eersterivier
Odendaal, P., 2018

hoor die rivier die rivier was eerste hier

hear the river[1] the river was here first
she carries the stories of generations
our pasts spume over stones
we are always under way
one day we'll return to the sea
to remind the waves of the gravity
that guides all currents into rivers

hoor die rivier die rivier was eerste hier
hear the river the river was here first

Untold waters

_Regrowing a coextensive urban riverine landscape through flood mitigation and rehabilitation strategies

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Masters Thesis Landscape Architecture
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Unless stated otherwise all pictures and graphics by author

^Mud-soaked shoes. Photograph by Nakkie van Wyk, nd.

STICHTING NHBOS
ter bevordering van de landschapsarchitectuur

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The introduction grounds the project by presenting the lens through which the research, design development, explorations, and final representations have been approached and shaped.

^Figure 1. Left: The rich cultural, geographical, and hydrological heritage of Africa can be found in its striking contrasts. River and stream surface area (%) map by Stevens (2018), edited by author.

^^Figure 2. Next page. The Hottentots Holland Mountains covered in native Fynbos vegetation.

Untold waters

Introduction

Keywords
Landscape architecture
South Africa
Riverine landscape
Urban city
Fynbos

^Figure 3. South Africa, the southernmost country in Africa

Abstract

Landscape roots

This thesis investigates how fragile urban landscapes[2] can be strengthened and rehabilitated towards a coextensive urban riverine landscape[3].

Unexpected floods frequently devastate vulnerable communities, such as the informal settlements[4] in Sir Lowry's Pass Village, South Africa, located in the Western Cape province of South Africa. These seasonal and increasing occurrences often destroy homes and, tragically, claim lives due to insufficient flood mitigation strategies and policies.

The practice of slowing, diverting, and using floodwaters has been developed across diverse cultures and contexts into unique water strategies. These strategies have proven sustainable due to the locals' understanding of the natural cycles and patterns. In many cases, these water management strategies have been implemented to improve agricultural productivity and the liveability of the locals - and unlike many contemporary solutions, which often rely on mechanised, and linear systems, a hands-on[5] approach prioritises direct human involvement and care, emphasising local knowledge over engineered interventions. The value of studying such case studies is to learn from and extract principles that could inform contemporary urban approaches.

The purpose of this research is therefore to explore alternative flood mitigation and riverine rehabilitation strategies that draw inspiration from existing low-tech water management practices, with a focus on simplicity, sustainability, and community engagement.

Locating the project

Riverine landscape

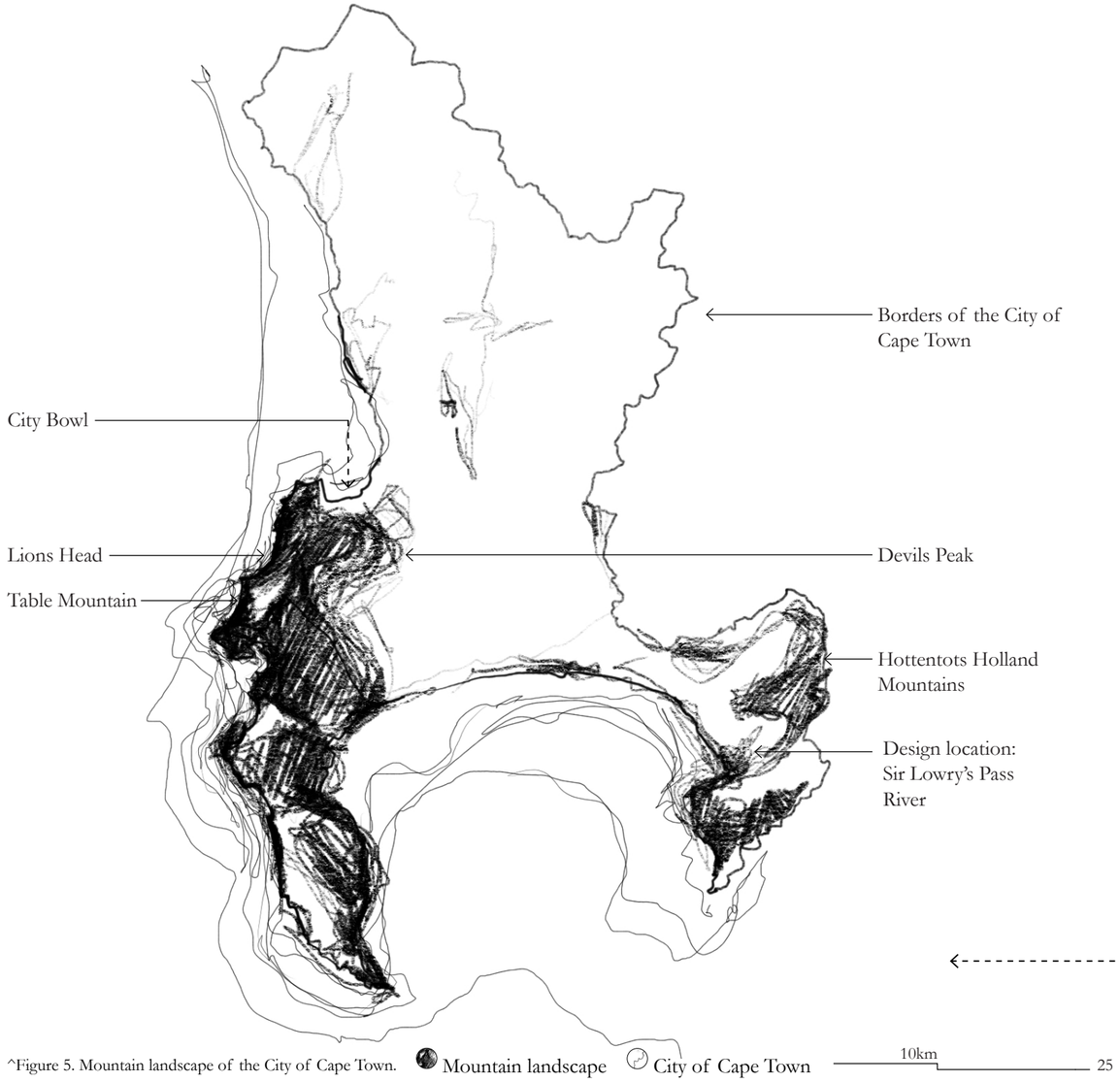
For this project, we find ourselves in the Republic of South Africa, the southernmost country in Africa. The project is located in one of the three capital cities of South Africa, the vibrant City of Cape Town[6] (Figure 3).

The project further unfolds over a barely noticeable riverine landscape, slowly suffocating under a neglected urban layer - the Sir Lowry's Pass River landscape (Figure 7). A riverine landscape can be described as a landscape shaped by the movement, the liveliness and the dynamism of a river.

The twelve kilometre river is located within the south eastern region of the city, and is bordered by one of South Africa's many timeless and rugged mountain landscapes, the Hottentots Holland Mountains. The extent and scale of this project is determined by the riverine landscape, its interactions with other landscape elements, with people, and with the spatial qualities that arise from these relationships.

^^Figure 4. Next page: City of Cape Town - a place where the mountains meet the sea. Photograph by McNally, 1946.

City of Cape Town
Table Mountain
Lions Head
City Bowl



^Figure 5. Mountain landscape of the City of Cape Town.

Cape Town

Cape Town is locally known as the place where the mountain meets - or even becomes - the sea*. Globally, it is renowned for its unique and striking landmark, a World Heritage Site and one of the Seven Natural Wonders of the World: Table Mountain (South African National Parks, n.d.). Rising up to 1,590 metres, the mountains and the sea are iconic features of Cape Town, sculpting a landscape where the boundaries between earth and water flow seamlessly into one another (Figure 4). The rich heritage of Cape Town is deeply intertwined with these mountains and waters, which have become an enduring anchor in the identity of its people.

^^Figure 6. Outline of the Western Cape, South Africa.

For the residents of Cape Town, commonly known as Capetonians, the mountain represents more than a natural wonder; it stands as a cultural anchor and a vital part of their identity. The local community has shaped itself around the contours of this mountain-and-sea landscape, forging a profound sense of place within the City Bowl. This area is embraced by natural landmarks such as Signal Hill, Lion's Head, Table Mountain, and Devil's Peak (Figures 4 and 5).

The influence of the landscape on the lives of its inhabitants traces back to the very origins of Cape Town, once known as *Ilkhamis sa* - the Khoi term meaning "sweet water for all" (Camissa Museum, n.d.)**. Fresh water flowed abundantly from rivers and springs cascading down the mountains, nourishing the indigenous Fynbos vegetation and providing a vital home for both animals and humans ***. This plentiful supply of fresh water was the principal reason this region was chosen as a midway point for passing ships. In 1652, the Dutch East India Company (VOC) established the first European settlement in what is now Cape Town. Initially conceived as a resupply station to provide fresh produce to ships involved in the East Asian spice trade, the settlement grew as Dutch settlers began cultivating the surrounding land. Over time, the initial colonial boundaries expanded eastward and northward, eventually culminating in the formation of the Union of South Africa in 1910 (Government Communication and Information System, 2003). Thus, the **fresh water sources** of Cape Town laid the essential foundations for what would develop into modern South Africa.

*The indigenous Khoi people of this land named the mountain *Huri ǂOaxa*, which carries the meaning of "where the sea rises" (Breda, n.d.).
**Further elaboration of the indigenous groups, such as the Khoi can be found on page 37 and in Appendix B.
***The Fynbos Biome is South Africa's dominant shrubland vegetation. Further elaboration and images can be found on page 42 and in Appendix A.

Over hundreds of years, the landscape has been central in shaping the contemporary city[6], its identity, and its growth. This project explores the narratives, water systems, communities, and rich biodiversity that have collectively shaped the cultural diversity, depth, and distinctiveness of this South African city. The following pages of this introduction will thus reveal the value of water within the history of Cape Town, its people, and the design location. It will examine how water has inspired perceptions of the landscape and influenced the relationship between people and land. How water has inspired art and poetry while simultaneously becoming a symbol of political tension. How it has shaped urban patterns, been obscured within them, and then held accountable for their decline. How it has sculpted childhood memories and trauma. How it has been viewed as failing infrastructure and as a challenge to visions of growth. Ultimately, this project is dedicated to the river and the telling of its story.

