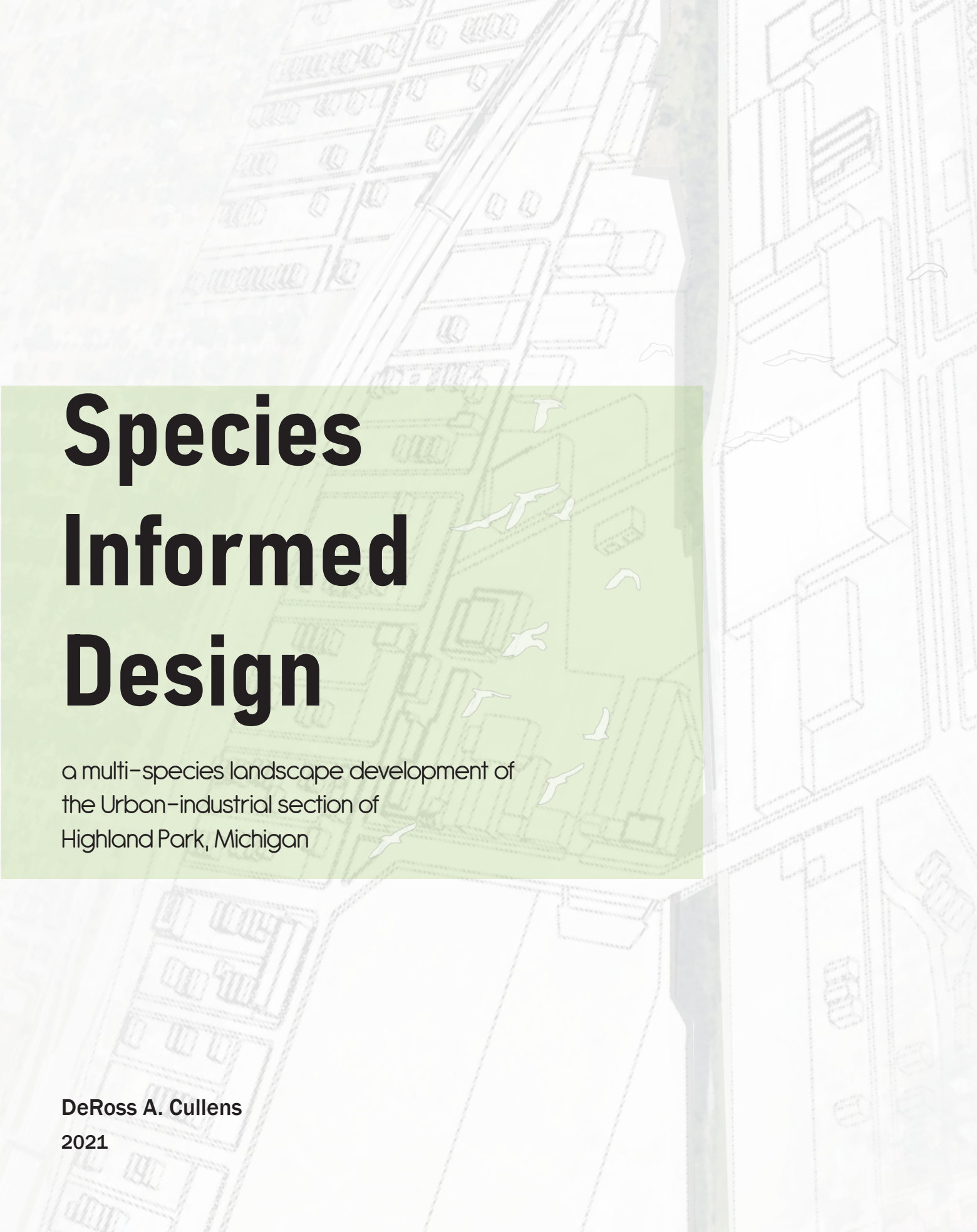

Species Informed Design

a multi-species landscape development of the Urban-industrial section of Highland Park, Michigan

DeRoss A. Cullens

2021

Species Informed Design

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“Be encouraged forever.” - Gayla C.

To each of the birds and urban wildlife neighbors that I have come to know...

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Abstract

A species informed approach to design is an essential part of development as we combat the effects of the negative impacts of modern urbanization. Biodiversity and ecologies of urban areas have a concentration on human life. Humans are not the only urban animal, thus the optimization of spatial resource allocation for other urban animals becomes critical. The animals that live and benefit from an association with humans and that of human developed artificial habitats are identified as synanthropes; they are highly urbanized animals and also our design partners within the pursuit of a more inclusive, flexible, and more resilient urbanism. Though the study of synanthropic design, This thesis seeks to propose design consideration criteria that seeks to promote the volue of natural resourses through species informed landscape design decitions.

Thesis Statement

Many forms of wildlife have created habitats on the surfaces, edges, and crevices of the built environment. Many animals have learned and are still learning to adapt to human activity and to our ever-changing landscape.

Once wild species have converted and have been redefined as synanthropic species– animals who benefit from living in close proximity to humans. Due to humankind's lack of control over and inability to domesticate these types of animals, such animals are often seen as pests. As the conflict of city and nature worsen, the inclusion of wildlife in our understanding of architectural design becomes more critical.

Architecture traditionally supports commercialism that places the human species at the center. Rather than displacing other animal species in the creation and implementation of human-centered design, architectural practice can serve to increase the biodiversity in the urban landscape in such a way that a more beneficial ecosystem can be formed and/or discovered.

This thesis, titled *Species Informed Design*, re-evaluates human-animal interactions and conditions within the urban-industrial context of Highland Park, Michigan through the use of design that aids in the development of hybrid relationships that positively contribute to the development of a more healthy, coherent, and supportive ecosystem.

I

Introduction

Synanthropic Life

The Area Between Domestic and Wild

Non-human animal species are categorized into two classifications in relation to human behavior; they are either *domestic* – usually living alongside humans while posing no threat, or *wild* – able to sustain life independent of human-sustained support.

It is not atypical for humans to respond in fear to the independence of wild animals. Untamed species outside the anthropogenic activity range become associated with idealizations of landscape conditions which support them. They are ingrained into humanity's conception of nature as a condition that is pure-- untainted by human activity or human influence. Attempts to preserve these landscapes, such as initiatives for conservation reserves and national parks, are created to protect the state of the wildlands from human encroachment.

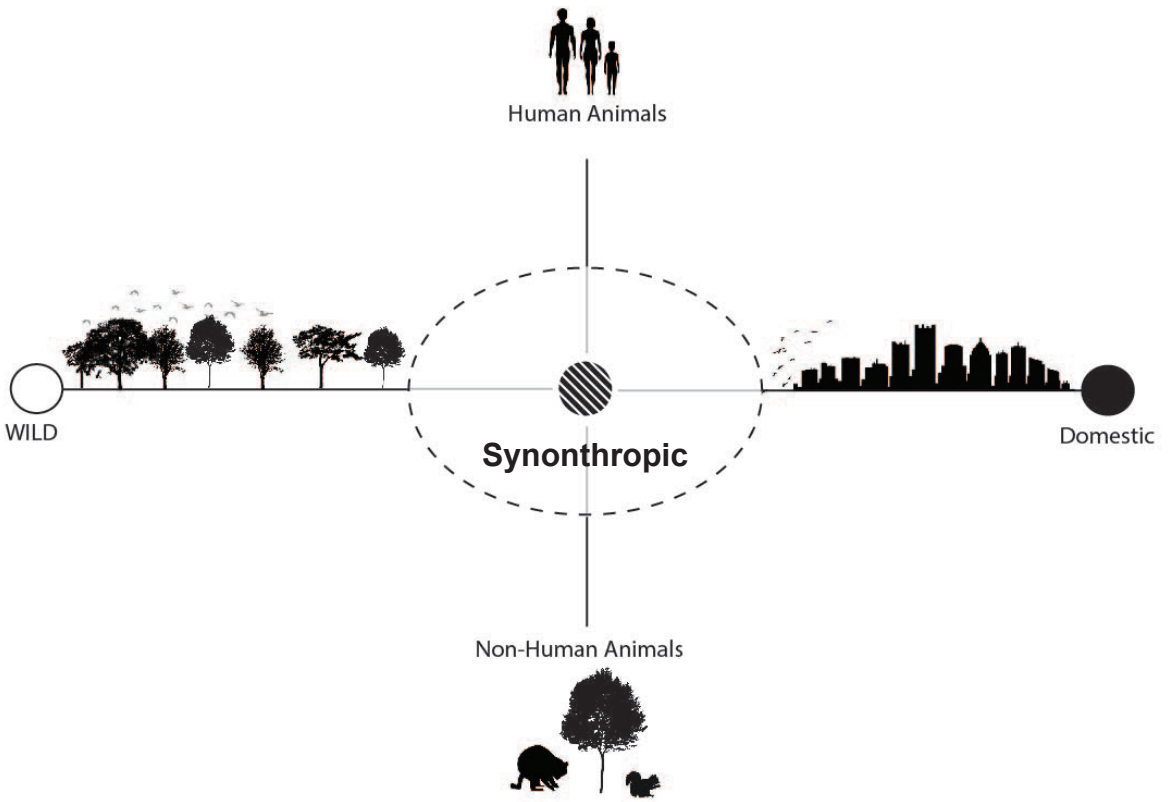


Figure 1.1. The Species Between Wild and Domestic (Gunawan 2015)

However, these efforts by developers and ecologists may appear to cause arguably destructive and erosive effects. Sociologist Henri Lefebvre is credited with introducing the idea that space is socially produced. His analysis includes a historical study of how spatial experience has changed over time depending upon social circumstances (Lefebvre 2004).

Lefebvre argues that abstract space-- defines as space produced and perpetuated through grids, plans, and schedules-- is utilized and dominated by the capitalist system of production.

Lefebvre proposed that socially produced space and time is held in place through administrative policies, social conventions, and technological systems for living so that each day as people wake up to an alarm, commute to work, watch television, or pay bills, this system of space and time is perpetuated and reproduced, i.e. a matrix.

Lefebvre argues that humans are inadvertently urbanizing wildlife landscapes around the world.

Conditionally, the human-animal relationship resulting from efforts of preservation and restoration result in hybrid relationships and hybrid problems. For example the dilemma of conservation-reliance; animals and or plant species are increasingly requiring a continuum of species-specific wildlife management intervention such as predator control, habitat management and parasite control to survive even when a self-sustainable recovery in population is achieved.

Population of conservation-reliant species are growing and are still being understood as a result of “humans gardening the wilderness” (Michael Scott 2008). This is resulting in the shifting of our understanding of conservation and domestication-- the difference between complete reliance and total independence.

In what ways can human production create a more suportive relationship without creating a core relience upon humans?

Urban Deployment & Synurbanization

Wildlife Adaptation to Urban Development

The synanthrope dwells within hybrid conditions. A species between wild and domestic, a synanthrope is an organism that benefits from living near humans; see Figure 1.1. They have become accustomed to the activities and patterns acted out by human civilizations and have sustained a steady flow of life. They thrive most in urban landscapes where they occupy buildings and other infrastructure.

In cities, humans mostly encounter synanthropic species of birds such as the house sparrow and pigeon, as well as land animals such as the squirrel or racoon, whom inhabit urban environments. Many of these animal neighbors are seen as pests and are shunned by property owners through the use of physical and chemical deterrents such as spikes along the ledges of building facades, barbed wire along tree limbs in some parking areas in an effort to prevent perching, and the placement of rodent poisoning agents. When not seen as pests, such animals are typically allowed to remain within certain domains of the urban landscape– such as parks– to serve as points of divertissement.

Often, one can witness a select few individuals engaging with synanthropic wildlife as a companion species. For example, elderly individuals can be seen at parks feeding large flocks of pigeons. Often, humans express empathy for synanthropic wildlife when one is injured or deceased. Many engage with the synanthropic wildlife in their own back yards through the installation of bird and squirrel feeders.

The synanthropic condition challenges the human perception of the city as an area with little to no engagement with the nature of other species. Synanthropic species are often viewed as unimportant and many urban inhabitants neglect to recognize the impact of litter and other environmental pollutants on such species; these individuals dwell in a conscience with no recollection of the unforetold contributions these animals make in our daily lives. Humans have not fully embraced cohabitation in its entirety; instead, animals *survive* within the urban fabric rather than *live* in coexistence with the human species.

Urban development has residual effects that create opportunities that these species have adapted to. Within the rate at which the urban landscape is changing a process of synurbaniztion emerges (Luniak 2004).

What could be the cause of this microevolutionary process of the adaptation of wildlife to urban development?

Anthropomorphic activity alters species behavioral patterns generally found in their natural habitat: shifting migration patterns, altered hunting and foraging behaviors, increased population, increased human interaction, etc.

As many beneficial qualities that a synurbanisation process gives to species, it also comes with damaging effects.

According to Luniak, in the formation of the city, the decrease in ecological diversity results in a limit of the survival of many species (2004). The prevailing wildlife then may have a longer life span due to less predatorial pressure; however, they are more susceptible to disease with increased numbers and typically unhealthy dieting throughout the city. The urban condition may provide animals with opportunities, but does not replace the necessity for a diverse range of species.

Divergent species develop survival responses to human-altered conditions. Regardless of whether the new habitat was constructed by humans or resulting from nonhuman natural occurrence, species often see opportunity within the material elements.

Urban populations of wildlife also tend to be more aggressive, less bothered by change, bolder, and have fewer fleeing behaviors than that of rural settings.

The integration of a diverse range of species not only contributes to our health and wellbeing, but also creates opportunity for an expansion of the human understanding of the physical world. The interconnectivity of a species' habitat embedding on another can result in new patterns within the ecosystem.

Jakob van Uexkull, a 19th century German biologist, sought to study the comparison of the perception of various species. According to Uexkull, a species environmental response is a proportional response to its own complexity (1936). This type of awareness is what Uexwell describes as a species' *umwelt*. One of the closest translations of *umwelt* into the English language is "environment." However, this word has come to imply a species' "self-centered" survival behavior. The study included behavioral analysis of various species of animals to better understand how their actions reflect in accordance with their perceived "lived worlds."

Amongst all animals are continuous cycles and patterns of perception that then lead to action. This Uexkull would later describe as a species' *Funktionskreis* or "Functional Cycle."

The perception that an animal has plays a key role in its ability to identify ideal elements of the city that could provide necessary tools for a process of synurbanization. Uexkull proposes that an organizational structure helps to give an understanding of the agency to which each is an independent actor that plays in its own environment. The desire to replenish, to do something to continue to fortify the system we call living, is linked to their circular state.

Our concept of “being in the world”, a Martain Heidegger reference, then begins to include all that is biological and technological. That of existential identity and that of the world are completely interconnected.

Regarding animal *umwelt*, this thesis gives observation to design considerations that contribute to the feeding, breeding, and success of a multispecies environment. The research and design methodologies strive to engage and invite a multitude of perspectives to better conduct and coordinate more productive hybrid conditions. The study considers the behavior of animal species within the development of human and non-human lived realities. Within the process of synurbanization, new human relationships have emerged that encourage healthy forms of cohabitation (Luniak 2004).

Species Relationships

The relationships and relationship barriers between species is vastly complex. This thesis study seeks to analyze the complexities and find connections and opportunities of design support wildlife within the urban fabric.

Two rudimentary aspects within interspecies relationships that will be explored are biological interactions and the shared spatial conditions. Biological interactions include but are not limited to food resourcing, waste production, and disease transmission.

In Figure 2, illustrations of examples of biological interactions can be seen on a spectrum. They span from mutualism, a relationship where all species involved benefit, to commensalism, where one species benefits while another neither gains nor sacrifices within the relationship. Parasitism is another interspecies relationship where one life form benefits at the expense of another.

All these relationships operate continuously within a common physical space.

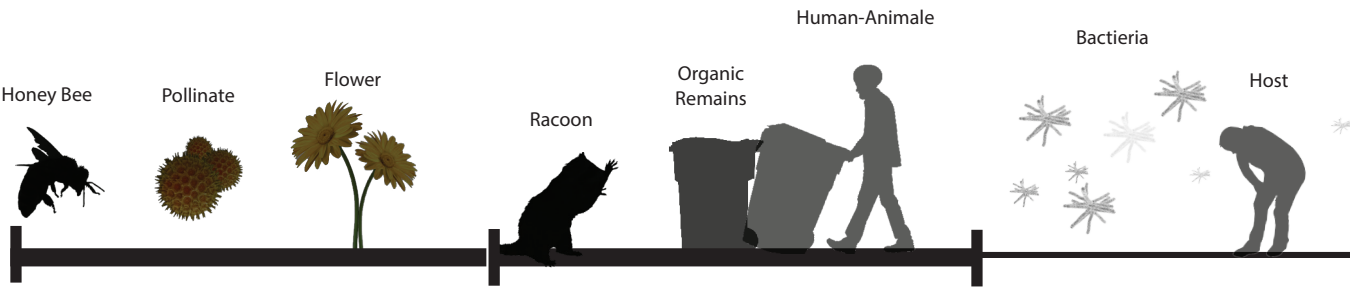
The other rudimentary element is the shared spatial condition. These are the shared elements between both human and non-human species that allow for spatial overlaps of desired territory. For example, a bird may take no issue living in the chimney of a house, while the homeowner may be intolerable to this proximity and see it to be a commensalistic relationship.

