecology principles were championed by Michael Hough (1983) as a blend between urbanism and nature, and are particularly relevant in reference to the Don Mouth Naturalization Plan. The current planning frameworks in place at the mouth of the Don reveal an attempt to re-integrate natural processes as part of an overall development strategy in the region. However, this differs greatly from the planning processes and land uses that have neglected natural process at the site historically. In understanding this new way of planning for nature in the city, it is logical to refer to theories that advocate for the inclusion and protection of ecological processes in urban environments. The most influential of these theorists was Michael Hough, who left behind a legacy of urban ecology in academia and as part of his involvement in naturalization efforts at the mouth of the Don. As a member of the Task Force to Bring Back the Don, Hough brought his vision of a naturalized river mouth to the forefront of municipal agendas, and saw the mouth of the river as the ideal opportunity to implement his theories of urban ecology as a restoration solution.

This chapter traces the evolution of theories that are related to urban ecology. From colonial ideologies of resource exploitation to current design methodologies of landscape

urbanism and low impact development, the understanding of these principles is imperative in order to understand the temporal evolution of policy and landscape changes at the mouth of the Don. Instead of controlling nature in cities, urban ecology theories emphasize re-connecting humans to nature through the practise of planning and design at the landscape level. Based on this type of theory, important takeaways can be made that relate specifically to the mouth of the Don. These include the understanding of underlying ecology before development occurs, valuing nature for its ecological role and function, and challenging modernist and rational-comprehensive histories that value control over natural systems for economic and aesthetic purposes.

Early Ecological Planning Theory

Natural systems in cities have been valued for different purposes throughout history. Concern over city appearance, living conditions, and efficiency have contributed to varying perspectives on how nature is valued in urban areas. However, ecological networks bordering or intertwining with human settlements have traditionally been sought after as a resource and harvested for human consumption and use. This colonial influence is exemplified by the control and cultivation of indigenous resources, and is prevalent in The Laws of the Indies. The Laws of the Indies describe the founding of North American towns in the sixteenth century, including the influence of European ideologies onto Amerindian ways of life through the establishment of new settlements and heavy exploitation of natural resources (Mundigo and Crouch, 1977). This history of exploitation was prevalent in the Don River Valley in the 18th and 19th centuries, particularly through deforestation and agricultural production in the river valley (Bonnell, 2014). During the Romanticism era, the great park movements gained popularity not only as an aesthetic element of design, but as a way to improve the quality of life

for urban citizens (Hough, 1983). Utopian ideals from the City Beautiful movement such as Ebenezer Howard's Garden City advocated for naturalized space in cities as a way to improve the public realm and human health for urban citizens during the heavily-polluted industrial era (Howard, 1965).

Despite the impacts of human settlement on nature, environmental schools of thought have typically been neglected as a main concern for planning theory (Wilkinson, 2011). As a discipline, the role of preliminary planning theories rooted in rationalism was to ensure maximum economic gains, and the natural world was typically seen as a resource used for human consumption (Beatley, 1989; Jacobs, 1995; Rahder, 2010). The beginning of the 20th century in North American cities marked the beginning of zoning for land uses, and in the case of many cities, the primary focus was on protecting the health, safety, and general welfare of citizens (Gilbert, 2015). Modernist planning principles of urban economic development have shaped planning processes in North American cities since the early 20th century. Planning is typically an anthropocentric-focused discipline, and this differentiates greatly from the holistic environmental ideologies of fields such as deep ecology, which respect the intrinsic value of the natural environment (Jacobs, 1995). Deep ecology and early environmental planning ideologies value a "re-connection to the local environment and revitalization of one's sense of place through intentional subjectivity, rather than objective detachment associated with rationalism", as well as maintaining a "healthy functioning of local and global ecosystems for purposes beyond ourselves" (Rahder, 2010, p. 9).

The difficulty in transferring such concepts to traditional planning ideology arises because the value systems entrenched in environmentalism differ from the orderly, economically-driven value systems within rational comprehensive planning (Jacobs, 1995).

Towards the end of the 19th century, Patrick Geddes pioneered a type of integrated ecosystem planning, analyzing the natural landscape's relationship to human influence which culminated in his Valley Section Model of 1892 (Hodge and Gordon, 2013). Geddes sought to plan with a more regional approach, preaching that the dynamics of broader landscape processes should be understood as the preliminary step to planning urban settlements (Hodge and Gordon, 2013). Interestingly, this work began at a time that challenged the negligible value of natural systems associated with modernist planning. The channelization of the Don River and lake infilling of the lower marshes as a result of the Waterfront Plan of 1912 is an example of the predominant modernist ideology to control nature for the purposes of economic and industrial development (Desfor, 2011). The ramifications of this ideology and its impact on the marshes can be analyzed theoretically: "One of the important lessons from political ecology dialectics is that attempts to dominate and control socio-nature can never be complete. Such attempts are always vulnerable to ideological contestation, political opposition, social transformation, economic change, and, of course, unknown or unpredictable ecological relationships" (Desfor, 2011, p. 64-65). The historical relevance of natural systems exploitation at the mouth of the Don will be discussed further in Chapter 2. In *Design with Nature*, Ian McHarg was critical of urban development and control of natural systems, and examined how ecological processes might interact with urban landscapes. McHarg believed that humans and nature should function with a certain level of interdependence, as both depend on each other (Ndubisi, 2002). He developed a type of environmental planning that locates areas of least ecological value and function for development. McHarg was extremely influential in joining the processes of landscape ecology and urban planning, in order to create more environmentally sustainable cities through traditional planning processes (Spirn, 2000). Much like Geddes, McHarg's projects and analysis models

such as the valley section, suitability maps, and adaptation strategies emphasize the understanding of existing ecological systems in a region before recommending development strategies (Ndubisi, 2002; Spirn, 2000). Phillip Lewis, working on related concepts around the same time period as McHarg, developed models to preserve sensitive landscape features such as wetlands, river valleys, and wildlife corridors, and proposed the protection of what he called ‘environmental corridors’ (Ndubisi, 2002). Michael Hough, a former student of McHarg’s, developed this concept further. His book, *Cities and Natural Process*, continued within this line of thinking to examine ecological values within cities, the understanding of ecology in urban areas, and strategies to incorporate nature into development proposals (Hough, 1995). This book is grounded on the existing disconnect between urban societies and nature, lack of understanding about the cyclical relationship between city formation and ecology, the unsustainable patterns of urban growth, as well as issues related to the societal valuation of the natural world in cities (Hough, 1995). Hough saw the urban fabric of a city as more than a vessel for economic activity: “City spaces have a significance beyond the transportation, economic, or recreational assets that we normally ascribe to them. The notion of investment in the land now begins to acquire conservation and health values. An ecological basis for urban form suggests that when the city’s water is recycled back into the system there are reduced costs and increased benefits. Urban development becomes the participant in the workings of natural systems” (Hough, 1995, p.81). Hough believed that traditional planning frameworks must be re-evaluated, and that “this can be achieved by integrating the concept of urbanism and nature through the discipline of urban ecology” (Hough, 1983, p.14). By integrating ecology into the planning process as a preliminary step (as McHarg and Geddes suggested), Hough believed ecological integration could be achieved as a focal point of design. Hough believed this was a way to

“serve environmental and social uses and to ensure maximum diversity” (Hough, 1983, p.14). This type of urban-ecological planning tends to seek “ecological justification for specific planning approaches and goals” (Pickett, Cadenasso, Grove, Nylon, Pouyat, Zipperer, and Costanza, 2001). Hough saw the city as an ecosystem, and was critical of the way nature was valued for its aesthetic qualities over ecological function, such as in the use of street trees. He was also critical of excluded urban spaces that contained less pristine forms of nature (Hough, 1995). Hough’s influence at the mouth of the Don River will be discussed further in Chapter 3. In *Uncommon Ground: Rethinking the Human Place in Nature*, Cronon concurs with this critique. Rather than exclude humans from isolated forms of untouched wilderness, Cronon, like McHarg, advocated for the integrated and harmonized relationship between humans and nature (Cronon, 1996). These works recognize the importance of balance within urban systems, and emphasize ecological health as a priority within the planning process so that we can live more responsibly in harmony with nature (Cronon, 1996, Hough, 1995; McHarg, 1969).

Post-Modernism, Landscape Urbanism, and the Re-Assessment of Conventional Design

“The environmental crisis is a design crisis. It is a consequence of how things are made, buildings are constructed, and landscapes are used. Design manifests culture, and culture rests firmly on the foundation of what we believe to be true about the world”.

- Van der Ryn and Cowan, 1995, p. 24.

Environmental design is differentiated within the field of urban ecology as an alternative to conventional design. Focusing on the interactions of human relations and ecological

processes, environmental design emerged as a relational and reactionary process to modernist ideologies. As a discipline, it sought to rectify the ideologies that emphasize rationality, progress, and the control over nature and people (Gilbert, 2015). Environmental design also emerged as a reaction to the deterioration of the physical and social environment and is fuelled by a desire to reconnect humans and natural processes (Gilbert, 2015).

Similarly, ecological design developed as a counter to traditional urban design that placed humans and natural communities as separate entities: “Ecological design is predicated on the coevolution of nature and culture. It is a kind of covenant between human communities and other living communities: Nothing in the design should violate the wider integrities of nature” (Van Der Ryn and Cowan, 1996, p. 104). In ecological design, additional emphasis is placed on making nature a more visible part of the urban environment, not only as a way to reacquaint humans to broader communities of life, but to teach humans about the consequences of environmental degradation (Van Der Ryn and Cowan, 1996). This concept is also discussed by Hough, who determined that “children learn about their environment less by the occasional visit to the nature centre or museum than by constant and direct experience in their daily surroundings. The pond in the park that is constantly changing character, full one week and empty the next, provides the best opportunity for understanding hydrology in cities” (Hough, 1983, p.12). This suggests that the typical urban citizen experiences a disconnect between themselves and natural processes. In relation to broader themes of urban ecology, this fundamental element of daily interaction becomes important for strengthening ties between the social component of cities (humans) and the natural environment.

This relationship between humans and nature is commonly understood as the concept of biophilia, which recognizes the importance of frequent interactions between humans and nature

in planning and design. Biophilic design suggests that the ecological city bridges humans and their surroundings in the modern era by reconnecting people to their natural environments. Beatley (2011) describes the biophilic city as “a city that puts nature first in its design, planning, and management; it recognizes the essential need for daily human contact with nature as well as the many environmental and economic values provided by nature and natural systems” (2011, p.45). Thus, biophilia emphasizes the importance of nature in cities for human health, but also recognizes the environmental benefits of urban ecology.

While it is well known within urban ecology literature that re-establishing nature within cities is important, it is less clear how nature should be defined in an urban setting. In the context of a restoration and naturalization project such as the Don Mouth Naturalization Plan, it becomes necessary to associate restoration targets with a desired definition of nature. As an urban estuary, the Don Mouth Naturalization Plan’s design represents a re-constructed form of nature, since reverting back to pre-European settlement characteristics was determined to be unfeasible after over a century of anthropogenic influence on the landscape. However, this re-constructed form of nature contains several characteristics that align with designed landscape, critical habitat, and recreational space criteria. Figure 1 describes these criteria from Gobster (2001)’s visions of nature, which can be used as a rudimentary guide for definitions of nature in comparison to elements of nature in the Don Mouth Naturalization Plan.

Table 1
Visions of nature expressed by Montrose Point stakeholders

Criteria	Designed landscape	Critical habitat	Recreation	Pre-European settlement
Function	Aesthetic experience, enclosure, sense of infinite, mystery	Primary focus on birds	Nature as substance and backdrop	Emulate pre-settlement ecosystems and processes
Structure	Native plant palette, multi-layered masses	Food and cover, less of a concern if it is native	Natural appearance	Native plant communities
Values	Landscape art	Uniqueness, bird diversity	Nature appreciation, wildness, special place	Biodiversity, endangered species, nature experience
Use	Passive-appreciative	Limit use except for birders	Balance nature with use	Active (restoration) appreciative
Icons	The meadow, the long view	The Magic Hedge	Beach, harbor, “hook”, revetment	Entire landscape

Figure 1: Visions of nature (Gobster, 2001, p.40)

Though these criteria are not used or compared by the TRCA, the Don Mouth Naturalization Plan aligns with different elements within Figure 1 due to emphasis on native plant communities, biodiversity, and a landscape-based approach (Toronto and Region Conservation Authority, 2014). As discussed in Chapter 3, returning the river mouth to pre-European settlement conditions as an alluvial river delta was the original goal of the Task Force to Bring Back the Don, however it was determined to be unfeasible and alternative designs were proposed.

In understanding the limitations of ecological design feasibility in a city environment, I found it necessary to draw on literature that assessed urban-environmental systems. Notable works in this field include Alberti and Marzluff’s *Ecological Resilience in Urban Ecosystems: Linking Urban Patterns to Human and Ecological Functions* (2004) as well as Alberti’s *Advances in Urban Ecology* (2008). I found the latter of these sources to be particularly useful in understanding many of the difficulties of designing an urban naturalization plan, due to the emphasis on effects to hydrologic resources. Alberti (2008) discusses urban-hydrological conflicts due to landscape fragmentation and river channelization, as well as the impact of

increased stream flow due to runoff. This results in landscapes with increased erosion and sedimentation, as well as water quality issues (Alberti, 2008). These issues are common in riparian zones within cities, but also specifically when applied to the mouth of the Don River. Many of the solutions to these problems can be attributed to the increased use of low impact environmental design, as highlighted by Dietz in his article *Low Impact Development Practices*. First named and used in 1999, low impact development within urban areas is designed to minimize impacts on soils, vegetation, and aquatic systems. This contrasts from more traditional infrastructure design elements in cities, such as a stormwater treatment facility that only mitigates peak flow rates, and diverts stormwater to other locations. The Credit Valley Conservation and Toronto and Region Conservation Authority's Low Impact Development Stormwater Management Planning and Design Guide functions as a tool to help developers, consultants, municipalities and landowners implement these techniques to improve watershed health (Toronto and Region Conservation Authority, 2010). Low impact design is also recommended for future actions to improve ecosystem health in the TRCA's Living City Report Card (Toronto and Region Conservation Authority, 2011). Low impact design elements incorporate ecological principles to improve the condition of the urban watershed. As evidenced from the image in Figure 2, an urban watershed alters natural hydrological functions, and becomes a uniquely impacted urban-hydraulic system. For example, channelization of water bodies can alter stream flows within urban watersheds (Alberti, 2008). In addition, "urban development disturbs soil, increases the movement of sediments, and removes vegetation from the streambank" (Alberti, 2008, p. 137). These types of alteration to the natural landscape correlate to many of the pressures exerted on the river mouth of the Don in the early 20th century, as explained in Chapter 2.



Figure 2: Hydrological processes in the urban landscape (Alberti, 2008, p.135)

The Don Mouth Naturalization Plan’s Preferred Alternative incorporates elements of low impact design in order to restore rainfall to the water table, handle floodwaters, link critical habitat networks, and to small degree, filter river contaminants (Toronto and Region Conservation Authority, 2014). Understanding and recognizing the potential function for natural systems,

particularly restored wetlands and river valleys, is also necessary in evaluating the purpose of naturalization at the Don Mouth. The function of urban wetlands is explored in Platt et al.'s *The Ecological City: Preserving and Restoring Urban Biodiversity*, Marsh's *Landscape Planning* and Ehrenfeld's *Evaluating Wetlands Within an Urban Context*. Indicators such as size of wetland, connectedness, hydro-geomorphic alteration, urban setting characteristics, and human value can lead to stronger analysis of urban wetland restoration potential (Ehrenfeld, 2000). Recognizing the constraints of naturalization within an urban system is integral, since the realities of urban development, sediment flow, and channelization must be accommodated in the Don Mouth Naturalization Plan. Wetlands provide multiple benefits including hosting a variety of land and aquatic species, and functioning as important actors in hydrological systems (Marsh, 2010). Flood protection through wetland and natural river path creation is a defining element of naturalization efforts at the mouth of the Don River.

After a long industrial history, the area south of the Don River's mouth, known now as the Port Lands, remains an industrial hub today. As a central part of Toronto's waterfront, the Port Lands also offer the opportunity for prime residential development. However, current provincial regulations in place prohibit development in certain areas due to the immense flooding risk in this region. Since the naturalization efforts at the river mouth unlock development opportunities due to the increased flood protection, new urban landscapes must operate in tandem with natural spaces. Common dilemmas in planning such as "the property conflict" (between planning for economic growth and social justice), "the development conflict" (between planning for social justice and environmental protection), and "the resource conflict" (between planning for economic growth and environmental protection) have relevance at the mouth of the Don (Agyemen and Evans, 2003, p.37). Re-thinking development as sustainable community

growth through planning and policy “away from our present market-driven, resource-intensive development paradigm” is a necessary first step to navigating the tensions between natural systems and urban development (Agyeman and Evans, 2003, p.39). In this way, economic forces can become a tool to “achieve policy goals as opposed to being the source of such goals” (Agyeman and Evans, 2003, p. 40). This type of thinking is particularly relevant in the case of the Don Mouth Naturalization Plan, where the economic gains of residential and community development potential in the region necessitate naturalization efforts to remove the flood risk. This will be discussed in further detail in Chapters 4 and 5.

Figure 3 describes how the incorporation of ecological thinking across different scales (lot, block, neighbourhood, city, metropolitan area, region, and globe) allows urban areas to be more self-sufficient and adaptive. The concept of scale is particularly important in reference to the Don Mouth Naturalization Plan. As a site situated as part of a large ecological network, the role of naturalization extends beyond the site and block level, especially in relation to flood risk.

Figure 3: Ecological design actions at different scales (Loukaitou-Sideris, 2012, p.481)

Table 1. Examples of ecological design actions at different geographic scales

Building/lot	Block	Neighbourhood	City	Region
Disaster-safe buildings	Pedestrian infrastructure (sidewalks, lighting, short blocks, etc.)	Provision of open space. Parks with natural landscape	Preservation of green space and natural areas	Preservation/ restoration of natural habitats, open spaces, coastal zones, river systems, riparian systems
Green building design. Smart/ energy efficient technology/ passive heating and cooling systems/green roofs and walls	Urban forest (street trees)	Mixed use	Mitigation of brownfields	Water conservation
Align building to natural sunlight	Urban infill	Mass transit connections/ easy access to public transit systems	Coordination of land use and transportation/ transit oriented development	Preservation of farmland at the hinterland; minimization of the extent of the urban footprint
Water efficient landscaping and yard treatment	Adaptive reuse of vacant buildings, abandoned and under-utilized sites	Complete streets/ Sidewalks and bike paths	Public transportation linking centres and sub-centres	Allocation of new growth close to existing transportation nodes.
Use of grey (non-drinking) water		Good connectivity; direct routes linking neighbourhood facilities	Compact urban form; allocation of growth to desired locations with emphasis on reducing dependence on automobiles	Regional planning and resource sharing among cities in the region
		Availability of different densities and housing options	Curtailling of sprawl through growth boundaries, countryside preserves, greenbelts	Avoidance of building in natural hazard areas (floodplains, high erosion zones, etc.)
		Nodal development of neighbourhood retail and services Shared use parking		Curtail deforestation

The theoretical evolution of sustainable park design also has relevance to the Don Mouth Naturalization Plan, particularly since the time scale of sustainable park theory development overlaps with the timing of naturalization conceptions in the Don Valley by the Task Force to Bring Back the Don in the 1990's. Cranz and Boland's (2004) work on sustainable park models reveals that the modern park design looks at public space through a unique lens. Elements such as ecological restoration, native plant vegetation, green infrastructure, resource self-sufficiency and permeable surfaces distinguish this type of park from previous models. While parks have been valued in planned communities for centuries for a variety of purposes, sustainable parks function beyond aesthetic, social, recreational, and human health purposes. This park type focuses on "solutions to ecological problems" and explores how "new ideas about nature can build upon the traditional social genesis of urban parks" (Cranz and Boland, 2004, p. 102). The sustainable park functions as part of a broader ecological system in the urban metropolis. The multi-functional purpose of re-naturalization efforts in the Don correlates to this notion, where

parcs in cities are valued beyond recreational uses. Figure 4 details the evolution of park designs over time. These parks have the potential to influence ecological health beyond the boundary of the site.

Table 1. A Comparison of the Sustainable Park to Prior Park Types after Cranz (1982).

	Pleasure Ground 1850–1900	Reform Park 1900–1930	Recreation Facility 1930–1965	Open Space System 1965–?	Sustainable Park 1990–present
Social Goal	Public health & social reform	Social reform; children’s play; assimilation	Recreation service	Participation; revitalize city; stop riots	Human health; ecological health
Activities	Strolling, carriage racing, bike riding, picnics, rowing, classical music, non-didactic education	Supervised play, gymnastics, crafts, Americanization classes, dancing, plays & pageants	Active recreation: basketball, tennis, team sports, spectator sports, swimming	Psychic relief, free-form play, pop music, participatory arts	Strolling, hiking, biking, passive & active recreation, bird watching, education, stewardship
Size	Very Large, 1000+ acres	Small, city blocks	Small to medium, follow formulae	Varied, often small, irregular sites	Varied, emphasis on corridors
Relation to City	Set in contrast	Accepts urban patterns	Suburban	City is a work of art; network	Art-nature continuum; part of larger urban system; model for others
Order	Curvilinear	Rectilinear	Rectilinear	Both	Evolutionary aesthetic
Elements	Woodland & meadow, curving paths, placid water bodies, rustic structures, limited floral displays	Sandlots, playgrounds, rectilinear paths, swimming pools, field houses	Asphalt or grass play area, pools, rectilinear paths, standard play equipment	Trees, grass, shrubs, curving & rectilinear paths, water features for view, free-form play equipment	Native plants, permeable surfaces, ecological restoration green infrastructure, resource self-sufficiency
Promoters	Health reformers, transcendentalists, real estate interests	Social reformers, social workers, recreation workers	Politicians, bureaucrats, planners	Politicians, environmentalists, artists, designers	Environmentalists, local communities, volunteer groups, landscape architects
Beneficiaries	All city dwellers (intended), upper middle class (reality)	Children, immigrants, working class	Suburban families	Residents, workers, poor urban youth, middle class	Residents, wildlife, cities, planet

Figure 4: Sustainable park development timeline (Cranz and Boland, 2004, p.103).

Sustainable designs at broader landscape scales have the potential to preserve and restore riparian systems and natural habitats, while also creating stronger ecological networks

throughout the city. The concept of scale at a landscape level is particularly important when understanding the Don Mouth Naturalization Plan as an example of landscape urbanism.

Landscape urbanism, a term pioneered by James Corner and Charles Waldheim, is a theory of planning that focuses on landscape as the primary design element of a city, as opposed to architecture and built form (Waldheim, 2006). Landscape urbanism recognizes the separation of built environments and green landscapes, and seeks to rectify the division (Corner, 2006). The importance of scale and functionality within landscape urbanism is depicted by Corner in Waldheim's *Landscape Urbanism Reader*:

More than aesthetic and representational spaces, however, the more significant of these traditional urban landscapes possess the capacity to function as important ecological vessels and pathways: the hydrological and stormwater system underlying the necklace-like structure of Boston's Back Bay Fens, for example, or the greenway corridors that infiltrate Stuttgart and bring mountain air through the city as both coolant and cleanser. These kinds of infrastructural landscapes will surely continue to be important to the overall health and well-being of urban populations. These precedents also embody some of the more significant potentials of landscape urbanism: the ability to shift scales, to locate urban fabrics in their regional and biotic contexts, and to design relationships between dynamic environmental processes and urban form" (Corner, 2006, p. 24).

Stemming from post-modernist design concepts and philosophies championed by landscape architects such as Ian McHarg, landscape urbanism seeks to understand how social, economic, political, and cultural processes are embedded with the natural world (Corner, 2006). Landscape urbanisms have urged designers and planners to rediscover and privilege natural systems (open spaces, waterways, natural landscapes) as important determinants of the metropolitan form

(Waldheim, 2006). Landscape urbanism is a relatively recent concept in academia, but it has already been referenced as the design basis of the initial naturalization efforts of the lower Don Lands (Steiner, 2011). The landscape design approach was used to help develop a unifying vision for the Lower Don Lands, including the site defined by the Don Mouth Naturalization Plan, in order to accommodate a wide range of planning initiatives for a broader area. This competition was implemented in order to create a cohesive landscape that tied together various planning objectives, and thus landscape urbanism is an integral theory to understand and apply when analyzing landscape change in the Port Lands. The landscape urbanism design process is particularly useful in understanding how economic and social structures in place at the Port Lands can coexist with naturalization. Landscape urbanism has a foundation in mitigating urban problems on the natural environment, improving ecological conditions through design, and improving quality of life for citizens in cities through increased access and exposure to the natural environment (Waldheim, 2006). All of these qualifications have applicability to naturalization efforts at the mouth of the Don.

Opponents of landscape urbanism (and often, proponents of new urbanism) argue that planning at the landscape level can create unsustainable urban areas in the form of isolated patches of green sprawl, and that it is not a feasible design concept in the highly populated modern city (Duany and Talen, 2013). While connectivity, access, and walkability are important aspects of sustainable cities at certain scales (see Figure 2), at this specific waterfront site, accommodating and improving natural processes of the Don River Valley using the landscape approach is most appropriate. New urbanism creates a sustainable urban environment through landscapes conducive to transit connectivity and walkability, and is a logical type of urban design for Toronto's downtown core. This urban grid design could be identified as a T6 urban

zone in Andres Duany's *Urban Transect* model, a model which emphasizes protecting nature by excluding it from the highest density regions of a city (Duany Plater-Zyberk and Company, 2014). However, since the river mouth of the Don is located primarily within an ecologically sensitive and low-density region, its land use is substantially different than a traditional downtown core. Thus, I believe a landscape urbanism-oriented approach to its design is appropriate.

