Avian Urban Dwellers: Opportunities To Increase Bird Habitat And To Enrich The Human - Urban Birds Experience Within Winnipeg's Urban Environment

This Practicum Report is submitted to the Faculty of Graduate Studies in partial fulfillment for the degree of Master of Landscape Architecture.

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March 2007

THE UNIVERSITY OF MANITOBA

FACULTY OF GRADUATE STUDIES

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Avian Urban Dwellers: Opportunities To Increase Bird Habitat And To Enrich The Human – Urban Birds Experience Within Winnipeg's Urban Environment

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Reesa Cowan

A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of Manitoba in partial fulfillment of the requirement of the degree

Master of Landscape Architecture

Abstract

This practicum is a reaction to the lack of bird habitat within Winnipeg's urban area, specifically the Exchange District. Planning and design decisions have a huge influence on the urban landscape, which in turn has an impact on animal diversity. At certain scales, a connection exists between the scale-dependent decisions of humans and their effect on different species of animals. Human decisions interact across scales to ultimately determine the specific location of a species. This can inform ways in which landscape architects and ecologists collaborate to understand human habitat and its effect on bird communities, especially in urban areas.

This investigation will discuss the relationship between the human species and the bird family throughout history. What is it about birds that evoke so much interest, joy and curiosity and how can that be channeled into our everyday lives? This investigation will also examine, two existing urban areas that have made deliberate efforts to encourage bird activity within their urban environments. We are only beginning to understand the benefits of the interaction between humans and the natural environment, creatures included. Humans have an intrinsic need to be connected with living things. An environments' ecological health directly impacts its inhabitants. Urban areas are no exception, and its health intimately affects its citizens, both human and other living beings.

The goal of this practicum is to develop an existing non-descript space within Winnipeg's Exchange District into a place that supports a greater breadth of bird life than it does presently. An examination of the bird species that are currently found in the area was conducted. Three species that are not currently present but are potential inhabitants of this urban greenspace was identified and carefully assessed. This place has been designed as a feeding ground and/or resting location for migratory species, it will provide protective cover and nesting habitat for year round species and it will become a place for people to enjoy watching and interacting with birds. Not only can the enhancement of urban biodiversity have a positive influence on the people within the downtown, it can also have a direct economic impact as residential properties adjacent to greenways or urban parks have a higher market value than similar non-adjacent properties.

For my parents: Thank you for your unconditional love and every opportunity.

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Introduction

Bird watching is the second most popular hobby in North America, with 65 million participants, second only to gardening, and often these two go hand in hand. It is estimated that one in three households in North America feed birds, spending more than $500 million annually on seed. The relationship between humans and birds has existed since human history. Humans have an intrinsic need to be connected with living things and there is no doubt that nature has the capacity to restore the mind, relieve stress, inspire and educate. We are only beginning to understand the benefits of the interaction between humans and the natural environment, creatures included. An environments' ecological health directly impacts its inhabitants. Urban areas are certainly no exception, and its health intimately affects its citizens, both human and other living beings. The presence of birds, or lack of it, is a strong indication of an environments' health as birds are quite sensitive creatures.

We share a planet, a region, a city and a community, yet we are only exposed to small glimpses of the complex world of birds. Located in the centre of North America, Winnipeg, Manitoba lies within two important bird conservation regions: The Prairie Pothole Region and the Boreal Hardwood Transitional Region. The landscape hosts a large proportion of the migratory species which use the Mississippi Flyway Migration Route, this translates into a large number of diverse species living in and passing through the region every year. In all there are about 382 species of birds found in Manitoba making it a bird watching hot spot. Within Winnipeg's suburban communities and large parks we find a high level of species diversity and healthy populations where many wonderful birds can be enjoyed. Unfortunately, within Winnipeg's urban environment, there are very few similar opportunities, as the level of species diversity is low. The Manitoba Naturalists Society as well as the City of Winnipeg's Naturalist Department reference several habitat rich locations around the City of Winnipeg to watch birds and other forms of wildlife, none of which are within Winnipeg's downtown area.

> The outlook for bird populations in North America is mixed. All birds face a multitude of threats, and although some species are increasing in numbers, such as the Peregrine Falcon and House Finch, the populations of many others are declining dramatically. Virtually all of these declines are related to human activities. The destruction and modification of habitat is by far the most significant factor affecting birds (Sibley 2000).

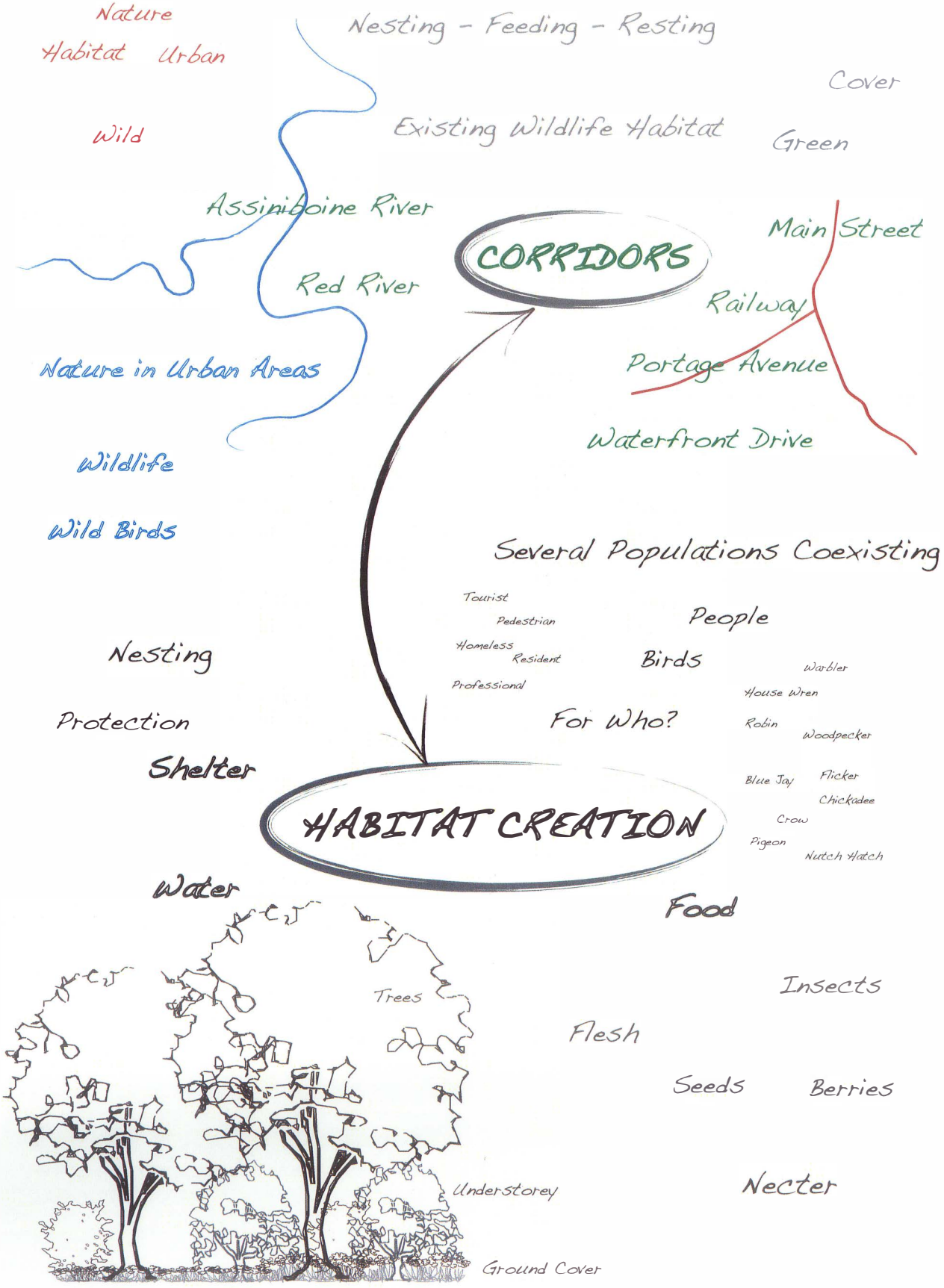
This practicum is a reaction to the lack of bird habitat within Winnipeg's urban area, specifically the Exchange District & it explores the following:

1) What is the human-bird relationship?
2) What are the components of rich bird habitats?
3) How does Winnipeg's urban environment support bird life?
    a. What is the existing spatial distribution of areas favorable for bird habitat in Winnipeg's urban environment?
    b. What bird species are currently found in Winnipeg's urban environment?
    c. What additional bird species could be encouraged to inhabit Winnipeg's Exchange District in an effort to increase species diversity and enrich the human-bird interface? What are the components or elements that are lacking in order to achieve this?

This investigation will discuss the relationship between the human species and the bird family throughout history. What is it about birds that evoke so much interest, joy and curiosity and how can that be channeled into our everyday lives? This investigation will examine, two existing urban areas that have made deliberate efforts to encourage bird activity within their urban environments.

The goal of this practicum is to develop an existing non-descript space within Winnipeg's Exchange District into a place that supports a greater breadth of bird life than it does presently. An examination of the bird species that are currently found in the area will be conducted. Three species that are not currently present but are potential inhabitants of this urban greenspace will be identified and carefully assessed. This place will be designed as a feeding ground and/or resting location for migratory species, protective cover and nesting habitat for year round species and as a place for people to enjoy watching and interacting with birds.

Certainly large parks with natural habitats are extremely beneficial but not all efforts need to be grand in scale. Small urban pockets of habitat can serve a significant function by creating a network of habitat rich spaces or islands that can support birds within Winnipeg's urban environment. Reducing the impact of urbanization on biological diversity such as avifauna is a high conservation concern, one that should be incorporated into urban planning and development (Walsh, 2005). In the future, this work could be used as a model for developing additional spaces within Winnipeg's urban environment into rich bird habitat benefiting both biodiversity and increasing the frequency of human-bird interactions.


Nature
Habitat
Urban
Wild
Nesting - Feeding - Resting
Cover
Existing Wildlife Habitat
Green
Assiniboine River
Red River
CORRIDORS
Main Street
Railway
Portage Avenue
Waterfront Drive
Nature in Urban Areas
Wildlife
Wild Birds
Several Populations Coexisting
Tourist
Pedestrian
Homeless
Resident
Professional
People
Birds
For Who?
Warbler
House Wren
Robin
Woodpecker
Blue Jay
Flicker
Chickadee
Crow
Pigeon
Nutch Hatch
Nesting
Protection
Shelter
HABITAT CREATION
Water
Food
Trees
Insects
Flesh
Seeds
Berries
Necter
Understorey
Ground Cover

Chapter One Bird Culture and the Human Experience

The relationship between humans and birds has existed since human history and we have always been linked with birds in some capacity. They have served humans in utilitarian positions such as war, land discovery, food sources, educational tools, hunting and as security measures. Equally birds have been important sources of inspiration for artists, writers, religions and folklore. Most cultures throughout the world utilize birds in some manner, from First Nation Totems to Irish Folklore to Greek Mythology, birds have always been respected, feared and admired.

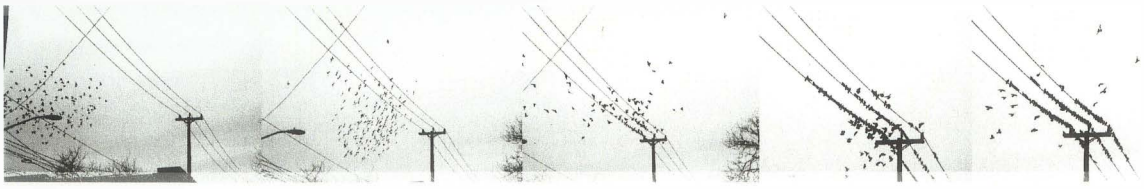
Several cultures credit birds with creating the earth, creating life. Finland's great national epic, the *Kalevala,* featured a duck and her eggs, which become the earth and the sky (Gibson 2005). The earliest human record of a bird has been found in the form of Egyptian hieroglyphs. A product of self generation, The *Benu* bird, depicted as a heron-like creature on the walls of many pyramids and ceramics, was believed to be a creator. This heron laid the egg that became the Egyptian sun god, whose form was that of an eagle-like bird with fiery wings of orange and red, an avian deity, who created the world. As it built a nest of cinnamon bark, the bird god would begin to burn and finally succumb to the flames. Its successor was reborn out of the ashes, a cycle that was said to continue for 500 years. The Greeks later labeled this the Phoenix.

Birds are often seen as prophets, strong signals of things to come. They can be indications of upcoming battles, as it was commonly believed that crows and ravens could smell death before it arrived. As a failed messenger of Noah, their ominous cawing voice and sharp intelligence continue to shed dark suspicious shadows over the crow and raven's activity. It was common practice for Scandinavian sailors to bring crows aboard and use them as navigational tools. The assumption was that crows are land birds and will fly great distances to reach land, as land meant food. A low ranking sailor would be posted high up along the ship's mast to watch the direction and flight once the bird was released, hence the term 'crow's nest.' As a species native to North America, the American Crow

and Common Raven can be observed to be extremely dedicated parents, providing an abundance of food as well as to be fierce protectors and loyal partners. Lumberjacks and similar trades considered many crows and ravens to be their companions when away from home for long periods of time. The men would feed the birds scraps of food and talk endlessly to them and the birds in return would follow them from camp to camp, loyal to handouts. Crows and ravens are exceptional when it comes to adapting to different environments, which is why they can be found in almost every forest type as well as within the densest of urban areas. The crow's failure with Noah was the defining opportunity for the dove, as it returned to Noah with an olive branch, a symbol that the flood had ended. Henceforth our association with the dove is one of peace, hope and trust.

An important food source during the Middle Ages, doves and pigeons were raised in 'dovecotes', an architectural advertisement of high social standing. These structures were typically large brick buildings with hundreds of recessed notched where the birds would roost.

In addition to the valued meat, their feathers were used in mattresses and quilts, their manure was used for fertilizing the fields and as an important component in manufacturing gunpowder. Dovecotes slowly went out of fashion as once firm ownership restrictions were lifted allowing common people to build dovecotes. Pigeons have been bred as carriers of messages, especially useful during times of war and are still domesticated and bred for racing.



By 2000 BC, falconry was well establish in the Middle East. Birds of prey were trained and handled by humans for hunting purposes as well for war tactics. Observations would be made and falcons would be sent out to kill the messenger pigeons of the enemy. By the end of the 18th Century it had already become something of a rarity to see a trained falcon at work in the British countryside. Traditionally the birds were obtained by stealing young birds directly out of their nests in the wild. This activity and black market trading is illegal and closely monitored today. There is an extensive list of falcon breeders in North America, the average price of a 'hacked' (trained) falcon is $1500 US Dollars. This activity, sport and business is very much alive, the North America's Falconers Association boasts 3000 active members, with a mandate of "Working to Conserve Birds of Prey in Nature" through their extensive breeding and release program.

Courtesy: Mark Robb

Feathers, an important symbol to many peoples, as signs of power, prayer and honour. Arrows are flanged with the feathers from geese – to represent the arrow's long and successful flight. Canada's First Nations and Native American Tribes hold the sacred 'Eagle feather' in the highest regard, as something to be earned and treated with the utmost of respect for the eagle flies the highest and sees the furthest of all creatures. It is intimately linked to the Creator. Being two toned, the 'Eagle feather' represents the creation; the light and the dark; the trees and the water; life and death; and summer and winter.

> The first creations on the Earth here, before man, were the birds. The eagle was the king bird of this world….This is the native teaching from way back: when we make a prayer, the eagle gets our prayers, and he takes them to the Creator, as close as he can get to the Creator, and he lets them go. - Farley Eaglespeaker, 2006

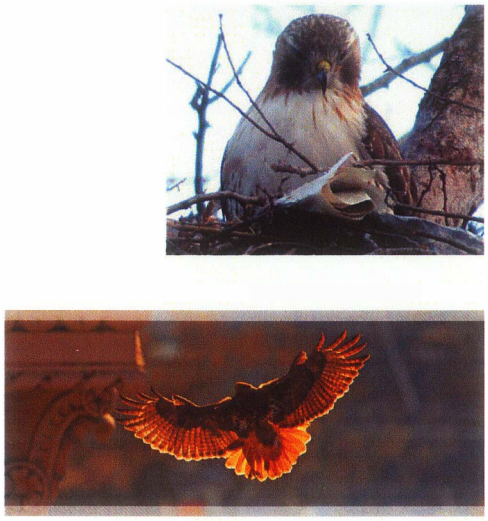
Wildlife officials have an extremely long waiting list of people wanting an 'Eagle feathers' or entire birds, as it is illegal to possess any part of an eagle and if charged, this act can carry a serious fine (up to $50,000) and a six month jail sentence. Regrettably there is a black market, whether it is on the internet or through Pow Wow gatherings, people are buying feathers, talons and entire birds which were illegally harvested. The bodies are ending up as mounted trophies, talons are being incorporated into wood-carvings and sold in galleries and prized 'Eagle feathers' are false claims of honor. In February of last year, fifty mutilated remains of bald eagles were found on two Reserves in North Vancouver, investigator still have not laid charges.

Man is the only singing primate; a fact that may cast some light on the connection between humans and birds (Gibson, 2005). We have had a long relationship with the avian world. Birds have existed for millions of years; we on the other hand are a relatively new creature. Birds represent the 'ancient lineage of life (Gibson 2005), and we are envious of their freedom. To watch them is to get to know them, an activity, in which one can loose themselves in and become just as the rocks, as the trees and as the wind. Birdwatching is an activity that connects us with the natural world and interjects an overdue reminder of our place within nature.

People who haven't caught onto the activity often find it difficult to understand what all the fuss it about. Why is watching and learning about birds so fascinating? The late Roger Tory Peterson, whose field guides made bird identification easier, believed it was because birds are the most vivid expressions of life. After all, they demonstrate behaviors and characteristics we humans find admirable: beautiful plumages; elaborate musical singing; courtship of mates; dedicated raising of offspring; defenders of home territory; and, perhaps most wondrous of all, flight - something humans have only mastered in the past 100 years. Birds, for me, are wondrous. I am amazed at the distance they travel, the secret lives they lead and the sheer beauty of their forms, colors and talents.

With more North Americans living urban lives, making the connection to nature is essential, if people care about protecting the environment. The National Audubon Society boasts that over 400,000 of its members develop grassroots conservation programs in their communities. The desire to get involved and to be connected is undeniable.

> New Yorkers have found new connections with each other, high above New York's Central Park, a truly remarkable event is unfolding. In the midst of this busy city, a bold and daring red-tailed hawk has taken up residence. Affectionately known to locals as "Pale Male," the hawk courts, breeds, and hunts as its devoted urban fans root for its survival. After unexpected perils, triumphs, and tragedies, onlookers gaze in rapt anticipation as the hawk's chicks prepare to take their first tentative flight from a nest on the ledge of a luxury apartment building. "Pale Male" is a rare glimpse of the survival techniques of one of nature's great predatory creatures, and a surprising account of the magical relationship humanity can have with nature (www.Palemalethemovie.com).



Pale Male
Courtesy: Lincoln Karim

With their natural melodies, gift of freedom and delicate nature, birds have been inspiring poets, artists and composers for hundreds of years. In several recent musical reviews the label of '*singer*', has is often been replaced with the term '*warbler*'. One of the few artists who left copious notes about the relationship of bird song to his musical efforts was 20thcentury French composer Olivier Messiaen. Much of his music contains bird calls, such as "Oiseaux Exotiques" ("Exotic Birds") for piano and chamber orchestra, "Catalogue D'oiseaux" ("The Complete Bird Music") for piano and the haunting "Abime des Oiseaux" ("The Abyss of the Birds") for solo clarinet. Messiaen used bird song in his compositions symbolically and as direct sources of melody (Dixon 2000).

In the late spring of 1787, Wolfgang Amadeus Mozart held a formal funeral for his beloved pet starling, where he read a poem that he created in honor of his friend. It is thought that Mozart enjoyed the companionship as well as the natural musical compositions that the bird sang. Historical documents show the recorded expense, including the price and date as well as a small musical hand notation illustrating the bird's melody at the time of the purchase. To Mozart's delight the bird's melody was strangely a small portion of the last movement of his Piano Concerto in G major, K.453. He couldn't resist the bird, which sang his music. He believed that by some means the bird must have been exposed to his music through the shopkeeper. Concerto, shop-keeper, starling or starling, Mozart, Concerto? This will never be known.

The Roar of the Greasepaint – the Smell of the Crowd is a 1966 musical about two unequal men on a journey filled with unfairness, one-upmanship and deceit masked as friendship. The moment arises when the character who has been manipulated for such a long time finally overthrows the greedy companion after a tiring voyage of mind games. The moment is celebrated as he croons the song: "Feeling Good" by Anthony Newley and Leslie Bricusse, a song that has been subsequently performed by several major recording artists, most notable, Sammy Davis Jr., Michael Buble and Nina Simone.

