

Ghost Creeks: Reconnecting with the Lost Waters of Winnipeg

by

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An aerial photograph of a river flowing through a lush, green forest. A semi-transparent pink map overlay is positioned on the left side of the image, showing the river's course and various tributaries. The map overlay is semi-transparent, allowing the natural colors of the river and surrounding vegetation to be visible beneath it. The river itself is a deep, dark green, contrasting with the lighter green of the surrounding forest. The map overlay is a light pink color, with the river's path and tributaries highlighted in a slightly darker shade of pink. The overall composition suggests a connection between the natural landscape and the historical or planned map.

GHOST CREEKS: RECONNECTING WITH THE LOST WATERS OF WINNIPEG

BY MADELEINE DAFOE



ABSTRACT

Winnipeg has been shaped socially and geographically by the waters that passed through it. Since settler development began, there has been a constant struggle between natural processes and development. The low lying land of Winnipeg was marshy in many areas and prone to flooding. In an attempt to remedy this, many of the streams which made their way from what is now farmland in the northwest, to the Red River in the east, and the Assiniboine River in the south were simply removed from our landscape. These streams are now marked only by a small dip in the road or an extra manhole cover. Although these ghost creeks have been lost to development, they have continued to have a lasting effect on our city.

Every city has layers of history which have been buried under progress. By peeling back these layers we acknowledge a more complete history of our urban spaces and we create space for collective remembering of these lost landscapes.

This practicum seeks to establish exemplary ways in which ghost creeks can find their place within Winnipeg's contemporary urban fabric. This design provides site sensitive design solutions which reveal the history of the landscape, acknowledge the past, honour existing communities, and return natural ecosystem functions to the landscape. It will provide a precedent for revealing lost histories which could be built upon in a variety of contexts.

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INTRODUCTION: WATER MEMORIES

I have always felt a strong sense of place in relationship to water. Water flows through my memories and defines many of the spaces that make up my life. Growing up in Northern British Columbia the Skeena River cuts directly through our town; powerful and swift, its waters racing towards the ocean only a handful of kilometers away. There are other waters here too that remind me of my childhood; the cold, glacial waters of Kalum Lake, the river rocks that line the banks of the Copper River, smoothed from thousands of years being tossed around by the currents, the sandy, tree lined shores of Lakelse lake where we would play as kids. I would watch these waters swell and shrink, freeze and thaw over time marking the passing seasons.

When I moved to Winnipeg after graduation I already had water memories of this place. We visited my grandparents here when I was a child and most of our days were spent at the lake. Waking up to the water lapping the shores, the sounds of small bare feet running along the rickety wooden pier before leaping into the muddy waters below. Here I have seen the waters change drastically over time reminding me what is at stake if we do not respect the resources that we are stewards of. The willows were removed from the banks of the lake to improve the views for cottage owners and pedestrians along the waterfront. The banks never really recovered after this, slowly slumping down as

the lake reclaimed large portions of the shoreline. The sandy beach disappeared, no longer protected by the vegetation. In a desperate effort by the municipality the banks of the lake are now reinforced with large limestone boulders in an attempt to prevent further erosion. Later, I watched as the shells of zebra mussels began to form drifts along the water's edge, resting where the waves pushed them ashore. The lake has changed so much from my first memories, it is hard to imagine the long term damage that we have caused since settlers first began expanding the urban area of Winnipeg in earnest in the mid 1800's.

In this practicum I will explore the memories and marks that water has left on Winnipeg. Colony Creek once flowed widely across the northwest of Winnipeg eventually spilling into the Red and Assiniboine Rivers. Now these creeks lie drained and buried beneath our city; disappeared to make way for development. This practicum explores how the presence of water has shaped the history of our city and seeks to answer the question of how we honour the waters that have been lost during development in ways that reflect the past without trying to replicate it. The goal of this practicum is to reveal the layers of history present across Winnipeg, uncovering a story of development that is hidden beneath our streets and buildings.



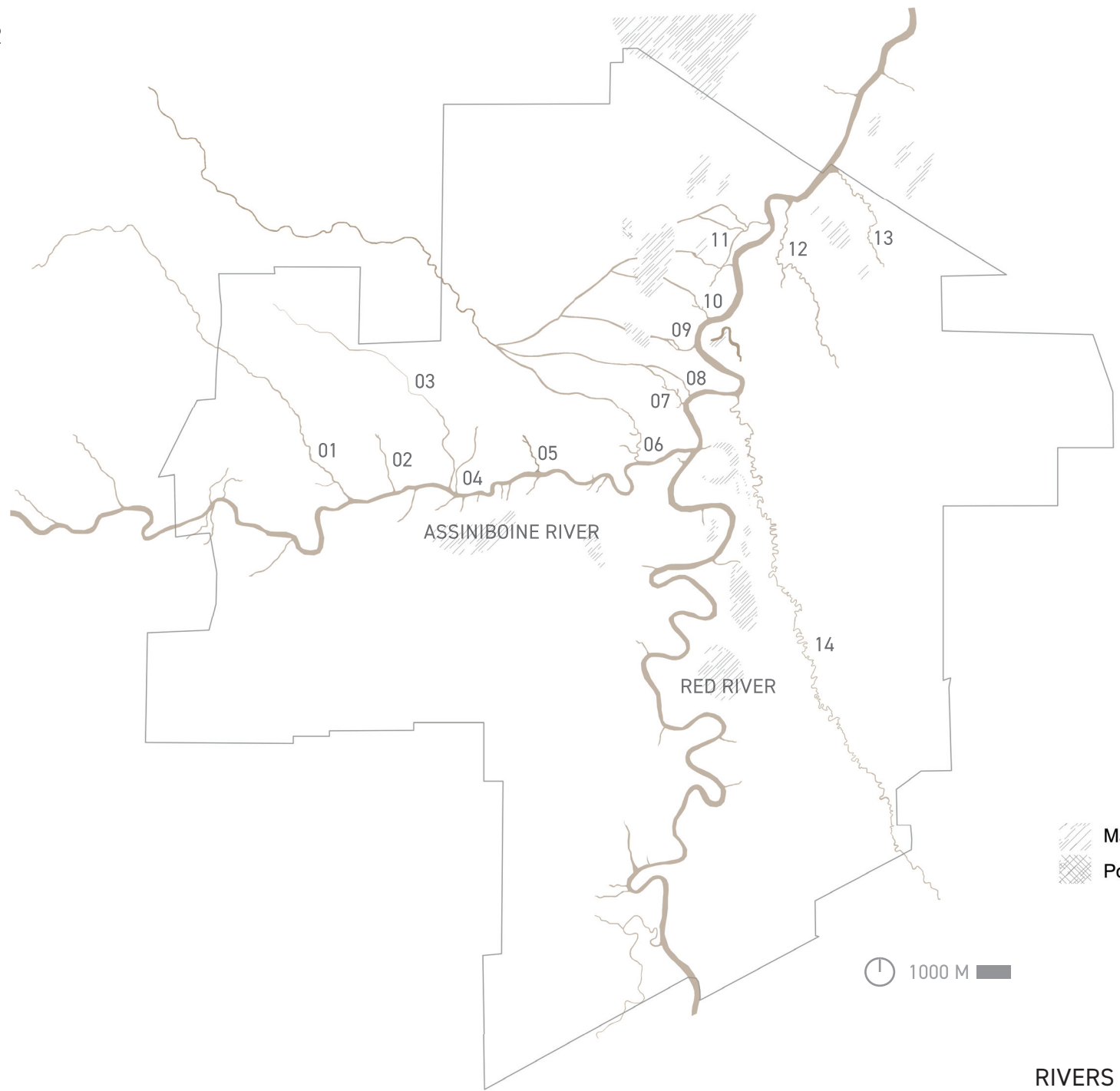
01 | COLONIZING WATER: GHOST CREEKS AND A HISTORY OF FLOODING IN WINNIPEG

DRAINING THE PRAIRIE

Before European settlement expanded in earnest engulfing everything in its path the channels of over 36 streams and coulees cut their way through the thick prairie soils towards the Red and Assiniboine rivers.¹ Many of these streams were ephemeral, filling with water during times of high water, spring snow melt or heavy rain events.² In an attempt to free up land for development haphazard drainage projects were thrown together across Winnipeg.³ Henry Youle Hind an early settler in Manitoba stated at the time "I know of no other enterprise of the kind which could be executed with so little cost and labour and promise at the same time such wide spread beneficial results."⁴ However, many of these drainage projects ended up making flooding worse rather than better.⁵ The less affluent areas of downtown Winnipeg were the hardest hit by these mistakes, and they experienced an increased rate of disease due to the stagnant waters mixing with raw, open sewage.⁶ This greatly exacerbated the typhoid death rate in Winnipeg, however there was little political will to improve the drainage in these areas because these communities held little political sway.⁷ It was not until the typhoid epidemic of 1904 when the disease began to spread to the wealthy elite in the south that the city put in place legislation that required proper sewage management throughout the city.⁸

It is also important to note that when the waters were drained from Winnipeg they did not just cease to exist, they had to be redirected somewhere. Many projects meant to drain water to make way for urban development in Winnipeg exacerbated problems with flooding on reserve land.⁹ Although the government was happy to provide assistance with large scale drainage projects for rural settler communities, assistance for Indigenous communities was denied.¹⁰ One official stated that "although drainage would no doubt enhance the value of the land and make it possible for more extensive farming operations," they would not provide support because there was no, "guarantee that the improvement of the lands would be appreciated or made use of," even in areas where Indigenous communities had shown initiative in building drainage of their own.¹¹





RIVERS & STREAMS OF WINNIPEG 1874

- 01 - Sturgeon Creek
- 02 - McMillans Creek
- 03 - Miry (Truro) Creek
- 04 - Scully Creek
- 05 - Catfish (Omand's) Creek
- 06 - Colony Creek
- 07 - Browns Creek
- 08 - Logans Creek
- 09 - Pritchards Creek
- 10 - St. Johns Creek
- 11 - Inksters Creek
- 12 - McLeods Creek
- 13 - Taylors (Bunn's) Creek
- 14 - Seine River

- Marsh or Hayland
- Pond

1000 M



RIVERS & STREAMS OF WINNIPEG 2021

- 01 - Sturgeon Creek
- 03 - Truro (Miry) Creek
- 05 - Omand's (Catfish) Creek
- 13 - Bunn's (Taylors) Creek
- 14 - Seine River

1000 M

PAST MISTAKES, FUTURE PROBLEMS

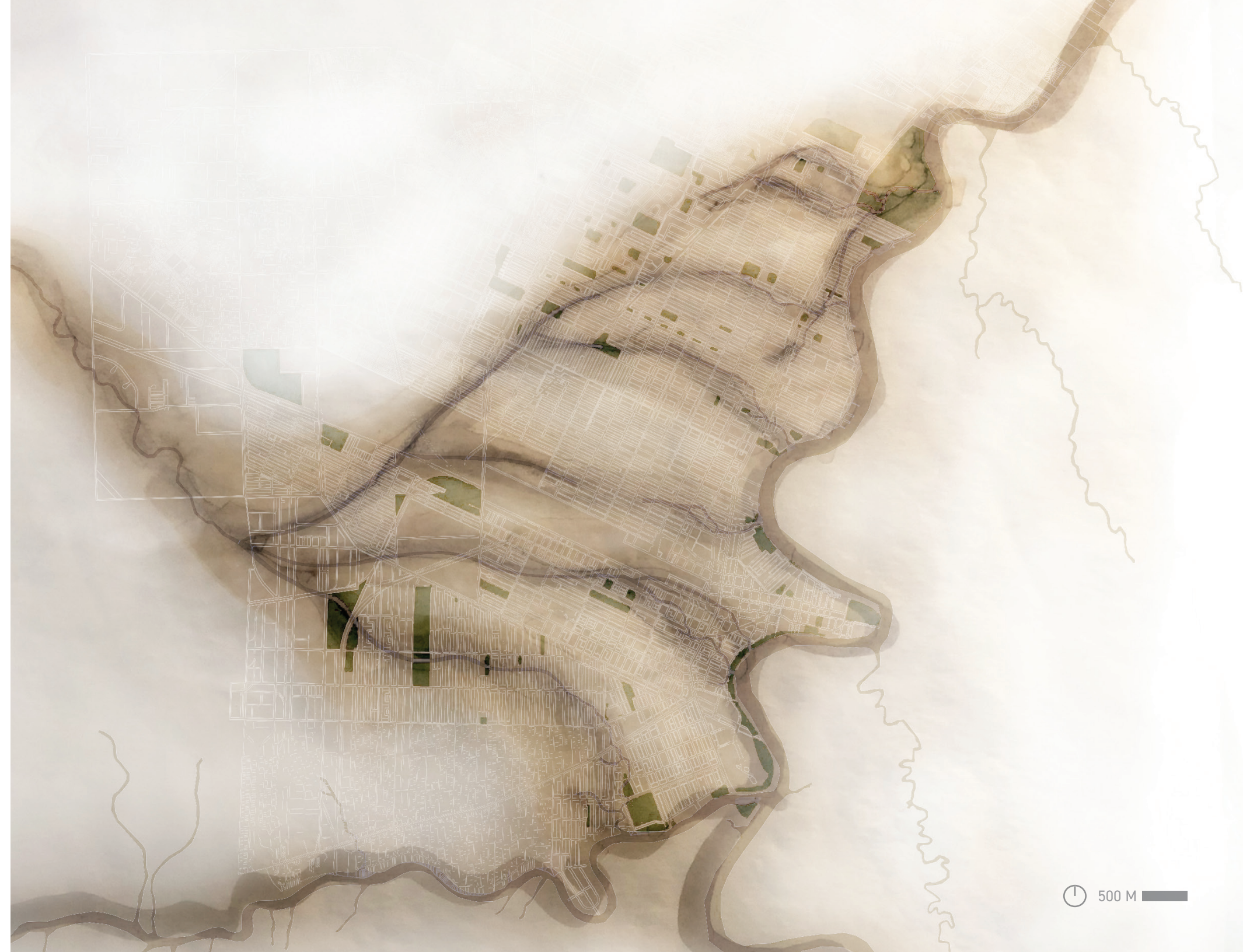
Colony Creek in particular posed a large threat to the development of Winnipeg. Colony Creek ran from the northwest corner of Winnipeg and, due to a low drop in elevation in this area, sheet drained across the entire northwest corner connecting to Brown's, Logan's, Pritchard's, St. John's, and Inkster's creeks.¹² The first diversion along Colony Creek was built in the 1870's.¹³ It consisted of a small ditch which connected Colony Creek in the north to Omand's Creek in the south with the purpose of diverting water away from the valuable rail lines.¹⁴ However, this solution was soon met with lawsuits from nearby residents who found that the berm of the rail line combined with the new diversion forced the water to back up onto the residential lands to the west.¹⁵ Next, the city endeavored to construct a flume down Alexander Street to carry away the waters of Colony Creek.¹⁶ However, this too failed when the flume was found to be below the needed capacity and quickly collapsed due to frost heave.¹⁷ Lawsuits from residents began to pour in spurring the city to construct a more permanent solution.¹⁸ This led to the construction of the diversion that is still in place today and is now called Omand's Creek.¹⁹

The First Land Drainage Act was passed in February of 1880 and the Second Land Drainage Act was passed in March 1895 however, due to a lack of cohesion among the various maintenance districts and because many of the drainage decisions of the late 1800's and early 1900's were political rather than based on the advice of engineers, flooding continued throughout Winnipeg.²⁰ It wasn't until amalgamation in 1972 that drainage works began to focus on the landscape of Winnipeg as a

whole.²¹ In 1967 the Water Control and Conservation Branch Act was passed which gave the province control of all the stream outlets to the Red and Assiniboine Rivers.²² This was too little too late however, the damage was already done and many of the streams that had once drained the temporal waters of Winnipeg were gone leaving the water to be funneled into sewers and diversions, separating the land from the water.²³

The problems created by the filling of these streams still exist today, because although it is no longer visible, the water never left the prairie. Basement flooding is worse near these old stream beds and many of our older neighbourhoods still have a combined sewer system in place.²⁴ During times of heavy precipitation or rapid snow melt our sewer system easily becomes overwhelmed with stormwater, forcing untreated sewage to flow directly into the Red and Assiniboine Rivers.²⁵ This leads to eutrophication of our lakes which in turn leads to excess algae blooms and the death of other marine life needed to support the ecosystem.²⁶ Had these streams been protected they would help collect and clean stormwater, prevent flooding without the need for costly infrastructure projects, and reduce the load on our sewer system thereby improving the health of our lakes. They would also provide important green recreational space in communities throughout the North End of Winnipeg.

Right: Speculative Flooding Map



02 | PEOPLE OF THE WET PRAIRIE: WINNIPEG'S SOCIAL HISTORY

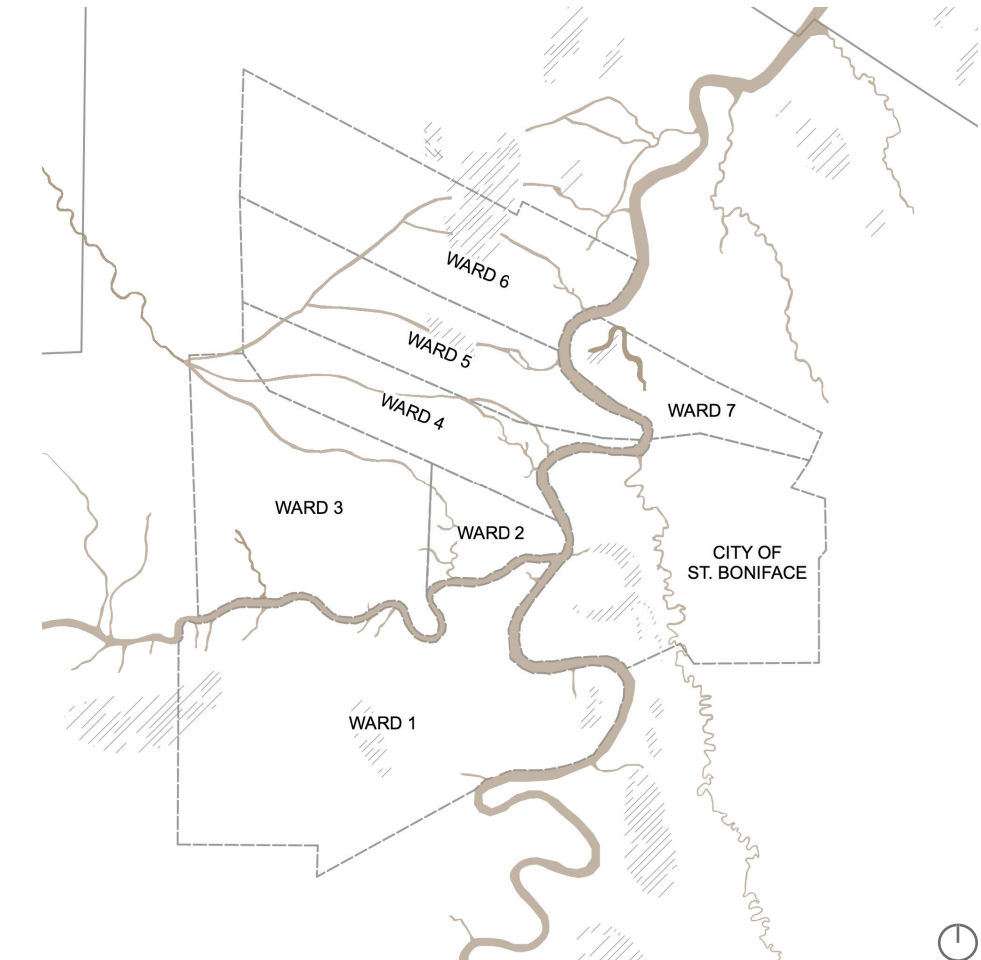
THE WARDS OF WINNIPEG 1880-1910: A DISPARATE EXISTENCE

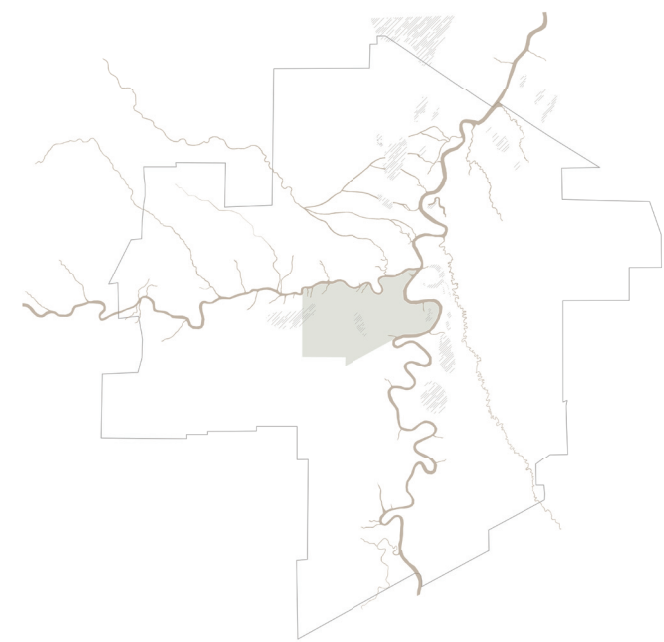
Understanding who lived in the areas where these creeks once flowed and how demographics have shifted as Winnipeg has continued to expand, provides important insight into why these creeks were lost and the long lasting effects this has had on the communities in these neighbourhoods.