Chapter Conclusion

This chapter examined the theoretical evolution of natural systems planning in cities. Natural systems in urban areas have served a variety of purposes in urban areas, however, they were traditionally neglected in favour of industrial and economic land uses. Urban ecology emerged as a relevant discipline that changed the way nature is valued, designed, and planned in cities. An understanding for underlying natural process is fundamental to this theory, as well as valuing nature for its ecological role and function over aesthetic and economic ideals. Current landscape and ecological-based theories of design seek to re-connect symbiotic relationships of humans to nature by valuing ecological systems as a vital component of the urban framework. In this sense, design practices implementing principles of urban ecology challenge modernist and rational comprehensive ideologies of control over nature. Stemming from the influential work of Patrick Geddes and Ian McHarg, Michael Hough played a significant role in the shaping of urban ecology theory, and his influence on planning practise at the mouth of the Don River will continue to be discussed in Chapter 3.

Chapter 2: From Marshland to an Industrial Hub

Chapter Introduction

This chapter analyzes the historical trajectory of landscape change at the mouth of the Don River until the 1980's, as human influence left a legacy of dominance over natural processes. At the beginning of the 20th century, the marshes of Ashbridge's Bay at the mouth of the Don were infilled for industrial purposes. A clear shift in the valuation of natural systems at the site is indicative of a planning history rooted in rational comprehensive motivations, as economic revitalization proved to be the dominant force behind the Waterfront Plans of 1912 and 1967. A myriad of social, economic, political, and environmental influences contributed to the devaluation of natural processes in the region. The inability of engineers and planners to understand the underlying ecology of the area, perceived and actual health risks, and the lure of economic potential led to the formation of Toronto Harbour Commission. This change in governance was fundamental to the landscape changes at the mouth of the Don. Driven by the lure of economic prosperity, the planning and management style of the Toronto Harbour Commission resulted in sweeping changes that converted the river mouth for industrial purposes. Nature was seen as a place to control and fear, and metropolitan engineering solutions of lake-filling and channelization were portrayed as solutions to a lagging industrial economy by the Toronto Board of Trade. A defining failure during this historical time period was not assuming broader economic and environmental conditions would change, as evidenced by the demise and transitions of shipping and industry, as well as the inability to address environmental issues.

Ashbridge's Bay and the Rise of Industry

“No area in the Toronto region has been as richly or continuously imagined – or as persistently debated – as the Waterfront”

- Reeves, 1992, p. 98.

The site of Ashbridge's Bay was historically one of the largest wetlands in eastern North America (Bonnell, 2010). Described as a “marshy delta” stretching five square kilometres, this site was home to a diverse selection of wildlife as “one vast jungle of tall flags and reeds” (Bonnell, 2010, p. 36). The 1880's saw a rise in hunters, trappers, and fishermen, who had settled cottages and camps in the sand spit at the mouth of the Don (Bonnell, 2010). Despite this modest settlement pattern at the river's mouth, upstream of the Don River, rapid changes to the landscape were beginning to occur.

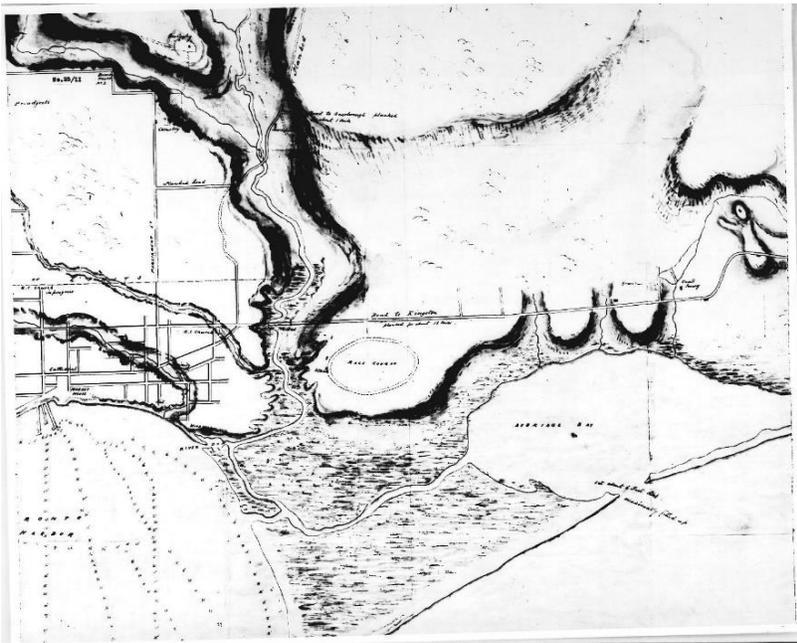


Figure 5: Don River mouth, 1846 (University of Toronto Map and Data Libraries, 2015). The site of Ashbridge's Bay is featured in the east end of the image, with the harbour in the west. The sand spit divides the two water bodies, and the Don River drains in to both systems.

Throughout the 19th century, the length of the Don River Valley was impacted by colonial mentalities of settlement and resource exploitation, which affected the natural features of the lower Don River (Bonnell, 2014). Deforestation weakened the integrity of the landscape, as natural features were converted to productive land uses such as agriculture. Despite remaining relatively untouched until the 20th century, the debate on whether to drain or infill the marshes at the mouth of the Don began as early as the start of the 19th century (Bonnell, 2014). Seen initially as place to fear and avoid, the lower Don River was looked at increasingly more “for its problems than for its potential” (Bonnell, 2014, p. 27). The pre-industrial mouth of the Don was a designated health risk, posing threats of diseases from malaria to cholera (Bonnell, 2014, Desfor, 2011). After 1850 the region became more attractive for its industrial potential, due to its location as a port and its connectivity with rail lines. The river mouth continued to be affected by land consumption that destroyed wetlands and natural cover, as the river lost the majority of its ability to filter pollutants and had developed a “yellowish green colour, and a slimy, soup-like consistency” (Bonnell, 2014, p.37). As mills gained popularity with the influx of steam technology, industrialization became prolific along the Don. The river was essentially converted into a waste corridor, posing threats of heavy metal and industrial remnants, typhoid fever, and cholera to the citizens who lived near the river’s mouth (Bonnell, 2014). This put pressure on the City of Toronto in the late 1800’s to make bold decisions on the region of the lower Don. The threat of the marshes to human health was influential in causing a shift in management at the river’s mouth. This impact on human health is described in personal communication with Dr. Jennifer Bonnell, a historian and professor who has extensively researched and written about the history of the Don River Valley:

I think there is a number of factors at work here. The level of pollutants in Ashbridge's Bay Marsh by the 1870's and 80's ... It had just gotten to the point that the city was concerned that they would be facing, you know, litigation, due to the risk of cholera outbreaks by the 1890's. So there was a real push from the Provincial Board of Health to have the City act and take some measures to solve this pollution problem (J.Bonnell, personal communication, September 16, 2015).

Early engineering efforts to solve issues of pollution, flooding, disease and silt accumulation were often unsuccessful at the mouth of the Don. Challenges arose from the inability of workers to “accurately comprehend the environment they were working with (Bonnell, 2014, p. 45). As plans were formed to direct sediment accumulation caused by deforestation, erosion, and periodic flooding, dams were created to help direct sediment flow and heavily polluted waters to the marshland at the river's mouth. These actions inadvertently reduced the flow and flushing capacity of the marshes, resulting in stagnated waters that created further health risk to citizens (Bonnell, 2014). In the context of urban ecology theory, this dismissal of underlying ecological conditions is directly related to the shortcomings of traditional planning theory and design (Hough, 1995; McHarg, 1969). Failure to understand the river's natural filtration and flow patterns resulted in further environmental degradation in the region. This lack of understanding is contextualized by the time period:

I would certainly say that for the 1880's, very little understanding, to the extent that they don't even really know what's there. And they are planning to straighten this river bed down to 12 feet and they hit all of this shale and substrate material that they hadn't anticipated at all. So I think not only complete lack of understanding, I mean the word ecology wasn't even in public use really until the 1930's and beyond. So certainly, an

understanding of environmental processes? No, no one is even looking at that. But they also just weren't even that aware of the particular conditions of the landscape they were seeking to transform. That meant, the project took twice as long, they had to abandon their efforts to really deepen this channel, it costs a lot more, and so what you end up with is a project of half measures (J.Bonnell, personal communication, September 16, 2015).

This lack of ecological understanding resulted in attempts to control natural processes, which is typical of a rational comprehensive planning ideology (Rahder, 2010). The straightening and deepening of the river bed was a fundamental step in the creation of the Don Improvement Project (DIP), a plan developed in the mid 1880's, which sought to remediate many of the problems found at the mouth of the Don related to pollution, disease, flooding, and silt accumulation (Bonnell, 2014). The municipality had the majority of decision making authority over the Harbour Trust at this time, and emphasis was placed on improving the environmental conditions while exploring the potential of the region for further industrial expansion (Bonnell, 2014). The DIP had four main objectives: "(1) To improve the sanitary condition of the area, 2) to make the Don a navigable stream for large vessels, 3) to accommodate rail traffic in to the city, and 4) to create new lands for industrial purposes. Flood control was considered an associated benefit" (Bonnell, 2014, p. 55).



Figure 6: Natural flow path of the Don River, 1887 (University of Toronto Map and Data Libraries, 2015)



Figure 7: Straightened Don River, 1894 (University of Toronto Map and Data Libraries, 2015)

The rationale for planning projects such as the Don Improvement Project at the mouth of the Don was to improve public health and economic potential, whereas ecological health was not considered as important. Flood control was considered an associated benefit of this project, while three of the four objectives for the DIP were in place to improve economic activity at the site. This differs substantially from the importance and reliance on flood control at the mouth of the Don in the 21st century. This will be discussed in further detail in Chapter 4. Towards the end of the 19th century, the landscape of the lower Don was influenced to an even greater extent by the rise in industrialization, as a larger variety of goods were able to be produced. A straightened river was thought to improve transportation access to industrial lands, and had the potential to remove the problem of sedimentation accumulation, a common problem in urban deltas. The adaptations to the river were also intended to facilitate shipping and industrial development, and reduce the threat of disease through the creation of a “metropolitan corridor” (Bonnell, 2014, p.59; Desfor, 2011). The river was straightened, widened, and deepened by 1892, from Gerrard Street to the outlet in to Lake Ontario (Reeves, 1992). The rise of shipping and trade during this time period influenced future decision making at the mouth, since after the Don straightening, larger ships were able to pass through, and shipping activity was thought to increase. Industrial expansion and the rise of the transportation hub at the mouth of the Don continued to develop into the 20th century, furthering the status of the river mouth as a designated industrial zone and ‘space apart’ from the lived spaces of Toronto (Bonnell, 2014; Desfor, 2011). Changes to the landscape made at this time period must be viewed within the context of its political economy, as well as the existing conditions of the river mouth. The channelization of the Don River and inspirations for industrial expansion were relative to the needs of the city at the time, as basic ecological understanding still did not exist, nor did a formal metropolitan

planning department until 1930 (Reeves, 1992). In reference to the factors guiding decision making during this time period, an explanation is given by Bonnell:

I think it's just recognizing, first and foremost, that this is an entirely different political economy, one that's focused on production rather than on consumption. And so the port is seen, within that context, as kind of the city's backyard, the entire waterfront. It's the price of prosperity. And people aren't thinking about, you know, ecological concerns and they're not thinking about beautification. I mean, certainly the 1912 plan does have building in recreation and building in some beauty aspects, but to certain other parts of the waterfront. And the eastern waterfront was to be sacrificed for these industrial demands. And they are tying it in with really seeing and thinking about the entire Great Lakes system, and the kind of transportation and industrial development that's happening at a broader scale. So Toronto wants a piece of that. So I would say those things. But I mean, real ongoing risks of typhoid fever, cholera, and the fact that industries really supported each other in these industrial constellations that happen near the mouth of the Don. Where you have, you know, canneries providing the leather to support the factory belts in other industries nearby. So, industry spawned more industry, and certainly rail played a big role in that. Rail brought about other industries needed to produce the iron rails that the rail needed. So industry spawned more industry (J.Bonnell, personal communication, September 16, 2015).

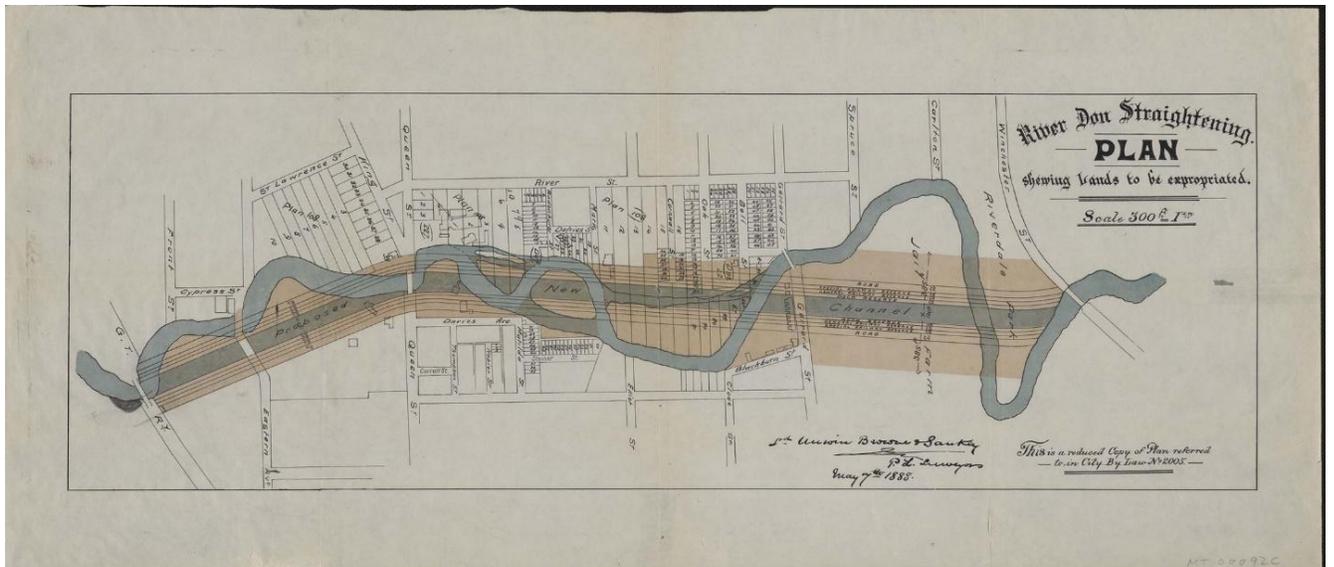


Figure 8: Straightening of the Don River, 1888 (York Space Institutional Repository, 2011)

The Waterfront Plan of 1912

At the beginning of the 20th century, a shift of power began at the mouth of the Don River. The Waterfront Trust, managing the waterfront in conjunction with the municipal government up to this point, was being questioned for how they had managed resources and land use at the waterfront. During this transitional phase, there was a “general distrust of local government’s ability to handle the complexities of a large and rapidly growing industrial, financial, and commercial city” (Desfor, 2011, p. 58). The general consensus was that the port was not living up to its economic potential and that the expansion of rail was beginning to threaten the viability of shipping (Desfor, 2011; Reeves, 1992). Pollution within Ashbridge’s Bay also began to mount, leading to a referendum in 2011 to establish a new Harbour Commission to manage the region. The Toronto Board of Trade was particularly influential in this regard, appealing to the public with advertisements such as the one featured in Figure 9.

**A PLAN SUGGESTED BY
THE TORONTO BOARD OF TRADE
FOR THE DEVELOPMENT OF
ASHBRIDGE BAY**
*Showing provisions for the
entry of all Railways
under City Control*

THE
BOARD
OF
TRADE
OF
THE
CITY
OF
TORONTO

F. G. MORLEY
Secretary

ARE YOU IN FAVOR OF THE CONTROL
AND DEVELOPMENT OF ASHBRIDGE'S BAY
AND THE WATERFRONT IN THE CITY'S
INTEREST BY A COMMISSION HAVING A
MAJORITY OF ITS MEMBERS APPOINTED
BY THE CITY ?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
---	-----------------------------

SOME REASONS WHY YOU SHOULD VOTE

YES

FOR THE HARBOR COMMISSION

On JAN. 2nd, 1911

VOTE FOR THE HARBOR COMMISSION
And develop Toronto's greatest asset.

VOTE FOR THE HARBOR COMMISSION
And the neglected Ashbridge's Bay can be made worth many millions of dollars to Toronto.

VOTE FOR THE HARBOR COMMISSION
And the Harbor will pay for its own development, and regulate freight rates for all time.

VOTE FOR THE HARBOR COMMISSION
And make Toronto's Harbor the finest on the Great Lakes.

VOTE FOR THE HARBOR COMMISSION
And make this City one of the greatest Industrial Centres of the Continent.

VOTE FOR THE HARBOR COMMISSION
An improved Harbor means more work, more wages, cheaper freight, and a Greater Toronto.

VOTE FOR THE HARBOR COMMISSION
And secure a wise, business-like and continuous management for Toronto's Harbor.

VOTE FOR THE HARBOR COMMISSION
The present Harbor Board unanimously approve of this Commission.

VOTE FOR THE HARBOR COMMISSION
And help yourself and your city.

Figure 9: Toronto Board of Trade's campaign for a Harbour Commission and the infilling of Ashbridge's Bay (Reeves, 1992, p.66)

The promise of economic opportunity guided public opinion and spurred the eventual creation of the Toronto Harbour Commission (Bonnell, 2014). The rise of the Commission during this time was seen as a “corrective to a perceived imbalance between public and private interests” (Reeves, 1992, p.99). Sweeping industrial changes which were intended to make Toronto’s Harbor the “finest” on the Great Lakes and one of the “greatest industrial centres of the continent” (Reeves, 1992, p.66). The Toronto Harbour Commissioners Act was passed in 1911 (Reeves, 1992). This resulted in a sweeping breadth of powers for the Commission, including the power to manage and plan waterfront resources in the region encompassing the mouth of the Don. The Commission was “given an unprecedented degree of institutional authority, combining powers usually provided by a state agency with those of a private corporate body” (Desfor, 2011, p. 59). The commission model to manage Toronto’s waterfront was likened to Montreal’s, free from state intervention (Desfor, 2011). The change in power “essentially gave a select group of individuals the jurisdiction to “acquire, expropriate, hold, sell, lease, and otherwise dispose of such real estate, building or other property as it may deem necessary or desirable for the development, improvement, maintenance and protection of the harbour” (Reeves, 1992, p.65). The economic focus of the plan was its rationale, as “the greatest emphasis was placed on the industrial sector, rather than on harbour work, shore protection, or park development. Not surprisingly, Ashbridge’s Bay (Which was to be called the “Toronto Harbour Industrial District” or the “Eastern Harbour Terminals”) constituted the plan’s focal point and, in fact, its justification” (Reeves, 1992, p.70).

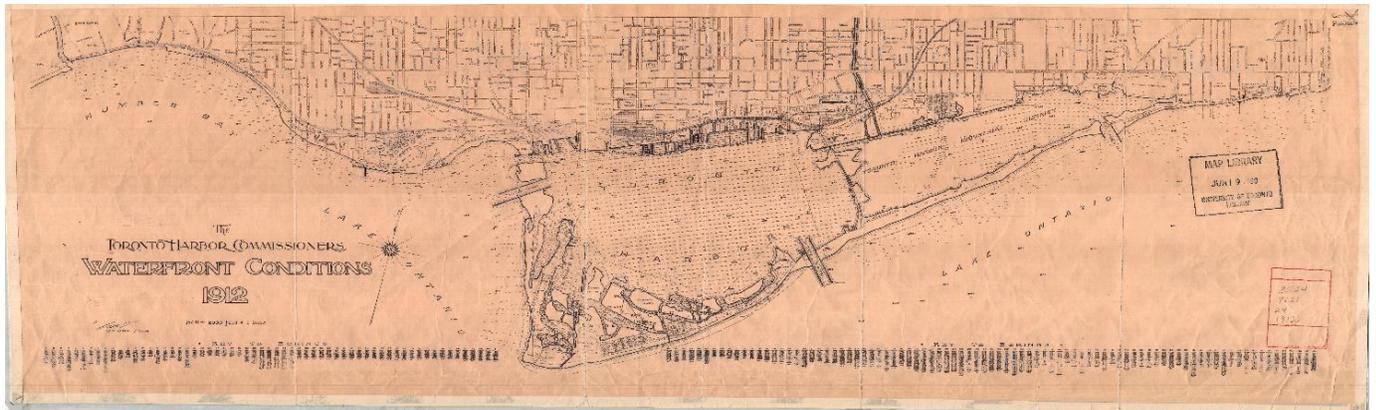


Figure 10: Waterfront conditions of 1912. These conditions reflect the state of the Don River mouth just before the Waterfront Plan of 1912 began to shape the landscape. Ashbridge's Bay is already denoted as "Toronto Harbor Industrial District" at the mouth of the Don River (University of Toronto Map and Data Libraries, 2015).

The economic potential of the region suddenly superseded all other associated benefits:

“Industrial improvement of Ashbridge’s Bay was no less important than its sanitary improvement (E.H. Keating); aesthetic improvements were not made to be for their intrinsic value, but to advertise Toronto and impress potential investors (the OAA); and effective waterfront planning and administration would help advance the region’s business prospects (the Board of Trade) [Reeves, 1992, p.100]. This excerpt further emphasizes the reliance on the lower Don’s landscape as a tool to attract investment. The mentality to revitalize the landscape at the Don’s mouth to cater to economic interests continues to be prevalent today and will be explored further in chapters 4 and 5. The beginning of immense landscape change started with the ‘reclamation’ of Ashbridge’s Bay, which was the main agenda of the Waterfront Plan of 1912. The bay, a 1300-acre marshland at the mouth of the Don, was first recommended to be infilled in 1835 due to economic and health concerns (Reeves, 1992). The reclamation of Ashbridge’s Bay was the largest project of its type in Canada. Influential as a grandiose waterfront planning initiative, the infilling of the marshes sparked public excitement due to the potential of economic prosperity. Daniel Burnham, the modernist planner-architect, is well recognized for his quote “Make no little plans; they have no magic to stir men’s blood” before

unveiling his 1909 Plan for Chicago (Reeves, 1992, p.1). Burnham's development philosophy spread to other cities across North America, and had particular influence on the Toronto Harbour Commission's work on the Waterfront Plan of 1912 (Reeves, 1992). Burnham has been criticized for his belief in social progress through vision, knowledge, and control over nature (Beauregard, 1989). The element of grandness in the creation of Toronto's industrial waterfront is highlighted by Bonnell:

I think there's a certain hubris and bigness that's really characteristic of these kind of development initiatives from the late 19th century right through the 20th century. You see it especially in the middle of the 20th century, where something that a historian might call high modernism which was reigning large, in that people thought big, and they really had a huge faith in technology to be able to transform environments to human ends. And I think, you can think about the St. Lawrence Seaway as something that fits that high-modernist 1950's 'think big or go home' kind of context. And I think we can see certainly the filling of Ashbridge's Bay marsh and the development of the Port Lands – that's one of the largest megaprojects in the history of the region right? And the size and scale of that project was immense in that they had to actually create new equipment, new dredging equipment, to do that project. And it's attracted workers from, in some cases, around the world to come and help work on that project but certainly from a much wider region, from the U.S. and other places. So, huge. And I think people really thought that they could just think about this as a tabula rasa, they could create an entirely new thing and drop it in on this landscape without a lot of problems. I think as time would tell, part of the problem is, they're planning on such a large scale but they're not assuming that larger conditions are going to change and I think this is what we see in the wider Great

Lakes is that the emphasis shifts away from shipping as the core place for economic prosperity and moves to rail and then moves to freight trucks. So, from shipping to trucking, all of that investment and creating this industrial Port Lands, it's for a very short lived time that it actually thrives. If it's not even finished until the 20's it's already starting to decline by the 30's. They thought really big, but what they didn't anticipate was that broader conditions would change, and I think that there was definite such confidence in both ongoing growth and prosperity that we just continued to move in a linear way, and not really thinking about 'let's move slow, let's move small' (J.Bonnell, personal communication, September 16, 2015).

Bonnell elaborates further on this topic, in a discussion of where the Toronto Harbour Commission allocated their funds to solve environmental problems at the mouth of the Don:

I think you have to whip up a lot of excitement to get commitment to projects of this size. One of the things people always say about the Don, and it certainly came up in my research, is why on earth didn't they spend the money on a trunk sewer? Instead of straightening this river, and filling in the marsh. They always said, straightening the river is going to help with the pollution problem because it's going to flush stuff out in to the lake. It's going to help with the flooding problem because it's going to flush stuff out in to the lake by deepening and straightening this channel in the 1880's. Certainly other places, at that time, were putting in trunk sewers. And instead, Toronto would continue to go back to older models. And the trunk sewer would have solved the pollution problem, it would have certainly come a long way to solving their residential sewage problem, and the industrial wastes, that was another issue. It's hard to get people excited about a trunk sewer. They like the idea of taming nature to create prosperity and

I think the level of investment needed for the sewage treatment infrastructure is hard to get not only politicians, but residents, to support, because all of this had to go through referendum. So it's not really until the metro Toronto takes control in the early 1950's that much of that sewage infrastructure that's been languishing for decades finally gets built because Metro can make big decisions and can borrow a lot of money more so than previous municipalities could. Its political setups that allow for these moments when governments can make really big decisions and get sweeping changes done (J. Bonnell, personal communication, September 16, 2015).

