Abstract

Habitat loss and fragmentation are the most significant factors causing species extinction. Consequently, architectural and landscape designers are shifting their approaches from anthropocentric design to ecocentric design, prioritising designing with entire ecosystems in mind. In this thesis, the Cap Nature neighbourhood development project in Montreal serves as both a case-study and a site for ecocentric design. CapNature, proposed in 2005, caused public disagreement about consequential urban sprawl and environmental concerns. The project was canceled in 2017 and the untouched post-agricultural landscape remains. This thesis uses speculative site plan and building design strategies supported by environmental mappings, habitat drawings, and theoretical reflections of existing ecological design frameworks to investigate the potentials of ecocentric design as a counterproposal for the site. The counterproposal blurs boundaries between human and non-human landscapes and inverts anthropocentric design practices, presenting an architectural typology that reprioritises wildlife, habitat construction, and cohabitation between human and non-human species.

Acknowledgements

I would like to thank my thesis advisor, Lisa Moffitt, for providing so much knowledge and guidance throughout my thesis. Her encouragement helped propel my thinking and my creativity throughout my thesis journey. I would also like to thank my fellow studio-mates with whom I could count on to collaborate and share ideas. Thank you as well to the Azrieli School of Architecture and Urbanism for fostering a creative environment that allowed me to explore any and all ideas I wished to pursue. Finally, a huge thank you to my friends and family for their endless love and support throughout this year.
## Table of Contents

Abstract .................................................................................................................. Page 2
Acknowledgements ................................................................................................. Page 3
List of Images .......................................................................................................... Page 6

### 1.0 Introduction

1.1 Chapter Overview .......................................................................................... Page 10
1.2 Research Questions & Aims .......................................................................... Page 12
1.3 Research Methods ......................................................................................... Page 14

### 2.0 Ecocentric Architecture

2.1 The Accidental Ecosystem ............................................................................ Page 16
2.2 Green Infrastructures .................................................................................... Page 18
2.3 History of Ecological Design ......................................................................... Page 22
2.4 Methods of Drawing & Making Habitats ....................................................... Page 25
2.5 Ecocentric Framework .................................................................................. Page 30

### 3.0 The Site: Pierrefonds West, Montreal

3.1 Context .......................................................................................................... Page 34
3.2 Fieldwork ....................................................................................................... Page 50
3.3 Cap Nature Proposal ...................................................................................... Page 62
3.4 Cap Nature Controversies ............................................................................. Page 66

### 4.0 Counterproposal

4.1 Analysis Framework & Key Concepts ............................................................ Page 74
4.2 Blurred Strategy ............................................................................................. Page 82
4.3 Inverted Strategy ........................................................................................... Page 88
4.4 The Counterproposal ...................................................................................... Page 92

### 5.0 Conclusions

Appendix I: Glossary of Terms ........................................................................... Page 120
Bibliography ........................................................................................................ Page 128
List of Images

| Figure 2.2.1 | Hand-bound booklet containing annotated article, “Towards the Establishment of a Green Infrastructure in the Region of Montreal (Quebec, Canada)” | Page 24 |
| Figure 2.3.1 | “In the Air is a visualization project which aims to make visible the microscopic and invisible agents of Madrid’s air (gases, particles, pollen, diseases, etc.), to see how they perform, react and interact with the rest of the city.” | Page 28 |
| Figure 2.3.2 | Urban Algae Canopy - The Urban Algae Folly | Page 29 |
| Figure 2.3.3 | “Pollinators Pavilions produces new habitat for solitary bee species at the Old Mud Creek Farm... in New York’s Hudson Valley.” | Page 29 |
| Figure 2.3.4 | “Bat Tower is the first built prototype in a series of bat habitation projects which explore strategies for increasing public awareness of bats as a critical component of our ecosystem.” | Page 29 |
| Figure 2.3.5 | Gowanus Canal Sponge Park | Page 29 |
| Figure 2.4.1 | Hand-bound booklet containing mappings and drawings for three Canadian species | Page 32 |
| Figure 2.4.2 | Northern Saw-Whet Owl mappings and drawings | Page 34 |
| Figure 2.4.3 | American Badger mappings and drawings | Page 36 |
| Figure 2.4.4 | Yellow-Banded Bumble Bee mappings and drawings | Page 38 |
| Figure 2.4.5 | Precedent projects | Page 40 |
| Figure 2.4.6 | Porous model | Page 42 |
| Figure 2.4.7 | Nest model | Page 42 |
| Figure 2.4.8 | Burrow model | Page 42 |
| Figure 2.4.9 | Excavate model | Page 42 |
| Figure 2.4.10 | Fossorial model | Page 42 |
| Figure 2.4.11 | Talus model | Page 42 |
| Figure 2.4.12 | Imaginary cladding inhabitants | Page 44 |
| Figure 2.4.13 | Speculative cladding systems | Page 45 |
| Figure 3.1.1 | Map of Montreal | Page 53 |
| Figure 3.1.2 | Map of canopy cover | Page 54 |
| Figure 3.1.3 | Map of tree classification | Page 55 |
| Figure 3.1.4 | Map of open land | Page 56 |
| Figure 3.1.5 | Map of flooding zones | Page 57 |
| Figure 3.1.6 | Map of water | Page 58 |
| Figure 3.1.7 | Map of human presence | Page 59 |
| Figure 3.1.8 | Layered map of Pierrefonds West | Page 61 |
| Figure 3.2.1 | Map of photographed points of interest | Page 63 |
| Figure 3.2.2 | Photographs of points of interest in Pierrefonds West, observing and noting relevancy to key frameworks | Page 64 |
| Figure 3.3.1 | General site plan for neighbourhood development in Pierrefonds West | Page 67 |
| Figure 3.3.2 | Cap Nature development footprint | Page 68 |
| Figure 3.3.3 | Promises made by developers | Page 69 |
1.0 Introduction

Ecological architecture accommodates and supports all living beings. It promotes a symbiotic relationship between urban and natural environments. Traditionally, and especially within the dominating Western culture in North America, humans have colonized natural landscapes and have consequently destroyed animal habitats. Today, urbanization is ever-growing as urban sprawl threatens to overtake the few natural landscapes and greenspaces that seem to be left in or near urban environments. With the threats of climate change increasing, protecting wildlife and biodiversity is essential. In this pivotal era, architects are presented with the opportunity to become stewards of the environment by embracing ecological design methods that carefully, thoughtfully, and intelligently support the environment and reduce further harm to it.
1.1 Chapter Overview

This thesis is divided into five chapters: 1.0 Introduction; 2.0 Ecocentric Architecture; 3.0 The Site: Pierrefonds West, Montreal; 4.0 Counterproposal; and 5.0 Conclusions.

Chapter 1.0 introduces the main ideas covered in this thesis. I begin with a chapter overview that elaborates on the scope of my work and what to expect from the document. I then discuss my research questions and aims to give a conceptual starting point for my work, and finish with an explanation of my research methods, outlining the ways I am conducting my research and work to hopefully answer those initial questions.

Chapter 2.0 provides a theoretical overview of ecocentric design, focusing on three key resources that impacted my thinking about this concept. First, I elaborate on Peter S. Alagona’s book *The Accidental Ecosystem: People and Wildlife in American Cities*, explaining human and non-human relationships in urban environments. I then discuss the article “Towards the Establishment of a Green Infrastructure in the Region of Montreal” By Jérôme Dupras et al. as an overview of infrastructures that can be implemented in Canada. I follow with an overview of Lydia Kallipoliti’s article “History of Ecological Design,” explaining ideas and work situating ecocentric design within a wider disciplinary historical context. I focus my analysis on the Dark Naturalism subchapter, as it relates most to future work and concepts I discuss later on. I then introduce methods of drawing and constructing ecologies I have developed by showing and discussing work I completed early in my thesis. Finally, I summarize the major ecocentric themes present in the three key resources I overviewed.

Chapter 3.0 introduces the site I am focusing on by first discussing the greater context of Montreal and its environmental plans. I then discuss Pierrefonds West’s development plans, the history of the site, and its current features. I also discuss the animal species that are present in Pierrefonds West to give an understanding of the local ecology. I move onto some fieldwork where I show site photos I have taken and discuss my observations. I conclude by introducing the Cap Nature development proposal, elaborating on the associated controversies that lead to its eventual cancelation.

Chapter 4.0 introduces my counter-design proposals. First, I explain my ideas in more depth, discussing some more specific guiding questions I have for the counterproposal as they relate to key theories from Chapter 2.0. I focus on two main concepts from the previous analyses that relate to my counterproposal concepts, which are ‘blur’ and ‘invert,’ and explain why they are important for my work. I show drawing explorations for each concept and then present a final proposal that combines strengths from the two previous studies into a final drawing set, including supporting explanations for my design choices.