During the late 1800s and early 1900s Winnipeg was divided into 7 wards.²⁷ These wards embodied large disparities across classes often driven by racism towards Slavic-immigrants and an apathetic attitude regarding issues affecting the working classes.²⁸ Income disparity, access to clean water, fire protection, overcrowding, and access to safe sewage disposal varied widely across these wards.²⁹ Wards 4 to 6 were mainly home to Eastern-European immigrants.³⁰ The North End, Wards 4 to 6, lacked proper access to basic needs such as sanitation, while Wards 1 to 3 home to the rich, British, political elite, were seen as clean and sanitary.³¹

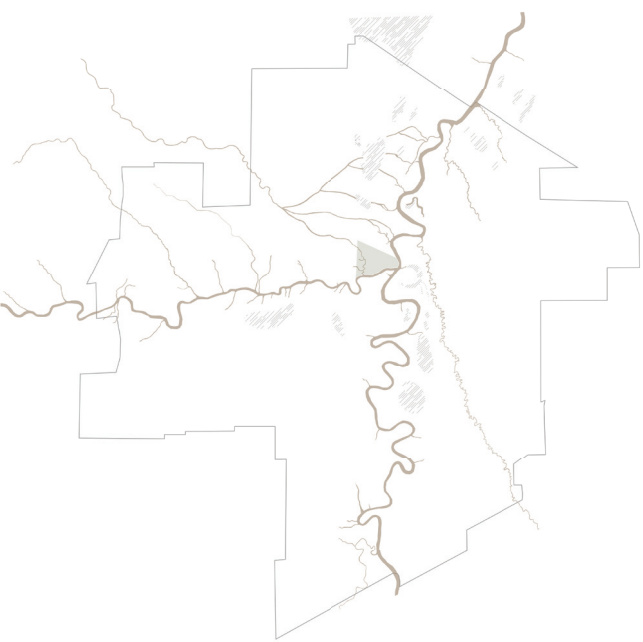
During the early days of settler development in Winnipeg the Anishinaabe were removed from the area surrounding what is now known as Winnipeg and confined to reserves and the Métis were systematically displaced from their traditional lands with scrip vouchers strictly limiting Indigenous presence within the city.³² Racist, anti-Slavic laws prevented Eastern-European immigrants from owning land, forcing them instead to labour in Winnipeg's industrial sector in Wards 4, 5, and 6.³³ The prosperity of the commercial (British) elite of Wards 1, 2, and 3 was built off of the labour of these workers.³⁴ Disparaging views of the quickly built, slum-like conditions of Wards 4 to 6 were closely tied to ideas of purity and whiteness and seen as a problem with the residents of these wards rather than a social and infrastructural issue.³⁵

Right: The Wards of Winnipeg 1880-1910

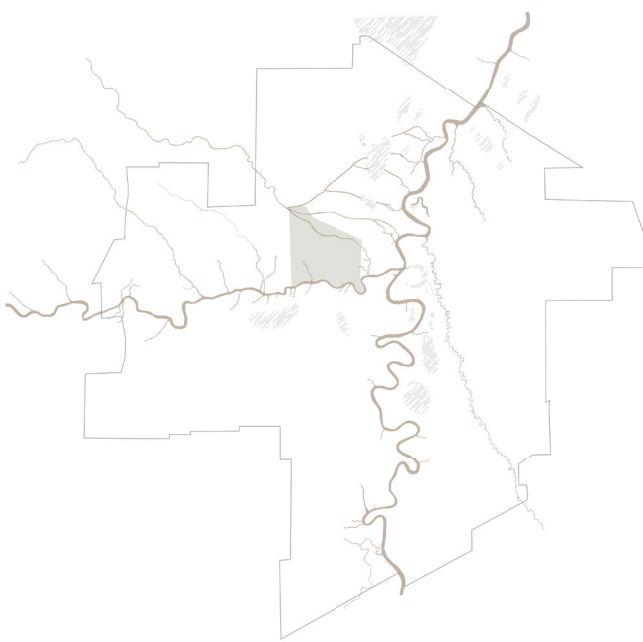




WARD 1
1880 - 1910



WARD 2
1880 - 1910



WARD 3
1880 - 1910

WARDS 1 - 3
Originally the Hudson's Bay Reserve, Ward 2 was settled quickly by the commercial elite.³⁶ When it became full the wealthiest residents moved south to Ward 1 while Ward 3 was socio-economically diverse.³⁷ The commercial elite who inhabited these wards were mainly of British decent with high-paying white collar jobs.³⁸ These three wards were privileged with reliable access to the municipal water supply and connections to the sewers.³⁹ They were for the most part clean and uncrowded.⁴⁰ These wards wielded strong political power and often acted in favour of their own economic interests while ignoring the social failings of the system and the abject effects on the wards of the North End.

- Overcrowding | 5%
- Access to Bath | ~100%
- Inadequate Heating | 2%
- Houses with Rats | NA
- Infant Mortality Rate | <25%



Broadway Ave, Ward 2, 1910



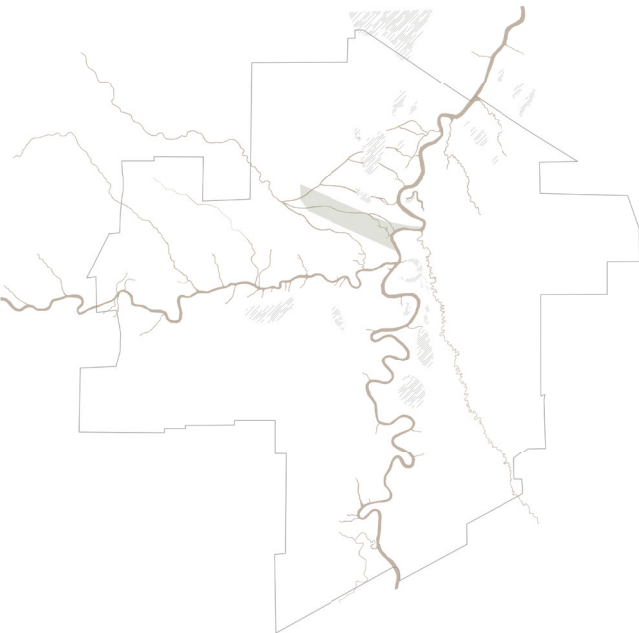
Kennedy Street, Ward 2, 1900



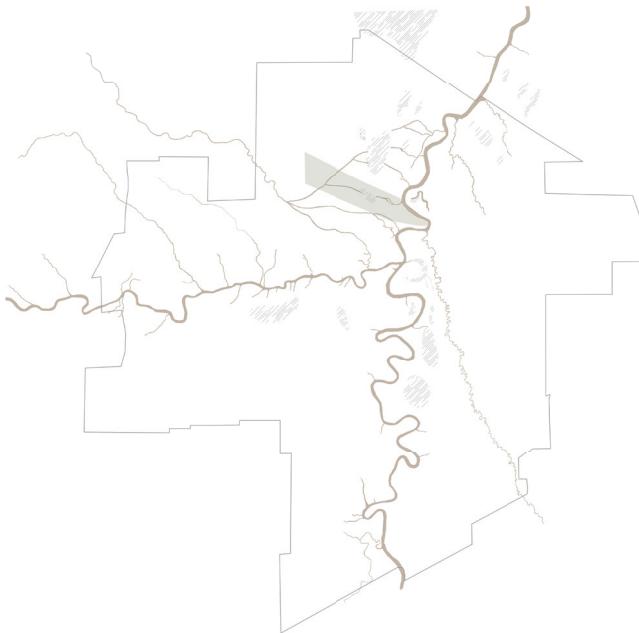
"The Foreign Quarter" on Dufferin Ave, Ward 5, 1904



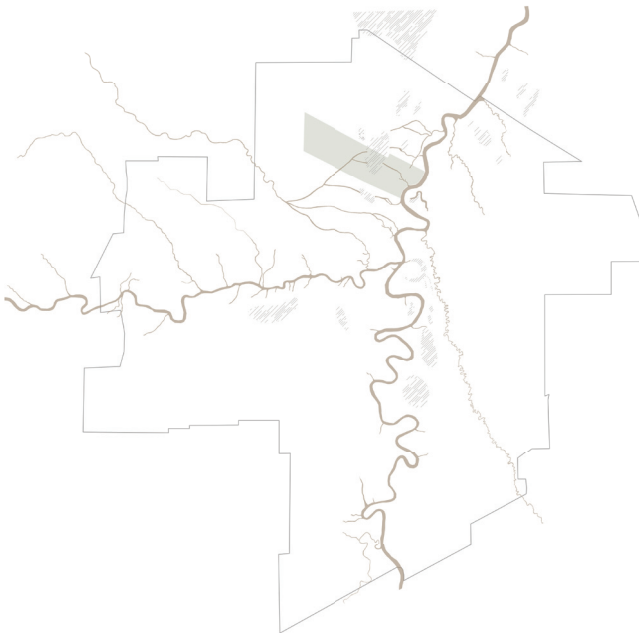
McDermot Ave, Ward 4, 1881



WARD 4
1880 - 1910



WARD 5
1880 - 1910



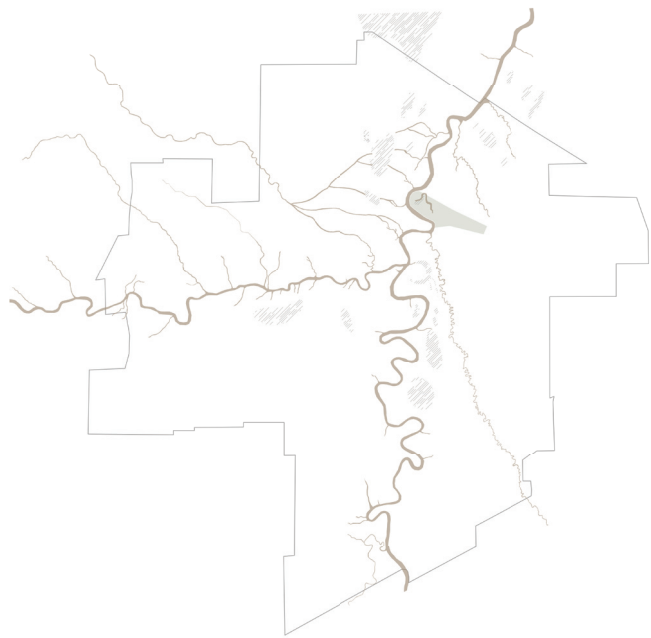
WARD 6
1880 - 1910

WARDS 4 - 6

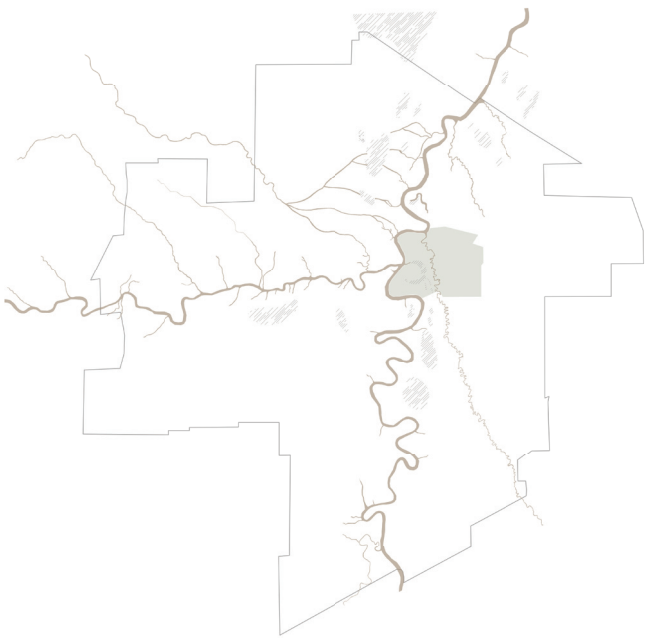
Known as the North End, Wards 4, 5 and 6 were mainly inhabited by unskilled and semi-skilled labourers in the late 1800s and early 1900s.⁴¹ Real estate values in this area dropped dramatically with the construction of the CPR rail yards which brought with them noise and smells of live stock.⁴² The tracks drew a stark separation between the upper and middle class wards to the south and the working class wards to the north.⁴³ Wards 4, 5 and 6 did not have proper access to the City of Winnipeg water mains or sewers which increased the risk of house fires and diseases such as typhoid in these neighbourhoods.⁴⁴ These wards were densely populated with recent immigrants mainly of Slavic

and Jewish decent.⁴⁵ The overcrowding was made worse by exorbitant housing and rent prices which forced the residents of this area to sublet individual rooms.⁴⁶ Boarding houses for transient workers were also concentrated in this area which brought with them demand for a red light district eventually located in North Point Douglas.⁴⁷ At this time only those who owned property could vote.⁴⁸ Since most of the residents in this area had no choice but to rent, the political power of the blue collar workers in these wards was minimal at best making it difficult for them to improve their position through social reform.⁴⁹

-  Overcrowding | 31%
-  Access to Bath | 41%
-  Inadequate Heating | 10%
-  Houses with Rats | 82%
-  Infant Mortality Rate | >50%



WARD 7
1880 - 1910



CITY OF ST. BONIFACE
1880 - 1910

WARD 7 & THE CITY OF ST. BONIFACE
Ward 7 and the City of St. Boniface seem to have been outliers in the class and racial disparities that occurred between the northern and southern wards on the west side of the Red River. The City of St. Boniface itself was socio-economically mixed and remained a stronghold of French culture.⁵⁰ Not much is mentioned about these two areas in the social history of Winnipeg which can lead us to the assumption that they were not polarizing in any specific way, most likely populated primarily by middle-class residents from a variety of backgrounds.

Right: St. Boniface Cathedral, circa 1900-1925





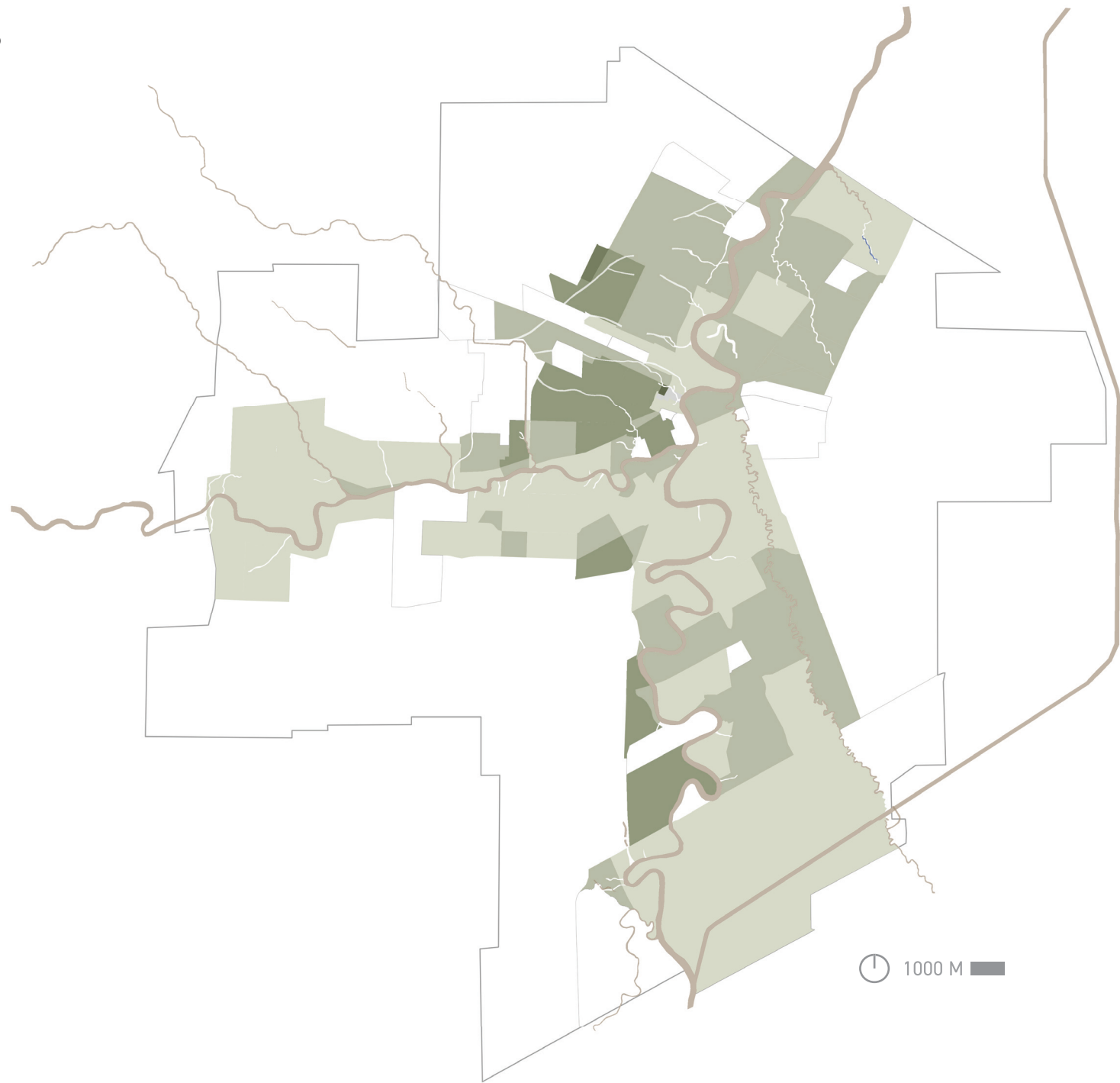
WINNIPEG'S CONTEMPORARY SOCIAL HISTORY: CONTINUED DISENFRANCHISEMENT OF THE NORTH END

The working class of Winnipeg who dominated Wards 4-6 began forming strong cultural bonds and unionizing leading to the 1919 strike.⁵¹ Attempting to distance themselves from Black people, Indigenous peoples, and people of colour, Slavic strikers relied heavily on their whiteness toting racist and anti-immigration slogans to enforce their similarities to the commercial ruling class of Winnipeg.⁵² Overtime, the white workers successfully separated themselves from the BIPOC citizens of Winnipeg, culminating with the election of Stephen Juba the first non-Western European mayor of the city and who was born and raised in the North End.⁵³ Eastern-European immigrants previously segregated to the neighbourhoods of wards 4, 5, and 6 now began to move to the newly built suburbs and a camaraderie of “pan-European whiteness” began to emerge.⁵⁴

Métis communities which had previously been pushed to the outskirts of the city were once again finding themselves displaced.⁵⁵ In the mid 20th-century the Government of Canada began officially encouraging Indigenous migration to urban centres in order to remove them from Northern Manitoba where new development was occurring.⁵⁶ Indigenous peoples remained strongly unwelcome south of Portage Avenue and so, in the years following the suburban shift Indigenous, Métis, Black and Asian communities began to replace the former residents of the North End in what had been known as wards 4, 5, and 6.⁵⁷

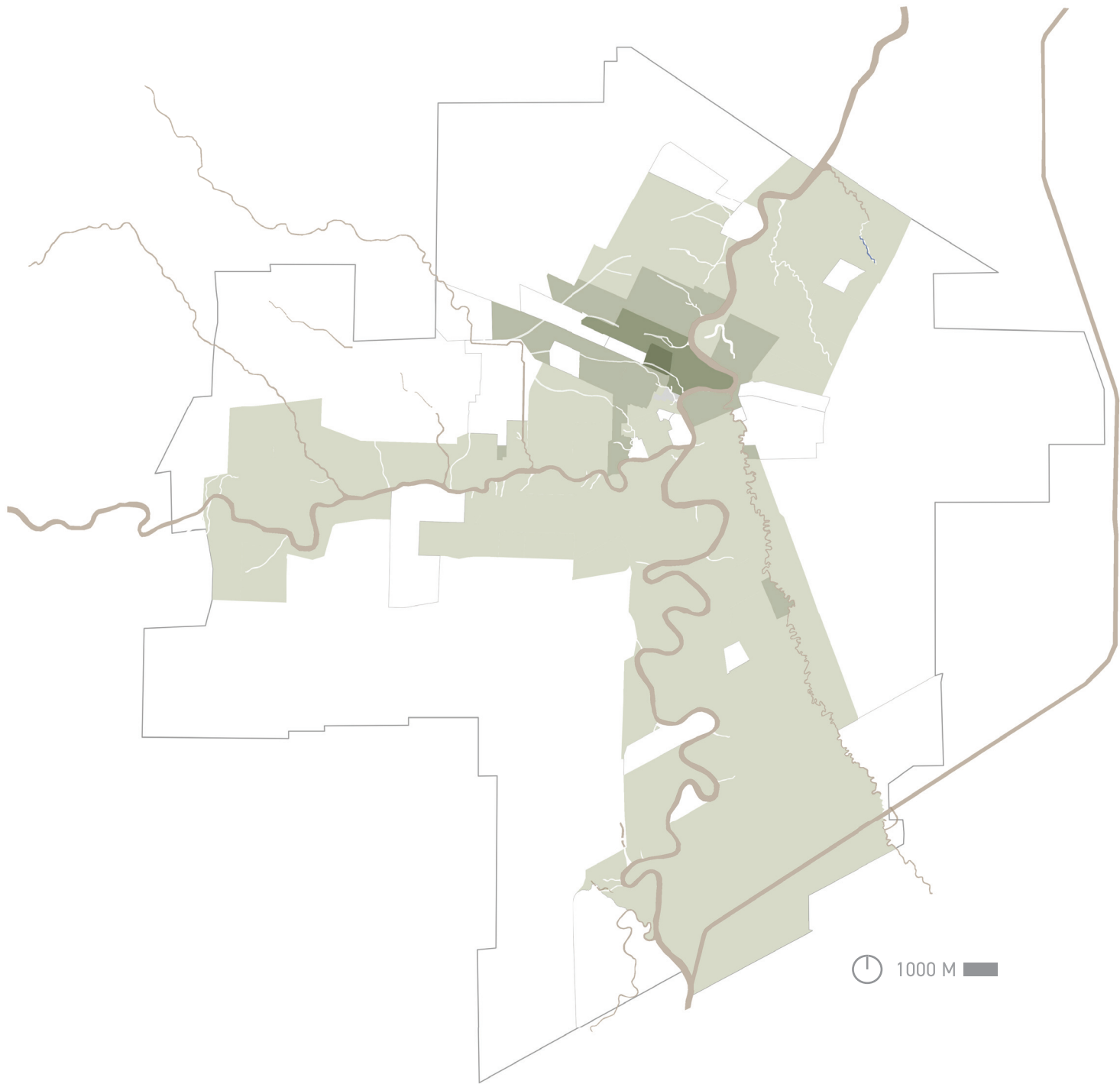
This area now known as the North End, is still home to much of the urban Indigenous population of Winnipeg and a large first generation immigrant population. The median individual income in these neighbourhoods is well below the city average with many individuals earning less than \$30,000 a year.⁵⁸ Housing values also remain low in these areas.⁵⁹ Once home to a large Eastern-European immigrant population, the population of the North End has transitioned over the years and is now largely comprised of immigrants from South Asia and Southeast Asia.⁶⁰ There is a specifically high population of Filipino immigrants.⁶¹ Some European immigrants have remained in the North End including a strong Polish community.⁶² However, the most notable difference in population statistics is a resurgence of the Indigenous population in these neighbourhoods.⁶³

The following maps highlight the contemporary demographic breakdown in the North End, focusing on the recent immigrant and Indigenous communities. They also illustrate the disparity in annual income and housing values in this area compared to the rest of Winnipeg. The coloured areas on the map are divided based on the electoral districts of Winnipeg. Only those neighbourhoods adjacent to waterways have been included. Any gaps in the map information represent neighbourhoods not included in the 2006 Census data for the city.