Both human and animal further define the physical and conceptual limits of our territories based upon our needs. The physical limits are the built structures that define the edges and domains of space such as a building footprint or fence. Non-human animals also construct physical limits such as nests and dens.

For humans, conceptual spatial limits are applied values to a space that change at diverse rates. When conceptualizing, the value of a space alters between species because of the differences in species perception (Uexkull 1936).

Within the dynamics of perceived physical and conceptual space, opportunity emerges for design intervention. Where applicable, species informed architectural design can enhance the way in which the interaction of various functionalities can flourish along side one another.

High Productivity



MUTUALISM

Relationship which benifits species involved, a symbiosis between two different species, a “biological bartering”

COMMENSALISM

The suporting organism have a neutral relation to the other although some parasitic affects can be discovered, one organism benifits from a given relationship without effecting the other

PARASITISM

A non-mutual relationship in which one species benifits at the minor expence of another

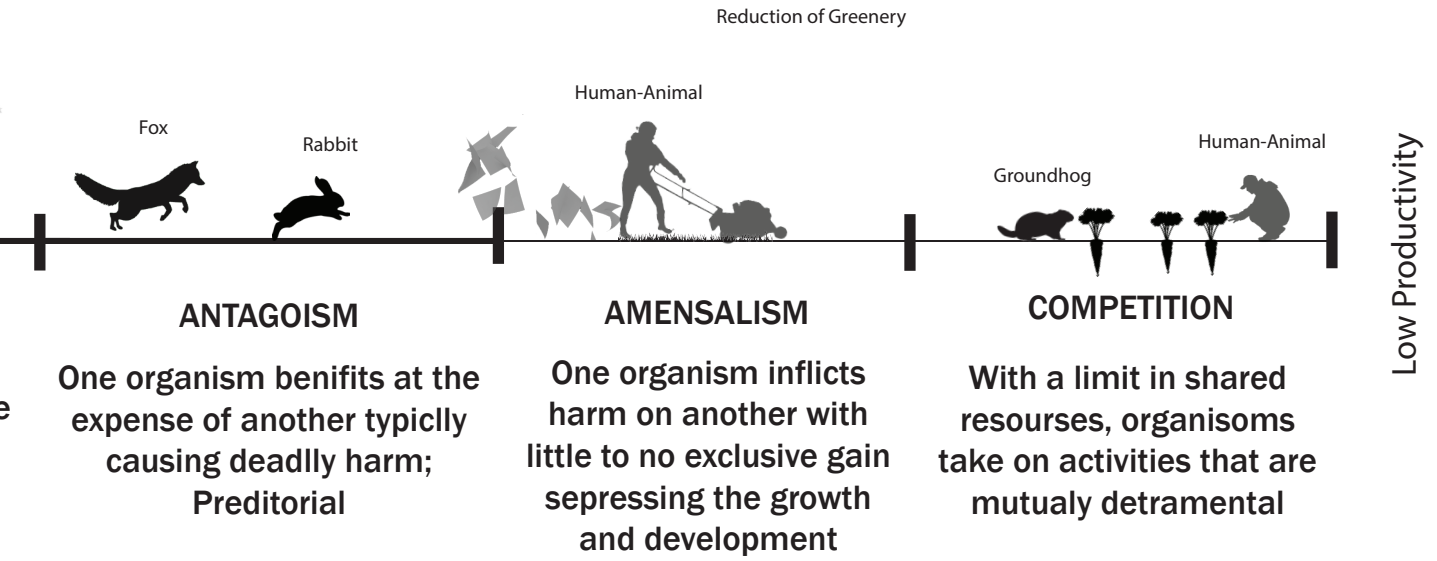


Figure 1.2. Biological and Spatial Relationships

II

Urban Beastiary and Landscape Ecological Services

Raccoon

Scientific name: *Procyon lotor* (Greek meaning "washing pre-dog")

Lifespan: 2 – 3 years (in the wild)

Captive Lifespan: 20 years

Mass: 7.7 – 20 lbs (adult)

Height: 9.1 – 12 in. (at shoulder)

Speed: 9.9 – 15 mph

An example of a commercialism relationship is our relationship to the raccoon. Raccoons are often seen as a pest due to their tendency to search through human rubbish. Raccoons actually contribute to the comfort of human environment– they consume wasp larvae, destroy wasp nests, eat small rodents, and– while going through rubbish– help reduce landfill waste.

Squirrel

Scientific name: *Sciuridae*

Lifespan: 6-18 years

Captive Lifespan: 20 years

Mass: .88lbs – 7.3lbs (may vary)

Length: 9.1 – 12 in. (at shoulder)

Speed: 9.9 – 15 mph

Squirrels help plant seeds for future trees and eat mushrooms and disperse the fungi throughout forestry lands through their waste. Squirrels are also an important food source for birds of prey, ie. Red-tailed hawk and Peregrine Falcon.

PLANTING OF NUT

GROWTH OF NEW HABITAT AND FORESTRY

ATTRACTION OF OTHER SPECIES

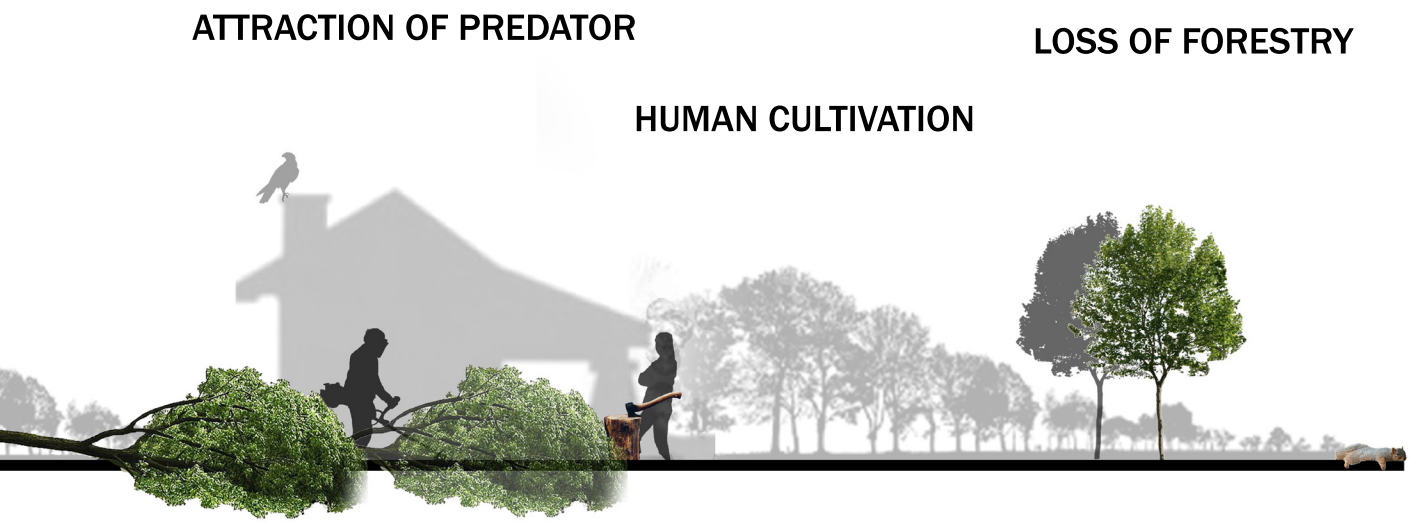


Figure 2.1. Ecosystem Services of Squirrels

From left to right, this chart expresses how the habitats and life of the squirel have a huge impact on the condition of our environment. This also expresses how human cultivation can have a counter effect on the eco-services that a squirel provides.

Blue Jay

Scientific Name: *Cyanocitta cristata*

Lifespan: 7 years (wild)

Captive Lifespan: 17-26 years

Mass: 2.3 – 3.8 oz

Length: 8.7 – 12 in.

Another example of a synanthropic animal are birds such as the Blue Jay. Their prey consist not only of nuts but also of insects. By clearing the air the Blue Jay becomes a living source of insect filtration eliminating bugs like yellow jacket wasps which are known for being highy aggressive.

Peregrine Falcon

Scientific Name: *Falco peregrinus*

Lifespan: 19 years

Captive Lifespan: Up to 25 years

Mass: Female: 1.5 – 3.3 lbs (adult),

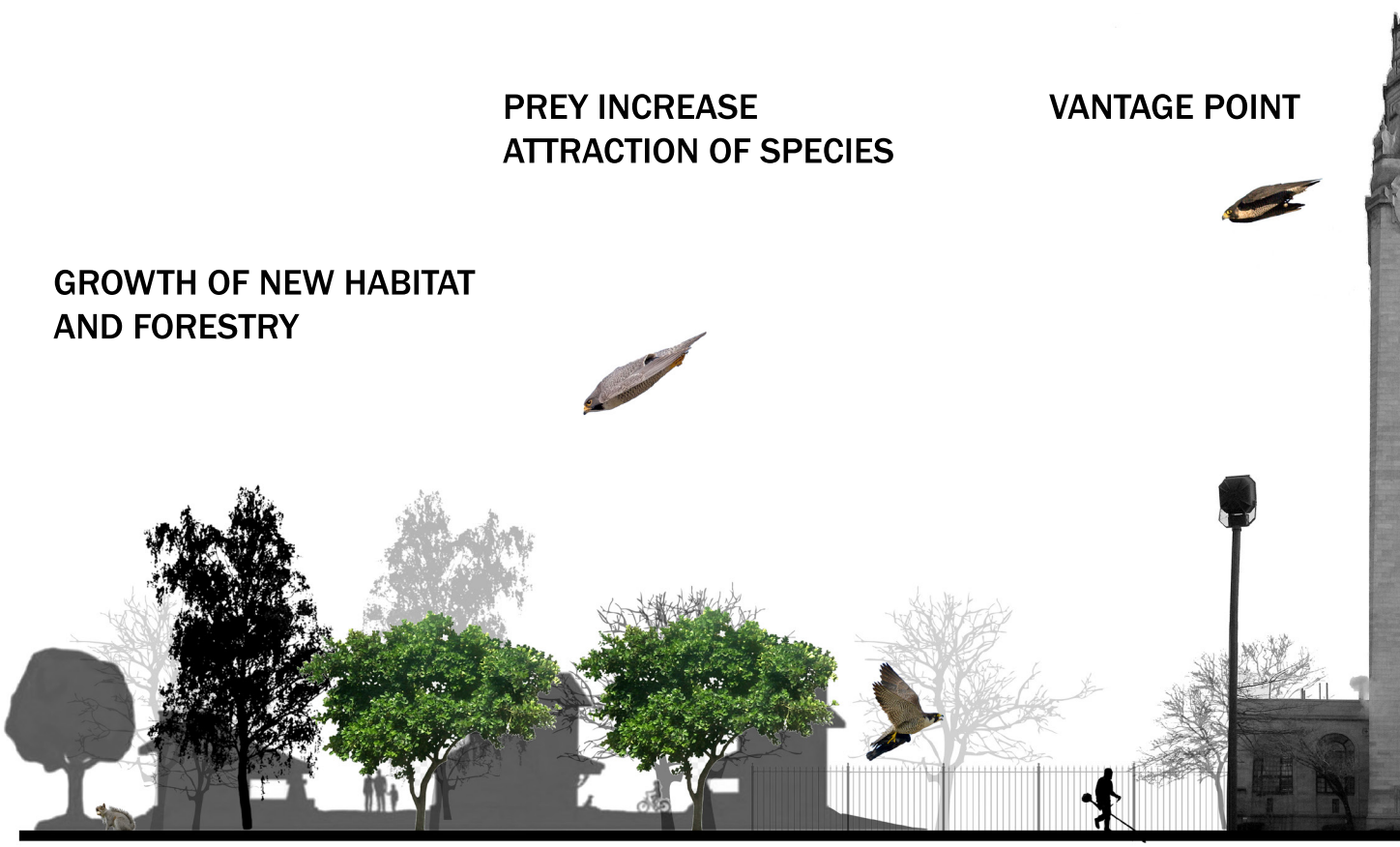
Male: 0.73 – 2.2 lbs (adult)

Wingspan: 2.4 – 3.9 ft. (adult)

Transport: Flight & walking

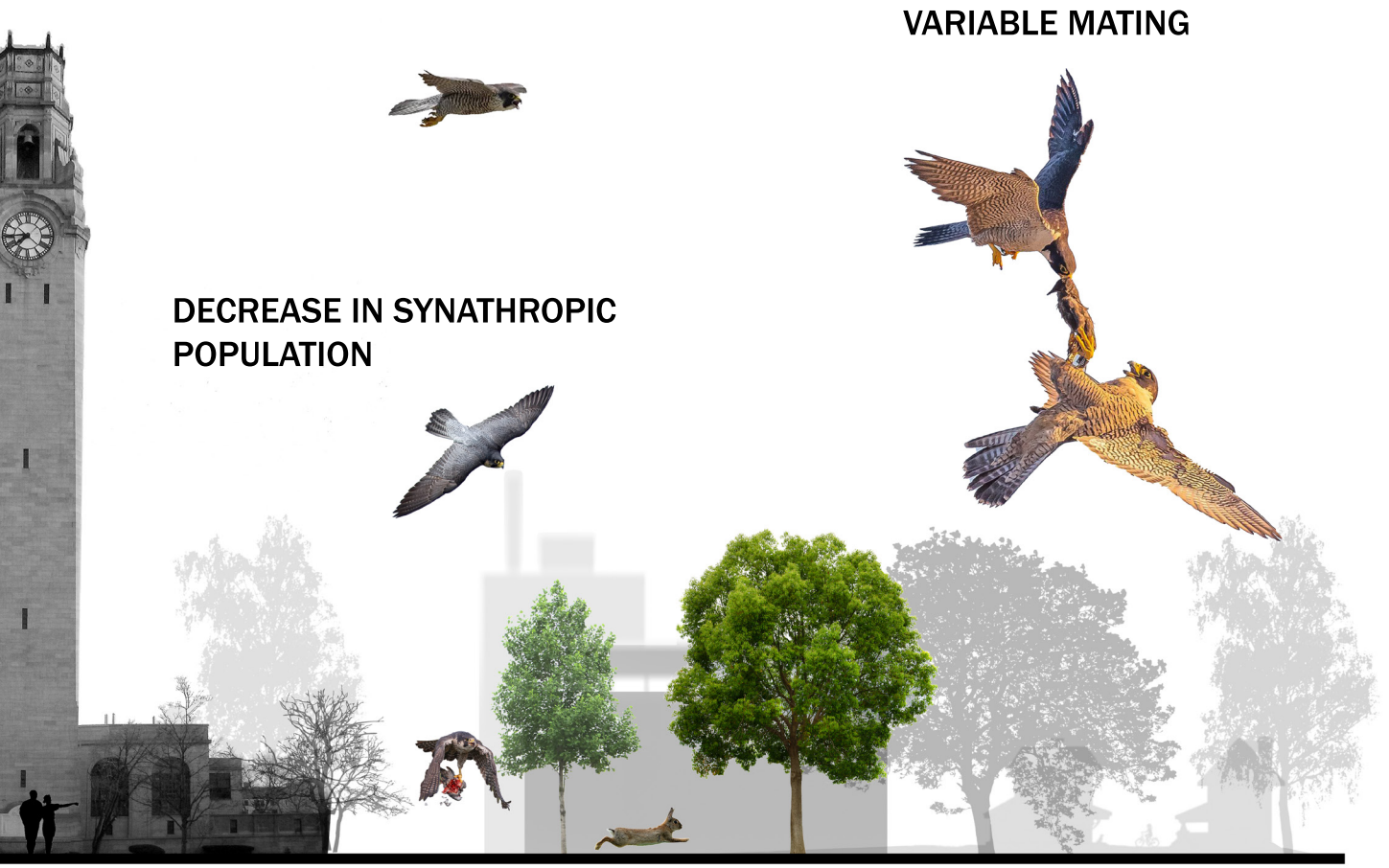
The Peregrine falcon also provides unique ecological services in that they help regulate the population of other synanthropic wildlife. An over population of any species can have a negative effect on the conneced network of habitat.