Chapter 5.0 summarizes the work done and the methods used. I relate my proposal back to the guiding questions posed throughout all phases of my thesis and reflect on the meaning and importance of such a speculative design project. I also elaborate on areas that require further work and research, as well as potential avenues for future directions.
I began my thesis with three main questions. Fundamentally, how can architecture be better integrated into a specific local ecology? How can architecture accommodate animal habitats? What tools do architects need when designing to take the local ecology into account in a critical and thoughtful way? I focused on the idea of designing for non-human species as if they were clients or stakeholders, so I started by examining a range of landscapes throughout Canada and researching animal species and their habitats that were specific to those landscapes. As I progressed in my research, my attention diverted to broader systemic issues of urban sprawl and habitat loss and fragmentation. I eventually settled on working within a specific site in Pierrefonds West, Montreal that has a contested history. Consequently, different questions began to emerge. For instance, what happens at the interfaces between human and non-human landscapes? How can architects enrich these ecotones to support the flora, fauna, and people present in these landscapes? My interests and goals have been aligned with a shifting paradigm in architecture. This shift is a change in focus from human needs and comforts to non-human needs, and the relationships that can be fostered between both groups. This thesis is a counterproposal to the Cap Nature neighbourhood design project, questioning which species should be considered or favoured when designing. This thesis further asserts that the local ecology, as well as human and non-human relationships, should be the main considerations in design projects to benefit all living things in a given landscape.

When I first started exploring species across Canada in their varying landscapes, my research methods began with habitat research and creating corresponding mappings of their locations and relevant geographic conditions, as well as drawings of the species themselves and their specific habitats. In the next phase of my thesis, I focused on analysing existing ecological design frameworks and concepts, and existing case study projects that related to those concepts. I then completed a thorough analysis of the site in Pierrefonds West to understand its history, its landscape features, and its human and non-human residents. This site analysis consisted of reading newspaper articles, reviewing research papers and documents from the city of Montreal and its communities, drawing various maps depicting the layers of landscape conditions on the site, and photographing the site. I also explored various spatial concepts that arose in all stages of my research through model-making and taking decontextualized photographs to further inspect their usefulness and application as various building elements that could respond to habitational or other ecological needs in some way. Following this initial work, I then used concepts from my analyses of existing frameworks to inspire an analogous framework that was specific to the site in Pierrefonds West and that would attempt to answer my research questions. I explored these concepts through hybrid drawings that were created digitally and then painted over. I continued to use this method of drawing and painting as my counterproposal progressed. As a result, I designed a counterproposal to the abandoned original neighbourhood design proposal for Pierrefonds West, countering ideas of traditional urban sprawl that erases natural landscapes and their essential ecosystems.
There are many different ecocentric design frameworks that exist in North America, as well as opportunities for new frameworks and methods of designing. In this chapter, I complete an overview of three of the most influential readings to my thesis. I elaborate on observations, ideas, and opportunities outlined by these readings in this chapter.
2.1 The Accidental Ecosystem

Despite human efforts to segregate themselves from nature and wildlife, humans and non-humans have always lived in shared environments that have fostered mutually impactful relationships. In his book *The Accidental Ecosystem: People and Wildlife in American Cities*, Peter S. Alagona illustrates multiple examples of these relationships, focusing on urban environments as unintentionally rich ecologies with telling characteristics that reveal human histories with animals.

Alagona is a professor of Environmental Studies at the University of California, Santa Barbara. He refers to himself as a historian of the environment and science, a conservationist, and a geographer of nature and culture. His research interests include human and animal relationships, what happens in their shared environments, and multidisciplinary approaches for studying ecology over varying scales of time and space. Throughout his time researching and teaching, Alagona has received 26 awards and grants and has completed 59 publications, including two books, the first of which was published in 2013. This book in particular that I am analysing was published in 2022. Alagona’s own research questions and interests are similar to the ones explored in this thesis, specifically those concerning human and animal relationships at both large and small scales. As an environmental expert who does not have a scientific background, Alagona’s multidisciplinary approach to and perspective on the issues he discusses in this most recent book are pertinent to the architectural design and planning strategies explored in this thesis.

Alagona’s book merges ecology, history, geography, and cultural studies to create a rich narrative that tells the complex story of human and animal interactions in urban spaces. This narrative has helped shape my own narrative in terms of the approaches taken with this thesis, especially considering the city-scale it is operating at and the human-animal relationships it is exploring and supporting.

Alagona makes an interesting comparison between the characteristics of natural landscapes and human landscapes, which is apparent in many ways throughout all of his anecdotes and examples in the book. He states that natural areas are varied and have a rough, random, and interspersed patchiness to the way they meet and mingle with each other. On the other hand, there are fewer types of human or urban areas, and the ones that exist are large expanses of geometric shapes, usually with very clear and rigid boundaries. Suburban areas tend to have the most blending between non-human and human landscapes. It seems as though, despite humans trying to maintain harsh boundaries that separate the landscapes they inhabit from landscapes dominated by wildlife, animals often still find ways to cross over those barriers. Alagona recounts specific incidents of animals integrating themselves into human environments, such as a bear establishing itself as a beloved member of a New Jersey suburban neighbourhood, or squirrels having once been invasive species, then rare pets, and finally integral parts of an urban ecosystem.

While Alagona’s examples are mainly intended as clear examples of the prevalence of wildlife interactions and relationships, they are also an indication of nature trying to enmesh itself into human environments despite humans’ desires for the opposite. This observation begs the question of the necessity of such rigid boundaries when human/animal segregation is so futile, alluding to possible future attempts at dismantling such rigid boundaries, which this thesis aims to explore.

Alagona establishes a useful wider context for thinking about ecological conditions in urban contexts specifically. Until relatively recently, urban areas were ignored when it came to studying flora and fauna. For example, within the field of ecology, human-dominated landscapes, or environments with any sort of human presence, have been overlooked as unworthy of being studied. It was only in the early 20th century that humans and their created environments began to be seen as influential...
actors in wildlife ecology. Arthur Tansley, the first president of the British Ecological Society in 1913, was a major proponent of this idea, his thought process being, “If humans had helped create and sustain this landscape, then it made sense to include people in the ecological study of it.” This philosophy counters the idea that pristine landscapes untouched by human hands are the sole locations for animals to live and be studied. This philosophy astutely points out that idealistic, pristine landscapes are harder to come by, yet there are plenty of animals that still manage to live in ever-expanding human-dominated landscapes. Therefore, these human-dominated landscapes are worthy of care and focus. It is well-established that expanding human-dominated landscapes are destroying animal habitats, but the fact still remains that to ignore areas with human presence would be to ignore important ecological relationships. This way of thinking has also begun to prompt designers to come up with design solutions that accommodate both humans and non-humans, as described later on when discussing Lydia Kallipoliti’s article, and as this thesis aims to explore as well.

To further understand why this human versus non-human segregation has historically been made, at least in Western culture, Alagona draws on the traditional distinctions made between natural landscapes and human landscapes, referring to these landscapes as “nature” versus “culture.” This idea of one versus the other, that one is inherently distinct from the other, is a way of thinking that dates back to ancient Greece. This idea speaks to the intricate ways of life that humans have made for themselves as a result of their complex and “civilized” minds, which was felt to be in opposition to the untamed wild of natural landscapes.

Needless to say, and as demonstrated throughout Alagona’s book, this thought process does not work for the world we live in today. Humans are not so different from any other animal in an ecosystem, having manufactured our landscapes to suit our needs and to thrive, like any animal does in the environment it occupies. Therefore, it would be a missed opportunity to keep human environments out of the equation when investigating environmental issues (like habitat loss and landscape fragmentation).

Alagona concludes his book with a final poignant statement: “Coexistence is about care, not control. It is about reciprocity, not retribution. It is about creating a context for mutual thriving while having the humility to understand that things will not always go as planned.”

Building on these ideas, decision-makers like architects, designers, and planners should not avoid creating environments that merge human and non-human landscapes. There will always be interactions between the humans, flora, and fauna that inhabit these landscapes, so it would therefore behoove those decision-makers to develop strategies that cultivate advantageous inter-species interactions and relationships. These are thoughts that I carry with me moving forward in my thesis.
While The Accidental Ecosystem establishes ways of thinking about urban ecologies more widely, the article “Towards the Establishment of a Green Infrastructure in the Region of Montreal (Quebec, Canada)” begins to situate these concerns within the specific context of this thesis in Montreal. Many cities in Canada have started to reframe the way they think about city planning and ecological conservation. As explained in the article, Montreal is one of the cities that could benefit from this shift in perspective (Figure 2.2.1). While Alagona’s book and Lydia Kallipoliti’s article (overviewed next) elaborates on overlooked relationships, shifts in perspective, and innovative solutions, the article discussed here provides a practical study specific to Montreal that indicates potential real, imminent changes. The frameworks discussed in this article indicate a possible future where design strategies, like the ones explored in this thesis, can seamlessly fit within.