Feeling Good

Birds flying high
You know how I feel
Sun in the sky
You know how I feel
Reeds driftin' on by
You know how I feel
It's a new dawn
It's a new day
It's a new life
For me
And I'm feeling good

Fish in the sea
You know how I feel
River running free
You know how I feel
Blossom in the tree
You know how I feel
It's a new dawn
It's a new day
It's a new life
For me
And I'm feeling good

Dragonfly out in the sun you know what I mean, don't you know
Butterflies all havin' fun you know what I mean

Sleep in peace when the day is done
And this old world is a new world
And a bold world
For me

Stars when you shine
You know how I feel
Scent of the pine
You know how I feel
Yeah freedom is mine
And I know how I feel
It's a new dawn
It's a new day
It's a new life
For me

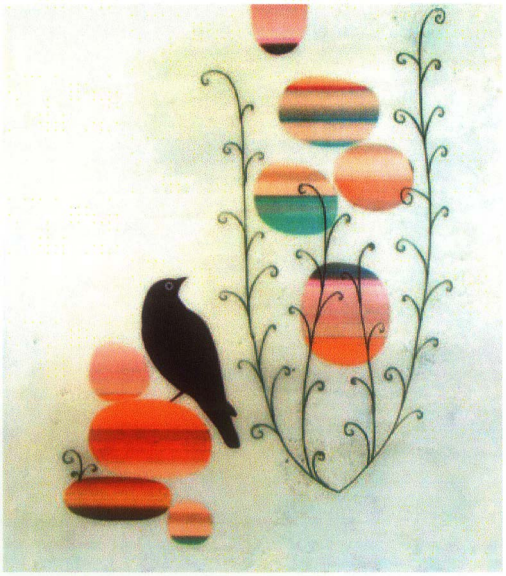
And I'm feeling good

Sketching and painting almost 500 of North America's bird species, James John Audubon (1785-1851) spent much of time studying nature and birds with extraordinary vigor and interest, his work published as "The Birds of North America". Most other wildlife artists presented just the specimen, but Audubon was also interest in their habitat, their diets and their behaviors, all of which can be studied in his work. He had no role in the creation of The National Audubon Society that exists today. It was named by one of the founders, in the late 1800s, who was aware of Audubon's works and who was tutored by Audubon's widow Lucy.

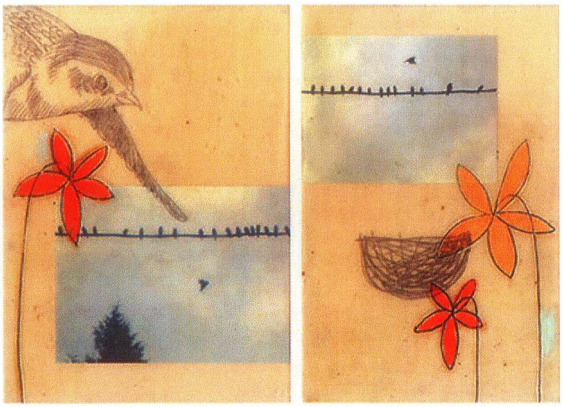
Born in Toronto, Ontario, Robert Bateman is possibly Canada's premiere Naturalist painter, who has set himself apart by concerning himself with the larger picture rather than the tiniest of details, much like Audubon. Admittedly, he reports, it hasn't come easily and it is work rather than a labor of love, a labor that defines his existence. His masterpieces can take your breath away like you have never seen them before:

I feel much wildlife art is just the opposite. When you see it, you feel you have seen it a thousand times before – yet another wolf, or another loon, or some other overworked subject done in the same old way. And, it looks as if it is done with a great deal of effort – every feather or every hair painted in great detail, but no sense of form or air or space or time, and often flat as a pancake. I can't conceive of anything being more varied and rich and handsome than the planet Earth. And its crowning beauty is the natural world. I want to soak it up, to understand it as well as I can, and to absorb it…and then I'd like to put it together and express it in my painting. This is the way I want to dedicate my life (www.robertbateman.com).

Today there is much more whimsy found in artists who focus on the natural world as their subjects. An up and coming contemporary artist whose latest collection has been deeply inspired by birds, is Amy Ruppel from Portland, Oregon, describes her work as "painting with scissors and fire instead of a brush".



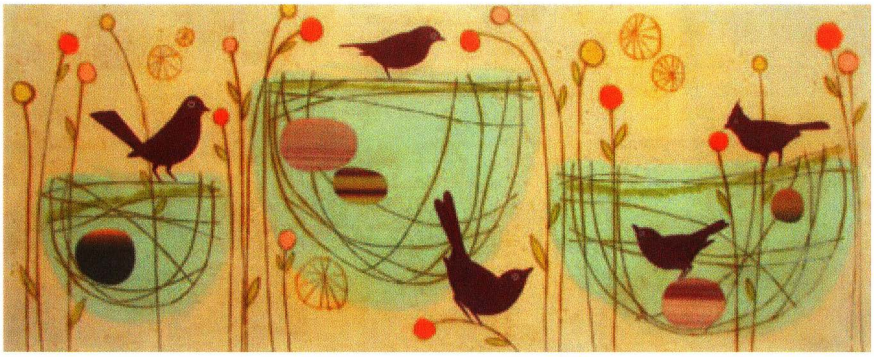
"Boardwalk"
Courtesy: Amy Ruppel



"Migratory Love"
Courtesy: Amy Ruppel

She works with digital photography, beeswax, wood and flames. In correspondence with Amy her response to the question “why birds?” she wrote:

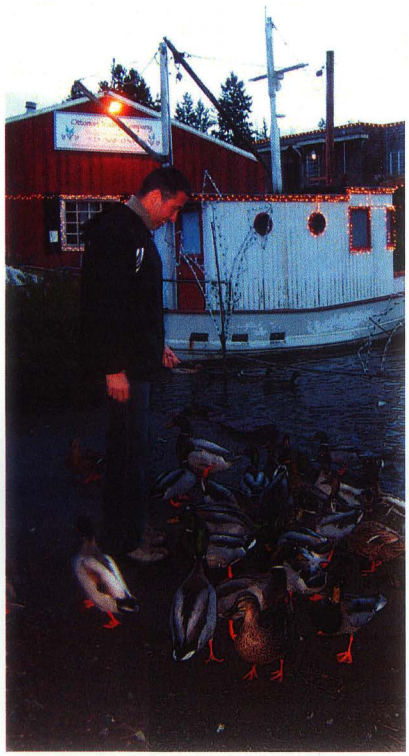
> *I think the reason I use birds as the main focus in my works is because they add so much movement to a still image. Birds are never still, it seems... always flitting about. Some part of them is always moving, even when perched. So just putting their silhouette in a piece (which is how we usually see them, as silhouettes on the line, in a tree, etc.) adds motion to it. I think we as humans secretly envy birds, because they can fly, and look down on everything at will.* Amy Ruppel 2006



“Primeval Explosion 1”
Courtesy: Amy Ruppel

Chapter Two Birds and the Urban Environment

Several diverse programs and efforts exist to increase bird populations and biodiversity, as well as to protect, encourage and assist birds in the urban and suburban environment. Bird feeding is an extremely common practice. Close to 33% of Manitobans participate in this activity. Whether it be Sunday summer visits to the duck pond in Assiniboine Park with bread crumbs in tow for the resident Mallards, placing a suet feeder on a birch tree or planting Mountain Ash trees for the hardy winter birds to feast on in January, feeding birds brings people great pleasure. Extreme joy and entertainment is found throughout the year if one has a feeder in their yard. Watching a nuthatch's acrobatic maneuvers as it searches beneath the bark for insects or recognizing the food hoarding behaviors of a Blue Jay can occupy an entire afternoon. Bird activity and bird diversity is on the rise in suburban neighbourhoods due to bird feeding and the installation of birdhouses/nest boxes and birdbaths.



Two exceptional examples of urban parks designed to bring nature into the city are Tanner Springs Park in Portland Oregon and Ramler Park in Boston Massachusetts.

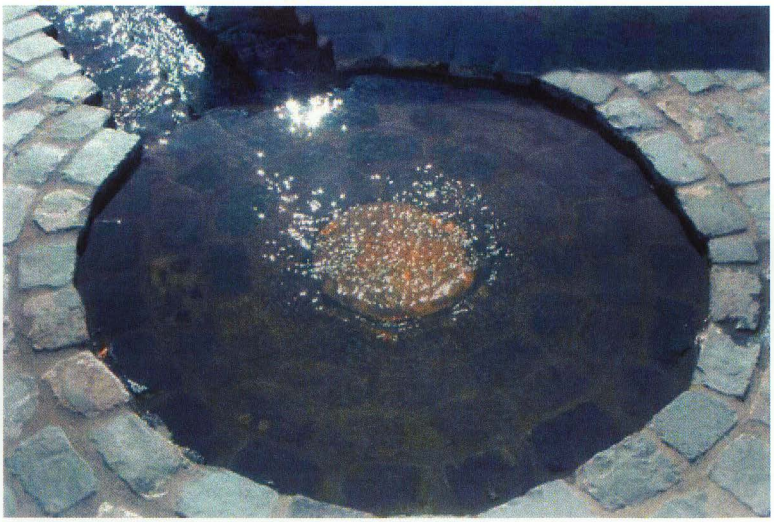
Tanner Springs Park, Portland Oregon

From 1999 to 2001, American Landscape Architect Peter Walker created a master plan for the City of Portland's 'Pearl District". This master plan organized the transformation of an industrial area into a residential neighbourhood and resulted in a series of locations for small urban parks to be spotted throughout the area. The City of Portland's planning department has focused its development and management of greenspaces on small pockets of nature, much like stepping stones, throughout the City rather than setting aside a large parcel on the outskirts. Tanner Springs Park, designed by German landscape designer Herbert Dreiseitl, has become the jewel of this park network.

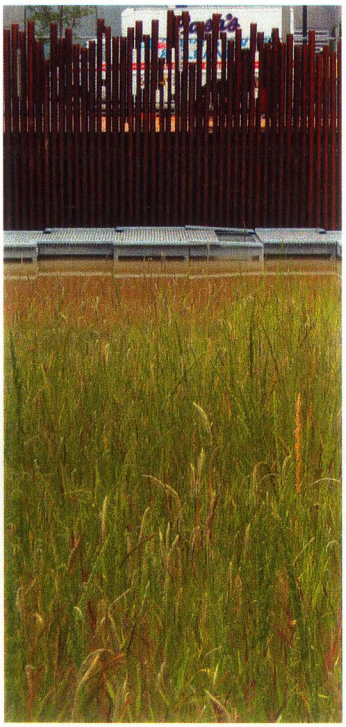
Tanner Springs Park sits on what was historically Tanner Creek. In an attempt to reintroduce urban dwellers to the spirit of nature and to the natural processes of cleansing storm water runoff, Dreiseitl peeled back the urban fabric, and developed a functioning urban wetland. Essentially, he designed a storm water management park through the skilled and artful eye of a landscape designer. This wetland demonstrates the process of cleansing rainwater and polluted runoff through the functional and beneficial landscape of an urban wetland rather than completely relying on catch basins, pipes and sewer systems to cleanse this waste from the water before it finds its way to a freshwater body. In doing so Dreiseitl has created the foundation for a rich habitat within the urban environment that supports numerous wildlife species: from insects to small mammals to several bird species as well as a green urban refuge for people to come and enjoy.

Tanner Springs Park has its critics, who call this type of ecological design "boutique ecology", meaning it looks as if it is functioning properly but it is only meeting that challenge half way. "Boutique ecology" is a new term used when something is to look 'eco' but really is not, as it depends on artificial means of support. Tanner Springs Park does have some substantial mechanical assistance, as it does not allow any of its cleansed water to percolate down

into the water table. While water is filtered, retained and cleansed by the parks native biomass, it makes its way to the river via mechanical means. Regardless of this fact, this is an ambitious endeavor and an impressive achievement for a densely urban environment. The incorporation of native vegetation, transplantation of mature trees (from a different site where they were to be destroyed) and the use of reclaimed industrial materials helps to communicate a strong message of ecological restoration, recycling and the importance of healthy ecosystems. The human users of this greenspace, or 'urban functioning wetland', are exposed to several natural processes while standing in the centre of a large metropolis. At a final cost of $2.8 Million, Tanner Springs Park was completed in 2005.



Tanner Springs Park
Courtesy: Greenworks



Ramler Park, Boston Massachusetts

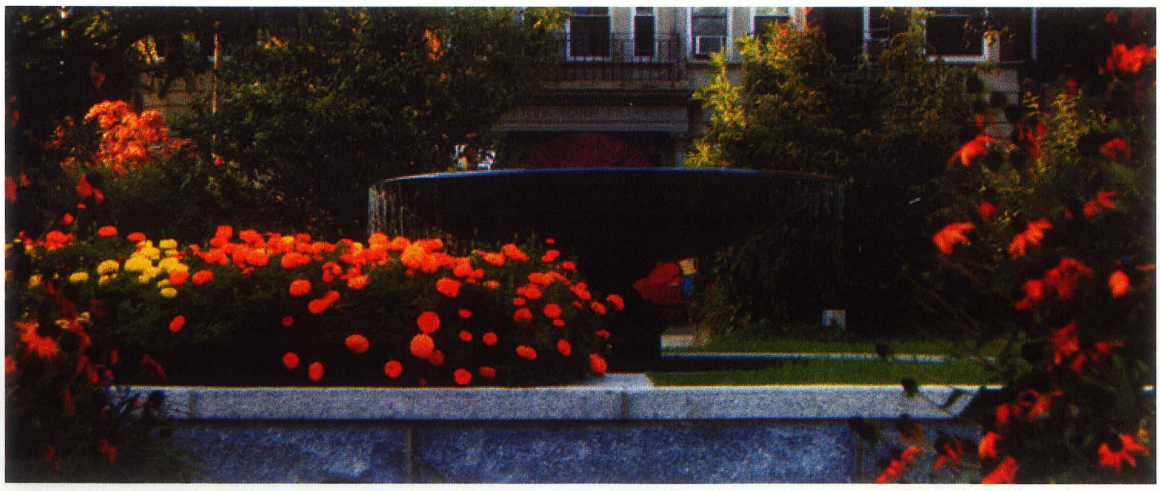
The City of Boston has not planned or built a park within the last 30 years. Recently with very strong and active community participation, it was determined that a half acre lot within the Fenway Neighbourhood would be resurrected from a derelict muddy informal parking area, into a park. The surrounding community had no interest in tot-lots, skateboard features or a community pool as few children live in the area. Seniors, older adults and hospital employees would be the most common users. They desired a park that would be an elegant and tranquil resting spot where people could sit, talk and read while being surrounded by nature, including butterflies and birds.

The Friends of Ramler Park organization was established and it is from their hard work and volunteer efforts that they were able to raise close to $640,000 which enabled this park to be realized. In addition to the funds, the Friends of Ramler Park also negotiated an agreement with The City of Boston to take on the responsibilities of maintaining the planting material, a very large yet enjoyable task.

Ramler Park
Courtesy: Elena Saporta

Elena Saporta, a Graduate of the University of Pennsylvania School of Landscape Architecture, was awarded the commission to work with the local community group to design this urban bird sanctuary. It is important to note that nearly 90% of the vegetation in this park is native to the Boston area. This is an extremely challenging and a rare find when investigating public urban greenspaces within North America. In correspondence with Elena, I asked her, "By the looks of your planting list, many of these plant species are not native to your region……Could you tell me how you made your choice? I can see the pros and cons for both sides of the debate but I am interested in your decision". Elena responded:

> *At Ramler Park, we used a native plant palette as a point of departure in making our woody plant selections. Most plants were chosen for their food/ nectar value to birds/ butterflies. Dawn Redwood and Norway Spruce, both non-natives, were included as plants that could provide cover for birds along the park's edges. Other non-natives, such as Kousa Dogwood and Japanese Crabapple were selected for both their food value and superior hardiness. As a graduate of the University of Pennsylvania (during the McHarg era), I have an ingrained bias, (though not a dogma), towards using native plant materials (Saporta 2007).*

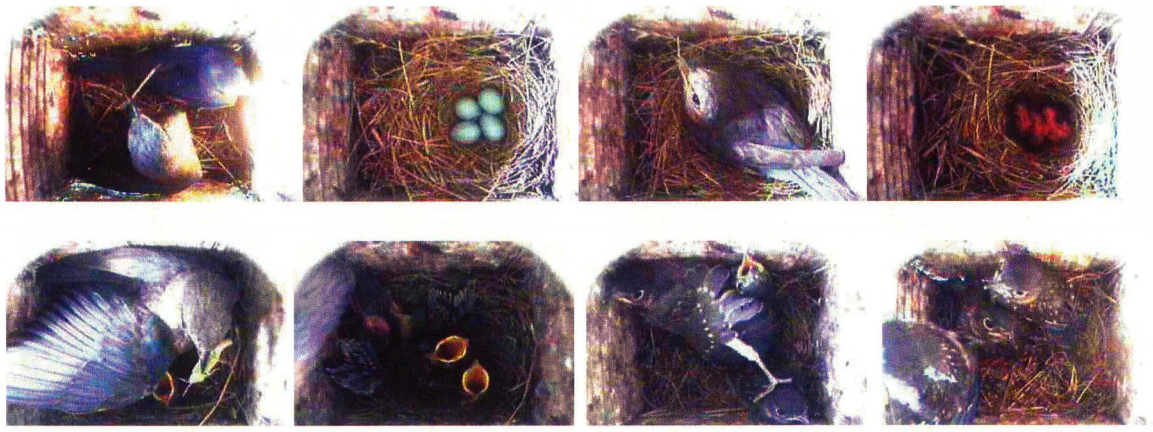


Ramler Park
Courtesy: Elena Saporta

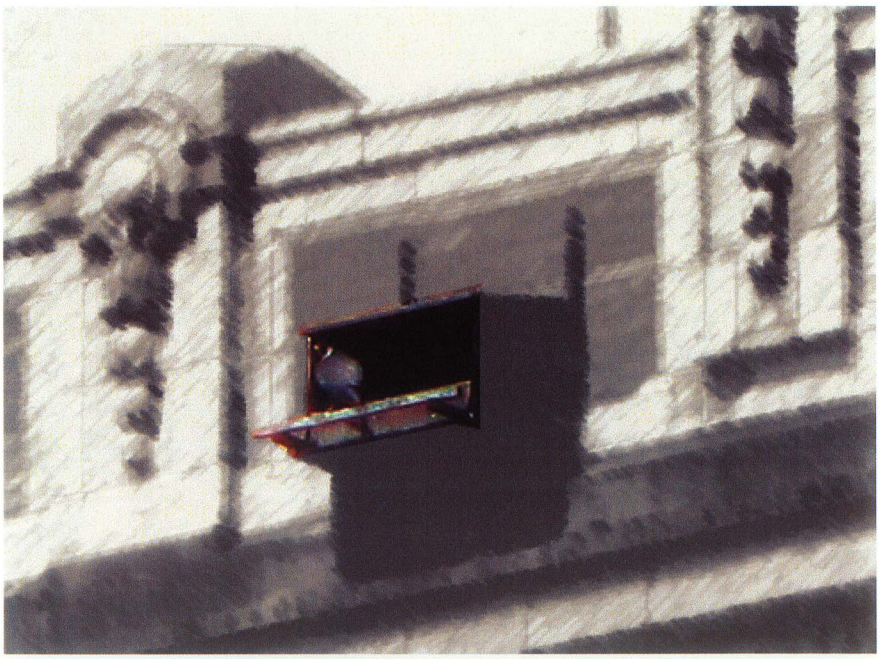
Ramler Park
Courtesy: Elena Saporta

With regards to the planting list or palette, Elena's response rang true to my thinking as well. When trying to attract insects and birds, you must keep their natural diet and tendencies at the forefront of your mind. Logically, when attempting to attract native bird species to a landscape, it is essential to incorporate elements of their natural diet is critical. That being said, there are hundreds of very valuable, non-native plant species that can also be prolific sources of food, as well as great providers of shelter and nesting habitat. Many non-native coniferous plants provide extremely reliable and strong structures that can be used for winter protection, nesting and roosting sites, not to mention the insects they harbour. Ramler Park is approaching its third growing season and the Friends of Ramler Park report no vegetation issues. They are starting to see several bird species that they never encountered in the neighbourhood before the park's birth. The park was completed in 2004 at a final cost of $850,000.

Manitoba, has a log history of aiding bird species and their populations. In 1959, the late Dr. Jack Lane, from Brandon Manitoba, erected several hundred Bluebird nest boxes along much of southwestern Manitoba's rural roadways. Since then, this effort has spread across the Canadian prairies, in particular due to the interest and efforts of Scouts Canada. Today there are an estimated 4750 bluebird nest boxes and this network, now referred to as 'Bluebird Trails", is close to 4000 km long. A thirty-minute drive north of Winnipeg's Perimeter Hwy towards Gimli, there is an active trail in place. The popularity of these trails has led to a significant population increase of Bluebirds within Manitoba since the 1960's.