Structure and reading of the report

Untold waters[7]

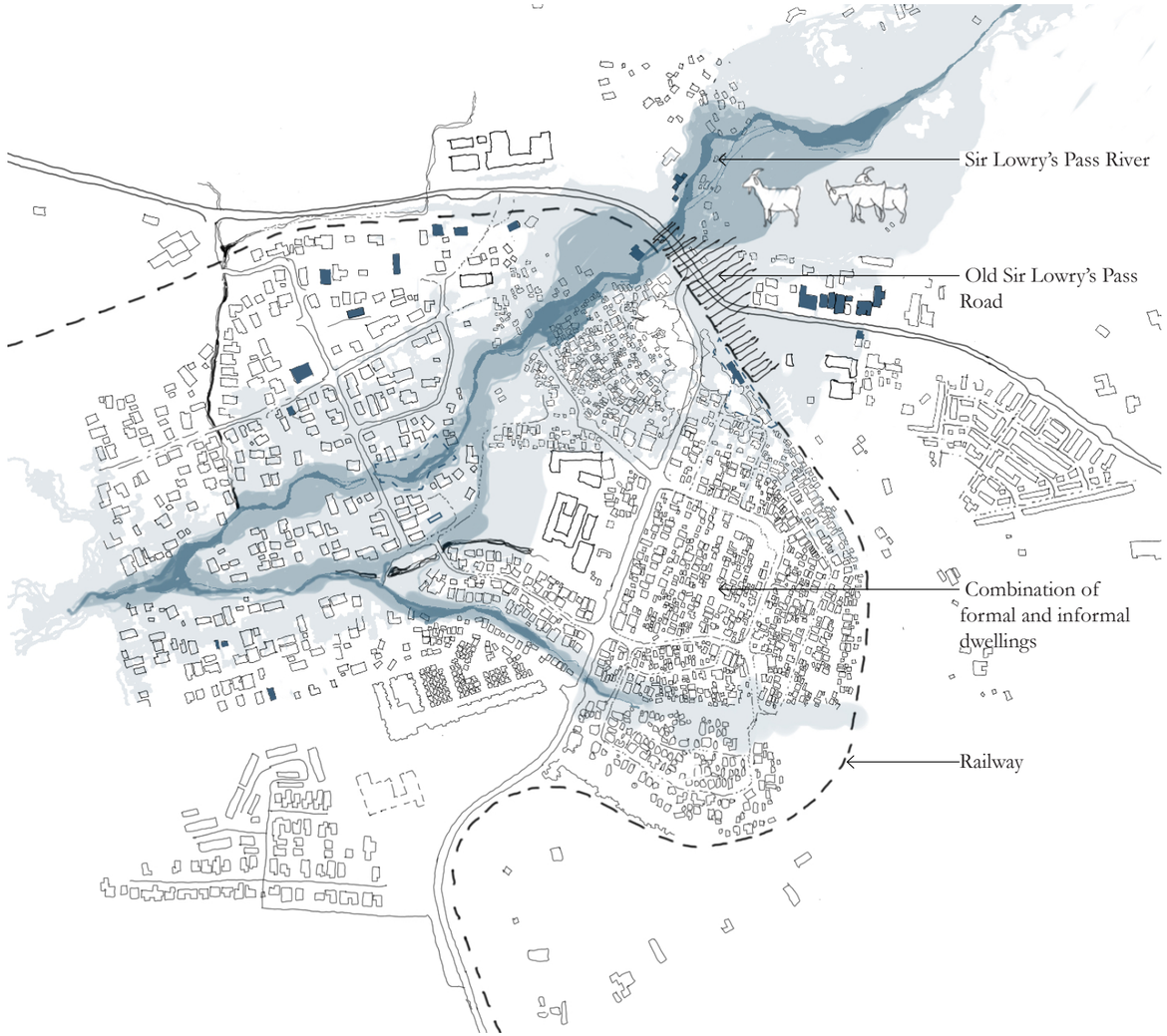
Untold stories, situated knowledge lost, history revealed. Cape Town's hydrological heritage embodies multiple cultures, languages, identities, and narratives - all intrinsically linked to water in some way. As noted earlier, water's presence often lives on in the names given to people and places, such as the indigenous group known as the *IIAmmaqua*, or "water people." For centuries, water was regarded as an invaluable resource, carefully tended and respected. However, with population growth and urban expansion, the condition of the rivers declined. Reflecting this deterioration, merchant Saul Solomon described in 1880 a "state of misery, if not of sin," referring to the poor sanitary conditions of the canals (Brown & Magoba, 2009) (See Appendix B for further elaboration). This project seeks to tell the story of the water that has shaped Cape Town, focusing in particular on one river threading through its landscape - the Sir Lowry's Pass River (Figure 7). Despite centuries of history and change, the river continues to flow, yet it has never been given the chance to tell its own story.

Report structure

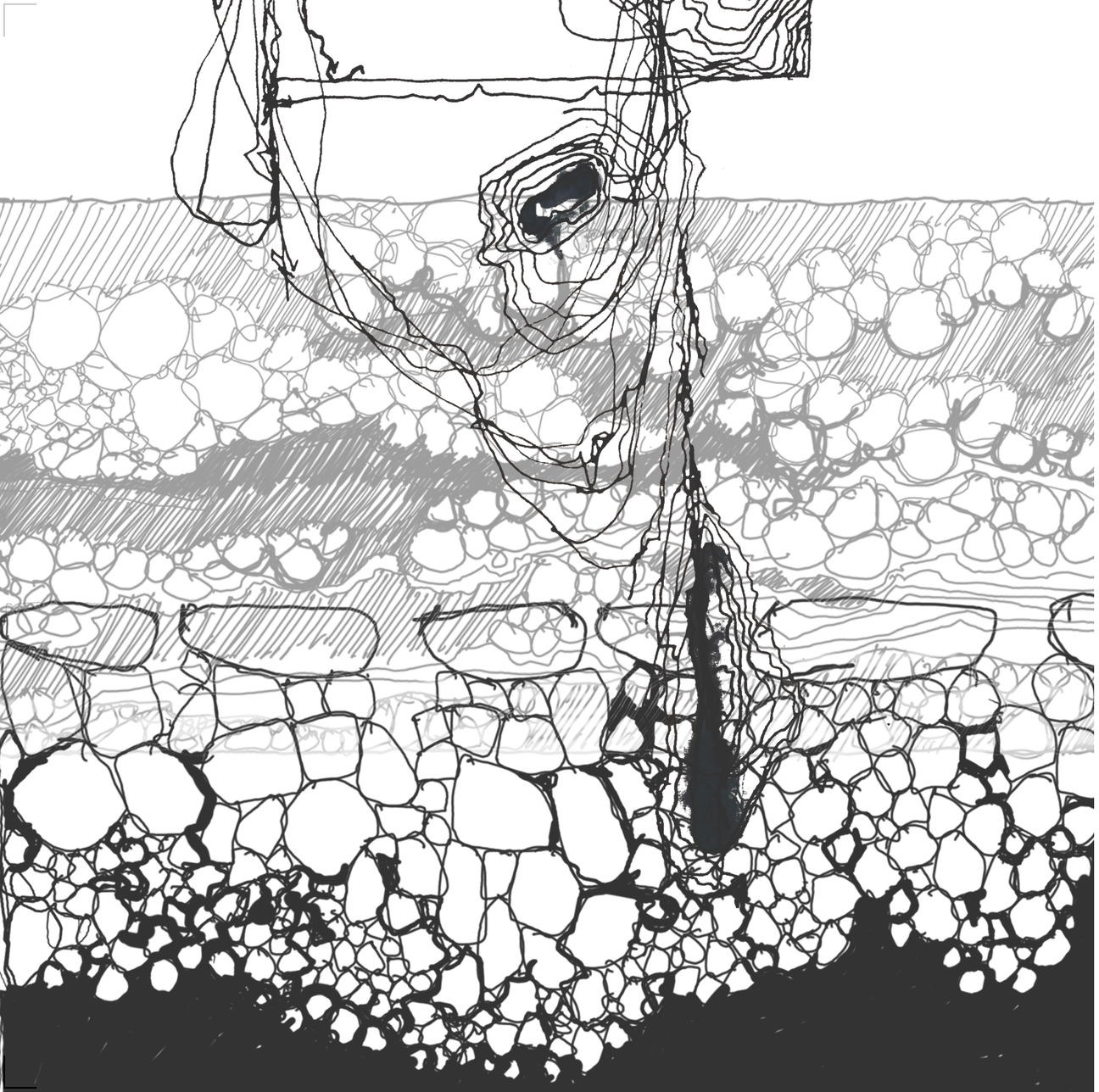
The report and project unfold as an extension of the riverine landscape, recognising that a river's water goes beyond its banks - it seeps into our bodies, dreams, stories, and songs. Along with the author's approach to landscape architecture, the river's presence has shaped how the report is written, explained, and shown. Because of this, the report uses glossaries to explain terms, sketches to show ideas, and drawings to communicate concepts and the presence of the river.

Glossary

The glossary is placed after each section and appears throughout the report, as certain terms gain relevance only later in the project, offering moments to pause and reflect on the meaning of specific words.



^Figure 7. Zoom-in design location: Sir Lowry's Pass River passing through the Sir Lowry's Pass Village.



Thinking by sketching

Sketching is a way to quickly test spatial ideas and concepts, and it is perhaps the most important tool for a designer. Visualising ideas can often communicate and engage more effectively than words. For this reason, the **development** of the project is shown throughout the report in the form of experimental sketches and models.

Drawing as a methodology

The intention of the report is to represent and visualise the concepts and themes of the project through drawing. These drawings are not meant to illustrate a final product, but rather to **express a narrative**, an idea, or an approach that is specific to this project. The narrative is sculpted by the relationship of the fixed / predictable / designed and the unpredictable / spontaneous / flexible nature of the landscape and the community. The drawing methodology is explained further on page 29.

Book parts: Territorial Entanglement, Roots, The Riparian Dweller, The Waterkeepers

The overarching themes of the project led to the naming of the report's parts: Territorial Entanglement, Roots, The Riparian Dweller, and The Waterkeepers. Each of these themes holds a unique meaning in relation to time, scale, and intention.

^Figure 8. Entangled narratives represented in the parts of the report.

Territorial Entanglement:
This section orients the reader within the context and intention of the project. It outlines the theoretical framework and introduces the methodology, offering a lens through which the work is viewed, questioned, and shaped.

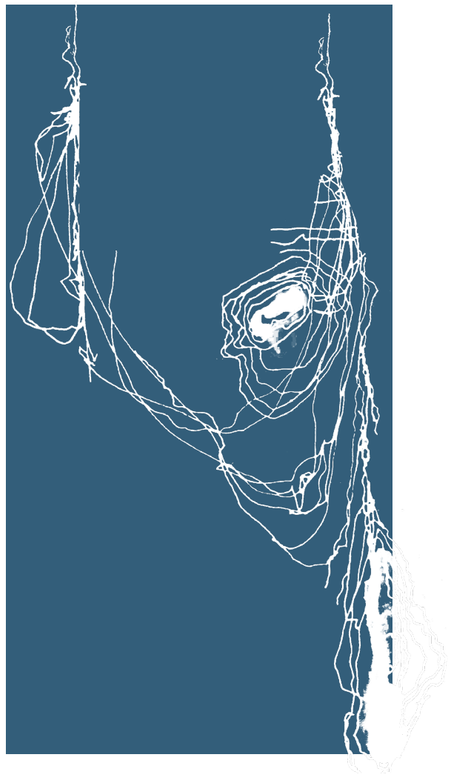
Roots:
Here, the research traces the forces of time, growth, and transformation within the project landscape - conceived as a layered and evolving terrain. Roots is an exploration of the geographical, hydrological, social, and political context that have shaped the site and its waters. This part further illustrates the overall design strategies, and outlines the objectives for the zoomed-in design intentions.