The article first defines green infrastructures as “a type of land-use consisting of a network of natural areas and open spaces that optimizes biodiversity protection and generates other environmental and social benefits.” Green infrastructures depart from the traditional greenbelt planning in that it focuses on establishing green areas within urban landscapes that preserve ecological connectivity and biodiversity while also allowing for human access in a more integrated way. This concept holds significance for this thesis as it speaks to merging both human and non-human needs in a mutually-beneficial framework. Not only do green spaces need to be preserved and protected, but human interactions with these spaces need to be accounted for and accommodated. As Alagona observes the merits of studying the interactions between humans and animals and the landscapes they inhabit, so too does this article observe the significance of these interactions, noting the importance of creating beneficial human and animal interactions to support an integrated ecological existence in Montreal.

A series of interviews given by experts shed light on the important elements of green infrastructures, the benefits of implementing these infrastructures, and the barriers that face this implementation. These experts consisted of 32 people from the main institutions, both governmental and non-governmental, that have crucial impacts on land use and resulting modifications. These people were very experienced with environmental planning processes and had concerns about urban sprawl. The general consensus among the interviewees was that in order to have successful green infrastructures, there must be “landscape connectivity,” “communication and public awareness,” and “legal recognition.” Landscape connectivity is an essential concept that is imposed throughout this thesis, not only to foster thoughtful human and non-human interactions, but to preserve local biodiversity as well. Experts also agree that there are many benefits and opportunities that would arise from these green infrastructures, like maintaining quality of life, real political context for green infrastructures, the creation of new programs, and increased public interest in environmental issues. However, lack of political will or interest as well as disinformation are some of the main barriers faced by the implementation of green infrastructures. Reframing city planning and ecological conservation requires cooperation from policy makers, farmers, private business owners, and the general public.

It is clear that integrating human and non-human lives more seamlessly would create many environmental, economic, and social benefits. Both this article and Alagona’s book point to a need for cross-disciplinary cooperation and integration of various fields to support humans and non-humans, both essential stakeholders in our global ecology. The barriers and obstacles in place to making these integrative choices are discouraging, but they are at least known, acting as starting points for where...
to enact change. However, getting those changes in motion takes time, a luxury that the world is rapidly losing. This thesis aims to highlight the potential possibilities and benefits of working within a world that has made those changes.

2.3 History of Ecological Design

The previous readings establish ways of thinking about ecological principles in urban contexts, but focus less on approaching designing within these urban ecologies. In “History of Ecological Design,” Lydia Kallipoliti describes designers’ philosophies, ideas, and projects throughout history that address this issue of designing and building ecologically for humans and non-humans. Lydia Kallipoliti, an architect, an engineer, and a scholar, is currently a professor at the Cooper Union and has a rich education and career in architecture and design. Kallipoliti has written a number of publications and has received many awards, reflecting her research interests in architecture, technology, and environmental politics, as well as on building materials and the theories of waste and self-sufficiency in design. Building on the article in the subchapter above discussing the benefits of implementing green infrastructures in Montreal and on Alagona’s book that investigates human and animal relationships at a wider city-scale, Kallipoliti’s article focuses more narrowly on specific architectural and structural methods of exploring and supporting these relationships.

Kallipoliti explains that designers must first reconceptualize “…the world as a complex system of flows rather than a discrete compilation of objects…” in order to design in such an integrative and harmonious way. Buildings and other structures should not be built as discrete objects placed within a natural landscape. They should be part of the landscape, part of its ecology, so that they can be true ecological designs. Kallipoliti references Sim van de Ryn’s and Stewart Cowan’s definition for ecological design, coined in...
1996, which is “…a seamless integration of human activities with natural processes to minimize destructive environmental impact.” Kallipoliti describes three categories representing time periods of ecological design: Naturalism, Synthetic Naturalism, and Dark Naturalism. Naturalism took place from 1866 until World War II and was deemed a time period that was “searching for roots.” Naturalists focused on examining landscapes, understanding the natural elements of these landscapes, and exploring interconnected and immersive relationships with nature. Synthetic Naturalism took place from 1966 to 2000 and was considered a time of “searching for systems.” Environmental issues such as pollution and excessive waste were causing social activism to rise and people began thinking of the redistribution of global resources as a solution. Finally, Dark Naturalism, which I will focus on in more detail, took place from around 2000 to 2016 and was an era of “searching for data.” This period focuses on creating new objects that are designed to become their own environments, or to be more integrated into environments.

Dark Naturalism, which aligns with the current moment, is divided into sub-categories: Subnaturalists, Machine Expressionists, Corporate Performatists, Nonhumans, Resilients, Contextualists, Living Fabricators, and Planetarians. In the article, Kallipoliti elaborates on these terms and illustrates their application through a series of case study projects. I will focus on a few of these sub-categories that aligned best with my interests.

‘Subnaturalists’ design entirely new environments and look at elements in nature that are often overlooked or deemed unfit or unusable, like gas, dust, puddles, and insects. For example, “In the Air” by Nerea Calvillo is a project analyzing often overlooked environments (Figure 2.3.1). ‘Subnaturalists’ also question what makes a landscape natural versus unnatural, since humans are capable of creating new landscapes that support life and nature without looking traditionally natural. I was particularly interested in Subnaturalists’ purely creative standpoint on addressing issues of changing ecologies and loss of environments. It suggests that designers can possess the knowledge and imagination required to create innovative environments that address environmental issues.

‘Machine Expressionists’ are interested in portraying the systems that make up and support architecture, as well as the ecological functions of a project. For example, the Urban Algae Canopy project by ecoLogicStudio exemplifies this idea by creating cladding systems that clearly portray their integrated microalgal cultures (Figure 2.3.2). I appreciated the transparency that ‘Machine Expressionists’ typically adhered to, allowing people to experience, understand, and learn about the systems they are taking part in. This method of designing creates a more integrated, immersive, and educational relationship between people and the architecture they experience.

The category ‘Nonhumans’ believes that “…design should accommodate more types of life than merely human.” Examples include Harrison Atelier’s projects that accommodate non-human species (Figure 2.3.3) and Joyce Hwang’s projects that seek to bring support and awareness to supposedly unwanted species (Figure 2.3.4). The ‘Nonhumans’ approach is one that resonated most with my thesis early on. Their approach to the destruction of environments and habitats is straightforward, directly targeting the vulnerable species in a landscape that are not human by designing for their habitat needs. The philosophy of designing for all beings, not just humans, is one that carries through the entire thesis.

Lastly, ‘Resilients’ emphasize “…designers’ combat with climate change through the remediation of contaminated ecosystems and the recreation of soft boundaries between dense human settlements and sparser, more rural areas.” Dlandstudio’s Gowanus Canal Sponge Park is a good example (Figure 2.3.5). This project remediated natural corridors alongside a polluted canal so that they would serve the local ecology as well as provide greenspaces for human use. Much like green infrastructures would attempt to do, spaces are created with both humans and nonhumans in mind, blurring the lines between human and animal landscapes and blending the two together through careful design choices.

Each of these sub-categories propose different approaches to designing in ways that treat the environment, natural
landscapes, and the non-humans that live in them as essential stakeholders in built designs.

As time passed, people gradually paid more attention to climate change and to searching for solutions to help mitigate its resulting destructiveness. After World War II, design became a tool to help the environment. It was a way for people to have “a sense of social activism,” to feel as though there was actually something to be done in the face of environmental disaster that was fast approaching. Since humans have touched every corner of the earth, and have manipulated all these corners in countless ways, ecological design proposes a perspective shift away from the human race as the “protagonist in the ecosystemic equation.” Kallipoliti dissects the term “Anthropocene” to highlight this idea humans have as being “…at the core of the stage set…” As this overview shows, Kallipoliti’s article proposes that a more ecologically-focused era is developing, and has been for some time now. This thesis aims to implement these ideas, thereby highlighting methods of designing that create enriching environments and habitats for all living beings, further strengthening their ecosystems.

14. Ibid. 2.
15. Ibid. 2.
16. Ibid. 31.
2.4 Methods of Drawing & Making Habitats

Early in the thesis process, I developed a method of working that focused on specific animal species across Canada, their habitat requirements, and information about their specific environments. I created a series of maps, species drawings, and habitat drawings, compiling them into a hand-bound booklet (Figure 2.4.1). I decided to focus on three animals in Canada: The Northern Saw-Whet Owl, brooksi subspecies that is endemic to the Haida Gwaii islands in British Columbia (Figure 2.4.2);1 The American badger, jeffersonii, jacksoni, and taxus subspecies that are found in the southern provinces of Canada (Figure 2.4.3);2 And the Yellow-banded Bumble Bee, or the bombus terricola, that is found across Canada and in the United States3 (Figure 2.4.4). I chose these species to study because they are three distinct types of animal species present in very different landscapes. This owl sub-species is only found in the Haida Gwaii islands, which contains minimal human presence.4 The badger can be found mostly in rural areas, which has a moderate presence of human development in the landscape, or at least nearby.5 The bee is found in all types of areas, from cities, to rural areas, to completely remote landscapes.6 I wanted to gain an understanding of these animals’ habitat needs and the ways in which they do or do not inhabit landscapes with varying human presence. In this regard, each species has its own specific set of needs and it became evident that research into individual species would be essential in this thesis’ pursuits to accommodate specific species in the site I eventually chose to work on. Building on this method of working and hoping to gain design inspiration, I researched precedent projects and related them back to concepts and terms I uncovered through my species research (Figure 2.4.5). A list of all relevant terms I encountered throughout my thesis are included in Appendix I.