Figure 2.2. Ecosystem Services of the Peregrine



Through the growth of habitat comes the attraction of these birds of prey. These birds utilize various tall vantage points within the urban fabric in order to hunt.

An example of a great vantage point currently being useed by Peregrine falcons is the University of Detroit Mercy clock tower. You may hear these birds squawk during a warm season.



III

Human development and Uban Wildlife Response

Industrial Intergration Detroit

In the early 1900s, the idea of the city became a place of high job output and production. Due to conflict and demand, the construction of buildings needed to be built in a very timely manner. The use and demand of inorganic materiality became common.

High Housing Valume Detroit in 1800s.

(Grunow 2015)

Concrete construction reduces the amount of time it would take to erect a structure to house high volume production facilities.
Later strategies of pre-fabrication of metals and glass became available. However, this material became an antithesis of the systems that flourished before; housing and urban development.

The city of Highland Park, Michigan is a prime example of how a city highly industrialized has developed blight due to historical social change.
After WWII, production slowed within the highly industrialized city. Factories began to close, and a huge shift in the societal focus inspired a shifting in the functionalities that the city holds.
The idea of nature was not as inclusive during the later 1970s while most of society's, according to the law practices at the time, built environment was informed by the political, economic, and social process. (CITE)

High Industrial Intergration Detroit in 1800s. (Grunow 2015)

The idea of the city began to evolve at the turn of the 20th century after sociopolitical revolutionary movements and technological advances. Using technology, humans beings were able to better understand what impact on the environment their actions were having. Technology helped promote the awareness of materiality, the production of material, and new measurements of efficacy. (Agar 2012)

In modern society, the outlook of animal life is now studied to provide analytical and procedural data for the development of the urban landscape. This thesis examines the specifications of select synanthropic species that make contributions to an ever changing ecosystem.

An assemblage of religious, mythological, and scientific data that depicts perceptions of an animal's lived world is called a bestiary. This documentation came in the form of narratives, imagery, and or books. Bestiaries were first used in medieval times depicting the animal's biological behavior, relationship to humans, and symbiotic value amongst other animals.

This thesis takes a look at historical human intervention in Highland Park. The changes done to the landscape grants the opportunity to enhance the health and wellbeing of animals. Urban wild life helps to combat the effects of the neglect that much of human development has had on an healthy ecosystem.

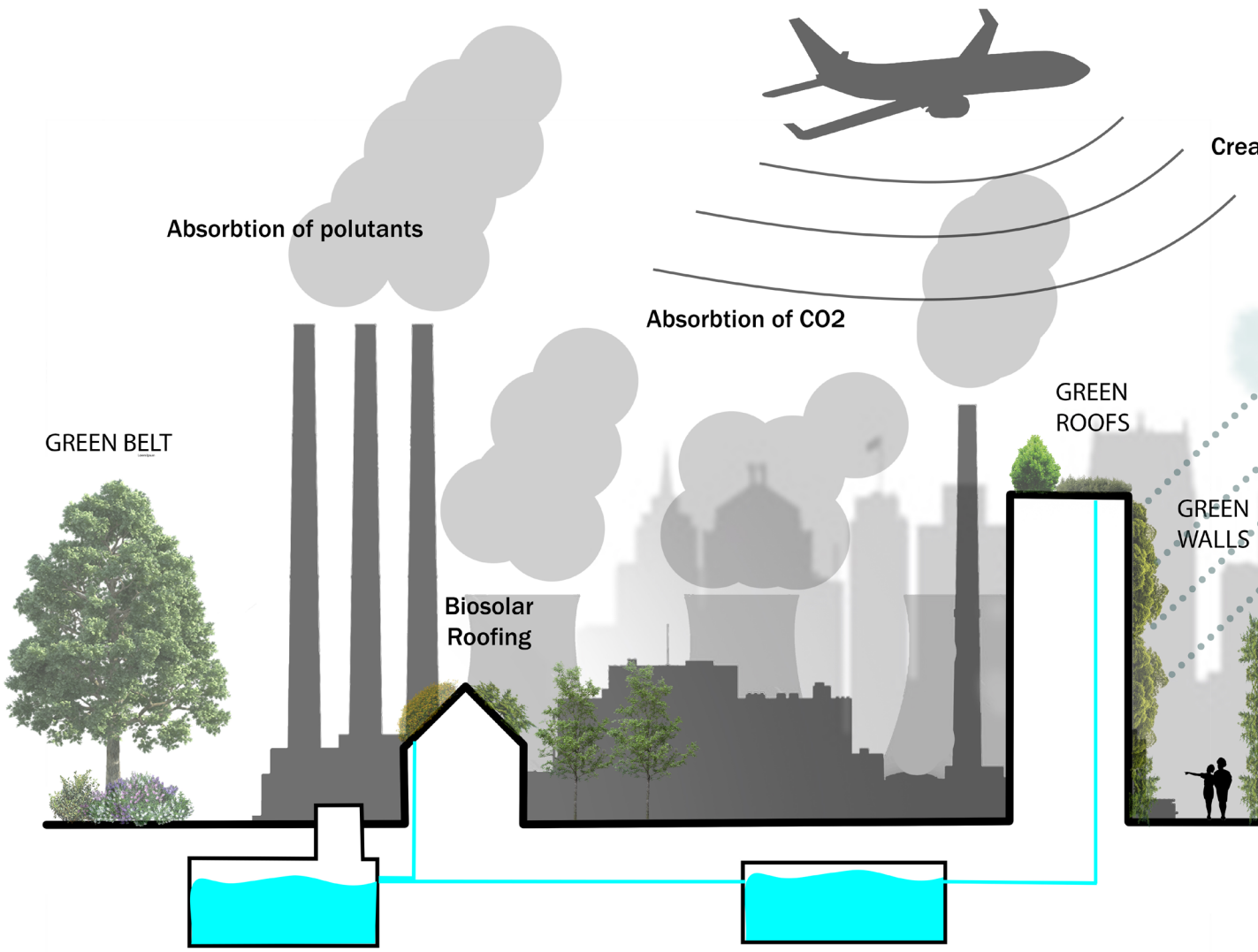
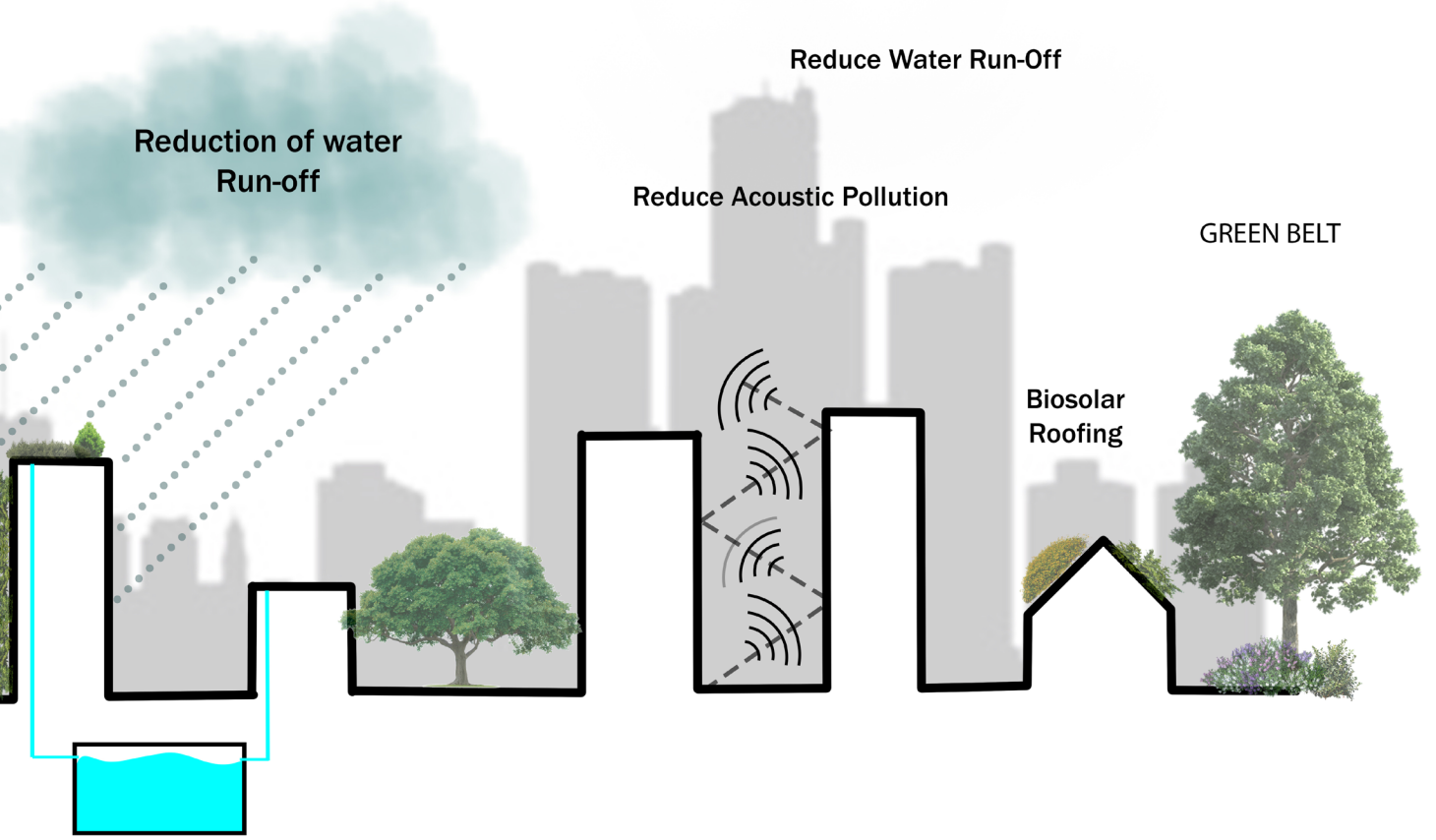


Figure 3.1. Current Green Infrastructure

tion of new habitat



Green Infrastructure Adaptation

One approach taken to enhance the quality of the ecosystem is through the green infrastructure. Figure 5 shows how green infrastructure is an approach to many economic problems. The development of green infrastructure helps to provide eco-relief from high rates of human development. Simultaneously these human interventions help to restore various habitual functions of urban wildlife.

Through this research, I have found that many synanthropic animals make new habitat out of these human constructed conditions; see Figure 6. From high vantage points for hunting, nesting and roosting, to green belts that attract various communities of birds and mammals. Bioswells and wetland development grant hydration and bathing opportunities. Urban wild life finding shelter within green belts and buffers.

Having gained an enhanced sense of space through the interaction of the diverse species, we have the opportunity to educate individuals about our urban neighbors; helping individuals understand the impact of human activity on various species and visa versa. Good species informed design happens when we see healthy biological responses to a design.

The goal of the study is to develop the urban industrial area such that we enhance the experience of the urban wildlife and ultimately contribute to a more suportive urban condition.

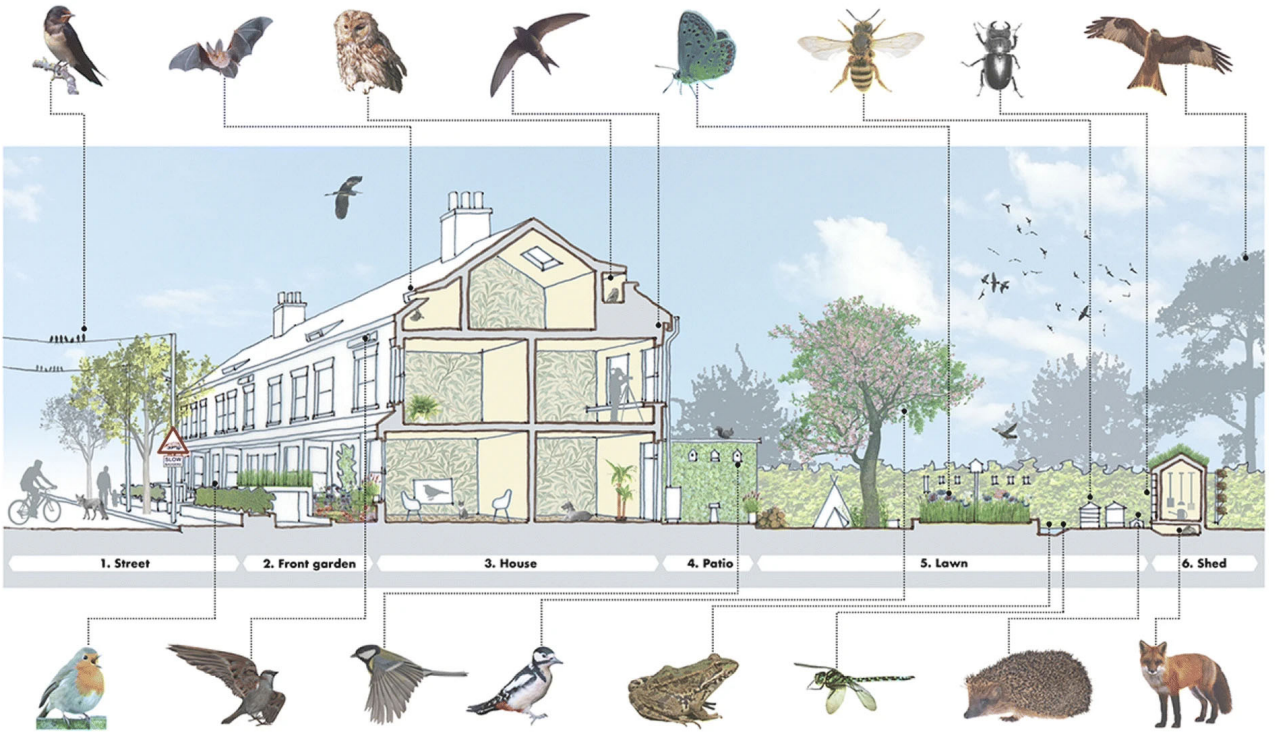


Figure 3.2. Examples of Urban Wildlife Adaptation to the Built Environment

(Section by Siân and Jon Moxon)

Enhancing Design Intervention

The value of a species informed approach to design is needed and welcomed within the intersection of functional elements within the shared physical interfaces. This is evident in that design can drive the intention of species conscious inclusivity.

French author and philosopher Jacques Derrida, known for developing a form of semiotic analysis, writes in their book entitled *The Animal That Therefore I Am;*

> "Being after, being alongside, being near would appear as different modes of being, indeed of being-with."
> (2008)

This study addresses how we dwell *with* other species.
Design that is informed by a multitude of animal species can multiply elements within shared physical limits. Design can usher in the enhancement functionality of inhabitable spaces throughout the landscape.

The site that this design study will focus on is a site located on the the south-western edge of Highland Park going into Detroit's District 2. An abandoned railway that is now seen as a wide alleyway presents a great opportunity to give healthy, all natural support to various species of bird.