Another very exciting program in this region is the Peregrine Falcon Recovery Project of Manitoba. By the 1970's there was only one known breeding pair of Peregrine Falcons in Canada. This decline was a result of Canada's heavy use of DDT pesticides in the agricultural sector. Peregrine Falcons have now been removed from of the endangered species list and the Species at Risk list due to a massive breeding and nest box program occurring across Canada and the United States. Since its inception in 1981, the program has released 170 Peregrine Falcons throughout Manitoba. Due to these conservation efforts, Winnipeg has a successful breeding pair of Peregrine Falcons living and breeding within the downtown area (along with Montreal, Regina, Hamilton, Fargo, Omaha and Indianapolis to name a few). These two have created much excitement as they can be seen soaring through the streets on a warm windy day as well as devouring their lunches, composed of mainly pigeons, on buildings rooftops.



Chapter Three

The Pros and Cons of 'Nature' and Birds in the Urban Environment

From a single hanging planter on the 10th floor of a downtown apartment building to the City's small community gardens, there is no doubt that humans have a strong urge to live alongside nature. Edward O. Wilson coined the term 'biophilia' which describes human's "love of living things". The one process now going on that will take millions of years to correct is the loss of genetic and species diversity precipitated by the destruction of natural habitats. This is the folly for which our descendants are least likely to forgive us (Wilson 1984 et.al). As a branch of science, concerned with environmental studies, nature writing and psychology, biophilia supports the argument that people continue to need rich and textured relationships with natural elements and diversity in order to achieve lives stuffed ripe with significance. During the long course of human evolution, we have valued nature and living diversity because of the adaptive benefits it offered us physically, emotionally, and intellectually (Kellert 1997).

Ecotherapy, a sub-branch of psychology is now commonly used as a simple, mild and drugless form of treatment for mild depression. Whether it is a parakeet, a schnauzer or a tabby cat, pet ownership is a very common form of ecotherapy. Beyond the great value of companionship, animals have the ability to calm our nerves and reduce the risk of heart disease by lowering our blood pressure through this special relationship. Exposure to wildlife and the natural environment is believed to have similar benefits.

According to the National Survey on Recreation and the Environment, over 71 million Americans find their way to nature through birds. This is a dramatic increase from the 54 million reported only five years previously. This statistic covers all levels of people who enjoy bird watching, from the ornithologist to the casual backyard bird feeder, however, all of these people enjoy birds (Eubanks 2001).

The well-known environmental psychology researcher Dr. Stephen Kaplan greatly supports the presence and benefits an urban forest can have on people who inhabit the area:…"an important component in nature's capacity to restore the mind and spirit – to allow one to recover from mental fatigue and to become once again comfortable, civil, and effective…urban forests have the great and not always realized potential to function as sorely needed restorative environments." (Kaplan 1995 et.al) The health of an urban forest, its density, size and species selection all greatly contribute to the populations and diversity of bird species found within our cities.

Courtesy: Alexis Bywater

The following table was drafted by The London Ecology unit – Nature Areas for City People:

PERSONAL BENEFITS OF PARTICIPATION IN AN URBAN WILDLIFE AREA

Emotional well-being	Opportunities to identify with nature Sense of freedom Peaceful retreat to repair emotions Sense of pride and achievement
Intellectual benefits	Seeing nature at work Learning about the variety of flora and fauna at work Learning about local history
Social benefits	Getting to know people better Becoming more responsible citizens
Physical benefits	Appeals to the senses Feeling fit A safe place to exercise and play

In an interview with The Winnipeg Free Press, the self proclaimed 'Urban Naturalist', the late Morris Sorensen, who conducted 'nature walks' throughout Winnipeg, expressed the importance of his work as a way 'to stimulate an interest in the outdoors with children and the general public, because we have a lot of pressures on the environment today. If people are going to preserve the environment, they have to gain an appreciation of it'.

How small an area is too small to enhance or rehabilitate to make a difference? Can enhancing a derelict & forgotten slice of land between buildings be considered habitat? I believe so. Habitat is everywhere - it is everything. The question to be more concerned about is - whose habitat is it? What does it support and encourage and what does it hinder? Currently, such spaces are not supporting urban wildlife in a direct and enjoyable way. Yes, perhaps they support microscopic organisms, which support insects, which are then potentially devoured by larger creatures, but can't these slices of land be more? Habitat is Mrs. Jones's backyard, a woodpile, the dirty mess around a BFI bin as well as wooded lots, marshes and day lit streams. Being in the presence of 'nature' is a powerful source of inspiration, curiosity and wonder. It is an educational that reflects our attitudes towards the world and towards ourselves.

As noted earlier, humans are the only singing primate; a fact that may cast some light on

the connection (Gibson, 2005) between humans and birds. Birds have existed for millions of years; we, on the other hand, are a relatively new creature. Birds represent the 'ancient lineage of life (Gibson 2005), and we are envious of their freedom. To watch them is to get to know them. You can sit in a small park or along the banks of a river and become lost within it. There comes a moment when you realize that you were absent. You have no idea for how long or even where your mind had gone. Often we don't realize the absence of ourselves in such moments, we have become like the stone beneath us and the leaves rustling along the ground. ***You just are***. For that moment all lists, tasks and responsibilities are gone, you are just another component of the biology of that place. Connecting with nature can heal your soul and clear your mind. Increasing the interaction between human beings and birds within the urban environment can elevate mood, encourage relaxation and contribute to environmental education.

Birds encounter several dangers when inhabiting urban environments: habitat loss is the leading hazard to birds. In suburban/residential communities, neighbourhood cats are the largest concern for bird survival rate. Within urban centres the major threats, beyond a lack of habitat, include: disturbance, glass collision, poisoning via pesticides, electrocutions, vehicles and communication towers. Yet they persist in the harsh urban environments, where many of their optimal habitat requirements are not being met, and when, perhaps with a little more care, they can thrive. There are concerns with increasing bird activity in our cities. Is it beneficial for them to be in the urban environment? Is it beneficial for humans to have more birds amongst us?

The Avian Flu, H5N1, and the West Nile Virus are both concerns that people have with regards to humans and birds being in close proximity with one another. The Avian Flu, which is thought to have originated in Asia, has not yet been found in North America. There have been no reported cases of one person infecting another. Humans are getting ill from direct contact with and from the handling of infected birds. There are an estimated sixty million birds that migrate from Asia to North America over Alaska's landscape. There is extreme doubt that an infected bird could survive this arduous migratory journey. No

cases of this flu strain have been found in North America. Currently, the U.S. Department of Agriculture does have a regulated testing program for this strain in Alaska. The real threat, however, isn't migrating birds but the commercial poultry industry, a concern that has lead to heavy and extensive monitoring of all aspects of the poultry industry that enters North America.

The West Nile Virus, regrettably a familiar term to many Manitobans, has found its way into our bird and human populations. This is a mosquito borne disease that in North America originated in New York City in the late 1990's. The West Nile Virus is of particular concern to endangered species, as it is infecting and killing precious individual species and depleting populations. In recent years, Manitoba's bird populations, especially those from the crow family, have been particularly susceptible to the West Nile Virus. Manitobans are very pro-active in safe guarding themselves against mosquito bites. The City of Winnipeg Entomologist has been diligent in educating the public on preventative measures as well as implementing a chemical spraying program. The spraying program has been met with much controversy and opposition. Many of Winnipeg's environmentally conscious citizens would prefer a nonpoisonous solution, as the City uses the effective and powerful chemical Malathion to kill mosquitoes. Increasing and diversifying the urban bird populations within Winnipeg's downtown will not increase the rate of West Nile infections. To reduce the danger to humans, birds and other animals, the breeding and life cycle of the mosquito must be interrupted and/or stopped completely.

The environmental, emotional and education benefits of increasing the urban bird population and creating additional greenspaces in Winnipeg's Exchange District are of substantial value to our health. An increase in bird activity within Winnipeg's Exchange District would not pose a health risk. Manitobans have already begun to learn the best environmentally responsible strategies to cope with mosquitoes and avoid bites, which reduces the potential exposure to the West Nile virus. Some of these strategies include the reduction of standing water, wearing long sleeve clothing and being aware of peak

mosquito hours (dusk to dawn). The benefits of creating additional greenspaces outweigh the potential health risks as Winnipeggers and regional health authorities are already addressing these health risks.

Chapter Four

City of Winnipeg
Urban Habitat Strategy

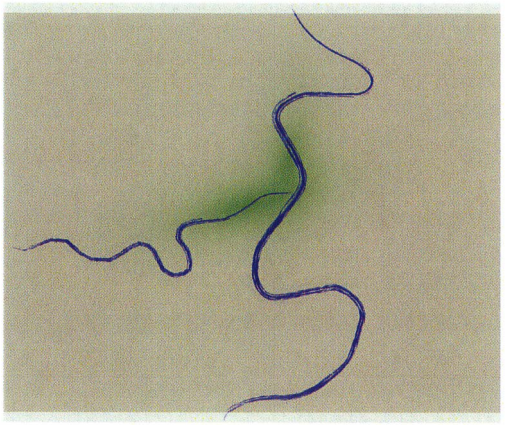
The creation and continued development of urbanized centres is the primary cause of wildlife habitat loss throughout the world. Urbanization is commonly recognized as a leading cause of species extinction because of its role in fast and permanent habitat elimination and/or fragmentation. The results are landscapes that are totally lost or disconnected – conditions that encourage poor biodiversity, the leading cause of species extinction. Species diversity is often measured by the presence of songbirds because this group of birds reliably reflects changes in habitat type and quality, making it a good indicator of ecological conditions. They are often referred to as species indicators. (Calgary Habitat Connectivity for Songbirds Project et. al)

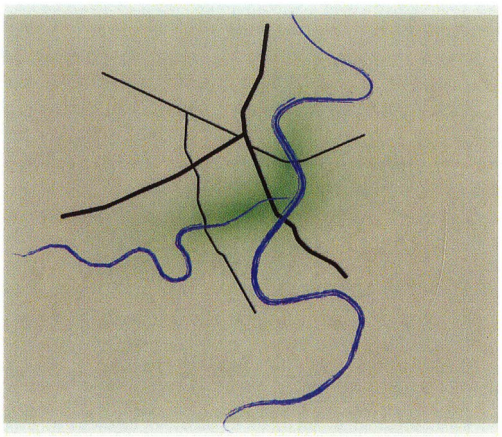
According to the Canada Statistics 2006 Census data, 61% of Manitoba's population lives in Metropolitan areas and 56% of Manitobans live in the City of Winnipeg. Manitoba's population is very centralized. It is estimated that the residential community of Winnipeg's downtown area is reaching thirteen thousand people.

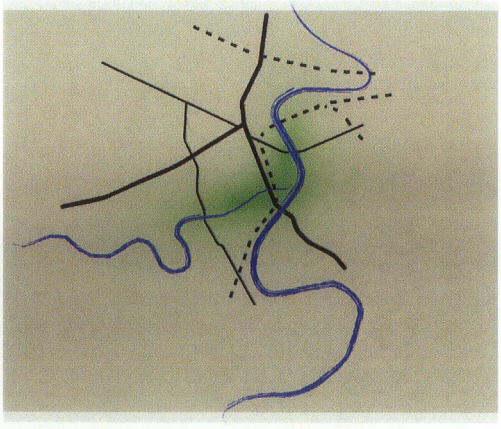
The presence of nature in a city has always enhanced the livability of the city, from the gardens of the Alhambra at Granada to the 'naturalistic plantings' that cushion office buildings within today's cities. Creation and careful management of wild flower meadows, ponds, and urban woodlands add to the resource base of cities.
As rural areas become more ecologically simplified through the impact of commercial agriculture, patches of natural land in urban areas gain an increasing biodiversity value (Douglas & Box 2000).

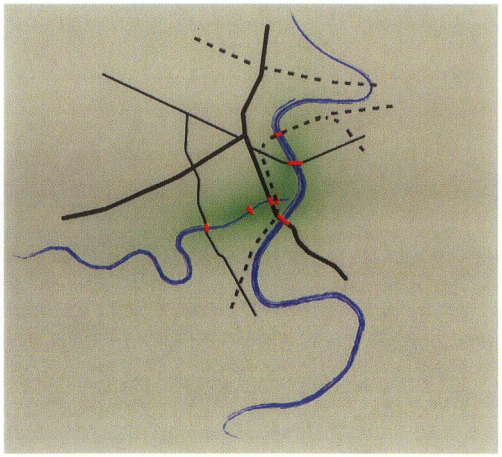
Some studies have shown that several bird species, particularly those reliant on vegetation as flight cover corridors, find elements like bridges and busy streets to be barriers, that deter their movement throughout the urban landscape regardless of their powerful flying skills.

Manitoba, in common with much of the rest of the world, has undergone extensive human-made environmental change. Natural landscapes simply do not exist in Southern Manitoba as they did when the province was created. Habitat within urban centres has been altered and degraded. Protection, conservation and rehabilitation of remaining urban habitats would benefit wild plants and animals and the quality of peoples' lives. Increased conservation and interpretive efforts in urban areas could increase understanding of natural processes and awareness of wildlife in and out of urban areas and increase the variety and quality of the wildlife resource (Sustainable Development Strategy for Manitoba 1998).









As cities are developed natural landscapes and habitats are destroyed. Ironically, we memorialize these deleted natural elements and features by projecting a sense of 'the natural' with community and street names such as Falcon Road, Oak Street and Beaver Trails: An informal homage program.

Maintaining habitat by conserving what already exists through prevention of habitat loss and enhancement is the favored strategy by The City of Winnipeg's Naturalist Services Branch, which is working on a Sensitive Lands Plan. The department is currently committed to restoring habitat along the banks of the Red, La Salle and Assiniboine Rivers. Habitat creation within Winnipeg's downtown, the Exchange District is not identified as a priority. The restoration of riparian corridors and the enrichment that habitat will no doubt benefit all types of wildlife including birds. The Plan being developed includes an inventory of Winnipeg's natural areas and supports "Sustainable Winnipeg: A Comprehensive Environmental Strategy".

Much of the information available to the public in the "Sustainable Winnipeg: A Comprehensive Environmental Strategy" is very heavily focused on educating public and private landowners about sustainable practices through seminars and educational

programming. There is no mention of urban habitat creation. By considering the following options, the City is attempting to make its operations more sustainable:

a. Using native plant species on prominent City properties (for example, City Hall);

b. Fostering biodiversity to the fullest extent possible on City-owned lands;

c. Rehabilitating endangered environments, protecting sensitive habitat and reintroducing natural species on

City-owned properties;

d. Continuing to educate City employees involved in landscape design, planning and maintenance on the value

of natural landscapes, and providing seminars on naturalization techniques to City employees;

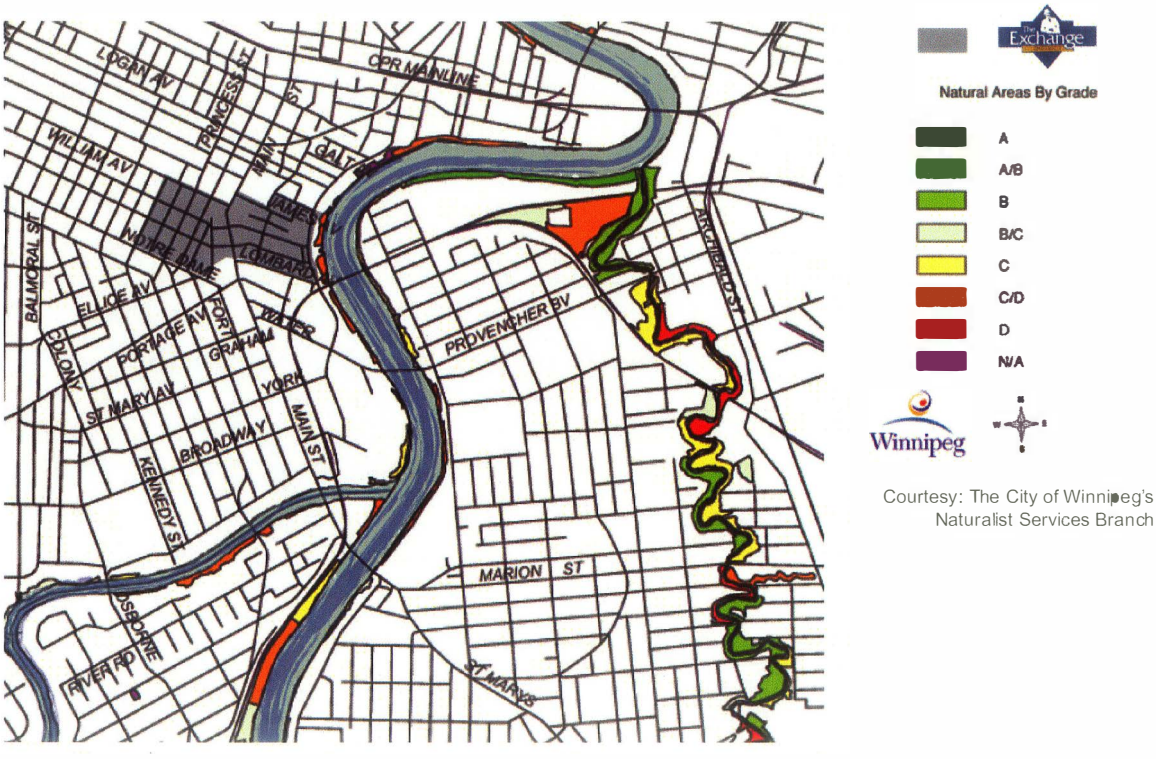
e. Promoting biodiversity, land stewardship, and the protection of natural areas;

f. Enforcing stabilization of rivers and streams; and

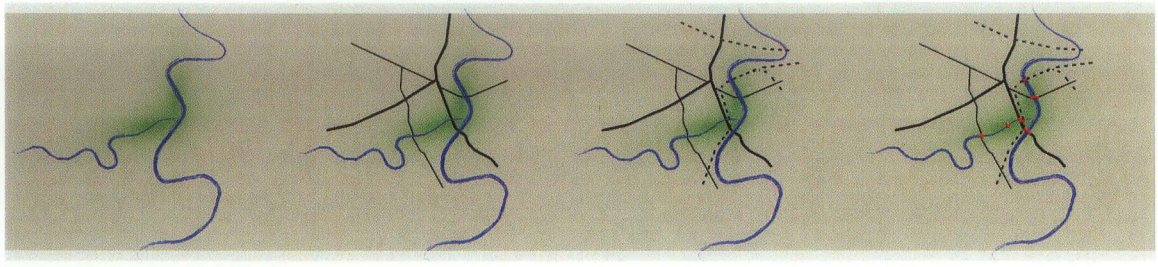
g. Identifying and enforcing highly sensitive buffer zones.

There is no formal program or policy for urban wildlife management in Winnipeg. The issues of managing urban wildlife is confusing for governments for two main reasons: Firstly, there is an absence of legislation which results in no jurisdiction being willing to take responsibility for managing species not officially given status under legislation. The second reason is that urban wildlife occurs in areas which overlap government jurisdictions, resulting in confusion as to establishing who is responsible for managing a certain species (Seunarine 1994).

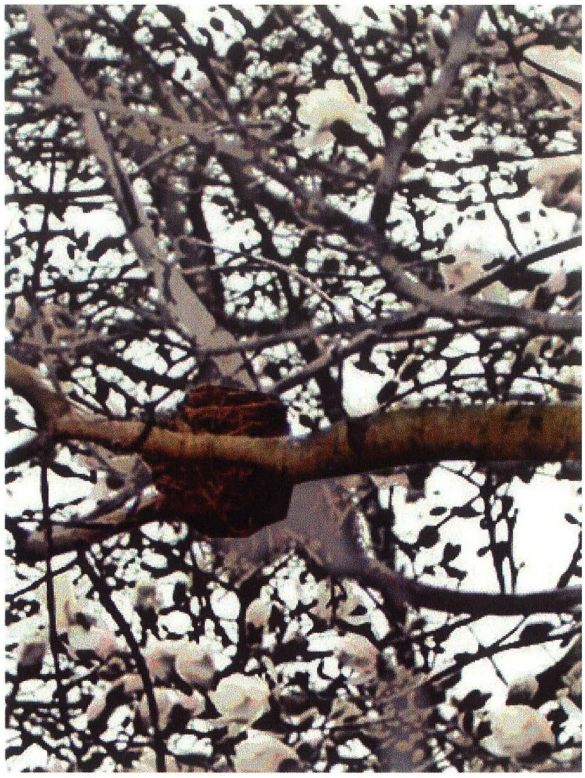
Considering the abundance of bird life in the province, Manitoba has become a bird watching hot spot. Within Winnipeg's suburban communities and large parks we find a high species diversity where many wonderful birds can be enjoyed. Unfortunately, within Winnipeg's downtown area, there are very few similar opportunities and by all accounts the City of Winnipeg is not making the creation of additional greenspaces or rehabilitating existing ones within Exchange District a priority.