This quotation exemplifies how public consensus was in favour of taming the natural systems at the mouth of the Don, and how controlling nature as part of grand waterfront planning initiatives was a way to draw necessary public interest and support.

While eight different plans for the reclamation of Ashbridge's Bay had been put forth between 1886 and 1909, the vision was not realized until the formation of the Waterfront Plan of 1912 (Reeves, 1992). While public health concerns played a role as part of the plan's rationale, they were "clearly subservient to those of business" (Reeves, 1992, p.14). The lake-filling of Ashbridge's Bay inspired the direction for the circulation of capital in Toronto during this time. As quoted in the Globe newspaper in 1907: "Toronto is to become the Pittsburgh of Canada. The heretofore despised region known as 'The Marsh' is to be the site of one of the great iron and steel plants in America, the headquarters of the manufacturing industries that will supply the cars and the equipment for the Canadian Northern, and the pig iron for the foundries and factories of the city. Toronto has been a city of light manufacturing up till the present time. It will soon be the biggest producer in Ontario of the basic material of twentieth century prosperity – iron and steel" (Desfor, 2011, p. 65). Regional economic and industrial competition

was influential in shaping the Waterfront Plan of 1912, as broader competition within the Great Lakes shipping network spurred the Toronto Harbour Commission's industrial motivations (Desfor, 2011). The Toronto Harbour Commission was in power from 1911 to 1999, and created over 800 hectares of new waterfront, spanning twenty kilometers in shoreline (Desfor, 2011). As a result, there is "no doubt that the establishment of the Toronto Harbour Commission was a defining moment in the history of Toronto's waterfront" (Desfor, 2011, p. 72). The influence of the Toronto Harbour Commission's governance on shaping the mouth of the Don, in particular, cannot be understated. The Commission was supported by business, the general public, and legislation. In retrospect, some believe that the Commission: "Should never have been created as a harbour commission or some such name. That was a misnomer. It should have been called an industrial and commercial development commission or some such name. No sane man would ever have spent \$25,000,000, which was the amount of the original bond issue, on Toronto's ambition to be a lake port" (Reeves, 1992, p. 96).

The Waterfront Plan of 1912, which was the only comprehensive plan guiding development at the waterfront between the Humber River and Victoria Park Avenue from 1912-1967, turned the swampy marsh conditions and "wasted wetlands" into an industrial parcel of land known as the Eastern Harbour Terminals (Desfor, 2011, p. 47,75). The marshes at the mouth of the Don were filled in to "secure the sanitary condition" of the Don by 1930, and this was heavily influenced by the Provincial Board of Health due to the increasing waste flowing through the Don (Bonnell, 2014; Hough, 1995). The three pillars of land use for Toronto's port in the Waterfront Plan of 1912 included commercial and dock development, recreational space, and industrial development concentrated at the river's mouth (Toronto Harbour Commission, 1912). The environmental and intrinsic value of the marshes at the mouth of the Don River was

negligible from a city building perspective, and marshes were viewed as useless land since they held no direct economic value (Bonnell, 2014; Desfor, 2011). Within the Waterfront Plan of 1912, “the logic of development was based on a speculative strategy: a major industrial district for manufacturing and warehousing firms would be constructed; firms located on this land would generate a need for more shipping and an expanded harbour; and increased shipping tolls and land rents would repay the expense of constructing the industrial land” (Desfor, 2011, p.54). The plan was “sweeping in its breadth and scope, calling for reclamation across the waterfront between Toronto’s boundaries to create land for industrial, commercial, and recreational uses” (Desfor, 2011, p. 45). The Plan’s “walking on water” strategy drastically changed the landscape at the mouth of the Don River, involving the production of over 500 hectares of solid land and deep water around the mouth of the Don (Desfor, 2011, p. 50). The Eastern Harbour Terminals (now known as the Port Lands) industrial district at the mouth of the Don was the centrepiece of the plan. While only a section of the Don was straightened until 1909, the channelized river transitioned into a right angle at the end of the mouth, resulting in the completion of the Keating Channel, which was finalized in 1915 (Desfor, 2011). The diversion of the Don to create the Keating Channel also provided frontage for additional ship building capacity (Desfor, 2011). This forced the Don River south-west into an unnatural right angle turn in to Toronto Bay, as the city “turned its back to the river” (Hough, 1995, p. 56).

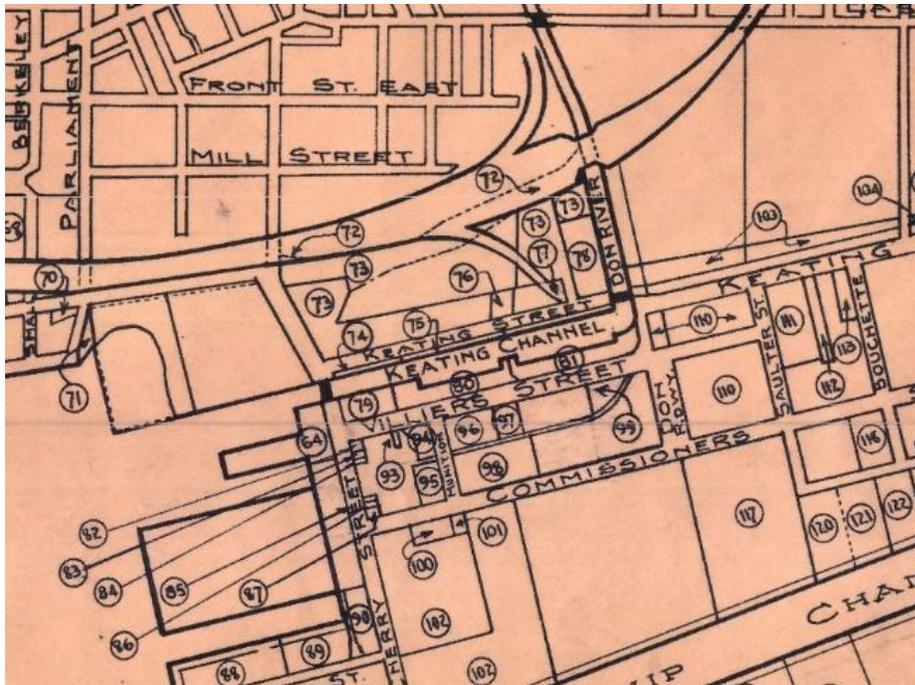


Figure 11: The Don River as it transitions in to the Keating Channel, 1937 (University of Toronto Map and Data Libraries, 2015)

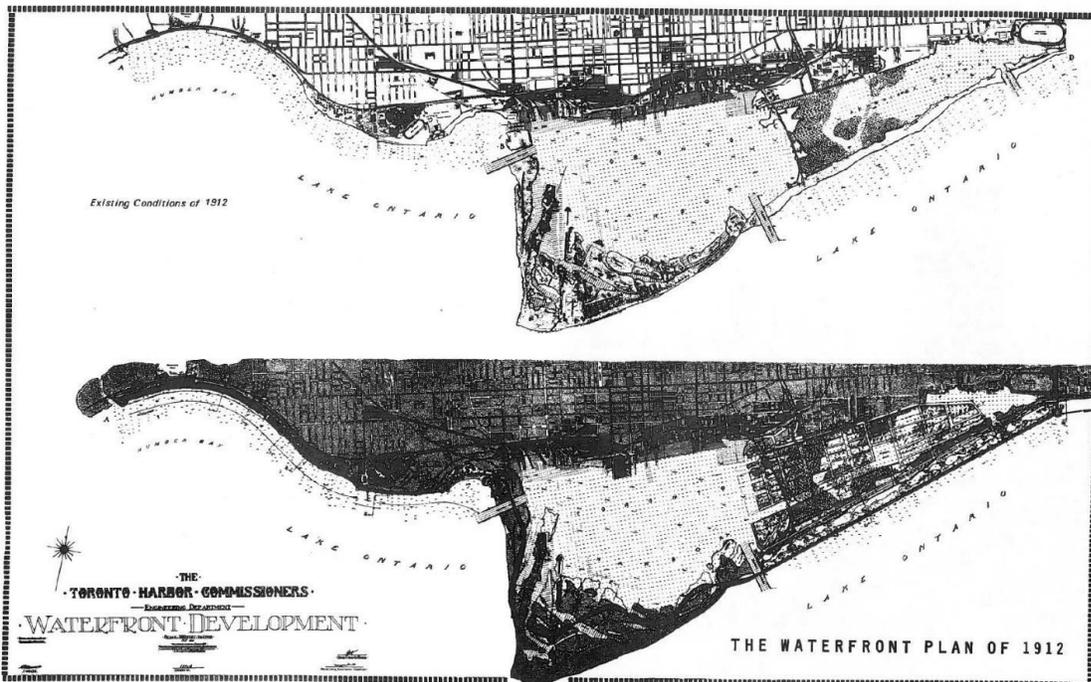


Figure 12: Landscape change at the Don River mouth, as proposed by the Waterfront Plan of 1912 (Toronto Harbour Commission, 1912)

A Big Dredging Proposition : The Eastern section, with the exception of the part lying east of Woodbine Avenue, will be filled to an elevation of eight feet above mean water level, and to do this work will require 27,000,000 cubic yards of material. This can all be secured from the bed of the inner harbor and from the bottom of the lake outside the sea wall. Two large hydraulic dredges will be employed in pumping this filling into the district as the wall is constructed. This will be the largest dredge work ever undertaken in Canada, and the dredges employed will be amongst the most powerful that the American Continent has so far known. The machinery will be of 2,000 H. P. of the latest improved type, and each dredge will be capable of digging either sand or clay from a depth of 50 feet, and pumping it for a distance of 4,000 feet through lines of pipe, from which it will be distributed to the area to be filled. The dredges will be of steel, of regular ocean-going steamship type, will be propelled by twin screws and will be controlled by steam steering gear.

The Industrial area proper will be north of a line drawn east and west and 1,000 feet back from the breakwater. This line will be marked by a street 66 feet in width, which will divide the Industrial District from the park area to the south. Immediately south of this street will be a tier of lots 100 feet in depth and extending for over three miles along the north face of the park area, which lots will be reserved as locations for summer homes. In front of the cottage reservations will be a park district and a bathing beach fronting on a lagoon patterned after the natural lagoons in the interior of the Island. This lagoon will be crossed by numerous foot bridges in order to give the public free access to the park lands, boulevard driveway and promenade, which will be constructed immediately behind the breakwater. The driveway will be fifty feet in width, and in addition there will be a bridle path, concrete walks and boulevard areas to make up a total width of 200 feet.

Figure 13: Dredging proposition in the creation of the Port Lands (Toronto Harbour Commission, 1912). The scale and grandness of the project is identified by the language.

The Eastern Harbour Terminals continued to develop and adapt to changing industrial demands throughout the 20th century. Canada played a role in providing ammunitions in World War 1, and shipbuilding became a major economic driver in the newly created industrial region at Toronto's river mouth (Desfor, 2011). While revisions to the Waterfront Plan of 1912 occurred over several years following its adoption, much of the ship building impetus for the Port Lands had subsided after World War 1 (Reeves, 1992). Ship building and the demand for waterfront industry was drastically reduced in 1921, and industrial development had peaked by 1940 (Desfor, 2011). Shipping access travelling north along the river in to the city did not materialize (Reeves, 1992).

Ecological Transitions from 1940-1967: The Rise of the Conservation Authority's Role in Managing Urban Ecology

While the landscape at the river's mouth has not been modified substantially since the Waterfront Plan of 1912, significant changes have occurred in terms of how ecological resources are managed, particularly where they intertwine with urban uses. In response to increased development on natural landscapes in the 1940's, the Conservation Authorities Act was passed in 1946. The Don Valley Conservation Authority (DVCA) was one of four conservation authorities in Toronto's jurisdiction, responsible for local flooding concerns and reforestation initiatives in the Don Watershed (Toronto and Region Conservation Authority, 2010; Toronto and Region Conservation Authority, 2015). In 1950, the DVCA released the Don Valley Conservation Report. Including the river mouth as part of the entire Don watershed, this was one of the first times that Toronto's ecological health had been assessed in a regional manner. With prioritization on the importance of agricultural production, the rationale for land use surveys was to "adjust land use and management to the capabilities of the soil" (Don Valley Conservation Authority, 1950, p. 30). Land uses throughout the document are commonly outlined as urban, recreational, or agricultural in the city of Toronto (Don Valley Conservation Authority, 1950). This type of analysis left little room for planning recommendations that enhanced or improved natural spaces. The land use recommendations tended to be one-dimensional in function, such that parks were to serve a singular recreational purpose. This remained separate from recommendations that existing wildlife corridors were to be maintained, which were also separate from recommendations that discouraged the polluting of water bodies (Don Valley Conservation Authority, 1950). This differs greatly from the multifunctional natural space recommendations in the Don Mouth Naturalization Plan, which are to be explained in further

detail in Chapter 5. Ecological understanding at this time was contextual to people's lived experiences, and planning for natural systems in cities followed accordingly. For example, floods were prepared for by analysis of spring melt and annual flow patterns, as opposed to accommodating the hypothetical fallout of less frequent, greater storms (Don Valley Conservation Report, 1950). Just as the economic conditions planned for via the Waterfront Plan of 1912 did not assume economic conditions would change, this type of planning did not assume that broader environmental conditions had the potential to fluctuate. This lack of flexibility would be questioned a few years later, as environmental management in the city changed drastically due to one particular storm event.

On October 15-16, 1954, Hurricane Hazel came to the Toronto area, impacting local infrastructure and settlements across the city as 285 millimetres of rain fell in 48 hours. 81 people were killed in the events, and 1800 people were left homeless (Desfor, 2011, Toronto and Region Conservation Authority, 2010). At the time, it was the largest flood event ever recorded in Toronto. Flows were four times higher than ever recorded in the Humber River, as saturated soil pushed 90% of rainwater into the ravines (Toronto and Region Conservation Authority, 2010). While the majority of damage occurred on the Humber River, which lies approximately twelve kilometres west of the Don River, destruction occurred to infrastructure such as bridges, homes, parks, and public utilities. Loss of life and massive economic damages ensued, estimated at 25 billion in 1954 dollars (Toronto and Region Conservation Authority, 2010). The ramifications of this storm caused governments and conservation authorities to think differently about environmental management in the city. The fallout from this storm brought forward a new understanding of biophysical processes, including the importance of valleys as drainage channels for flood waters (Toronto and Region Conservation Authority, 2015). In 1957, the four

Toronto-based conservation authorities amalgamated. With this change, the Don Valley Conservation Authority became part of the broader Metropolitan Toronto and Region Conservation Authority (MTRCA, now known as the Toronto and Region Conservation Authority), which allowed greater coordination between regions in the city. The impact of Hurricane Hazel caused several changes in environmental management throughout Ontario. The provincial government amended the 1946 Conservation Authority Act to enable a conservation authority the ability to acquire lands for recreation or conservation purposes (Toronto and Region Conservation Authority, 2010). The MTRCA finalized the Plan for Flood Control and Water Conservation in 1959, with the first stage of this plan being the Lands Acquisition Program, beginning in 1960. As the conservation authority worked to acquire land in vulnerable flood-prone zones, the Province of Ontario continued to develop floodplain policies to remove the hazards of flooding from future developments and land uses (Toronto and Region Conservation Authority, 2015). It was these policy changes that resulted in the restrictions on land use currently in place at the mouth of the Don River. As flood regulation policy continues to restrict development on what is potentially valuable land at the river's mouth, there is a stronger impetus to naturalize the lands and thus unlock potential development due to the improved flood protection. This concept will be explored further in chapters 3, 4, and 5. Because of Hurricane Hazel and the resulting policy changes that prevented development in the valley systems and flood vulnerable areas, the city retained substantial green space along the bisecting river valley systems. The network of green river corridors that was protected from these policies served to connect the lake with river systems travelling further north out of the Greater Toronto Area. While the initial implementation of the 1956 amendment to the Conservation Authorities Act was largely put forward to protect life and property, this policy

contributed to the growth of the Conservation Authority's mandate of conserving biological assets in urban environments (Toronto and Region Conservation Authority, 2010).

Waterfront Plan of 1967

The Waterfront Plan of 1967 was created as an effort to increase economic activity at the waterfront, and natural systems in the city were seen as areas to be exploited and displayed, appealing specifically to the aesthetic quality of the city. This aesthetic element of nature represents the valuation of non-functional urban ecology that Michael Hough was opposed to (Hough, 1995). While the Eastern Harbour Terminals were to maintain an industrial function, nearby waterfront features in close proximity to the mouth of the Don were to be showcased to the public. Instead of valuing the ecological function of natural systems around the mouth of the Don through design, isolated features of the natural environment were established to improve the aesthetics of the waterfront. The element of grandness in this plan resembles the modernist visions of the original Waterfront Plan of 1912, and these visions describe spectacular plans that further control and dominate natural systems.

By 1967, waterfront resources were managed through a variety of public stakeholders. Due to the demise of the shipbuilding industry, a new direction for the waterfront was needed since “the time had clearly arrived for another comprehensive look at the waterfront”, as determined by citizen groups and multiple forms of government (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.1). Due to these concerns, the City of Toronto formed a special Waterfront Committee.

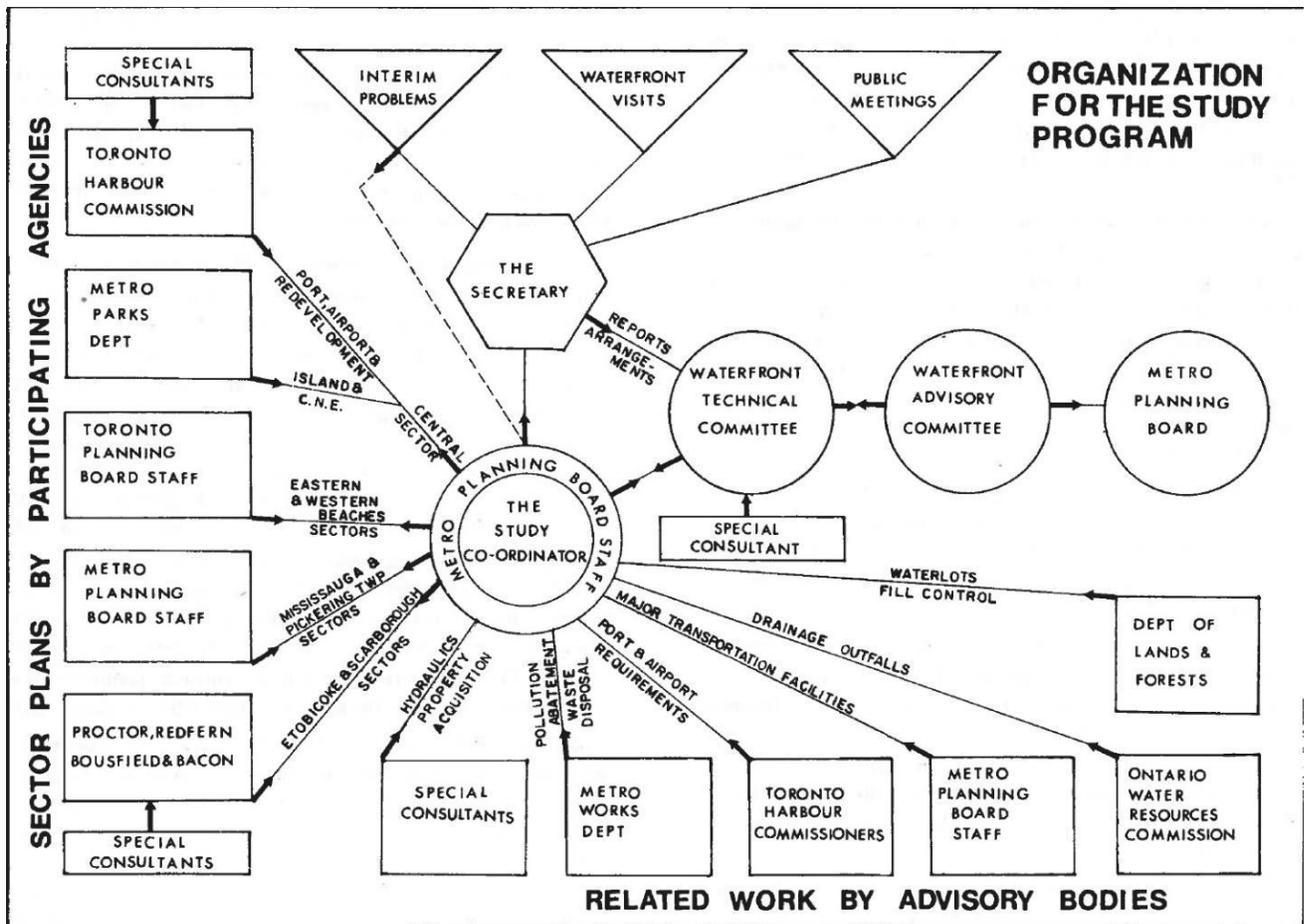


Figure 14: Policy contributors to the 1967 Waterfront Plan (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.2).

The requirements for a new waterfront plan rose from the need to remediate disjointed development patterns along the waterfront and improve recreational and economic opportunities (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967). Despite a recognition at this time of the disconnect between natural systems and the city, access to the waterfront was recommended to improve the synthetic aspects of city living: “In an era of increasing attention to the aesthetic aspects of urban life, the degree of separation between the lake and the city is a cause for concern and regret” (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.1). Under this new direction, waterfront planning in

Toronto continued to maintain many of the same principles underlying the Waterfront Plan of 1912, particularly economic potential and regional competition:

The second reason for recommending a comprehensive plan for the waterfront is one of long term economics. A healthy metropolitan area is one which can compete with other areas. With growing prosperity it will no longer be enough to have industry and commerce, to eliminate bad housing conditions, to improve traffic and do all the other things which the public demands as normal functions of public activity. To grow and maintain its position, a metropolitan area must not only *be* a healthy place but it must be *seen* to be a healthy and attractive place. A town which has by nature certain gifts should exploit and display them to advantage. Toronto has the ravines, the river valleys and above all the lake. Not to use these gifts is wasteful, to spoil them is extravagant (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.2).

Not only does this excerpt demonstrate the economic motivations behind this plan, it also demonstrates how natural systems in the city were to be exploited and displayed, to appeal to the aesthetic quality of the city.

The theme of grandness in waterfront planning continued in the Waterfront Plan of 1967. In the General Aims section of the document, it was determined that “to be merely acceptable is not enough. The plan must include dramatic proposals, for it is these which fire the imagination, and stimulate the drive to proceed” (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.6). This type of ideology resembles the grandeur of the modernist planning vision advocated for by Daniel Burnham, the same man who influenced the scope and potential of the Waterfront Plan of 1912. This rational comprehensive planning mentality resulted in further control and dominance over natural resources surrounding the

mouth of the Don River. Lake Ontario is noted for its usefulness as a resource for municipal water sources and treatment of wastes, its location for industrial purposes, and as a “convenient repository for fill”, while also seen as a threat in other locations (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.6). The mentality to control the mouth of the Don through infilling of the Ashbridge’s Bay as part of the goals from the 1912 plan continued to be prevalent in the 1967 plan, as “massive land filling becomes possible” for other development projects (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.10). Industrial potential was still the primary motivation for development: “The new hook of land is already partially complete, and by 1970 will enclose a body of water three quarters the size of Toronto bay, and provide ample space for flexibility in the design and redevelopment of new port facilities for many years to come” (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.10). Thus, natural systems were still seen for their economic and aesthetic value as part of this plan. Part of the rationale to create new land along the central waterfront was influenced by the potential to host the Olympic Games. The bid to host this international event encouraged the contributors of the plan to design a waterfront that excites the public and is aesthetically pleasing (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967). This theme would be relevant again towards the end of the 20th century, as noted in Chapter 3. The regional significance of Toronto’s port in relation to the Great Lakes is also obvious in the management of the waterfront, as comparisons to New York, Cleveland, Milwaukee, and Chicago were contrasted to Toronto’s waterfront governance in preparation of this plan. For example, “the commissioners are convinced that with the carrying out of the work projected by them the Harbour of Toronto will be second to none on the Great Lakes, and will be the equal of almost any harbor on either the

Atlantic or Pacific coasts, that proper facilities will have been provided for the encouragement of water borne traffic, and that Toronto will possess a lakefront parkway and boulevard drive which will not be surpassed by anything on the American Continent” (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.4). Not only did this element of competition spur further industrial development to the detriment of natural resources near the river mouth, it also contributed to the idea that natural resources are areas to be showcased and exploited.