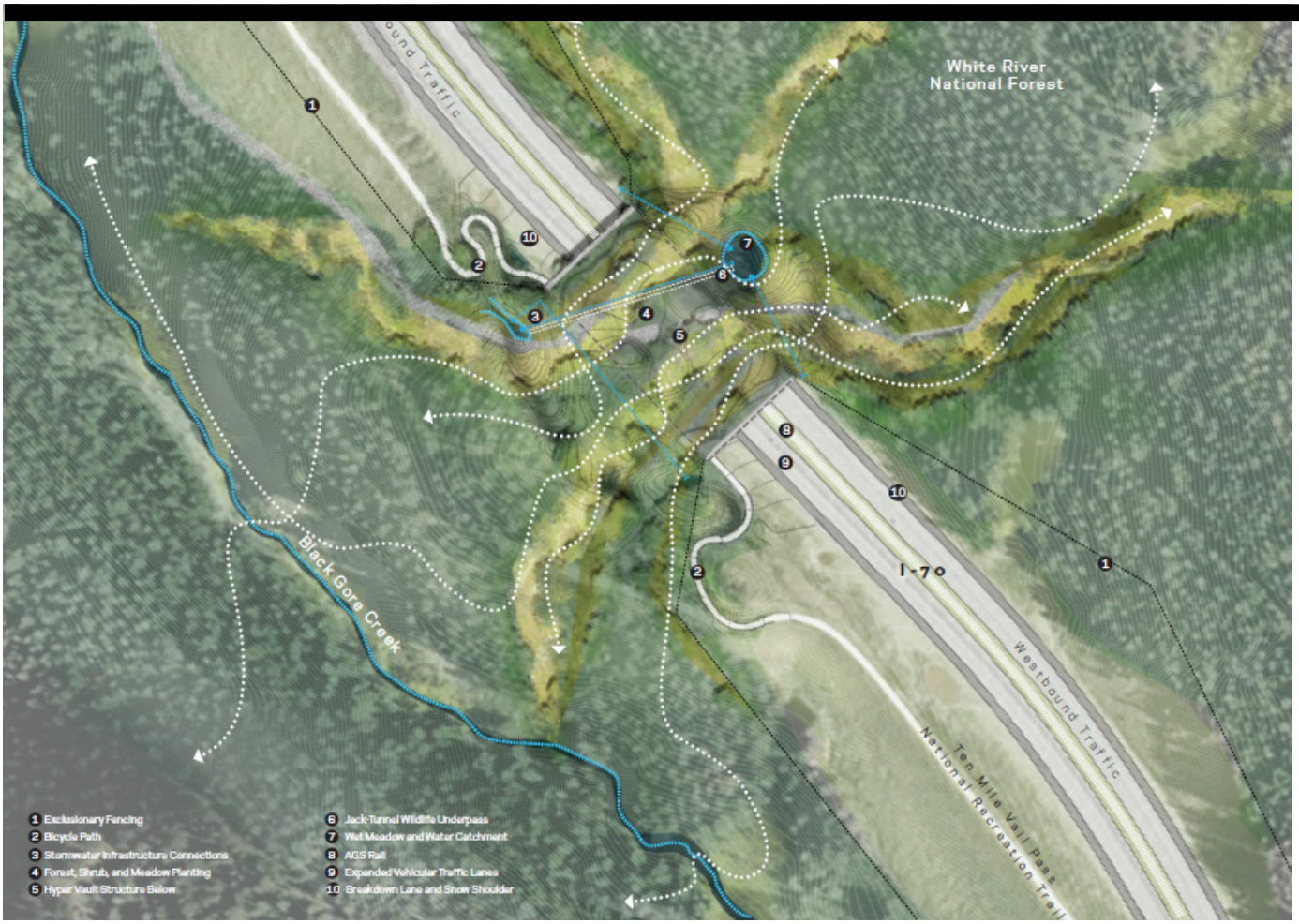
For this specific study, the focus will be on a design intervention with critical thought on the development of urban bird biohabitat.

Table 3.1. Benefits of a Species Informed Design Infrastructure

Aspect	Attribute	Results
Visual	Aethetics, Screening	Improved visual Environment
Human Health	Exciercise (walking, Running, de-stress, socialisation, recreation	Reduces costs to health providers,
Education	Study and experience of wildlife	Formal and informational Education, Skills through volunteering, hobby oppertunity (Photography, Bird watching)
Food Production	Allotments, gardens, orchards, vertical gardens, green roofs	Improved Diet, Communty bonding, Education, biodeversity, excercise
Transport	Alternate movment corridor for cyclists and pedestrians	Redused polution exposure, connectivity
Economic	Property prices, inward investment, tourism, improved business/shopping enivironment	Improved morale, improved wellness, attraction, reduced vacancy
Climate Control	Reduced heat-related mortality, Urban heat island, improved air quality and circulation, climate change mitigation	Increaced shading from UV-light, reduced cardiovascular mortality, reduced air and surface tempurature, freshens air
Sustainable Urban Drainage	Reduced runoff, flash flooding	Reduces risk, redused trama, destress, Improved ecotheropy
Pollution Control	Water, noise, air pollution (particulates, gases, aerosois, odor)	Absorbs nitrogen oxides, ozone, volatile organic chemicals; acts as heavy metal sink
Energy Efficientcy	Reduces ar conditioning and heating cost	Insultes buildings, shadpes windows
Biodiversity	Wildlife habitat, wildlife corridors and stepping stones	Provides producive habitat, increased food and resoures; promotes dispersal; reduces extinction risks

IV

Species Informed Design Intervention



Design Approach Precedent: Hypernature Project

by Michael Van Valkenburgh & Associates

The hypernature bridging system is driven by the demands of ecological engineering. Instead of attempting to recreate the surrounding nature, the design condenses and amplifies multiple landscape bands (forest, meadow, shrub, and screens) into habitat corridors that provide connections for a larger cross-section of species.

This approach takes materiality, sizes, shapes, and textures within the reconstructed environment and restores portions of land that provide natural resources that support a variety of species. Like examples seen in Detroit, the integration of road infrastructure can have destructive and divisive effects on urban and rural environments.

It was interesting to begin to explore through this firm's approach the many nuances that make up approaches to landscape architecture, where space and climate are perceived as constraining.

This intentional method of curating an exaggeration of the natural flows and species within a sub-site of a larger natural environment can be recognized by inhabitants and passersby, through the contrast and concentration of unique landscape elements.

The essence of hypernature-in-landscape approach was exercised by many of the principles practiced by American landscape architect Frederick Olmsted. Much of Olmsted's landscape theory was rooted in the principles of studying and creating landscapes in nature that can be experienced and enjoyed beyond just the curation of a beautiful space that alienates the viewer into an idealized landscape design.

Olmsted believed in the restorative power of the landscape. While in practice, Olmsted upheld insights that speak to the strategies of hypernature. One of Olmsted's principles "genius of place" holds that landscape interventions ought to stay true to the essence and character of their context (Grunow 2015). Respect to the condition of the context of a design project should respond in a sensitive manner to the language of the site.

This is essential not only to potential veiwers, but also the occupants within. This principle leads us to the next principle that states that "service must precede art". Inspired by the teachings of Marcus Fabius Quintilianus of Rome, Olmstead believed that a great practice of art is to conceal the art. That is, the landsacape design intervention should be seamless. Projects should be seamless as if it were not designed, but rather a result of natural proportions.

The principle that praticitioners should "design for sustainability and purpose"– design should not be solely for aesthetic, but should have a blending funtionality that mends social values.

The values that this thesis engages is that of the health of urban wilflife. Within an urban setting, landscape spaces are few.
They lie inbetween constructed spaces and are underused and underappreciated.

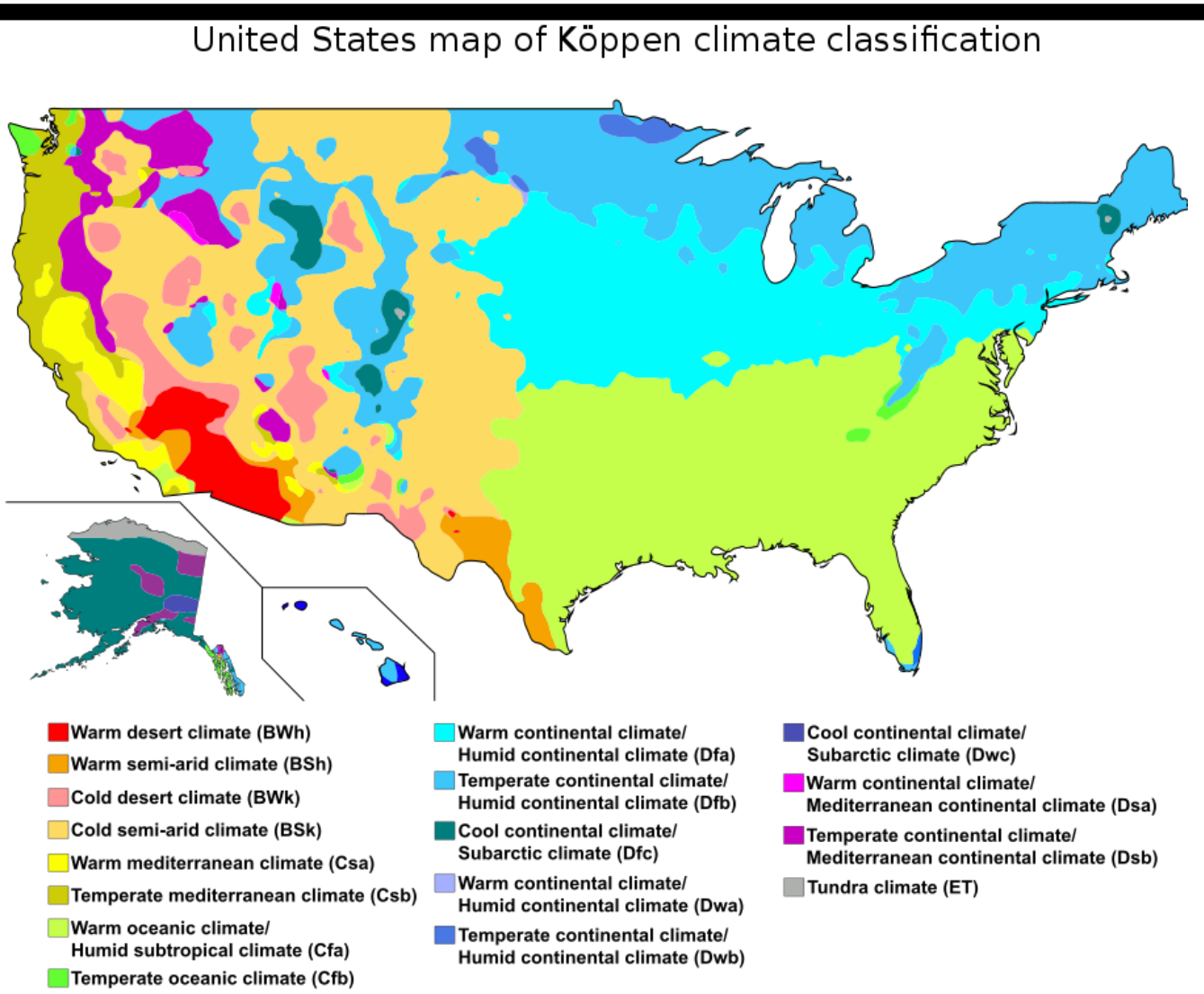


Figure 4.1. US Climate Zones PRISM Climate Group

The climate of this landscape design intervention lies within the warm/humid continental climate zone of Highland Park. As an adoption of Olmsted principles and that of hypernature, species informed design will utilize landscape elements that are native to Michigan and currently support various species.

Designing within a limited environment is a tough and sensitive challenge. However, it is important to use elements from the context of the site to ensure the survival of those plant species and their funtionality.

Site Evaluation

A site visitation occurred over several weeks during the fall season taking pictures of varying conditions.

There has been more in-depth species information that has been retrieved and is expressed in Figure 6.

Many birds take advantage of buffer zones and travel where there is a large number of people, as well as residential and retail activity.

SITE ANALYSIS
P1-P3

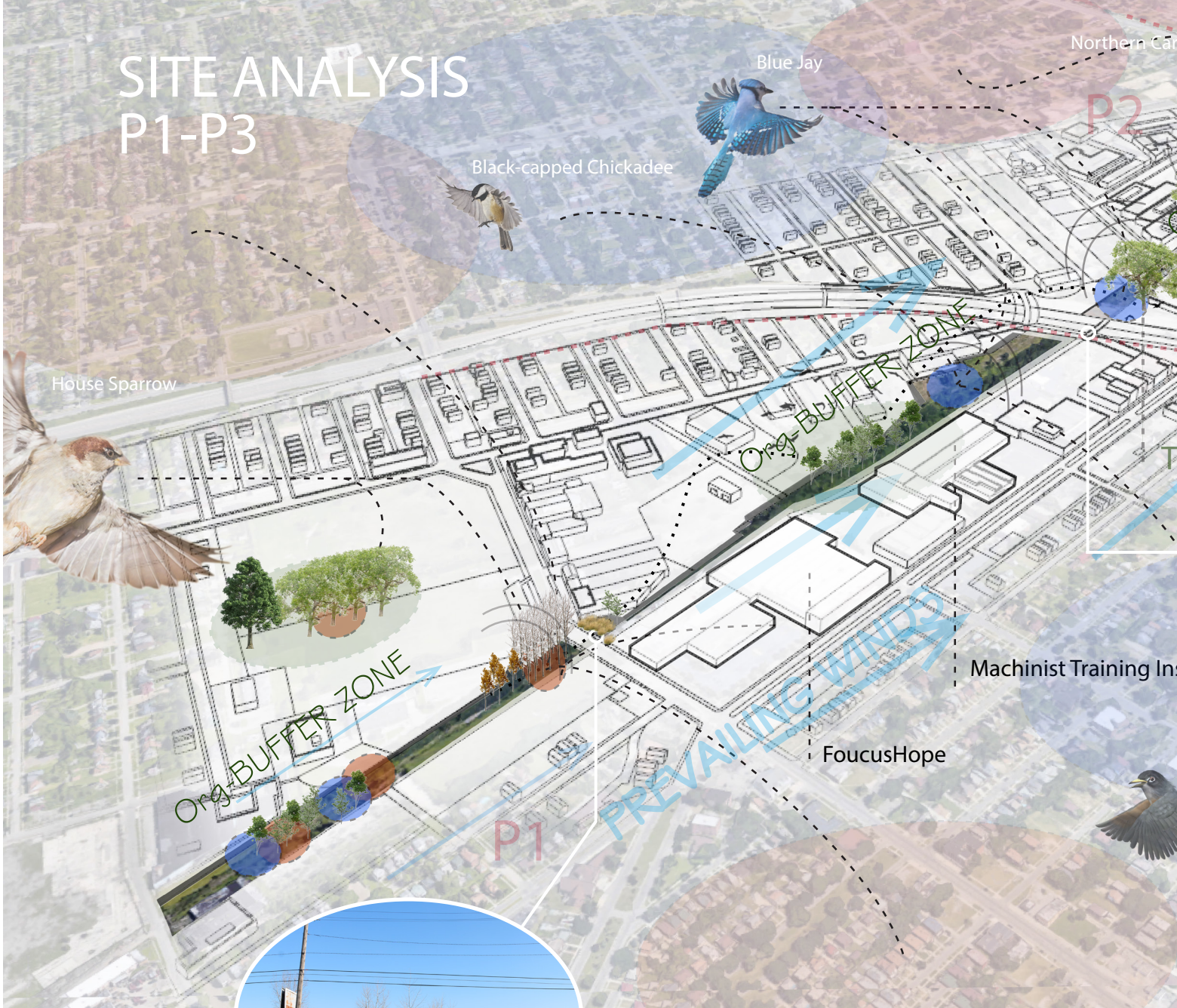


Figure 4.2. Indepth Site Analysis

The most common backyard birds spotted throughout the y

1. Black-capped Chickadee (45% frequency)
2. Blue Jay (43%)
3. American Robin (42%)
4. Northern Cardinal (41%)
5. American Goldfinch (39%)
6. Mourning Dove (39%)
7. American Crow (38%)
8. Downy Woodpecker (33%)
9. White-breasted Nutha
10. Song Sparrow (29%)
11. Red-bellied Woodpec
12. European Starling (2
13. Tufted Titmouse (23
14. House Sparrow (23
15. Common Grackle (2

This is the green belt site analysis. It shows marks and highlights where various species of bird could be spotted throughout the site. This green belt provides connection throughout the neighborhood.

It holds lots of resources and opportunities that help the growth of synanthropic wildlife and or urban wildlife.

The **house sparrow** nests in the tall service berries shrubs;

the **black capped chickadee** can be seen climbing up trees looking for seeds and flowers to give to a potential mate;

the **blue jay** and **cardinal** finding food and bringing it back to their nesting areas all bellowing out into the neighborhoods.

Common amongst the birds was roosting and the cultivation of nests along the constructed shrub and tree buffer bands.

One could witness clear signs of the process of synurbanization and urban wildlife cultivation of land. Many young trees were panted, not as a result of human cultivation, but rather a result of the increase in squirrel population and eco-services that it provides.

ear in the state of Michigan:

tch (30%)

cker (27%)
6%)
%)
3%)
3%)

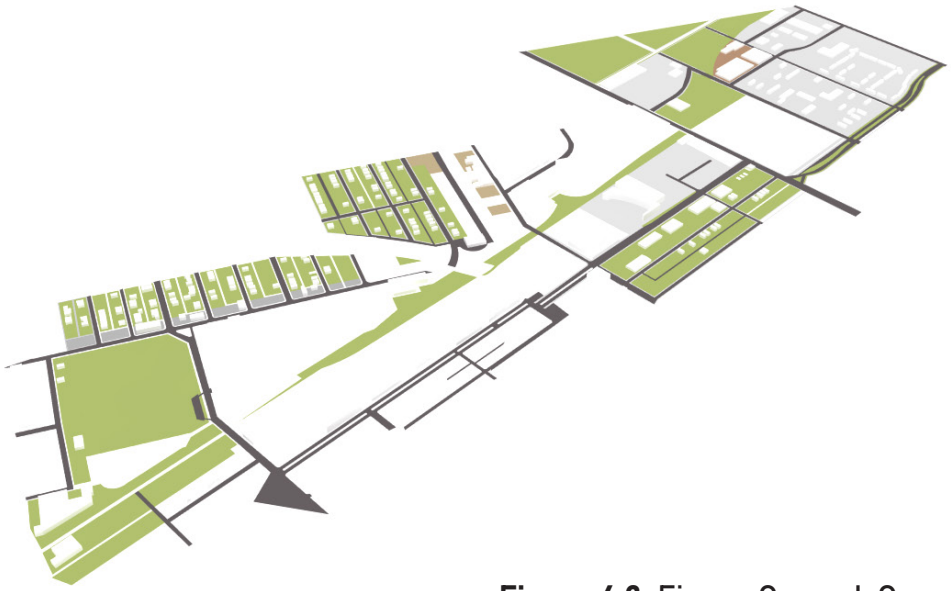


Figure 4.3. Figure Ground-Green Space

The context of the site's open green spaces were sporadic. The development of road infrastructure separated them, presenting hazardous crossing zones for animals. Due to the quiet environment it provides to the urban wildlife, the abandoned railway becames a synanthropic hotspot. This greenbelt also provides safe transit opportunities.