Courtesy: The City of Winnipeg's Naturalist Services Branch



Basic Requirements: Shelter, Food, Water and Space.



Urbanization generally leaves natural settings transformed into fragmented landscapes with urban parks, gardens etc…as the only refuge, for many bird species. Some species, mainly ground nesters and typically forest species, avoid small sized urban parks because there is not the food supply or the nesting and spatial requirements in place for them to survive.

The simplified vegetation structure within the urban environment greatly reduces opportunities for species diversity. Installing shade tolerant sod, or even worse, stone mulch, to replace the ground leaf layer within a wooded area essentially prohibits vegetative debris (deadfall & leaves) from breaking down into rich organic matter. In combination with sod and stone, a greatly modified shrub layer can no longer support the bird species that

feed and nest on the forest floor or within the shrub layer. A textured and rich vegetative structure, from tree canopies right down to the ground is essential in creating the habitat requirements that will attract a variety of bird species. Other features, such as a small woodpile or stone pile, can become habitat for many amphibians and insects, which are potential food sources for birds.

Vertical Stratification or a layered planting scheme: Canopy layer (trees of different heights) • understory layer • diversified shrub layer (including thickets) • ground cover layer are all important to incorporate when creating habitats for birds. Birds require different levels of vegetation to feed, raise their young, hide from predators and gain protection from severe weather. In addition to Elena Saporta's comments on the use of native vegetation, native species are recommended because they are hardy, they are generally self-maintaining and require less moisture than exotic species. The lack of a diverse vegetative structure, which are important, not only for nutrition but also for breeding and nesting opportunities, has greatly contributed to relatively poor species diversity in the bird communities of Downtown Winnipeg.

Urbanization has a homogenizing impact on birds – it leads to the loss of many original or native species (with the exception of the hardy crow and raven) due to drastic habitat loss and environmental modifications in a given area. Birds respond to vegetation composition and structure and to urban areas that retain native vegetation. These areas retain more native bird species than those that do not. Areas associated with urbanization, with greater numbers of predators, abundant food supply, increased habitat fragmentation and greater numbers of exotic plants, impact native birds in many different ways.

> Bird diversity in urban areas tends to be proportional to the existing volume of vegetation. During migration numbers and diversity of migrating birds within the city are also proportional to vegetative abundance. Enhancement of urban ecosystems, if done well, can have a significant and positive impact on the quality of life and education of the increasingly growing urban population and thus, indirectly facilitate the preservation of biodiversity in natural ecosystems (Savard, Clergeau & Menechez 2000).

Urbanization tends to favor omnivorous, grainivurous and cavity nesting species. The three 'target species' for this project, fall under these descriptions. They tend to be synanthropic species….meaning – those species that associate with humans and human dwelling in a reasonable way. The changes that humans cause to the landscape almost always benefit certain species while creating a negative impact for others. This is why we tend to associate urban areas with crows, starlings, seagulls and house sparrows – all of which are ubiquitous. Their habitat requirements are much more generalized than those of other birds.

When selecting the 'target species' of birds for this project, I thought based on the habitat that is going to be created. What are realistic species that could be expected in Winnipeg's Exchange District? The most important factor to increasing species diversity in small urban parks is to enlarge the habitat complexity, meaning its vegetative structure at all layers. This management strategy could transform small urban parks as high quality stepping-stones or habitat islands which could be temporarily used by different species on their way through the urban landscape. For some birds, like the target species it could become part of their feeding, breeding and/or roosting network within Winnipeg's urban environment.

Winter is an extremely difficult time for most non-migratory bird species. Finding enough food to keep their core body temperature constant is a daily challenge. Small non-migrating songbirds, spend most of the daylight hours constantly feeding. It is common to see a late day feeding frenzy at a feeder or on a shrub rich with berries, as the birds are aware that they must retain and store enough energy to sustain them through the cold night ahead. Providing these food sources is critical to assisting wintering populations. Blowing snow and wind are by far the harshest elements winter birds confront. In Manitoba, the winters are all about conserving energy and staying warm. Natural food sources as well as supplemental feeding through suet and seed feeders, are significant aids that many wintering birds depend upon to survive. To avoid dehydration and to aid in digestion, birds constantly seek out water. Much of their water intake is through the moisture found in the seeds and berries they select, but they also rely on puddles, rivers and small ponds to access fresh water. Water is essential for all forms of life. It is what separates our planet from all others. Not only is it critical for birds, who rely on it for digestion, cleansing and nest building, it is also a key component for the life cycle of many insects. In addition to providing a rich vegetation palette, a clean source of water is vital when attracting and sustaining wildlife in the urban environment. In urban areas especially, providing a clean water source is essential, as humans have built cities to drain water away and any water that happens to pool and collect contains toxins and pollutants that are not attractive or healthy sources of moisture for urban birds.

During the deep winter months, most of these options are not available, except for the small amounts of berries still clinging to trees and shrubs. Incorporating a year round water source into any Manitoba landscape that is specifically designed to attract and sustain birds is a must. It is also very important to be conscious to place the water feature in a location that ensures for a quick escape as well as a nearby resting perch.

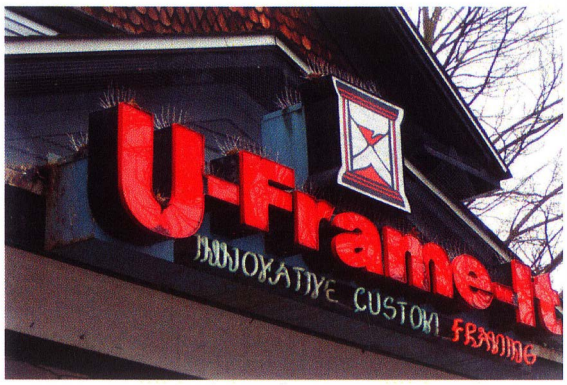
> Small parks could play a significant role in the connectivity of urban landscapes. Increasing the size of parks is difficult in cities, enhancement of habitat diversity and resource availability for birds within parks (e.g. nest boxes) appears to be a straightforward way of increasing urban bird diversity. Nest box provisions could also increase the availability of nest sites and increase the abundance of these species (cavity nesters) in urban areas (Fernandez-Juricic and Jokimaki 2001).

Birds require shelter, not only from harsh weather and predators, but also for rearing their young. It is quite common for people to put up birdhouses or nest boxes in suburban neighbourhoods. This encourages and supports numerous bird species to build nests. The residential community in the Exchange District is composed of apartment and condo dwellers. People do not have individual yards where they can erect birdhouses and bird feeders. This may be a contributing factor to the limited number of bird species that are currently found within the area. Supporting the needs of bird nesting habitat will, no doubt, increase the likelihood of attracting and retaining additional bird species within the Exchange District. This can be achieved by incorporating the desired tree species for cavity nesters. It is quite common for birds to take advantage of decaying trees as well as small holes created when a branch has fallen from a tree. Many bird species will take advantage of these opportunities. Due to a lack of decaying trees within the urban environment, introducing nest boxes for cavity nesters would be a tremendous benefit. In addition to food sources, planting vegetation that supports branch nesting as well as providing tree species that are common for birds to create cavities within, is very important when selecting a planting palette.

Chapter Six

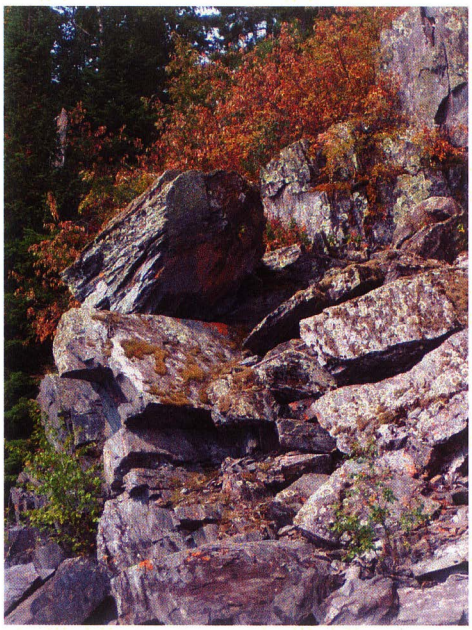
Bird Habitat and Bird Inventory: What Species Inhabit the Exchange District?

Hitchcock cast birds as sinister villains in his 1963 film The Birds. While fiction should never be confused with fact, birds – especially pigeons, famously documented as 'rats with wings' – are a daily menace in all towns and cities. Beyond the obvious health risks, they can cause serious damage to buildings. It is largely the bird droppings that cause problems. Acid secretions are produced by the fungus that grows on guano as it decomposes. This acid defaces the facade and accelerates deterioration by making the building envelope more porous and increasing water ingress (Cadji 1999).



Netting, taut wiring systems, irritating gel and/or sharp metal spikes are all common methods used to deter pigeons, and other 'nuisance birds' for that matter, from resting, nesting and roosting within alcoves, along ledges and atop light standards. Regardless of the methods used to discourage the birds, there will always be an urban bird species. Seeing a row of huddled pigeons trying to catch the sun's early morning rays after a cold winters night or watching their wings slightly teeter as they coast along the strength of the wind, is simply pleasurable.

Along with the population of pigeons, starlings and house sparrows, the crow population in urban centres seems to be growing, rather than declining, along side the human population. All of these adaptable species benefit from some element of disturbance, whether it is habitat fragmentation, garbage as a food source, buildings for shelter and/or the slight increase in the temperatures within urban centres versus the surrounding landscape. It is important to note that these species tend to be habitat generalists, meaning their habitat needs are very broad and far reaching. The urban environment, Winnipeg's falling within this, tends to foster environments for these ubiquitous species to thrive. In fact, peaks in these species populations and densities tend to correlate with urban cities across North America.



Cliff Nest Cavity
Lewis Island - L.O.W. Ontario

Urban Nest Cavity
Bannatyne Avenue

Downtown Winnipeg is dominated by roadways, buildings and areas designated for parking and due to premium land prices within downtown, particularly The Exchange District, very few areas of extensive green space can be found. Winnipeg's downtown still supports many bird species, albeit most of them habitat generalists (especially our year round residents), as the urban habitat somehow mimics or possesses some aspects of their natural environment. These species are often referred to as 'nuisance species'. The facades and roofs of buildings for many sparrows, pigeons and raptors provide nesting

opportunities just as cliffs do in their 'natural' habitat. Lamppost and hydro lines are the urban version of the perch. Hot dog carts, restaurant patios, trash bins and loading docks are, for many urban birds their main food source.

Very close to the end of December every year, volunteers concerned with populations and distribution of wild birds, organize themselves to conduct what is called the Christmas Bird Count, formerly the Christmas Bird Census. Founded in 1900, it is the largest organized birding event every year. This one-day reconnaissance (within a 24 km diameter circle) of identifying and counting birds, takes place in cities and towns throughout North America and Latin America. The data is collected, organized and analyzed into a database. It informs scientist, researchers and environmentalist of species migration patterns, population changes, health and the effects of global warming, among many other things. This database also allows for comparisons between regions and between years. It reflects the status of winter food sources as people record the fruits and berries they encounter throughout the day of their count. From the 2005 data, it is clear that almost all 'nuisance species' or common urban species, recorded in the city of Winnipeg were not represented very strongly anywhere else in the 'prairie region'. The most abundant bird species counted within the city of Winnipeg, during the 2005 Christmas Bird Count, were what are labeled 'nuisance species'. Furthermore, when compared to the total quantity of bird species recorded, these species represent an extremely low percentage of all birds recorded. The birds we see in the urban environment are essentially only seen in the urban environment and, when compared to the rest of the bird species recorded, their populations are very low. Only 26% of the total numbers of birds recorded were found within the city of Winnipeg. This leads one to conclude that, when compared to the rest of the province, the city of Winnipeg does not have a very high diversity of bird species present. Please see Appendices for complete data.

Lack of a diverse vegetative structure, not only for nutrition but also for breeding and nesting opportunities, has greatly contributed to relatively poor species diversity and density in the bird community we find in Downtown Winnipeg. A reconnaissance, undertaken

from January 2005 to July 2006, has inventoried the following birds within Winnipeg's downtown:

Bird Species	Rating	Seasonal / Year Round
American Crow	Very Common	Year Round
Pigeon	Very Common	Year Round
American Robin	Frequent	Seasonal
Chipping Sparrow	Frequent	Seasonal
House Sparrow	Common	Year Round
Common Yellowthroat	Rare	Seasonal
Blackburnian Warbler	Rare	Seasonal
Blue Jay	Occasional	Year Round/Seasonal
Ovenbird	Rare	Seasonal
Common Grackle	Frequent	Seasonal
European Starling	Occasional	Seasonal
Mallard	Common	Seasonal
Ring-billed Gull	Very Common	Seasonal
Peregrine Falcon	Occasional	Seasonal
American Kestrel	Rare	Seasonal

Very common = 1 per day
Common = 3+ per week
Frequent = 1 per week
Occasional = 1+ sighting
Rare = 1 sighting

The collision of migrating birds with human-built structures particularly windows, is a worldwide problem that results in the mortality of millions of birds each year in North America alone. Birds killed or injured by such structures are due to two main factors. The first, of these is the lighting of these structures at night, which "traps" many species of nocturnal migrants. The second factor contributing to the hazard is the presence of windows, which birds in flight either cannot detect, or misinterpret. In combination, these two factors result in a high level of direct anthropogenic (human-caused) mortality. FLAP (Fatal Light Awareness Program) continues a 30-year tradition in Toronto of rescuing birds trapped in the city's downtown core following late night collisions with tall buildings: in the wee hours of the morning, volunteers scour plazas and sidewalks beneath skyscrapers for dead, injured or disoriented birds, and later release the survivors back to the wild. Across North America, more birds die from collisions each year than succumbed to the Exxon Valdez oil spill (Ogden 1996).

Migrating birds caught in the light from the "Tribute to Light" at
Ground Zero Memorial, NYC>
Courtesy: F.L.A.P.

Another information source on bird species found in urban environments is FLAP, based in Toronto, as it keeps diligent records of the species which are rescued and collected by its members. Sparrow species represent a large proportion of the window strike victims. Starlings, pigeons and crows have relatively low representation. Neo-tropical migratory songbirds by far have the largest representation within the FLAP database. As a city with an east west distance greater than 25 km and a population larger than 1,000,000 people, Toronto is a wide and challenging band of built form, stretching horizontally across the landscape and within the migratory flight path of the Mississippi Flyway. If one were to calculate the total east west distances across all major cities within North America

and then place them on the same line of latitude, that line would cover 41% of North America's horizon, quite the obstacle for migratory bird species. Winnipeg, with a population of 600,000, is a city that also stretches 25 km from east to west, and both the World Wildlife Fund and FLAP classify it as an obstacle for migrating species. While It is important to reduce light emissions during migration periods in order to reduce migration window strikes, a different opportunity exists as well. Considering that the birds are flying through the region, including the urban landscape, the opportunity to create feeding and resting areas within the city could potentially increase their rates of survival and reduce glass collisions. The creation of small patches or islands of rich nutrition sources, fresh clean water and shelter from the elements and predators, could provide additional that these migratory species rely on to complete their migratory journey each year.

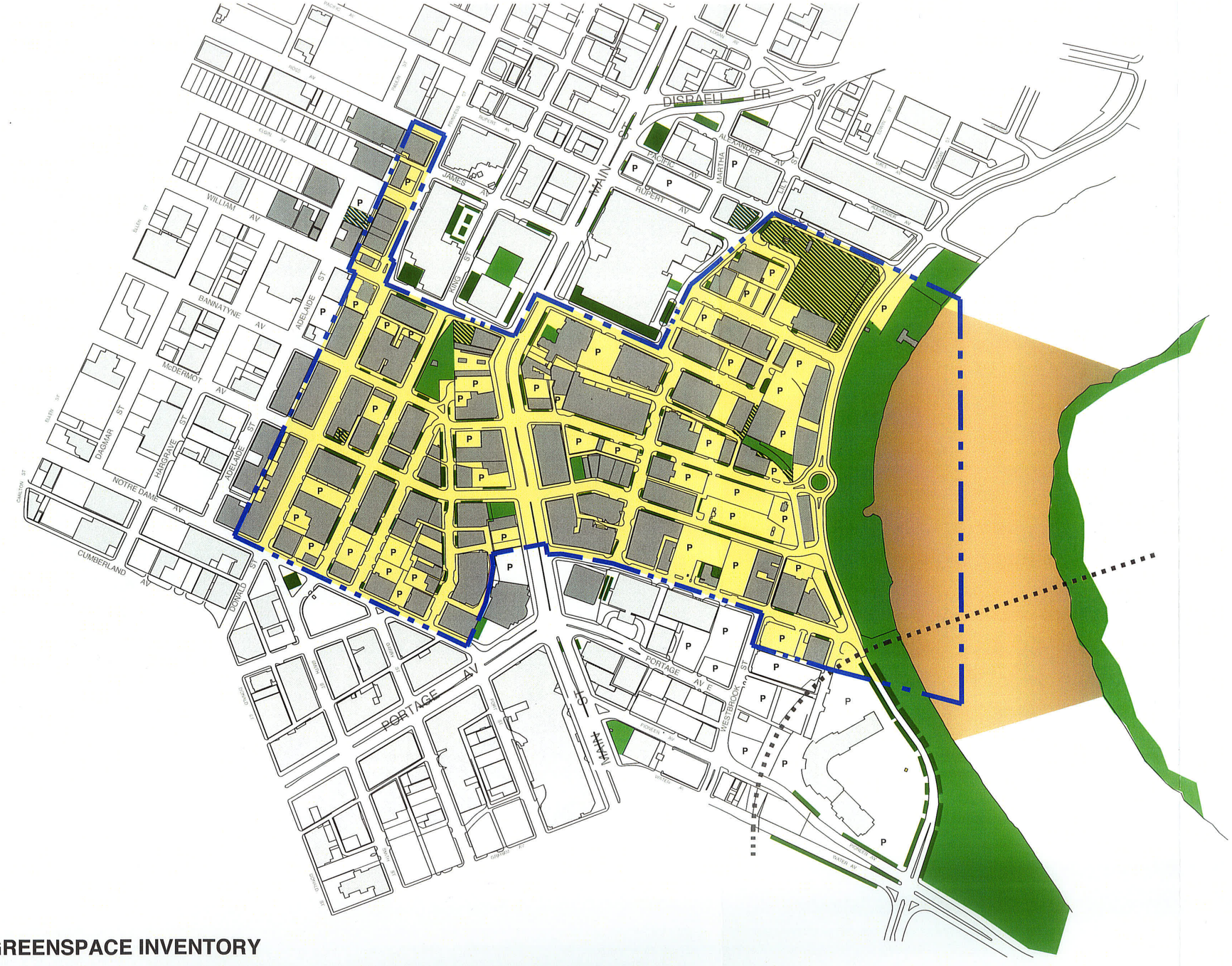
Within Winnipeg's downtown area, and especially within the Exchange District, little to no quality habitat exists. The area between the Red River and Waterfront Drive is the only 'natural' habitat that exists within the Exchange District. It is rated as 'satisfactory' by

the City of Winnipeg's Naturalist Branch. There are many riverbank restoration projects currently within the City's mandate, none of which are downtown. For people to see and enjoy birds in the urban environment and for birds to have quality sources of food, water and shelter, small parks (habitat islands) need to be created with a focus on a much more diversified and sophisticated vegetative than structure that currently exists, if biodiversity and overall health within the city is of a concern.

As the following diagram illustrates, Winnipeg's downtown is very surface parking lot and building heavy. Opportunities to create additional parks can be found not only by converting parking lots into parks but also by taking advantage of the small patches of land between buildings and parking lots. In addition, it is clear when looking at the diagram, that there is an abundance of roof surface area available. Some of which could be developed into roof gardens or greenspaces, essentially creating a lush and green 'greenroof corridor' within Winnipeg's downtown.

> As open spaces become more difficult to acquire, the use of the open space on the roof – which normally is wasteland –becomes more imperative (Halprin 1972).