The Riparian dweller:
This section explores how people in South Africa live with the river through case studies, both historical and contemporary. It examines traditional and current relationships between people and water, and influences the concept of intimacy, materiality, and hands-on nature of the design interventions.

The Waterkeepers
This final section is where the design zoom-in interventions are grounded in the site. It weaves the knowledge gathered from previous chapters into a narrative of care and design. The tools and strategies identified earlier now become tangible, as a series of proposals that reflect the river's story and the community's characteristics.

Untold waters_Regrowing a coextensive urban riverine landscape through flood mitigation and rehabilitation strategies

Part one_**Territorial Entanglement**



Part two_**Roots**

Part three_**The Riparian Dweller**

Part four_**The Waterkeepers**

^Figures 9-12. Visual representations of the report parts.

Sir Lowry's Pass River Flood, September 2023

The Sir Lowry's Pass River originates in the thick clouds that lay heavily on the Hottentots Holland Mountains*. The river then meanders through an extraordinarily rich and diverse landscapes, through thick shrubs of native Fynbos vegetation, out into False Bay, and into the Atlantic Ocean.

This project emerged in response to the recent flooding[8] of the Sir Lowry's Pass River, which had a significant impact on vulnerable communities living in informal settlements along its banks, particularly in Sir Lowry's Pass Village (Figure 14). Starting on the 23rd of September 2023, the Eastern and Western Cape provinces experienced extreme weather events, including heavy rainfall and strong winds. Over several days, rivers overflowed, roads were closed, trees fell, and parts of the region were left without electricity. Tragically, some people went missing and lives were lost. The Sir Lowry's Pass River flood began during the night of the 24th and intensified into the early morning of the 25th, when the river burst its banks. Within 24 hours, nearly 150 mm of rain had fallen - almost a third of Cape Town's average annual rainfall. The intensity of the event forced residents to evacuate their homes during the night (FloodList, 2023) (see interviews on the following page).

Photographs taken in the days following the flood show the scale of the damage, with homes and streets covered in water, mud, and debris (McFarlane, 2023) (Figure 15).

Seasonal flooding is no exception in riverine landscapes. The following reflection published by the South African Water Research Commission captures the recurring impact of seasonal floods on vulnerable informal settlements:

"During the dry summer months, many places here look perfect for settlement. People buy a shack on the informal housing market, or build on an open piece of land. But when the winter rains come to this natural wetland, the high water table seeps up, pooling in and around houses where it will stagnate for days. Even in the formally housed areas, where the wetland has been tarred over and cemented in, stormwater drains back up: debris and household waste then flood the streets and nearby homes and businesses."
- Ziervogel and Joubert, 2014**

For centuries, rivers have been denied a voice - subdued beneath streets, buried by development, channelled into silence, expected to conform to urban needs. But in the moment of flood, the river breaks its silence. Can we fault the river for this? This project acknowledges that rivers change, meander, swell, recede, split, and rejoin. Their rhythms are long and measured in geological time. Meanwhile, our lives mark only fleeting moments within that broader cycle. What we experience as destruction is, from the river's perspective, simply motion - continuation. Flooding, in this context, is not the failure of the river, but the result of our own interference.

^Figure 14. Aftermath of the 2023 flood in the Sir Lowry's Pass Village. Photograph by 4THE1, 2023.
*This natural occurence is locally referred to as the "tablecloth". Cape Town was referred to by the Khoi as ǁHui !Gaeb, translated to "where the clouds meet" (Breda, n.d.).
**Large areas of natural wetlands once covered parts of Cape Town but were rapidly transformed by human influence. See Appendix C.

A local teacher reported that the soil brought by the river was promptly removed by the City, despite community members intentions to use it as a resource for construction purposes. (Hope and Light Community Welfare teacher, 2025)

^Figure 15. Left: Build-up of river sedimentation post-flood 2023. Photograph by Hendricks, 2023.

^^Links to interviews post-flood in Sir Lowry's Pass Village : https://youtu.be/Qs20Q1xdzeg?si=EieKe5OguYQn6Y3w, https://www.youtube.com/watch?app=desktop&v=Qs20Q1xdzeg

Fascination with this river, its people, and context

Immersed in the landscape

Individuals become rooted[9] in the soil of the earth, and fill it with their memories, experiences, and stories for future generations to discover. People settle and grow in a place either by choice or by force. Within these landscapes, they endure hardship, drought, and isolation; through survival, loss, and renewal, they develop customs and practices that connect them deeply to the land.

When the extreme rainfall struck Cape Town in 2023, it became evident that existing infrastructure, as built and provided by the City of Cape Town, was insufficient to prevent such events. Although the City's policies emphasise the importance of flood mitigation and river rehabilitation (see Appendix D), implemented interventions often remain highly engineered and fail to reflect the realities and needs of local communities, as seen in the current project along the lower reaches of the Sir Lowry's Pass River (see Appendix E). This approach, particularly in vulnerable communities who feel the immediate effect of a powerful river, has encouraged an exploration of an alternative attitude toward flood mitigation strategies. This has further sparked my curiosity about the relationship people build with the places they inhabit - how they care for and remain committed to their environment despite potential risks.

This location is distinctive due to the way its residents have rooted themselves in the landscape (through in-situ upgrades and informal place making), the quality of life they maintain (need to adapt to uncertainty and temporality), the polluted state of the river, the heritage of the land, and the future potential of the riverine landscape. These characteristics - informality, flexibility, adaptability, and hands-on, situated innovation - have shaped the perspective and approach of this project.

Project position / framing the project

The authors positioning and framing of the project are rooted in personal experiences and knowledge as a local South African, alongside an open-minded exploration of the existing conditions on the site. This perspective is informed by an awareness of the more-than-human landscape and interpretation of the role of landscape architecture. The following four themes are essential to understanding how the project is framed:

Informal landscapes

According to a 2022 census, an estimated 170,000 households - each representing an individual home - currently live in informal areas, making up 11.7% of Capetonian households (City of Cape Town, 2023). This makes informal settlements a common and significant part of the city's identity. Informal areas often face the threat of temporality due to forced removals, relocations, and sudden natural events,

^Figure 16. Left: Regardless of. Children playing in the puddles left by the flood in the informal areas of Sir Lowry's Pass Village. Photograph by Hendricks, 2023.

causing them to appear and disappear within short periods.* Observers unfamiliar with informal settlements may not recognise them as a valuable part of Cape Town's landscape. However, informal areas include valuable family homes and are part of strong communities - rich with meaning, culture, belonging, and identity.

In conclusion, a central consideration of this project is the acknowledgement that informal areas are an intrinsic and valuable part of the South African context, deserving of dignity and urban opportunities. Engaging with the complexities of these living conditions poses a significant and necessary challenge. Although it is not possible to address every issue faced by informal communities within this project, focusing on targeted improvements - such as enhancing safety during future flooding events or enabling economic opportunities tied to the landscape - can have significant value.

Flexible landscapes

Many informal areas have developed without formal legal approval and therefore do not conform to conventional rules and regulations. Instead, they are autopoietic - in a process of self-creation, growing from internal logics shaped by the people who inhabit them, continuously adapting to changes in the landscape, and demonstrating a necessity for flexibility and self-reliance. The residents' ways of living and their spatial place-making have been sculpted by situated knowledge, a unique interpretation of place, and a capacity for adaptation. Consequently, the landscape itself evolves with the same inherent flexibility. These characteristics are unique to both the community and the landscape, and are often unpredictable and unknown to outsiders. Recognising that these human and non-human patterns cannot be designed or imposed, this project aims to respond in a similarly flexible manner - allowing space for continuous adaptation, growth, and individual transformation. This is done by introducing specific fixed landscape elements that serve as a foundation upon which unpredictable processes and narratives can unfold, evolve, and shape the future landscape.

This perspective on informal settlements was reflected in a series of workshops held in the Western Cape in 2017. The City of Cape Town hosted consultative sessions aimed at addressing key constraints that have historically limited the upgrading of informal settlements. These challenges included financial constraints, urbanisation pressures, procurement delays, and political or institutional barriers. In response, the city introduced a "toolkit" comprising resources and references designed to support municipalities in upgrading informal settlements. This initiative marks a shift away from the eradication of informal settlements toward an incremental, in-situ approach that empowers residents to improve their homes and environments without the disruption of relocation (du Trevou, 2018). This approach aligns closely with the aims of this project, which focuses on the potential for participatory, step-by-step upgrading of informal settlements.

*In winter 2024, over 40 informal settlements were flooded, displacing more than 2,000 residents (Francke and Yose, 2024). During a weather warning, the City demolished informal areas and blamed the community for obstructing flood infrastructure, without questioning the infrastructure's suitability for informal settlements (Cape Youth Collective, 2024).

River's Perspective

The river as a living being - it weaves and breathes its way through its informal surroundings. Yet, the urban pressures of Cape Town have pushed these living rivers beneath layers of built structures, pollution, and neglect.

Taking inspiration from McFarlane's recent book Is a River Alive? (2025), this project explores the ability of landscape design to influence the perception of a river's aliveness. The design exploration is a discovery of ideas and concepts surrounding the future landscape relationships between humans and the river, in a way that the river is experienced and understood as a living being. How might design reshape the way individuals, communities, cities, and governments perceive a river through a reframed infrastructural relationship? Yet, this project does not conclude with proposed interventions alone. Just as McFarlane describes writing his book with the rivers he addresses, the Sir Lowry's Pass River emerges in this project as the central actor in the ongoing story of its own future development. The river will shape the future design of the land.

Experiencing landscape architectural spaces

Through this research, the project aims to explore how the tools and insights of landscape architecture can be used to shape experiential landscapes - spaces that foster collaboration with the natural environment and support sustainable living in an urban context.

Experiential landscapes offer a powerful means of heightening our awareness of place. They provoke curiosity, deepen presence, and enhance our engagement with the environment. Finnish architect Juhani Pallasmaa, in The Eyes of the Skin (1996), describes touch as the "sensory mode which integrates our experience of the world and of ourselves." This suggests that the relationship between awareness, place, and space is fundamental to how we interact with our surroundings - potentially shaping our sense of care, responsibility, and belonging. This theme will remain central throughout the design development.

Landscape architecture, as a discipline, is uniquely situated to engage with the temporal, the ecological, and the human. With a background in architecture and experience designing enclosed spaces, I have come to value how landscape architecture extends beyond the static and structural. It embraces the unpredictable: wind and rain, growing roots and shifting seasons, migration and decay. It operates at both the vast scale of ecosystems and the intimate scale of the body. It is in this balance - between systemic complexity and the nuances of human experience - that the discipline finds its strength.

Landscape architecture can shape how people experience and relate to place, whether through subtle gestures, bold interventions, or the barely perceptible. As Ian McHarg writes in Design with Nature (1969), "Our eyes do not divide us from the world, but unite us with it." The perceptual connection to place matters

- it lingers in memory and shapes the way we live in and with landscapes. Elizabeth Meyer (2008), professor of landscape architecture, argues that designed experiences have the power to influence individual ethics toward the environment - thereby advancing sustainability. This notion is particularly relevant to this project, which depends on active human engagement[15] to sustain its function. Through carefully crafted experiences, we can encourage people to slow down, reflect, and recognise their own impermanence, collecting stories, memories, and values that reinforce sustainable action. The contribution of this project lies in acknowledging and reinforcing the existing relationship between people and the river - not to separate them, but to recognise their mutual dependence. The transformation the project hopes to inspire is one of perception: to see the river not merely as infrastructure or backdrop, but as a living being - deserving of health and valued life.