Later in my thesis, I worked on conceptual spatial models that related to the research I had been doing on non-human species, their habitats, and on the region of Pierrefonds West (Figures 2.4.6 - 2.4.11). When learning about animals and their habitats, certain terms would frequently emerge, as well as some terms I found spatially fascinating, like porous, nest, excavate, burrow, fossorial, and talus. These terms are some of the relevant terms I unearthed throughout this thesis that can be found in Appendix I. As seen in Figures 2.4.6 - 2.4.11, I used these terms as inspiration for my models and as a way to begin thinking of potential design systems that responded to or could serve some of the local animal species. As these models embodied those spatial terms I had discovered through my research, I imagined ways of incorporating them into speculative cladding systems that could possibly accommodate animal species that dwelled in spaces with the same descriptors as the models. I made drawings of these imaginary systems and started to conceptualize some of their inhabitants, which can be seen in Figures 2.4.12 and 2.4.13. As an additional experiment, I made a diagram and map depicting different animals’ thresholds for disturbances caused by human recreational activity,7 which can be seen in Chapter 4.4.

Using these methods of drawing, painting, modelling, and even book-binding by hand served as meditative exercises that helped me think through the terms that caught my attention and the concepts I was interested in pursuing. I also appreciated the slower processes of these methods and the amount of care and attention to detail they required. I wanted to imbue these qualities into further explorations I conducted. The process of thoughtful and careful designing that requires a keen focus on the subject at hand is one that I wished to explore early on so that I could carry it with me to later phases of my thesis.

---

3. COSEWIC Assessment and Status Report on the Yellow-Banded Bumble Bee Bombus Terricola in Canada (Ottawa: Committee on the Status of Endangered Wildlife in Canada, 2015).
5. COSEWIC Assessment and Status Report on the American Badger Taxidea Taxus.
6. COSEWIC Assessment and Status Report on the Yellow-Banded Bumble Bee Bombus Terricola in Canada.
Figure 2.4.1
Hand-bound booklet containing mappings and drawings for three Canadian species
Figure 2.4.2
Northern Saw-Whet Owl mappings and drawings
Figure 2.4.3
American Badger mappings and drawings
Figure 2.4.4
Yellow-Banded Bumble Bee mappings and drawings
Figure 2.4.5
Precedent projects

Biomimicry
Life Support by Ants of the Prairie

Holometabolous
Silk Pavilion I by Oxman

Teleology
Art: A Curious Cabinet by Pneumastudio

Arthropod
Cricket Shelter by Terreform I

Archipelago
Quarry Rings by Adam Kuby

Adaptation
Oyster-Tecture by SCAPE Studio

Talus
Animal Wall by Gitta Gschwendtner

Senescence
Feral Surfaces by Harrison Atelier
Porous
“full of pores; containing minute interstices through which water, air, etc., may pass.”
- Oxford English Dictionary

Nest
“a place in which a thing is lodged or deposited; a receptacle in which a thing is held or nestles snugly.”
- Oxford English Dictionary

Burrow
“a hole or excavation made in the ground for a dwelling-place by rabbits, foxes and the like.”
- Oxford English Dictionary

Excavate
“to make hollow by removing the inside; to make hollow in, to hollow out; to dig out (soil) leaving a hollow. Also, to excavate (something) into: to form into by hollowing.”
- Oxford English Dictionary

Talus
“a sloping mass of detritus lying at the base of a cliff or the like, and consisting of material which has fallen from its face; also, the slope or inclination of the surface of such a mass.”
- Oxford English Dictionary

Fossorial
“of an animal: capable of, or characterized by, digging burrows; burrowing.”
- Oxford English Dictionary

Figure 2.4.6

Figure 2.4.7

Figure 2.4.8

Figure 2.4.9

Figure 2.4.10

Figure 2.4.11
Figure 2.4.12
Speculative cladding systems

Figure 2.4.13
Imaginary cladding inhabitants
2.5 Ecocentric Framework

The above readings and design speculations provide invaluable insights into existing ecological design frameworks and human/animal interactions. They present many themes that are pertinent to this thesis. First, human-dominated landscapes have historically attempted to harshly segregate themselves from non-human landscapes. Despite this, animals constantly cross those boundaries and have existences within human landscapes. Building on this idea, these human/animal relationships are worth exploring and supporting through architectural design methods that aid in dismantling or blurring boundaries between human and non-human landscapes. Second, there are many city planning methods that attempt to protect greenspaces, and the introduction of green infrastructure methods might be a newer, better way of accomplishing this protection. One of the key elements of green infrastructures is the integration of human activities into natural environments so that people may benefit and learn from these green spaces and hopefully protect them in turn. Finally, people have historically thought of humans as the focal point of all life on earth. Hence the era of the Anthropocene. However, because of the increasing threats of climate change, this perspective must shift to include all living beings as equally essential on earth. There are many designers throughout history who have been designing with this concept in mind, inverting the traditional idea that humans are primary stakeholders in building and design. Therefore, by understanding the environments in which we live, conducting deep analyses of the species and habitats that reside in these environments and taking the time to explore them thoroughly, architects and designers will be able to implement these three themes so as to embody an ecocentric design framework.
The Site: Pierrefonds West, Montreal

I selected Pierrefonds West, a sub-sector of a borough in Montreal, as a site for exploring design and theoretical themes described in the previous chapter. The site contains many significant non-human species and non-human habitats that are threatened by urban sprawl and development. It was also the site of an extensive neighbourhood development proposal that was eventually discontinued after over 10 years of planning. The proposal reflects the general trend of urban sprawl and pressures for more housing and development on the island of Montreal. The area, currently empty of such developments, contains one nature park and is adjacent to another. The locations of these parks, as well as the current post-agricultural condition of the land, provide unique opportunities for potential design interventions in ways that can prioritize and protect the local ecology, while also responding to human needs and desires. This site will act as a case study for the implementation of ecocentric design theory and methods explored in the previous chapter.
3.1 Context

The City of Montreal has aims to reduce its contribution to carbon emissions and ecological degradation best exemplified through Montreal’s Climate Action plan 2020-2030. This plan addresses many issues concerning climate change mitigation. There is one main action outlined in the plan that pertains to land use and protection of particular importance to this thesis: the city aims to increase ecologically protected areas in Montreal from 6.1% to 10% by creating new parks, green corridors, wetlands, and water environments. The plan also makes an additional point of recognizing the importance of maintaining natural corridors for biodiversity. These actions and recognitions indicate the City of Montreal’s overarching intentions to maintain and protect natural habitats.

Pierrefonds is a borough in the West Island of Montreal. Pierrefonds West is a sub-sector within the borough. It is 455 ha of land, 181 of which are conservation zones, and 185 of which are development zones. The sector borders the Cap-Saint-Jacques nature park and contains part of the l’Anse-à-l’Orme nature park. Pierrefonds West also contains the Rivière à l’Orme, Montreal’s only inland river, which is surrounded by floodplains, woods, wetlands, and streams. These areas provide habitats for many animals and rare plant species. Pierrefonds West also contains former farmland, mature trees, and many heritage features.

Pierrefonds West is a unique sector in Montreal, as it is currently mostly green space with little development. Most of Montreal is almost completely urbanized (Figure 3.1.1). Pierrefonds West is an area that consists mostly of trees, croplands, and various kinds of greenspace, with development and residential areas to the East and to the South. The current conditions of the landscape reflect that in 1978, the agricultural area in Pierrefonds West was made part of the Permanent Agricultural Zone (PAZ). However, in 1991, this land, specifically the agricultural land to the east of the Rivière à l’Orme, was removed from the PAZ. Some farmers still remained in this region at that time, so to respect their presence, only small buildings like single-family homes, cottages, lodges, and other buildings for agricultural use were allowed to be built. Eventually, though, the farming presence in this region declined, and by 2004 the land became “a sector to be built while respecting its natural heritage.”