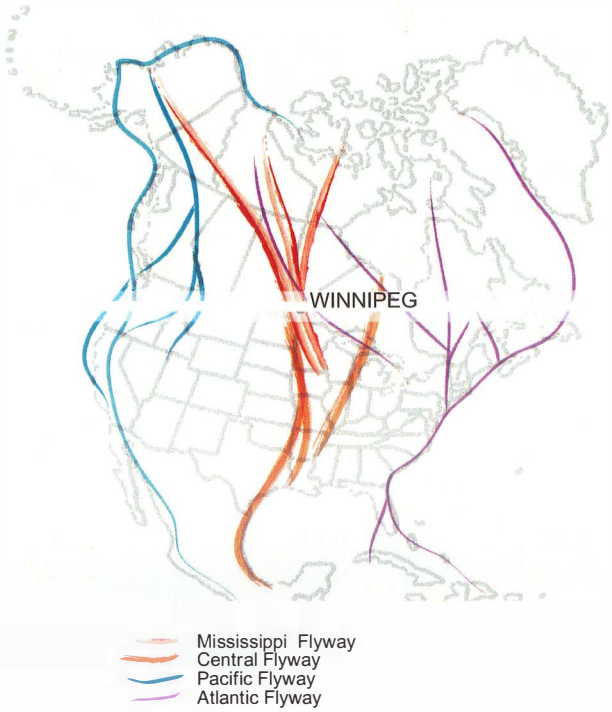
Creating wildlife habitat on roofs has its own set of challenges. Most of the buildings within the Exchange District are over a hundred years old and would require significant reengineering to support the weight of an extensive greenroof or roof garden, but it is possible. Setting aside the challenge of engineering, cost and private ownership, developing a second elevated network of parks or 'habitat islands' within the Exchange District would be a very rich addition to the same development on the ground level. A rich and diverse network of habitat islands and parks could be initiated. Not only could these be enjoyed by the people of Winnipeg, they could become, for the lack of a better term…. 'superstitions', where both migratory and resident bird populations could: rest, feed, breed and sing.



GREENSPACE INVENTORY

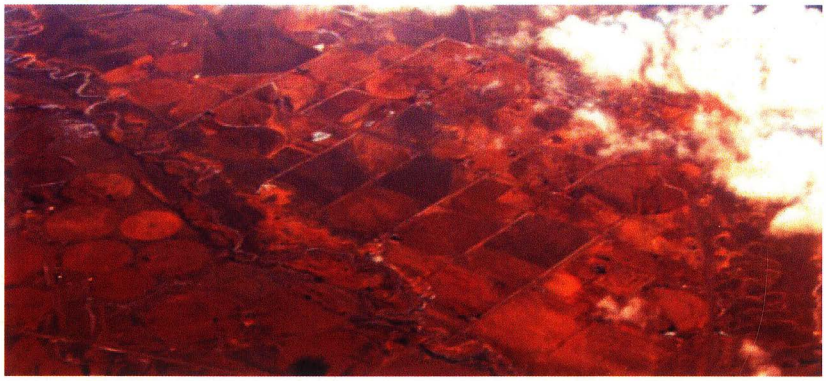
Chapter Seven Migration over the Landscape

Flight is a brilliant means of transportation. Winnipeg's central location within North America catches two of the most predominant migration routes, the Mississippi Flyway and the Central Flyway. Within these flyways are numerous routes, which have been established by groups of birds coming and going from various locations. The Mississippi Flyway is the longest route of any in the Western Hemisphere and is most heavily used by the bird species we find in Manitoba. It covers the Arctic coast of Alaska to the Patagonia. It is called the Mississippi flyway because its most eastern edge bisects the peninsula of Ontario,, extending across Ohio and Indiana and then following the Mississippi river until it reaches the mouth of the river. There are very few natural vertical obstacles that challenge the birds during their migratory journey, as there is not a mountain range within this flight route. Birds use the landscape and all of its features as well as the stars during night-migration, as a compass for migration.



MIGRATION ROUTES OF NORTH AMERICA

The landscape beneath is well furnished with adequate habitat for the many bird species to utilize for a short period of time throughout their migratory journey. It is believed that temperature, hormone levels, light and the status of food supply sources trigger migration. The migratory species we find here in Manitoba use this landscape as their 'breeding grounds' and their other biennial landscapes as their 'wintering grounds'. That is not to say that all of our species migrate south. Many in fact come south to us during their breeding season and return north in the summertime. The landscapes that are along this flight path, urban areas included, are wonderful locations to catch glimpses of some bird species who do not remain in that region for breeding. This is also an opportunity to provide the birds with 'refueling stations' or habitat islands consisting of shelter, food and water supplies.



Agricultural Fields & Riparian Corridor
Denver, Colorado

Ridge Line Corridor & Riparian Corridor
Rocky Mountains, Colorado

Dense urban areas are serious and often fatal obstacles that migrating birds must contend with. Aside from habitat loss and severe storms, glass collisions, also known as window strikes, are their largest threat during migration. The National Audubon Society estimates that in North America alone, between one hundred million and one billion birds die during migration every year due to glass collisions. As they negotiate their way through cities, the illumination of communication towers as well as the windows of office buildings an attraction that confuses them, much like a moth to a flame. Neo-tropical songbirds are by far the largest victims of window strikes, most likely because they tend to migrate at night. Night migration is quite common and favored as it is a time when predators are less active and the temperature is less exhausting.

One of the first signs that spring has finally arrived is the return of summer songbirds and the sound of their singing. When they do arrive in spring they have a large set of tasks in front of them; securing a nesting location and a mate and raising their young will take up much of their energy. Fall migration is a much more subtle and gradual process where birds gather and descend, a process that is very dependant on food supplies, hormone levels, temperatures and day length. Any habitat supplemental elements, especially during their mating season, will increase their rate of survival and the survival of their young.

Target Species:

Black-capped Chickadee
House Wren
American Robin

These three bird species were selected from a longer list of potential birds that could be expected to visit and inhabit a 'bird friendly' urban environment. They show the most promise and potential for attraction into Winnipeg's Exchange District, given that their habitat requirements can be met as much as possible. They have the inclination to adapt and make use of a very general environment. Successfully attracting these species will soon have additional and similar birds following into the area. In addition to increasing their urban populations and urban bird densities, they each bring unique and valuable bird watching traits or behaviors that would be educational and enjoyable opportunities for humans.

Black-capped Chickadee

Poecile atricapillus

"Hardy Busy-Body"

Courtesy: Wendell Long

The Black-capped Chickadee is found throughout much of Manitoba's natural habitat all year round, and is probably the most common backyard birdfeeder visitor throughout the year, including the winter. Their song is very recognizable: "*chick-a-dee-dee-dee*". Interestingly the more "dee's" strung together in one voice are a sign of an increasing sense of danger. Chickadees have a very inquisitive nature, one that bird watchers and bird feeders find friendly. Naturally curious and fairly tame, with a little patience, it's easy to feed chickadees right from your hand. It is amazing to feel how lightweight they and how gentle way tiny feet clutch onto your hand.

Black-capped Chickadees rarely migrate as they have physical adaptations that assist them to survive the harsh prairie winters of -40 degrees Celsius. They often form small flocks with which they feed in and also roost through the night together in. They are quite general in their habitat requirements; they tend to select both deciduous and coniferous forests types, riparian woodlands as well as urban parks and gardens. They are however cavity nesters and do require their nests to be roughly 10' to 40' above the ground. They will hollow out a small cavity for themselves but they will also take over an abandoned woodpecker hole or make use of nesting boxes. They begin to breed in Manitoba in early May and they almost always have just one brood. The Black-capped Chickadee pair bond lasts for several years, which is not a very common trait amongst birds.

In addition to cracking open black sunflower seeds from back yard feeders, the 'natural' diet of the Black-capped Chickadee consists mainly of insects (found within tree bark), seeds and berries. They are known to hoard food in a multitude of locations and will retrieve this nutrition during harsher times, most notably winter.

Attracting Chickadees to an area may soon have White-Breasted Nuthatches, Downy Woodpeckers and Warblers following suit. These species are very often found foraging together.

House Wren

Troglodytes aedon

"Branch Dancer"

Courtesy: Wendell Long

Courtesy: Bet Zimmerman

House Wrens arrive in Manitoba early May and begin their winter migration by mid-September. A relatively common suburban bird, the House Wren is a high-spirited migratory bird with a very chipper song. The males arrive earlier than the females and spend their time laying claim to a selected territory and chase of and threaten intruders as they defend their selected nesting grounds. They tend to favor thickets and shrubby edges of both coniferous and deciduous vegetation, were insects and larvae are plentiful. The males also begin nest construction before the females arrive to the area. They will construct several nests as a sign to others that this area is occupied, a strategy that result in less competition for food sources throughout the summer. Once the female arrives she surveys the nests, selects one and starts to rearrange the twigs to her liking. During the courting stage of mating, they are a pleasure to watch, as they lift their tails and shake their wings. Like the Black-capped Chickadee, the House Wren is a cavity nester and will inhabit abandoned woodpecker cavities as well as nest boxes. They are however extremely territorial and have been known to destroy the eggs of neighbouring birds, complete with tossing the young prematurely from their nest. Wrens are successful parents, perhaps due to a lack of competition, and they usually raise two broods and sometimes three. With their nest creation behaviors, their constant rearing of young and their delightful cheery voice, having a resident House Wren in close proximity can provide much animation to an environment.

American Robin

Turdus migratorius

"City Sinatra"

Courtesy: Alexis Bywater

Courtesy: Alexis Bywater

The American Robin is found throughout much of Manitoba's natural habitat and is a common residential or suburban bird of Winnipeg. Robins tend to select the edges of forests, woodlots, gardens and parks to inhabit. With their busy nest building behaviors and their recognizable cheerful song, the Robin is for many people the first sign of spring. In Manitoba, they usually arrive by the end of March or early April, and remain until the end of October. Usually the males arrive to the summer breeding grounds first and they compete amongst each other for nesting territory rights.

These birds are extremely dedicated parents. Once one brood has left the nest, the male cares for these young fledglings while the female incubates the next clutch. They are a very adaptable branch or ledge nester. Nests are cup shaped and are made of sticks, grass or loose bark held together by mud. Robins are very resourceful creatures. In dry conditions they will create mud by transporting dry soil to water and mixing their own mortar. Robins diet consists mainly of larvae, insects, fruits, berries and of course earthworms. They are known for their ability to hunt and devour earthworms. After a rainy day, it is very common to see Robins walking on the sidewalk edge and within grassy areas with their heads tilted watching the soil for movement. Lawn sprinklers spraying water, can be a simple way to attract Robins. Within minutes of turning on a sprinkler, quite often a few Robins will land nearby and start their head tilting adventure for worms.

'Oh…you're a bird watcher'….a delicate bending of the body and with an air of extreme secrecy.

'Do tell me, I've always wanted to know – what do bird watchers do?

What on earth can one answer to that?

'Well….we….er…look at birds.'

'You look at birds?'

'Well….actually…we…sort of study them.'

'You study their what?'

'Well…their…er…courtship, mating and all that.'

'You study their mating?'

'Well...er…some of us do, most of us just like to look at birds and…er…er…enjoy doing it.'

'I see.'

Well, of course, they don't, they don't see at all. They are quite convinced that while bird watching is good clean, healthy fun for their ten-year-old boy, it certainly isn't good clean fun for someone my age. Somehow, I say to myself, we have got to show people that bird watchers can actually be quite ordinary, normal members of society, not strange, slightly juvenile boys who never grew up (Gooders 1975).

Chapter Nine Boundary, Site & Analysis

The Winnipeg Exchange District is a National Historic Site with a large array of heritage buildings from the turn-of-the-twentieth century. It is an extremely active place during the day with a large concentration of people employed in the area as well as an active nightlife and theatre district. Located in the heart of Winnipeg and adjacent to the infamous corner of Portage Avenue and Main Street, the primary traffic corridors of Winnipeg's downtown, The Exchange District is eclectic and rich with beauty. Within blocks of Main Street to the east is the Red River, a substantial natural feature which wildlife constantly depends upon and use for all aspects of their survival. Riparian corridors, the Red River is no exception, are considered natural superhighways for wildlife as they are the bloodline of the landscape. Just 1 km south of the Exchange District is the junction where the Assiniboine River meets the Red River. Essentially the two major corridors that humans make use of and the two riparian corridors that wildlife utilizes are within half a kilometer of each other. This is a unique opportunity to encourage an interface between these two worlds for education, relaxation and pure pleasure.

According to the Canada Statistics 2001 Census data, 60% of Manitoba's population lives in Metropolitan areas and 55.3% of Manitobans live in the City of Winnipeg. Manitoba's population is very centralized. It is estimated that the residential community of Winnipeg's downtown area is reaching 13000 people and growing. In addition, it is estimated that there are up to 300 homeless people living in and along Main Street.

Throughout this study, homeless people have been observed socializing, sleeping and sitting within the site. When interpreting and reacting to the site in the physical form of a design program, a conscious decision not to design for or against this user group was made. Perhaps this type of user knows the downtown in a much more intimate way and probably has a deeper relationship with the bird species in the area.

The demonstration site for this study is in the Exchange District. It is located on a City of Winnipeg property located between Market Avenue and Bannatyne Avenue East, just to the west of Water Front Drive.

To its north: a large surface parking lot, a single storey professional building and an eight-storey condominium development (still under construction).
To its east: Water Front Drive, a walking trail and park and the Red River. To its south: a small surface parking lot and a three-storey/five-storey professional building.
To its west: the junction of three lanes. John Hirsch Lane extending directly from the site to Rorie Street, the back lane intersecting with Bannatyne Avenue and a closed off lane intersecting Market Avenue. Daily, this closed lane is used by pedestrians, office workers taking a break as well as garbage and delivery trucks servicing the buildings on Market Avenue.

The ±1600 sq.m. site is currently used by pedestrians navigating their way to destinations throughout the downtown area. Both the north-south route and an east-west route are heavily used. At the very west end of the site, there are a few benches beneath some estimated fifteen to twenty year old Shubert Chokecherry trees. This area is well used throughout most of the day especially in the spring summer and fall months of the year .

A casual crushed limestone path connects the west to the east and is lined by Basswood trees on its southern edge. These tress are in good condition. Growing along the north edge of the site and along the south façade of the single storey professional building, in a

raised planting area, is a grouping of Mugo Pines and junipers, both of which are thinning and in need of enhancement. The very west end of this professional building boasts a healthy patch of Engleman's Ivy which has taken hold of the building and is growing vigorously up that façade. This ivy is very valuable to the existing bird species, especially the sparrows. It is a source of food and shelter, both from any predators and from adverse weather conditions. Across from the ivy is a thriving thicket of False Spirea. Although this plant species is not a native to Manitoba, it does provide very good cover and helps define the transition between the 'hardscaped' seating area and the casual path and sod area.

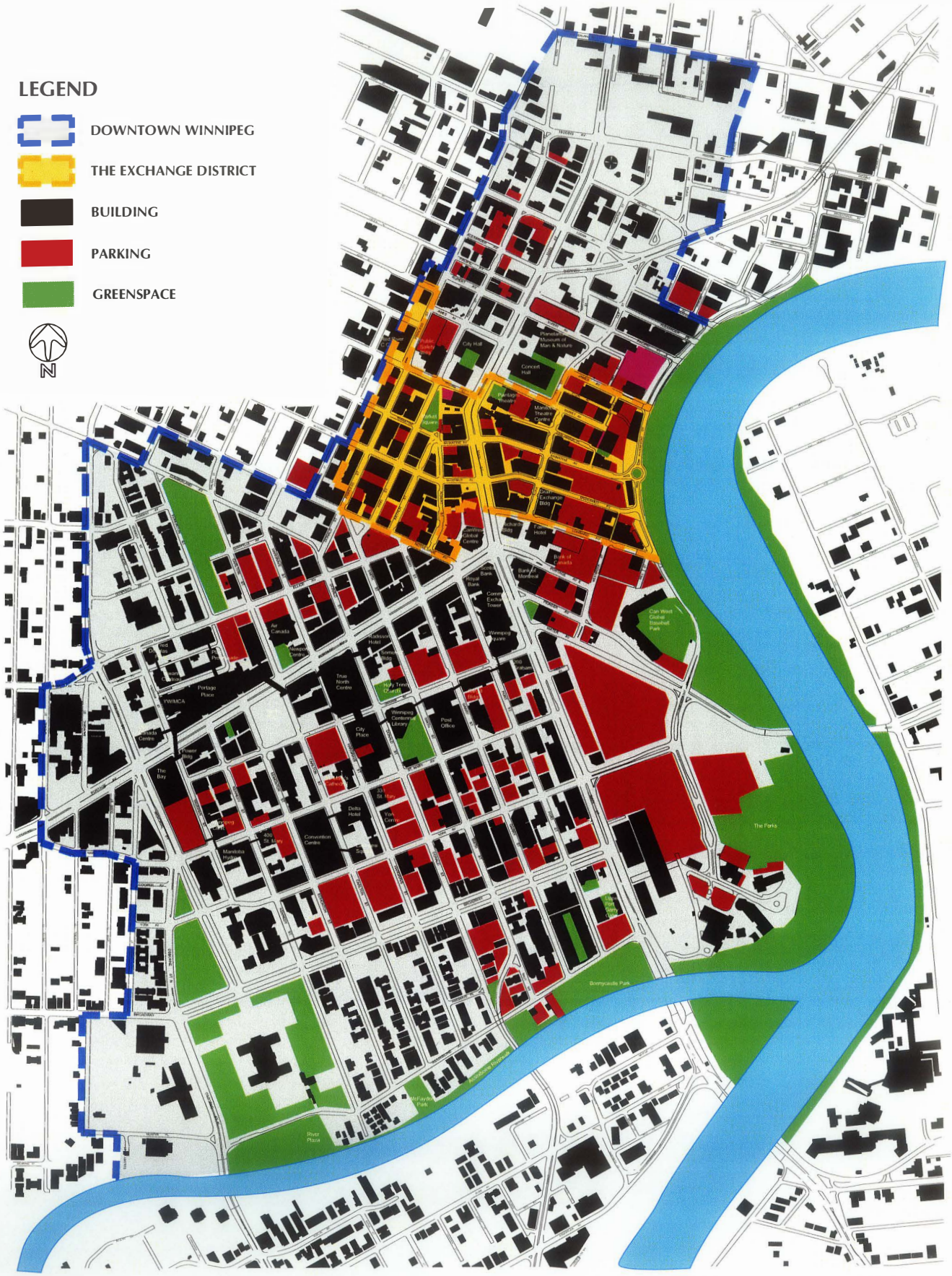
Site
Taken from 5 Storey Office Building - South of Site - 500 Bannatyne Avenue

North View of Context
8 Storey Condominium Building (under construction) to the left

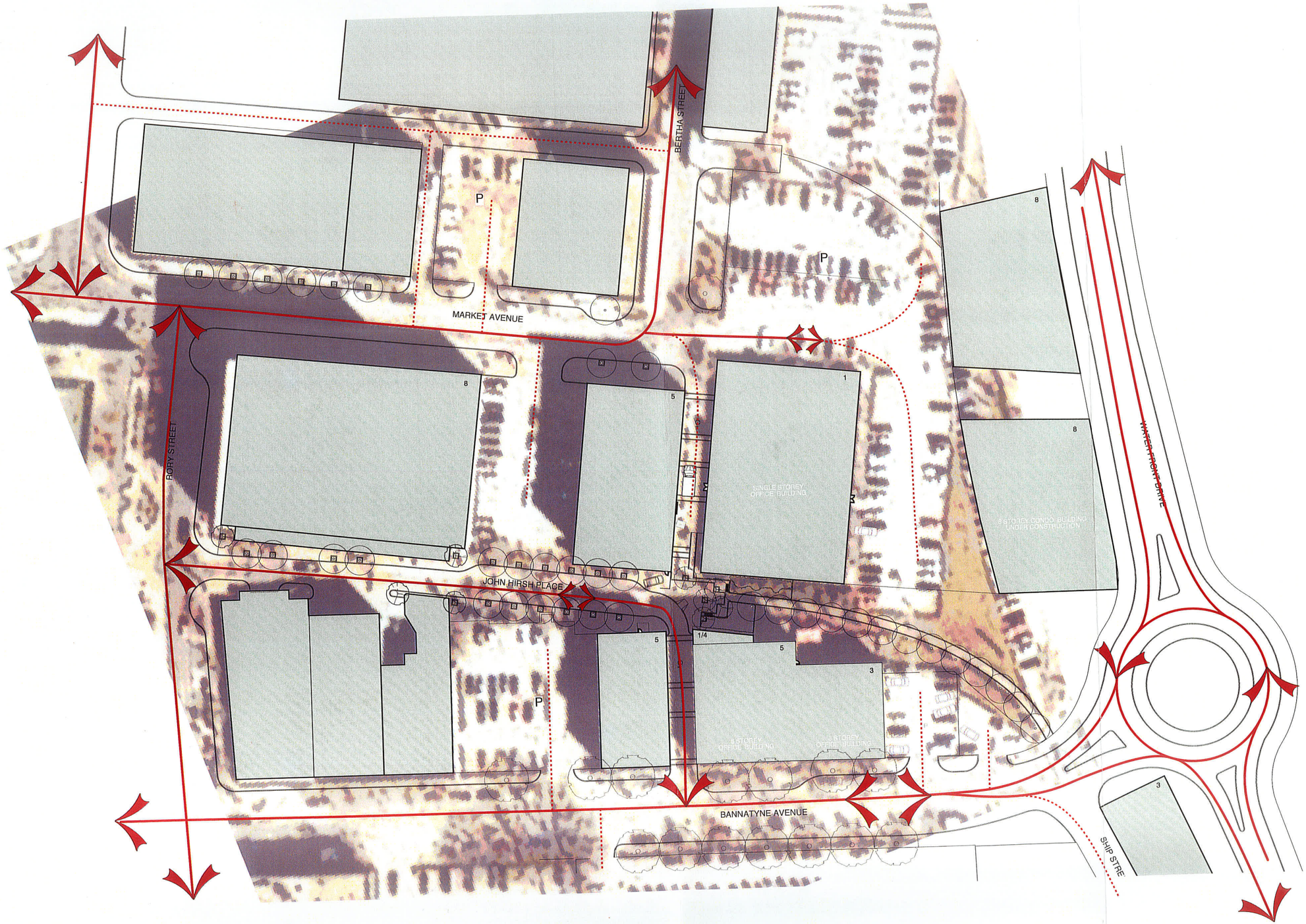
Existing Walkway - East View

Intersection of Alley off Bannatyne Avenue & John Hirsh Lane

East Context of Site
Intersection of WaterFront Drive and Bannatyne Avenue


LEGEND
DOWNTOWN WINNIPEG
THE EXCHANGE DISTRICT
BUILDING
PARKING
GREENSPACE
N
City Hall
Concert Hall
Manitoba Theatre Centre
Bank of Canada
Royal Bank
Air Canada
Portage Place
YWCA
True North Centre
Holiday Inn
Winnipeg Centennial Library
City Place
Post Office
The Bay
Delta Hotel
Convention Centre
Can West Global Baseball Park
The Forks
Bonnycastle Park
Assiniboine Riverwalk
Rivers Plaza