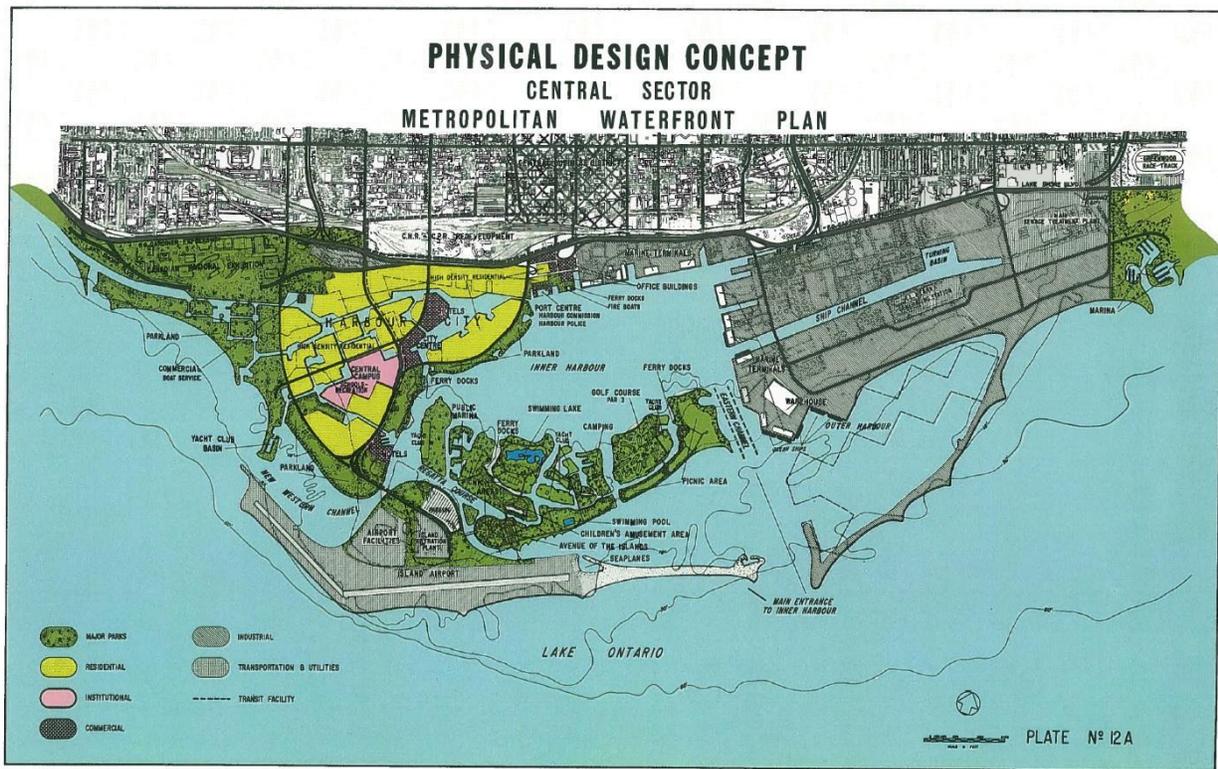


Figure 15: The industrial designation of the Port Lands (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p.32).

Urban parks were valued for their recreational value and their accessibility by vehicle, with no mention of environmental sustainability as a rationale for location and design. The only environmental concerns detailed near the mouth of the Don River pertained to erosion (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967). Channelization and

the control of nature was a recurring design element within the 1967 Waterfront Plan. In regards to hydrology, the central waterfront had a principal aim to “take advantage of the waterfront setting by creating a network of small channels throughout the whole complex. The main waterway, which is one of the general objectives of the waterfront plan, should be continued along the present shoreline. By so doing, expensive extensions to existing storm drainage outfalls will be avoided” (The Metropolitan Toronto Planning Board and the Metropolitan Council, 1967, p. 32).

By the early 1980’s, the TRCA determined that the lower Don River floodplain was the highest priority flood prone area within the TRCA’s jurisdiction (Toronto and Region Conservation Authority, 2015). This designation, as described in Chapter 3, was one of the driving factors that contributed to naturalization efforts at the river’s mouth.

Chapter Conclusion

Natural systems at the mouth of the Don River were altered drastically in the 20th century. Failure to understand the underlying ecology of the region related to sedimentation, flushing capacity, and flood risk led to planning efforts that sought to control nature. The change in governance as a result of the 1911 Referendum allowed the Toronto Harbour Commission to make sweeping changes to the landscape, motivated by economic development. This began with the infilling of the marshes of Ashbridge’s Bay to create the industrial region of the Eastern Harbour Terminals. Natural systems were conceived as a health risk, controlled and engineered for productive uses to remedy its former status as a place of disarray. Through economic revitalization and industrialization, the mouth of the river was utilized for its production value and its ecological value was neglected. The spectacular visions for the waterfront, heavily influenced by the visions of modernist planning principles, were created to excite the public and

remain competitive within the Great Lakes shipping network, much to the detriment of natural systems. As the 1967 Plan replaced the Waterfront Plan of 1912, nature was seen as a place to showcase and exploit. The landscape changes as a result of the Waterfront Plan of 1912 and 1967 left a legacy of industrial control over natural systems, a legacy that still exists today and must be accommodated as part of the Don Mouth Naturalization Plan. However, as industrial demands changed and environmental awareness of flood control became more prevalent as a result of Hurricane Hazel, the way nature was conceived and managed at the mouth of the Don River began to shift.

Chapter 3: Ecological Movement at the Turn of the 21st Century: Towards the Ecosystem Approach

Chapter Introduction

As the Toronto Harbour Commission gradually lost decision-making power, an environmental movement began with the influence of citizen task forces and the collaboration of municipal, provincial, and federal government. The Royal Commission on the Future of the Toronto Waterfront and the Task Force to Bring Back the Don became particularly influential in advocating for naturalization at the mouth of the Don. The driving force behind the Task Force's vision was the presence of Canadian architect and planner Michael Hough, who influenced a variety of stakeholders to value the landscape for its ecological potential. Economic influences also impacted the formation of a new model for waterfront revitalization and flood protection in the West Don Lands, which would soon become applicable to the remainder of the Lower Don Lands. This resulted in the transition of the site as a landscape of industrialization to a site with revitalization potential through naturalization.

1990's: The Environmental Movement Begins

The Task Force to Bring Back the Don was initiated in 1989, and formalized and supported by the City of Toronto council in 1990. Beginning as an "informal organization of citizens and interest groups that represent various public and private constituencies with interests in the Don", the Task Force took on a substantial role in shaping the landscape at the mouth of

the Don River (The Task Force to Bring Back the Don, 1991, Foreword). Through cooperation with various levels of government, the Task Force's main goal was committed to "promoting clean water, restoring open space, and improving public access to the valley" (The Task Force to Bring Back the Don, 1991, Foreword). As a citizen task force functioning both within city council and as a public stakeholder group, it sought to re-establish ecological diversity, and integrate cultural history with human and non-human values (Hough, 1995). The Task Force also sought to develop recreational and educational strategies that would reflect the essential functions of the river valley, and re-connect the river to the lake (Hough, 1995, p.51). As stated by Hough, the goals of the Task Force to Bring Back the Don required "an understanding of the valley as a whole, and the interconnectedness of its parts as a 'natural' and 'human' system" (Hough, 1995, p. 51). The realization of this goal as determined by the Task Force was to recreate a naturalized "delta marsh" at the mouth of the Don (The Task Force to Bring Back the Don, 1991, p. 3). This early vision was intended to "return the river to an approximation of its original form" (Task Force to Bring Back the Don, 1991, p.3). This is an important distinction, as the vision for a naturalized mouth was altered significantly over time to accommodate the urban realities of land use in the Port Lands. The original vision, as seen in Figure 16, was to recreate a delta and marsh habitat from accumulated sediment where the river meets the lake at the mouth (Hough, 1995). The progressive vision to restore natural processes at the mouth of the Don was a new way of conceptualizing the landscape. Connecting the river to the mouth as an approximation of pre-European settlement was a bold strategy that looked at urban land use and natural systems as co-dependent forces.

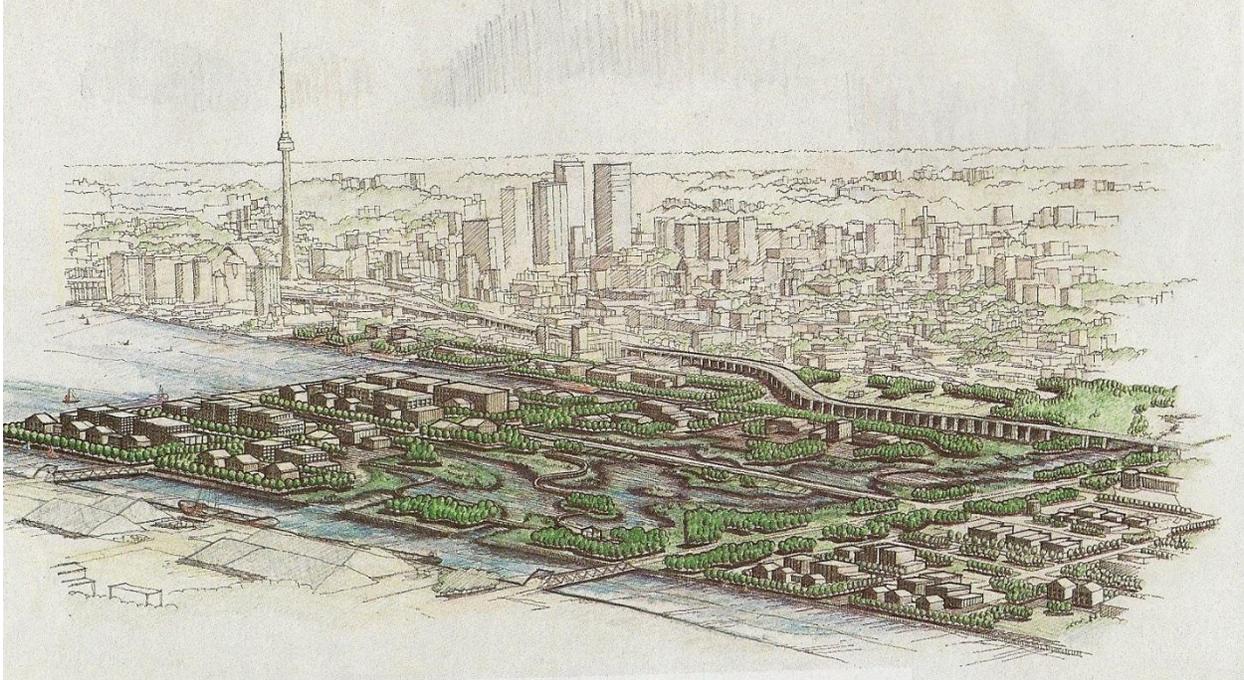


Figure 16: Port Marsh/Don Delta Strategy (The Task Force to Bring Back the Don, 1991, p.4-5). The preferred strategy by the Task Force to re-naturalize the river mouth was this delta-based approach.

The visionary for much of the work of the Task Force was Canadian architect and landscape planner Michael Hough. He was a key figure in establishing this new vision for an urban-nature system that began at the river's mouth. He thought about the Don River Valley as a connecting system, and was critical of the way planning policy had neglected the landscape in the past: "It was seen as an edge to a wide variety of planning districts, a transportation corridor unprotected by Toronto's Official Plan. It had, therefore, no status as a place in its own right, worthy of its own policies as a river valley. These circumstances, and a complex ownership pattern of public and private lands and often conflicting land uses within and surrounding the lower valley, influenced the long-range strategies for its restoration" (Hough, 1995, p. 62).

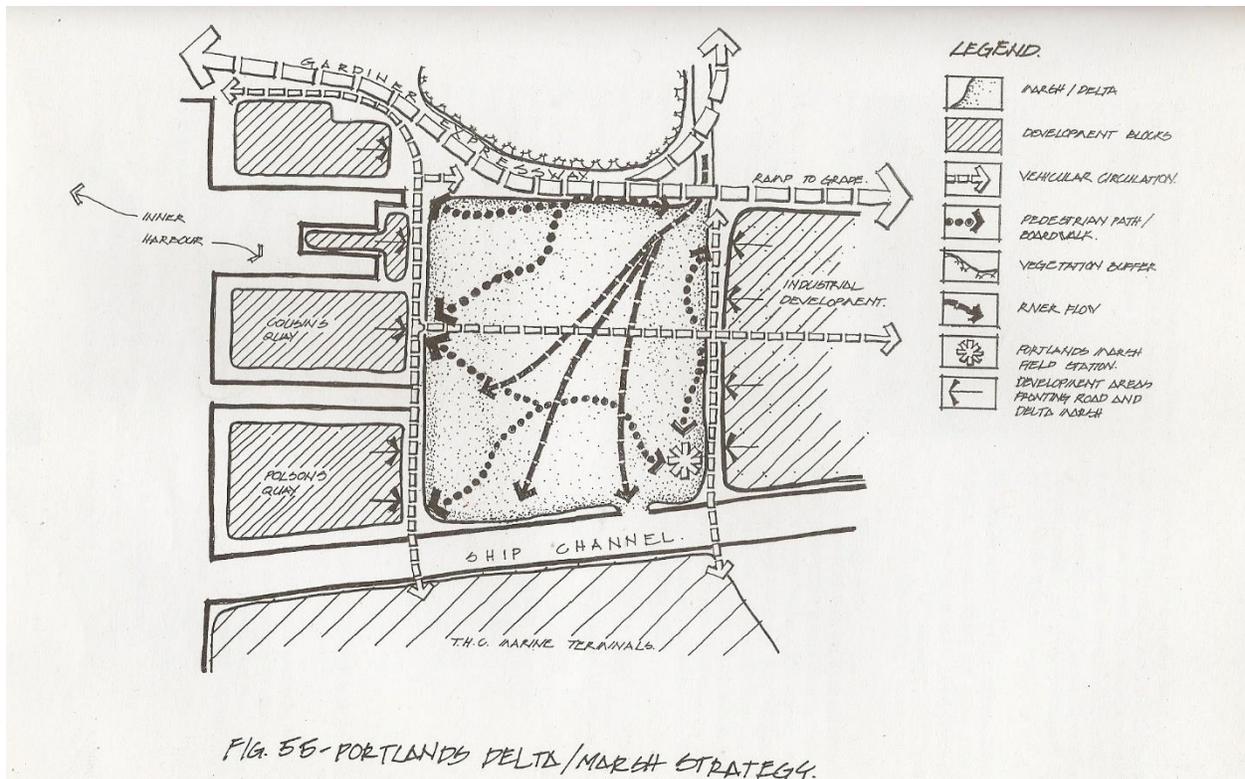


Figure 17: Portlands Delta/Marsh Strategy (*The Task Force to Bring Back the Don*, 1991, p. 67). This design sketched how natural systems such as riparian flows and vegetation networks could interact with port and urban infrastructure at the mouth.

Eha Naylor is the practice lead and director at Dillon Consulting Ltd. She began working at Michael Hough's design firm, Hough Stansbury Woodland Ltd., in the early 1980's. Learning from Hough's principles of urban ecology, Naylor has worked as a consultant on a variety of planning projects near Toronto's Don River mouth during her career. In her initial interactions with Hough, she discussed how the Don River mouth presented an opportunity for Michael's theoretical work to be manifested into a practical project of urban ecology:

So it was really ahead of the work, it was earlier than the work he did for the Don, but I think what happened was his research when he was in England and in Europe really started to think about how some of those concepts of urban ecology which the Dutch, the Netherlands were way ahead of, and even I think urban vacant land in Britain had been

really starting to evolve into ecological thinking so he was looking at ways to apply that in Canada. And he was looking really for applied research projects on urban ecology and naturalization and I think it was just the really fortuitous collision of the City of Toronto needing to look at the Don because of the flooding issues and conservation authorities concerned about water quality and his research that he's been doing, looking at urban form and natural processes, and there was a nice kind of layering of those – the time, the ideas he was thinking about, and that sort of became the foundation for the work that he did on the lower Don, or on the whole Don watershed (E. Naylor, personal communication, October 5, 2015).

While there was a pre-existing movement towards environmentalism in Toronto during this time from public stakeholders at the mouth of the Don, Hough brought many pieces together as a practical culmination of urban ecology implementation:

He brought systems, landscape systems thinking into an urban environment. That was what Michael's real kind of fundamental idea was. And it wasn't how we looked at landscape previously. It had been looked at as an aesthetic. Either an aesthetic landscape in the city or a rural or even a northern situation... it was thinking that bigger systems approach and applying it to an urban context. And that's I think what Michael brought. He made us think about the Don as the whole watershed. And conservation authorities wanted that as well. They were looking at it from a hydraulic perspective. And he brought--he was one of many to do it--but he brought the thinking of 'it's not just' the water and flood issue, it's the whole ecology, the terrestrial, the aquatic, the hydraulic, all has to work together (E. Naylor, personal communication, October 5, 2015).

The aesthetic aspect of the river mouth referred to by Naylor, which was a prominent aspect to be showcased as part of the Waterfront Plan of 1967, was the exact perception of nature in the city that Hough sought to rectify. He intended for people in cities to experience ecological change and natural processes, and interact with the less pristine features of nature. The work by the Task Force was considered extremely influential in taking the naturalization concepts to a municipal agenda at the mouth of the Don. This is discussed by John Wilson, former Chair of the Task Force to Bring Back the Don:

I think what you're speaking to is the fact that we would be at the table, at the early stages where plans are just being sort of flushed out. When you are working in collaboration with city staff, TRCA staff, and politicians, you can make your voice heard very early in the project and kind of direct the whole direction of how the project goes. So with the DMNP for instance, from the very outset, it's been directed towards the idea that this is a vital habitat link. And for the Task Force to Bring Back the Don, it's not just that it's pretty, but it's a critical habitat link connecting, you know, the new features of Tommy Thompson Park, and Ashbridge's Bay Park, up through the city to the Oak Ridges Moraine. As a citizen task force, who are a bunch of environmental types, to be able to get that written right into the outset of the whole thing, and also just being at the table to make sure that the means of nature is always front and centre, you know, it helps to be at the table. It helps to be in the discussions as early as possible. And that's what the Task Force model was good for. And I hope it comes back in a sense because the Task Force to Bring Back the Don has been wound up, and maybe it's time had come. But the idea that, you know, government should be supportive of citizen advisory groups I think is still one that has a lot of life to it and that governments and communities

need to be talking to each other all the time (J. Wilson, personal communication, August 19).

Contrasted with previous modernist planning efforts at the mouth of the Don, the Task Force's collaboration with municipal government was the first time that natural systems were discussed as part of a cooperative process. Hough's importance in this process is echoed by Wilson:

I have to say, it's critical that Michael Hough was there at the outset. He was the guy who had that 'city living in harmony with nature' vision from the beginning. And if it hadn't been for his output at the outset, it could have easily gone off the rails (J. Wilson, personal communication, August 19).

Around the same time as the Task Force to Bring Back the Don was formulated as an advisory group to city council, the management of waterfront resources was beginning to shift in other municipal departments as well. Waterfront planning in Toronto was beginning to adopt a more sustainable focus with the influence of Michael Hough and Toronto Mayor David Crombie's presence in the Royal Commission on the Future of the Toronto Waterfront. This organization, formed in 1989, was established to provide planning direction and guidance to governmental organizations of different levels as to how the waterfront should be developed (Lehrer and Laidley, 2008). In operation for four years, this organization established 80 recommendations, integrating them into an ecosystem-based approach. This was the first time that environmental integration was considered as an important pillar to design and waterfront planning by the City of Toronto. In 1989, the Royal Commission recommended that the Toronto Harbour Commission should serve only port functions, and that control of waterfront resources should be allocated to local authority, amending the Toronto Harbour Commissioners Act that was in place since 1911 (Royal Commission on the Future of the Toronto Waterfront,

1990). The Royal Commission also recommended a complete environmental evaluation of all Toronto Harbour Commission lands, as well as an evaluation of these lands for federal and provincial funding to determine environmental restoration potential. Under the Planning Act (1983), the Bayfront/Port Industrial Area was declared an area of Provincial Interest, with environmental assessment of these lands also supported by the federal and municipal government (Royal Commission on the Future of the Toronto Waterfront, 1990). This was the beginning of official zoning changes to the site at the mouth of the Don River, which had been designated exclusively for industrial uses since the beginning of the 20th century. This change in zoning was the initial step in identifying the Port Lands as an area in need of special planning consideration. One of the most important recommendations by the Royal Commission was the inclusion and recognition of a Don Valley Wildlife Corridor, beginning at the mouth of the Don River and continuing north to Unwin Street (Royal Commission on the Future of the Toronto Waterfront, 1990, p.140). The map in Figure 18 features the proposed allocation of public park lands in the Port Lands, including a park directly south of the Don River. This map identified the connection between different landscapes, as the proposed wildlife corridor was considered an important component of environmental regeneration in the area.

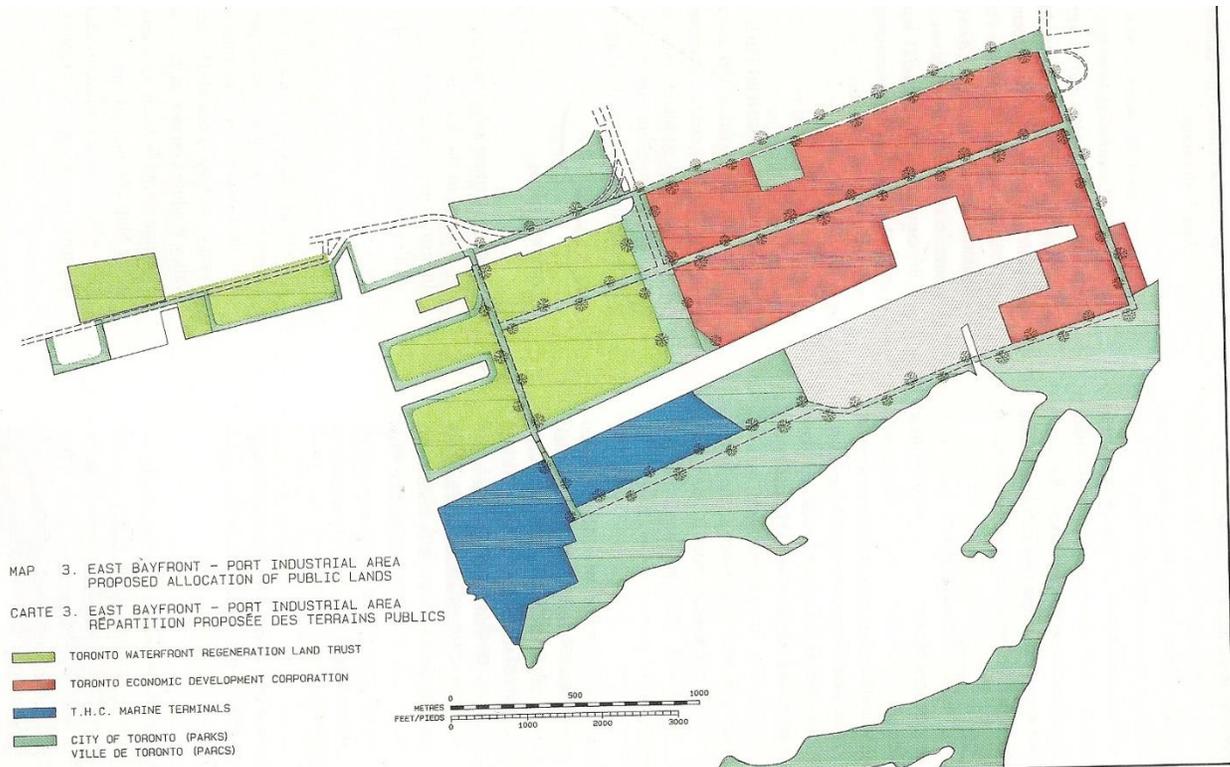


Figure 18: East Bayfront-Port Industrial Area Proposed Allocation of Public Lands (Royal Commission on the Future of the Toronto Waterfront, p.139). Note that a park is proposed directly south of the Don River's mouth.

The Waterfront Regeneration Trust, formed as the Royal Commission's successor, worked for a seven-year public mandate. Incorporating many of the principles outlined by the Royal Commission, the Trust worked to include "green infrastructure on the waterfront to accommodate public access and recreation concerns while simultaneously encouraging investment through improved environmental health and aesthetics" (Lehrer and Laidley, 2008, p. 791). The Waterfront Regeneration Trust was also responsible for submitting a bid to host the 2008 Olympic Games.

The Metropolitan Waterfront Plan, established in 1994, effectively replaced the outdated 1967 Metropolitan Waterfront Plan. Research in preparation of this plan compared studies on the ecological health of the waterfront with ecosystem planning objectives defined by Metropolitan Toronto. This plan highlighted a number of Environmentally Significant Areas

(ESA's) and Areas of National and Scientific Interest (ANSI's), as well as important waterfront features in need of protection (Metropolitan Planning Department, 1994). However, the mouth of the Don was not explicitly discussed as a priority area within this plan. Despite this omission, "the waterfront planning process takes an ecosystem approach that recognizes the dynamic and complex interactions of natural and human communities and processes, from the microscopic to the global" (Metropolitan Planning Department, 1994, p.10). This approach to planning also emphasized environmental impacts at the watershed scale, and recognized the importance of integration and cumulative impacts that occur beyond a specific site (Metropolitan Planning Department, 1994). According to the 1994 Metropolitan Waterfront Plan, barriers to implementing more ecologically responsible designs at the waterfront before this time were related to the pressures of industry and development, as well as fragmented governance through overlapping jurisdictions. One of the main objectives of the 1994 plan was to create and manage a waterfront green space system that "restores, maintains, and enhances ecological integrity" (Metropolitan Waterfront Plan, 1994, p. 15). Plans for the future of the waterfront aspired to create a scenario where the public could reconnect with nature, including the ability to "explore a wetland" (Metropolitan Waterfront Plan, 1994, p. 13). Natural areas were envisioned to be separated from conflicting land uses such as residential. The plan indicated a need to protect biodiversity through naturalization, however the mouth of the Don was not mentioned specifically as a location for such a project. The mouth of the Don was not included as part of the Waterfront Green Space System. However, the Don's mouth was identified as a region in need of planning changes as part of its inclusion as a Special Policy Area (Metropolitan Waterfront Plan, 1994).