Research question

Through an extensive exploration of the project's values and positioning, the following research question was developed:

How can hands-on water management principles inform flood mitigation and rehabilitation strategies to foster a coextensive urban riverine landscape?

Sub-questions:

The Sir Lowry's Pass River, like many rivers in the City of Cape Town, passes through contrasting and often disconnected urban areas. Yet, what these areas have in common is their connection to the river. One of the sub-research questions therefore asks: **How can the river act as a link between scattered urban nodes in a way that connects the disconnected residents?**

Current plans for the river, aimed at preventing flooding in the formal residential area, rely on engineered solutions to rectify, level, and dike the river. A system like this may discourage a human–river relationship based on intimacy, interconnectedness, and experience of the natural rhythms and cycles of the river. This project aims to address the mitigation of potential flooding through alternative, hands-on methods - one that strengthens the relationship between human and river. This leads to the second research sub-question: **How can existing hands-on water systems inform new flood mitigation methods in urban environments?**

If the flood mitigation system functions on the basis of low-tech, simple, and manageable methods, it would require active interaction between human and river - in an attempt to undo the nature-culture divide. An important question that follows is: **How can landscape design encourage responsibility and care from the local community?**

Approach

Contribution & motivation <----- How can hands-on water management principles inform flood mitigation and rehabilitation strategies to foster a coextensive urban riverine landscape?

River as a being

^Figure 17. Sir Lowry's Pass River extent during extreme rainfall in 2023. ● Sir Lowry's Pass River

1. River

Rivier (Afrikaans)
The river is an ancient presence - one that has shaped this landscape long before human settlement. It embodies continuous processes: building, eroding, shifting, and quietly resisting imposed boundaries. Then comes the moment of overflow - when its waters breach the limits of their containment, entering informal homes, disrupting daily life, and etching themselves into collective memory. In this moment, the river ceases to act solely on the physical terrain; it transforms perception. It forces us to confront what we have long neglected - its power, its presence, and its essential role in sustaining life.

2. Fragile urban landscapes

Fragile urban landscapes are limited in their capacity for long-term, sustainable planning, shaped by the pressures of a rapidly growing and increasingly demanding population. In these contexts, immediate human needs - particularly the need for shelter - often take precedence over ecological considerations. This prioritisation of human interests above those of non-human beings reflects a one-sided relationship with the environment. It is precisely this imbalance that renders such urban landscapes fragile.

3. Coextensive riverine landscape

A coextensive riverine landscape is proposed as a response to the fragility of current urban environments. It challenges the imbalance caused by development models that prioritise human needs at the expense of ecological systems. This approach reframes the landscape - not as a backdrop to urban life, but as a living, riverine system that predates human intervention and will continue to evolve beyond it. The landscape is not inert; it is shaped by water, sediment, vegetation, and time. Urban life cannot exist in isolation, sealed off from this dynamic terrain. Coexistence becomes imperative - sharing space with the river as an original and enduring inhabitant.

While the past cannot be undone, each design decision presents an opportunity to choose a different future.

11. Informal settlements

Informal settlements refer to areas occupied beyond the boundaries of authorised or legal conditions. The formation of such communities often result from state instability and the lack of affordable housing within cities, resulting in individuals addressing their housing needs independently by settling on land that may not be suitable for habitation (Nkoane, 2019). These areas frequently include riverbanks, vacant or transitional spaces, and sometimes privately owned lands, such as those belonging to railway companies or unused farmland. Such settlements inherently lack formal urban planning and architectural standards, leaving them vulnerable to natural hazards like flooding and fire. Furthermore, within informal communities, social structures, unwritten rules, and intricate relationships take shape. Thus, meaningful local engagement becomes essential to truly comprehend the needs of these communities.

5. Hands-on, low-tech

An infrastructural response grounded in intimacy, flexibility, and creativity toward its natural surroundings and ecological rhythms. These qualities were first observed during initial fieldwork visits to the rural Hantam region, where individuals - farmers and farmworkers alike - rely on physical resilience, ingenuity, and resourcefulness to sustain livelihoods in an environment marked by extreme conditions.

7. Untold Waters

Untold speaks to both what has been silenced or hidden, and to the immeasurable - an expanse too vast to fully grasp. In the context of this project, it refers to the unseen depths of the river: its identity, its history, and its uncertain future. The term was inspired by the oral accounts of the Saaidam farmers, who would sit in darkness, waiting for the river's arrival - unaware of its speed, volume, or impact on their fragile infrastructure. This tension, born from uncertainty and vulnerability, reveals the weight of what remains unspoken. Untold also reflects the condition of many informal communities in Cape Town - routinely overlooked, marginalised, and dismissed. Their stories, like those of the river, are often swept aside, despite being essential to the life and resilience of the landscape.

6. Cape Town

Cape Town is a city of colour - shaped by the convergence of diverse cultures that have contributed to a layered and distinctive identity, deeply rooted in its surrounding landscape. Its people are connected by shared natural elements: the mountains, winds, rains, and seas that define the environment. Yet the city bears the lasting imprints of its complex past. These are visible in the degraded condition of many rivers, the vulnerable living situations within under-resourced communities, and the stark socio-economic divides that influence daily life. Political tensions continue to echo unresolved historical injustices. Still, within this complexity, Cape Town remains a landscape of resilience and quiet hope.

8. Flooding

Flooding is defined as "the condition of becoming covered with a large amount of water" (Cambridge University Press, 2025). Despite this neutral definition, it is most often framed in negative terms. Phrases such as "at risk of flooding," "designed to prevent flooding," "victims of flooding," and "flooding was getting worse" (Pearson Education, 2025) reflect a widespread perception of flooding as solely harmful. While this project critically examines the impact of flooding within urban environments, it also seeks to reframe flooding as an essential and natural function of riverine systems. Periodic inundation plays a vital role in shaping ecosystems and sustaining specific habitats. It is only through the encroachment of urban infrastructure into flood-prone zones that flooding has come to be seen primarily as a destructive force, rather than an integral part of the hydrological cycle.

Sir Lowry's Pass Village fieldwork photographs.

Informal occupation of farm house remnants

Grazing goats

Informal living within the immediate floodplain of the Sir Lowry's Pass River

Community nodes

Street markets

Provided ablution blocks

Self-built homes and urban elements

^Figure 18-25. Nodes or important design considerations within Sir Lowry's Pass Village.

Sir Lowry's Pass Village fieldwork photographs

Social nodes in the community, such as small shops

Invasive eucalyptus trees

Soil degradation, wind, and table-cloth clouds

Fall of the land where the river once flowed through a Fynbos landscape

Old Sir Lowry's Pass Road dividing the landscape

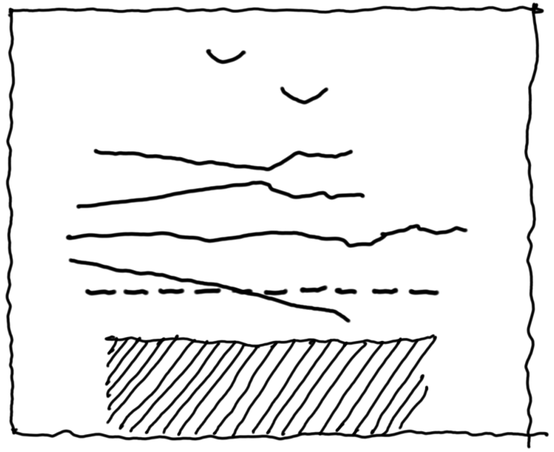
Remaining natural wetland

Historical buildings along the railway.

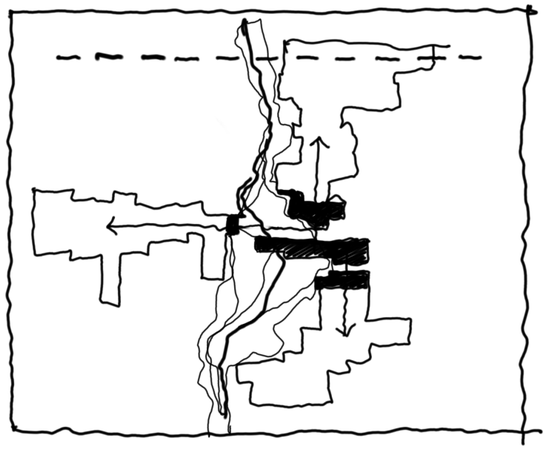
Large invasive alien tree species

^Figure 26-33. Nodes or important design considerations within Sir Lowry's Pass Village.

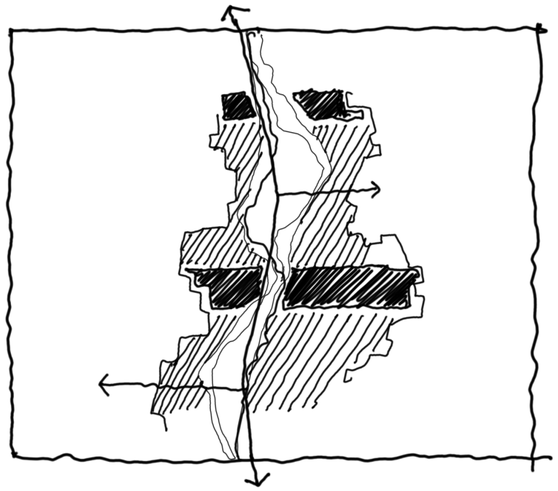
Conceptual design strategies
The themes discussed in the introduction has informed the following initial strategies:



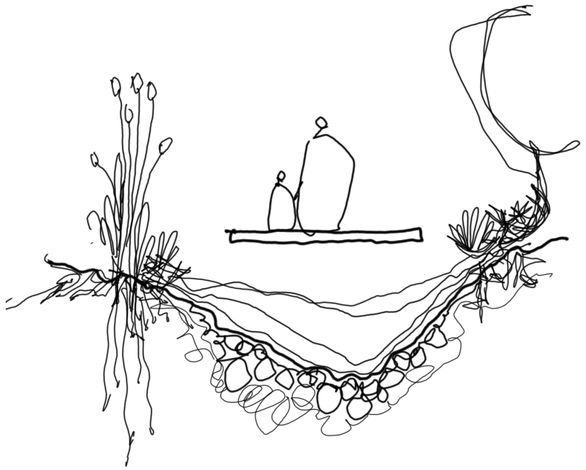
Strategy 1:
An overall strategy composed of a series of diverse landscape responses, designed to improve how residents perceive and adapt to the integration of floodwaters within their living spaces.



Strategy 2:
Centralising the river within the urban node and linking fragmented urban areas by creating a multifunctional and valued public space.



Strategy 3:
Prioritising space for the river and decentralising our needs in favour of the river.



Strategy 4:
Reflecting the flexible nature of the context by embodying the relationship between the predictable and designed, and the unpredictable and spontaneous - between what is fixed and what can adapt.