LAND USE



VEHICLE CIRCULATION

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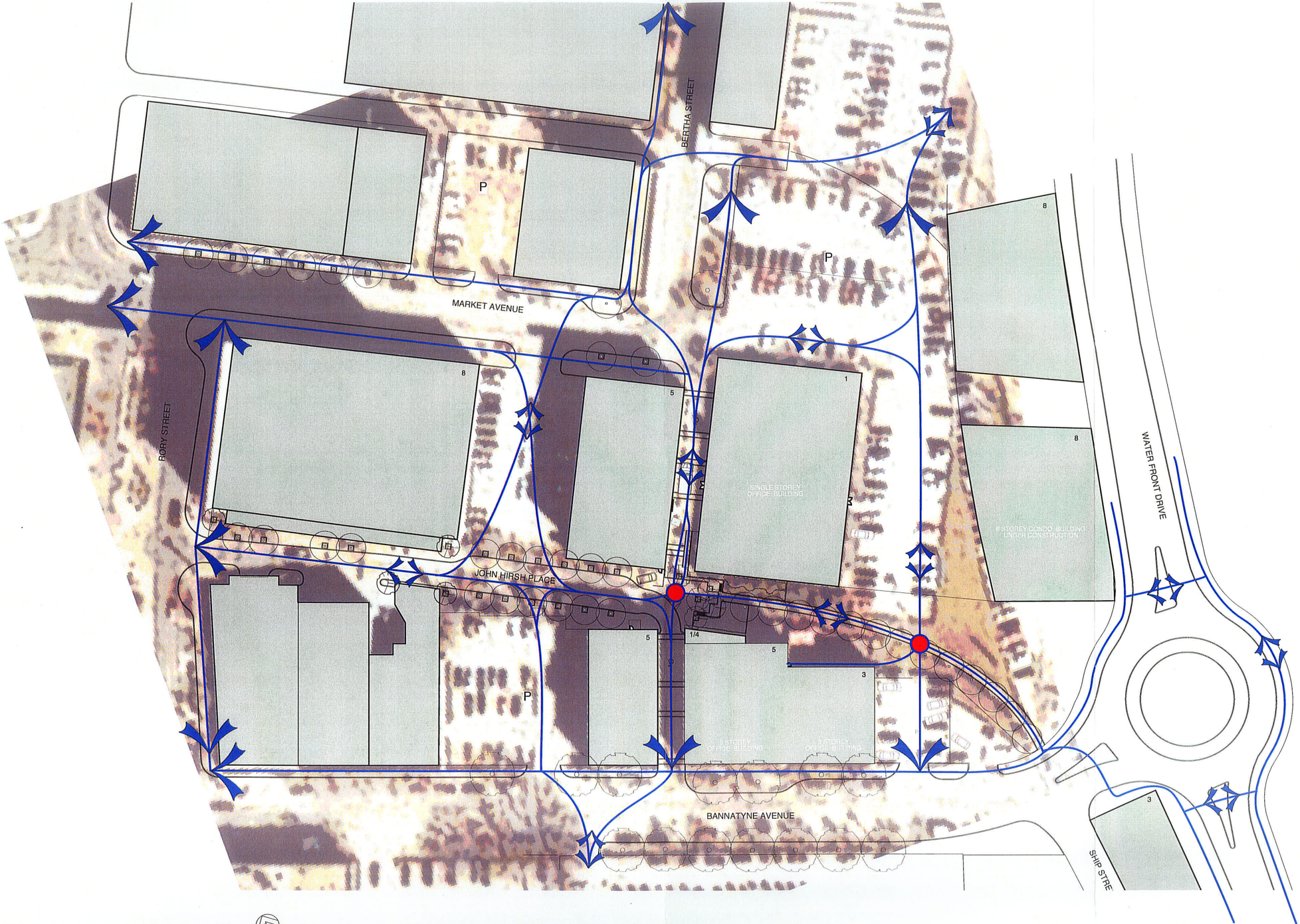

PEDESTRIAN CIRCULATION

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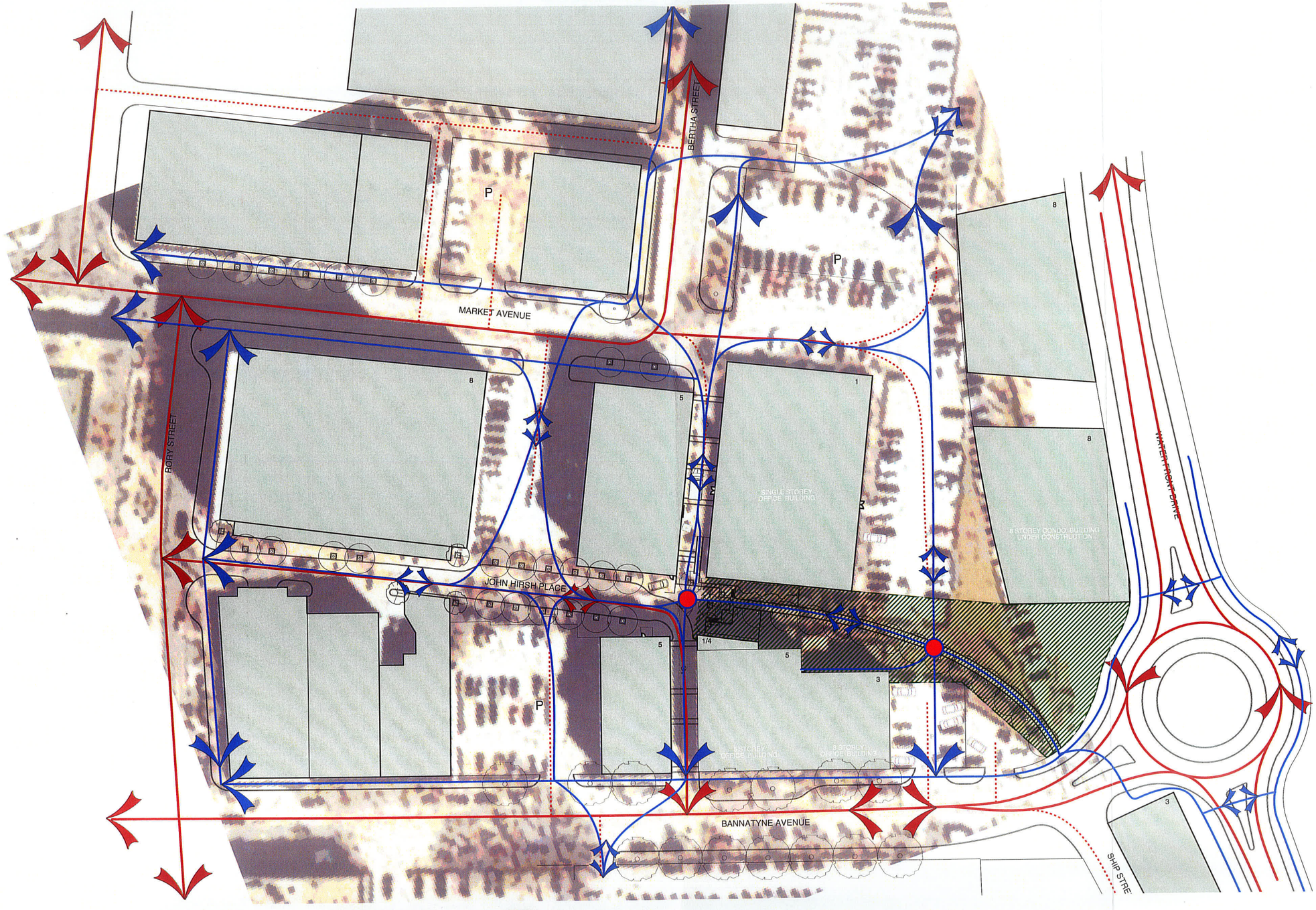
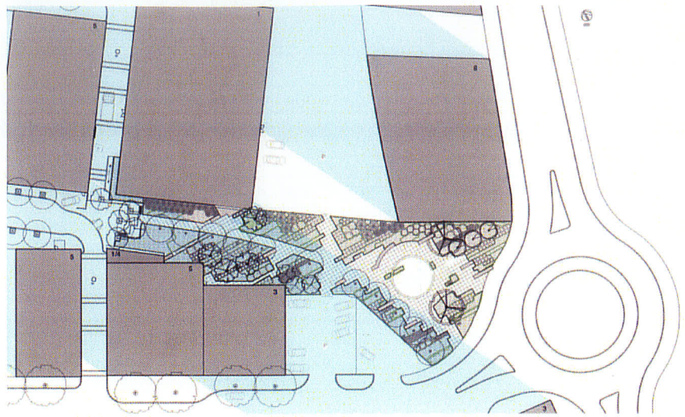


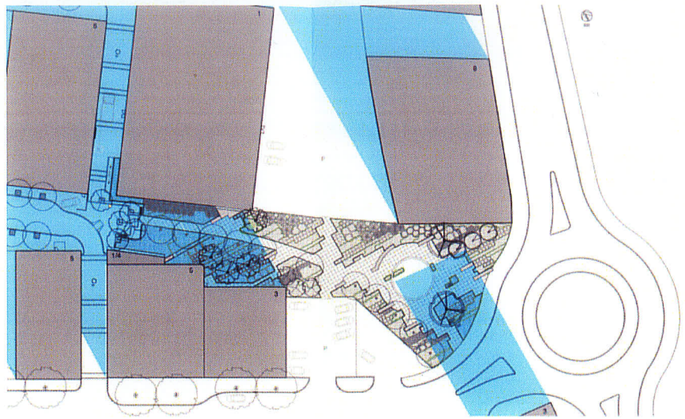
CIRCULATION & SITE SELECTION

NTS

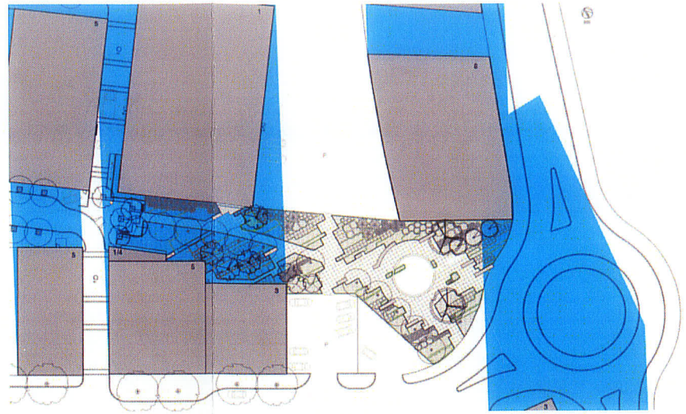
SITE SELECTION
VEHICLE CIRCULATION
PEDESTRIAN CIRCULATION



WINTER • 8am

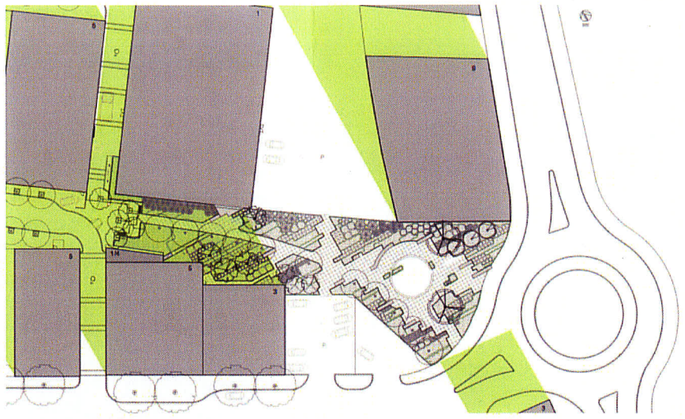


WINTER • noon

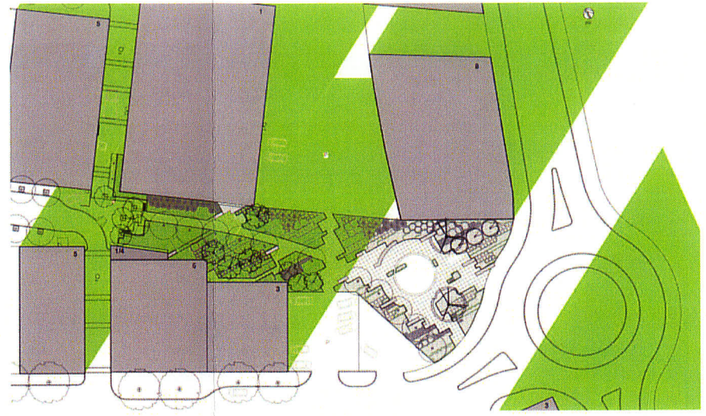


WINTER • 2pm

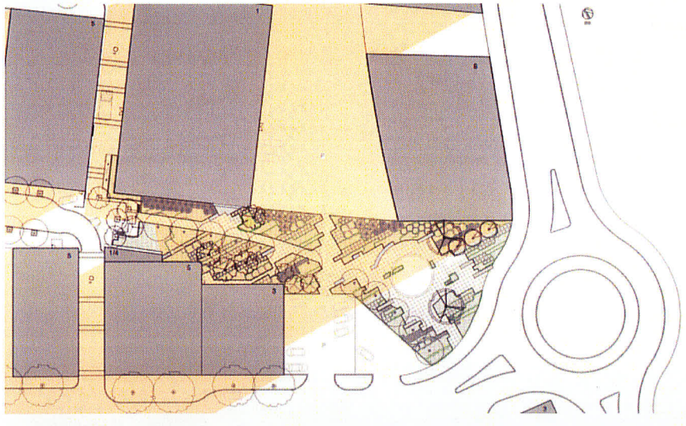
SPRING/FALL • 8am



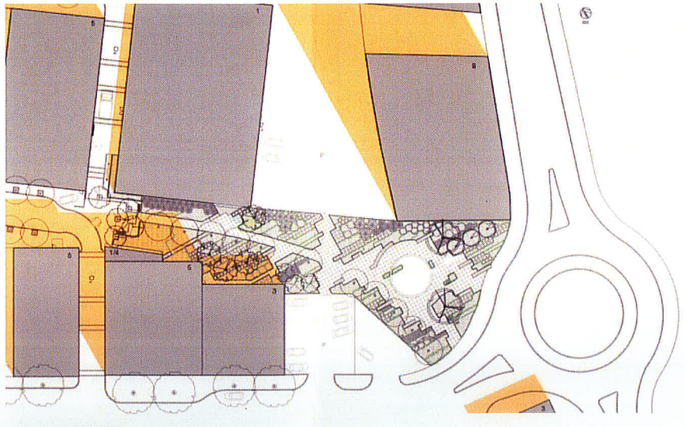
SPRING/FALL • noon



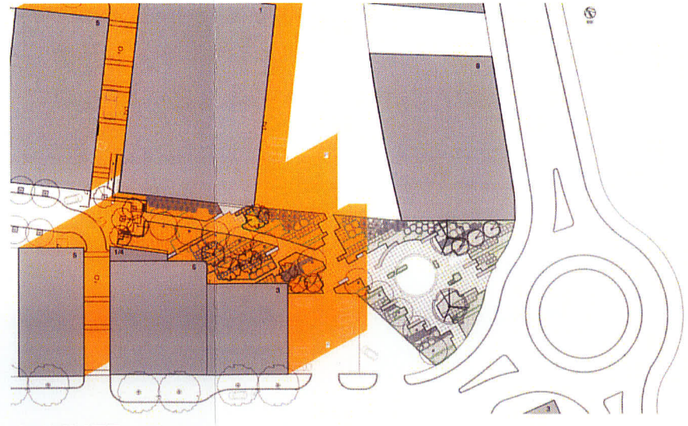
SPRING/FALL • 4pm



SUMMER • 8am



SUMMER • noon



SUMMER • 4pm

SHADOW STUDIES

Chapter Ten

Conceptual Development
Design and Drawings

Migration **provided the core inspiration for this design.**

Its cyclical nature: bursts of activity in spring and the slow descent in fall.

Direction

Climate

Time

Spring Green & sing

Gather Group and Descend

Wild Order

This greenspace was designed not only to attract birds into the urban environment but also as a place for people in the area to connect with nature amidst their hectic urban lives. The human users of the site could be professionals moving through or having lunch from 9-5, urban dwellers walking in the mornings and evenings, young children on mid-day daycare and school excursions, evening theatre and sports enthusiasts, or even transient individuals who use the park as a refuge at night. The park had to be a place where scale and microclimate allowed for a wide range of human activities to occur without disturbing its bird and animal inhabitants. The space was designed for people to stroll through, gather in small groups, play, find solitude, observe and learn. Best of all, whether its watching the birds hard at work when they gather materials for their nests, listening to a their songs, or observing them pulling a frozen berry off of a cranberry shrub, the design ensures there will be moments when people are exposed to the lives of birds.

One requirement humans, animals and birds share is environmental comfort. Birds need sunny spaces rich in food for grazing and harvesting nest-building materials. Humans need sunlight for their physical and psychological wellbeing. Many birds require protected shady locations to roost, socialize and nest within. Humans need protected shady spaces to enjoy the outdoors, especially on hot sunny summer days. The site is a spectrum running from sunny open spaces along the east boundary to shady secluded spaces along the western boundary. The seasonal impacts of sun position and wind were carefully studied, mapped and integrated into the design solution to optimize the availability, transition and comfort of a range of microclimate rich spaces.

Another key element in any sustainable human or avian environment is water. Both humans and birds drink, clean, cool off, and play in this magical element. Water was visible on the existing site through surface puddles as well as a large roof drain from the northern one storey building that spewed like a waterfall during heavy rains and the spring thaw. These existing conditions inspired a design that incorporates water as a functional

and playful element in the park. A water wall cascading down the one storey building face is dotted with ledges of varying depths and lengths forming safe watering access opportunities for a variety of bird species. The ledges modify an otherwise glassy sheet of water into animated groups of vertical streams, lightly splashing and dripping. Just the sound of water dripping or gurgling will attract birds, as these sounds are magnets to birds. These ledges will be locations where birds could drink clean fresh water and ruffle their feathers out for a cleaning. The elevated base of the feature collects water in a shallow trough inviting other animals to visit. Birds like bathing and drinking in different water depths, the different ledge sizes and the trough at the bottom will accommodate most bird species. Sensor triggered misters provide a touch of unexpected fun while cooling the area down. Passive water collection has also been built into bird perches throughout the site. Shallow bowls or undulations in the concrete forms extending from the seating elements, trap water for short periods of time after rain events creating puddles that will evaporate throughout the day.

A place to relax and hang out comfortably is a universal human and animal need. With this in mind human and bird site furnishings are fully integrated into the site design. The two main materials utilized are concrete vegetation. A large feature limestone block bisects the curved concrete seat wall that surrounds the earthwork feature and becomes embedded within it. This earthwork is planted with the native grass, Creeping Red Fescue, which is interjected by a short bold row of Karl Forester Grass, a non-native species. The edge of this earthwork is sandblasted with a range of native bird names subtly bringing attention to the main purpose of the park.

Dotted throughout the site are generous concrete blocks, some of which are finished with recycled wood slats. They were designed as elements that form comfortable multidirectional seating for humans. In some cases these blocks are divided into two heights with the portion extending into the planting beds reaching a height of one to two meters, forming

bird ledges or lookout locations. Some of these lookouts incorporate the shallow bowls discussed early on their surface to collect rainwater and become additional water sources for the birds to utilize. The east edge of the site is anchored with a similar concrete seating element. This feature however has a much more substantial bird lookout. It is twice the size and significantly taller than the rest, it is an informal entrance marker. Sandblasted into this concrete mass and a select few others are different songs from many bird species. For example, “chick-a-dee-dee-dee”, “ki ki ki”, “tsi tsi tsi tsi oodle oodle oodle oodle” etc. All signifying the avifauna of Manitoba that will inhabit this site.