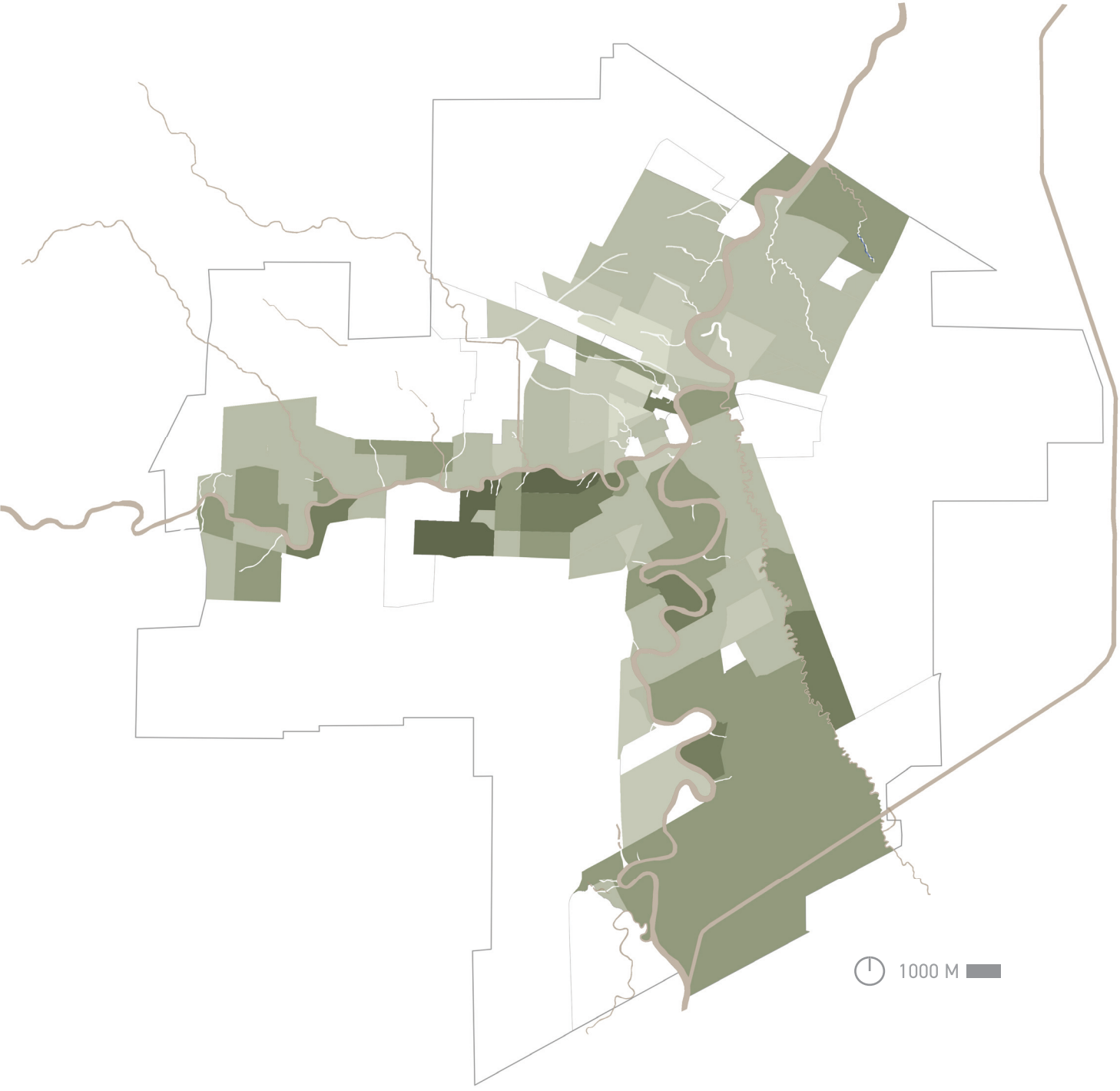
FIRST GENERATION
IMMIGRANT POP. % 2016

- 0% - 19%
- 20% - 39%
- 40% - 59%
- 60% - 79%
- 80% - 100%



INDIGENOUS POP. % 2016

- 0% - 19%
- 20% - 39%
- 40% - 59%
- 60% - 79%
- 80% - 100%



MEDIAN INDIVIDUAL
INCOME 2016

- \$10,000 - \$19,999
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- \$40,000 - \$49,999
- \$50,000 - \$59,999
- \$60,000 - \$69,999



HOUSING VALUES 2019

- Under \$300,000
- \$300,000 - \$750,000
- Over \$750,000
- 60% - 70%
- 80% - 100%



03 | WATER AS LINE, WATER AS FIELD

“A UBIQUITOUS WETNESS”

The streams of Colony Creek once ran across the Northwest of Winnipeg through what was then known as Wards 2, 3, 4, 5, and 6.⁶⁴ The low elevation change in this area prevented the creek from cutting channels through the thick clay soil resulting in the creek surface draining across the northwest corner of the city.⁶⁵ This poor consideration of the city's development context lead to widespread flooding which the first European settlers in the area sought to mitigate. They went about this by filling in the various channels of the creek. However, this did not solve the problem of building in a low lying area and they were met with flooding year after year.

This reveals a key issue not understood by the European settlers of Winnipeg; the cyclical movement of water does not follow the rigidity

of colonization. The rivers of Winnipeg fought against being colonized and forced into the Omand's Creek diversion. The settlers held a false idea that the flood waters were coming from a specific starting point and spilling out from the ends of the creek when in actuality water makes its way to the creek bed through a variety of means including surface run off, precipitation and snow melt. Water is not a visitor to the prairie, water is a constant state of being when living in low land. The water never left the areas that they slated for development and now with its channels filled it spilled freely onto the streets causing damage and disease which mainly affected the working class Wards 4, 5, and 6.

The settlers attempted to impose a strict line onto the shape of Colony Creek restricting its flux to a predetermined boundary based

solely on settler development. This brought the downfall of the ecological functions that the channels of Colony Creek once supported. Formerly sheet draining across the north west of Winnipeg, Colony Creek was now forced into a narrow diversion and left forgotten.

Winnipeg was been formed in direct relation to the rivers and streams that flow through it. The politics, the character, the history of the city were influenced by its waters. When we think about Winnipeg we often separate the rivers from the urban fabric. Maps depict lines cutting through the city, dominated by encroaching industry and speckled with bridges. In his book *The Intention of Rivers* Dilip da Cunha explains how viewing our landscape in this way, land versus water, allows for the commodification of our rivers.⁶⁶ He emphasizes that the act of mapping terrain brought about this new way of viewing rivers that

was spread through colonization.⁶⁷ The simple act of noting a water body on a map freezes it in time. There is no subtlety in a line drawn on a map that can account for the seasonal and annual fluctuations of water. This way of viewing land as commodity and water as something to be controlled puts us out of touch with natural cycles and is reflective of the idea of terra nullius in which settlers viewed Indigenous land as vacant because it was not inhabited in the same way that Europe was.⁶⁸ Settlers often make the mistake of thinking that land not currently occupied by water is therefore free for development. This colonial viewpoint is at odds with cyclical ways of being that is an important component of Indigenous ontologies. We view flood waters as a temporary visitor to the lands we occupy, when in reality

they have been residents of this place longer than colonial settlement has existed. Da Cunha suggests a new way of thinking about rivers as field rather than line.⁶⁹ Winnipeg was built on wet prairie and whether or not we can see it post-development, we are living in a field of “ubiquitous wetness”.⁷⁰

A new way of thinking about rivers as field rather than line can be seen in influential projects of the 21st century such as the Aire River redevelopment by Superpositions. This design by Georges Descombes and his team applies the use of lozenges to form the framework for the river to create a path. As Marc Treib states “Superpositions has provided the skeleton; nature will provide the flesh.”⁷¹ The use of the lozenges

follows da Cunha's logic treating the water as a field rather than a line. The lozenges are temporary, allowing the river to maintain an active relationship with its form by using the energy inherent in the river to carve the its own banks.⁷²

In Winnipeg we seldom see the water given the proper space to create it's own path. Our waters are confined, used as stormwater infrastructure, recreational infrastructure, ecological infrastructure rather than being viewed as living, moving beings. This transactional way of viewing the river has left us with spaces that are static and inflexible. When the river floods, the recreational paths close, separating us from the water as it takes over the land for a brief moment.



04

DRAINED AND DEVELOPED: WINNIPEG'S EXISTING CONDITIONS

EXISTING CONDITIONS

Flooding within Winnipeg is now mitigated by a complex system of drains and ditches. The agricultural lands are drained by ditches running along the mile to mile grid with some supplemental private drains built in between. The city itself relies heavily on a combined sewer system in this area with outlets to the Red and Assiniboine Rivers at controlled access points.

The land once occupied by Colony Creek and its waters is now heavily developed consisting mainly of residential to the north and far south of the site with a large swatch of industrial cutting through the centre. A strip of commercial buildings can be found along Main Street on the far east of the site. There are a handful of greenspaces scattered along the former creek beds. Many of the greenspaces available to the public are school grounds with very few public parks located within the site.

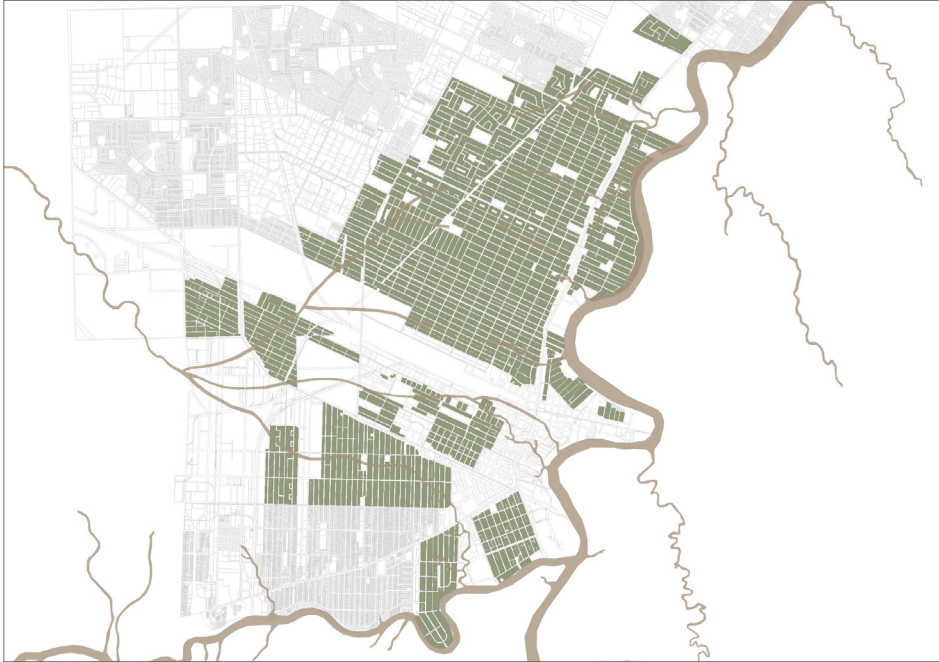
Right: Agricultural ditch draining into
a culvert along Omand's Creek



LAND USE ALONG FORMER CREEK



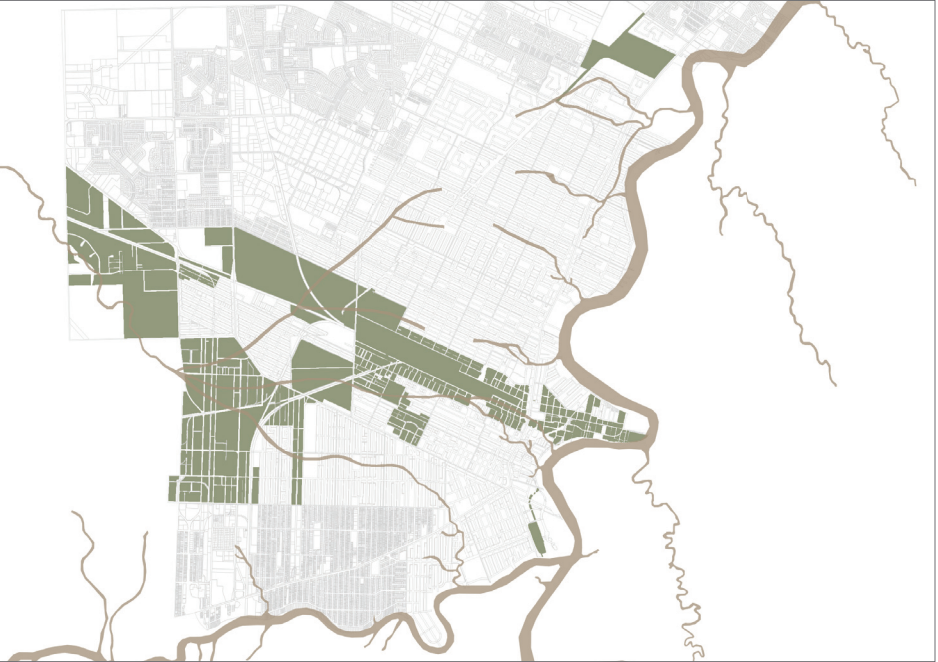
EXISTING PUBLIC GREENSPACE
+ Historic Streams (1874)



EXISTING RESIDENTIAL
+ Historic Streams (1874)



EXISTING COMMERCIAL
+ Historic Streams (1874)



EXISTING INDUSTRIAL
+ Historic Streams (1874)



**HISTORIC TREE COVER
(ESTIMATED PRIOR TO 1900)**

The map to the left is based on historic maps of the area with the trees along the former Colony Creek extrapolated based on the extent of riparian vegetation along the streams to the east of the Red River. This provides an approximate idea of the extent of the riparian vegetation in Winnipeg when European settlers arrived. These trees would have included Cottonwood, American Elm, Manitoba Maple, Green Ash and Basswood along with willows, chokecherries, American Hazelnuts and other native shrubs.⁷³



CURRENT TREE COVER

Today the urban forest of Winnipeg is generally confined to lines of street trees with a scattering of private trees in residents' backyards. There are a few larger clusters of trees in public parks with the most notable being Kildonan Park / Kildonan Park Golf Course. The historic streams retained almost none of their original vegetation. These green corridors have been lost, engulfed by development. Even the rivers and the streams that are still intact today have little of their riparian buffer remaining.

- 

WALKING / JOGGING
- 

DOGS ALLOWED
(ON LEASH)
- 

SLEDDING
- 

OUTDOOR FITNESS
EQUIPMENT
- 

PICNIC AREA
- 

PLAYGROUND /
NATURE PLAY
- 

CYCLING ROUTE
- 

SKATING

**PRESERVED AND NATURALIZED
RIPARIAN AREAS IN WINNIPEG**

The following case studies explore 4 existing riparian greenways in Winnipeg. These are Bunn’s Creek, Omand’s Creek, Truro Creek, and Sturgeon Creek. Exploring these greenways will contribute to our understanding of what could have been if Colony Creek had been saved from development. They offer valuable insight into the ecological and recreational value that a restored greenspace can add to a neighbourhood.

These case studies detail the recreational benefits that are available to the community in each greenspace. To help define and illustrate the recreational activities available in each greenspace at a glance a library of recreational icons has been created. These icons include: walking, picnic areas, cycling, dog walking, sledding, outdoor fitness equipment, playground, and skating.



250 M

BUNN’S CREEK

Bunn’s Creek runs westward from the agricultural lands east of the city to its confluence at the Red River. The creek’s namesake is Dr. John Bunn who was the first Métis doctor to settle in the area back in 1824.⁷⁴ It has a tributary of over 30 square kilometers that mainly consists of suburban development, semi-rural areas and agricultural land.⁷⁵ The drainage area of the creek was once larger,

but the construction of the floodway and the development of a more robust sewer system in Transcona now intercept much of the runoff that would have once been directed into the creek.⁷⁶ The water level of Bunn’s Creek in its contemporary context varies greatly throughout the seasons, running nearly dry in times of drought.⁷⁷



THE VISION FOR BUNN'S CREEK

In April of 1973 a small creek in the northeast corner of Winnipeg began to draw the attention of the city.⁷⁸ Development was increasing in the once agricultural and semi-rural area and the demand for storm drainage was increasing.⁷⁹ A task force was formed including representatives from the Water, Waste and Disposal Division, the Planning Division, the Parks and Recreation Division and the community of East Kildonan.⁸⁰ It was decided that the best course of action would be to leave the creek in its natural state, capitalizing on the existing storm water retention and recreational benefits that the creek offered as a cost effective solution.⁸¹

The area of the creek west of Gateway Road was to become a linear park and would allow stormwater to drain directly into the creek.⁸² Between Gateway Road and Lagimodiere Boulevard the creek was widened to form a retention pond that could capture stormwater

runoff from the surrounding suburban area and release it slowly into the creek.⁸³ The portion of the creek east of Lagimodiere Boulevard was to become a ditch functioning solely as stormwater infrastructure with little ecological benefit.⁸⁴ Overall, it was estimated that the city saved \$750,000 (nearly 5 million dollars today) by using Bunn's Creek to collect stormwater rather than building new stormwater infrastructure for the expanding suburbs.⁸⁵

The work on Bunn's Creek was phased to coincide with the pace of the surrounding residential development.⁸⁶ The vision for the new linear park included: a linear path wide enough to accommodate both cycling and walking, bridges and underpasses under major roadways to ensure the continuity of park and recreational infrastructure, footbridges to offer views along the creek and bring visitors closer to the water, small picnic sites along the length

of the park, a large picnic site at Centennial Park that could accommodate groups of 20-30 people, picnic shelter, washrooms, fire pits, firewood facilities, children's playgrounds, interpretive signage, and parking opportunities along the length of the trail.⁸⁷ The committee also had a vision for winter recreational infrastructure. They suggested that the creek be widened for ponding in certain areas to create a chain of skating rinks in the winter.⁸⁸ They also proposed winter shelters, multiple toboggan runs, and cross country ski trails.⁸⁹

To achieve this grand vision, the city acquired \$560,000 worth of land along the creek amounting to over 3.5 million dollars today.⁹⁰ This guaranteed continuous public ownership along at least one side of Bunn's Creek for the entire park length at a minimum setback of 30m.⁹¹



BUNN'S CREEK GREENWAY

While not all of the committee's visions materialized along Bunn's Creek, a majority of their ideas were realized. The naturalized riparian area along the creek extends eastward from the Red River towards Gateway Road. The viewpoint over the Red River offers a spot to stop and picnic, and intricately carved signage created by artist Becky Thiessen in partnership with the students of the neighbouring John G. Stewart School celebrate the Seven Teachings at regular intervals along the greenway.⁹² Even in the winter the path is bustling with families out for weekend walks, and bikers using fat-tire bikes. Joggers with their dogs and even the occasional cross-country skier go by. Centennial Park is the heart of the greenway. Here a toboggan hill shoots kids screaming and laughing across the frozen creek and families gather near the top of the hill around a skating rink that has been constructed. There is little skating on the creek as the original vision for

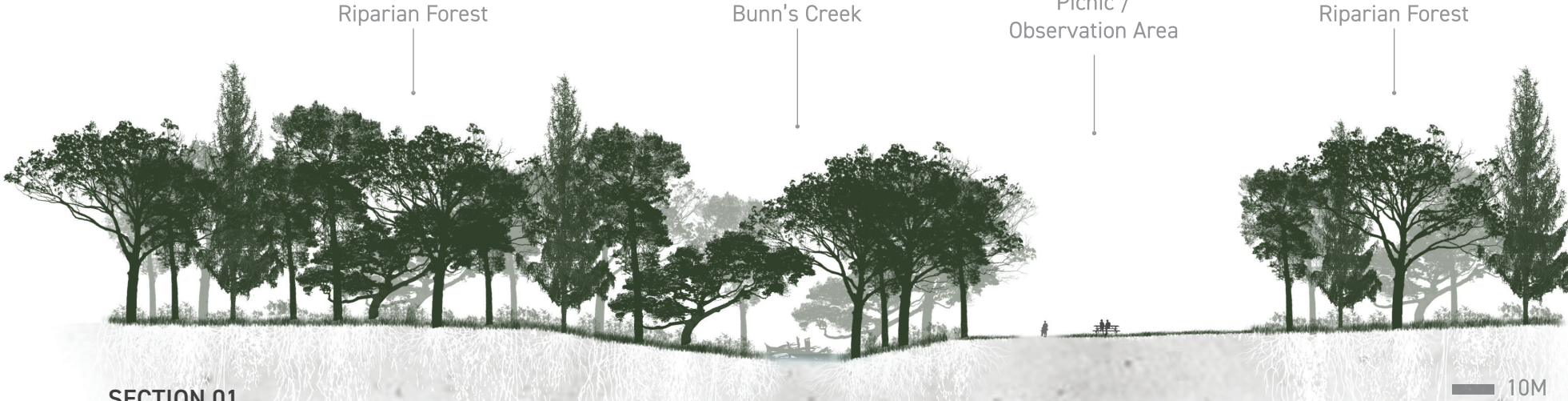
development intended, maybe because the undergrowth proved too vigorous for smooth ice, but the rink in Centennial Park is well used. Children are racing for the playground and hanging off the fitness equipment further down the trail that creates an activity loop when it's not covered in snow. Although only one toboggan hill seems to have been constructed plenty of makeshift hills have popped up on the steeper slopes around the creek.