^Figure 34-37. Initial strategies and framing of the design brief.

Conclusion

Untold Waters: Introduction

The project tells the story of the riverine landscape of the Sir Lowry's Pass River. It explores the river's presence not only in the physical landscape but also in the experiences, memories, and future of the community living alongside it. By tracing the river's role within an existing vulnerable informal settlement and a neglected public space, the project repositions the river - not as mere infrastructure, but as the primary actor shaping the land and the way of life.

The catastrophic flood of September 2023 highlighted the fragility of current infrastructural systems and the urgency for alternative approaches. Rather than relying on conventional, mechanistic flood solutions that suppress and silence the river's natural rhythms, this project encourages a shift towards coextensive strategies - a framework where human and riverine needs are integrated rather than opposed. The contribution of the project is to raise awareness of the river's lively, dynamic, and deserving presence within a rapidly growing urban context.

The strategies derived from the initial research reflect the following themes:

1. Integrating the river into the contrasting sections of the urban context through a connected series of diverse landscape responses, specific to its physical and cultural surroundings.

2. Embedding the forgotten value of the river into the lives (on a daily, as well as life-span scale) of residents.

3. Prioritising the ecological needs of the river over urban growth and expansion.

4. Designing interventions that enable both human and non-human processes to unfold at their own pace and according to their inherent nature.

The following sections of this report will explore, through analysis, case studies, and design investigations, how landscape architecture can support a coextensive riverine landscape - one that integrates flood mitigation, river rehabilitation, and an intimate human-river relationship - while responding to the unique informal characteristics of Sir Lowry's Pass Village.

Untold waters_Regrowing a coextensive urban riverine landscape through flood mitigation and rehabilitation strategies

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Part one

Territorial Entanglement

Theoretical grounding

Territorial Entanglement

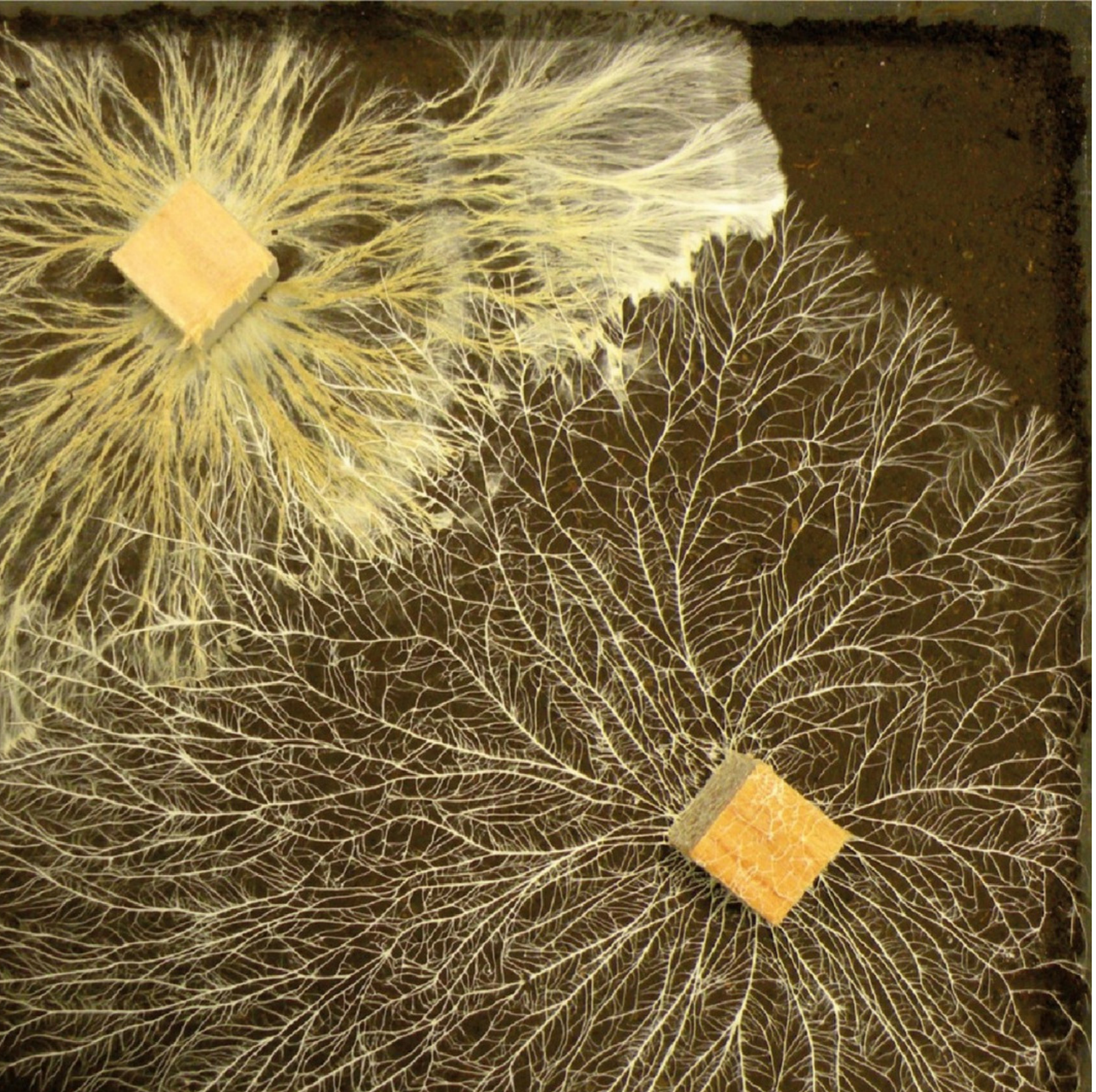
Entanglement can be defined as the making of complex relationships between human and non-human through continuous interweaving (Agarwal et al., 2016). This interweaving can take place within multiple scales, place and time. The landscape, as a palimpsest[9], is a representation of these entwined narratives. No matter how far apart, or in contrasting priority we tell them, narratives rarely exist independently.

So does the human body coexist with the non-human elements. According to environmental science major Jacober (2020), since the Industrial Revolution (mid-18th century), the bond between the human body and the non-human has been a "fragile existence, shrouded in fear and the desire to disconnect." Rivers, for example, have been pushed aside and enclosed as a response to our fear of flooding and loss of control. However, the non-human resides within us - the rivers flow through our bodies. Therefore, the distance that we construct between ourselves and the non-human seems temporary and vain. This forced disconnectedness and loss of intimate entanglement has led to our current perception of rivers, and has been a significant cause of polluted waters and destructive events, such as flooding.

Territorial[10] behavior can be identified in all living things. Fungi compete for root space and limited resources by excluding rivals through defensive measures (Biophile, 2015). Trees favor some over others by sharing their nutrients through a network, as a way to secure their own resources (National Forest Foundation, 2021). Unlike other living beings, humans have developed their territorial behavior on a global scale - developing technology, economic demands, social structures, cognitive awareness, etc. Unraveling the history of the project location has shown that the nature of human and non-human entanglement is heavily shaped by territorial behavior. The following section will serve as an introduction to theoretical explorations regarding the concepts of entanglement, human behavioural ecology, and a parallel unraveling of South Africa's human history, with a focus on our territorial relationship towards non-human elements, such as the rivers in Cape Town.

Rooted in the landscape

These above mentioned themes represent the idea of being rooted within the landscape. We physically experience the processes of the non-human, and we will continue to spread our narratives and perceptions to future generations if we don't alter our understanding of what surrounds and lives within us.



As mentioned in the introduction, the Sir Lowry's Pass Village community has deep roots that connect them and influence their behaviours towards the landscape in which they live. In order to understand these roots, the following parts of the report will slowly unravel the physical and historical context of the site, which will simultaneously inform and shape the design decisions. The context, within this analysis, refers to the connected social, political, economic, cultural, and environmental history and events.

Human survival and behaviour

According to Huffman (2011), the longest sequence of human development can be found in South Africa. The Cradle of Humankind, a paleoanthropological site in Johannesburg, South Africa, symbolises just how deep our roots are within the soil of this Earth.

We find the traces of South African ancestors hidden deep within layers of stone and soil, dating as far back as the Stone Age period, nearly 2.6 million years ago. The traces found from the Middle Stone Age, about two hundred and fifty thousand years ago, paint a picture of accomplished hunters, who hunted wild animals such as wildebeests, hartebeests, and elands. They made their homes in caves and warmed their bodies with human-made fires (Huffman, 2011). Twenty-five thousand years ago, during the Later Stone Age, the ancestors of the San hunted game with bow and arrow, collected shellfish, and created rock art. This civilisation showed traces of symbolic complexities, such as religious art and beliefs. Traditional healers were known to have the ability to influence and be influenced by both human and non-human factors. The contemporary practitioner of traditional African medicine, known as a sangoma, is still a prominent part of South African culture (Wreford, 2005). Two thousand years ago, when San hunter-gatherers and Khoi pastoralists were already present in South Africa, Bantu-speaking farmers, who came from West Africa, arrived as well. These farmers, who lived in wattle and daub houses, cultivated crops, herded livestock, and manufactured iron and copper objects (Huffman, 2011).

The first cattle, according to Huffman (2011), were traded with the Dutch by the Khoi in the 17th century, which is where the project's narrative will begin. From this period onwards, the traces of our heritage have become heavy and permanent in our contemporary landscape. The changes in the landscape and our more recent roots transformed and shaped drastically within a relatively short period of time.

A historical retelling of human interactions with both human and non-human entities reveals how our behaviours are shaped by fundamental needs: to survive, secure resources, obtain nutrients, and establish a place in the world. Behaviour can be understood as the movement, interaction, cognition, and learning of an organism (Aleklett et al., 2021). The strategies we have developed over time to survive continue to shape our contemporary behaviours. These include our sensory abilities - perceiving motion, temperature, light, sound, touch, and more- which play a central

^Figure 38. Territorial place making in the spread and interaction between two types of fungi. Photograph by Rotheray, 2021.

role in how we interpret and respond to our environment. Our experiences through these senses influence memory, instincts, and reflexes, which in turn guide future behaviours.

This theoretical exploration will examine how design can influence human behaviour, with the aim of reshaping both short- and long-term relationships with our surroundings. The goal is to encourage a coextensive sharing of space and resources - one based on mutual coexistence - rather than a defensive approach focused on dominance and extraction.

Infrastructure of care

The impact of humans has caused changes to the entirety of the Earth's system - its biodiversity, climate, geological characteristics, and geochemical cycles. During the late 19th and early 20th centuries, the increasing power of humankind was recognised by a number of scientists and geologists as a major force in the global ecosystem of all biotic and abiotic factors (Crutzen & Stoermer, 2021). The physical signs of climatic and ecosystem disruption through human activity became evident from the 18th century, which led to the onset of the geologic time unit, the Anthropocene Epoch[11], as assigned by biologist Eugene Stoermer and chemist Paul Crutzen in 2000 (National Geographic Society, n.d.).

As the evidence of climate disruption became clear, the activist thinker and ecologist Françoise d'Eaubonne was the first to coin the term ecofeminism in the late 20th century (Derzelle, 2020).