Currently, the conditions of the land have retained the characteristics of its agricultural past. The fallow agricultural land is lined with swales and is surrounded by mature trees, dense woods, wetlands, floodplains, and streams. Tree canopy covers much of the site (Figure 3.1.2), and there are three categories of canopy cover: “Temperate or sub-polar needleleaf forest”, “temperate or sub-polar broadleaf deciduous forest”, and “mixed forest” (Figure 3.1.3). “Mixed forest” is the most dominant type of forest on this site, with the “broadleaf deciduous forest” being the second most prominent on the site. Figure 3.1.4 shows the land characteristics of the site that are not forested, with the majority of the unforested land being cropland mixed in with some wetlands and grasslands. Figure 3.1.5 shows the flooding zones on the site, indicating areas around the Rivière à l’Orme to be the most at-risk for flooding. Figure 3.1.6 depicts the waterways on the land, some crossing through the forested areas and croplands. Figure 3.1.7 shows the roads in the area, clearly illustrating the lack of human presence and development on the site. Finally, Figure 3.1.8 is a map combining all the layers from Figures 3.1.2 - 3.1.7.

---

1. “Montréal Climate Plan 2020-2030” (Ville de Montréal, 2020).
2. “Montréal Climate Plan 2020-2030.”
3. Ibid.
4. Ibid.
5. Ibid.
6. Ibid.
7. Ibid.
8. Ibid.
9. Ibid.
The City of Montreal itself consists of 87.1% urban areas. This map gives some more detailed information about the land uses in Montreal, and some percentages associated with these land uses. This map also points out some of the large nature parks on the island and outlines Pierrefonds West.
Figure 3.1.2
Map of canopy cover

Figure 3.1.3
Map of tree classification
Figure 3.1.4  
Map of open land

Figure 3.1.5  
Map of flooding zones
Figure 3.1.6
Map of water

Figure 3.1.7
Map of human presence
This layered map depicts the interactions between all landscape characteristics on the site. For instance, there are forested areas and wetlands interspersed within the center of the large stretch of cropland. The flooding zones overlap with forested areas, a small portion of the cropland, and will feed into some of the wetlands in that region as well.
3.2 Fieldwork

I visited the site in Pierrefonds West, keeping in mind the ecological frameworks I analyzed in the previous chapter as I photographed key locations within and near the site (Figure 3.2.1). I noticed the juxtaposition between residential suburb and sprawling land largely unaltered by humans, usually with only a narrow two-lane road acting as a barrier or a divide. The most stark juxtaposition was between the l’Anse à l’Orme nature park that abuts the residential neighbourhood on one side and the Trans-Canada Highway and above-ground metro line being built on the other side. I paid close attention to these interfaces throughout the site and documented them with photographs (Figure 3.2.2). There were also moments when nature and human-development intersected, such as when the road crosses over the Rivière à l’Orme. I was able to venture off the perimeter of the site towards the center only where roads existed. Off of one of the residential roads, there is a trail that cuts through the interior of the site, which I was able to walk along for a small stretch. There is one long road that reaches the center of the site but that is not accessible, as it is barred by a locked gate.
Figure 3.2.2
Photographs of points of interest in Pierrefonds West, observing and noting relevancy to key frameworks.
3.3 Cap Nature Proposal

A public consultation report from 2017 called Future of Pierrefonds-Ouest Sector indicates that there is a need for housing and a desire for development in Pierrefonds West. The report also describes a large neighbourhood development project for the site called Cap Nature that was initiated in 2005 by five owner-developers. The project was set on mostly flat, grassy lands and croplands adjacent to the Cap Saint Jacques nature park in the Pierrefonds-Roxboro borough of Montreal. The owner-developers stated that not only were they providing some much-needed housing on the island of Montreal, but they were also doing so in a way that was harmonious with the local ecology.

They claimed (albeit vaguely) that they were providing “...a harmonious balance between natural environment preservation and responsible urban development.” Despite the confidence these developers had surrounding their proposal and its ecological merits, the proposal received heavy backlash. Studies were conducted that scrutinized the project’s ecological impacts to the region and surveys were completed to assess the public’s support of this project. In 2017, right before a spell of serious flooding in the region, the opposition party Project Montréal suggested that the land be reserved as a nature park. When the party’s leader, Valérie Plante, eventually became mayor, she ultimately reserved the site of the development proposal as a nature park. Furious and disappointed that the site was now un-buildable, the developers of the Cap Nature development proposal declared their intentions to sue the city of Montreal.

Figure 3.3.1 is a general site plan for the development project from the December 2007 edition of the Montreal Master Plan, and Figure 3.3.4 are renders done by Luc Denis Architecte of the Cap Nature proposal.

Figure 3.3.2 illustrates the location of the development project and Figure 3.3.3 illustrates some of the promises made by the developers. For instance, The development proposal promised to preserve “180 hectares of natural habitats,” which would supposedly have contributed to the City of Montreal’s goal of designating 10% of its land as “protected areas.” 56 hectares of this land was also promised to be donated back to the city, while 185 hectares of land would be used for constructing an “environmentally responsible neighbourhood” that consisted of 5,500 residences and 23 hectares of parks. The developers also promised that the 180 hectares of preserved land would expand the neighbouring L’Anse-à-l’Orme Nature Park.


5. Woodhouse.


7. Pierrefonds-Ouest.

8. Ibid.

Figure 3.3.1
General site plan for neighbourhood development in Pierrefonds West
Figure 3.3.2
Cap Nature development footprint

Figure 3.3.3
Promises made by developers
The resistance that the Cap Nature project met by institutional groups and by the general public indicates a strong desire and necessity to take a more proactive and forward-thinking environmental and ecological approach when designing building developments. For example, a poll taken in 2017 to gain insight on Montrealers’ opinions on the Cap-Nature development was heavily criticized for the nature of its questions. While results indicated that people in the Pierrefonds-Roxboro area were in support of the project and that the city as a whole was not in support of the project, many people had complained that the results were not trustworthy since the survey questions were skewed.  

There is a clear need for more clarity and transparency surrounding these important development projects so that the public can make educated and proactive decisions about the land they inhabit. Furthermore, when looking at this specific site, there were many ecological and environmental issues that the Cap Nature proposal would cause, despite meeting some environmental requirements and designing “in compliance with the best practices in sustainable development.”

Some of those requirements were set out by the City of Montreal and the ministère du Développement durable, de l’Environnement et de la Lutte contre les changements climatiques (MDDELCC – “Ministry of Sustainable Development, the Environment and the Fight Against Climate Change”). The owner-developers met those requirements through the preliminary studies they conducted themselves.

The environmental issues with the Cap Nature proposal did not go unnoticed by the public. For example, a citizen’s group called “Sauvons l’Anse-à-l’Orme” was

---

3. Ibid.
formed in May 2015 to stop the project. They condemned urban sprawl, the loss of green spaces, and the destruction of animal habitats and biodiversity. They pointed out the tremendous traffic increases that would result from the project and challenged the city on its claims of bringing in tax revenues and of creating a viable improvement to public transportation for the area. The group urged Montreal to stick to their Climate Action Plan promises and to protect this ecologically rich and unique landscape, amassing over 18,000 signatures on their petition to stop the development project. Even though the Cap Nature real estate proposal claimed to have met minimum sustainable design requirements, it was evidently not nearly enough to ensure the project maintained an adequate level of harmless intervention on the site and the local ecology.

An informative study titled “The Impacts of the Cap Nature Real Estate Project (Pierrefonds West) on Ecological Connectivity” (Figure 3.4.1) details the negative effects the development proposal would have had on the local ecology. The study indicates that the key issues this project would have caused were habitat loss, increased landscape fragmentation, and decreased habitat connectivity. In the study, ecological connectivity is defined as “the degree to which natural and semi-natural areas are connected by the movement of organisms across a landscape.” The article specifically states there would be “a pattern of decreased north-south connectivity between the Morgan Arboretum and Ile Bizard due to development.” The animals affected would be birds, small mammals like mink or rodents, large mammals like the white-tailed deer, amphibians like frogs, salamanders, and toads, and reptiles like snakes and turtles. I wanted to give further voice to the non-human species that would be affected by this project and researched some of the local animal species in the region. Figures 3.4.2 - 3.4.9 are paintings identifying some rare species in Montreal facing various levels of threats to their lives, which fall into those categories of species that would be affected by the project. Information shown in these figures are obtained from “Montreal.ca.”