The rise of environmentalism in Toronto in the early 1990's was greatly influenced by the impact of the Task Force to Bring Back the Don, of which Michael Hough played a significant role. Through the Task Force, visions of a naturalized waterfront were able to transition from an ecological concept praised by environmentalists and public advocates to a more concrete planning agenda at the municipal level. Through additional environmental awareness raised by the Royal Commission of the Future of Toronto's Waterfront, the landscape at the mouth of the Don was given a special policy area zoning designation, which was an integral first step in achieving naturalization initiatives in the region. While no concrete naturalization plans were put forward during this time period, the ecological function and potential for restoration at the river's mouth was recognized by government and public stakeholders in planning documents for the first time in the waterfront's history.

1999-2010: New Directions for the Waterfront

In 1999, the City of Toronto's waterfront plan *Our Toronto Waterfront! The Wave of the Future* used language of revitalization to portray a vision that was "big enough to embrace the 2008 Summer Olympics" (City of Toronto, 1999, p.3). Using the 2008 Olympics as a catalyst for investment, this plan identified a desire to "continue to enhance the natural resources in the Port Lands" (City of Toronto, 1999, p. 9). This, as it turned out, would have ramifications for future projects at the mouth of the Don, as indicated by John Wilson:

The specifics were to say, they wanted to look at how to accommodate an Olympic bid and an Olympic village, athlete's village, in the West Don Lands, in order to duplicate what had been done in Barcelona. Barcelona had plans for a new waterfront, and then

sort of accommodated the Olympics on the pre-existing plan, and made sure that the Olympics themselves left a legacy of a better waterfront after it was done. So you planned first, then you built the Olympic project, within the framework of the plan. And then at the end of the day, you have the Olympics, and then you had then a new section of the city. This vision was really where West Don Lands Committee made, they pushed that from about 1999 on, and we as part of that did that as well. And so then we got the first part of this re-naturalization of the mouth of the don was the West Don Lands work, the Lower Don West Flood Protection Project which is now virtually complete. And while we didn't win the Olympic bid, the thinking had all been done so that when we had an opportunity to have Pan Am Games bid, we had a robust plan in place that really, was probably one of the biggest factors in us winning the Pan Am Games selection. The initial vision from 1999, they did a design charrette...it was initially, as I say, directed towards what could we do towards an Olympic bid, but when we lost the Olympics, you know, the idea was still there, so that when the Pan Am Games came, all of the sudden, money is flowing, to do an athletes village, and here's the plan already in place, let's do that. And it really has compacted the amount of time it's taken to go from completed environmental project, which is the flood protection, to the build out, of West Don Lands. It took a long time to finish that flood protection, but once it's done the build out has just been almost shocking how fast it's come. (J. Wilson, personal communication, August 19, 2015).

Large scale revitalization efforts intended to capture the public's attention and provide economic prosperity have occurred in every major waterfront plan in Toronto since 1912. As an economic strategy, the Olympics bid was a useful tool to gain funding for revitalization objectives. In the

case of the West Don Lands, flood protection was used as a precursor to development, where the final build-out had the potential to accommodate the Olympic Games, and subsequently the Pan American Games in 2015. The West Don Lands lie just north of the Keating Channel at the mouth of the Don, as seen in Figure 19.

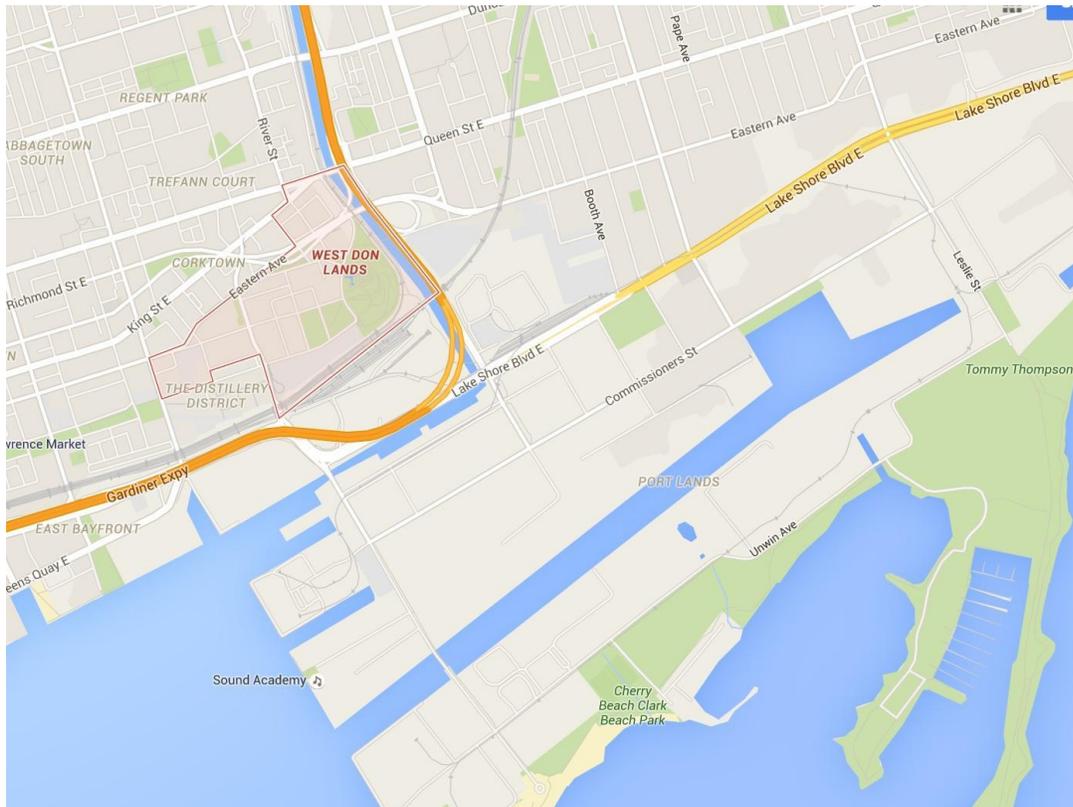


Figure 19: West Don Lands at the mouth of the Don River (Google Maps, 2015)

The concept of flood protection integration as a strategy to accommodate development in the West Don Lands would eventually become the overall landscape design strategy for the entire mouth of the lower Don. This strategy was used in the 1999 waterfront plan, when the intent to naturalize the mouth became clear: “the mouth of the Don River will be restored, solving flooding problems and re-creating marshland; reducing the flood plain will take away development constraints on properties in the Port Lands, East Bayfront and West Don Lands” (City of Toronto, 1999, p.11).

The Toronto Waterfront Revitalization Task Force published a document in 2000 entitled *Our Toronto Waterfront*. The influence of revitalization as a catalyst for the development strategies of the Olympic Games largely informed this plan. However, environmental concerns detailed the need for strategies that would allow the waterfront to re-establish natural linkages, including the Don River valley as it connects to the lake (Toronto Waterfront Revitalization Task Force, 2000). This led to the first municipal plan and design strategy to naturalize the Don River mouth, as seen in Figure 20. The movement to improve water quality in the lower Don was influenced at this time by the creation of the Toronto Area Remedial Action Plan, as a response to the International Joint Commission designation of the region as an Area of Concern under the Great Lakes Water Quality Agreement (Toronto Waterfront Revitalization Task Force, 2000). The naturalization of the Don was discussed as a legitimate strategy to improve environmental conditions at the river's mouth in accordance with this agreement. However, poor soil quality was an impediment to establishing a more detailed plan, due to the previous industrial uses in the region: "In order to facilitate the orderly and most economical development of these lands, it is necessary that the nature and extent of contamination be better understood for all sites, an orderly strategy for remediation be established and issues of long-term liability be addressed" (Toronto Waterfront Revitalization Task Force, 2000, p. 35). At the time this document was made, flooding had been established as the major barrier to development in nearby West Donlands as well as other parts of the Port Lands. This document described how a strategy to naturalize the Don would be created through the City of Toronto, the Waterfront Regeneration Trust, and the Task Force to Bring Back the Don (Toronto Waterfront Revitalization Task Force, 2000). The Toronto Waterfront Revitalization Task Force determined that naturalization would occur as follows:

Implementation of this strategy would create a meandering low flow channel in a wide floodplain, natural wildlife and fish habitat and some opportunities for improving stormwater quality. It would also allow for the integration of existing Don River trails and bicycle paths with a new and expanded waterfront trail system and provide an educational resource. Development in the vicinity of the mouth would relate to the River and crossings of the River would be undertaken in an aesthetically pleasing and hydraulically appropriate fashion to create a natural gateway to the Portlands (Toronto Waterfront Revitalization Task Force, 2000, p. 36).

This development approach suggested using the bid for the 2008 Olympics to act as a catalyst to redevelop and naturalize the Port Lands (Toronto Waterfront Revitalization Task Force, 2000).



Figure 20: The Central Waterfront Development Concept (Toronto Waterfront Revitalization Task Force, 2000, p. 42). This was the first design of the naturalized Don River to appear in a municipal planning document.

Both the 1999 and 2000 versions of *Our Toronto Waterfront* were presented and recommended to City of Toronto council on July 17, 2000. Council staff were supportive of the Toronto Waterfront Revitalization Task Force’s proposals, and believed that they aligned with “emerging planning policies and other City initiatives” (City of Toronto, 2000, p.9). City council approved the plans in August of 2000, along with an implementation strategy. Refinements to the proposal

outlined in the Toronto Waterfront Revitalization Task Force report were to be made when the City prepared a new Official Plan and Zoning By-law for the Central Waterfront. This provided a “statutory blueprint” for the development of the waterfront, and was recommended due to the looming bid for the Olympic Games (City of Toronto, 2000, p. 9). Focusing on the central waterfront, the council approved of the restoration at the mouth of the Don River as an example of a building block to a revitalized waterfront. The recommended approach for parks and open space revitalization was to establish the public realm first before determining development parcels, with careful consideration of environmentally sensitive areas (City of Toronto, 2000). Benefits of naturalizing the mouth of the Don River were stated as mutually agreed upon by the Toronto Waterfront Revitalization Task Force and the City, including: Improving the river hydraulics, flood protection, management of siltation problems, providing opportunities for wildlife and fish habitat renewal, and also improving river quality through bio-remediation techniques and public access to recreational opportunities (City of Toronto, 2000).

In 2001, the Toronto Waterfront Revitalization Corporation (TWRC) was created to act as a tripartite organization to carry out revitalization projects along the waterfront. In 2001, the TWRC, City of Toronto, Province of Ontario, and Government of Canada signed a contribution agreement made of four priority projects, one of them being to carry out an environmental assessment for the naturalization of the mouth of the Don River (City of Toronto, 2004; Government of Canada, 2005). The Central Waterfront Part II Plan, entitled *Making Waves: Principles for Building Toronto’s Waterfront*, functioned as the framework for implementing the recommendations of the previous reports. The third principle of this plan, known as “Promoting a Clean and Green Environment”, placed importance on “achieving a high level of environmental health in the Central Waterfront” (City of Toronto, 2004, p. 40). There were

various “Big Moves” proposed to achieve this, including “Move C_19: Renaturalizing the Mouth of the Don River”. This is described: “The mouth of the Don River will be rerouted through lands south of the rail corridor. This will improve the ecological function of the river, provide flood protection for the Port Lands and East Bayfront and attract new wildlife to the area. The renaturalized mouth of the river will also become a key open space and recreational link to the Don Valley, West Don Lands, Port Lands and waterfront park system” (City of Toronto, 2004, p. 41).



Figure 21: Waterfront trail system (City of Toronto, 2004, p.38). Note the original location of the naturalized river enters through the Keating Channel. The re-routed river’s planned location would continue to change over time.

Chapter Conclusion

A variety of influences led to policy transitions at the mouth of the Don River towards the beginning of the 21st century, however one of the most important factors was the shift in governance and management of waterfront resources during this time. The transition of control

from the Toronto Harbour Commission to municipal and provincial government caused a new direction in planning policy at the waterfront. The influence of the Royal Commission on the Future of the Toronto Waterfront in tandem with Michael Hough's influence on the Task Force to Bring Back the Don caused the naturalization vision to move from an ecological concept supported by environmentalists to a municipally supported agenda. With the rise of the ecosystem approach through the municipal government and the designation of the Port Lands as a Special Policy Area through provincial and federal assessment, a shift in the management of natural processes at the mouth of the Don began to take place. The initial vision of an alluvial delta at the mouth of the Don River, as designed by the Task Force to Bring Back the Don in the early 1990's, resembled a bold new direction for landscape planning at the mouth of the Don. While the design of the landscape differed in the vision of the naturalized river mouth published in the 2000 plan by the Toronto Waterfront Revitalization Task Force, the concept of natural integration at the mouth of the Don remained firmly entrenched as a defining element for waterfront planning initiatives in the Port Lands. The Olympics bid in 2008 functioned as a catalyst to fund revitalization projects along the waterfront, impacting the West Don Lands and providing a model for future flood protection development strategies at the mouth of the Don.

Chapter 4: A Site in Transition

Chapter Introduction

The urban estuary design by Michael Van Valkenburgh and Associates Inc. detailed a naturalized river valley as a fundamental feature among new development parcels at the mouth of the Don. Stemming from this design, a variety of more detailed planning efforts were set in motion. By 2010, a framework plan began to accommodate environmental assessments and precinct plans to determine how the naturalization could feasibly occupy the Port Lands. The Port Lands Acceleration Initiative proposed a phased approach to ensure development could proceed gradually at the site in tune with naturalization. Throughout this process, the realities of naturalizing a post industrial site (such as cost, flood protection incentive, and port functionality) are revealed as the most important factors influencing its final design. While the overall vision for a naturalized river mouth was maintained during this time, its design and characteristics were altered significantly from the original alluvial delta design suggested by the Task Force to Bring Back the Don in the 1990's. This change resulted in a new conception of nature at the river's mouth that is integrated within the urban framework of the region.

The Urban Estuary Design

In 2007, Waterfront Toronto (previously known as the Toronto Waterfront Revitalization Task Force) held an urban design competition to establish a vision for the entire Lower Don Lands. Among other criteria, the winning submission was required to feature a naturalized river mouth as the focal point of design. The competition was won by Michael Van Valkenburgh Associates Inc. for their concept of the Port Lands Urban Estuary. The jury selected this project

as the winning entry because they felt it “impressively integrated the natural and wild elements of the river’s mouth and the Lower Don Lands with urban place making, creating a spectacular and compelling vision for the area” (Michael Van Valkenburgh Associates Inc., 2010, p. 41). An important distinction of this design is the labelling of the entry as an urban estuary. Although the vision of a naturalized river mouth designed by the Task Force to Bring Back the Don in the 1990’s was initially conceived as an alluvial delta, the Michael Van Valkenburgh entry from 2007 proposed a more managed vision of nature. This distinction is clarified by Wilson (2015):

One of the things I’d like to point out with the naturalization of the mouth of the river is that because of our intervention, our interference, we basically have to almost make the opposite river mouth than the one that was there naturally. And by that I mean the difference between an estuary and a delta. A delta being where the river sort of projects itself into the water body, and an estuary being where the water body kind of projects itself up the river valley, so to speak. And, you know, both of them occur in nature, but what we’ve had to do here, is rather than going back to a delta, in other words, to re-naturalize it, to re-create something that was there initially, we’re making something new, but again, sort of in concert with nature, we’re making this urban estuary approach, which I say is kind of sort of the flipside of what a delta would be (J. Wilson, personal communication, August 19, 2015).

Thus, the conception of nature at the site changed from returning the river mouth to its pre-settlement characteristics as a delta to a new, reconstructed form of nature that could accommodate current and future land uses. The submission won multiple awards as an example

of progressive urban design but also for “articulating new relationships between nature and urban development” (Desfor, 2011, p. 306).



Figure 22: Port Lands Estuary design (Michael Van Valkenburgh Associates Inc., 2015)

The Michael Van Valkenburgh design was intended to bring together elements of urban form and nature which interact with each other, but also maintain distinct identities (Desfor, 2011). Serving as a starting point for future planning at the site, this design incorporated ecological considerations such as sediment and stormwater flow, city cooling, green space networks, and landscape types. However, it also considered how the naturalized river mouth could function within the context of an urban landscape, including the potential impact on views and sightlines, neighbourhood creation, institutions, heritage networks, and economic landscapes (Michael Van Valkenburgh Associates Inc., 2015). Early visions for naturalization at the river

mouth in 2000 by the Toronto Waterfront Revitalization Task Force and in 2004 by the City of Toronto designed the river to flow west directly in to the Keating Channel (See Figures 20 and 21). However, the design for the river in the Van Valkenburgh Plan maintained the existing Keating Channel as an “urban artifact and neighborhood amenity” (Michael Van Valkenburgh Associates Inc., 2015). Bypassing the channelized right angle turn in to the Keating Channel, the new river flow path in the Van Valkenburgh plan flowed south and gradually turns into its own channel parallel to the Keating, where a “meandering riverfront park becomes the centerpiece of a new mixed-use neighborhood” (Michael Van Valkenburgh Associates Inc., 2015). One of the defining attributes of this winning design was the aspect of scale. This is described by Wilson:

Well that’s one big part of it, is the scale of this is just unparalleled in this sort of project. I mean, perhaps there is something similar in land reclamation in either Singapore or Hong Kong where they actually just build new islands – they might have the same sort of scale. Aside from that, Amsterdam and Rotterdam have redone their waterfronts and you look at the projects and they are great, there is nothing to say against them, except that this one is just so much larger, and has so much more potential to really add to the core of our city (J.Wilson, personal communication, August 19, 2015).

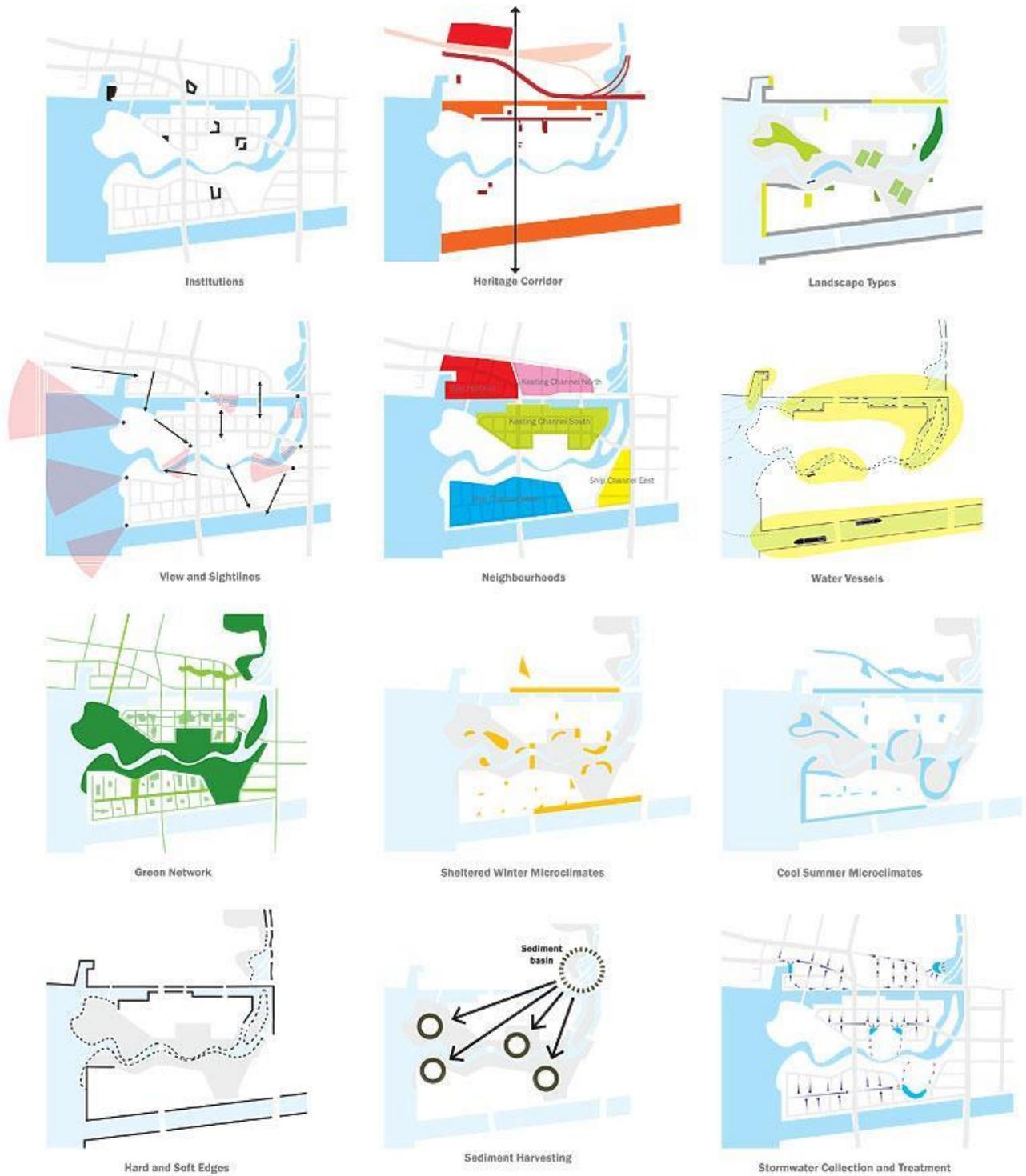


Figure 23: The Van Valkenburgh plan used a variety of design elements for future considerations of land use (Michael Van Valkenburgh Associates Inc., 2015)



Figure 24: The natural and wilderness elements in these renderings was a prominent aspect of the winning design competition entry (Michael Van Valkenburgh Associates Inc., 2015)

Relevant Planning Frameworks at the Mouth of the Don River

The Van Valkenburgh design was essential in providing an opportunity for the DMNP Environmental Assessment to analyze the potential impacts of the project beyond river alignments established by the Central Waterfront Secondary Plan in 2004. From this design, more refined planning frameworks were set in motion.

The Lower Don Lands Framework Plan was also prepared a few years later by Michael Van Valkenburgh Associates Inc. to contribute more detailed objectives and planning context to the initial design entry of 2007. This document integrated multiple planning frameworks into a cohesive vision for the region that faced a variety of urban land use challenges (Michael Van Valkenburgh Associates Inc., 2010). The Lower Don Lands Framework Plan facilitated the filing of environmental assessments, the amendment of the 2004 Central Waterfront Secondary Plan to reflect new design changes to the naturalized river mouth, precinct plan adoption, and urban design guidelines. The Lower Don Lands Framework Plan also gave the city an overall framework to use for ongoing planning projects, sustainable development projects, and funding opportunities (Michael Van Valkenburgh and Associates Inc., 2015). A key aspect of this plan was outlining how naturalization would exist within neighbourhoods, development parcels, and vital corridors of transportation and natural systems (City of Toronto, 2013).

Figure 25: Environmental Assessment processes in the Port Lands as of 2010 (Michael Van Valkenburgh Associates Inc., 2010, p. 29)

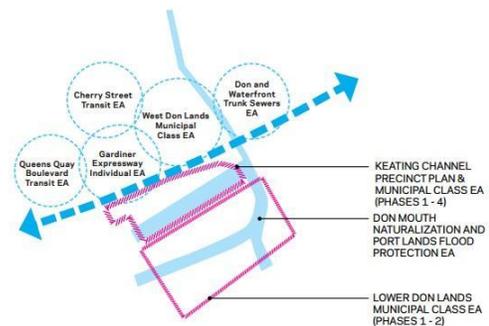


Figure 17
Coordination of Current Projects
The Lower Don Lands is located at the nexus of seven active environmental assessments.



LEGEND

 wooded prospect	 lrt stop	 non-motorized public boat launch
 passive use lawn	 bicycle trail	 small boating
 multi-use recreation	 school	 party boats
 esplanade	 daycare	 court sports
 playground	 cultural uses	
 public garden	 library	
 event space	 special commercial	
 water access	 community centre	
 heritage structure	 sports centre	

Figure 26: Community infrastructure in the Lower Don Lands Framework Plan (Michael Van Valkenburgh Associates Inc., 2015, p.35)



Figure 27: Natural systems networks in the Lower Don Lands Framework Plan (Michael Van Valkenburgh Associates, Inc., 2010, p.39).

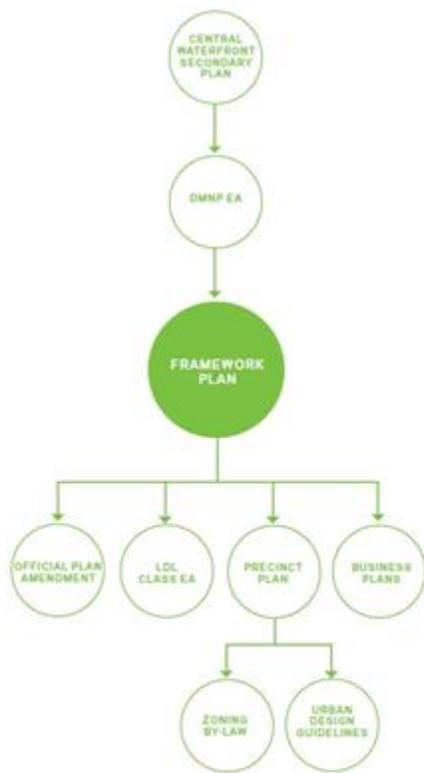


Figure 28: Planning hierarchy of the Lower Don Lands Framework Plan (left), (Michael Van Valkenburgh Associates Inc., 2010, p.21). Planning processes of the Lower Don Lands, (right), (Michael Van Valkenburgh Associates Inc., 2010, p.21).