According to Serafini (2021), ecofeminism is not a homogenous movement but a perspective that highlights the forms of domination and destruction, and the historical and symbolic links between the oppressed. Emerging from these feminist theories, the ethics of care can be described as a way of world-making in which the intrinsic connections between the oppression of ecosystems and minoritised groups are recognised (Serafini, 2021). As Van Nistelrooij & Visse (2018) note, it is important to recognise that ethics and practices of care prioritise responsibility:

"Responsibilities to care are taken by certain groups of people, making caring practices into moral and political practices in which responsibilities are assigned, assumed, or implicitly expected, as well as deflected... By drawing upon the work of the French phenomenologist Jean-Luc Marion, a care ethical conceptualization of responsibility can be enriched, by scrutinizing how responsibility is literally a response to something else."

Building on this, thinkers like Donna Haraway and Karen Barad deepen the concept through the notion of response-ability[12] (Barad, 2007) (Haraway, 2016). Haraway's response-ability involves cultivating ongoing relationships characterised by accountability and reciprocity rather than control or mastery. Similarly, Barad's relational ontology underscores that beings do not preexist their relations but emerge through intra-actions, emphasising that ethical engagement demands attentiveness to the entangled and dynamic nature of existence.

This project argues that in order to sustain a landscape where both society and ecosystems can thrive, we need to adjust our present way of being and perceiving, in order to help us permanently alter our future behaviour. A way of being that relies on care - not a superficial or sentimental notion of care, but an infrastructure of care that emphasises responsibility.

Momentary affect

Momentary affects[13] can provoke experiences, frame perceptions, stimulate meaning, or enhance awareness of an action. A momentary affect can be described as the "quick-moving reactions that occur when organisms encounter meaningful stimuli that call for adaptive responses" (Rottenberg, 2005). The momentary affect can be enhanced through design by provoking experiences and by framing and composing aesthetic environmental interactions. An example that embodies this notion is the sculpture Secant by Carl Andre: "He imposes a kind of geometry on the field that makes you not only look at the object but also become acutely aware of the place that it is in" (rudygodinez, 2013)*.

This project identifies the opportunity, in the endeavour to alter human perception, of design to root a long-lasting care, which can be triggered through momentary affects. To illustrate this, the research refers to the article by Elizabeth K. Meyer, Sustaining Beauty: The Performance of Appearance (2012). Meyer examines the role of beauty and aesthetics in a sustainability agenda. She argues that aesthetics and a designed landscape that intrigues the eye are vital to developing a design that is sustainable - both ecologically and culturally. Meyer compares Olmsted's theory - that the environmental performance of a landscape is equal to its appearance - to contemporary practice, which often disregards appearance in sustainable landscape design. She argues that aesthetics is not merely a visual addition to a sustainable landscape but an immersive experience that is essential to creating one. Meyer reflects on the writings of landscape architects Howett and Spirn and highlights the long-lasting effect of design:

"They argue that the act of experiencing designed landscapes polysensually, over time, through and with the body, is not simply an act of pleasure, but possibly, one of transformation" (Meyer, 2012). The project explores how the intimate act of experiencing our surroundings with the body can change our behaviour and perception towards them. This change in behaviour could have a significant impact on how we continue to react to our surroundings. Sensory experiences influence our present experiences and future behaviours.

*The sculpture by Carl Andre inspired the initial understanding of the lingering effect of designed interventions. An image of the sculpture can be seen in Appendix F.

Meyer reflects on philosopher Arthur Danto (Danto 1999: 192–193), noting:

"He argues that beauty is not found or discovered, immediately, through the eye and in relationship to known tropes. Rather, it is discovered through a process of mediation between the mind and body, between seeing and touching/smelling/hearing, between reason and the senses, between what is known through past experiences and what is expected in the here and now" (Meyer, 2012).

This project argues that designed landscapes can enhance awareness of the effects of individual actions and can fundamentally influence a culture's behaviour of care. Designers arguably hold both the authority and responsibility to influence moments - to enhance the sense of existence.

The theoretical grounding informs the lens through which the context is analysed and the design interventions are developed. The project's design approach is to enhance or create moments in which the human body feels the lingering affect of the living non-human in an attempt to alter the distant and disconnected relationship that we currently have towards for example the river. Reflection, responsibility, and care are crucial to enable transformation within a shared landscape. This thesis is a reminder to see the movement of the river, to sense our entanglement with our surroundings, to feel compassion towards the non-human, and to alter our own being.

^Figure 39. The entanglement of human and non-human of the Sir Lowry's Pass Village is deeply rooted in the history of Cape Town. Photograph by Hendricks, 2023, edited by author.

● The presence of water seeps into our being - our stories, songs, and dreams

Methodology

Tracing the landscape

This project is a study of how the river and the humans have lived alongside each other for centuries, and how they have mutually influenced one another. In order to understand these parallel timelines, the project explores them both individually and coextensively. The river and the informal nature of the Sir Lowry's Pass Village proved challenging to study due to the limited availability of information regarding their deeper structures and hidden narratives.

The search for riverine heritage in Cape Town revealed that the city's smaller, less prominent rivers are often represented solely through scientific data and environmental reports concerning their health and ecological services. These accounts frequently overlook the rivers' origins, cultural meaning, and their role in the historical development and urban heritage of the city. However, select publications, such as Rivers and Wetlands of Cape Town, edited by Cate Brown and Rembu Magoba, do begin to uncover deeper layers of aquatic heritage, particularly in reference to rivers like the Sir Lowry's Pass River.

The scarcity of detailed information led to the shaping of the river's story through alternative sources, such as early travellers' diaries, understandings of indigenous relationships with water systems, and archaeological findings indicating where certain groups once grazed their herds. The methodology thus evolved into a dual approach: analysing existing reports to understand the known qualities of the river, while simultaneously uncovering its unique story through historical and contemporary photographs, news articles, narratives, poetry, oral histories, and speculative reconstructions.

The same approach was applied to understanding the Sir Lowry's Pass Village. However, unlike the river, crucial insights were gained through conversations with local residents from the community. Fieldwork played an essential role in understanding the design site, as well as the case studies*.

Finally, because this project aspires to serve as a reference and inspiration for future South African riverine projects, it incorporates and responds to existing policies and programmes defined by the City of Cape Town (see Appendix D). These documents informed many of the design decisions, ensuring that the proposals remain grounded in the socio-economic realities of the context.

Drawing as a methodology

The drawing techniques used to represent this project have been developed as a deliberate methodology to communicate the core narratives and essence of the thesis. The project is a layered composition of values and characteristics that emerged through careful analysis and understanding of the landscape. These values - permanence, temporality, freedom, security, and individual growth - are central to the thesis. As such, the drawing methodology plays a crucial role in visually conveying these themes.

South Africa, and this site in particular, is defined by stark contrasts: between formal and informal spaces, between different living conditions, mindsets, cultural expressions, and relationships to the landscape. Together, these contrasts form a culturally rich and complex landscape. Rather than viewing these frictions as purely negative or positive, the project embraces them as distinct characteristics of the South African condition. The drawing method reflects this understanding - serving as a choreography of contrasts that interact and coexist as a unified whole. While not complex or new, the methodology is designed specifically for this project. The values of the project are categorised and represented as the following two overarching themes:

1. Uncertainty, flexibility, growth, and situated methods

Certain aspects of this landscape cannot - and should not - be predicted, as noted in the introduction. The drawing methodology reflects this through a sense of spontaneity and flexibility, shaped by a variety of shifting, uncontrollable forces. These include the flow of water, the patterns of human movement, the unpredictable behaviour of people, the accumulation of litter, the occurrence of fire, the diverse growth of Fynbos, and the direction of the wind. To communicate this complexity, the drawing process embraces looseness and variation. It incorporates hand-drawn hatches, differing materials, varied line thicknesses, surface textures, and expressive marks (see Figure 40). These elements allow the drawings to remain open-ended and responsive - mirroring the dynamic, layered, and evolving nature of the landscape itself.

2. Defined components as the foundation for processes to take place.

Yet, to allow these processes to unfold in accordance with their own time, intensity, and will, the project introduces a series of "fixed" interventions - elements that offer guidance without imposing control. These interventions exist as intentional moments of stability within a shifting and unpredictable landscape. In the drawing methodology, they are expressed through digital drawing techniques, defined edges, and clear lines (Figure 41). These sober visual indications stand in quiet contrast to the spontaneity of hand-drawn marks, reflecting a dialogue between the planned and the unpredictable - between human intention and the will of the landscape.

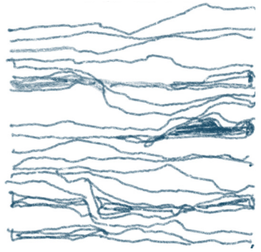
The final composition of the drawings emerges as the product of multiplicity and diversity - each layer complementing and completing the others. Together, they form a tapestry of interwoven narratives, textures, and meanings. These layers do not exist in isolation, nor can they be arranged according to a fixed hierarchy of importance. Their significance is only fully realised when they are perceived as a unified whole - an expression of the landscape's complexity and the project's intentions.

*Refer to the reflection for further elaboration on the role of fieldwork and community engagement within this project.

1. Uncertainty, flexibility, growth, and situated methods

The following legend represents the drawing techniques that will be used in the final representation:

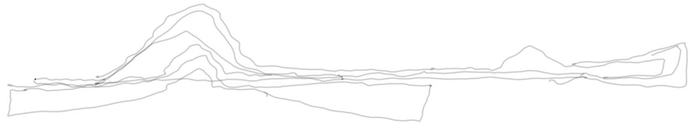
Waterbodies, wetness, river-flow



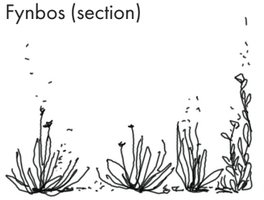
Human movements

Fire (section)

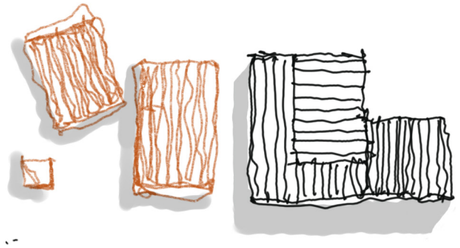
Wind



Fynbos (section)

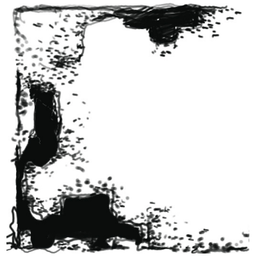


Informal housing (new and existing)



Litter accumulation

Litter and sedimentation

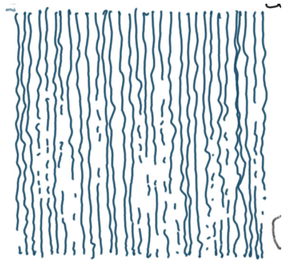


Soil decomposition

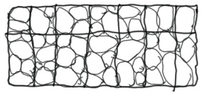
^Figure 40. Drawing legend used throughout final representation of the project

2. Defined components as foundation for change

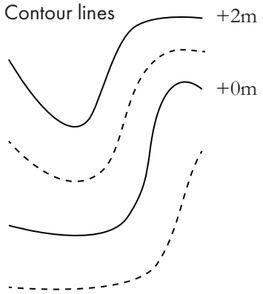
Rain (section)



Gabion / reinforcement edges

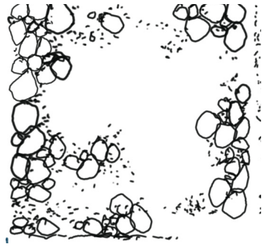


Contour lines



Earth structures, such as swales.