Of the ones I’ve shown, the map turtle, bobolink, yellow warbler, wood frog, white-tailed deer, and hoary bat are present in the Pierrefonds West region. This article also points to urbanization and urban sprawl in general as a significant, on-going threat to ecological connectivity, biodiversity, and habitat maintenance. As populations continue to rise and housing requirements increase, the natural instinct is to look at untouched lands as opportunities for new building developments. Unfortunately, this mindset is threatening local ecologies and subsequently the environment as a whole, further highlighting the urgent need to come up with better solutions.
Figure 3.4.2
Brown Garter Snake
Location: Bois-de-Liesse nature park, l’Île-de-la-Visitation nature park, Pointe-aux-Prairies nature park
Habitat preferences: fields, wildlands, wood-fringes, shorelines, vacant lots

Figure 3.4.3
Bobolink
Location: Cap-Saint-Jacques nature park, Bois-de-la-Roche agricultural park
Habitat preferences: nests on the ground in cultivated prairies, fallow grasslands, agricultural environment

Figure 3.4.4
Yellow Warbler
Location: majority of Montreal’s parks
Habitat preferences: wetlands, fallow lands, forest edges

Figure 3.4.5
Long-Eared Owl
Location: Pointe-aux-Prairies nature park, Île-Bizard nature park
Habitat preferences: woodlands, groves, open environments

Figure 3.4.6
Hoary Bat
Location: Pointe-aux-Prairies nature park, Île-Bizard nature park, l’Anse-à-l’Orme nature park, Bois-de-Saraguay nature park, Angrignon park, Dieppe park
Habitat preferences: trees, tree leaves

Figure 3.4.7
Wood Frog
Location: majority of Montreal’s parks
Habitat preferences: mature woodlands, swamp forests

Figure 3.4.8
Map Turtle
Location: Cap-Saint-Jacques nature park
Habitat preferences: shallow bays

Figure 3.4.9
White-Tailed Deer
Habitat preferences: deep forest
Based on the wider understanding of the failings of the Cap Nature project and elaborating on observations made through fieldwork and earlier habitat studies, I developed a counterproposal for the site. My counterproposal to the Cap Nature neighbourhood design project questions which species should be considered or favoured when designing. My counterproposal further asserts that the local ecology as well as human and non-human relationships should be the main considerations in design projects so as to benefit all living beings in a given landscape. Building on ecological design frameworks and concepts analyzed in Chapter 2, I am primarily countering the idea that humans must be the primary focus and the primary beneficiaries of our built environments. I am conducting a site planning project where I counter the Cap Nature design proposal and its intentions through speculative, alternative site plan and design intervention strategies. These speculations are inspired by guiding questions that challenge traditional design notions and ways of thinking. These strategies, questions, and challenges are outlined in this chapter.
Figure 4.0.1
Process work (cutting, taping) for spatial applications of key concepts
Figure 4.6.2
Process work (painting) for spatial applications of key concepts
4.1 Analysis Framework & Key Concepts

A first step in determining a counterproposal entailed understanding the program for the initial project. The key elements of the Cap Nature neighbourhood development project in Pierrefonds West, as expressed by the developers responsible for the project, were as follows: Pierrefonds West’s residential needs would be met through over 5,000 new residences (1,500 of which would be dedicated to housing co-ops and social housing), new parks, bike paths, a “comprehensive mass transit grid,” and through building schools and daycares.1 The project would provide sustainable, environmentally and ecologically friendly neighbourhood design solutions;2 and a sufficient amount of the natural landscape would be preserved.3

Figure 4.1.2 and 4.1.3 shows a set of conceptual drawings with a painted overlay, depicting this Cap Nature proposal.

As discussed in the previous chapter, in reality, the neighbourhood development would do a great deal of harm to the local ecology and the natural landscape of the region. After a comprehensive study was conducted for the project, the main ecological issues that would arise from this project were habitat loss, landscape fragmentation, and decreased habitat connectivity.4 The negative ecological effects, in conjunction with public protest and increased flooding in the region at the time, caused the city of Montreal to cancel the project.

As it stands, the land that was destined for this neighbourhood project now remains unchanged. As landscape analyses from Chapter 3 suggested, this land is full of rich agricultural history and varying landscape conditions. The question still remains for how to treat this land. Is it a pristine landscape that must remain as untouched as possible by human hands in order to function optimally as a haven for wildlife? Are there things humans can do to assist this landscape and to improve its ecology? Is there still a need, or a desire, for humans to reside in this space, and is there a way to do this that is in harmony with the local ecology?

Throughout my research and analyses, I settled on three key action terms, blur, invert, and integrate, to help shape my ecocentric counterproposal design concepts for the untouched piece of land in Pierrefonds West, Montreal. As I returned to the question of how to design on the site, I further reflected on these terms and how they might inform a design proposal. These action terms represent the three main themes that were extracted from analyses done in Chapter 2 and that were explicitly summarised in Chapter 2.5. To reiterate, Alagona’s book points out the constant and inevitable interactions between humans and animals, highlighting the importance of blurring these harsh boundaries created between both parties and of considering non-humans as active members in the local ecology.

The Green Infrastructure’s article mentions the importance of large-scale planning methods that facilitate and integrate human interactions with nature in an ecologically sensitive way. Finally, designers operating within the Dark Naturalism framework were largely interested in contributing to or creating new environments that directly supported or enhanced local wildlife and ecologies, inverting ideas of who the primary stakeholders are in these designed environments.

Additionally, all three key terms can also be applied to each of the three main themes discussed above. Each of the references that inspired these themes bring forth ideas of blurring the lines between what has been traditionally thought of as “nature” vs. “culture,” as Alagona eloquently explains in his book. By creating human-made designs to support non-human species and environments, by analysing the interactions between animals and humans throughout history, and by promoting the implementation of green infrastructures that help the environment and support interactions with nature, the philosophy of further blending “nature” and “culture,” and essentially integrating
the two, is universally encouraged and one I explore in my counterproposal. The concept of inversion arose throughout these readings as well, through my interpretation of understanding who and what the stakeholders of these designs and landscapes are or could be. Again, for example, creating human-made structures for non-humans and detailing instances of animal life in urban environments speaks to a shift in perspective. By bringing awareness to non-human lives, the stakeholders are no longer only the humans; they are also the non-humans that are just as present and involved in all landscapes as we are. Therein lies the shift from anthropocentric design to ecocentric design.

During my initial experimental design phase, I focused on the terms blur and invert to ground my distinct design ideas, as I felt the term integrate was naturally embedded in the resulting design outcomes for those two terms (Figure 4.1.1). I first created two site design strategies which can be seen in Chapters 4.2 and 4.3.

For the blurred strategy, I first question what it means to blur certain conventional neighbourhood design elements. As Alagona points out in his book, human-developed areas are usually very rigid, they have clear boundaries, and their areas or segments are very fragmented. Conversely, natural landscapes tend to be more blurred and blended. There are no harsh edges between the different types of landscapes as landscape characteristics blend together and gently taper off. What would it look like for human and non-human landscapes to be more blurred and blended? What would happen at those edges, or lack of edges? Much like how the Subnaturalists in Kallipoliti’s article explored creating new environments, what could be designed to facilitate this blurring and blending, or to become this blurring and blending?

For the inverted strategy, I questioned what it means to invert certain neighbourhood design elements. For instance, we can look at inverting human dwellings. Human dwellings are normally above ground, foregrounding themselves with substantial footprints and relegating non-human species and their habitational needs to the background. What if this relationship was inverted? What if human dwellings were predominantly underground, subverting ideas, even if just aesthetically, of which species are traditionally prioritized in a given landscape? What if the idea of inversion was applied to corridors? Normally, wildlife corridors are created so non-humans can navigate through a human-developed world. What if corridors were designed for humans to navigate through a non-human-dominated landscape? What if the idea of habitat clusters was inverted as well, meaning humans would cluster their habitats in a non-human landscape, when normally it’s the reverse?

My final counterproposal, which can be seen in Chapter 4.4, is a site design combining these two strategies that also incorporates ideas of integration. In this way, the counterproposal opposes the main elements and philosophy of the Cap Nature project. It attempts to counter the habitat loss, landscape fragmentation, and decreased habitat connectivity that Cap Nature would have caused. The counterproposal also opposes the philosophy of the entire Cap Nature proposal that pushed ideas of urban sprawl, subsequently favouring human lives and comfort over the well-being of animal and plant species and their habitats.
Figure 4.1.2
Painted map of Cap Nature proposal

Figure 4.1.3
Painted section of Cap Nature proposal
4.2

Blurred Strategy

As seen in Figures 4.2.2 and 4.2.3, I created a plan and section with painting overlayed on top, similar in style to the drawings I made representing the Cap Nature proposal (Figures 4.1.2 and 4.1.3). Using a drawing of the site as a base that maps basic landscape features, I painted my conceptual ideas for what a blurred site design strategy could entail. Light green brushstrokes illustrate open green spaces, dark green brushstrokes illustrate forested areas, light pink represents existing buildings, dark pink represents potential human developments or interventions on the site and dark teal blue represents potential additional landscape interventions. In this blurred site plan strategy, there is a gradient of pink brushstrokes that bleed into the green landscape, depicting a gradual progression of human development into the natural landscape. The painting also shows a gradual blending of additional forestation into the open, light green landscape. The section drawing depicts what is above and below the ground line, giving notice and importance to the natural systems that exist in the planes above and below. This section also aims to illustrate the potentials for biodiversity above, on, and below this amalgamated landscape. The gradual dispersal of pinks and greens in this strategy corresponds to the ideas of blurring described in the subchapter above.
Figure 4.2.2
Painted map of Blurred proposal

Figure 4.2.3
Painted section of Blurred proposal
4.3 Inverted Strategy

Using the same base-map and painting method described above, I created another set of drawings to illustrate the concepts of an inverted site design strategy (Figures 4.3.2 and 4.3.3). In this site plan strategy, I created clusters of dark pink within the light green landscape. The pink clusters represent human neighbourhoods dispersed within a largely natural landscape, with corridors to connect them to each other. The section drawing depicts this dispersed patchiness as well, also illustrating the possibility of extending some of these human developments above and below the ground line, further inverting the traditional concepts of where and how humans are able to dwell within their environments. As shown in the section drawing, the speculated biodiversity in this strategy is patchier than in the previous strategy, as it corresponds to the patchiness on the ground plane. However, because of the suggested concept of intervening beyond the ground plane, there is further opportunity for inter-species interactions above and below the ground plane.