The Lower Don Lands Framework Plan functions in cohesion with the Provincial Policy Statement of 2005, the Places to Grow plan, as well as the Growth Plan for the Greater Golden Horseshoe. Designated as a ‘Regeneration Area’ under the City of Toronto’s Official Plan, this region provides an opportunity to develop commercial, residential, light industrial, park and open spaces, as well as institutional spaces to “underutilized” areas of the city (Michael Van Valkenburgh Associates Inc., 2010, p. 27). The Lower Don Lands Planning Framework will

align with the Central Waterfront Secondary Plan pending revisions (Michael Van Valkenburgh Associates Inc., 2010).

The Port Lands Acceleration Initiative (PLAI) was created in 2011 and was endorsed by City Council in 2012 to refine the DMNP and act as a business implementation plan to accelerate development opportunities in coordination with flood protection. This document was intended to engage with the private sector, and has been influential in phasing development with naturalization and infrastructure requirements in the Port Lands. The Lower Don Lands Infrastructure Master Plan is in the process of being amended based on the PLAI. As time progresses, more specific precinct plans and district designs will be completed. Despite the complexity of multiple plans in place in the region, the naturalization of the Don's river mouth serves as the backbone to future planning processes in the region. Certain phases of other plans can be completed at different time scales, as part of the phased approach. This is explained by Cassidy Ritz, who is the Project Manager in Future Planning at the City of Toronto for the Port Lands:

Even if there was a whole phased approach, it's a major infrastructure, like if we did a subway, that's going to take years and years to build out. Just because that plan got approved, we didn't need to have the other plans in place. It [the Don Mouth Naturalization Plan] fundamentally informs all the other plans. So when we were originally scoping out how we were going to do the Port Lands Acceleration Initiative, round 2, you know, it was always "well we should let the EA finish first, we should let the EA get approved first". There's a whole aspect once you get the EA approved, you still have to do detailed designs. There's a detailed design component and then there's actually getting the funding and starting mobilization and doing construction. So they

don't all have to be done at the same time. (C. Ritz, personal communication, August 21, 2015).

Current Land Use Profile at the Mouth of the Don River

While current planning conditions at the mouth of the Don River are in a state of policy flux, the existing land use remains predominantly industrial-based. Located just south of the river's mouth and east of Toronto's downtown, the Port Lands consist of 356 hectares of "unparalleled redevelopment opportunity for Toronto" (City of Toronto, 2013, p. 1). Understanding the complexities of the current landscape is necessary to determine where naturalization can occur within the Port Lands, and how it can coincide with municipal initiatives and priorities along the waterfront. The extent to which land uses and stakeholder interests are accommodated as part of naturalization efforts in the Port Lands reveals how natural systems are valued at the mouth of the Don.

Current land use could be described as "a legacy of the historic attitudes to the Don", in reference to the site's history of heavy industrialization and shipping (Task Force to Bring Back the Don, 1991, p. 39). While the port still contains light and heavy industrial uses, there is a mix of vacant and public lands in the area as well. Property within the Port Lands is predominantly owned by public agencies. The City of Toronto, via the Toronto Port Lands Company, owns 236 hectares including all parkland and excluding streets. The Federal Government owns approximately 25 hectares, including Toronto Port Authority lands, while the Provincial Government via Ontario Power Generation owns 25 hectares. Waterfront Toronto owns 1.5 hectares, while an additional 28 hectares are held by private interests (City of Toronto, 2013). Some of the leases on this property are long term, which must be accommodated through

development and land use patterns at the site. Approximately 100 establishments employ a total of 4100 people in the Port Lands. Existing employment is mostly based in the fields of manufacturing, warehousing, office and governmental uses, media and film, bulk storage, industrial processing, and shipping (City of Toronto, 2013). These lands remain part of an active port. The top cargoes in the Port Lands as of 2011 were salt, cement, stone, aggregate, and asphalt (City of Toronto, 2013). While some recreational boating occurs, one of the significant elements of the DMNP's interaction with this working district is the influence of shipping and dockwalls for the Toronto Port Lands Company and additional private interests. After the completion of the DMNP, a loss of 2140 metres of dockwalls will occur, as space is required for the naturalized river mouth to overflow south into the Ship Channel via the Don Greenway (City of Toronto, 2013, Toronto and Region Conservation Authority, 2014). This will be discussed further in Chapter 5. Some of the industrial buildings in the Port Lands, such as the Essroc Silos and Lafarge Silos, represent the dominant heavy industrial landscapes that characterize this area. While some industrial sites will be phased out of the area for heritage or adaptive re-use purposes, there are many industries in the Port Lands that will continue to exist and thrive at the river's mouth. This presence of industry, and why it is still necessary for economic development in Toronto as the essence of a working port, can be understood through Naylor:

We're talking big industry too. We're talking about you know, it's an aggregate camp, (this is for the aggregates for concrete manufacturing) come in to the city, you know, let's face it, it's better to ship bulk things like that by boat than it is by truckload, you know, thousands of trucks coming in to the city to bring that material in, its where all of our winter salt comes in to salt our roads, it is a strategic piece of port infrastructure and you

can't cut them off, you can't actually get rid of them, you have to work with them (E. Naylor, personal communication, October 5, 2015).

This would suggest that the industrial nature of the Port Lands is still an important characteristic of the landscape, and one that has to be accommodated in conjunction with naturalization.

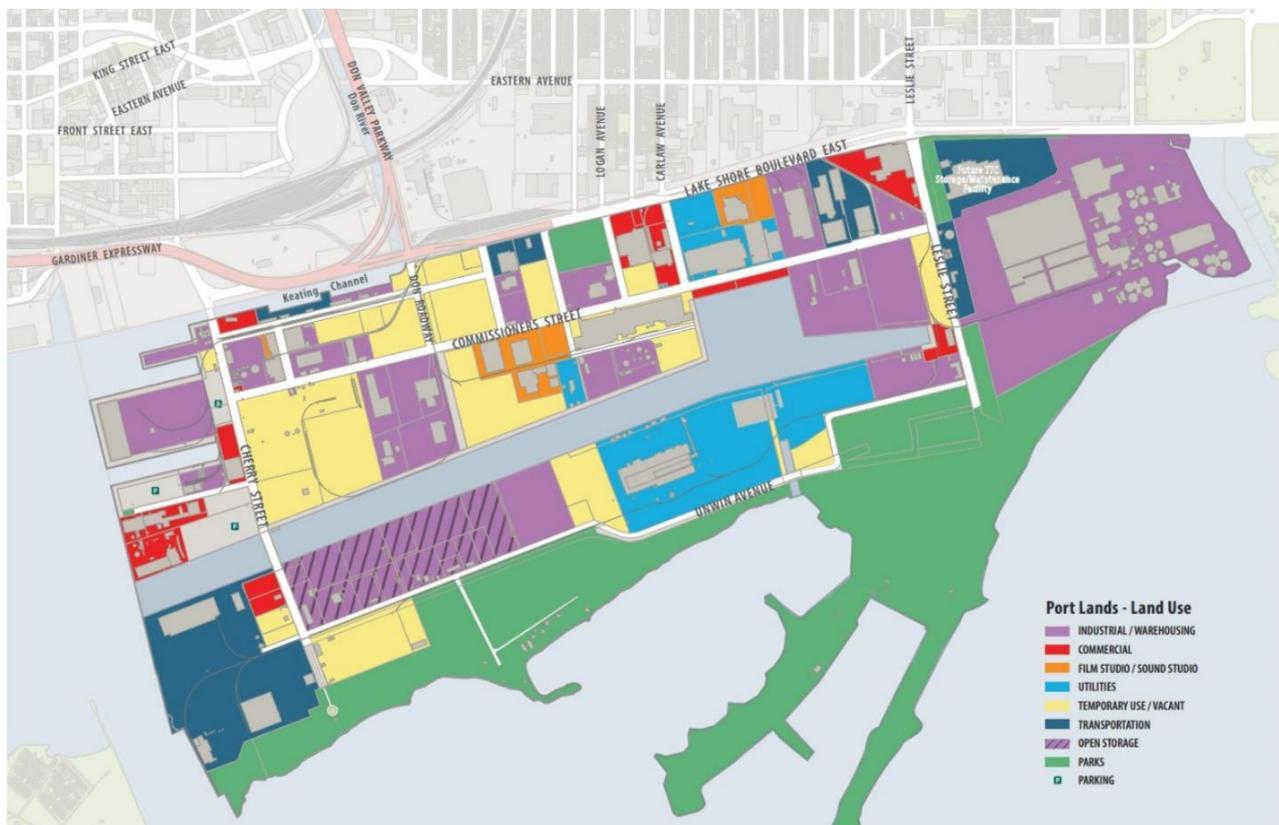


Figure 29: Current land uses at the Port Lands (City of Toronto 2013, p. 19).

Industrial heritage is an important element of preservation and character in the Port Lands. There are several buildings within the Port Lands that are listed on the City's Inventory of Heritage Properties, indicating the City's intent to have them preserved (City of Toronto, 2013). As of 2013, one building was designated under the Ontario Heritage Act. 15 structures in the Port Lands are listed by the City of Toronto as buildings of heritage importance, pending

designation as a cultural resource under the Ontario Heritage Act (City of Toronto, 2013). Some land uses are protected in preservation of heritage resources deemed culturally significant by the municipality. Potential cultural heritage landscapes not currently listed offer additional complexity to this scenario. Significant views and vistas also need to be protected, as well as archeological resources (City of Toronto, 2013). Identifying these characteristics of the landscape is important for understanding the limits to naturalization, since it reflects how there are interests beyond ecological health that are imbedded into the history and future direction of the landscape.

Current State of Natural Systems at the Mouth of the Don

Understanding the current ecological conditions at the mouth of the Don is a necessity in order to understand the impetus for naturalization initiatives. Existing natural spaces that offer the potential for habitat connection, flood protection, and environmental restoration helped to determine the ultimate location for naturalization in the Port Lands.

The mouth of the Don River is the drainage point for the tributaries that flow within the Don River watershed. These tributaries flow into the Don River, which is the most environmentally degraded and urbanized river in the Greater Toronto bio-region (Hough, 1995).

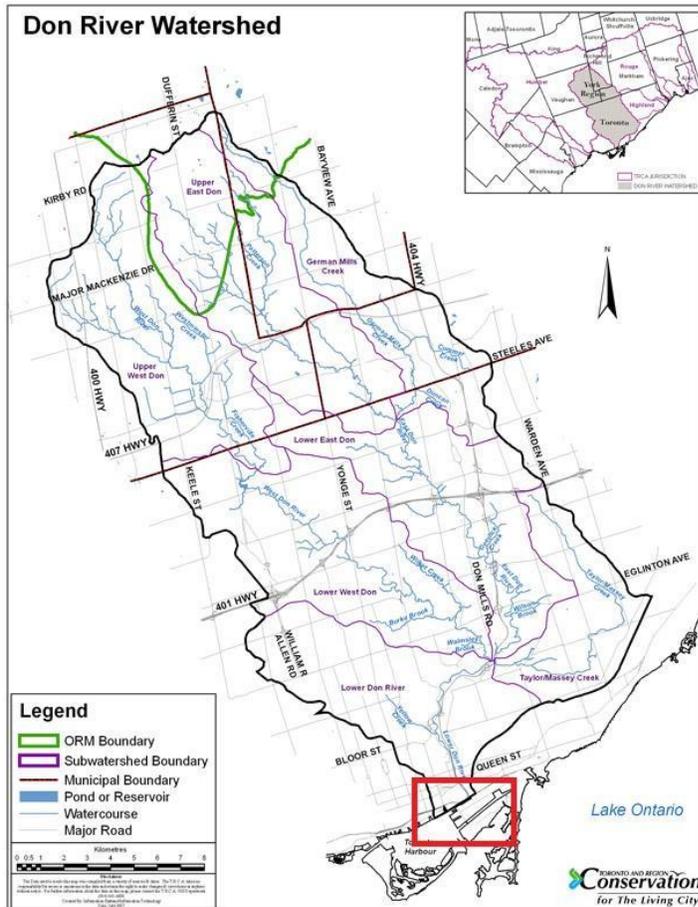


Figure 30: The mouth of the Don River as part of the broader Don River Watershed (Toronto and Region Conservation Authority, 2015).

The Port Lands contain open spaces and recreational parks, and the mouth of the Don represents an opportunity to connect these features to a broader natural heritage system. The 191.3-hectare Tommy Thompson Park and the adjacent Leslie Street Spit are well known sites for migratory birds, and they also contain a variety of snakes, frogs, mammals and turtles, as well as early to mid-stage vegetation (City of Toronto, 2013). Tommy Thompson Park is situated directly south of the Port Lands, and a potential heritage system exists from that park through the mouth of the river travelling north through the Don River Valley to the Oak Ridges Moraine. Despite the anthropogenic alteration to the site of the Don River mouth, geographically, the Port Lands remain an integral component of this natural heritage system.

Figure 31: Natural heritage potential as a result of river mouth naturalization. Left: (Michael Van Valkenburgh Associates, Inc., 2015, p.24) Top right: City of Toronto, 2013, p.31) Bottom right: (City of Toronto, 2013, p.29).



Nearby North Shore Park is considered an Environmentally Significant Area (ESA) by the TRCA as a protected reserve for butterflies. Cherry Beach contains similar species and additional wildlife habitat as Tommy Thompson Park (City of Toronto, 2013). This surrounding wildlife habitat furthers the argument for implementing naturalization at the river's mouth as a vital habitat link.

Despite the potential for habitat creation at the mouth of the river, arguably the most impactful environmental benefit is also an economic benefit - the potential to reduce flooding in the area. The DMNP is projected to remove the flood risk of 240 hectares of urban land to the east and south of the river, while 13 hectares of new aquatic area will function in tandem with 16 hectares of terrestrial/wetland habitat (City of Toronto, 2013, Toronto and Region Conservation Authority, 2014). The lower portions of the Don River floodplain were identified by TRCA in its 1980 Watershed Planning initiative as the number one priority location requiring flood protection in TRCA's jurisdiction (Michael Van Valkenburgh Associates Inc., 2010). The City of Toronto and TRCA's commitment to a "comprehensive solution" vs. "site by site" management of the flooding problem is indicative of a landscape based solution to solve flooding issues near the mouth of the river (Michael Van Valkenburgh Associates Inc., 2010, p. 38). The Provincial Policy Statement (2005) allowed more flexibility in Special Policy Areas to communities that have historically existed in floodplains, including much of the Lower Don Lands (Michael Van Valkenburgh Associates Inc., 2010). The naturalization efforts at the mouth of the Don will lift floodplain regulations at the site for Spill Zones 1 and 2, which are currently part of the regulatory flood spill zones for the lower Don River (City of Toronto, 2012). These Spill Zones can be seen in Figure 32.

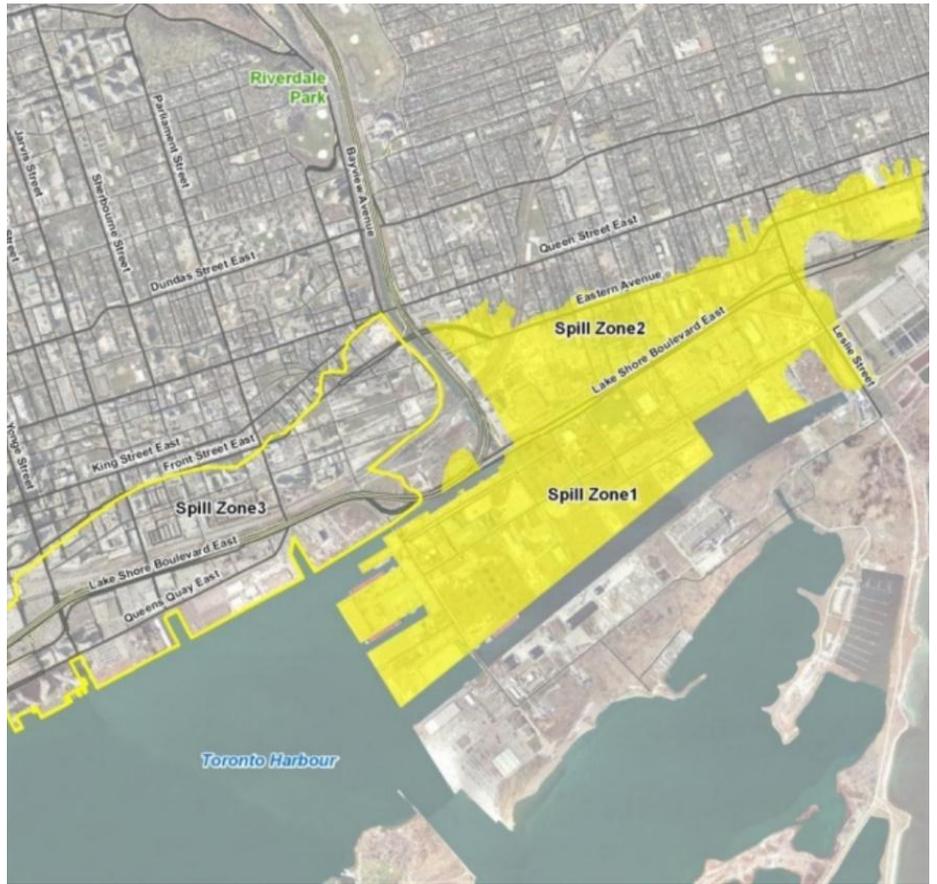
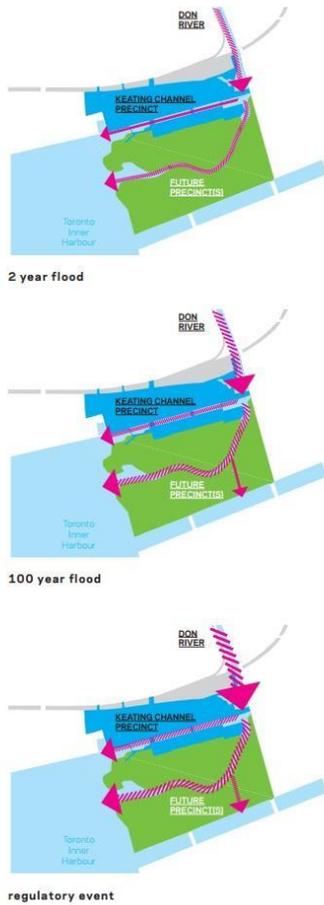


Figure 32: (Left) Flood conveyance of the re-naturalized river valley. The Keating Channel's role in flood reduction increases as storm severity increases (Michael Van Valkenburgh Associates Inc., 2010, p. 28). (Right) Regulatory floodplain spill zones of the lower Don River. Note that Spill Zone 3 has been negated by the flood protection completion in the West Don Lands (City of Toronto, 2012, p.3). Spill Zones 1 and 2 will be protected from flooding through naturalization via the DMNP.

Additional environmental concerns at the site arise due to the variance in subsoil quality, caused by the industrial infilling of Ashbridge's Bay in the 1900's. Since the land at the river's mouth is to be converted in some places from industrial to more sensitive land uses such as residential, further testing and monitoring is required via the Brownfields Statute Law Amendment Act (City

of Toronto, 2013). The realities of urban development dictate to what extent urban ecology projects such as the DMNP can be implemented. Since the naturalization will unlock development potential, there must be space for additional services and facilities to accommodate new land uses. Since the mouth of the Don is a post-industrial site, there are few facilities such as schools, and libraries, child care centres, community centres, recreation spaces, parks, playgrounds, and other amenities required for the residential component of the build out (City of Toronto, 2013). There is little servicing capacity in the Port Lands, so new services such as storm servicing networks are required to be integrated with the DMNP in order to best manage the water flows in the area in a sustainable way (City of Toronto, 2013).

Adaptation: Assessing Naturalization in the Context of Urban Realities

While designs for naturalization at the mouth of the Don have changed slightly over time to adapt to these urban realities, the initial vision of a naturalized river mouth put forth by Michael Hough has remained a constant. This importance of adaptation and flexibility, which is necessary for all planning initiatives within cities, is explained by Naylor:

So when the concept, the original vision to bring back the Don was put forward, it was before ecological perspective, and was a real kind of opportunistic or idealistic vision about how to work with the river, its hydro, its fluvial geomorphological process, it came from a certain perspective, looking back, it was from a relatively narrow perspective. As time passes, things change. It's inevitable. And 20 years have passed, or something like that. And some of the fundamental concepts that Michael had put forward was to rehabilitate the Port Lands, rehabilitate it back to an alluvial marsh. Well, you know, from an ecological perspective, really interesting idea. From an economic perspective –

not possible, because there are so many existing uses in that area. And you can't ignore the economic land value and land development. So, the work that was done very early, was highly visionary, and in fact, it ignored a lot of land use realities and infrastructure realities that were in place at the time. This design competition came along and it had to face those – the Van Valkenburgh one that was successful – had to face those realities, still embracing this concept of returning the river to more of its original configuration and layout but acknowledging that there needed to be other land uses – residential, industrial, and employment in the area – and frankly those land uses would have to fund this new vision, and this is a billion dollar exercise to reconfigure the mouth of the Don as the Keating Channel. So where are the billion dollars going to come from? Nobody was asking those questions when Michael was doing this work because even the work he was doing, was so radical ...but really, what happened was, you know, people started seeing flood control as unlocking development, potential flood control was a way of naturalizing and improving the ecology, flood control was a way of re-introducing recreation, it was really a lot of positive things that were possible. It took decades to sort that all out. So yes, things have changed, yea, the visions changed, but that's life, it goes on, planning is not stagnant, planning is iterative, it changes, you absolutely have to acknowledge that there are these forces – economic, social, political, that really mold what finally can happen there. And so there have been a number of iterations, they're reworking the original environmental assessment that was done for the mouth of the Don, it was re-considered when Rob Ford was there because he had a different vision for the area, it's being reconsidered again for affordability reasons so what the ultimate design for the mouth of don is going to change, many times, but the fact of the matter is it's an

edit, now, in the Official Plan, its imbedded now, in all kinds of watershed planning, that concept that Michael put forward 25 years ago is now going to be a reality, it's taken two and a half decades to get there and yes it's changed, but fundamentally, the idea was put out there and the idea is now – we will see it one day. Will it be in the next five years? I don't know. But it's going to happen, and yes, it should happen. Things change, and that's just kind of the evolution of the city over time (E. Naylor, personal communication, October 5, 2015).

While the original naturalization design by the Task Force to Bring Back the Don included an alternative design featuring a built- up Port Lands region that accommodated urban renewal, the Task Force advocated for the wilder and more natural delta approach (Task Force to Bring Back the Don, 1991). However, environmentalists and public supporters of the original alluvial delta concept have accepted the realities of the revised vision that is in place today. In the context of urban ecology, these supporters can still see the main elements of a naturalized river mouth in the revised design:

Yes, um, you know, certainly it wasn't a unified vision, I suppose, throughout time, it changed over time. As you know, when you look at the mouth of the Don from the 1991 report, at that point, the location was entirely different, and as much as anything, the design was that a delta would be recreated, and that sediment coming down the don river would then begin to build up again, as it had done historically before there was significant alteration. As time wore on, it didn't take very long for many people to realize that that would not really work in the centre of the city – to have an unmanaged delta forming in the port of Toronto, so other ideas began to be brought forward and dangled out there, a little more of a managed scenario, naturalizing the mouth but keeping it in

check in terms of dredging and removing sediment and managing ice flows and things like that. Probably the biggest idea that came forward was the idea that by doing this we could also kill two birds with one stone by naturalizing the mouth of the river, and also managing the flood protection of the area. As it got more technical, there became more modern engineering considerations, there were those who just wanted to let it be, to have a kind of a 'see no evil hear no evil' hands-off approach. We had to have some long discussions internally among the Task Force members and then we began to get other allies who came to add to the mix. I think that probably the biggest ally that came on as time went on was the West Don Lands Committee... They were a collective of groups/neighbourhood groups, environmental groups, and business groups, right along the waterfront who really adopted a more sophisticated ravine approach to living in harmony with nature at the waterfront. They were a group of people who were not averse to saying, 'ok, we're going to manage this, it's going to be a place where development properties are going to be built up, and some of that is going to help pay for the work that's being done at the mouth but we will still keep in mind the goal of having a naturalized system there. So, it changed I think from perhaps a little bit more naïve approach that was there at the outset, and got a little more sophisticated as time went on (J. Wilson, personal communication, August 19, 2015).

The cyclical pattern of flood control to accommodate development (which then helps to fund naturalization efforts) is an integral aspect of how the naturalization plan evolved to accommodate financial barriers. This awareness also helped the naturalization project progress from an ecological vision to a firmer landscape planning design with the cooperation of multiple levels of government:

In a situation like the Don River, where development is excluded by regulation, by TRCA's flooding regulation, it's always easy to kind of get some people together to plant some trees and re-naturalize things, but to take it to another level, which is what was needed at the mouth of the river, which has been so altered over time, there really has to be a lot of money applied to it. And that doesn't just happen because of good will. It would be great if there was an unlimited supply of money and everybody felt good about something so we just apply that money to wherever we like. But in fact, there does need to be a payback, especially in something like this, where the social goods are hard to calculate. You can say, anytime you plant trees and wetlands there are great things that happen, the frogs and fish come back, but the social goods are harder to calculate, and until we figure out a way to do that, there was really not much chance of getting the hundreds of millions of dollars that are needed to make this happen (and of course we are still waiting for that final paycheck to come in). We are pretty optimistic that it might happen. We are now in a situation where both the current federal government is in favour of spending the money to fix the Don River, the NDP, if they form the next government, they're in favour of spending the money to fix the Don River, the city is already committed to spending the money to do it, and the province is now in those final throes of doing a risk assessment and value for money project to just figure out or not whether they are out or in so what that means is we are just very short steps away from having the money to make that happen from three levels of government over a 5-8 year project build out. Until you could say we are going to protect a whole swath of land from flooding, we're going to have that close to the downtown of the city, we're going to be able to develop that and make a really vibrant, sustainable, new part of our city, we're

going to be able to take pressure off development of the Oak Ridges Moraine and the farther reaches of the urban sprawl, all of these pieces falling in to place together, becomes a far more robust and strong argument to bring the sides together to make it happen. (J. Wilson, personal communication, August 19, 2015).