Permeable walkway surface

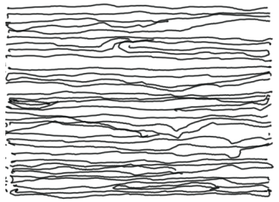


New and existing trees

Public space

Loose earth / stone surface (section)

Compacted / not loose soil (section)



Fixed constructed landscape elements

Fixed earthworks

^Figure 41. Drawing legend used throughout final representation of the project

9. Palimpsest

Landscapes, as they appear to us at any given moment, are the outcomes of successive developments - a layering of decisions made at different points in time for a variety of political, cultural, and economic reasons. In this sense, landscapes can be understood as palimpsests - revealing the transformations of the past. In the case of the Sir Lowry's Pass riverine landscape, the palimpsest is deeply shaped by social change. The river, serving as the parchment upon which these layers are inscribed, carries the cumulative effects of years of human activity and transformation.

11. Anthropocene Epoch

The term Anthropocene should be critically examined because, by suggesting that the new geological epoch is defined by human impact, it reinforces the idea of human exceptionalism. Rather than promoting multispecies entanglement, as emphasised by Donna Haraway in her concept of the Chthulucene (2016), the term risks perpetuating cycles of control and management without fostering a real shift away from human domination.

10. Territorial

Territory refers to the relationship between living beings and the environment they inhabit. It may be understood as a political construct - where boundaries are drawn to demarcate and control space, often to limit perceived external threats - or as a human construct grounded in a sense of belonging, shaped through rootedness, memory, and generational interaction (Maghsoudi, Mansouri & Haghir, 2024). In the context of this project, a clear tension emerges between these two conceptions of territory. This conflict is further complicated by the river's inability to assert its own territorial rights or speak for its spatial presence. As such, the river becomes a silent participant in territorial negotiations - its needs often overlooked in favour of human-centric claims.

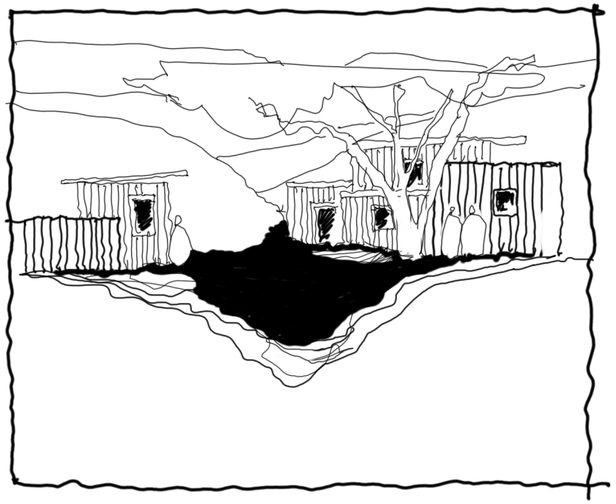
12. Response-ability and intra-action

The term response-ability (Haraway, 2016) emphasises the capacity to respond ethically and attentively within multispecies entanglements. In contrast to interactions, intra-actions, as described by Barad (2007), reflect that entities do not pre-exist as separate and independent, but rather are constituted through their relations. All things - including humans, non-humans, thoughts, and intuitions - are already entangled and therefore cannot be understood as discrete or separate entities.

Therefore, how can our perception of our own self be shifed towards accountability, awareness and being present within the already entanglement with other beings?

13. Momentary affect

The idea of how a momentary affect impacts a human individual supports the shift toward perceiving our accountability, awareness, and presence within our entanglements. It aims to move us from the isolation of the singular "I" toward the sudden and inseparable experience of the "we." This "we" might be the "I" and the coolness of the shadow, or the "I" and the flow of the river - moments when the boundaries between self and other dissolve. The more frequently the "I" becomes the "we," the more our awareness deepens of our presence within the complex entanglements of multiple "we's." This ongoing process cultivates a relational sense of being, reminding us that we are always embedded in shared worlds rather than existing alone.



^Figure 42. Coextensive urban riverine landscape. ● Sir Lowry's Pass River ◍ Informal dwellings

Conclusion

Territorial Entanglement

Part One, Territorial Entanglement, has established the theoretical and methodological grounding for a design exploration that embraces the entangled relationship between human and non-human actors.

Through an exploration of environmental history, behavioural ecology, and ethics of care, the part aims to understand how our current detachment from ecological systems is a product of historical processes rooted in fear, control, and territorial dominance.

In contrast, the project investigates the potential of landscape architecture to inspire alternative methods of sharing a landscape - ones rooted in responsibility, reciprocity, and sensory experience. By situating the river and the community of Sir Lowry's Pass Village as co-authors of space, the project challenges conventional narratives of urban development and flood mitigating strategies.

The strategies emerging from the theoretical framework and methodology reflect the following themes:

1. Establishing an infrastructure of care that enables greater recognition and prioritisation of the river, enabling its reintegration into the urban fabric.

2. Designing experiential moments through bodily movement, sensory engagement, and altered visual perspectives.

3. Prioritising the ecological needs of the river over urban growth and expansion.

4. Designing interventions that enable both human and non-human processes to unfold at their own pace and according to their inherent nature.

Part Two

Roots

^Figure 43. Cape Town city. Photograph by South African Tourism, 2008

Contextual exploration

Layered landscape

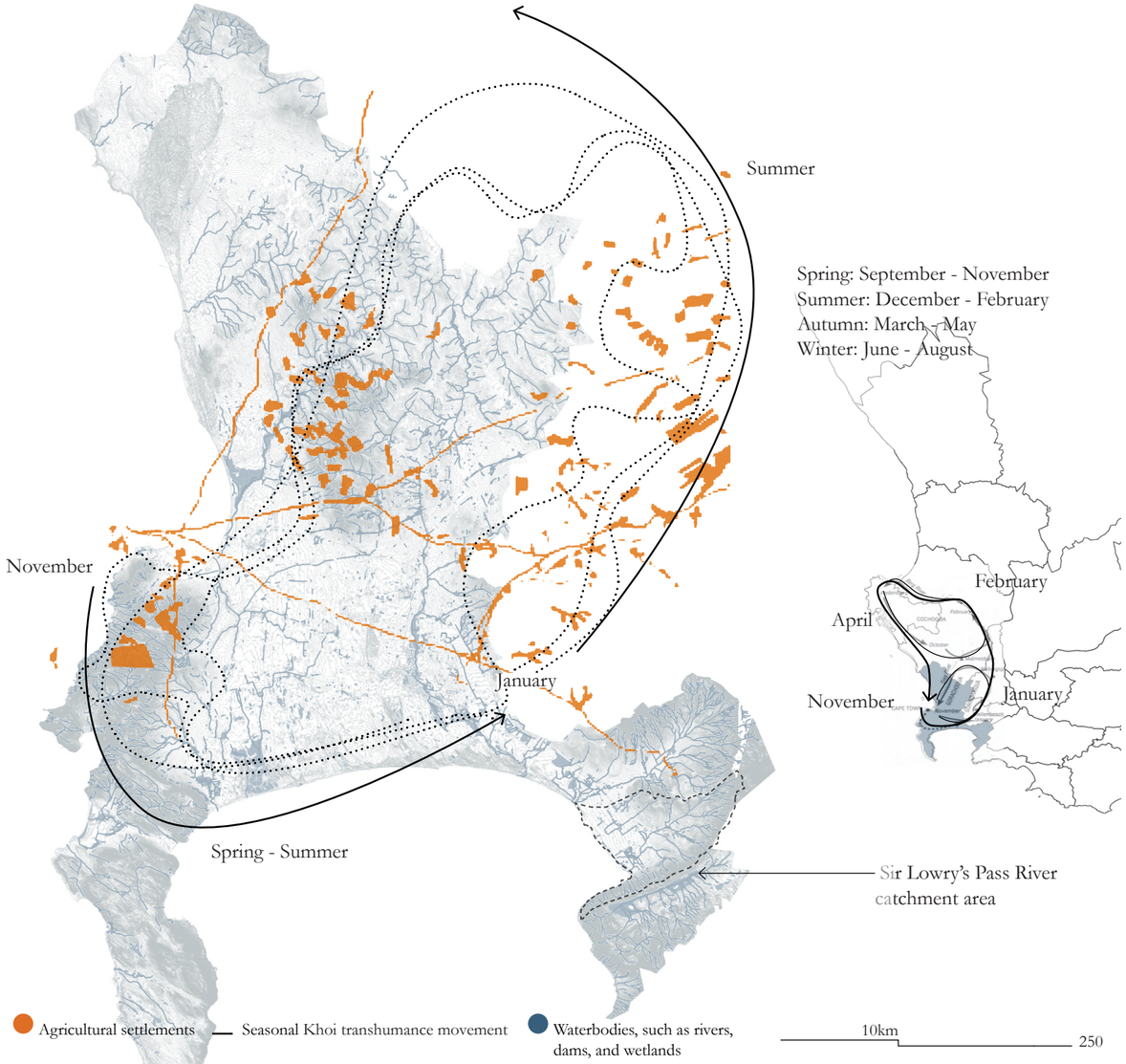
The first section of Part Two, Roots, explores the geographical, hydrological, social, and governmental layers of Cape Town that have shaped the current conditions of the Sir Lowry's Pass River. It presents an analysis of geological and human time, societal and ecological growth, governmental and social responses, and change as components of a layered landscape. (Some themes are briefly summarised in this section, with detailed analysis in the appendix. The outcomes of the analysis illustrates the entanglement of causes, responses, and effects among multiple human and non-human stakeholders within this dynamic Capetonian landscape (Figure 61). To address broader stakeholder relations through small-scale strategies, the project proposes spatial tools that influence the river's value and the on-site informal community, thereby shaping the responses of policy-making stakeholders such as the City[14], educational institutions, and employers[15]. These tools define the spatial strategies and interventions within the Sir Lowry's Pass Riverine Landscape, as presented in the second section of Part Two. The Sir Lowry's Pass River catchment scale (page 53) offers a closer, site-specific analysis of the Sir Lowry's Pass River and its immediate context, introducing the overarching strategies on the scale of the entire river which are based on the spatial tools developed in the Part One.