In the spring as the new growth begins to emerge from the snow wildlife reappears. The creek is home to many rabbits, foxes, and beavers, even porcupines and the occasional crane have been spotted here.⁹³ Local residents enjoy the wild plums, Saskatoon berries and chokecherries that summer brings and warm summer nights also bring with them festivals and picnics in Centennial Park.⁹⁴





AREA 01
Area 01 is a transition zone. Here the creek passes under Henderson Highway before spilling into the Red River. The creek bed is wide and feels enclosed with steep banks and trees surrounding the space. Houses back onto the pathway just east of Henderson Highway making the space feel more suburban than other areas of the greenway. Tree cover is lighter here and tall grasses and small shrubs surround the creek making it hard to access.



SECTION 01



AREA 02
In Area 02 the tree cover becomes denser with groves providing shelter on either side of the path. The houses are invisible, hidden behind the lush greenery of the plants. Moving eastward along the greenway the path opens up approaching Bonner Ave. Here a bridge raises the path above the steep slope to the creek on the western side. The sweeping green lawn of the neighbouring house comes right up to the path.





AREA 03
Area 03 transitions from sweeping lawns to thick understorey plantings along its length. The northern side of the path is close to Bunn's Creek and short understorey plants allow visitors to connect with the water along the majority of this segment. The tree cover is thick along most of Area 03 with hardly any houses visible.





AREA 04
Continuing eastward the path in Area 04 remains close to the water before passing through a thick grove. Interpretive signage educates passersby on the creek. The trees are more diverse in Area 04 with evergreens beginning to appear among the forest which had predominantly been deciduous trees in the previous areas.





AREA 05
Wide sweeping lawns define Area 05. A low hill leads upwards from the creek bank to a brick pavilion above. One small grove of trees shades the western edge of the path in this section, but overall very few trees are present. The lawn offers areas for picnicking and diverse recreational activities. Views from the top of the hill overlook the creek below.



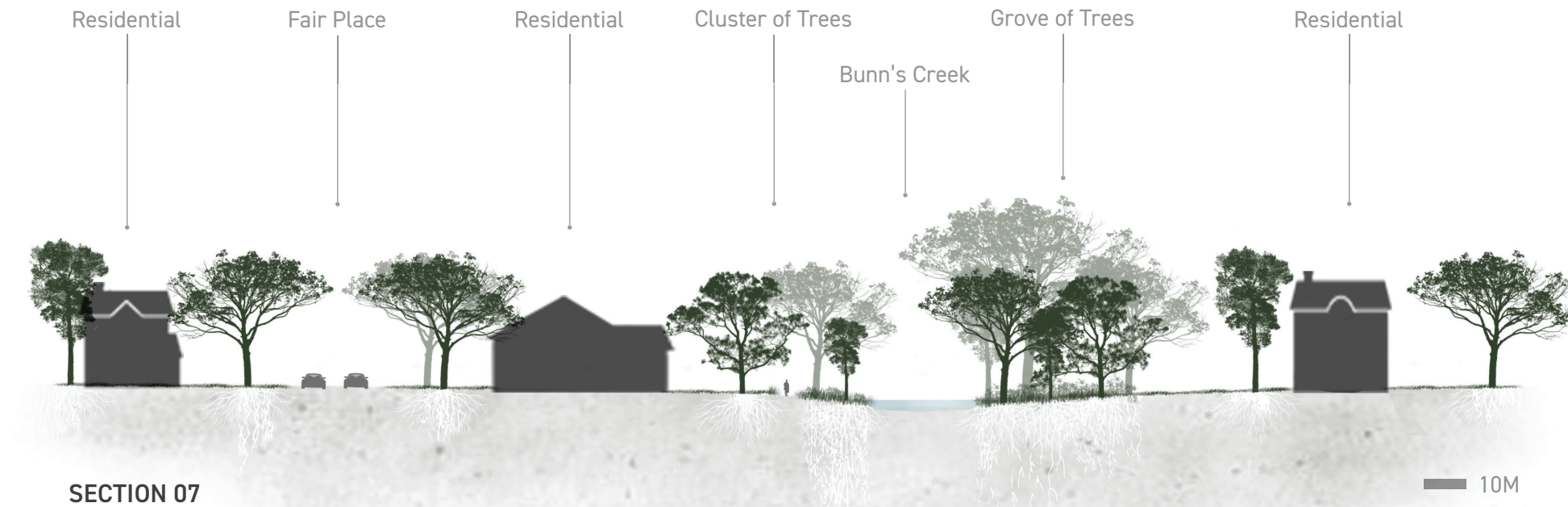


AREA 06
Area 06 covers Centennial Park. Here the forest becomes thick and dense. The path splits into two with one fork directing you across a bridge and into the nearby neighbourhood and the other fork taking you through a forest playground. In the forest playground little understorey is present leaving a large shaded area for children to run and play. The forest begins to thin as houses come into view on the eastern edge of this zone.



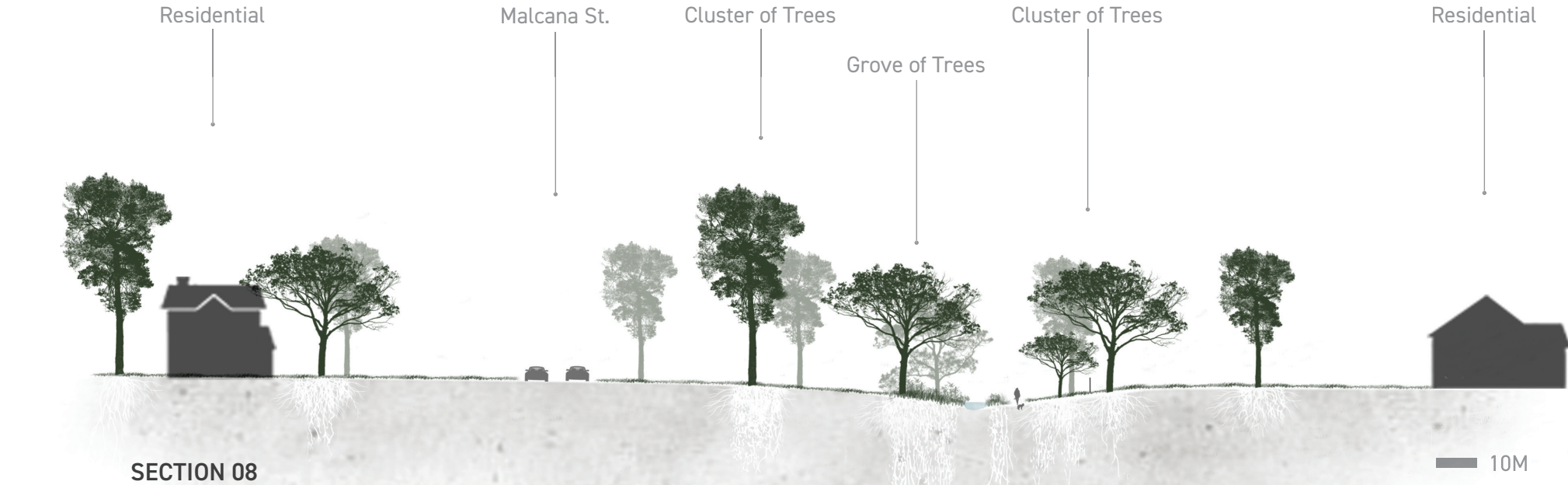


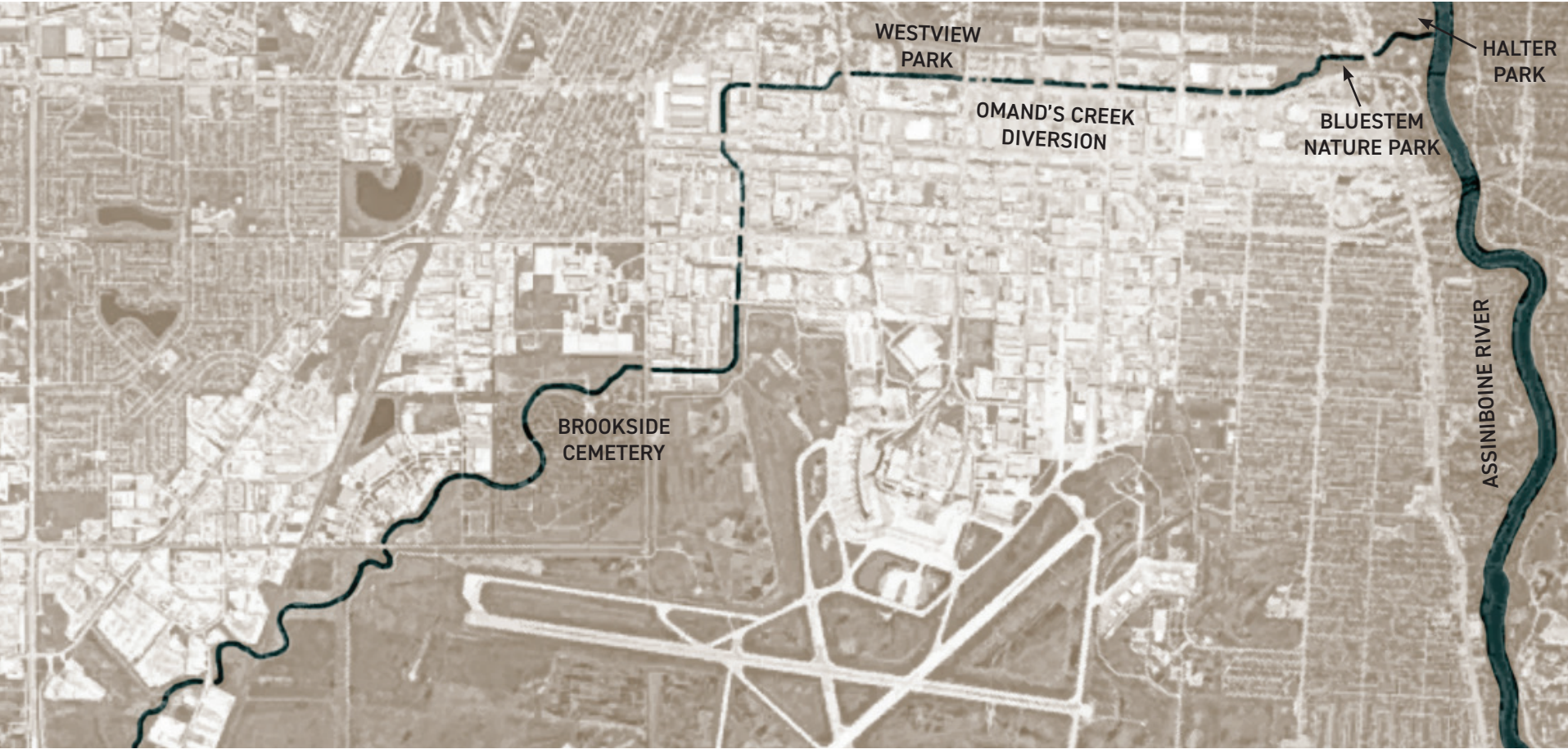
AREA 07
The vegetation is less thick in Area 07 of Bunn's Creek. Here many houses are visible and lawns run right up to the path in many areas to the south. The vegetation becomes slightly thicker moving eastward through this section approaching McIvor Ave.





AREA 08
Area 08 is vast and open. More traffic noise can be heard here and the landscape consists mainly of mowed lawns. Little riparian vegetation is present. Raleigh Road cuts across the creek and the water is directed into a culvert under the road. Bunn's Creek Greenway terminates here, connecting to Northeast Pioneers Greenway and Chief Peguis Greenway.





OMAND'S CREEK

Omand's Creek lies northwest of Winnipeg, running from the agricultural lands north of the airport and under Portage Avenue to the Assiniboine River. Although the entire waterway is now known as Omand's Creek, only a small stretch near the mouth of the creek where it enters the Assiniboine River was originally Omand's (Catfish) Creek.⁹⁵ The far northern stretch once fed the streams of

Colony Creek, but a diversion was constructed in 1880 to prevent flooding over the nearby CPR line and in the adjacent neighbourhoods.⁹⁶ The diversion (seen on the map above) directed the waters of Colony Creek into Omand's Creek and eventually into the Assiniboine rather than the Red River.⁹⁷

Omand's Creek currently runs through four unique greenspaces: Brookside Cemetery, Westview Park (Garbage Hill), Bluestem Nature Park, and Halter Park. Access to the creek in the industrial and commercial areas is extremely limited, but the parks themselves offer a variety of recreational opportunities. Brookside Cemetery offers a peaceful, shaded walk. Westview Park accommodates walkers, dog walkers, and tobogganers. Due to its linear nature Bluestem Nature Park is a great place for cyclists, dog walkers, joggers and bird watchers. It also provides connections to Halter Park which allows for walking, dog walking, jogging, cycling, and even tobogganing and skating. Other areas of the creek may provide further opportunities for skating, however access to the creek is limited and so are facilities such as benches for putting on skates.

More could be done along this waterway to provide recreational infrastructure and make it more ecologically robust. The area where the diversion lies is particularly devoid of ecological value and even in areas like Westview Park the creek is not explored as an asset.





STURGEON CREEK

Sturgeon Creek winds through single family residential housing from the agricultural lands to the northwest of Winnipeg, under Portage Avenue and eventually to its confluence with the Assiniboine River. Sturgeon Creek Park is a linear greenway which borders each side of the creek from Hamilton Avenue to the Assiniboine River. Although the greenway only formally continues to Hamilton Avenue in the

north, an informal path extends the route all the way to Saskatchewan Avenue on the edge of the city. The path is paved for the most part with sweeping lawns sloping down from the adjacent houses. The vegetation directly along the creek is left to grow wild and untended offering valuable habitat for wildlife and a few trees are scattered along the greenway. The pedestrian path passes under all of the major



roads that it intersects with making the route perfect for families with small children or dogs. The path is wide and accessible to a variety of modes of transportation including cyclists, joggers, dog walkers, parents with strollers, and wheel-chair users. It is well used and in the winter offers opportunities for skating in areas where the vegetation is less dense. A historic mill stands near Portage Avenue which draws many visitors to the park. As you pass under Portage Avenue towards Woodhaven Park a playground is nestled among the trees along with a skating rink and community centre. The path truncates abruptly here just short of reaching the Assiniboine. During the spring many parts of the path are flooded with the connection from Sturgeon Creek Park to Woodhaven Park cut off completely.





TRURO CREEK

Truro Creek runs from south of the airport, passing through the Assiniboine Golf Club before eventually spilling into the Assiniboine River just west of Douglas Park Road. The section of the creek nearest to the airport runs along Assiniboine Golf Course. Here the creek has been heavily compromised with almost all of its vegetation removed along the fairways. It can also be assumed that many chemicals and fertilizers

are making their way into the creek in this area due to the intensive maintenance procedures of the golf course. Two parks run along Truro Creek, Truro Park which lies north of Portage Avenue and Bruce Park south of Portage. Truro Park feels wild and unmaintained. The creek was widened and deepened in this area.⁹⁸ The vegetation surrounding the creek has been

left to grow unmanicured. Rather than gravel paths which are common in many parks in Winnipeg, Truro Park has mowed grass paths. These paths, although less expensive, are not accessible. In areas the maintained lawns widen, in others they become narrow and the vegetation closes in. The mowed paths form a softer delineation between pathway and vegetation which invites visitors to explore the landscape. In this section Truro Creek is often surrounded by backyards. This flaw in the original neighbourhood planning means that Truro Park is less heavily used and often experiences problems with dumping and general neglect.⁹⁹

On the other hand, the more formal Bruce Park is heavily used. Asphalt paths curve through the wide lawns of the park. A playground and benches offer places to sit and play and bridges cross the creek at two points providing views down its length. The riparian vegetation right along the creek has been left to grow tall and thick, but the buffer is much narrower than at Truro Park. Although attempts at native plantings were made along the creek, a lack of maintenance by the City has lead to the spread of invasive weeds such as Burdock and Buckthorn.¹⁰⁰

Nineteen riffle structures were constructed along Truro Creek to compensate for canalization of the creek bed.¹⁰¹ A few of these lie within the bounds of Bruce Park, however the stream course is more natural here.¹⁰² The riffle structures play a much larger role further north in Truro Park where the stream has been more heavily altered.¹⁰³



LESSONS LEARNED

There is little money in Winnipeg for creek maintenance and although Bunn’s Creek, Omand’s Creek, Sturgeon Creek and Truro Creek have been visually preserved, they have been stripped of many of their ecological functions over the years. Weeds have taken over in many areas even where attempts at native revegetation projects have occurred. This is due in large part to a lack of funding and maintenance. Despite the creeks’ naturalized appearance they have been shifted and altered in many areas to accommodate development.¹⁰⁴

Throughout Winnipeg the creeks have been woven through the urban fabric rather than vice versa. The creeks are often culverted at road crossings which severs the green corridor that could otherwise be used by wildlife. This also

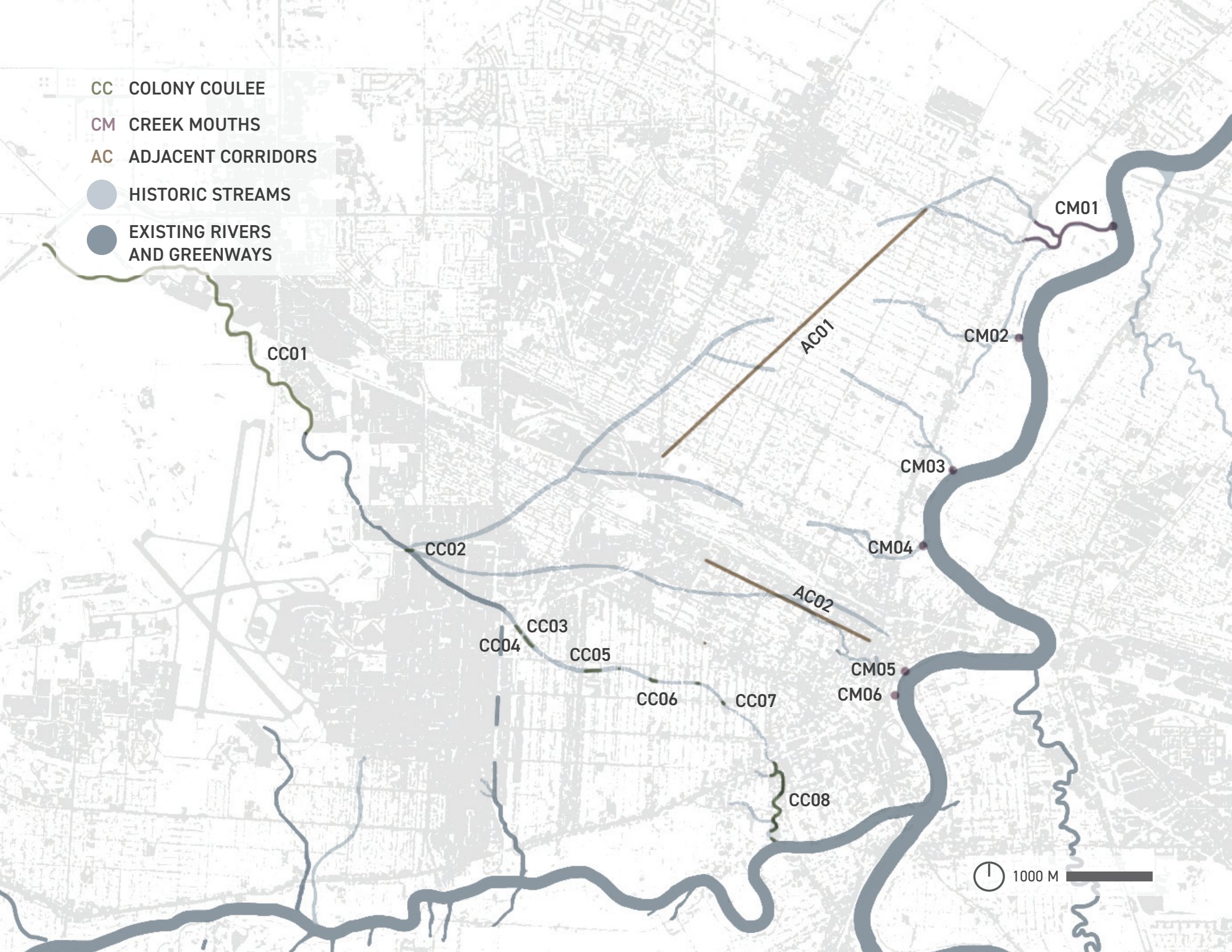
limits the creeks’ use as recreational corridors for local residents. The benefit of creating a continuous green corridor can be seen at Sturgeon Creek where a concerted effort was made to lift the road crossings above the creek rather than constructing a culvert.