The existing birds on site have long been using building notches, ledges and overhangs or thick vertical vine brambles as homes and comfortable resting places. Along the back lanes that connect John Hirsh Lane and Bannatyne Avenue there is a little void within the office building on the west facade. This is a result of a brick coming loose and breaking away. A House Sparrow has made her nest within this void, which is no larger than a standard brick in size. Drawing inspiration from these bird adaptations, the design offers building wall mounted nesting boxes, vertical “roosting columns” made of concrete, and various green canopies and vines as permanent nesting locations. The roosting columns vary in height from four and half to eight meters. They are reminiscent, albeit very abstractly, of Totem Poles of Canada’s First Nations Peoples, and mimic the trees found in the river bottom forest habitat, the natural habitat condition of this riverside site. The roosting columns contain numerous brick sized excavations and ledges set at least two and a half meters off the ground to prevent physical human disturbance. These unique features are set into the site between the buildings and the walkway at a distance that reduces the effects of human disturbance but still allows for people to see bird activities. Watching a bird enter and exit a cavity as they build their nest or constantly bring food for their young is a very educational and beautiful activity to witness.

Migration is intimately dependant on direction, climate and physical landscape features. Not only are birds exposed to rivers, lakes, mountains, cites and towns, etc., they also contend with agricultural fields throughout their journey. For some bird species, these fields provide habitat but for others they are vast island of danger. When flying high above the fields appear as a patchwork of varying colors and sizes.

Integrating climate and light was the key design consideration as these factors greatly affect not only migration but also the general lives of both birds and humans. Excluding the River Lot division system (land parcels in narrow sections at right angles to the river), much of Manitoba's landscape was originally parceled by the Rectangular Land System and designated in eight square mile townships, almost always on a true north orientation. The buildings that surround this site all have slight differences in their orientation. Many people make the assumption that north is straight down Main Street and that Winnipeg's downtown streets are oriented on a north grid. This is not the case.

A grid for the site design was established and was oriented to true north. The grid is carried through the cast in place concrete pavement. It delineates the layout of the planting material and it locates other features on the site.

Ornithological and ecological research suggests that a complex and diverse stratification of vegetation needs to be incorporated when attempting to provide healthy and appropriate habitats for birds, especially within the urban environment. Canopy density, height, light tolerance and aesthetic value are common when considerations for a planting plan. In addition, specific factors such as: fruit and seed production, nectar value, blooming time, shelter quality and branching formation for nesting locations are all crucial when considering a planting palette for the main users of this site - birds.

Plant material is a key design feature. It has been used to help emphasize the grid and overall layout of this site. The plant selection within this project directly correlates to the geographic region and the hardiness zone of this site. It is designed to best suit the targeted bird species, in addition to other bird species that can be expected. Seed and fruit baring perennials, shrubs and trees are used wherever possible, as they are natural providers of nutrition. Evergreens, specifically large coniferous shrubs and trees provide essential locations for nesting, night roosting activities as well as protection from predators and adverse weather conditions. The existing vegetation was consciously retained except for two of the Basswood trees. These needed to be eliminated in order to achieve the desired circulation paths within the geometric grid that was established. The remaining Basswoods were retained because they are well established, in good health and will be long-lived trees. There was no sensible reason to remove them all entirely as they are a native tree species of Manitoba and have great value in contributing to habitat for insects and birds. On the northwest corner of the site, existing Mugo Pines transplanted at grade. False Spirea and Engleman's Ivy would remain but be expanded upon with additional specimens.

Tall deciduous shrubs, like High-bush Cranberry, have a high dense canopy that provides hiding cover as well as being an excellent food source. Buffaloberry, Western Snowberry and Prickly Rose were heavily utilized for their food value and their drought resistant

tendencies. Perennial grasses are wonderful for texture and movement and also provided seeds as a food source. The following is a complete list of all of the plant material incorporated into this design solution.

PLANTING LIST

CONIFEROUS TREES
Colorado Spruce

CONIFEROUS SHRUBS
Mugo Pine*
Savin Juniper*

DECIDUOUS TREES
Green Ash
Long-Spined Hawthorn
Native Birch
Showy Mountain Ash

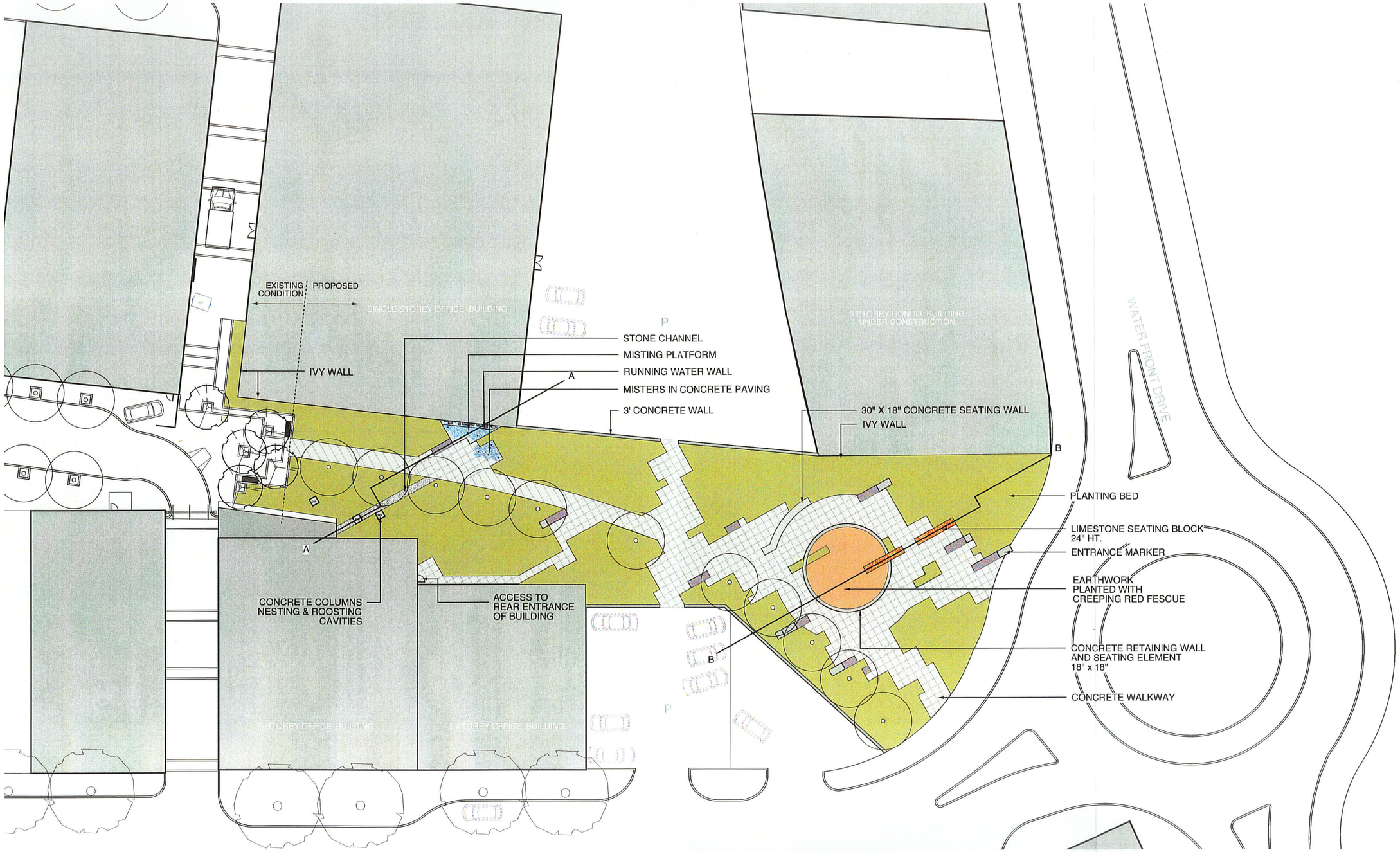
DECIDUOUS SHRUBS
Buffaloberry
High Bush Cranberry
Nannyberry
Prickly Rose
Red Osier Dogwood
Western Snowberry
Wild Red Currant

PERENNIALS
Black-eyed Susan
Engleman's Ivy
Gaillardia
Gallium
Giant Hyssop
Joe Pye Weed
Liatris
Native Fern
Purple Coneflower
Rough Heliopsis
Solomon's Seal
Swamp Milkweed
Wild Ginger
Yarrow
Yellow Flag Iris

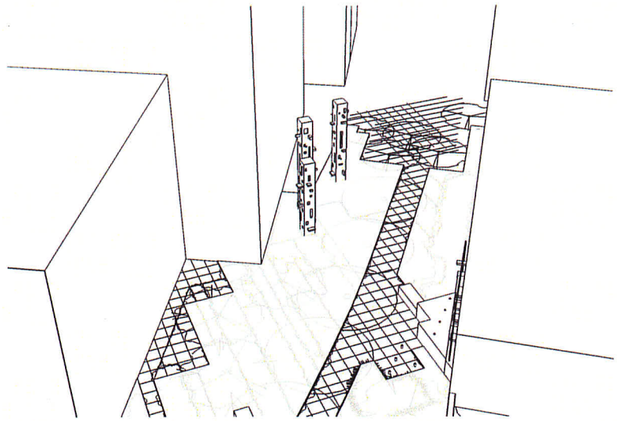
GRASSES
Creeping Red Fescue
Karl Forester Grass*

* Indicates non-native

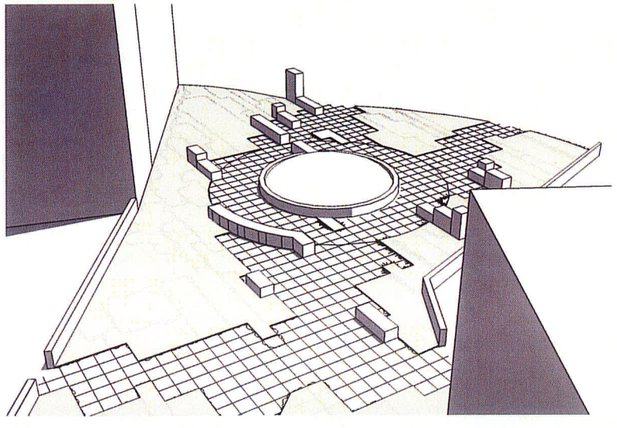
In the planting plan, these plants are installed in row and masses that all conform to the prescribed grid that has been established. Many of these plants, especially the perennials are self-seeding: reproducing and spreading through seed production. This site is designed to be maintained with minimal effort allowing these plants to naturalize the site through competition and natural reproduction. It is expected that with time, some of these plant masses will expand while others will shrink the areas they occupy, illustrating the process of natural selection and the authority of climate and nature. A state of stillness does not exist.



SITE LAYOUT NTS



WEST VIEW VEGETATION OMITTED



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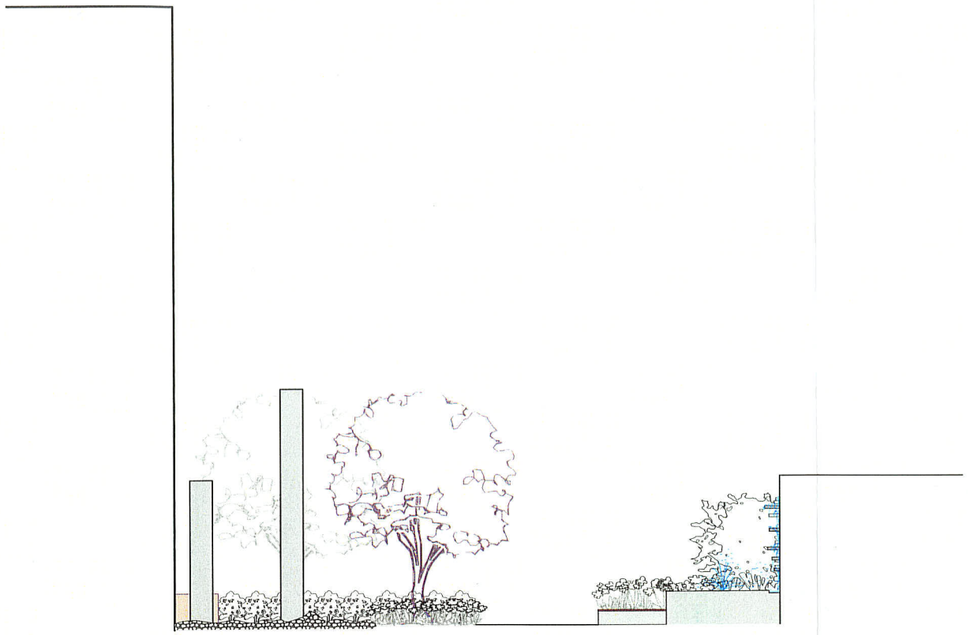
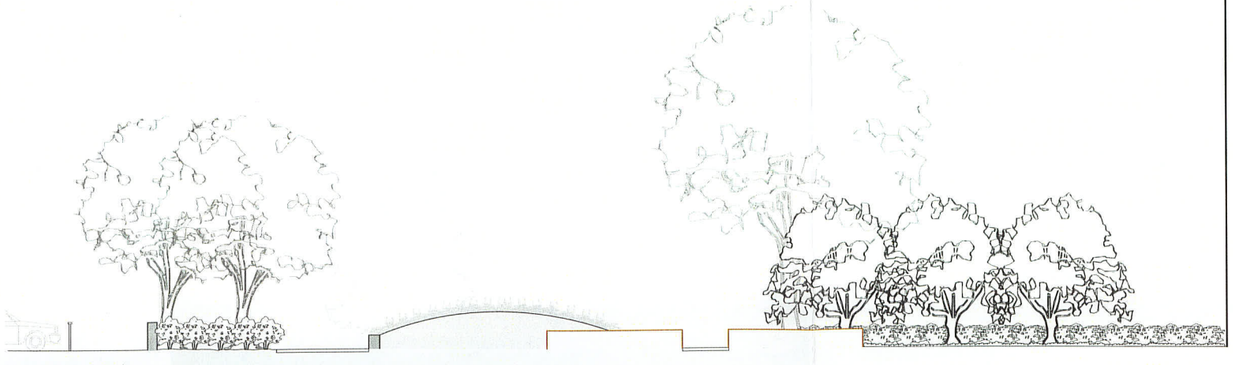


SECTION A-A



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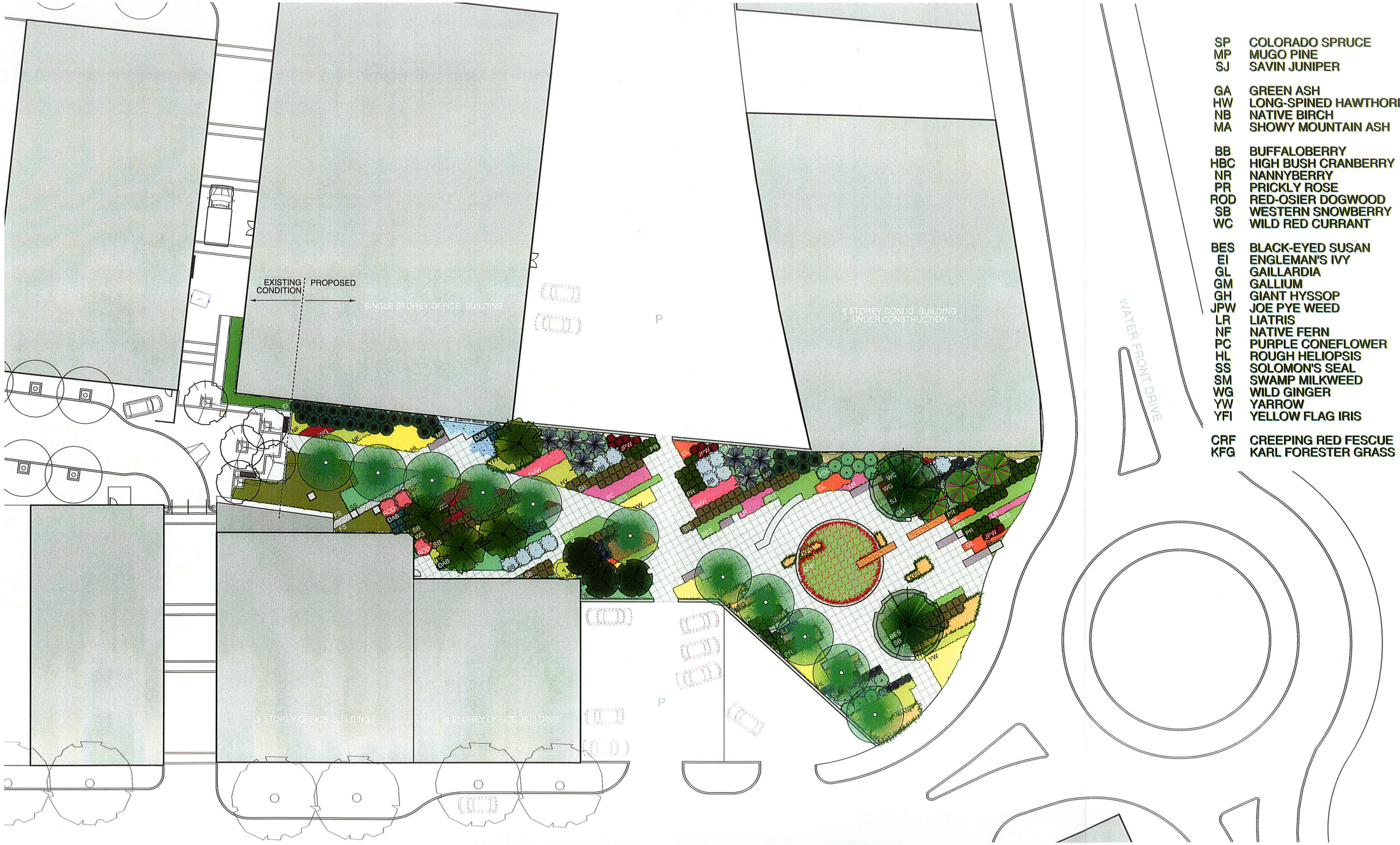
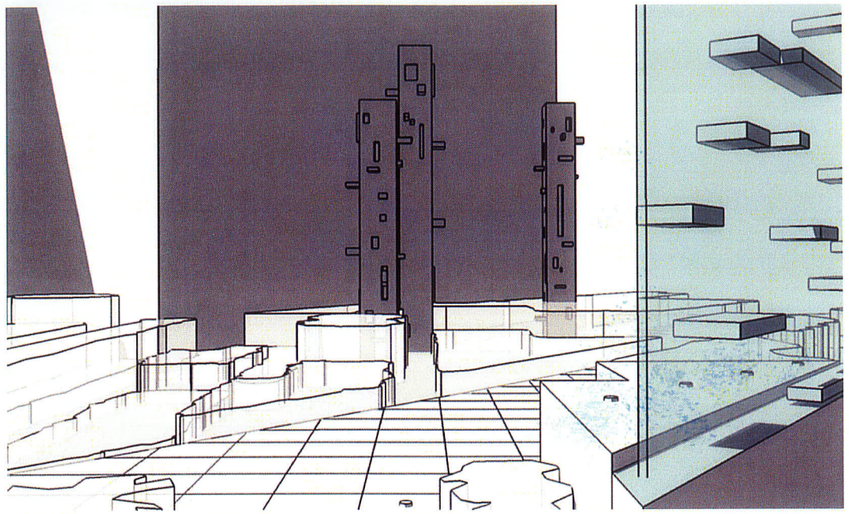


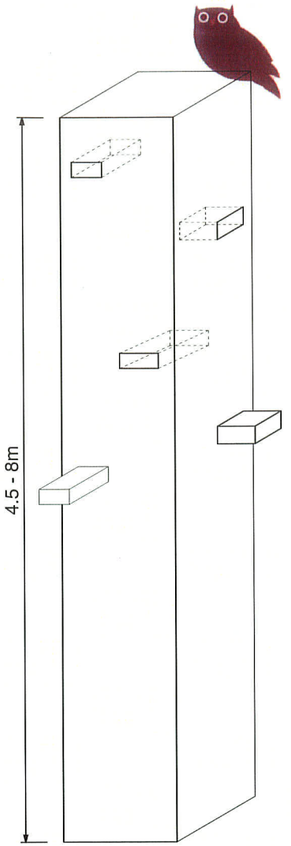
SP	COLORADO SPRUCE
MP	MUGO PINE
SJ	SAVIN JUNIPER
GA	GREEN ASH
HW	LONG-SPINED HAWTHORN
NB	NATIVE BIRCH
MA	SHOWY MOUNTAIN ASH
BB	BUFFALOBERRY
HBC	HIGH BUSH CRANBERRY
NR	NANNYBERRY
PR	PRICKLY ROSE
ROD	RED-OSIER DOGWOOD
SB	WESTERN SNOWBERRY
WC	WILD RED CURRANT
BES	BLACK-EYED SUSAN
EI	ENGLEMAN'S IVY
GL	GAILLARDIA
GM	GALLIUM
GH	GIANT HYSSOP
JPW	JOE PYE WEED
LR	LIATRIS
NF	NATIVE FERN
PC	PURPLE CONEFLOWER
HL	ROUGH HELIOPSIS
SS	SOLOMON'S SEAL
SM	SWAMP MILKWEED
WG	WILD GINGER
YW	YARROW
YFI	YELLOW FLAG IRIS
CRF	CREEPING RED FESCUE
KFG	KARL FORESTER GRASS