The whitespace on the map shows a high density of industrial and residential land use. This project combats human encroachment and replenishes natural landscape functionalities; striving to carfully select plant species that help to give back land to urban wildlife. According to the principles of Olmsted, the human experience of the landscape should not be at the cost of natural environmental funtions. This project upholds the prinicple that the human experiences of a landscape should not be that if a museum-like experience where natural design elements within the landscape design are seen as ornamental; rather, they should speak to– or function as– a contributer to the health and well being and support of multiple habitats.

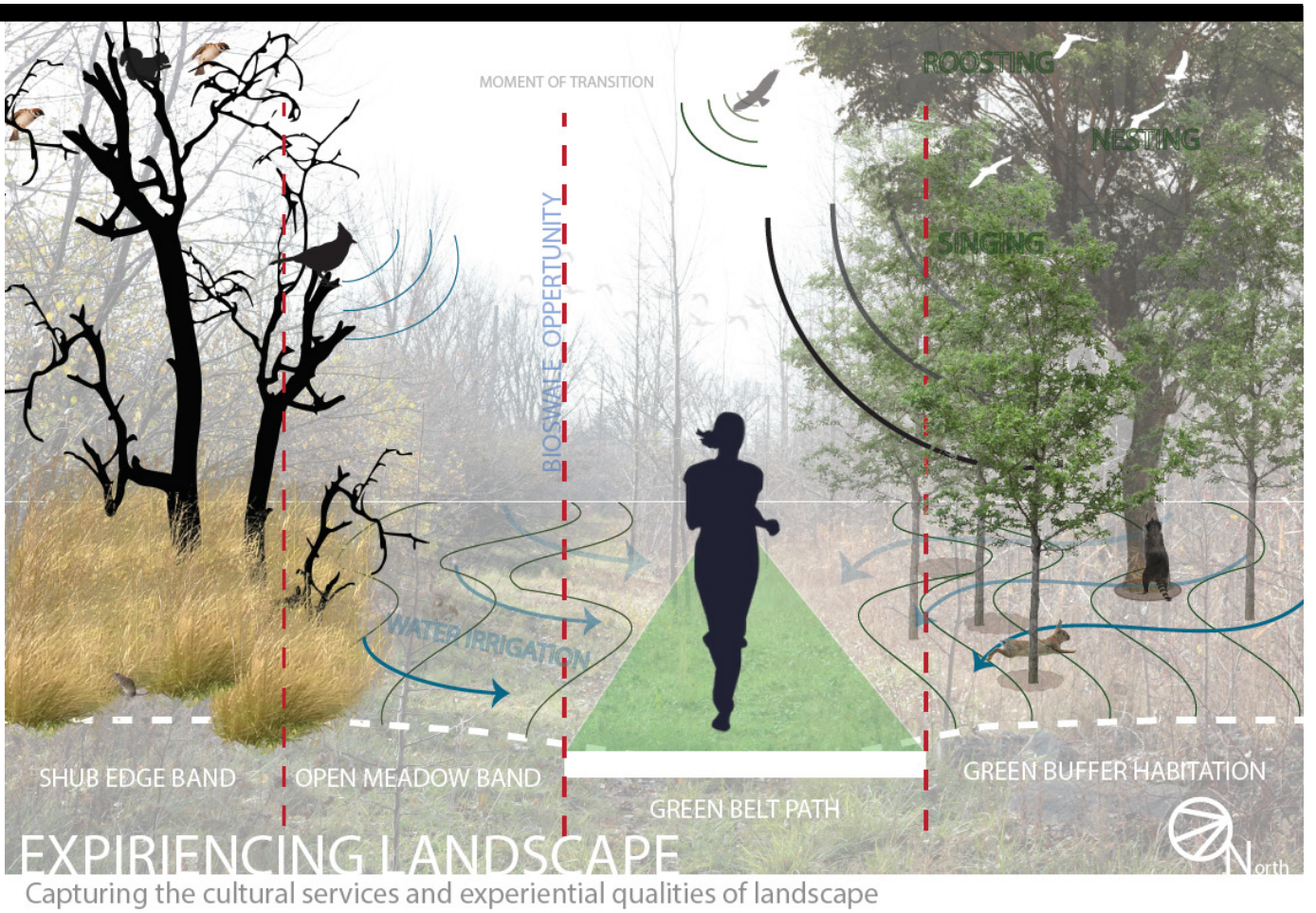


Figure 4.4. Landscape bands

The original design idea included a path that would be constructed of asphalt; however, to uphold principles of using natural elements, the pathway was taken out and replaced with native grass species that would provide shelter for synanthropic rodents and birds. Some areas would be low as to provide and extend bands of shrubery that were already in place. The project adopted landscape stratgies used in the hypernature design done by Michael Van Valkenburgh & Associates (MVVA). Their landscape masterplans used bands as a strategy to organize the attempt to expand the density of select types of plant species. One may examine the adoption of this strategy within the section within Figure 6.

Contribution of Native Tree and Shrubs

The design process involved a large collection of field data; surveying the site in order to insure the extension the various plant species that are currently grow within the context of the green belt. The tables below show key information that inform the designer of specific plant species that produce healthy resources for a multitude of species.

Native Michigan Canopy Trees

Category	Common Name	Scientific Name	Light			Moisture			Size	Use by Birds					
			Full	Part	Shade	Dry	Med	Wet		C	F	H	L	N	S
Summer Fruit	Black cherry	*Prunus serotina*	x	x	x	x	x		50'-100'		x		x		
	Red mulberry	*Morus rubra*		x	x		x		30'-60'		x			x	
Fall Fruit	Mountain-ash	*Sorbus decora*		x	x			x	25'-50'		x				
Winter Fruit	Hackberry	*Celtis occidentalis*	x	x			x		40'-60'		x			x	
	Hawthorn species	*Crataegus spp.*	x	x			x	x	20'-35'	x	x		x	x	
	American crabapple	*Malus coronaria*	x	x			x		15'-25'		x		x		
Seed	Red/Sugar maple	*Acer rubrum/saccharum*	x	x			x		50'-100'				x	x	x
	Eastern white pine	*Pinus strobus*		x		x	x	x	70'-100'	x			x	x	x
Nut / Mast	White oak	*Quercus alba*	x			x	x		60'-100'				x	x	x
	Bur oak	*Quercus macrocarpa*	x			x	x	x	60'-85'				x	x	x
	Northern red oak	*Quercus rubra*	x				x		60'-100'				x	x	x
Shelter	Eastern red cedar	*Juniperus virginiana*	x			x	x		20'-40'	x	x			x	
	Eastern arborvitae	*Thuja occidentalis*	x	x			x	x	30'-50'	x					x

Use by Birds Key: C = Cover; F = Fruit; H = Hummingbirds; L = Larval host; N = Nesting location or material; S = Seed

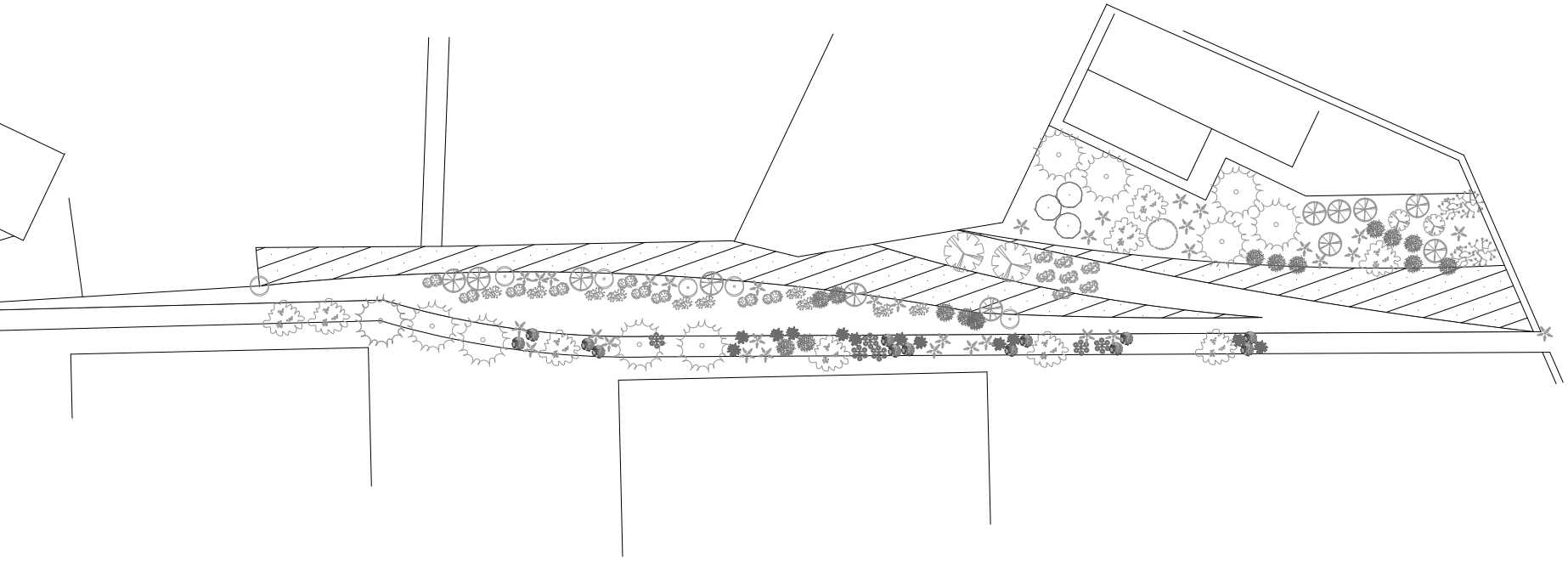
Table 4.1. Michigan Audobon Department of Education

Native Michigan Shrubs

Category	Common Name	Scientific Name	Light			Moisture			Size	Use by Birds					
			Full	Part	Shade	Dry	Med	Wet		C	F	H	L	N	S
Early summer fruit	Serviceberry, Juneberry	*Amelanchier spp.*	x	x		x	x		12'-25'		x		x		
	Chokecherry	*Prunus virginiana*	x	x		x	x		10'-30'		x		x		
Midsummer fruit	Wild black currant	*Ribes americanum*	x	x			x	x	2'-4'		x				
	Raspberry/blackberry	*Rubus spp.*	x	x	x	x	x	x	3'-6'	x	x		x	x	
	Red elderberry	*Sambucus racemosa*	x	x		x	x		5'-12'		x			x	
	Lowbush blueberry	*Vaccinium angustifolium*	x	x	x	x	x	x	1'-2'		x		x		
Fall fruit	Black chokeberry	*Aronia prunifolia*	x	x			x	x	2'-6'		x				
	Alternate-leaved dogwood	*Cornus alternifolia*	x	x			x		12'-25'		x		x		
Winter fruit	Fragrant sumac	*Rhus aromatica*	x			x	x		4'-5'		x				
	Winged sumac	*Rhus copallina*	x			x	x		6'-12'		x				
Nesting	Speckled alder	*Alnus incana*	x	x			x	x	6'-25'					x	x
	Pasture rose	*Rosa carolina*	x	x		x	x		1'-3'		x			x	
Shelter	Common juniper	*Juiperus communis*	x	x		x	x		3'-5'	x					x

Use by Birds Key: C = Cover; F = Fruit; H = Hummingbirds; L = Larval host; N = Nesting location or material; S = Seed

Table 4.2. Michigan Audobon Department of Education



Northeast Portion of Highlandpark Landscape Plan

Forest side

Forest Edge Bird Biohabitat

White Pine(Shelter)

Chokecherry(Shelter)

Indian grass(Seeds)

little Bluestem(Seeds)

Ironweed(Seeds+Shelter)

Cream Wild Indigo(Pollination)

Compass Plant(Seeds)

Wild Strawberry(Fruit+Seeds)

Pennsylvania Sedge(Caterpillar Species)

Smooth blue aster(Pollination)

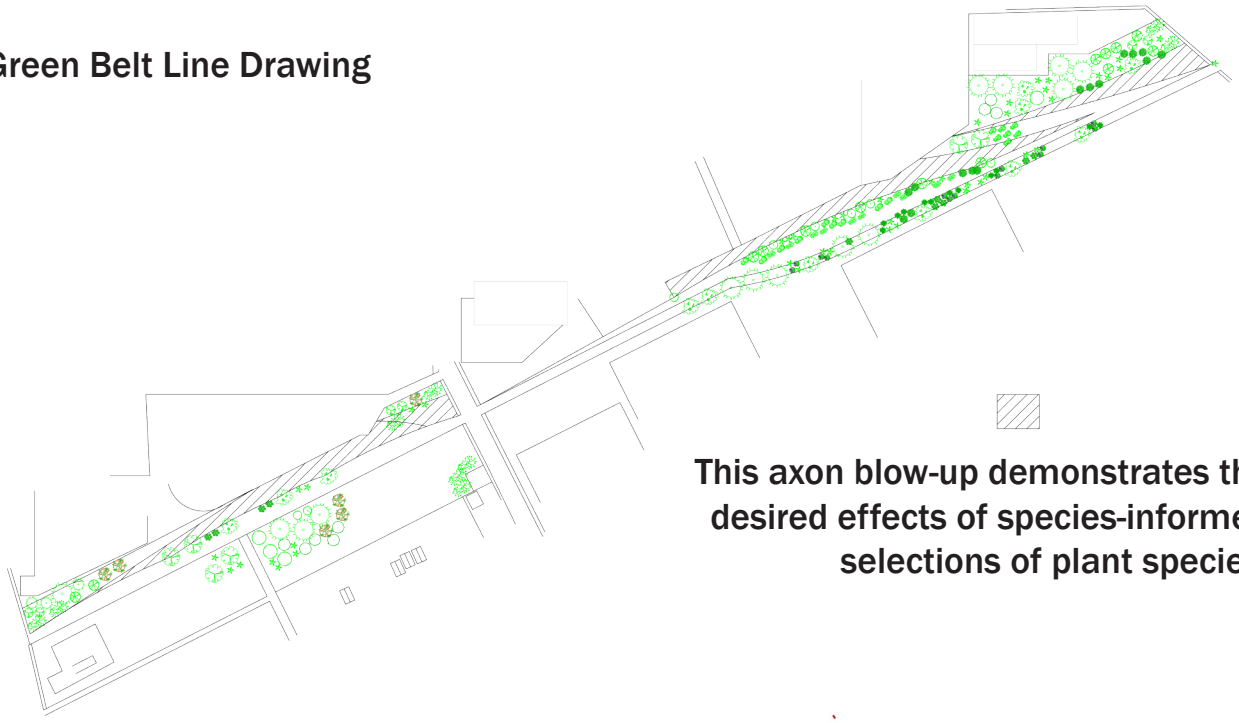
Anise Blue Hyssop(Pollination)

Pale Purple Coneflower(Pollination)