While volunteer groups have played a crucial role in advocating for Winnipeg’s remaining creeks, there needs to be more onus on the city to preserve them. According to a 1992 bylaw, the City of Winnipeg is required to issue a permit for work that could alter the course or cause instability along any of these waterways.¹⁰⁵ However, there seems to be no legislation regarding the preservation of the riparian vegetation along these creeks. While the city suggests no-mow zones adjacent to

urban creeks, there are no by-laws that actually enforce this.¹⁰⁶ It also seems that permits for altering these creeks are given out too freely, as can be seen in the case of Truro Creek which was redirected at the request of a homeowner.

The health of Winnipeg’s remaining creeks could be better preserved if the city were to stop allowing the alteration of the creek banks completely and put in place legislation that prevented removal of riparian vegetation by enforcing a no-mow zone. A city steward tasked with safeguarding the health of these creeks would enable a consistent maintenance plan to be put in place with strict mowing and weeding guidelines aimed at removing invasive species and preserving important native riparian vegetation.¹⁰⁷





SELECTED SITES

The map to the left shows the paths of the former Colony Creek as it was mapped in 1874, overlaid on a contemporary map of the City of Winnipeg. The areas highlighted in green, purple and brown respectively denote the sites of proposed designs meant to reveal the path of the historic creek. While the exact path of the former creek must be speculated from hand drawn maps, it is also important to note that the creek would have continued to shift and change over the past 140 years had it not been filled. This means that the paths traced on the following maps are frozen in time.

The proposed designs will reveal a more complete history of Winnipeg. They will acknowledge the creeks that once flowed across these areas and provide a place for collective remembering. They also seek to

return natural ecosystem functions to these sites which have been heavily developed.

The locations for the proposed designs were selected based on opportunities to reveal the creek in site sensitive ways without displacing people, houses, and existing vegetation.

Three types of selected sites are proposed. These include:

Colony Coulee (annotated as CC on the map to the left) which now lies beneath the neighbourhoods of Sargent Park, Daniel McIntyre, St. Matthews, Spence, Colony, West Broadway and the Legislature.

Creek Mouths (annotated as CM on the map to the left) where the former streams once

entered the Red River. Many of these areas are already public access points, however they lack acknowledgment of the history of the landscape which the new designs will provide.

The **Adjacent Corridors** (annotated as AC on the map to the left) do not follow the ghost creeks directly, rather they make use of adjacent public lands to make space for larger design opportunities. During times of high water these areas would have been flooded by the waters that spilled out of Colony Creek. Two Adjacent Corridor sites are proposed. One is located within a rail right of way that runs diagonally northeast from the Weston Shops rail yard to Winnipeg Beach. The other runs along Alexander Avenue which was the site of a former flume meant to reduce flooding in downtown Winnipeg.¹⁰⁸



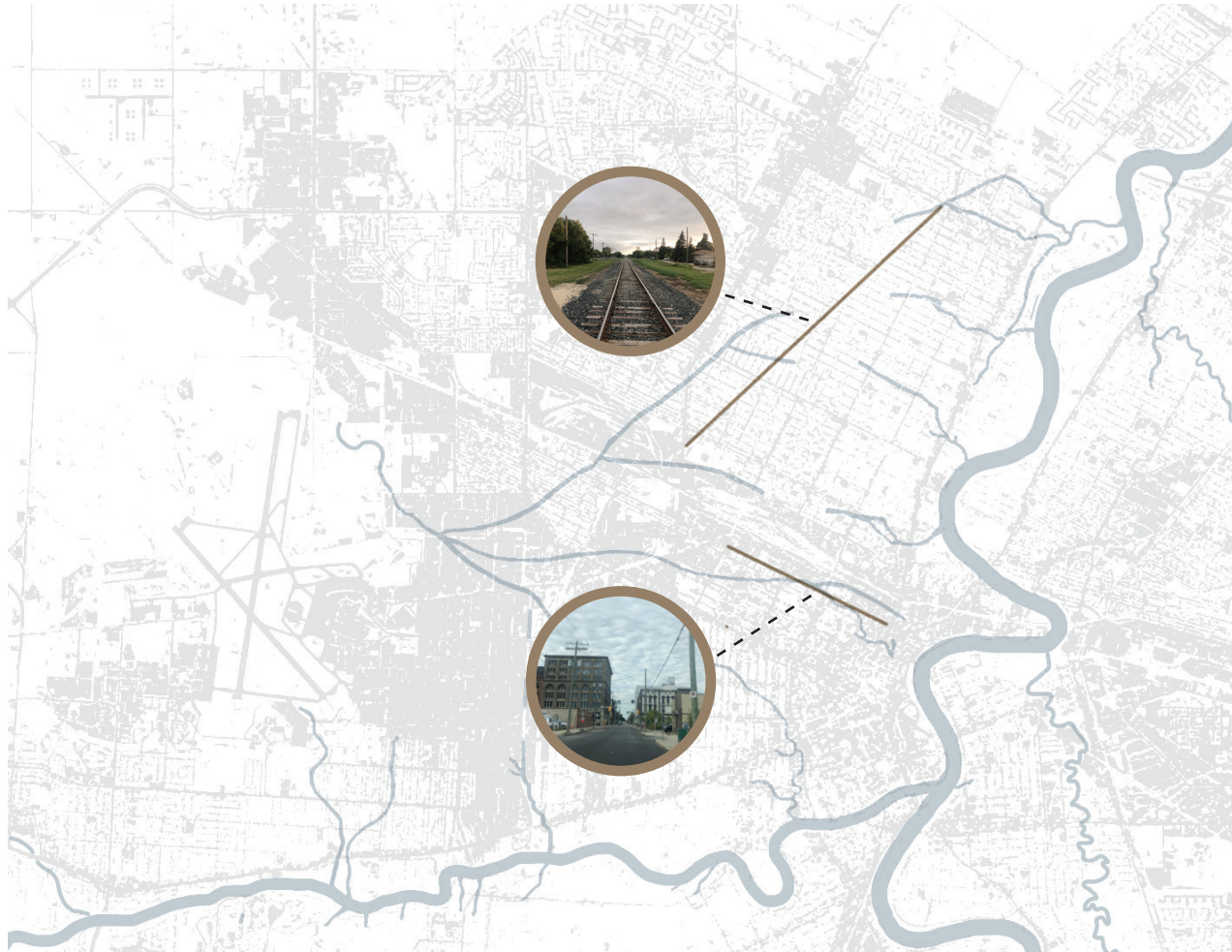
COLONY COULEE

The former Colony Coulee once flowed across what is now north of the airport draining southeastward and entering the Assiniboine River near where Manitoba's Legislative Building now stands. Here the stream mainly runs through a low-income residential area with a large community of recent immigrants. Tree cover is limited with street trees being the main source of vegetation. This location provides valuable opportunities to re-vitalize underused public greenspace that mainly consist of bare grassy fields.



CREEK MOUTHS

Dotted along the Red River from Kildonan Park to just north of the Forks, the locations of these designs will activate the riverbank where Colony Creek once spilled into the Red River. While many of these areas are currently publicly accessible, connection with the river is lacking and access to the water is not provided.



ADJACENT CORRIDORS

The linear projections make use of existing public land adjacent to the former path of the creek to reveal the history of the site and provide room for larger, linear designs without the need to displace existing developments and infrastructure. One linear projection will run along a rail corridor which is adjacent to a main channel of the historic creek and provides the opportunity for a greenway through the Borrows Central, Robertson, Garden City, Templeton-Sinclair, Jefferson and Margaret Park neighbourhoods. Another linear projection will take the form of a design along Alexander Avenue. This was once the site of a failed flume design which was meant to direct waters along Alexander Avenue and prevent flooding.¹⁰⁹ However, the flume was built under the necessary capacity and unfortunately did nothing to prevent flooding in the surrounding wards during the heavy flooding of the early and mid 1800's.¹¹⁰



DESIGN OPTIONS

There are many ways that temporary and former waterways are marked in our landscape. They can appear as slight dips in a paved road as Colony Creek does near Osborne and Broadway, they can stand out in a field of wheat as a faint line of untended vegetation, or they can be water cutting a curved course through our thick prairie soils.

As we begin to extract the lines of Colony Creek from our built landscape, a series of design options is created that illustrate potential design

solutions for revealing these ghost creeks. Each design option gives life to the former creek, creating flexible, adaptable spaces that serve the surrounding communities. Interpretive signage could also be included to educate the public on the history of the land beneath them. The design options seek to do more than trace the former Colony Creek as a line, but rather they attempt to encourage the view of the creek as a field. Often blending into the landscape around them, these hidden spaces reveal the history of the site only on close inspection.

DRY CREEK

Prairie grasses, rocks and a scattering of trees mark the dry creek. Tracing the path of the historic Colony Creek this design option highlights the former channel without the need for a water source. During times of heavy precipitation or snow melt the creek bed will fill with water, doubling as a stormwater retention area. The stones and small shrubs of the creek create a natural play space where

children can be encouraged to explore and discover the natural landscape. There would be no path included in this design option, instead visitors are welcome to explore the landscape as they wish. The natural area will provide ample habitat for diverse flora and fauna. This design option would be ideal for situations like a schoolyard.



WILDFLOWER MEADOW

Sometimes, while driving through the prairie, a small waterway is only made visible by the riparian vegetation lining its banks. The wildflower meadow highlights the path of the historic creek without the need for excavation while also providing important habitat for pollinators, birds, and small animals. This design option would be combined with a multi-use recreational path that could provide space for cycling, walking, running, and cross-country skiing depending on the context. An emphasis on blue wildflowers will evoke memories of water similar to driving past a field of flax in bloom.



POCKET CREEK

In areas where excavation or connection to a water source is possible a pocket creek could be formed. The pocket creek would consist of a series of small wetlands of various depths. Water will come and go from the pockets throughout the year, sometimes widening and at times running almost dry. A multi-use recreational path along the pocket creek would allow visitors to connect with the water. This design option would provide diverse habitat and stormwater control. In areas where deeper ponding occurs the stream could allow for skating in the winter. It is important that the new stream is not seen as a return to the old creek, but rather a new space that pays homage to the past.



AQUEOUS GROVES

The grove of trees provides a vertical demarcation of the former creek. Standing out against the flat land around it, this is one of the most visible design options. The grove of trees could also include a shallow ditch meant to retain stormwater. The understorey beneath the trees should be planted with prairie grasses and native woodland species and left unmown. Mown grass or permanent pathways can be included on one or both sides of this design option. While no path cuts through the trees people are welcomed to step beneath the shade and explore. An emphasis should be placed on planting diverse, hardy, and pest tolerant trees. This would also be a good place to plant trees that are not as well suited to other contexts such as fruit trees.



POTABLE HYDRANTS

In areas with limited greenspace, where revealing the creek using vegetation would be difficult, the water will be revealed through a series of public fountains and sprinklers. Based on the Ivócsap (drinking tap) project by a group of students in Hungary,¹¹¹ this design option would transform already existing hydrants into water fountains and sprinklers which the local community could use to access clean, fresh water or to cool down on hot summer days.

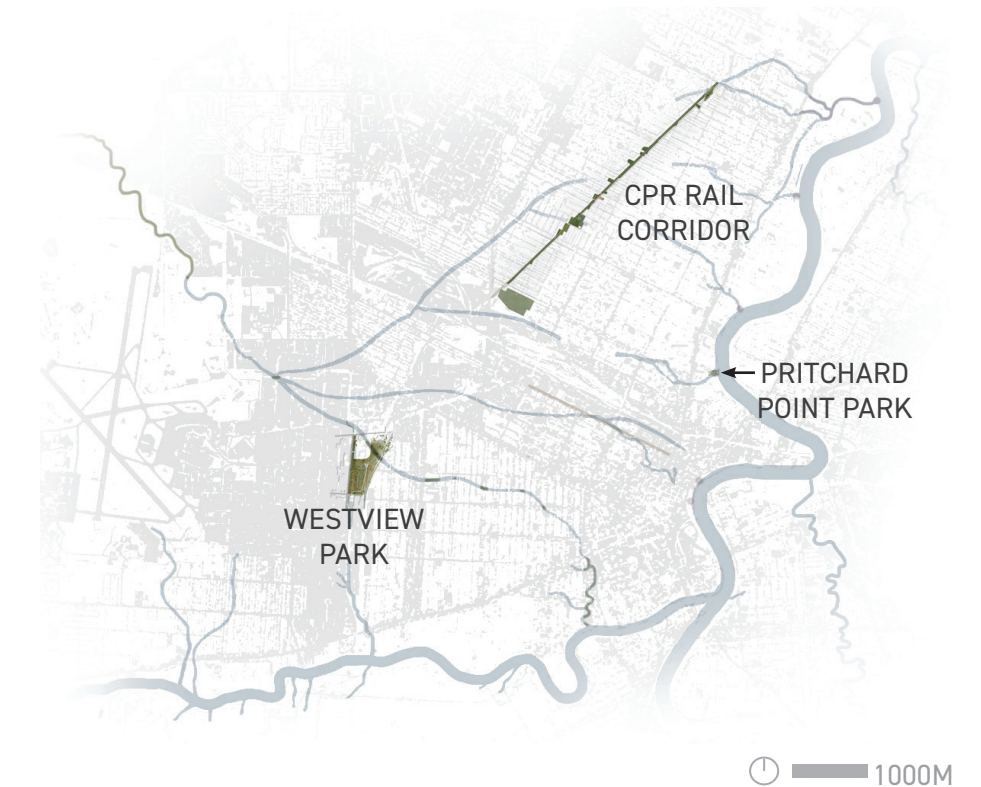


07 | RECONNECTING TO LOST WATERS: DESIGN DEVELOPMENT

SITES FOR FURTHER DEVELOPMENT

After the initial analysis, Westview Park (Colony Coulee), Pritchard Point Park (Creek Mouths), and CPR Rail Corridor (Adjacent Corridor) were selected for further design development. These were refined in further detail by applying the design options defined previously. Each design will adapt the design options in unique and site specific ways, with a focus on ecological diversity, ecosystem services, recreational opportunities, and community building.

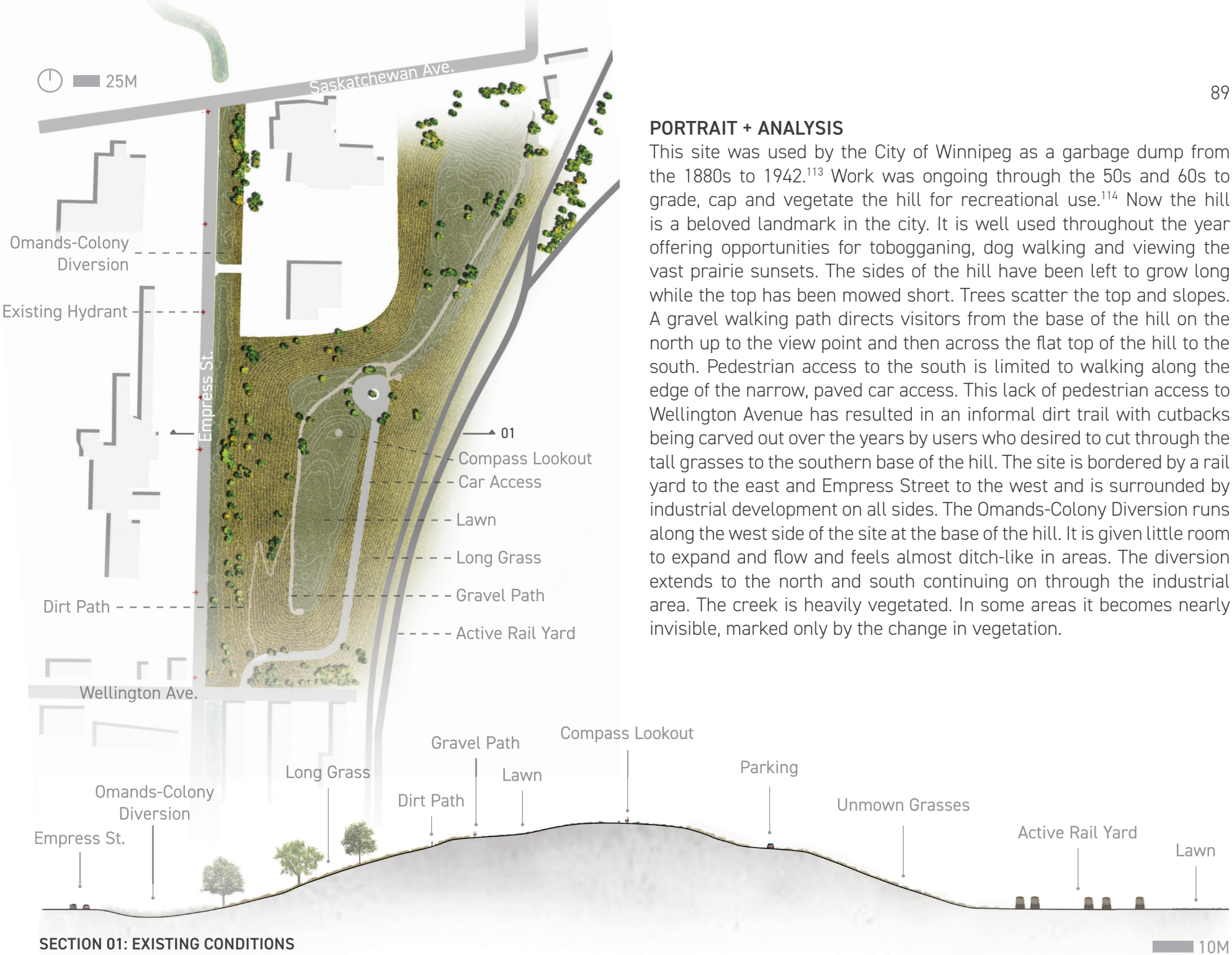
The former Colony Coulee ran under where Westview Park now stands. Here the old creek path and the new path of the Omands-Colony Diversion split apart, offering opportunities to reveal multiple layers of the creek's story. Pritchard Point Park is situated at the former mouth of Pritchards Creek where it drained into the Red River. The CPR Rail Corridor follows the path of an active rail right of way which is adjacent to the former main arm of Colony Creek. These sites were all selected as they provide opportunities to reveal or evoke associations to the ghost creek in areas that are currently underused. The goal through this site selection was to develop areas of existing greenspace that were providing limited ecological and recreational functions; enhancing these spaces while revealing the former creek and keeping existing residential and commercial structures intact. The design focus in this practicum was placed on the CPR Rail Corridor which was developed in depth while Westview Park and Pritchard Point Park were developed in less detail.