Figure 4.3.1
Sketch painting of ‘invert’ concept
Figure 4.3.2
Painted map of Inverted proposal

Figure 4.3.3
Painted section of Inverted proposal
The Counterproposal

This section proposes a design framework. The framework draws from insights from the previous Blurred and Inverted strategies and outlines key moves I make for a counterproposal that combines the two strategies. I maintain the density of the Cap Nature proposal (over 5000 residences) so that my counterproposal shares a common starting point with the Cap Nature proposal. This approach creates a fair comparison between the two proposals. Maintaining landscape connectivity and minimizing negative impacts to animal habitats and wildlife corridors are essential components of my neighbourhood design strategy. As mentioned in Chapter 2.4, I briefly investigated animals’ thresholds for disturbances caused by human recreational activity, and took these ideas into account when proposing interventions on the site (Figures 4.4.4 and 4.4.5). As a result of this investigation, as well as those explained in Chapter 3.4, I reduce sprawling building footprints and increase individual building densities by placing point towers on the site so that large portions of undeveloped land remain. I also keep structural interventions to the perimeter of the site so that important natural elements within the center of the site, such as areas with high amounts of animal sightings and activities (Figure 4.4.7), will remain as undisturbed as possible.
Figure 4.4.2
Painted map of Counterproposal

Figure 4.4.3
Painted section of Counterproposal
Figure 4.4.4
Disturbance thresholds of various animals

Figure 4.4.5
Disturbance thresholds overlaying the site
Figure 4.4.6
Counterproposal site plan

Figure 4.4.7
Site plan of species sightings overlaying Counterproposal
Many ideas from the previous Inverted strategy have informed the framing of this design proposal. First, I invert the concept of animal habitat clusters by clustering human neighbourhoods, roughly the size of half a neighbourhood block, together on the site. Second, I am interested in inverting the idea of wildlife corridors by instead creating human corridors within the natural landscape. I designed two types of human corridors: grounded human corridors (Figure 4.4.8) and elevated human corridors (Figure 4.4.9). The grounded human corridors are strategically placed, pressed-dirt paths designated for walkers and bikers that connect the neighbourhood clusters at the ground level. There are clear markers along the paths so people do not get lost, as well as moments of pause and reflection along these paths. The paths provide a grounded circulation strategy throughout the neighbourhood that also allows animals to safely pass without any barriers, providing minimal impact and disturbance to the surrounding environment. The elevated corridors are a series of bridges that connect the point towers to each other, providing a secondary circulation system that also acts as an experiential outdoor walkway. This bridge system gives people an alternative way of enjoying the outdoors with minimal disturbance to the environment. The bridge system is also designed in a way that is suitable for bat habitats (Figure 4.4.11), which is inspired by the Congress Avenue Bridge in Austin, Texas that, because of the way it was designed, accidently provided habitats for bats. The integration of habitats into human-made structures (Figures 4.4.12 and 4.4.13) is also inspired by concepts and design methods explored by 'Nonhumans' in Kallipoliti’s Dark Naturalism chapter.

Figure 4.4.10
Aerial view of counterproposal
Figure 4.4.11
Elevated human corridor

Figure 4.4.12
Integration of habitats into human-made structures
Figure 4.4.13
Integration of habitats into human-made structures
Ideas from the previous Blurred strategy provided additional framing for this counterproposal design. The design choices I made for the two human corridor systems, such as creating experiential walkways and paths and implementing design strategies that support animal habitats, contribute to the idea of blurring the lines between human-dominated and wildlife-dominated landscapes. These design choices create a more blended and integrated environment for all beings present on the landscape. As well, the placement of the neighbourhood clusters at the edge of the site acts as an ecotone between natural landscape and human landscape, contributing to a more blended gradient between the two landscapes. I also use ideas of blurring to explore the framework of a neighbourhood or a home, which is loosely inspired by design ideas explored in Kallitpoiti’s Dark Naturalism chapter, specifically when discussing ‘Machine Expressionists.’ I want to create a neighbourhood typology that materializes the dissolution of a home, investigating which spaces require closed doors and privacy, and which spaces can benefit from a communal approach. This results in a neighbourhood with private sleeping rooms and bathrooms, as well as a mix of private and public lounging and gathering spaces (Figure 4.4.14).
I briefly touched on ideas concerning the slowness of making in Chapter 2.4, and I wanted to imbue my counterproposal with some of that sense. I explore the idea of the slowness of making at the scale of this entire design through a proposed intervention timeline (Figures 4.4.15 - 4.4.17). This timeline considers phases of construction as well as phases of human activity and presence on the landscape. The idea is to avoid abrupt, harsh changes to the landscape and its inhabitants (both human and non-human) to potentially allow the counterproposal to integrate into the landscape and its ecology more seamlessly.
Figure 4.4.16
Proposed intervention timeline

Figure 4.4.17
Sketch painting of proposed intervention timeline
I am also suggesting a landscaping strategy to help support the local ecology that works with the designs I am proposing to implement (Figure 4.4.18). The landscaping strategy further integrates human activity and developments into the natural, non-human environment. I have chosen local plant and tree species for the area that will attract pollinators, support a number of the local animal species in the area, and that are varying degrees of rare or endangered on this site. For example, I propose to plant black maple trees, black cherry trees, and shagbark hickory trees. Black maple trees are present in this landscape already but are designated as “vulnerable.” These trees also tolerate floodplains, which is a good fit on the site given the flood-prone landscape consisting of many wetlands. Because they are very tolerant of heavy shade, I propose to place them north of the point towers. Black cherry trees thrive in sunlight and a variety of soils including moist soil, and will attract pollinators such as bees, flies, wasps, and butterflies. I propose placing these trees south of the point towers and elevated corridors. Shagbark hickory trees are also present on this site already but are likely to be designated as threatened or vulnerable. I propose planting more of these trees along my developments as well. Many pollinators including bats also benefit from bodies of water, so I am proposing to construct a pond in the eastern area of my design.

All of these design strategies are specifically tailored to the site, creating a neighbourhood that is well-integrated into the site’s landscape and that serves its ecosystem. The elements of this counterproposal create a neighbourhood that is porous, permitting all species to move through and within it at varying levels, while also challenging and inverting traditional design conventions.

---

5. “Évaluation Écologique de l’Ouest du Territoire de Pierrefonds-Roxboro.”
5.0
Conclusions
I have been struggling with a fundamental issue throughout my thesis. This issue is one of developing on land that has plenty of reasons not to be developed on. In the case of this site in Pierrefonds West, I have been questioning whether there should be any form of neighbourhood development on it at all, despite the counter-designs I have proposed. Given the site’s agricultural history, the various degrees of protected status it has received over time, the development attempts on this land, and the massive communal rallying to preserve the natural landscape, this site is better left unaltered by neighbourhood development endeavours. One of the arguments made by the public was that there are plenty of other, smaller sites in Montreal that are already in urban areas that could be built on to address the need for more housing on the island.¹ I believe this avenue is worth exploring, especially given the City of Montreal’s explicit desires to preserve natural parks and landscapes.²

My initial reasoning for working with this site was that its contested history spoke to the tensions between a rich ecological landscape and a pervasive need for urban sprawl. Two key stakeholders, humans and non-humans, were clashing in this contention, which sparked my interest in exploring avenues of unifying the two. Furthermore, Ecocentric Architecture is a type of designing that takes into account all living beings in a given environment. Therefore, from a practical standpoint, I feel that Ecocentric Architecture needs to be extremely site specific, so I used this site to exemplify the ways that site-specific design choices can inform Ecocentric Architecture concepts and typologies. In reality, the methodologies used to arrive at these typologies can be applied to any site that wishes to implement Ecocentric Architecture concepts.