PLANTING PLAN NTS



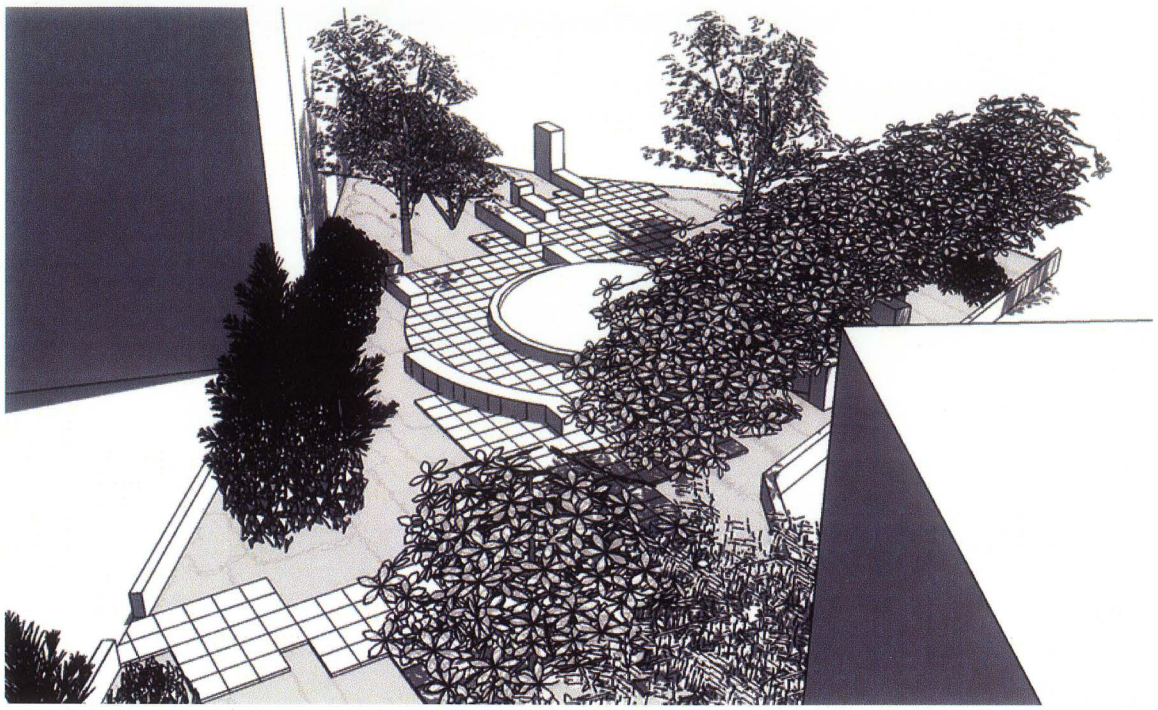
WEST VIEW - ROOSTING COLUMNS AND WATER WALL FEATURED

HOUSE SPARROW UTILIZING
VOID IN BUILDING FACADE

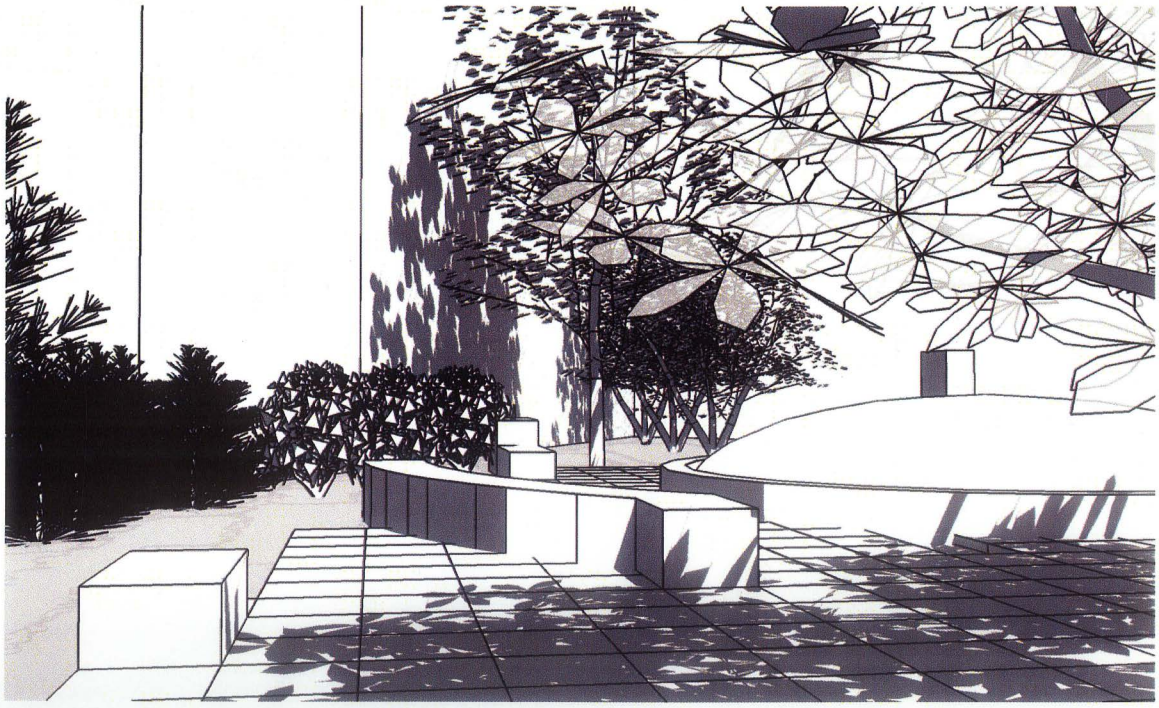


ROOSTING, PERCHING & NESTING COLUMN

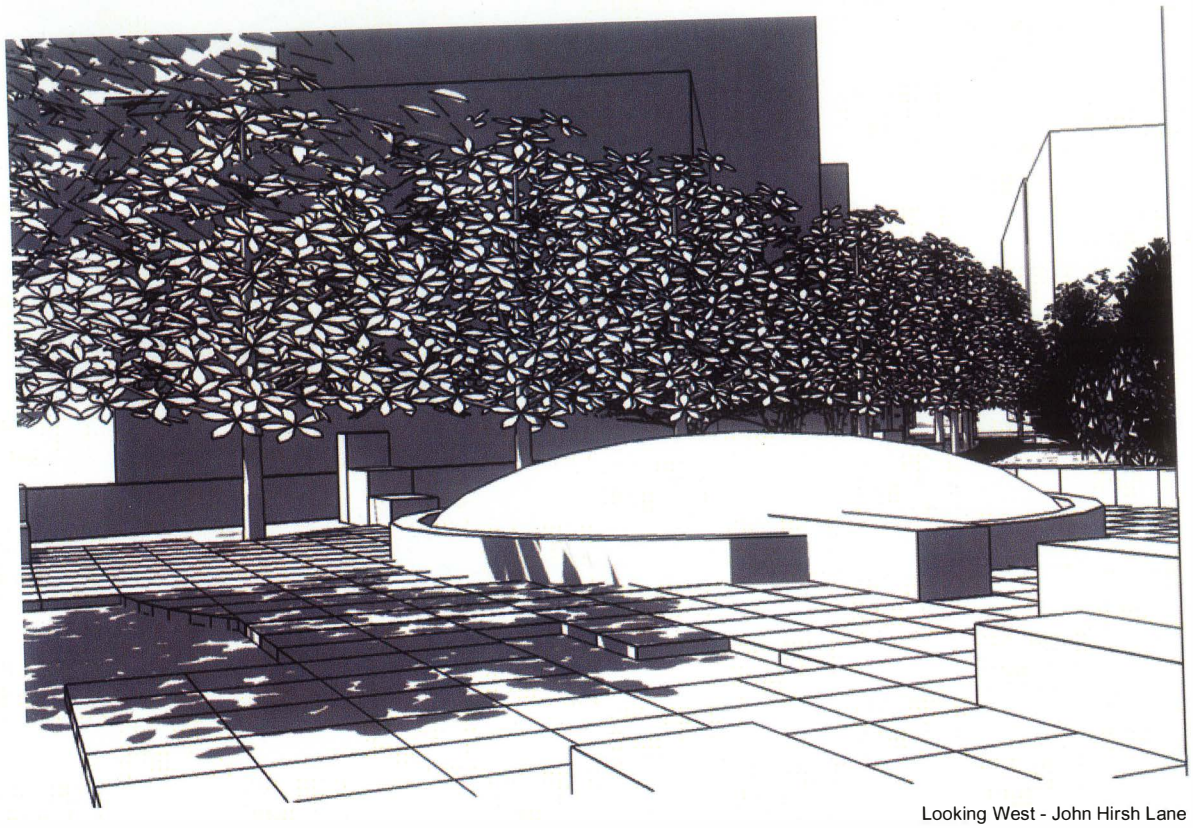
ENTRANCE MARKER AND CONCRETE SEATING BLOCK



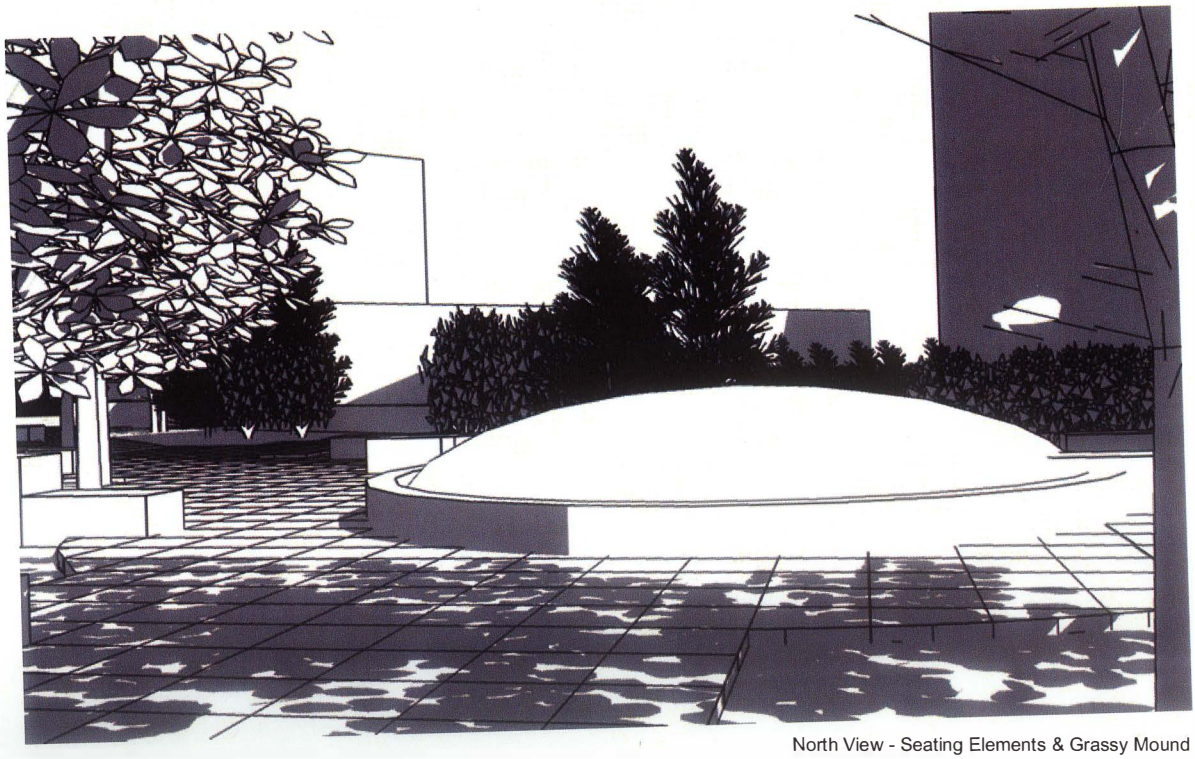
East View - Looking Towards Water Front Drive



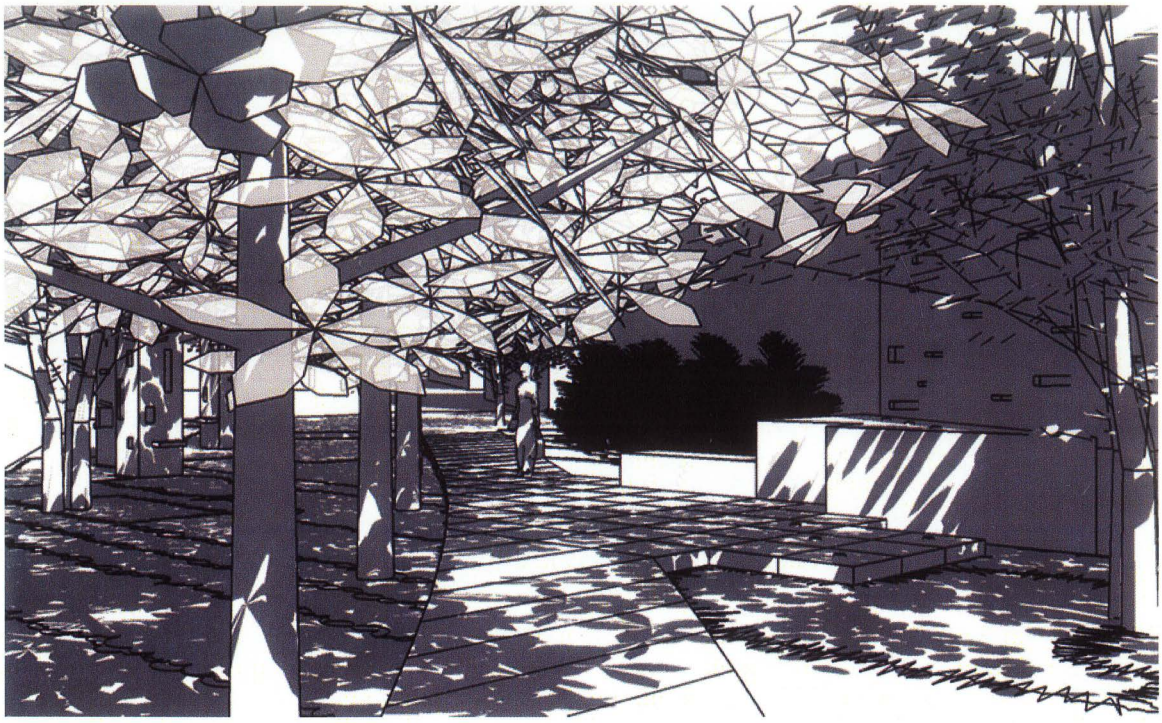
East View - Seating Elements & Grassy Mound



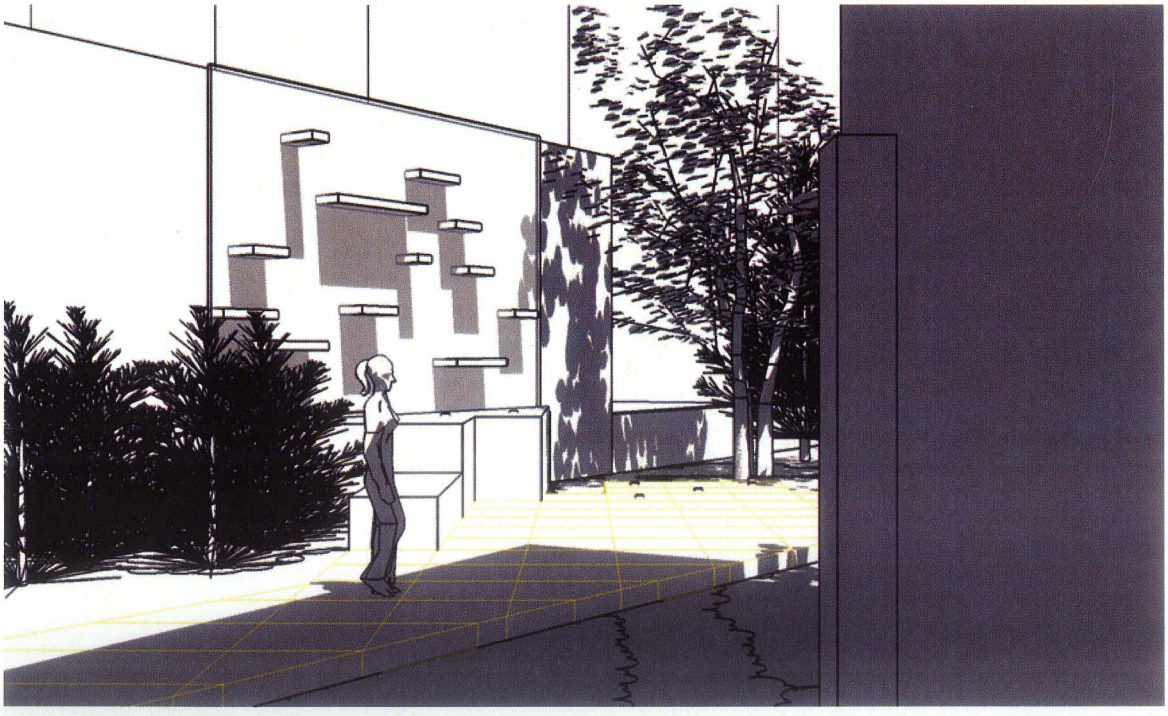
Looking West - John Hirsh Lane



North View - Seating Elements & Grassy Mound



Looking West - Towards John Hirsh Lane - Water Wall



Water Wall Feature

Concluding Thoughts

In New York's Central Park, the largest urban park in North America, some birders have reported seeing up to one hundred species in a given day. At eight hundred and forty three acres of greenspace Central Park is larger than Winnipeg's seven hundred and forty one acre downtown area. Nevertheless this urban area is rather large for a city of 600,000 people. It is comparable in surface area to the downtown areas of much larger cities, such as San Francisco and Philadelphia. Winnipeg's urban core is dominated by paved surface parking lots and sterile roofscapes. The reconnaissance conducted during this study recorded only a handful of different bird species over the coarse of an entire year within the Exchange District, a 20-city block downtown neighbourhood composed of nearly 150 buildings.

The number and quality of urban greenspaces directly correlates to the bird species found within any area. Birds require places to rest and feed and they look for the closest greenspace that will satisfy those needs. If new greenspaces were approached from a habitat creation point of view while still considering the needs of the human users, these greenspace, especially within a larger network will increase urban bird diversity and populations. The realities of private land ownership and the immense quantity of surface parking within the Exchange District presents large challenges for the establishment of bird friendly greenspaces within Winnipeg's Exchange District. In addition to the ground plane, there is a vast amount of roof space within the area that could become an elevated secondary network of greenspaces or 'super stations'. In addition to supporting year round bird species, such as the Black-capped Chickadee, these food, water and shelter rich greenspaces could tempt migrating birds into the area and become habitat islands that they could rely upon. Creating additional urban greenspaces within Winnipeg's downtown will have a positive effect on the urban bird population and in turn on the human population as a close contact with nature can inspire, reduce stress and educate.

> Bird conservation in urban and sub-urban habitats is no longer a fruitless task. Theoretical and empirical developments for understanding the functioning of wildlife in cities, along with the increasing interest placed on urban habitats as reservoirs of wildlife, open up new perspectives to direct conservation efforts with active public involvement (Fernandez-Juricic and Jokimaki 2001).

Everything affects everything

Planning and design decisions have a huge influence on the urban landscape, which in turn has an impact on animal diversity. At certain scales, a connection exists between the scale-dependent decisions of humans and their effect on different species of animals. Human decisions interact across scales to ultimately determine the specific location of a species. This can inform ways in which landscape architects and ecologists collaborate to understand human habitat and its effect on bird communities, especially in urban areas. Being conscious of how every decision will affect the potential users (birds included) of an environment as it evolves is essential. One element or aspect will no doubt have an affect on another and so on.

The state of stillness simply does not exist

Because of the highly dynamic nature of urban ecosystems a small effort in design and management can have a significant influence on bird populations and diversity. Not only can the enhancement of urban biodiversity have a positive influence on the people within the downtown, it can also have a direct economic impact as residential properties adjacent to greenways or urban parks have a higher market value than similar non-adjacent properties.

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