Understanding naturalization within the realities of urban land economics is integral for this project. The vision for nature at the mouth of the Don was adjusted in tandem with the realities of urban land values and the financial constraints of a large project. With these adjustments, public perceptions of nature in the city have also changed:

The main thing that strikes me is the nature of the public support has been strong all along, but it's become a little more tolerant of the fact that this is a city builder's project. There was a stronger element of "let's just send it back to nature" so to speak, when the project started. As time has gone on, the idea that we could have spectacular estuary and wetlands and greenway and naturalized waterfront and still have intense city core development around that, to have support for those two things to happen together has been a big change. There has always been people who, basically, their idea for the Toronto waterfront was sort of like Georgian Bay, you know, let's keep it really pristine, and the only problem is the only people who can afford to live there are people who can afford multi-million-dollar estate homes overlooking the water. So those contradictions had to be worked through in a lot of people's minds. Their vision of a naturalized waterfront changed from the Canadian north, it didn't come from other urban centers, and I think people had to then become more comfortable that we do need to accommodate more and more people and not let the fact that this is a city, and a 21st

century large city, compromise our vision of working in tune with nature (J. Wilson, personal communication, August 19, 2015).

Wilson continues to describe how we may begin to experience a shift in how urban citizens value nature in the city, in the context of the naturalization efforts at the mouth of the river:

It's interesting, Toronto being, it's really an urban city, compared to many others. Not only that, but the people who live in Toronto, it's grown so quickly, that many people who live in Toronto, growing up living there Canadian from halfway around the world or people who came from southern Ontario, many of them had grown up in very small rural or semi-rural communities (including myself, I grew up in farmland). And I think for all of us, it's a real kind of growing experience to accept the fact that we are living in a dense urban environment, and begin to relish that and enjoy it. When I first came to Toronto, most of the people who went to Toronto's waterfront were people who couldn't afford to go out to their cottage, and everyone who could possibly afford to go to a cottage did. And now, our waterfront is becoming a real region and people are going there, and spending their time there...The city is beginning to get a little more settled and comfortable in its own skin (J. Wilson, personal communication, August 19, 2015).

This dialogue may suggest that historically, citizens thought of Toronto's waterfront as a degraded industrial landscape, and escaped to the more isolated wilderness areas outside of the city to experience nature. However, the proposed reconstructed form of nature that blends natural processes into the cityscape via the DMNP has led to a new understanding of nature in the city. If people experience nature in the city the way Michael Hough envisioned as a result of the DMNP, the mouth of the Don River has the potential to be valued for its ecological properties within the urban environment. Despite the history of control and exploitation at the

river's mouth, current planning frameworks aim to create a landscape where humans live in harmony with natural systems.

Chapter Conclusion

The urban estuary design by Michael Van Valkenburgh Associates Inc. initiated more concrete planning frameworks at the mouth of the river, and represented a reconstruction of nature that blended urban life with natural processes. This design led to the creation of guiding documents such as The Lower Don Lands Framework Plan. Part of the difficulty in achieving naturalization at a large scale lies in accommodating the complex planning processes in place throughout the region. Additionally, despite the environmental benefits, the naturalized river valley would need to function among new and existing land uses. The Port Lands Acceleration Initiative began the phased approach to ensure these realities could be accommodated in conjunction with naturalization. As the naturalization design at the mouth of the river has evolved over time, so has the acceptance of how a river valley can be feasibly created in the Port Lands. As a result of the Urban Estuary design in 2007 and the subsequent planning documents that followed, a shift in how nature can be perceived and accommodated in the city is beginning to occur at the mouth of the river.

Chapter 5: DMNP EA and Future Land Use Direction at the River's Mouth

Chapter Introduction

Urban realities of land value, waterfront showcasing, and stakeholder conflicts continue to shape land use direction at the Port Lands over a century after the Waterfront Plan of 1912 was created. As the DMNP has been refined over time, it has been altered to accommodate various stakeholder priorities at the river's mouth, and facilitate development parcels in the Port Lands as quickly as possible. Design alternatives were evaluated for their environmental integrity; however economic factors were influential in altering the original preferred alternative to the current amended reconfiguration of the river's mouth (as part of the 2014 Don Mouth Natural Plan Environmental Assessment). Similar to the Waterfront Plans of 1912 and 1967, economic competition at the mouth of the Don remains prevalent today, yet at a different geographic scale. Design inspiration has been taken from international cities, as opposed to the influence of regional competition within the Great Lakes shipping network in the 20th century. The propensity to showcase the waterfront, evident in waterfront plans since 1912, now exists as revitalization and naturalization planning at the Port Lands. Despite the transition of the landscape from an industrial hub, the economic importance of the Port Lands and its role as a functional urban port is also revealed as a barrier to naturalization implementation. While economic considerations of naturalization have been fundamental to the DMNP since its creation, the evolution of the DMNP design reveals how the realities of urban land economics impacted the final design to meet the needs of a city builder's project.

The DMNP and the Evolution of the Amended Alternative

The Don Mouth Naturalization Plan was first submitted to the Ministry of Environment for approval in 2010, and has gone through a series of holds and delays due to refinements at the municipal level (Toronto and Region Conservation Authority, 2015). Subject to the Ontario Environmental Assessment Act, the Don Mouth Naturalization Plan Environmental Assessment (EA) gained approval from the Province of Ontario in January 2015 (Toronto and Region Conservation Authority, 2015). The Toronto and Region and Conservation Authority are now progressing through preliminary designs as part of the Due Diligence of the Port Lands Flood Protection and Enabling Infrastructure Project, which effectively combines the DMNP EA and Lower Don Lands Master Plan into a single overarching project. The evolution of the DMNP and its integration over time reflects the difficulties in achieving naturalization efforts in a post-industrial urban landscape.

The Don Mouth Naturalization Plan was developed by the Toronto and Region Conservation Authority, City of Toronto, and Waterfront Toronto. After the creation of the Central Waterfront Part II Plan, more detailed planning initiatives at the mouth of the Don River were able to move forward. The Terms of Reference for the DMNP were approved by the Minister of the Environment in 2006. As part of the Terms of Reference, the goal of the Don Mouth Naturalization Plan is “to establish and sustain the form, features and functions of a natural river mouth within the context of a revitalized city environment while providing flood protection up to the Regulatory Flood” (Toronto and Region Conservation Authority, 2014, p. 1-4). The objectives for the DMNP, as seen in Figure 33, were related to naturalization within the context of a functional and liveable new port. These objectives were relevant because they were

the criteria of which alternative river mouth designs were graded against, and ultimately determined the naturalization design that would shape the landscape at the mouth of the river.

As outlined in the ToR, the **goal** of the DMNP is to *establish and sustain the form, features and functions of a natural river mouth within the context of a revitalized city environment while providing flood protection up to the Regulatory Flood*. The project **objectives** are to:

1. Naturalize and rehabilitate the mouth of the Don River utilizing an ecosystem based approach;
2. Provide flood protection for Spill Zone 1 – the Port Lands and Spill Zone 2 – east of the Don River and north of Lake Shore Boulevard (see **Section 2.1.2**);
3. Maintain the provision for navigation and existing flood protection through sediment, debris and ice management;
4. Integrate existing infrastructure functions that could not be reasonably moved or removed (including road, rails, utilities, trails and power);
5. Encourage additional compatible recreation, cultural heritage opportunities and improved accessibility for the public and persons with disabilities;
6. Contribute to the revitalization and sustainability of the waterfront and co-ordinate with and inform other planning and development efforts and associated certain and foreseeable infrastructure; and,
7. Design and implement the DMNP in a manner consistent with Waterfront Toronto's Sustainability Framework and applicable provincial legislation.

Figure 33: DMNP objectives. A balance between naturalization and functional city space is evident (Toronto and Region Conservation Authority, 2014, p.1-4).

The objectives also set the initial parameters for conducting naturalization within a city environment, including the accommodation of infrastructure and coordination with other planning processes in the region. The DMNP set out to address problems related to an ecologically dysfunctional river mouth, flood risk vulnerability, and a derelict waterfront (Toronto and Region Conservation Authority, 2014). It provided detailed land use constraints and opportunities analysis for the work required to naturalize the river's mouth. Detailed descriptions of river characteristics (sediment, flooding, ice, water quality, debris, and hydrology concerns), the natural environment (such as habitat and vegetation concerns) soil and groundwater, and socio-economic problems were analyzed for potential effects as a result of naturalization (Toronto and Region Conservation Authority, 2014).

Multiple design alternatives for naturalization were considered in the DMNP. The alternatives were evaluated in the Individual Environmental Assessment Process by a consultant team led by AECOM, hired by the City of Toronto and TRCA (Toronto and Region Conservation Authority, 2014). Through criteria and indicators, the design alternatives were measured for how well they met project goals and objectives.

Objective	Alternative 	Alternative 	Alternative 	Alternative 	Alternative 
1. Naturalization	Least preferred	Least preferred	Moderately preferred	Moderately preferred	Most preferred
2. Flood Protection	Least preferred	Least preferred	Most preferred	Most preferred	Most preferred
3. Operational Management and Constructability	Most preferred	Most preferred	Moderately preferred	Least preferred	Least preferred
4. Integration with Infrastructure	Most preferred	Most preferred	Least preferred	Least preferred	Moderately preferred
5. Recreational and Cultural Opportunities	Most preferred	Moderately preferred	Moderately preferred	Least preferred	Most preferred
6. Co-ordination with Other Planning Efforts	Moderately preferred	Least preferred	Moderately preferred	Least preferred	Most preferred
7. Consistency with Waterfront Toronto Sustainability Framework	Moderately preferred	Most preferred	Least preferred	Most preferred	Most preferred
Summary	<i>Moderately preferred</i>	<i>Moderately preferred</i>	<i>Moderately preferred</i>	<i>Least preferred</i>	<i>Most preferred</i>

Figure 34: Alternatives summary matrix (Toronto and Region Conservation Authority, 2014, p.5-77).

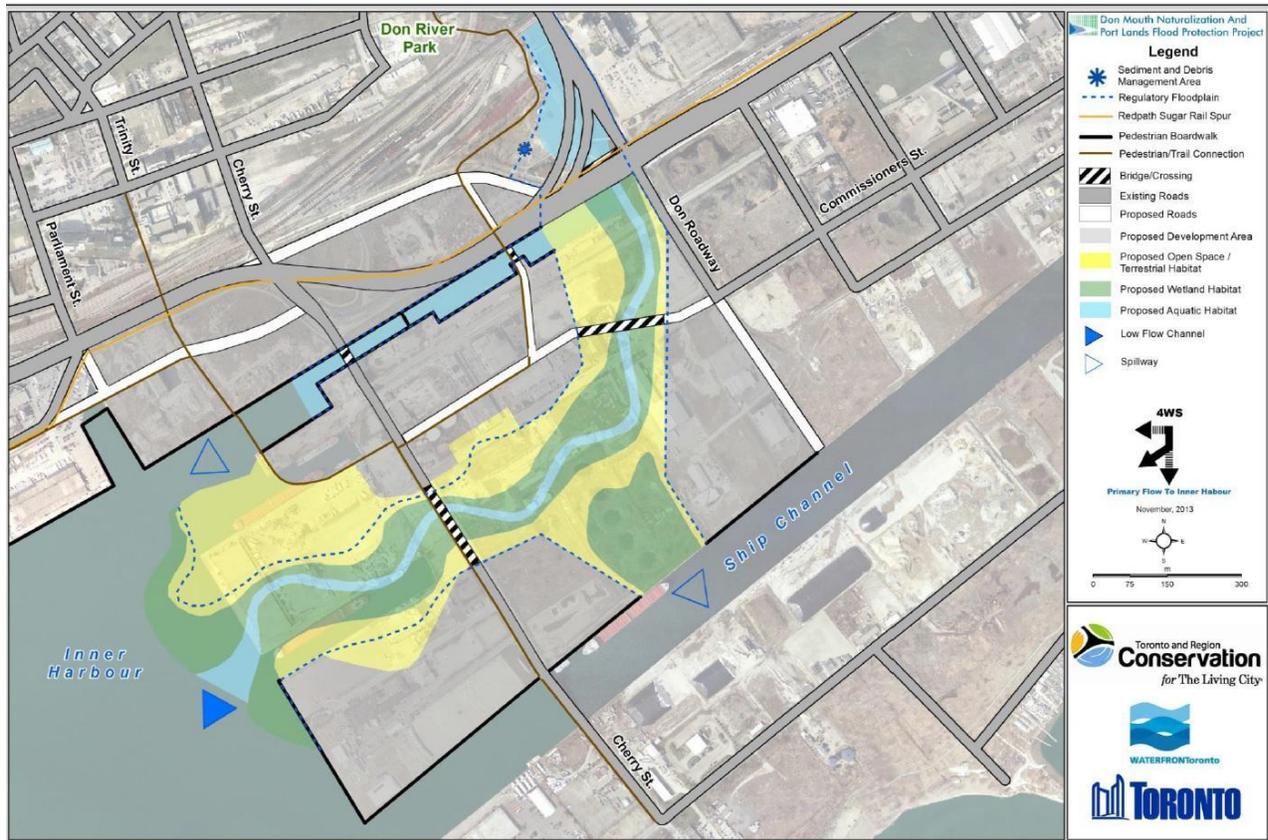


Figure 35: Alternative 4WS, the original preferred alternative (Toronto and Region Conservation Authority, 2014, p. 5-44).

Initially, the 4WS design was chosen as the preferred alternative, which was based on the vision proposed by Michael Van Valkenburgh Associates Inc. in 2007 during the design competition. This alternative was chosen because it “contains the highest quality of habitat and provides considerable naturalized area and recreational space; it provides greater adaptability for flood protection than single and even double discharge alternatives; it best meets the intent of the central waterfront secondary plan; it will allow for the greatest reuse of material on site and has the lowest cost for soils management” (Michael Van Valkenburgh Associates Inc., 2010, p. 40). Alternative designs focused on less costly attempts of containing the regulatory flood by increasing the grades within the Port Lands, which would actually increase deeper flows

upstream and increase flood risk to other areas of the city (Toronto and Region Conservation Authority, 2014). During the initial environmental assessment approvals process in 2011, the DMNP EA team was asked by the City to revise the conclusions of the DMNP EA process based on concerns raised by port operators in the area, and to explore opportunities to allow private funding to contribute to the overall costs (City of Toronto, 2012). Lake-fill west of the existing dockwall, originally intended to be used as a promontory, was expressed as a concern by the Toronto Port Authority and users due to navigation concerns (City of Toronto, 2012). Additional concerns rose due to the limited availability of port space as phased development occurred, resulting in the industrial inclusion alluded to in Figure 37.

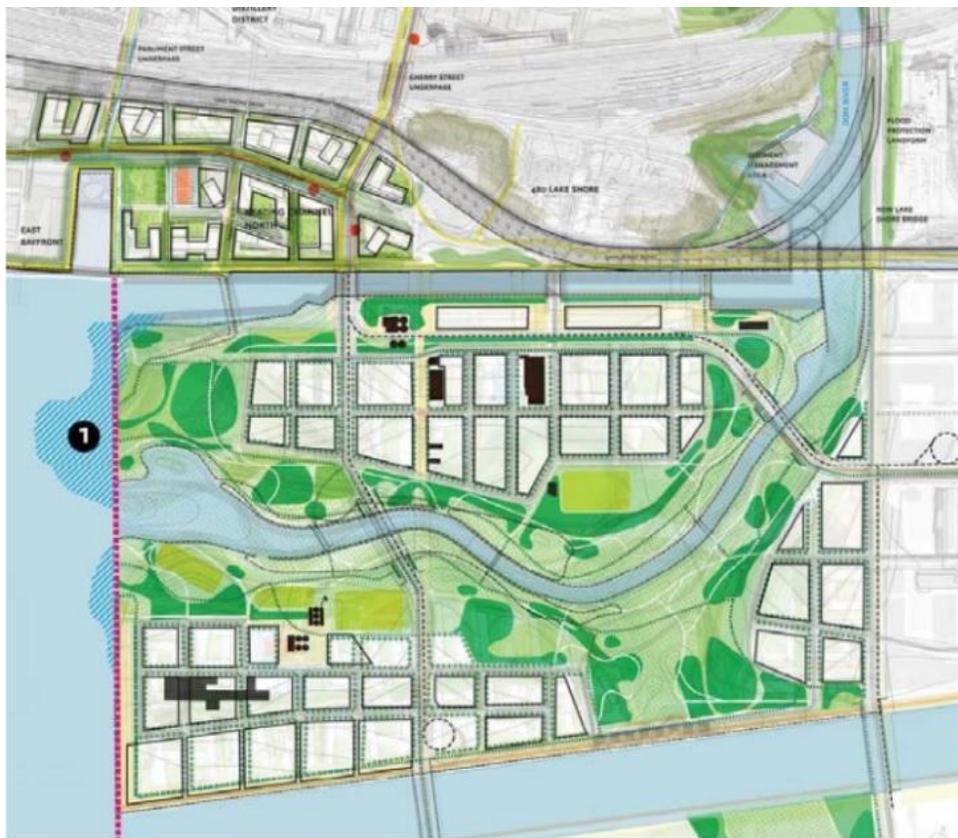


Figure 36: Point 1 indicates an area of concern for shipping and navigation (City of Toronto, 2012, Appendix 10, p.16).

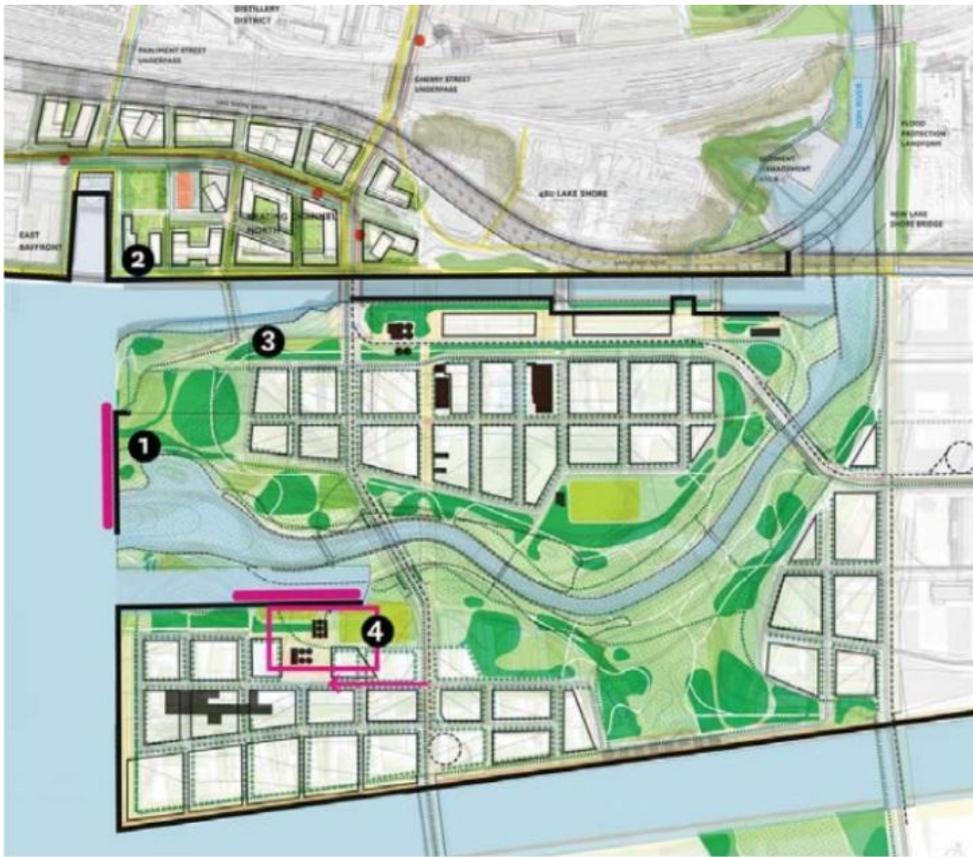


Figure 37: Naturalization is limited by industrial stakeholder land use, as Redpath is to maintain season operation at point 1, while Lafarge will operate at point 4 (City of Toronto, 2012, Appendix 10, p.16).



Figure 38: Greenway is transferred to eastern location directly south of re-aligned river in point 1 (City of Toronto, 2012, Appendix 10, p.17).



Figure 39: Comparison of the original Michael Van Valkenburgh Design (left) and the revised 4WS Amended Design (right). Though not a functional solution in 2007, the Michael Van Valkenburgh design was a valuable tool to allow multiple environmental assessments in the area to work towards a consolidating vision. The Van Valkenburgh design served as the blueprint for Alternative 4WS (City of Toronto, 2012, Appendix 10, p.14).

The adoption of Alternative 4WS Amended was revealed in the Port Lands Acceleration Initiative in 2012. This design offers slightly less natural inclusion than Alternative 4WS. The amended version has a slightly shorter length of river channel, and less naturalized area since the proposed wetland is narrower (Toronto and Region Conservation Authority, 2014). The amended design also has more habitat fragmentation due to the infrastructure passing through natural areas. Less naturalized area results in less capital costs due to the price of vegetation, modifications to infrastructure, and armoring of the river valley (Toronto and Region Conservation Authority, 2014). However, it is anticipated that the amended alternative will provide similar naturalization benefits and flood protection benefits. Flood protection costs are lower and implemented faster for the phased approach, which is made possible through the amended 4WS alternative (Toronto and Region Conservation Authority, 2014).

Objective	Alternative 4WS	Alternative 4WS Amended
1. Naturalization	Preferred	Not preferred
2. Flood Protection	Not preferred	Preferred
3. Operational Management and Constructability	Not preferred	Preferred
4. Integration with Infrastructure	Not preferred	Preferred
5. Recreational and Cultural Opportunities	Preferred	Not preferred
6. Co-ordination with Other Planning Efforts	Not preferred	Preferred
7. Consistency with Waterfront Toronto Sustainability Framework	Same	Same
Summary	Not preferred	Preferred

Figure 40: Comparative analysis between Alternative 4WS and Alternative 4WS Amended designs (Toronto and Region Conservation Authority, 2014, p. 5-85)

The implementation of the amended 4WS alternative is rationalized by the problems of cost, industrial history, and development pressure associated with land use transition at a large scale. As planning efforts become more site specific and detailed with multiple potential land uses coordinated together, more specific problems arise:

I do think that it's a technically very complicated problem. Like, as soon as you move one thing that affects another. So I guess the biggest issue here is it's actually a very complex problem. Even if one could just agree how much of the land use is going to go to what function it's a solvable problem but I think that's the dilemma, no one has been able yet to say you know, half of the land should be ecological restoration and the other half of the land should be opened up for development. Part of it is that whole 'how much development do you need to actually pay for it' and it all depends on how significant the project is, they're all a series of moving parts and you have to make some decisions and as I started with, the longer you wait the more things change, and the more complicated and changeable these decisions become. One of the main issues down there I think is infrastructure. Whether it's roads (because you have the DVP going through there) or whether it's servicing infrastructure (which is very important in the area), it needs to be all serviced. The road system isn't nicely lit, you've got new bridges and things to connect all the various - all the islands that the Don mouth goes in. So it's a pretty complicated tangle of infrastructure and I don't think anybody has really agreed yet on ultimately what the land uses should be. There's some really heavy industrial land uses that need the port. There's an aggregate camp there, there's still the ship channel which has active shipping, so there's still a lot of very economically viable port related uses down there. All you need to look at is Redpath, and the Lafarge concrete facilities. We're trying to move, you know, higher order land uses in there but we still, the economics of industry there is still working. So that's the complicated part, is all this has to happen with some kind of coordination and I think that's proven to be very challenging (E.Naylor, personal communication, October 5, 2015).

Due to the industrial history of the area, the current stakeholders at the mouth of the Don have been influential in the modifications of the naturalization design. As exemplified by Ritz, stakeholder perspectives at this site are one of the more difficult aspects to manage when attempting to naturalize such a large, post-industrial area:

I think, from a stakeholder perspective, there's a wide range of different stakeholders that are involved in this plan, and there's people like John Wilson who have been involved and actively engaged in port lands matters for a very long time. And there's other folks like that. But then there is also active industry...there are things that are currently happening there today. They don't see the river the same way that our stakeholders see the river. Then there's also, you throw in to the fray, the private land owners in the area that have development ambitions, and in any planning exercise this is always the case, but you have competing interests and you have different folks wanting to do different things with the land. Very much from our public stakeholders, the notion of revitalizing in lockstep with re-naturalization of the river valley is pretty important to them. Whereas with the industry, it's let us continue to do work that we're doing. Industry is incredibly challenging, you can't just relocate it, you can't just pick it up and say "ok you're going to go over here", because there's really only limited areas where the industry can actually go. The Port Lands offers a really unique location within the city. You've got the DVP, Gardiner, access to water, rail into the site, and it's in close proximity to the city's downtown. So all of the industries have expressed a desire to stay. There's also even, the developers enjoy the river valley because that increases their value with their land and the ability to use mix used development and maximize their profit.