COLONY COULEE: WESTVIEW PARK

Westview Park (also known as Garbage Hill) is the site of a former garbage dump which has been re-purposed and is now an important landmark for Winnipeggers, offering sweeping views over the city from its highest point.¹¹² At the base of the hill on the west side of the park runs the Omands-Colony Diversion. It sits narrow and forgotten at the base of the large hill. Little has been done to acknowledge its existence in this space. No formal pathways have been constructed on that side of the park and there is no sidewalk along the creek side of Empress Street. Even less visible, is the path that Colony Creek once cut through the site before it was diverted, now long buried under the hill to the north. Although Westview park is well used by many locals and is a popular place to bring your dog, Colony Creek is all but forgotten in this space. The proposed design for this site will activate the underused west slope of the park providing views and access to the existing diversion, and define the former creek’s location on the grassy lawn to the north.



PORTRAIT + ANALYSIS

This site was used by the City of Winnipeg as a garbage dump from the 1880s to 1942.¹¹³ Work was ongoing through the 50s and 60s to grade, cap and vegetate the hill for recreational use.¹¹⁴ Now the hill is a beloved landmark in the city. It is well used throughout the year offering opportunities for tobogganing, dog walking and viewing the vast prairie sunsets. The sides of the hill have been left to grow long while the top has been mowed short. Trees scatter the top and slopes. A gravel walking path directs visitors from the base of the hill on the north up to the view point and then across the flat top of the hill to the south. Pedestrian access to the south is limited to walking along the edge of the narrow, paved car access. This lack of pedestrian access to Wellington Avenue has resulted in an informal dirt trail with cutbacks being carved out over the years by users who desired to cut through the tall grasses to the southern base of the hill. The site is bordered by a rail yard to the east and Empress Street to the west and is surrounded by industrial development on all sides. The Omands-Colony Diversion runs along the west side of the site at the base of the hill. It is given little room to expand and flow and feels almost ditch-like in areas. The diversion extends to the north and south continuing on through the industrial area. The creek is heavily vegetated. In some areas it becomes nearly invisible, marked only by the change in vegetation.



PROPOSED DESIGN: MEADOW TRAIL

The design for the Meadow Trail connects people to the existing Omands-Colony Diversion and activates the underused west slope of this site.

Along Empress Street, the lanes of traffic would be narrowed to accommodate the construction of a sidewalk down the east side. This would also help to slow traffic. A new allée of trees define the street, providing shade and bringing a pedestrian scale to the oversized, industrial environment. A new gravel path would extend from the southern entrance of the park running adjacent to the Omands-Colony Diversion before cutting back and forth across the hill to the lookout area above. Along both the new path and the new sidewalk, lookout areas would be established to allow visitors to get closer to the creek. A bridge near the centre of the new path will provide unique views along the creek and provide connection between the street and park. A few of the existing fire hydrants along the west of the site will be fitted with attachments based on the Ivócsap project (as detailed in the design option section of this practicum) to turn them into public water fountains for both humans and dogs while still keeping them available for emergency use.



SECTION 02: MEADOW TRAIL



SECTION 03: EPHEMERAL CROCUS MEADOW



LOOKING SOUTH DOWN OMANDS COLONY DIVERSION OVER WET MEADOW

PROPOSED DESIGN: EPHEMERAL CROCUS MEADOW

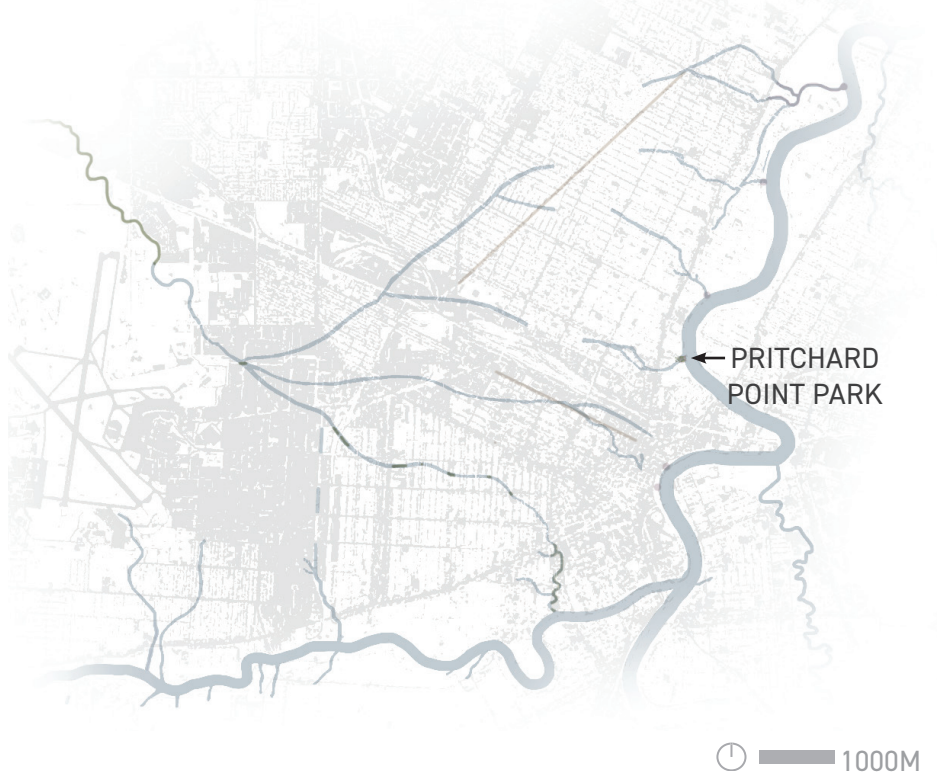
Colony Creek cut through this site long-ago before it was filled in and diverted to make way for development. The creek would have been ephemeral, filling with water in times of snow melt and heavy rains, but at times drying out almost completely. To honour this temporal nature of the original creek the proposed design seeks to lightly trace its path along the lawn and grassy slopes of Westview Park with a simple strip of prairie crocuses. These soft purple flowers will bloom in the spring at the time when the creek likely would have held the most water. By June the flowers will have disappeared back into the earth. The line of the former creek remaining barely visible, dotted with erratics and left to grow about six inches high, longer than the surrounding lawn to hint at the path of the former creek once the flowers have finished blooming for the season. This is reminiscent the vegetation that would have once marked the path of the creek even when water was no longer visible. Over time the flowers will move and spread outwards into the lawn as the creek would have once eroded its banks pushing outwards and curving inwards on itself.

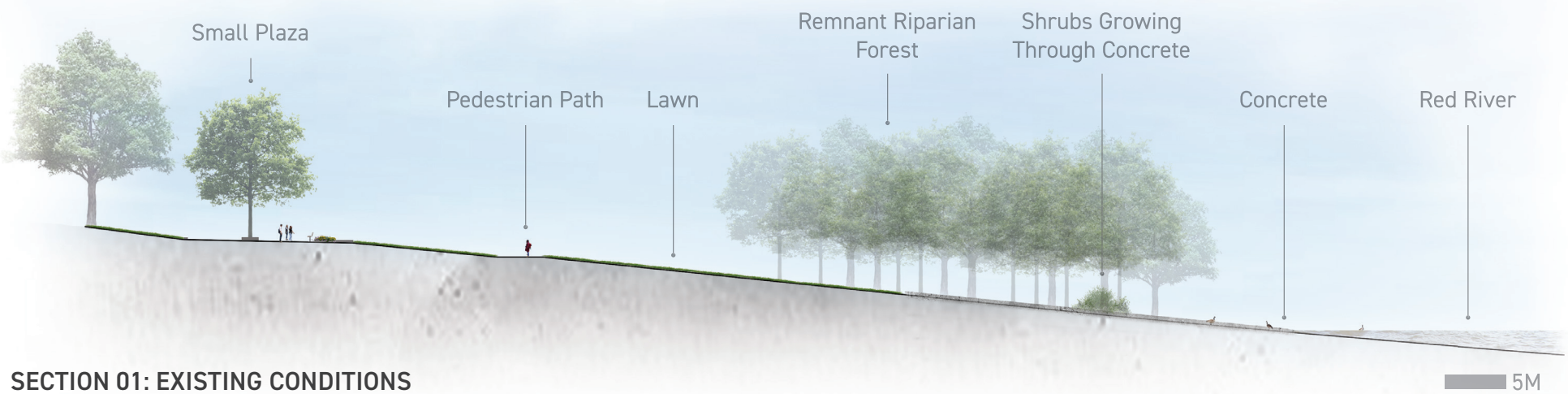
Right: Looking north over
Ephemeral Crocus Meadow



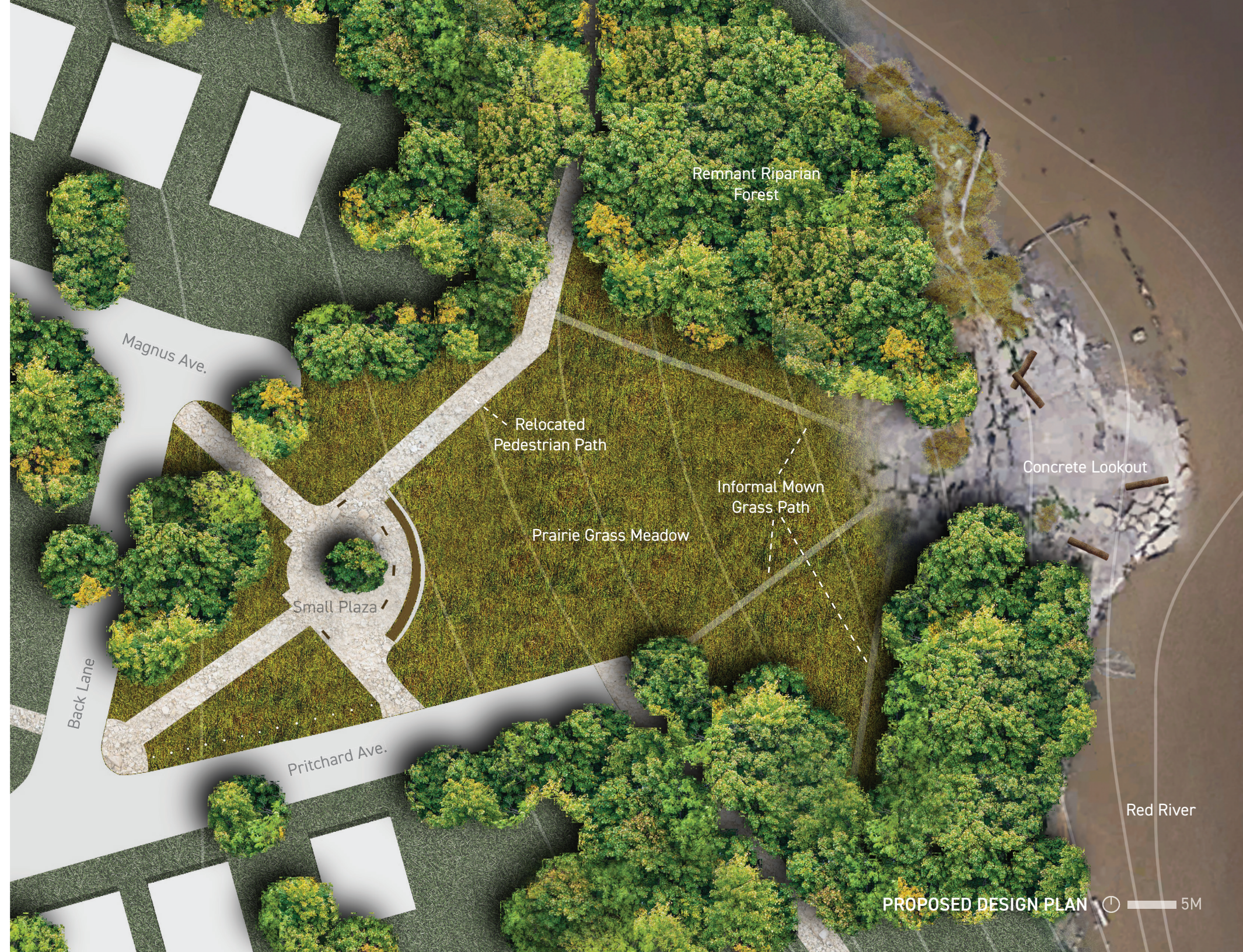
**CREEK MOUTH: PRITCHARD POINT PARK
PORTRAIT + ANALYSIS**

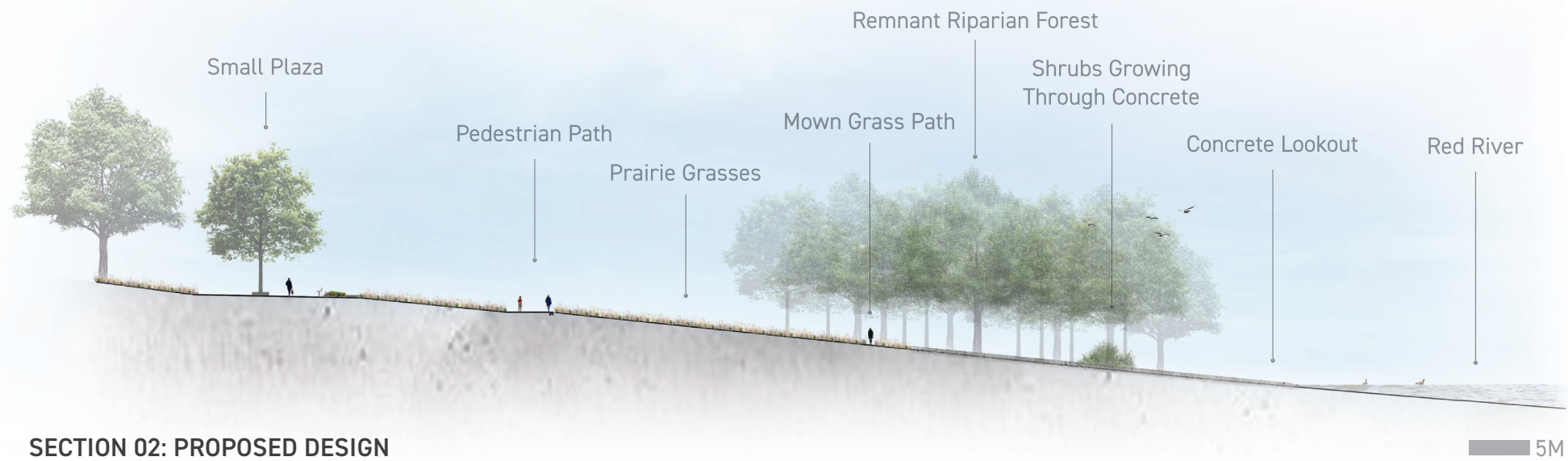
It is in this area that Pritchards Creek, which was once fed by Colony Creek would have drained into the Red River. The park is currently small and underused. There is a small plaza with a handful of benches and an empty planting bed. Garbage has collected here and overall, the park seems in need of maintenance. A gravel path bisects the lawn of the park connecting to a trail which meanders along the river. The slope of the bank where the park meets the river has been reinforced with concrete for some long-forgotten purpose. Shrubs and grasses now push through the concrete taking advantage of the cracks that have appeared overtime. The park is bordered by the parking lot for Winnipeg SOS to the west and by remnant riparian forest to the north and south. The surrounding area consists mainly of single family residential homes.





SECTION 01: EXISTING CONDITIONS





PROPOSED DESIGN

The proposed design for Pritchard Point Park utilizes the existing break in the riparian vegetation to bring awareness to the creek that once flowed here. The existing gravel path is severed and pedestrians are instead directed up through the existing plaza area and around to the existing path on the other side. Emphasizing this break in the trees and hinting at the presence of something on the site. Interpretive signage in the plaza will inform users of the creek that once cut through here and the important ecological role that it would have played. The existing lawn will be replaced with native prairie grasses which will be left to grow tall except for three narrow paths. These paths will be mowed across the site, creating an informal connection between the two edges

of the severed gravel path and the existing concrete area on the bank. These paths can be mowed differently each year allowing the site to morph and change over time. The concrete will be left as is to reveal another layer in the story of this site. The concrete pad offers a secluded place to lookout over the Red River. As time wears on the shrubs will continue to break up the concrete. The window in the riparian forest will be kept open to bring attention to the stream that once flowed through this space. Annual maintenance should be performed by either mowing or burning the meadow to prevent the trees from closing in.

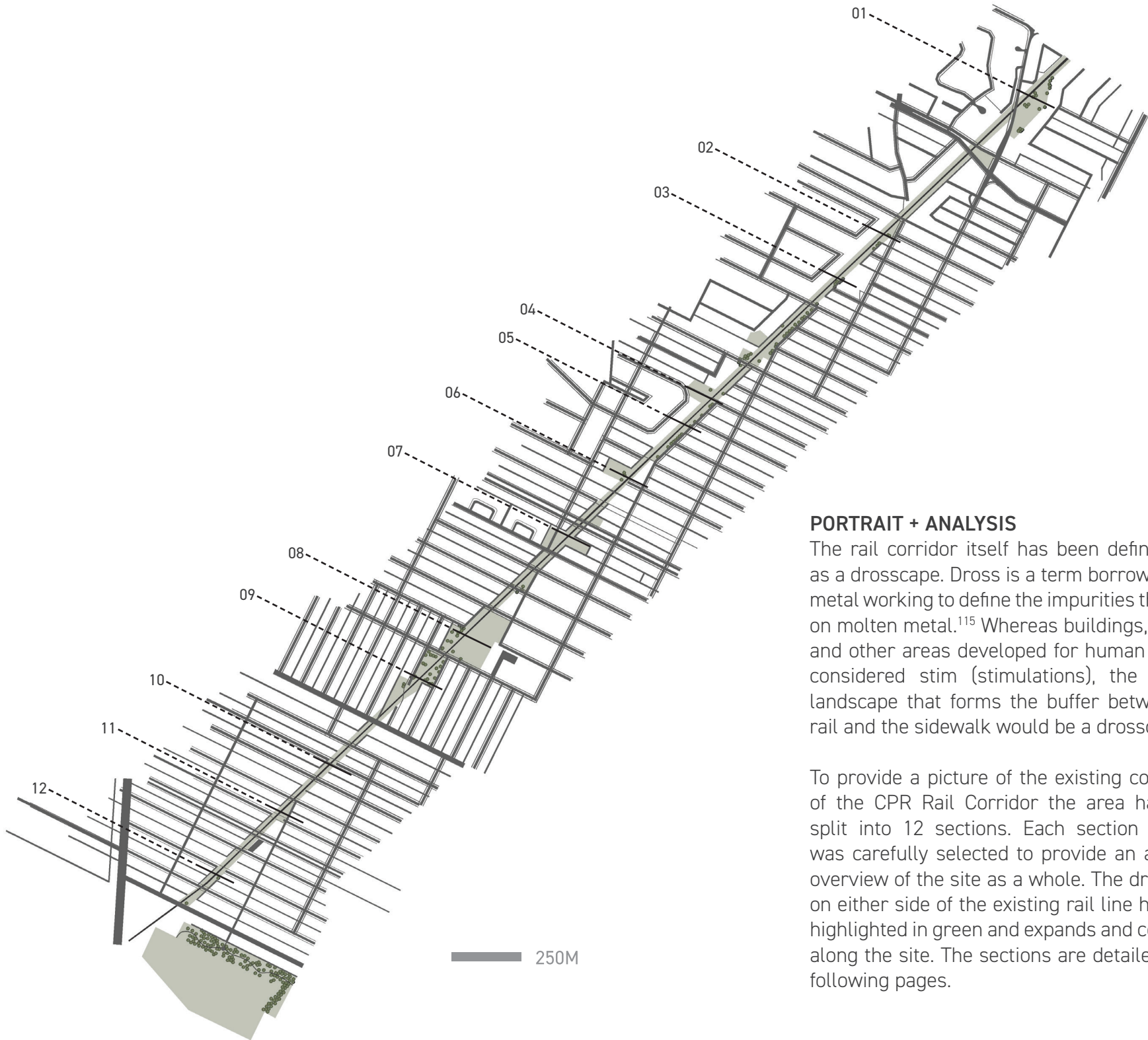


LOOKING EAST OVER PRAIRIE GRASS MEADOW TOWARDS THE RED RIVER

ADJACENT CORRIDOR: CPR RAIL CORRIDOR

The adjacent corridor does not directly mirror the course of the creek. This linear strip of land is located adjacent to a former arm of the creek. Intersecting multiple former creek beds, the CPR Rail Corridor cuts through an area that was once marshy and wet. This corridor provides a unique opportunity to elicit a memory of the former creek without tracing the historic path explicitly. A sequence of meadows and small treed groves weave their way along this green strip, providing the CPR Rail Corridor with a unique sense of place.