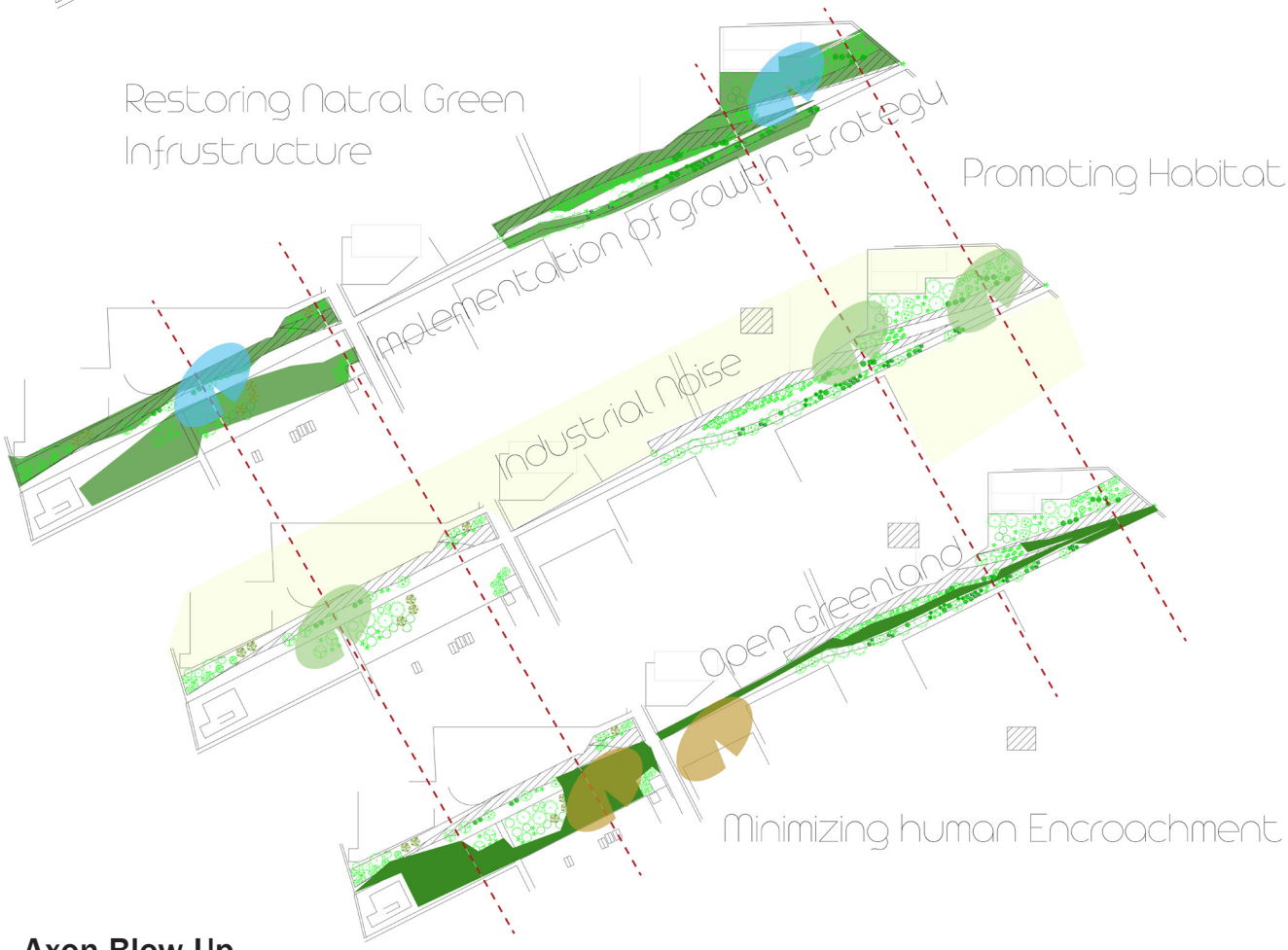
Gray Headed Coneflower(Seeds+pollination)

Lawn

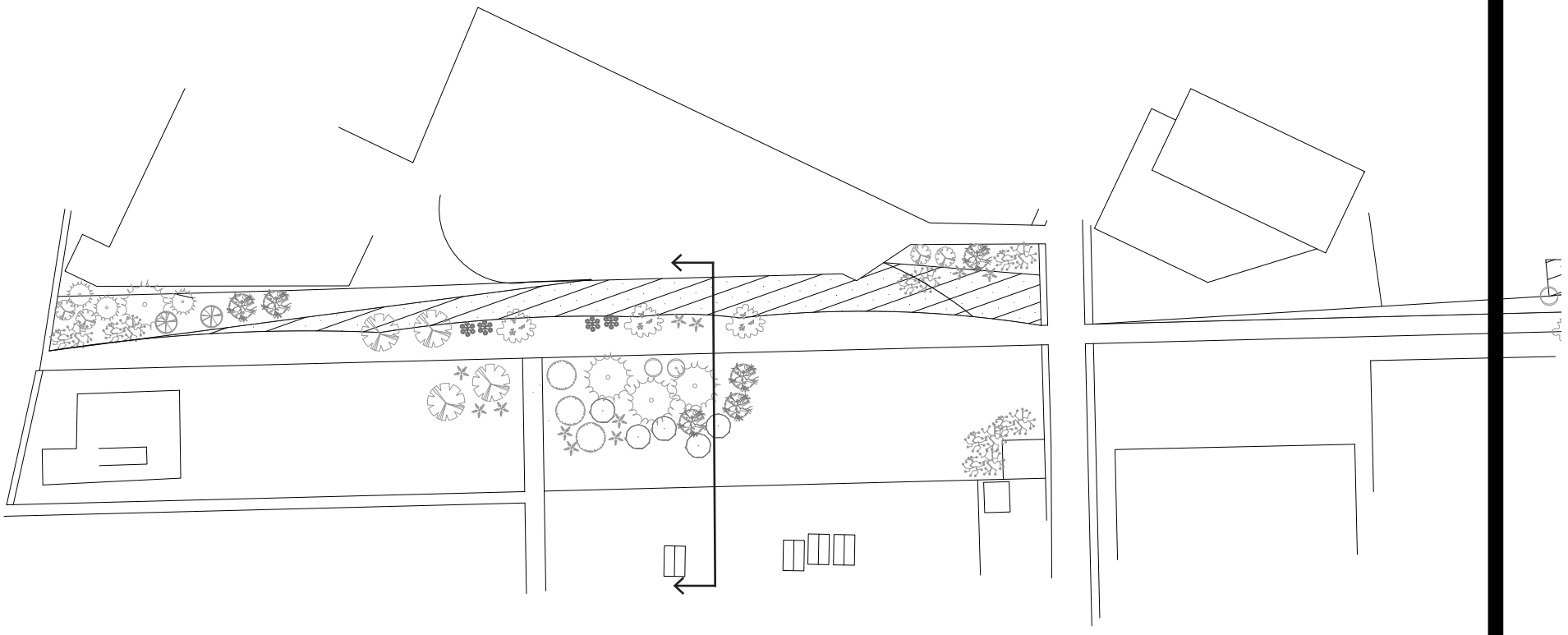
Green Belt Line Drawing



This axon blow-up demonstrates the desired effects of species-informed selections of plant species.



Axon Blow-Up



Southwestern Portion of Landscape Plan

Forest side

Forest Edge Bird Biohabitat

White Pine(Shelter)

Chokecherry(Shelter)

Indian grass(Seeds)

little Bluestem(Seeds)

Ironweed(Seeds+Shelter)

Cream Wild Indigo(Pollination)

Compass Plant(Seeds)

Wild Strawberry(Fruit+Seeds)

Pennsylvania Sedge(Caterpillar Species)

Smooth blue aster(Pollination)

Anise Blue Hyssop(Pollination)

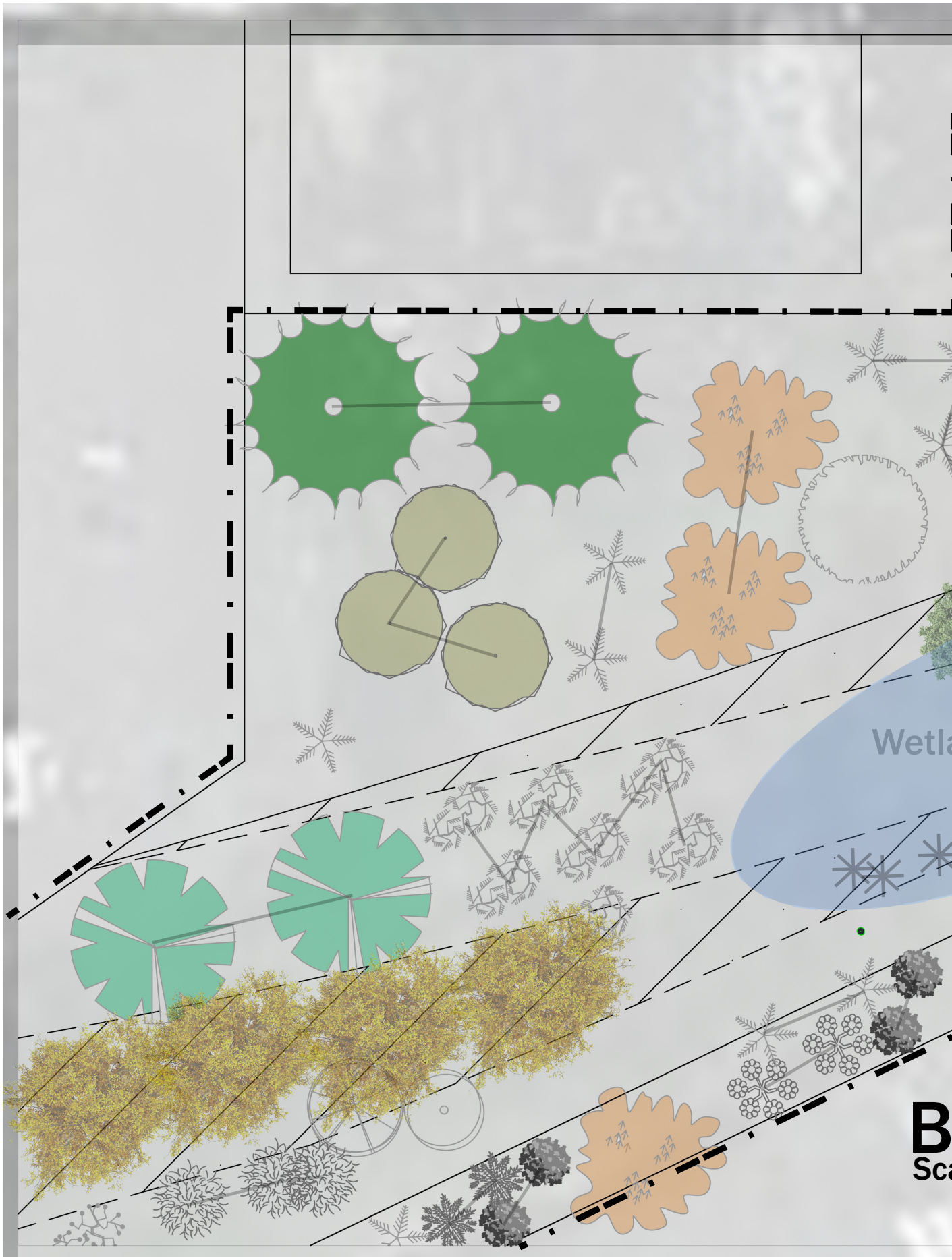
Pale Purple Coneflower(Pollination)

Gray Headed Coneflower(Seeds+pollination)

Lawn

IV

Species Informed Design Intervention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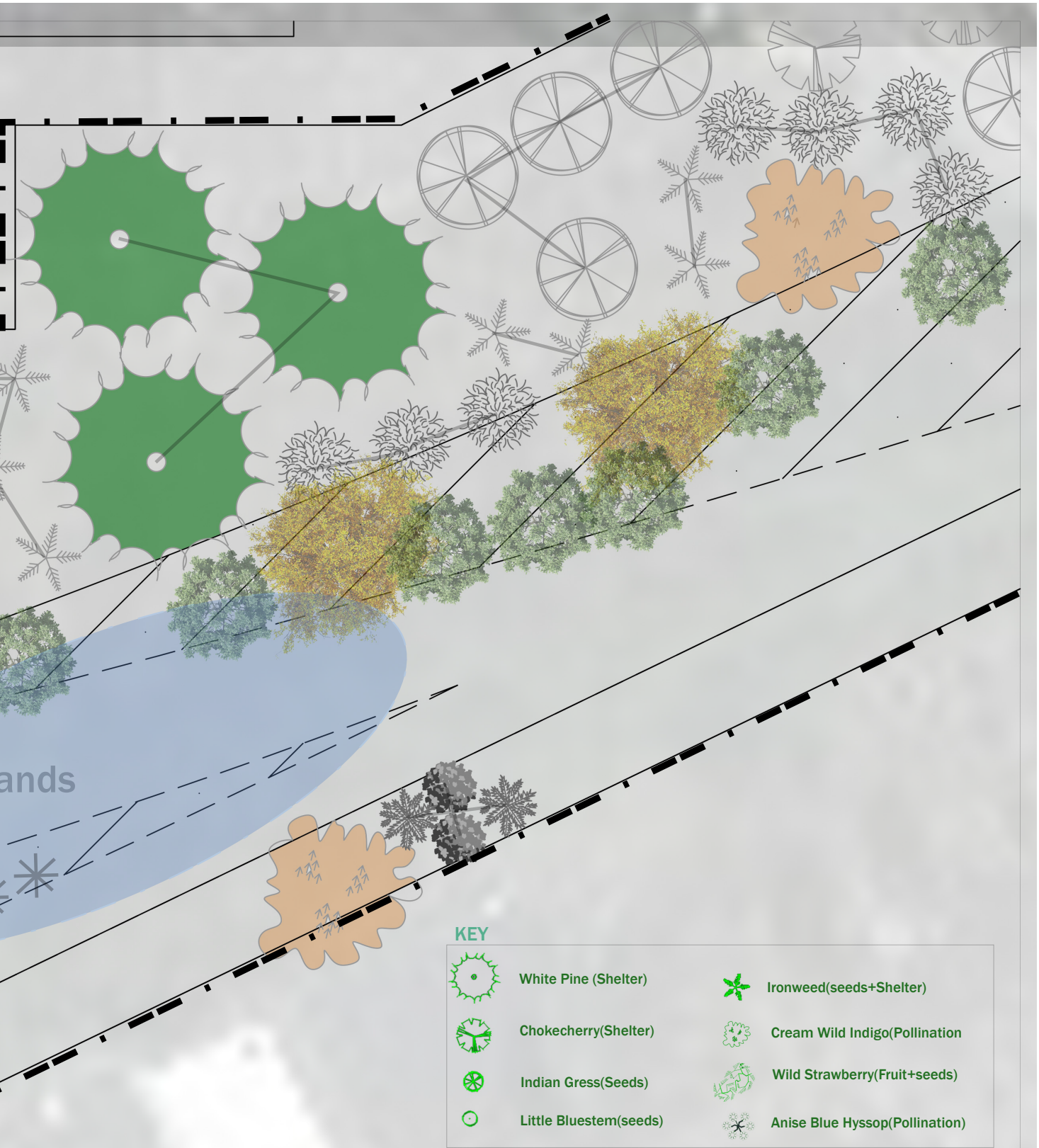


iohabitat Plan

ale 1/32”=1’

Plant Species and Their Contribution to Synanthopic Habitat

Pine Seed Pod

Eastern White Pine

Fruit and Larval Host

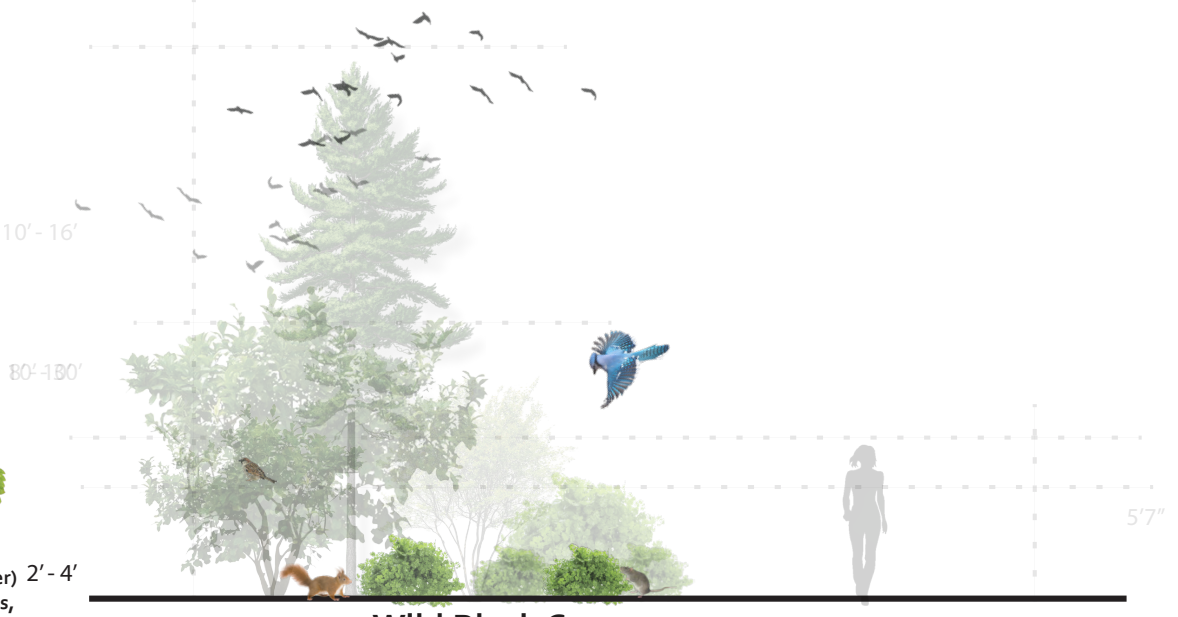
Blooms White Flowers in the early summer