One of the Ecocentric moves I made that responded to this specific landscape included maintaining my interventions to the North-Eastern edge of the croplands on the site, taking into account that this portion of the landscape is already cleared of trees and is outside the boundaries of the flood zones surrounding the Rivière à l’Orme. Intervening in this location also created an ecotone between the natural landscape and the developed landscape that were on either side of the interventions. Point towers also reduced the footprint on the ground to further reduce interventions within the landscape that would disrupt the local ecology and various species’ habitats, as observational reports have shown a heavy presence of various animal species in the center and towards the South of the site. These point towers also began to explore ideas of occupying air space and what that could look like as a method of providing additional potential ecological benefits. The idea of integrating local animal habitats into structures that are also used by humans is further explored in the elevated corridors I propose. I also wanted to ensure circulation between the neighbourhood clusters I proposed, allowing for moments of the natural landscape to exist between areas where a stronger human presence would be. These moments would create some porosity within the human developments, or porosity within the natural landscape, that would allow all living beings to navigate through these landscapes. Lastly, another clear Ecocentric move is the proposed tree planting strategy, as the choice of trees and their locations respond to what exists in this landscape already, what species are rare and vulnerable, what can contribute to local pollinators for the region, and also reduces the footprint on the ground to further reduce interventions within the landscape that would disrupt the local ecology and various species’ habitats, as observational reports have shown a heavy presence of various animal species in the center and towards the South of the site. These point towers also began to explore ideas of occupying air space and what that could look like as a method of providing additional potential ecological benefits. The idea of integrating local animal habitats into structures that are also used by humans is further explored in the elevated corridors I propose. I also wanted to ensure circulation between the neighbourhood clusters I proposed, allowing for moments of the natural landscape to exist between areas where a stronger human presence would be. These moments would create some porosity within the human developments, or porosity within the natural landscape, that would allow all living beings to navigate through these landscapes. Lastly, another clear Ecocentric move is the proposed tree planting strategy, as the choice of trees and their locations respond to what exists in this landscape already, what species are rare and vulnerable, what can contribute to local pollinators for the region, and also plays on the strengths and environmental requirements of the trees themselves.

As an architecture graduate student, it is difficult to make concrete design decisions that are meant to contribute to or support a local ecology, since architecture and ecology are distinct fields with their own knowledge bases. The fields of architecture and ecology are both spatial disciplines in their own right and it therefore makes sense that one field would impact the other, and vice versa, so making these design decisions feels necessary. This issue speaks to the importance of collaborating with professionals outside of our profession and hiring relevant consultants such as ecologists, biologists, and others who work within environmental sciences. In addition to hiring the necessary consultants, I believe it is pertinent for architects and designers to become acquainted with the environments in which they design, which includes doing our own research to gain a foundational understanding of the ecologies we will be impacting. This practice was an integral part of my research when exploring how to create a counterproposal for the site I chose. I feel that gaining an understanding of ecological perspectives is crucial, as it facilitates the implementation and practice of Ecocentric Architecture and begins to bridge the knowledge gaps

¹ “Future of Pierrefonds-Ouest Sector.” 24-25.
² “Montréal Climate Plan 2020-2030.”
between architectural designers and the scientific and environmental consultants they will encounter in their careers. This foundational understanding further allows for environmentally sensitive and responsive design solutions to arise.

To further the specificity of these typologies and the design choices that are made within them, it would be beneficial to take a deeper look into the materiality of the structures proposed, especially when beginning to design the buildings themselves in more detail. This thesis focused mostly on speculative site design strategies, so there was not room for much material research to be conducted within the allotted timeframe. I would suggest looking at building and design methods such as regenerative design methods, as its philosophy is in line with the philosophy of my counterproposal: “In contrast to sustainably designed buildings, regenerative buildings are designed and operated to reverse ecological damage and have a net-positive impact on the natural environment.”

When investigating applications of regenerative design, concepts for regenerative neighbourhood developments started to emerge in my findings. Regenerative developments integrate “…science and practice, ecological, social, cultural, spiritual, and geophysical components of living systems as well as their temporal and spatial dynamics.” These developments aim to use a holistic and informed multidisciplinary approach to designing environments that serve all beings. A further look into regenerative developments would probably support my Ecocentric Architecture concepts.

A productive Ecocentric Architecture exercise would also involve conducting thorough, site-specific habitat research for the local animal species. Having a deep understanding of the local animals and the ecology as a whole would permit even more specific and effective design decisions to be made, especially at a more granular level.

Another avenue to further explore would be on the slowness of making. Throughout this thesis, I had a strong interest in using creative methods of handwork, such as drawing, painting, modeling, and even bookbinding. I felt that slow, thoughtful making and the allowance to immerse myself in creative processes lent themselves to the careful analyses and specific research required of Ecocentric Architecture. I would encourage these methods be used as a way of thinking about and conceptualizing Ecocentric Design ideas, as they may produce new perspectives and ways of designing. Additionally, these methods further challenge traditional, fast-paced, and arguably mass-produced architectural conventions that this thesis starts to counter.

To summarise, this thesis proposes and explores the Ecocentric Architecture typology. It was important to first analyze the existing theoretical frameworks surrounding ecological architecture, and then to test these concepts through creative explorations. After settling on a site to locate my counterproposal, understanding the landscape and its history was essential. From this research and the resulting analyses, I was able to further test creative concepts that contributed to my counterproposal before finally developing its design under an Ecocentric Architecture framework.

Returning to my initial research questions, some conclusions can be drawn. These questions were: How can architecture be better integrated into a specific local ecology? How can architecture accommodate animal habitats? What tools do architects need when designing to take the local ecology into account in a critical and thoughtful way? What happens at the interfaces between human and non-human landscapes? How can architects enrich these ecotones to support all beings present in these landscapes? This thesis suggests that to answer these questions, architects and designers must become closely acquainted with their site’s history (both culturally and environmentally), its landscape features, and its various species and their needs. To do so requires research and knowledge beyond the scope of the discipline of architecture, encouraging a cross-disciplinary approach that will facilitate bridging across different channels of knowledge so that they may be shared and used. Overall, the typology of Ecocentric Architecture aims to be as site-specific as possible, demonstrating the possibility and feasibility of a thoughtful, holistic approach to design that accommodates all beings who inhabit and interact with a given landscape.
### Appendix I Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>adaptation</td>
<td>A process of change or modification by which an organism or species becomes better suited to its environment or ecological niche, or a part of an organism to its biological function, either through phenotypic change in an individual or (esp.) through an evolutionary process effecting change through successive generations.</td>
</tr>
<tr>
<td>archetype</td>
<td>&quot;The essence of a definite form or pattern that can be recognized in all the forms produced through development from it; a form that is present in the mind as a model for the development of actual things.&quot;</td>
</tr>
<tr>
<td>arthropod</td>
<td>&quot;Any of a phylum (Arthropoda) of invertebrate animals (such as insects, arachnids, and crustaceans) that have a segmented body and jointed appendages, a usually chitinous exoskeleton molted at intervals, and a dorsal anterior brain connected to a ventral chain of ganglia.&quot;</td>
</tr>
<tr>
<td>arthricle</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
<tr>
<td>arthropleuran</td>
<td>&quot;Any of a phylum (Arthropoda) of invertebrate animals (such as insects, arachnids, and crustaceans) that have a segmented body and jointed appendages, a usually chitinous exoskeleton molted at intervals, and a dorsal anterior brain connected to a ventral chain of ganglia.&quot;</td>
</tr>
<tr>
<td>arthrite</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
<tr>
<td>archipelago</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
<tr>
<td>archaeologist</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
<tr>
<td>archetypal</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
<tr>
<td>archetypic</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
<tr>
<td>archetypize</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
<tr>
<td>archetypist</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
<tr>
<td>archetypize</td>
<td>&quot;Any sea, or sheet of water, in which there are numerous islands.&quot;</td>
</tr>
</tbody>
</table>
Connectivity is essential to disperse to habitats where they can reproduce, feed and find shelter—in short, meet their vital needs. These corridors play a leading role in connectivity. Like a path through a forest, corridors allow animals to move and plants to regenerate. They provide habitats where they can reproduce, feed and find shelter—in short, meet their vital needs. Connectivity is essential for wildlife to remain healthy.”

teleology
“The theory or belief that divine purpose or design is discernible in the natural or physical world, the theory or belief that certain acts, processes, or phenomena are to be explained in terms of intention, design, or purposiveness rather than by prior causes, explanation in such terms.” - Oxford English Dictionary

talus
“A sloping mass of detritus lying at the base of a cliff or the like, and consisting of material which has fallen from its face; also, the slope or inclinations of the surface of such a mass.” - Oxford English Dictionary

threshold
“The magnitude or intensity that must be reached or exceeded for a certain reaction, phenomenon, etc., to occur. Also more generally: a certain limit or level beyond which something comes into effect.” - Oxford English Dictionary

wildlife corridor
“Wildlife corridors are land or water passages that connect areas together. These corridors play a leading role in connectivity. Like a path through a forest, corridors allow animals to move and plants to regenerate. They provide habitats where they can reproduce, feed and find shelter—in short, meet their vital needs. Connectivity is essential for wildlife to remain healthy.” - natureconservancy.ca

Bibliography


thank you