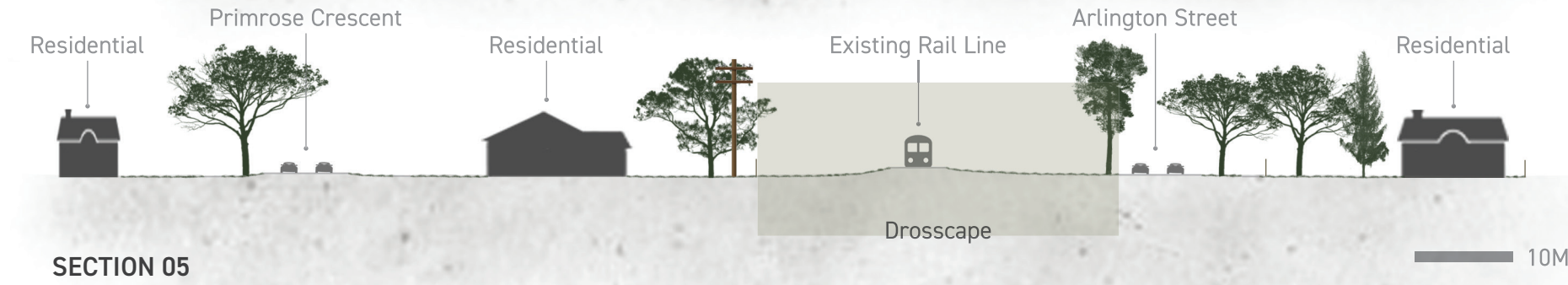
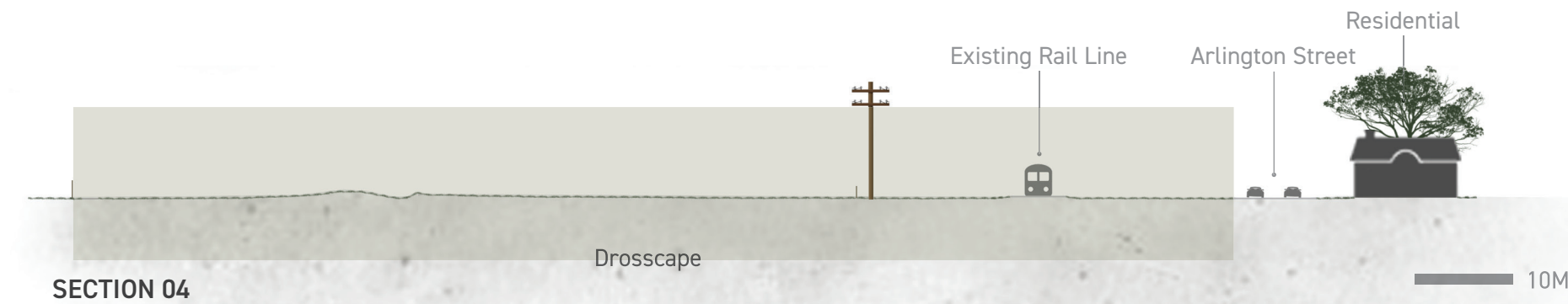
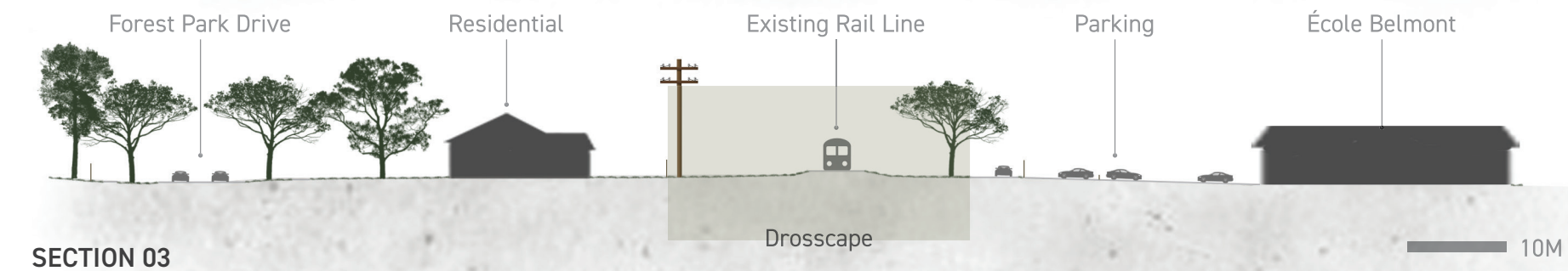
The CPR Rail Corridor stretches for just over four kilometers. This site runs along an active rail line with a wide green buffer on either side that is home to little other than a hydro corridor, quack grass and a few dandelions. A vast expanse of underused urban land. This corridor closely mirrors the path of the former creek offering a unique opportunity to highlight what has been lost, revitalize what is existing, and bridge the past and present realities of the site in a way that gives back to the surrounding community.

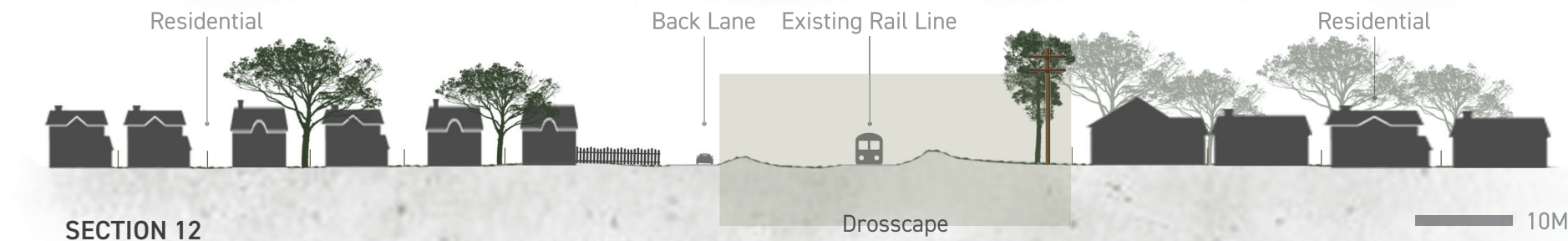
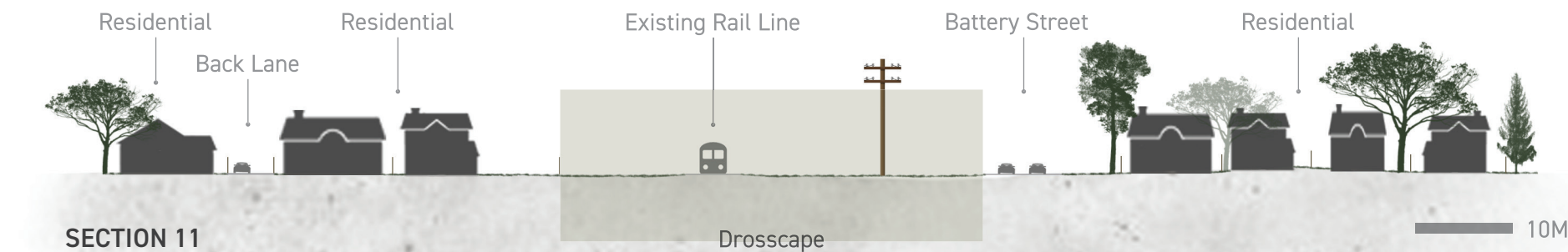
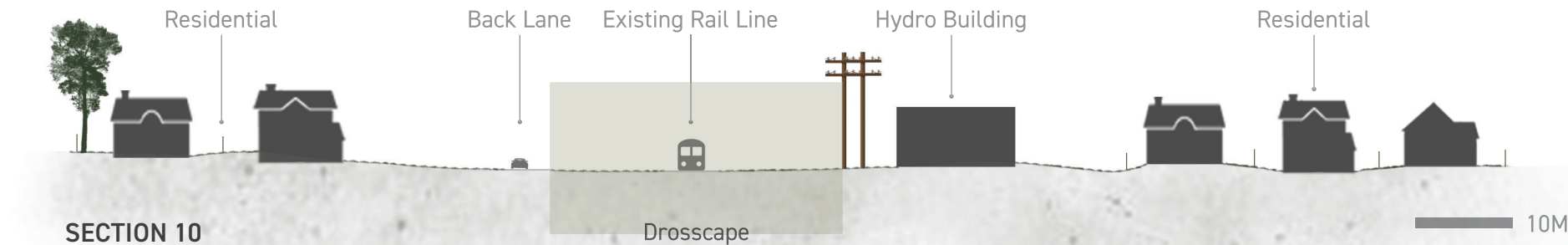
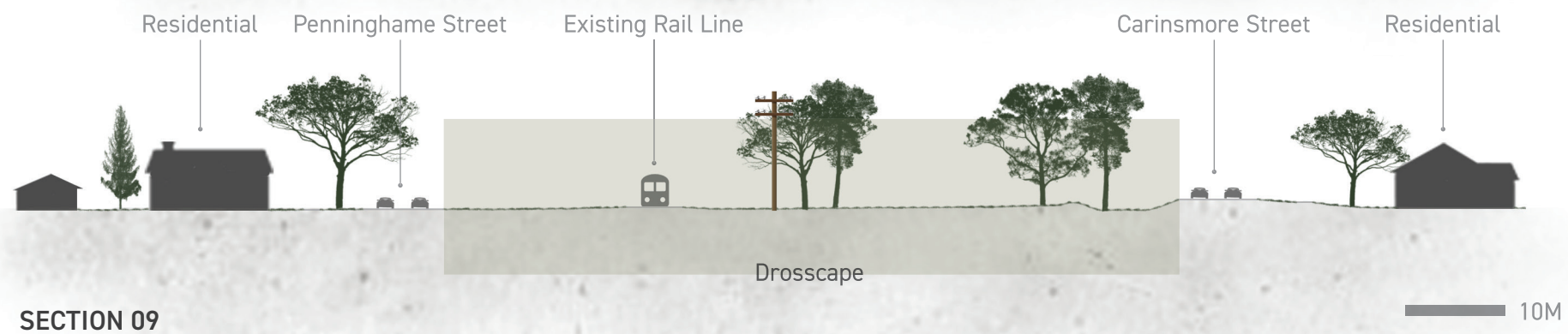
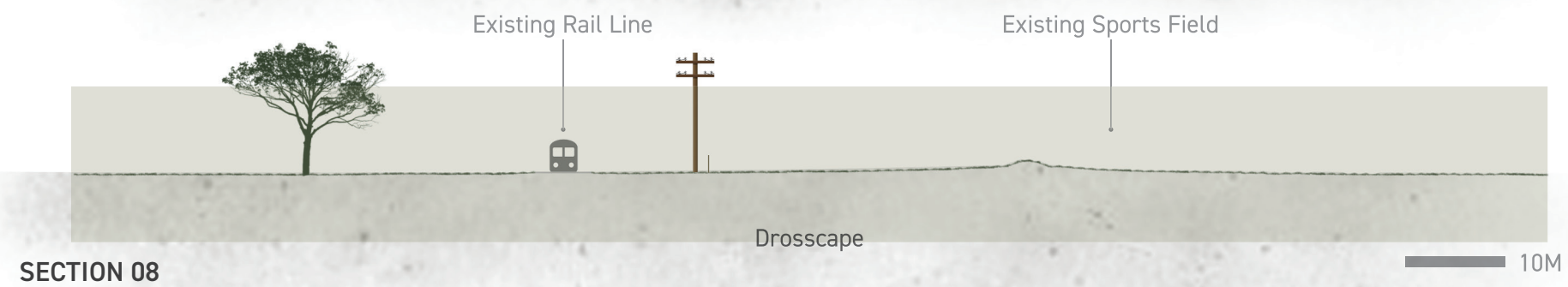
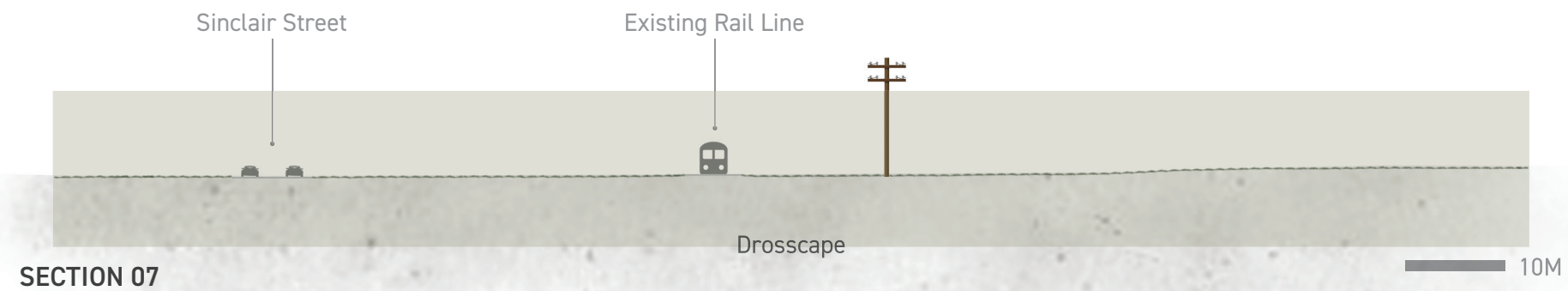


PORTRAIT + ANALYSIS

The rail corridor itself has been defined here as a drosscape. Dross is a term borrowed from metal working to define the impurities that form on molten metal.¹¹⁵ Whereas buildings, streets, and other areas developed for human use are considered stim (stimulations), the leftover landscape that forms the buffer between the rail and the sidewalk would be a drosscape.¹¹⁶

To provide a picture of the existing conditions of the CPR Rail Corridor the area has been split into 12 sections. Each section location was carefully selected to provide an accurate overview of the site as a whole. The drosscape on either side of the existing rail line has been highlighted in green and expands and contracts along the site. The sections are detailed in the following pages.







PORTRAIT + ANALYSIS: DESIGN CONCLUSIONS

The existing rail right-of-way cuts through swaths of single family residential homes in Winnipeg's North End. The vegetation mainly consists of weedy grasses with a few trees scattered along its length. The site is flat with very minimal change in topography. A hydro corridor runs along the rail line crossing from the east to the west near Polson Avenue.

The area of land adjacent to the rail line offers little ecological or recreational value. The grasses are mowed short in most areas reducing habitat opportunities for birds, small mammals and insects. In areas where the grasses are left to grow long a mix of Kentucky Bluegrass, Quack Grass and Dandelions dominate. The species diversity is minimal and most of the species present are non-native or invasive.

There is little evidence of recreational activity in this greenspace. As it exists currently a fine of \$220 could be levied against any person found trespassing in the area.¹¹⁷

The existing rail line provides unique design constraints. For safety reasons any path that is added to the site would need to be at least 5 to 7 meters away from the existing rail line as it is still active.¹¹⁸ In addition to this, a fence or barrier would need to be installed between the pedestrian area and the rail line.¹¹⁹

After completing an initial site assessment it is found that the site would benefit from improved ecological diversity, increase of habitat and untouched spaces for non-humans, and increased recreational opportunities. It is proposed that native plants be introduced in a series of three meadow types: xeric, mesic, and wet which will be mainly determined by micro-topography and soil type. These meadow types will be defined on the following pages.

Due to range site capability the three types of meadows will mix and blur along their borders. Some of the plants will migrate up and down the short slopes of the site to find their ideal moisture content. The final result will be one

cohesive meadow at first glance, but upon closer inspection the meadow species will reveal the underlying site conditions.

A small ditch along the existing rail line will act as a barrier between the active railway and the pedestrian corridor. This ditch will also act as a means of reflecting the creek that once flowed here; bringing water back to the site in a clearly constructed way. This acknowledges the departure from what could have been, but honours the ecological functions of the original creek.

Areas of meadow will remain inaccessible to human visitors allowing birds, insects, and small mammals to seek refuge here. In other areas a mixed-use recreational pathway will provide opportunities for cycling, running and walking. This path will be kept at least 5 meters away from the rail line for safety. Small pockets of greenspace will be retained from existing green sites along the rail line and re-developed into community gathering spaces.

**MEADOW PLANT SELECTION:
RUDERAL MEADOW CHALLENGES**

Selecting the species for the meadows along the CPR Rail Corridor posed a specific challenge. The land adjacent to the rail corridor experiences a high level of disturbance. Landscapes like this are highly polluted, have low levels of nutrients, and experience standing water or drought conditions throughout large parts of the year.¹²⁰ This landscape is defined as ruderal meaning a waste landscape or drossscape which experiences a high level of human caused disturbance.¹²¹ Treed woodlands along the CPR Rail Corridor have the benefit of shading out competition, however the grassland plantings would be especially susceptible to invasive species.¹²²

Ruderal landscapes adjacent to rail corridors experience a high degree of vegetation dynamics which leads to a high level of species diversity.¹²³ This is due to seeds from invasive species along further reaches of the rail line sticking to the mud and dirt along the side of the train.¹²⁴ These seeds can be transported long distances before falling off and spreading to other sites along the track.¹²⁵ Although there is a high level of species diversity in ruderal landscapes, many of these species are invasive and will out compete native plants.¹²⁶ Areas directly next to the rail line have the highest probability of being colonized by invasive plants.¹²⁷ To preserve the existing turf grass along the CPR Rail Corridor frequent maintenance would be required and annual pesticides sprays would be needed.¹²⁸

In the right conditions native species are able to thrive and can even out perform non-native species in ruderal habitats.¹²⁹ Planting native species along roadsides and rails will help prevent the spread of invasives along these ruderal corridors.¹³⁰ As more native species are planted along rail lines the ability for non-native seeds to spread and take hold will be reduced. During maintenance and construction re-using the soil from the site allows the native seed bank to remain in place and helps encourage continued growth of native species in disturbed sites.¹³¹

Although some studies have been conducted regarding roadside ruderal landscapes, much less research has been done around rail lines. However, studies have shown that rail adjacent landscapes behave much the same as roadside landscapes in terms of vegetation succession and colonization by invasive species.¹³²

More research is still needed to determine which native species from Manitoba will perform well in these sites. The species selection for the meadows along the CPR Rail Corridor includes both early colonizer species and species with a prolonged lifespan. Early colonizer species establish quickly in disturbed sites, but have shorter life spans and longer lived species take more time to establish but will provide enduring cover for the meadows. A seeding rate of 45 pure live seeds per square

foot is proposed for the CPR Rail Corridor.¹³³ This will allow the early colonizer species to move in while the longer lived species take time to establish themselves. This will reduce the amount of vacant ground and minimize the space available for invasive species to take over. In areas where disturbance has just occurred and the plants in an area have been removed, the early colonizers from the adjacent meadow plantings will begin to spread back into this section and re-establish.

Due to the length of the CPR Rail Corridor and the range of meadow types specified in this project, it is suggested that this site would offer a good opportunity to study which species are able to thrive in rail adjacent habitats through surveys of vegetation change over the years after meadow establishment. If the native plantings are robust enough, it is hypothesized that they should be able to push back against extensive invasion by weedy non-native species, especially if the use of a broad leaf pesticide during regular maintenance procedures continues.

A thriving native meadow grassland in this ruderal environment will bring important ecological services back to this landscape. These meadows will also provide important habitat and can act as a case study for ruderal plantings elsewhere in southern Manitoba.

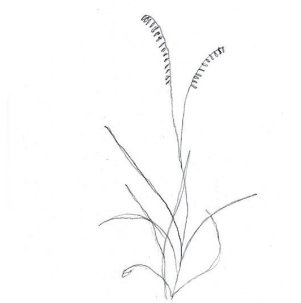




MEADOW PLANT SELECTION: XERIC MEADOW

The Xeric Meadow is found on uphill and rocky sites along the greenspace. The soil here is often dry especially during the heat of summer. The soils in these areas will be amended to create a sandy-loam with lower moisture retention than the clay and silty-clays typically found in this region.¹³⁴ Any lower-quality excavated fill from near the rail tracks can be used to build up these areas.

The plants found here are drought tolerant native grassland species including Blue Grama, Junegrass, Wild Flax, and Sheep Fescue. The flowers selected for this site have been chosen for their blue and purple tones which are reminiscent of water.



SIDEOATS GRAMA
Bouteloua curtipendula



BLUE GRAMA
Bouteloua gracilis



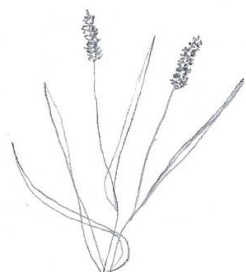
GREEN NEEDLE GRASS
Nassella viridula



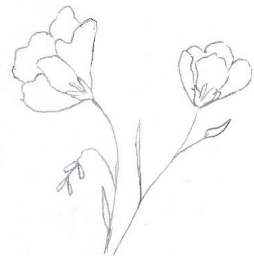
PURPLE PRAIRIE CLOVER
Dalea purpurea



HAIRY WILD RYE
Elymus villosus



JUNEGRASS
Koeleria macrantha



WILD FLAX
Linum lewisii



PRAIRIE CROCUS
Pulsatilla patens



SHEEP FESCUE
Festuca ovina saximontana



MEADOW PLANT SELECTION: MESIC MEADOW

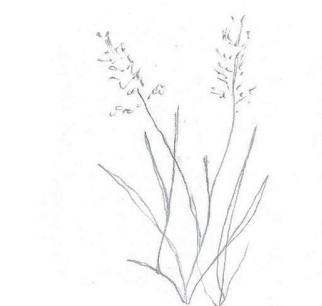
The Mesic Meadow dominates the design for the CPR Rail Corridor. This meadow features well-known prairie plants such as Big Bluestem, Harebell, Sorghastrum, and Giant Hyssop. Again, the flowers in this section have been selected for their blue and purple tones. This meadow has relatively moderate moisture content, with its soils being neither too wet nor too dry. The Mesic Meadow will grow on the existing thick clay and silty-clay prairie soils of this site.¹³⁵



BIG BLUESTEM
Andropogon gerardii



LITTLE BLUESTEM
Schizachyrium scoparium



SORGHASTRUM
Sorghastrum nutans



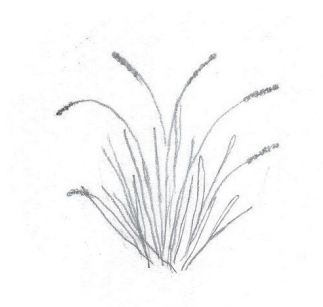
HAREBELL
Campanula rotundifolia L.