Serviceberry/ Juneberry

Fruit and Larval Host

Blooms White Flowers in the early summer

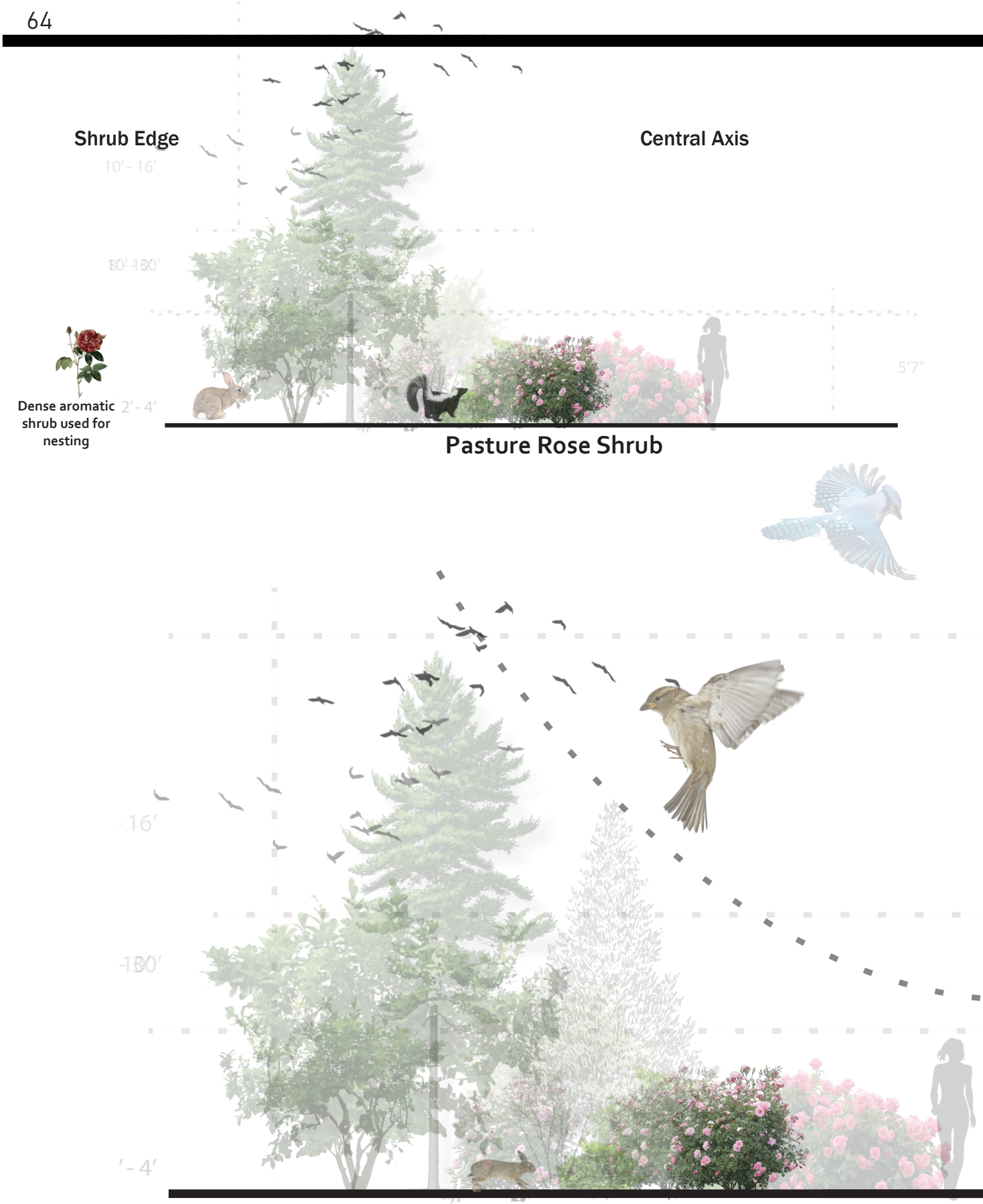
Chokecherry



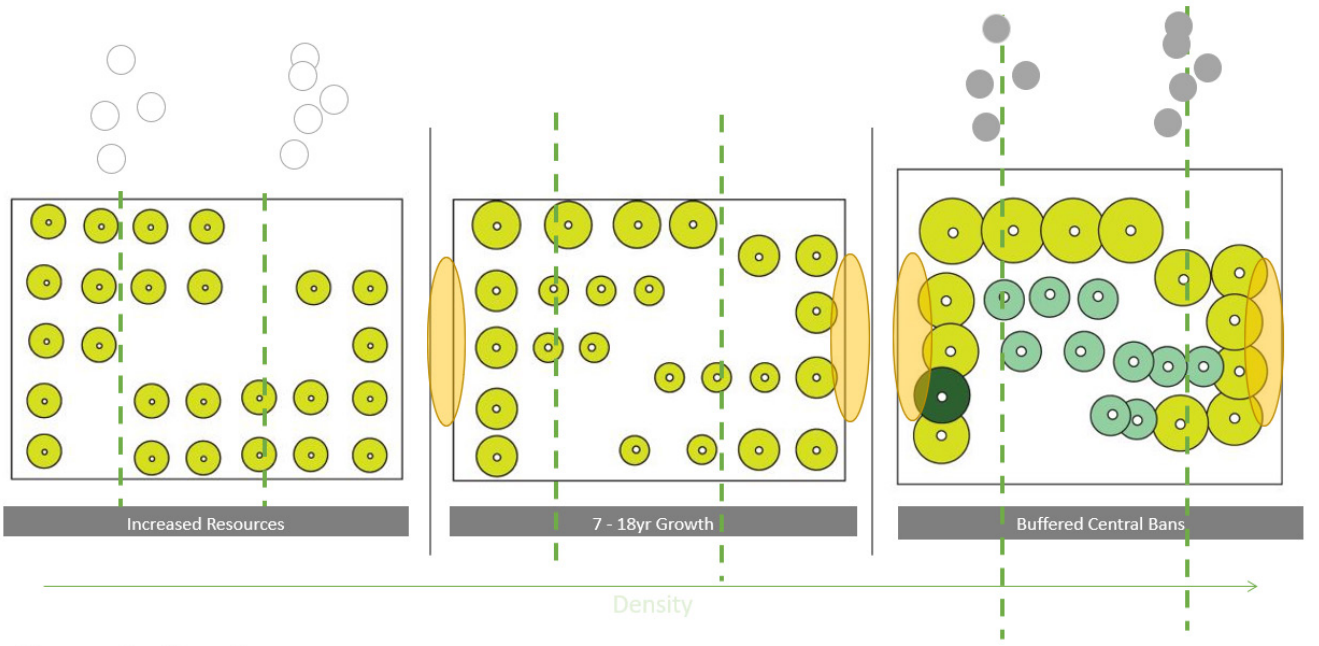
Host berries(midsummer) for grazing animals, dence shrub providing cover

2′ - 4′

Wild Black Currant

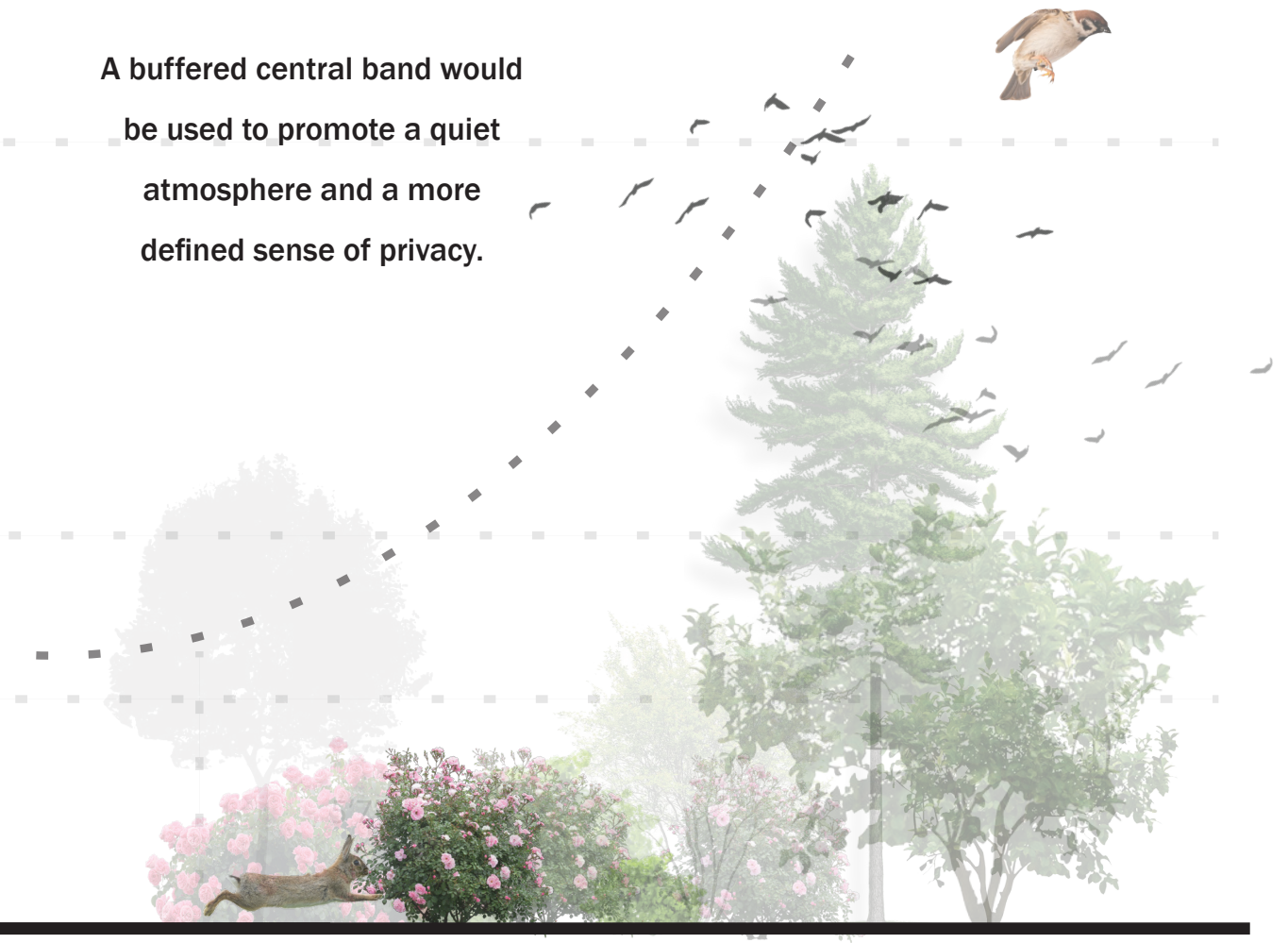


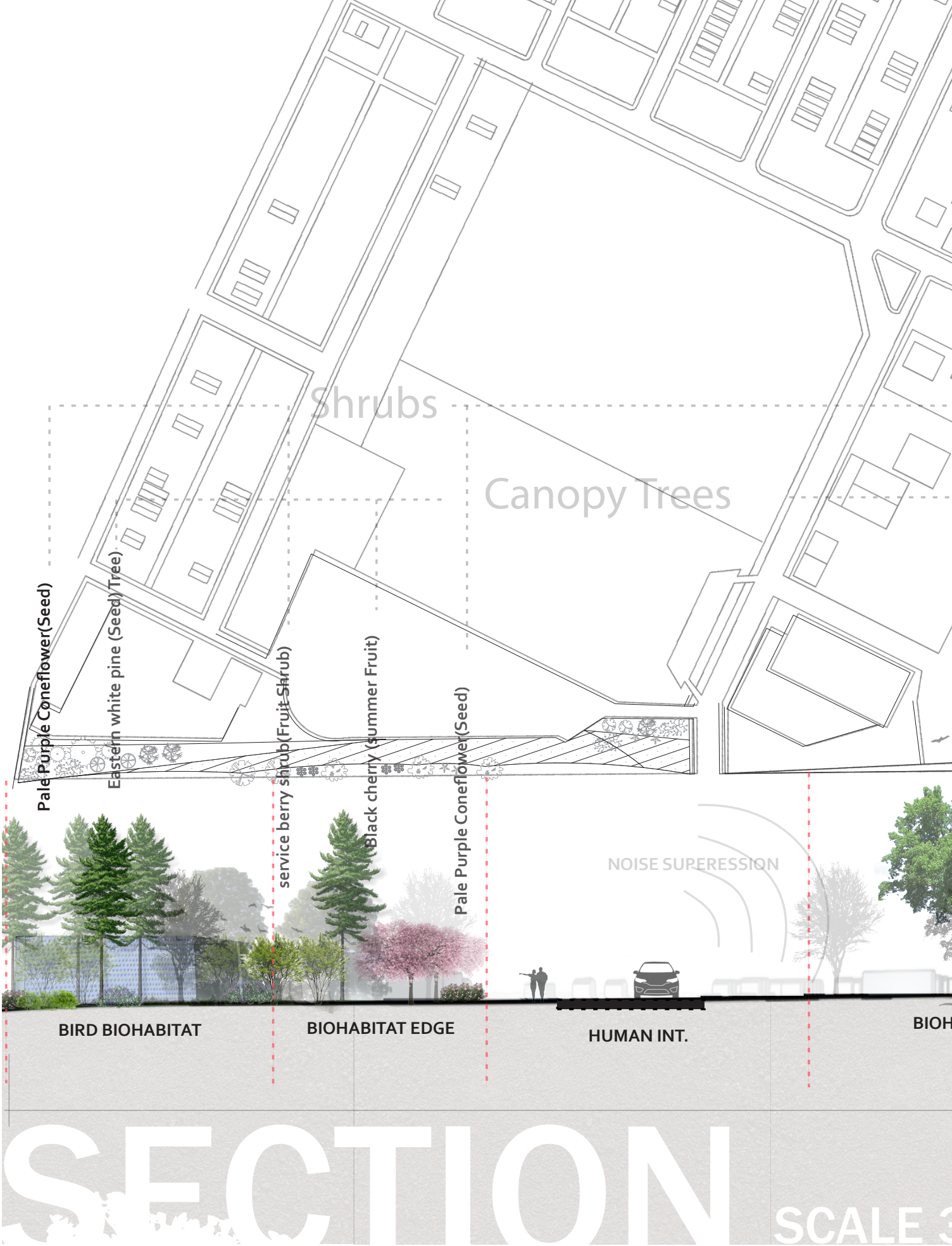
Parabolic Overstory Design with Buffered Central Axis (Total of 56'W