After a long history of industrialization on the landscape, the potential shift in land uses in the area demonstrates that despite the necessity for flood protection, different types of private stakeholders are in disagreement. While developers are in favour of the naturalization as the key to unlocking land, industries that have maintained a presence in the Port Lands for decades are decidedly not in favour (C. Ritz, personal communication, August 21, 2015).

Port Lands Planning Framework: Land Use Direction

In 2014, the Port Lands Planning Framework was developed by the City of Toronto, Waterfront Toronto, and Toronto and Region Conservation Authority to serve as a blueprint to guide development and revitalization efforts in the Port Lands for the foreseeable future. This document aimed to establish specific land use direction, protect and establish parks and open space systems, identify the character and community services needed to guide development, provide conservation of heritage resources, and provide implementation and phasing direction for the Port Lands.

The importance of shipping is highlighted in this document, an industry that was the focal point of economic growth in the Port Lands for over a century. Much like the language in previous waterfront plans dating back to the Waterfront Plan of 1912 and especially the Waterfront Plan of 1967, the Port Lands are seen in this document as a region to be displayed: “The Port Lands has several major assets that will be capitalized on and showcased in revitalization efforts” (City of Toronto, 2014, p. 14). This desire to showcase the landscape comes from the ground breaking nature of the naturalization efforts in the Port Lands:

So, you know, we're doing this major, it's an awesome project really, creating a new river, not many cities or places in the world actually do that, and so the type of development that should go along with such a massive undertaking really needs to also be amazing and awesome and visionary, and something that isn't typical, right? So, a lot of everything that we do, you know we always talk about the Port Lands having this really unique context and so therefore, ergo, we should have unique everything else, right? So that, I think, is how we're sort of approaching it. And it doesn't necessarily mean that you know, we're doing this river valley which means that we're just going to have, you know, bedroom communities but it's about really creating a city within a city, is what we want. And with the land use direction, and some of the other important aspects of the Port Lands, because it's not just the river valley, but other important aspects of what the Port Lands are, the Ship Channel is also an amazing water feature that provides a very useful function for the city, a city-serving type use, with the port function. So we're trying to look at literally building a city within a city that has all of the other type of uses that any other city would potentially have (C. Ritz, personal communication, August 21, 2015).

The showcasing of Toronto's future plans for the mouth of the Don is also related to international inspirations of waterfront revitalization:

One of the examples I like to give is Hafencity city in Hamburg, it was a former port in Hamburg, and it doesn't have a river valley. It's on a river, it's the Elbe, it's a big river that runs through Hafencity. I can't remember the exact hectarage, but it's probably about 140 hectares or something like that, and so in our particular instance we are dealing with you know, 800 plus acres of land, 350 hectares of land, which, you're not

going to develop that out in the same amount of time that you're going to build that up, that's going to involve decades. Hafencity, they originally put, for that 140 hectares at least 25 years, and they're behind. So, we, the climb that we're creating now, is a 15 year plan. So, as long as we can get those first pieces completed that will enable development to proceed in steps as construction is starting to happen, then were flying, and all of the other pieces will fall once that's done (C. Ritz, personal communication, August 21, 2015).

In this instance, the time scale completion of the naturalization is being compared to similar waterfront revitalization in the international city of Hamburg in Germany. Additional international inspiration for the revitalization of the Port Lands came from Rotterdam, Netherlands, as well as Port Vell in Barcelona, Spain (City of Toronto, 2013). Many of the revitalization narratives in these cities were spurred by threats to development and urban land from flooding, the influence of the Olympic Games as a catalyst to gain funding, and an overall vision to create synergies between port function, economic activity, and public space (City of Toronto, 2013). These scenarios closely resemble many of the factors rationalizing Toronto's naturalization efforts. While Toronto once looked to other cities in the Great Lakes shipping network for inspiration and economic competition, the landscape revitalization of the Port Lands can now be compared on an international scale:

I would say that Toronto is placing itself not so much as it once did in a kind of Great Lakes framework of competition looking to the Cuyahoga, looking to the Chicago River and other Great Lakes cities and what they were doing – it's now putting itself in a global context. And it's looking to cities like Hamburg and Copenhagen and others who

have revitalized their waterfronts and seeking to do the same (J. Bonnell, personal communication, September 16, 2015).

The land use options in the Port Lands Planning Framework are cross referenced with revitalization objectives. Since the revitalization objectives have an economic focus, when combined with land use options the outcome is largely directed towards financial gain: “This option best serves the Port Lands’ function as a working port by providing the most land for this purpose with a contiguous dockwall. Additional opportunities for economic development are provided with lands available for synergistic uses, other employment uses, new city serving uses and green industries” (City of Toronto, 2014, p.43). The other land use options contain similar language, and thus it can be determined that economic prosperity is an integral component of the revitalization objectives in this document. This is confirmed by Ritz:

There’s lots of different factors that we take into consideration from a land use perspective. Obviously, it’s a core component of it, but, you know, there’s, whenever we do land use planning, what are the city building objectives that we’re actually trying to achieve? From a city perspective, it’s about maintaining some of the essential functions that happen down there for the long term to help build the city. It’s about creating great communities for people to live in around a new river valley. It’s about creating business for people to work and to grow our economy. So it’s not as simple as saying the river valley informs our land use. The river valley really helps to shape development, as opposed to dictating what land use might be (C. Ritz, personal communication, August 21, 2015).

One of the major takeaways from this quote is the concept that the naturalization features of the new river valley will shape development, and this re-emphasizes the City of Toronto’s

perspective on naturalization as a precursor to a city builder's project. The Phasing section of the Port Lands Planning Framework gives a brief description of the seemingly paradoxical relationship between naturalization and development: "The first phase unlocks development potential in Cousins and Polson Quays... The second phase of the DMNP unlocks the most amount of land for redevelopment, extending east of the Don Roadway in both the Port Lands and South of Eastern area south of the Go rail embankment" (City of Toronto, 2014, p.47). Under the section describing land use themes, one of the themes is titled "Supporting naturalization of the Don River and accelerating development" (City of Toronto, 2014, p.54). Ritz discusses how the ecological features of naturalization lead to development goals:

The river valley gives us the benefit of being able to unlock the lands, to allow for types of development, so there is that environmental component to it, without the river valley, we wouldn't be doing what we're doing today. The other aspect of it is we're potentially contemplating different uses, we wouldn't want to necessarily be putting our industrial uses next to our new river valley. Although we will, and continue to have- like Lafarge is going to continue to operate there and that's something at the mouth of the river so it's not inconceivable, and most cities, you know, a lot of their previous industrial areas, they're all located around water, so it's not unheard of that you have industrial along a river valley. But we are looking at land use differently along the river valley, not from an environmental perspective, per se, but because of the other benefits associated with the river valley...It's hard to pinpoint, like the wetlands, I think there's so many great features associated with the river valley, the Don greenway, and everything else, that it's going to attract a whole range of different types of uses and different things. You know, like I said, it's not the only thing that was taken in to consideration, certainly we

recognize what the benefits are of the naturalization, it's not driving how we're defining land use, it's a component, not the only thing (C. Ritz, personal communication, August 21, 2015).

Naturalization of the river's mouth is thus viewed by the City as the necessary flood protection to unlock lands for development, which will attract investment to the nearby commercial and real estate centres (City of Toronto, 2014; Lehrer and Laidley, 2008). It could be postulated that in the context of an urban site this large, bold land use changes such as the new river valley formation can only occur if the economic benefits are as high as the naturalization benefits:

It's not going to happen if it doesn't make sense. If it doesn't make sense economically, if it doesn't make sense societally, if it doesn't make sense ecologically. All of those three things have to come together, and these enormous projects, like relocating the mouth of the Don, is very substantial, and it can't be done on the basis of ecology and recreation, it has to be done on the basis of either protecting lives, saving lives, if the flooding was putting people at risk, then there's a justifiable cost to a catastrophic flood, so you might be able to find some money to do that. But even more important, is there's this economic potential of having land redeveloped. (E. Naylor, personal communication, October 5, 2015).

Chapter Conclusion

Although the landscape at the mouth of the Don River is transitioning to a post-industrial site, influences of urban land value, waterfront showcasing, and stakeholder conflicts continue to impact the Port Lands over a century after their creation. In this chapter, I have discussed the evolution of naturalization designs at the mouth of the Don River. The 2014 Don Mouth

Naturalization Plan Environmental Assessment rigorously compared alternatives of flood protection designs in the Port Lands through environmental and economic criteria. Input from developers and private stakeholders was revealed in the Port Lands Acceleration Initiative, and an amended design was created to maximize development opportunities and share naturalization costs with private industry. Refinements were made to the naturalization plan that accommodate expedited flood protection infrastructure as a necessary component to development. The costs of naturalization, largely associated with the integration of infrastructure and flood protection features, were impactful in shaping the finalized 4WS amended alternative design. Thus, despite the fact that design alternatives were evaluated for their environmental integrity, economic and stakeholder influences helped to shape the amended reconfiguration of the river's mouth design. While economic considerations within the context of an urban environment have always been a component of the DMNP, the evolution of naturalization designs at the mouth of the Don River and its integration with other planning priorities reveal how the implementation of a restored river valley will be completed to meet the needs of a city builder's project.

Conclusion

The relationship between nature and the city at the mouth of the Don River has been impacted substantially by economic, social, environmental, health and political influences over the course of its history. The site's early history is marked by modernist and rational comprehensive planning efforts that sought to control, modernize, and harness natural systems. Projects such as the Don Improvement Project aimed to channelize and control the functionality of the river, and the Port Lands themselves were created as an industrial parcel of lake-filled land with the sole purpose of industrial growth. The natural processes of Ashbridge's Bay Marsh were altered due to the potential threat to human health and economic vitality, and the landscape was transformed to meet the city's perceived needs. The showcasing of nature and emphasis on aesthetic quality in the Waterfront Plan of 1967 further emphasized this lack of inherent value associated with natural systems at the mouth of the Don. The manipulation of nature and emphasis on aesthetic showcasing continues in current planning processes at the site. However, the Don Mouth Naturalization Plan differs as an attempt re-create ecological function within a landscape that was already severely disrupted by human influence. Since returning the landscape to an alluvial marsh is not feasible within an urban port, nature is still controlled (i.e. through sediment control and the man-made re-routing of the river's path), though it is controlled in an attempt to mimic natural processes.

As planning policies and decision-making shaped land use at the site over time, a shift became evident away from ideologies emphasizing control and dominance over natural systems. In its place, a new conception of nature in the city has been realized in planning policy and

design that integrates natural processes within the functional urban framework of Toronto. The proposed naturalization efforts currently in place at the site represent a reconstruction of nature as a new type of territory. This reconstruction of nature accommodates and improves ecological function in the region, and this closely matches the vision of urban ecology valued and envisioned by Michael Hough. While current amendments to the river mouth also contribute to economic growth through development potential, the primary function of flood protection and natural linkages to the lake remain integral aspects of the naturalization effort. Early recognition and influence by community task forces and the conservation authority was integral in maintaining this aspect of the project. The ties between flood protection and development potential as a method to finance the naturalization is one of the more necessary relationships revealed in transforming a landscape so large.

Planning at the Toronto waterfront in the 20th century often failed to adapt to changing economic conditions, and did not adapt to environmental conditions until after the fallout of Hurricane Hazel. Adapting the vision of naturalization to the realities of an urban landscape was essential to the formation of the current amended design for the Don Mouth Naturalization Plan. Planning is an iterative process, and while adapting to changes within the landscape has led to the alteration of designs at the river mouth, the initial vision of naturalization has been maintained. This has been greatly influenced by collaboration efforts between the municipality and groups such as the Task Force to Bring Back the Don during the environmental movement, and exemplifies the importance of governance and management in shaping landscapes along the waterfront.

The formation of the Toronto Harbour Commission was instrumental in shaping the landscape at the mouth of the Don River, as their sweeping powers converted the mouth of the Don into an industrial zone. As governance of the resources along the waterfront changed, the landscape at the mouth began to be viewed for its potential to reconnect with natural elements lost during the construction of the current Port Lands. The modernist-style of grandiose planning established by the Toronto Harbour Commission as a method to excite the public began with the creation of those lands, and has been relevant at this site ever since. From multiple Olympic Games bids and international events to a naturalization plan that rivals international waterfronts, the landscape at the mouth of the Don continues to be subject to showcasing. While this is telling of what the landscape has been valued for, economic development in the 21st century and grand waterfront plans can be seen as a tool for naturalization, yet also vice versa. In the 20th century, the river mouth was valued for its potential to create an industrial mecca within the Great Lakes shipping network. However, the current Don Mouth Naturalization Plan reveals how the land is valued ecologically, socially, and economically. In a movement away from the river mouth's history of environmental neglect, current governmental forces managing the waterfront have used economic development in tandem with naturalization to design a reconstruction of nature in the city.

Future Research

As a landscape transitioning from heavy industrial use, study of the Don River mouth and its planning history demonstrates a need for future research to examine post-industrial landscapes as they transition to new economies, using naturalization as a tool for waterfront revitalization. Cities with industrial histories along their waterfronts that are in the process of

changing land use direction could benefit from understanding the factors influencing landscape change at the mouth of the Don. Changing forces of capital at the Don's mouth is an additional avenue for research, as it could be argued that economic value is now being exchanged through real estate and commercial development as a result of naturalization implementation, whereas capital was traditionally gained through industrial uses. Due to the constraints of large scale naturalization efforts in an urban setting, future research could also examine the differences between similar-sized projects in various types of landscapes, ranging from rural to urban.

While flood protection requirements were a significant and necessary catalyst in achieving naturalization plans at the site, future research could assess the economics of flooding in coastal deltas that have greater inundation risk and vulnerability, as well as cities located in riparian floodplains. The cycle of increased funding for naturalization projects as flood risk increases is an avenue for future research, particularly as climate change worsens ecological vulnerability in cities. The international role of Toronto as a global city would also be useful in understanding how large scale naturalization in cities can become an effective tool for showcasing on a larger scale. The neoliberal economic system prevalent in North American cities could be a factor in the implementation of large scale naturalization projects, due to the economic value assigned to urban land. Additionally, the planning frameworks in Ontario that require approvals from multiple stakeholders can result in planning projects that must accommodate a variety of planning goals. Future study could determine the applicability of these types of projects in a different political economy, where more powerful governmental bodies value landscapes differently than private industry.

As the Don Mouth Naturalization Plan is implemented, future research could examine if the resulting landscape differentiates from the intended design, and if so, what those

discrepancies reveal about planning design and practice in a naturalization plan of this scale. The barriers to overcoming the disparity between design and practical implementation could reveal the difficulties of planning in an urban area with a history of a vastly different land uses. The process of overcoming these barriers in the design stage, such as the way costs were shared and functional port activities were accommodated, has relevance to other cities struggling to accommodate stakeholder demands in contested urban space. As evidenced by naturalization efforts at the Don River mouth, building strong economic arguments to support naturalization strategies and adapting to the realities of urban land use is an integral aspect of re-establishing the connection between humans and nature in cities.

References

- Alberti, M., and Marzluff, J.M. (2004). Ecological resilience in urban ecosystems: linking urban patterns to human and ecological functions. *Urban Ecosystems*, 7, 241–265.
- Alberti, M. (2008). *Advances in urban ecology*. New York, NY, USA: Springer Science.
- Beatley, T. (1989). Environmental ethics and planning theory. *Journal of Planning Literature*, 4(1), 1-32.
- Beatley, T. (2011). *Biophilic cities: Integrating nature in to urban design and planning*. Washington, DC, USA: Island Press.
- Beauregard, R. (1989). Without a net: Modernist planning and the post-modern abyss. *Journal of Planning Education and Research*, 10(3), 189-193.
- Bonnell, J. (2014). Reclaiming the Don: An environmental history of Toronto's Don river valley. Toronto, ON, Canada: University of Toronto Press.
- Bonnell, J. (2010). Imagined futures and unintended consequences: An environmental history of Toronto's Don River Valley. Ph.D. Dissertation, *Graduate Department of Theory and Policy Studies in Education, University of Toronto*. 1-394.
- Corner, J. (2006). Terra fluxus. In C. Waldheim (Ed.), *The landscape urbanism reader* (pp.21-33). New York: NY, USA: Princeton Architectural Press.
- Cranz, G., and Boland, M., (2004). Defining the sustainable park: A fifth model for urban parks. *Landscape Journal*, 23(2), 102–120.
- Cronon, W. (1996). *Uncommon ground: Rethinking the human place in nature*. New York, NY, USA: W.W. Norton & Company, Ltd.
- Desfor, G. (2011). *Reshaping Toronto's waterfront*. Toronto, ON, Canada: University of Toronto Press.
- Dietz, M. (2007). Low impact development practices: A review of current research and recommendations for future directions. *Water Air Soil Pollution*, 186, 351-363.
- Don Valley Conservation Authority. (1950). Don Valley Conservation Report. *Department of Planning and Development*, 1-95.

Duany, A., and Talen, E. (2013). *Landscape urbanism and its discontents*. Gabriola Island, BC, Canada: New Society Publishers.

Duany Plater-Zyberk and Company. (2014). *More about the transect*. Retrieved <02/22/15>, from <<http://www.dpz.com/Initiatives/Transect>>.

Ehrenfeld, J. (2000). Evaluating wetlands within an urban context. *Ecological Engineering*, 15, 253-265.

Gilbert, L. (2015). *Lecture 2: Re/discovering the origins of design*. [PowerPoint slides]. ENVS 6132 Environmental Design.

Gilbert, L. (2015). *Lecture 3: Re/visiting urban design*. [PowerPoint slides]. ENVS 6132 Environmental Design.

Gobster, P.H. (2001). Visions of nature: Conflict and compatibility in urban park restoration. *Landscape and Urban Planning*, 56, 35-51.

Google Maps. (2015). Retrieved <October 31, 2015>, from <<https://www.google.co.uk/maps/place/West+Don+Lands,+Toronto,+ON,+Canada/@43.6490902,79.3549487,14.67z/data=!4m2!3m1!1s0x89d4cb15a75e7ee9:0x689e0dbb745bb1f9>>

Government of Canada. (2005). *Audit of the Toronto Waterfront Revitalization Initiative*. Retrieved <05/21/2015>, from <<http://www.cic.gc.ca/english/resources/audit/twri.asp>>

Hodge, G., and Gordon, D. (2013). *Planning Canadian communities*. Toronto, ON, Canada: Nelson Thompson.

Hough, M. (1983). The urban landscape: The hidden frontier. *Association for Preservation Technology International*, 15(4), 9-14.

Hough, M. (1995). *Cities and natural process*. New York, NY, USA: Routledge.

Howard, E. (1965). *Garden cities of to-morrow*. Boston, MA, USA: MIT Press.

Jacobs, H.M. (1995). *Contemporary environmental philosophy and its challenge to planning theory*. In Sue Hendler (ed.) *Planning Ethics: A Reader in Planning Theory, Practice and Education*. New Brunswick, N.J.: Centre for Urban Policy Research. pp. 83-103.

Lehrer, U., and Laidley, J. (2008). Old megaprojects newly packaged? Waterfront redevelopment in Toronto. *International Journal of Urban and Regional Research*, 786-803.

Loukaitou-Sideris, A. (2012). Addressing the challenges of urban landscapes: Normative goals

- for urban design. *Journal of Urban Design*, 17(4), 467–484.
- Marsh, W. (2010). *Landscape planning: Environmental applications*. USA: Wiley.
- McHarg, I. (1969). *Design with nature*. New York, NY, USA: Natural History Press.
- Municipality of Metropolitan Toronto. (1994). *The Metropolitan Waterfront Plan*. The Metropolitan Planning Department.
- Michael Van Valkenburgh Associates Inc. (2010). Lower Don Lands Framework Plan. Brooklyn, NY, USA.
- Michael Van Valkenburgh Associates Inc. (2015). *Lower Don Lands*. Retrieved <October 26, 2015>, from < <http://www.mvvainc.com/project.php?id=60>>.
- Mundigo, A., and Crouch, D. (1977). City planning ordinances of the Laws of the Indies revisited. *The Town Planning Review*, 48(3), 247-268.
- Ndubisi, F. (2002). *Ecological planning: A historical and comparative synthesis*. Baltimore, ML, USA: John Hopkins University Press.
- Pickett, S., Cadenasso, M., Grove, J., Nylon, C., Pouyat, R., Zipperer, W., and Costanza, R. (2001). Urban ecological systems: Linking terrestrial ecological, physical, and socioeconomic components of metropolitan areas. *Annual Review of Ecology, Evolution, and Systematics*, 32, 127-157.
- Platt, R., Rowntree, A., and Muick, P. (1994). *The ecological city: preserving and restoring urban biodiversity*. USA: University of Massachusetts Press.
- Rahder, B. (2010). When rationality is unreasonable: Planning theory in Sri Lanka. *The Planning Research Journal*, 2(2), 1-10.
- Reeves, W. (1992). *Visions for the metropolitan Toronto waterfront 1: Toward comprehensive planning, 1852-1935*. University of Toronto, Centre for Urban and Community Studies, University of Toronto, 1-109.
- Royal Commission on the Future of the Toronto Waterfront. (1990). Interim Report August 1990. Toronto, ON, Canada.
- Spirn, A. Whiston (2000). Ian McHarg, landscape architecture, and environmentalism: Ideas and methods in context. In M. Conan, *Environmentalism in landscape architecture*. Washington, DC: Dumbarton Oaks Research Library and Collection.
- Steiner, F. (2011). Landscape ecological urbanism: Origins and trajectories. *Landscape and Urban Planning*, 100, 333-337.

- The Metropolitan Toronto Planning Board and the Metropolitan Council. (1967). *The waterfront plan for the metropolitan Toronto planning area*, 1-67.
- The Task Force to Bring Back the Don. (1991). *Bringing back the Don*. Toronto, ON, Canada: Planning and Development Department.
- Toronto and Region Conservation Authority. (2015). *Flood protection*. Retrieved <09/20/2015> from <<http://www.trca.on.ca/protect/water-management/flood-protection.dot>>
- Toronto and Region Conservation Authority. (2014). *Don mouth naturalization and Port Lands flood protection project environmental assessment*.
- Toronto and Region Conservation Authority. (2015). *Don mouth naturalization and Port Lands flood protection project*. Retrieved <03/16/2015>, from <<http://trca.on.ca/the-living-city/green-infrastructure-projects/environmental-assessment-projects/don-mouth-naturalization-and-port-lands-flood-protection-project/>>
- Toronto and Region Conservation Authority. (2015). Don River watershed plan. Retrieved <09/03/2015>, from <<http://www.trca.on.ca/the-living-city/watersheds/don-river/don-river-watershed-plan.dot>>
- Toronto and Region Conservation Authority. (2010). *Low impact development stormwater management and planning and design guide*.
- Toronto and Region Conservation Authority. (2010). *The history of flood control in the TRCA*. Retrieved <09/02/2015>from <<http://www.trca.on.ca/dotAsset/18310.pdf>>
- Toronto and Region Conservation Authority. (2011). *The living city report card*.
- Toronto, City of . (1999). *Our Toronto waterfront! Wave of the future*.
- Toronto, City of.. (2000). Our Toronto waterfront! Building momentum. Retrieved <01/23/2015>, from <http://www1.toronto.ca/city_of_toronto/waterfront_secretariat/files/pdf/staffreport.pdf>
- Toronto, City of. (2004). *Central waterfront plan. Making waves: Principles for building Toronto's waterfront*.
- Toronto, City of. (2012). Port Lands acceleration initiative.
- Toronto, City of. (2012). Port Lands acceleration initiative. Appendix 9: Flood protection strategy.
- Toronto, City of. (2013). *Port Lands profile*. Toronto, ON, Canada: City of Toronto, City

Planning – Toronto and East York District.

Toronto, City of. (2014). *Port Lands planning framework: Land use direction*. City of Toronto, City Planning - Toronto and East York District.

Toronto Waterfront Revitalization Task Force. (2000). *Our Toronto waterfront: Gateway to the new Canada*.

Toronto Harbour Commission. (1912). *The waterfront plan of 1912*.

Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Ka'zmierczak, A., Niemela, J., James, P. (2007). Promoting ecosystem and human health in urban areas using green infrastructure: A literature review. *Landscape and Urban Planning*, 81, 167–178.

University of Toronto Libraries. (2015). *Don Valley historical mapping project*. Retrieved <06/23/2015>, from <<https://maps.library.utoronto.ca/dvhmp/maps.html>>.

Van der Ryn, S., and Cowan, S. (1995). *Ecological design*. Washington, DC, USA: Island Press.

Waldheim, C. (Ed.). (2006). *The landscape urbanism reader*. New York: NY, USA: Princeton Architectural Press.

Wilkinson, C. (2011). Social-ecological resilience: Insights and issues for planning theory. *Planning Theory*, 11, 148-169.

York Space Institutional Repository. (2011). *River Don straightening plan, showing lands to be expropriated, 1888*. Retrieved <02/04/2015>, from <<http://yorkspace.library.yorku.ca/xmlui/handle/10315/1210>>.

Interview References

Bonnell, Jennifer. Title: Professor in the Department of History at York University, published author of *Reclaiming the Don*. (2015, September 16). [Interview with Jennifer Bonnell].

Naylor, Eha. Title: Practice Lead/Director at Dillon Consulting Limited, former colleague of Michael Hough. (2015, October 5). [Interview with Eha Naylor].

Ritz, Cassidy. Title: Project Manager in Future Planning at the City of Toronto for Port Lands. (2015, August 21). [Interview with Cassidy Ritz].

Wilson, John. Title: Former Task Force to Bring Back the Don Chair. (2015, August 19). [Interview with John Wilson].