BLUE-EYED GRASS
Sisyrinchium montanum



AWNED WHEATGRASS
Agropyron subsecundum



PURPLE OAT GRASS
Schizachne purpurascens



GIANT HYSSOP
Agastache foeniculum



PRAIRIE DROPSEED
Sporobolus heterolepis



MEADOW PLANT SELECTION: WET MEADOW

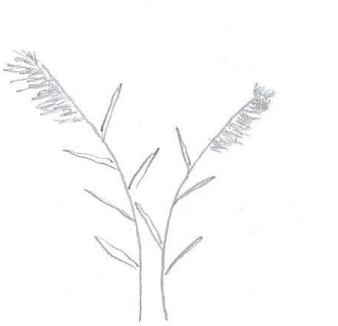
The Wet Meadow is found in low lying areas along the CPR Rail Corridor. These areas will be built on clay and silty-clay soils which are typical for this region.¹³⁶ In the wet meadow areas water is often present during times of heavy precipitation, spring melt, and flooding.

The wet meadows will be non-accessible to humans. These spaces will instead provide habitat for a variety of insects, reptiles, and small mammals to seek shelter. The wet meadows will also act as a safety barrier for the human users of the site, preventing them from accessing the train tracks.

The species selected for this meadow are flood tolerant and prefer high moisture content in the soils. Blue and purple flowers are provided by Wild Iris, Blue Vervain and Closed Gentian. Grasses and reeds such as Sweetgrass, Cordgrass, and Bluejoint Reedgrass fill out the pallet.



WILD IRIS
Iris versicolor



BLUEJOINT REEDGRASS
Calamagrostis canadensis



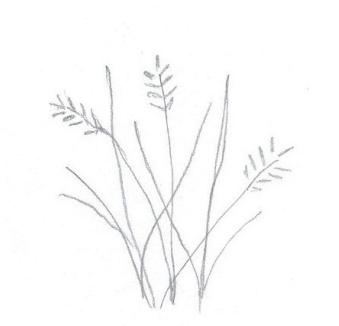
AMERICAN SLOUGH GRASS
Beckmannia syzigachne



FOWL BLUEGRASS
Poa palustris



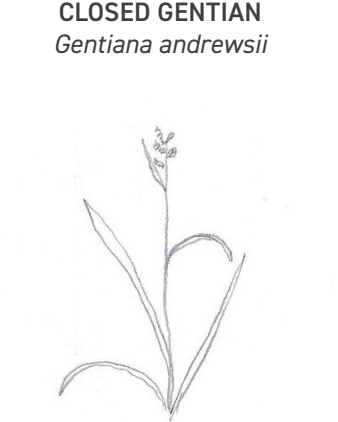
CLOSED GENTIAN
Gentiana andrewsii



PRAIRIE CORDGRASS
Spartina pectinata



BLUE VERVAIN
Verbena hastata



BEBB'S SEDGE
Carex bebbii



SWEETGRASS
Hierochloa odorata



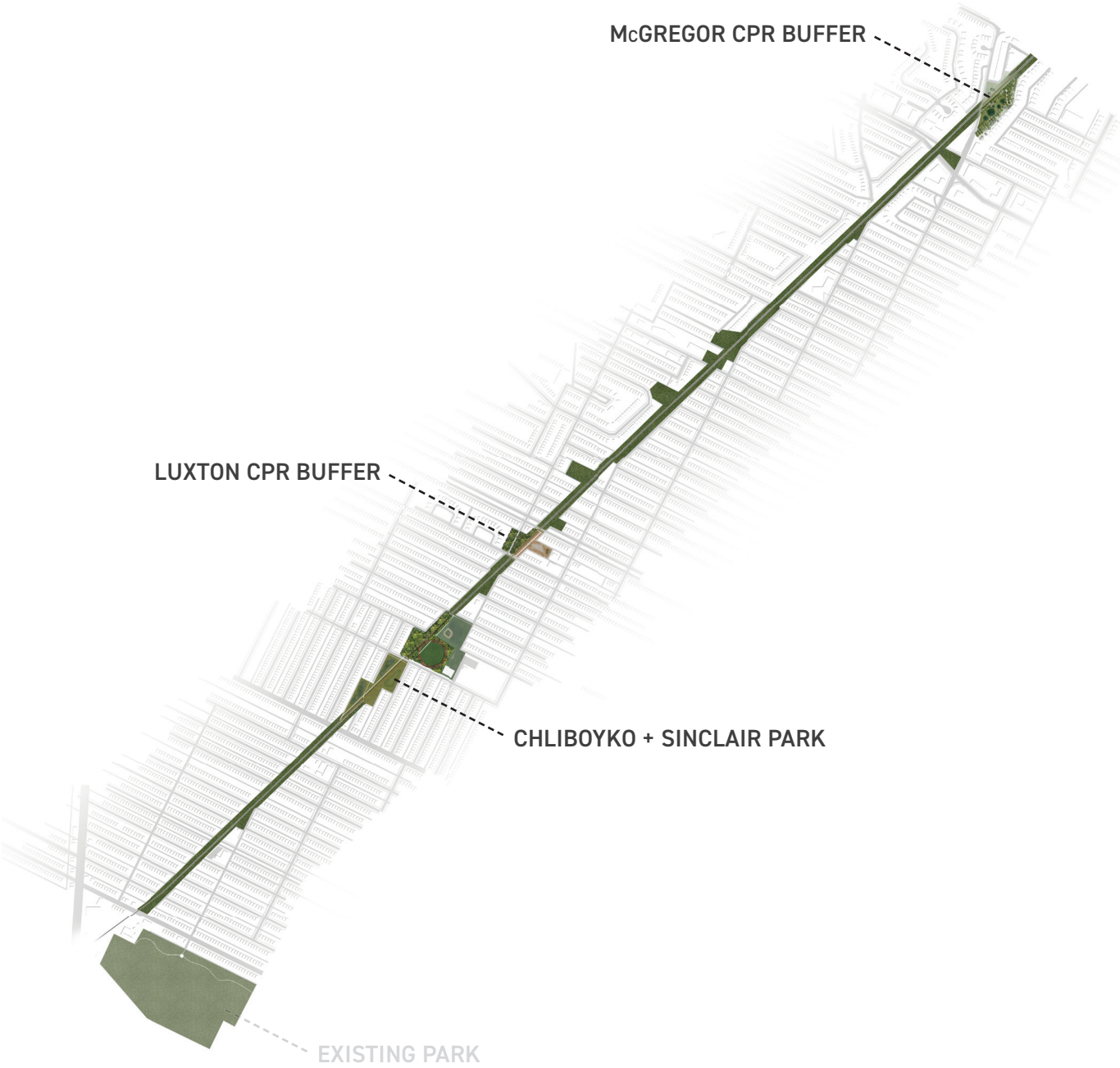
PROPOSED DESIGN: LINEAR MEADOWS

The meadows (Xeric, Mesic, and Wet) wind in and out of each other along the linear greenspace bisected by the existing rail corridor. On one side of the tracks the meadows are left untouched; providing habitat and refuge for the wildlife of the area. On the other side of the tracks a wide multi-use recreational path cuts its way through the meadows allowing access for cyclists, runners, and pedestrians. A precise depression is cut into the thick clay soils of the site to be planted with wet meadow species. This trench will collect runoff from the site and allowing it to slowly percolate into the soil and create a protective barrier between the pathway and the rail line.

PROPOSED DESIGN: POCKET GROVES

While the linear greenspace of the CPR Rail Corridor is defined with a variety of meadows, the small pockets where the greenspace swells outwards into the adjacent neighbourhoods are marked with groves of trees. The trees stand tall against the horizontal plane of the CPR Rail Corridor adding a vertical demarcation of the community gathering spaces and acting as a landmark for those travelling along the path. The meadows flow in and out of these spaces offering a continuous sense of place. Nine pockets punctuate the linear greenspace. Each pocket provides opportunities for gathering, community building, and recreation.

Three of these pockets have been selected for detailed design development. These are Chliboyko + Sinclair Park, Luxton CPR Buffer, and McGregor CPR Buffer. These sites were selected due to the amount of underused greenspace in these locations. These sites provide valuable opportunities for further development which would breathe new life into these spaces, providing habitat for small wildlife and new recreational opportunities for locals.





PROPOSED DESIGN

CHLIBOYKO + SINCLAIR PARK

This site currently consists of lawn with a few trees scattered throughout. The existing community centre to the east of the site uses the lawn for various sports as well as the baseball diamond to the north east. The southern section of the site appears unused except for a few lone dog walkers. The north and south of the site feel very disconnected.

The proposed design will turn the southern half of the site into a meadow which will flow into the linear meadows that extend the length of the CPR Rail Corridor. Here the western area of the site will be excavated slightly to create low lying wet meadows as well as a protective swale separating the path from the tracks. The eastern edge of the site will only be accessible from the adjacent neighbourhood and will not have any formal paths. Here a hill built from the excavated fill from the wet meadows will offer views for those who choose to explore it.

The northern half of the site will be planted thickly with deciduous trees. A clearing in the centre ringed with specimen trees will provide space for sports games and recreational activities to continue while also providing shade to spectators. Here the barrier to the tracks will consist of individual vertical wooden posts placed at six inch intervals to blend in with the trunks of the trees. The grove of trees will continue to the far north of the park before turning back into linear meadow.

Right: Looking northwest over clearing towards rail line





PROPOSED DESIGN

LUXTON CPR BUFFER

This small site is nestled between rows of single family houses. It lies in a disjointed intersection between various streets and alleyways. The west side of the site appears unused while the eastern side, where the land is lower, has become an informal garbage dump.

It is proposed that the western side of the site be planted with trees with only an informal forest trail cutting through this side offering space for those who wish to explore. The eastern side of the site will be filled with small rocks and boulders. The edges of the site will be planted with xeric meadow plants which will do well in the drier rocky environment. Shrubs and a scattering of trees will offer some shade to visitors. The centre area of the dry creek bed will contain natural loose parts. This exploratory play space can be used by the children of the adjacent neighbourhoods. Narrow paths connect the dry creek bed to the surrounding alleys and it is expected that more informal paths will form as people cut through the space. Boulders provide a protective barrier between cars and the west side of the park. A mix of shrubs and boulders provide a barrier between the park and the rail tracks.

Right: Looking west over reminiscent dry creek bed





PROPOSED DESIGN

McGREGOR CPR BUFFER

This site is bordered on the northwest by the rail tracks and on the southeast by the backyards of the adjacent single family residential homes. The whole site dips in the centre forming a swale which drains south towards McGregor Street. Some existing trees border the site. The rail line is raised above the existing lawn in the centre and the vegetation bordering the rail is left untended to provide a sort of barrier.

The existing hill and vegetated barrier between the tracks and the meadow will be retained for safety. The proposed design frames the space with a new gravel path. As this is the end of the linear greenspace along the CPR Rail Corridor the path forms a complete loop. New trees are planted in gridded rows among the existing trees, providing a frame for the site and offering some shade. In the centre, mesic meadows surround circular depressions where wet meadow plants thrive. The wet meadows will help catch run off from the adjacent train tracks and filter it before allowing it to slowly percolate into the ground. Mowed paths are cut through these central meadows inviting visitors to explore.

Right: Looking west across wet meadow



**MARKING COLLECTIVE
MEMORIES IN THE LANDSCAPE**

Water has always been a part of this land. Winnipeg is a wet prairie city; a river city. When European settlers arrived in this place and began to develop this city, the wealthy elite settled far from where Colony Creek sheet drained across the north end and into downtown.¹³⁷ However, to make way for industry which sat in the centre of these wet, working class neighbourhoods the wealthy elite began to drain the prairie.¹³⁸

Today these ghost creeks lie buried beneath our streets and buildings. Only a handful of creeks remain visible, saved from development by luck or location or the hard work of people who cared. It is hard to picture what our city would look like without the loss of these creeks. However, any attempt to return these lost waters would result in the displacement of many who currently live in lower income neighbourhoods. Not to mention that new,

expansive greenways are one of the quickest ways to spur on gentrification in these areas where most residents rely on affordable housing.

There are some things that can not be undone, but landscape architecture can begin to reveal these hidden stories. Water has shaped our city and continues to be a defining element of life in Winnipeg. This practicum begins to explore how the history of development in Winnipeg can be revealed without trying to return to the past or mimic an idealized image of nature. This research seeks to find ways in which history can be marked within our city in unexpected and sensitive ways. The landscape can help foster collective remembering and acknowledgment of how our city has changed over time. Hopefully, as we continue into the future we will make space to reveal more of these layers of history, slowly peeling back the layers of time in an effort to connect with our collective past. By

acknowledging the history buried beneath our landscape we create a public reminder to be more mindful of the ways that we develop. This practicum intends to create space to reveal the history of Winnipeg's development while also returning lost ecosystem services to the landscape. As development continues throughout Canada and the prairies we must learn from the past to improve our cities in the future.

As Landscape Architects we can fight for legislation to protect our existing creeks. These are often left forgotten and vulnerable to future development as illustrated in the case studies section of this practicum. Without proper protections in place, these creeks will continue to deteriorate until they are stripped of their ecological functions all together. Places for remembering our history become meaningless without actions taken to prevent these mistakes from reoccurring in the future.



ENDNOTES

1. Robert Michael W. Graham, *The Surface Waters of Winnipeg: Rivers, Streams, Ponds, and Wetlands 1874 - 1984, The Cyclical History of Urban Land Drainage*, (Winnipeg: University of Manitoba, 1984), 3.

2. Graham, *The Surface Waters of Winnipeg*, 38.

3. Graham, *The Surface Waters of Winnipeg*, 50.

4. Shannon Stunden Bower, *Wet Prairie: People, Land, and Water in Agricultural Manitoba*, (Vancouver: UBC Press, 2011), 19.

5. Graham, *The Surface Waters of Winnipeg*, 81.

6. Graham, *The Surface Waters of Winnipeg*, 90.

7. Graham, *The Surface Waters of Winnipeg*, 91.

8. Graham, *The Surface Waters of Winnipeg*, 91.

9. Stunden Bower, *Wet Prairie: People, Land, and Water in Agricultural Manitoba*, 47.

10. Stunden Bower, *Wet Prairie: People, Land, and Water in Agricultural Manitoba*, 45.

11. Stunden Bower, *Wet Prairie: People, Land, and Water in Agricultural Manitoba*, 45.

12. Graham, *The Surface Waters of Winnipeg*, 37, Figure 1.

13. Graham, *The Surface Waters of Winnipeg*, 78-79.

14. Graham, *The Surface Waters of Winnipeg*, 78-79.

15. Graham, *The Surface Waters of Winnipeg*, 78-79.

16. Graham, *The Surface Waters of Winnipeg*, 78-79.

17. Graham, *The Surface Waters of Winnipeg*, 78-79.

18. Graham, *The Surface Waters of Winnipeg*, 78-79.

19. Graham, *The Surface Waters of Winnipeg*, 78-79.

20. Graham, *The Surface Waters of Winnipeg*, 51, 61.

21. Graham, *The Surface Waters of Winnipeg*, 51.

22. Graham, *The Surface Waters of Winnipeg*, 55.

23. Graham, *The Surface Waters of Winnipeg*, 55.

24. Graham, *The Surface Waters of Winnipeg*, 102-103; Garth Woolison, *Water Works*, (Winnipeg: University of Manitoba, 2018), 25.

25. Woolison, *Water Works*, 7, 19.

26. Woolison, *Water Works*, 7.

27. Daniel Hiebert, "Class, Ethnicity and Residential Structure: The Social Geography of Winnipeg, 1901–1921," *Journal of Historical Geography* 17, no. 1 (1991): 60.

28. Alan F. J. Artibise, *Winnipeg a Social History of Urban Growth, 1874-1914*. (Montreal: McGill-Queen's University Press, 1975), 225.

29. Artibise, *Winnipeg a Social History of Urban Growth*, 207, 225.

30. Hiebert, "Class, Ethnicity and Residential Structure: The Social Geography of Winnipeg, 1901–1921," 66.

31. Hiebert, "Class, Ethnicity and Residential Structure: The Social Geography of Winnipeg, 1901–1921," 214.

32. Owen Toews, *Stolen City: Racial Capitalism and the Making of Winnipeg*. (Winnipeg, ARP Books, 2018), 45, 50.

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FIGURES

All figures are by Madeleine Dafoe except as follows:

Pg 012 Rivers & streams of Winnipeg 1874
Created by author. Adapted from: Graham, Robert Michael W. *The Surface Waters of Winnipeg 1874*. 1984. Map. In *The Surface Waters of Winnipeg: Rivers, Streams, Ponds, and Wetlands 1874 - 1984*. The Cyclical History of Urban Land Drainage. (Winnipeg: University of Manitoba, 1984), 11.
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Pg 017 The Wards of Winnipeg
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Pg 078	Linear Projections Created by author. Source layers used: Graham, Robert Michael W. <i>The Surface Waters of Winnipeg 1874</i> . 1984. Map. In The Surface Waters of Winnipeg: Rivers, Streams, Ponds, and Wetlands 1874 - 1984. The Cyclical History of Urban Land Drainage. (Winnipeg: University of Manitoba, 1984), 11; Google

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Pg 087	Sites for Further Development Created by author. Source layers used: Graham, Robert Michael W. <i>The Surface Waters of Winnipeg 1874</i> . 1984. Map. In The Surface Waters of Winnipeg: Rivers, Streams, Ponds, and Wetlands 1874 - 1984. The Cyclical History of Urban Land Drainage. (Winnipeg: University of Manitoba, 1984), 11; Google Earth. 49°54'24"N 97°10'52"W. Elevation 233m. Imagery Date, September 25, 2014. Accessed May 12, 2021. hhttps://earth.google.com/web/@49.90667567,-97.18127702,233.01103558a,15020.44118578d,35y,359.51184978h,0t,0r .
Pg 088	Colony Coulee: Westview Park Created by author. Source layers used: Graham, Robert Michael W. <i>The Surface Waters of Winnipeg 1874</i> . 1984. Map. In The Surface Waters of Winnipeg: Rivers, Streams, Ponds, and Wetlands 1874 - 1984. The Cyclical History of Urban Land Drainage. (Winnipeg: University of Manitoba, 1984), 11; Google Earth. 49°54'24"N 97°10'52"W. Elevation 233m. Imagery Date, September 25, 2014. Accessed May 12, 2021. hhttps://earth.google.com/web/@49.90667567,-97.18127702,233.01103558a,15020.44118578d,35y,359.51184978h,0t,0r .
Pg 089	Colony Coulee: Existing Conditions Plan Manitoba Land Initiative. <i>1:20,000 Digital Topographic Mapping, Contours</i> . 2004. SHP File. Government of Manitoba. https://mli2.gov.mb.ca/t20k/index_topo_capital_region.html .
Pg 090	Colony Coulee: Proposed Design Plan Manitoba Land Initiative. <i>1:20,000 Digital Topographic Mapping,</i>

	<i>Contours</i> . 2004. SHP File. Government of Manitoba. https://mli2.gov.mb.ca/t20k/index_topo_capital_region.html .
Pg 094	Creek Mouth: Pritchard Point Park Created by author. Source layers used: Graham, Robert Michael W. <i>The Surface Waters of Winnipeg 1874</i> . 1984. Map. In The Surface Waters of Winnipeg: Rivers, Streams, Ponds, and Wetlands 1874 - 1984. The Cyclical History of Urban Land Drainage. (Winnipeg: University of Manitoba, 1984), 11; Google Earth. 49°54'24"N 97°10'52"W. Elevation 233m. Imagery Date, September 25, 2014. Accessed May 12, 2021. hhttps://earth.google.com/web/@49.90667567,-97.18127702,233.01103558a,15020.44118578d,35y,359.51184978h,0t,0r .
Pg 100	Adjacent Corridor: CPR Rail Corridor Created by author. Source layers used: Graham, Robert Michael W. <i>The Surface Waters of Winnipeg 1874</i> . 1984. Map. In The Surface Waters of Winnipeg: Rivers, Streams, Ponds, and Wetlands 1874 - 1984. The Cyclical History of Urban Land Drainage. (Winnipeg: University of Manitoba, 1984), 11; Google Earth. 49°54'24"N 97°10'52"W. Elevation 233m. Imagery Date, September 25, 2014. Accessed May 12, 2021. hhttps://earth.google.com/web/@49.90667567,-97.18127702,233.01103558a,15020.44118578d,35y,359.51184978h,0t,0r .

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