Growth Strategy

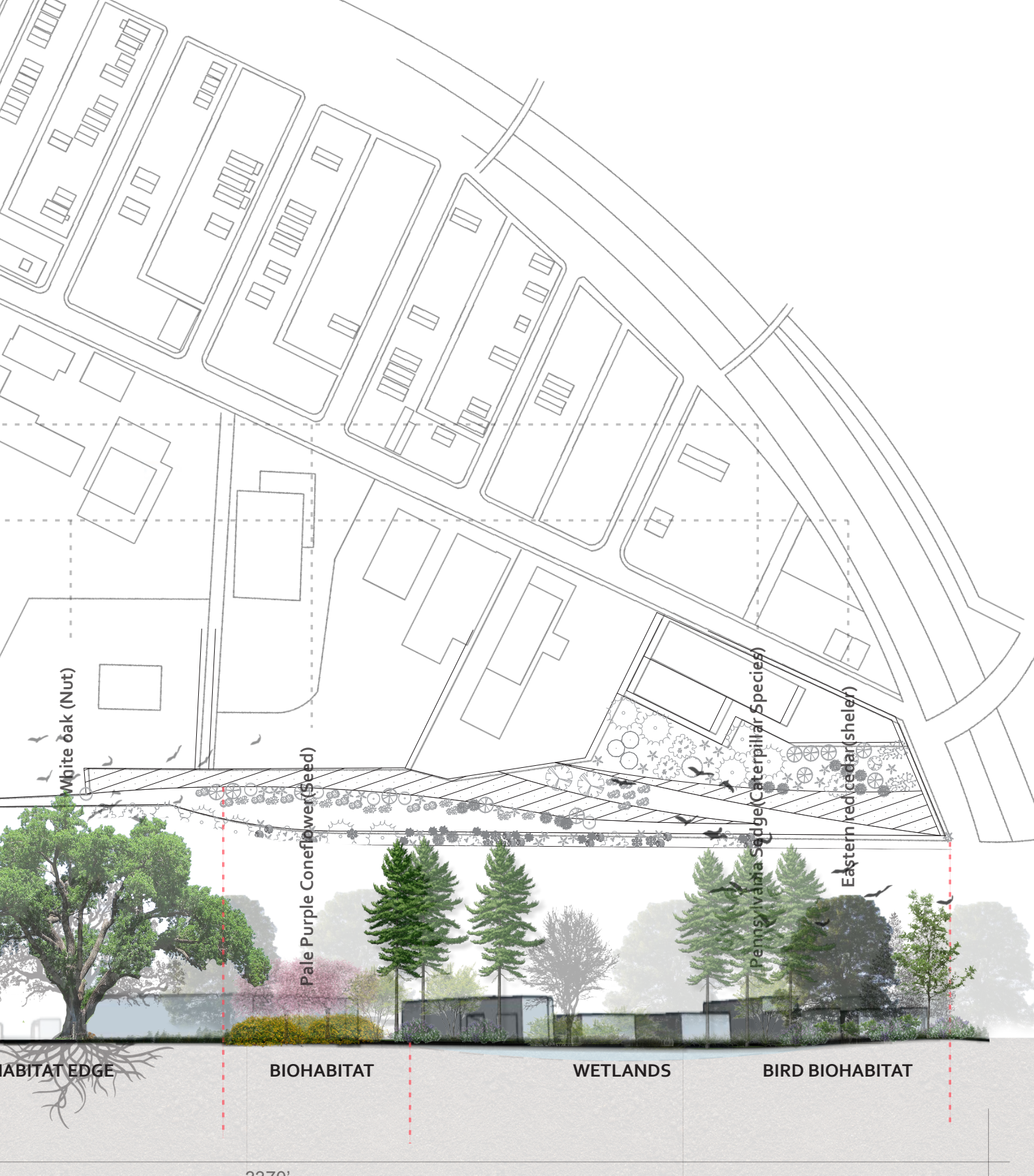
A buffered central band would be used to promote a quiet atmosphere and a more defined sense of privacy.





SECTION

SCALE 3



3/4” = 1’ 15.5acres

Counterarguments

Humans observe and reflect on the behaviors of animals and compare them to their own. Observations often inform a human's morality. A belief in animal rights teach us that there are things morally wrong to do to animals.

Accepting the creed of animal rights would mean:

- No experimentation of animals
- No breeding of killing of animals
- No use of animals for hard labor
- No zoos or use of animal entertainment

Arguments against the idea that animals have rights include:

- Animals lack the capability for free moral judgment
- Animals are not truly conscious
- Animals are biological robots
- The religious belief that animals were put on earth to serve humans.

Other arguments may be more concerned with the potential threat to humans that wild animals may pose. However, Design can yet serve as an educational tool in the growth of awareness and appreciation of the continual ecological service performed by healthy wildlife habitats.
We may have not been able to communicate with animals through the languages that we speak, however, we may be able to communicate through the landscape interventions.
This thesis proposes a landscape design intervention that communicates an inviting message.

Future Practice

The study of species informed design five years from now will have a large focus on mammals and how human-centered built structures can adopt various methods and approaches that promote habitats for the natural production of food resources. The hybrid habitat would be a shared space between human and other mammals. Architectural practice will take on new strategies as to how our built environment could house, feed, and most of all provide designed and constructed shelter for wildlife.

While there may be many constraints, I see architectural practice evolving to a practice that considers the health and wellbeing of wildlife in all projects. I envision the practice of architecture adoption zoning laws that require a percentage of species informed design elements and/or landscape design that curates the development of natural resources that give back.

The following rendered image represents the mergence of city and zoo. These two programs may becoem more seamless, such that the design of our cities may someday become more of a hybrid condition.

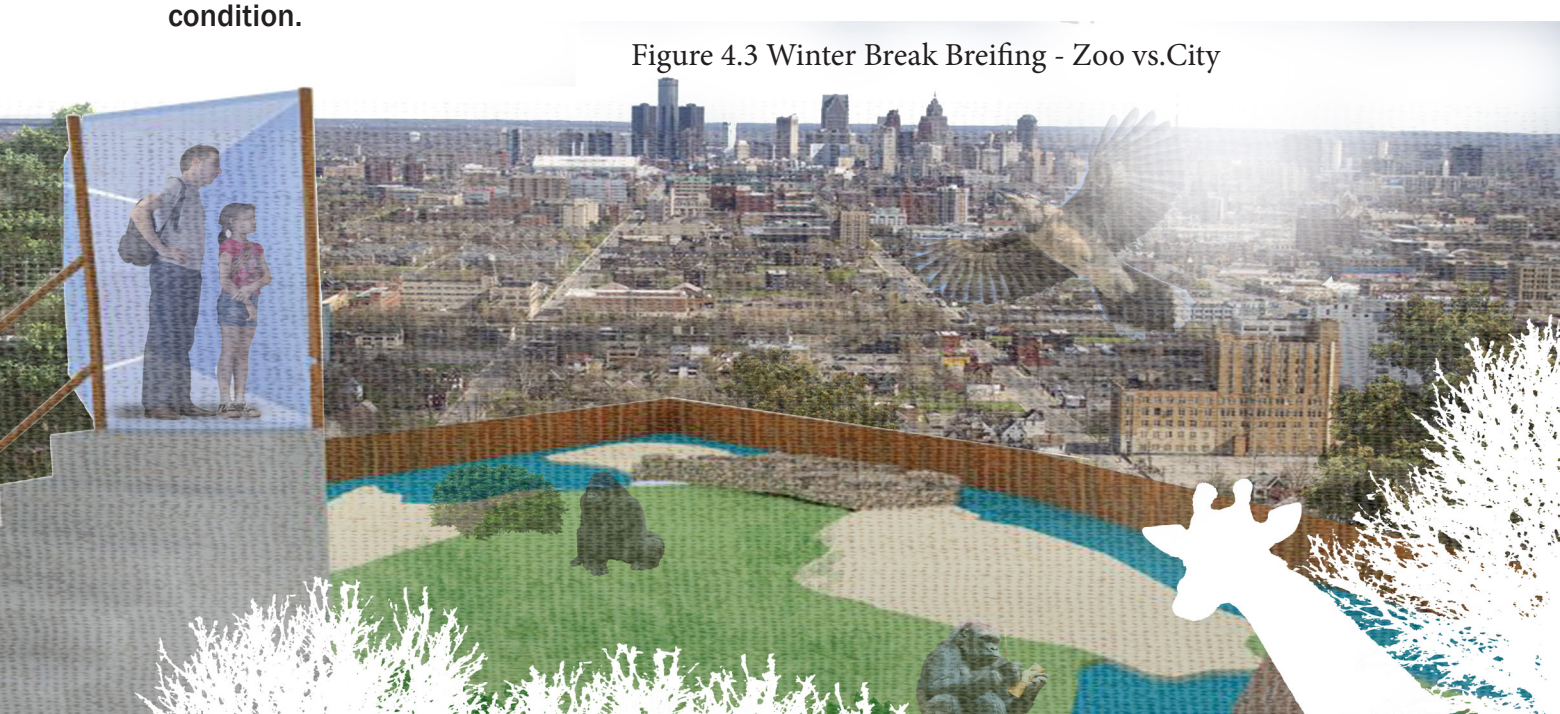


Figure 4.3 Winter Break Breifing - Zoo vs.City

Final Reflection on Benchmark 4:

"I have always felt that is you knew what you are going to do in advance, then you won't do it."

- Frank Gehry

My benchmark IV went well. The most exiting aspect of the thesis research has been the discovery of a possible alternative to how developers, architects, and designers alike can give back land by way of species informed green belts and/or strips that could possibly be planted with in the ally ways; giving back vital resources and building a sense of permanence when growing trees and shrubs. I did not intend to find an alternative, however, the research into the native species of plant life was fruitful.

I never know how many life form a single shrub could help sustain life. Architects must look to the context of the land scape in order to promote healthier development processes.

It was interesting to become aware of the various animals that live close to me. I hope to continue to spread awareness of the impacts of human development has on Urban Wildlife within architectural practice.

Thank you.

Bibliography

1.) Lefebvre, Henri, Gerald Moore, and Stuart Elden. 2004. Rhythmanalysis: Space, Time and Everyday Life. London: Bloomsbury Academic. [https://peopleplacespace.org/toc/section-9/] ‘

2.) Scott, J. Michael, US Geological Survey; Dale Goble, University of Idaho Law School (December 2008). “Endangered Species and Other Conservation Reliant Species”. 9th National Conference on Science, Policy, and the Environment (Washington, D.C.). National Council for Science and the Environment.)

3.) Luniak, M. (2004). Synurbanization – adaptaion of animal wildlife to urban development (pp.50-55). In Shaw et. Al., (Eds.) Proceedings 4th International Urban Wildlife Symposium

4.) Uexkull, J. Von, (1936). Neigeschaute Welten: Die Umwelten Meiner Freunde, Berlin: S. Fisher.

5.) Agar, Jon (2012). Science in the Twentieth Century and Beyond. Cambridge: Polity Press.

6.) Thomas Sugrue, The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit (Princeton University Press, 2005), p. 10

7.) Derrida, J. (2008). The animal that therefore I am.

8.) Grunow , Francis M., and Sponsor Model Detroit Media. “A Brief History of Housing in Detroit.” Model D, 17 Nov. 2015, www.modeldmedia.com/features/detroit-housing-pt1-111715.aspx.

9.) Agar, Jon (2012). Science in the Twentieth Century and Beyond. Cambridge: Polity Press.

10.) (Francis M. 2015)

11.) “Climate Classification System (Page 2).” Climate Classification System (Page 2) PRISM Climate Group, line.17qq.com/articles/pbbjehofz_p2.html.

12. Holmberg, Tora. Urban Animals:
Crowding in Zoocities. Routledge Taylor & Francis Group, 2017.

Figures

Table 4.1. Native Michigan Canopy Trees

Michigan Audobon Department of Education

Table 4.2. Native Michigan Shrubs

Michigan Audobon Department of Education

Figure 4.3. Zoo vs. city

Appendix:

Additional photos of synanthropic wildlife roosting in buffer zones:

Squirrel Nests within Dense Buffer Zones:






Literary Review Chart

DeRoss Cullens
University of Detroit Mercy
School of Architecture
AR 4919 Winter 2020

Citation	Keywords	Def./Terminology	Key Points	Methods	Relevance	Quotes
Maclachlan, Ian. "Book Review: Animal Spaces, Beastly Places: New Geographies of Human-Animal Relations." Progress in Human Geography, vol. 26, no. 3, 2002,	Non-human animals Domestic/Domesticate	- Not belonging to, appropriate to, or produced by human beings - Trained to live or work with or for humans	Examining how animals interact with people in different ways How human-animals place categories on non-human animals according to type of species, usefulness, domesticity or wildness	Focus groups	Organizing our understanding of animals Human and animal interaction	
Anderson, Kay. "A Walk on the Wild Side: a Critical Geography of Domestication." Progress in Human Geography, vol. 21, no. 4, 1997,	Settlement Livestock	- A place where humans establish a community - Typically farm animals regarded as assets	Science and biotechnology to the domestication of plants and animals Human control over nature The making of human settlements		Examining how humans gain control of land/territory and how they effect animal habitats	*"After all, the process of domestication did not lie only with functional need on the part of humans, but with "aesthetic values" and inclinations to bring "other beings into association with our own lives"* - Anderson p.481
Elder, Glen. Wolch, Jeniffer. Emel, Jody. "Race, Place, and The Bounds of Humanity." The White House Press, Cambridge. UK. 1998	Dehumanize Subaltern Post-modernity	- Deprive of positive human qualities - Of lower status, ranking, and or importance - A period or movement representing a departure from **modernism**,a movement toward modifying traditional beliefs in accordance with modern ideas	Spivak's notion of "wild practice, "		Reviewing historic information on how animals where used to dominate other humans How animal-linked rationalization was used to keep dominant groups in power over others	*"But, while humans and animals manifestly differ, the interspecific divide is not solely a behavioral or biologically determined distinction. Rather. like many other categorizations (e.g., race, ethnicity), it is a place-specific, social construction, subject to change over time. Depending on time and place, the reasons for assigning groups to one side of the boundary or another change."*

Literary Review Chart

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School of Architecture
AR 4919 Winter 2020

Citation	Keywords	Def./Terminology	Key Points	Methods	Relevance	Quotes
Uexküll Jakob von, and Uexküll Jakob von. "A Foray into the Worlds of Animals and Humans: with A Theory of Meaning." University of Minnesota Press, 2010.	Post-humanism Animality *Umwelt* Anthropocentrism	- A person or entity that exists in a state beyond being human - Animal nature, character, physical, instinctive behavior or qualities - German Word/Concept meaning "Environment" "The environment that matters to the way that a particular species perceives things." projecting human emotions on nonhuman *animals*	Nonhuman perceptions must be accounted for in any biology worth its name Arguments against natural selection as an adequate explanation for the present orientation of a species' morphology and behavior "Magic" as Associated with "Search"	Theoretical Research Historical Research	Nonhuman perceptions Arguments against natural selection	*"but now we see that the subject controls the time of its environment. While we said before, "There can be no living subject without time," now we shall have to say, "Without a living subject, there can be no time."*
Berger, John. "Why Look at Animals.". 2009..	Pet	- A domestic or tamed animal kept for companionship or pleasure	The marginalization of animals have shaped the way in man and animals interact in the modern era. Process began in 19th century.		Marginalization of species Human consumption of animals How animal habitats inform humans of the environment	*"The animal has secrets which, unlike the secrets of caves, mountains, seas are specifically addressed to man."*
Hancocks, David. "A Different Nature The Paradoxical World of Zoos and Their Uncertain Future" University of California Press, Berkeley, 2001	Zoo	an establishment which maintains a collection of **wild animals**, typically in a park or gardens, for study, conservation, or display to the public	Bioexhibit institutions--museums, parks, gardens and aquariums and argues that, of all these, zoos have the greatest capacity to adapt, absorb new functions, and promote holism The title "Zoo" in comparison to conservation center	Critical examination of the current state of these institutes	The re-visioning of institutions that house animals	

Literary Review Chart

DeRoss Cullens
University of Detroit Mercy
School of Architecture
AR 4919 Winter 2020

Citation	Keywords	Def./Terminology	Key Points	Methods	Relevance	Quotes
Franklin, Adrian. Animals and Modern Cultures: a Sociology of Human-Animal Relations in Modernity. Sage, 2008.	Modernity Companion Animals Biopholia	-A modern way of thinking -Species also share our homes and our lives. -A hypothetical human tendency to interact or be closely associated with other forms of life in nature.	-Pets and modern Culture -Zoology in modernity -The unintended consequences of philosophical scientific discourse, social conflict, distinction and social class	-Literary research review	Human-Animal Relations in modernity	“During the earliest pert of the 20th century, there were three types of spaces relevant to the consideration of animals: urban area,intermediate development areas and marginal wild areas.”
Holmberg, Tora. Urban Animals: Crowding in Zoocities. Routledge Taylor & Francis Group, 2017.	Urbanization(Wolch) Multi-Species	-Acting upon “empty space” - not taking Non-Human Habitat seriously -Space containing multiple species of animal	“Zoocities” - The Theoretical framework in which animal studies meets urban studies, resulting in a re-framing of urban relations and space	Archival Research	“humanimal crowding”, a sociospatial process through which bodies and places become transformed.	“The Challenging notion, what does it mean to consider spacial formations and urban politics from the perspective of human/-animal relations?”
Urbanik, Julie. Placing Animals: an Introduction to the Geography of Human-Animal Relations. Rowman & Littlefield, 2012.	Space	-Relations between objects, -denoting a location in the abstract and general	The legal and legislative systems provide on method of policiing “Proper” human-animal boundaries and right/wrong behavior toward animals	Archival Research	Human Superiority - all non humans as inferior to humans and therfore not apart of the human moral system	“The anthropocentric (Human-centered) view does not necessarily see all non-humans as inferior, but what we choose to or not do to other species matters only in terms of how it will impact humans.”