Rivers as the carriers of human history

The project's understanding of the complexities that have, and continue to sculpt the landscape of the Sir Lowry's Pass River was profoundly influenced by a poem by South African poet Dr. Pieter Odendaal (See Appendix G). The poem communicates the significance of two themes: *Grond*[16] *en Water*[17]. Land and Water - central to South Africa's history for hundreds of years - remain pivotal themes in ongoing political and social discourse, deeply tied to issues of equality and justice. Odendaal situates his poem within the landscape of the Eerste River, located in Stellenbosch, reflecting on the interdependent connections between social and ecological systems, and linking the work to broader political events such as land conflict in Mangaung and the water crisis caused by the severe drought of 2016–2018. These themes resonate in Cape Town's history of spatial injustice[18], shaped by centuries of inequality and ongoing challenges in land governance, policy-making, social inclusion and urban development. The project draws on Odendaal's reflection, and positions the Sir Lowry's Pass River as the central actor within its socio-political landscape. The project reflects on the ongoing social and governmental impacts that have shaped it, and highlights the river's enduring presence through time.

^Figure 44. Common Eland*. Photograph by WILDARK, nd.

**"A Khoi tribe, known as Gantauwers (People of the Eland) also followed the Sir Lowry's Pass. They called the path T'kanna Ouwe or Gantouw, 'Gan' being the Khoi word for eland and 'touw' the Khoi word for path."* Chadwick, 2021



^Figure 45. Layering current rivers and wetlands within the City of Cape Town, the Khoi transhumance movement and agricultural settlements during the colonial era, between 1660, 1680, and 1690. Patterns compiled from van Biljon, S., Worden, et al., and Smith, A. and edited by author.

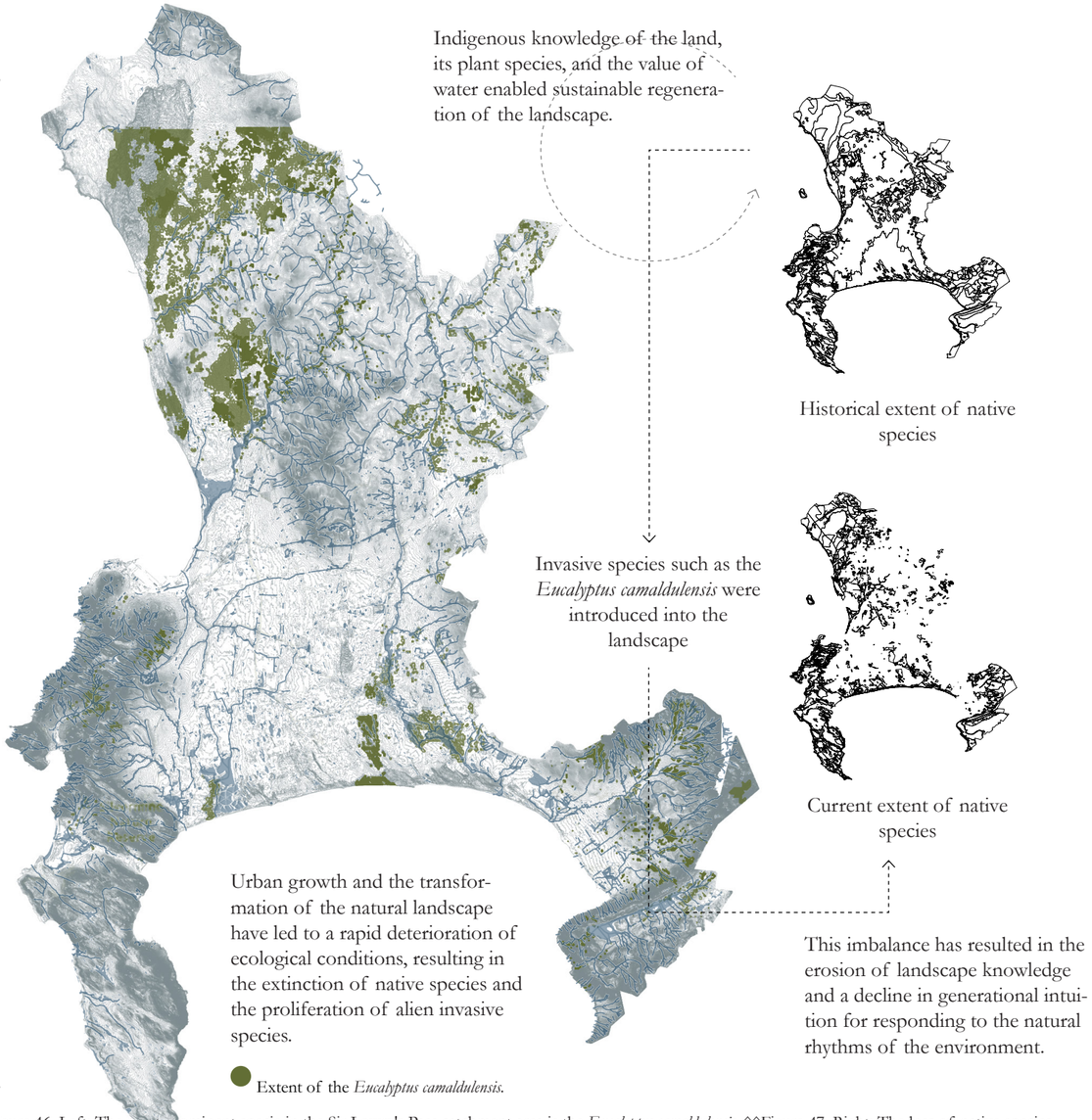
Disconnectedness towards the natural landscape

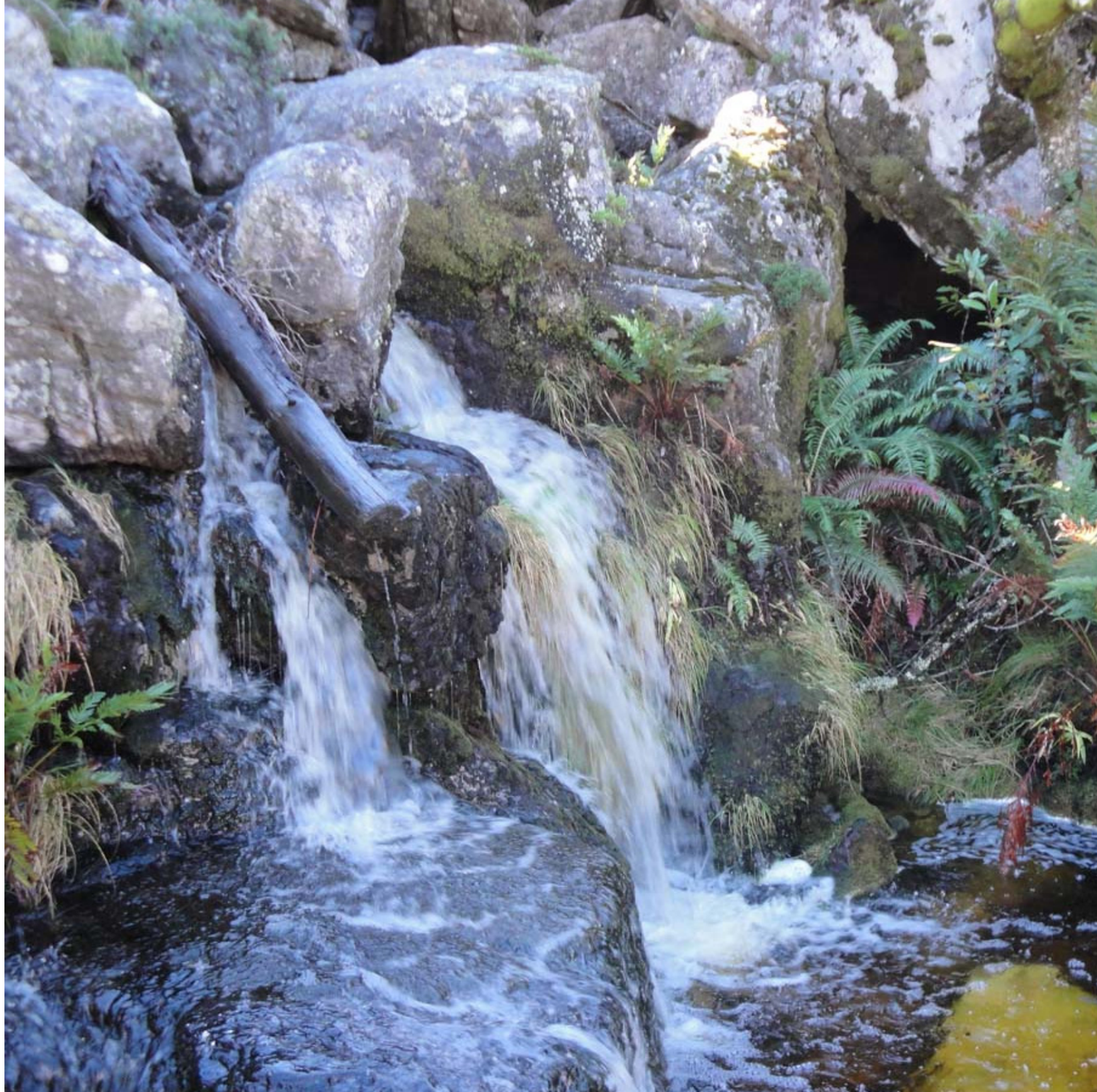
Over time, human settlements grew and densified around rivers, increasingly demanding their water and reshaping these waterways, which gradually lost their natural freedom to flow as they once did. In Cape Town, rivers, wetlands, and lakes - once more extensive - have been drastically reduced due to urban expansion and historical land use changes*. The continuous disconnection to the landscape processes and patterns, as well as the introduction of harmful means of living has increased the intensity of ecological degradation from its natural state.

Indigenous groups such as the Khoi lived in close, respectful relationship with these water systems, practicing seasonal transhumance movement (Figure 45) aligned with natural cycles, viewing land and water as common property. However, colonial settlement disrupted this balance by enforcing land and water ownership, privatising resources, and restricting indigenous access, leading to loss of traditional livelihoods and ecological changes (See Appendix B). The loss of indigenous understandings of the landscape - shaped over generations through intimate relationships with the soil and its waters - has led to a sudden transformation in the interactions between humans and non-human life. In response, the project explores the possibility of long-term learning with the landscape - listening to the strength of the river and drawing on situated knowledge and lived experience to support a coextensive way of living that does not starve the river and its surrounding environment. The project recognises the critical importance of context-specific knowledge and seeks to elevate its value - asserting that knowledge rooted in generational storytelling and persistent indigenous wisdom is more meaningful in supporting a sustainable urban landscape than externally imposed engineering or so-called "state-of-the-art" advancements. This quieter, yet strong approach informs and shapes the design interventions.

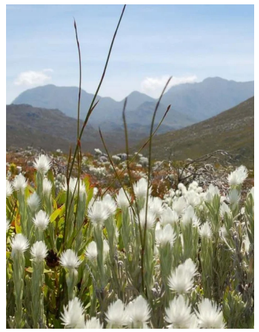
Agriculture and urban development further altered the landscape, reducing wetlands and altering waterways. For a wider range of cultivation, many plant species, between 1653 and 1806, were introduced from Europe and Asia for agricultural and horticultural purposes (Fynbos Biome January 2006) (See Appendix B). Farmers planted invasive trees such as *Acacia, Pinus, Eucalyptus, Cinnamomum camphoar* and *Quercus* species, recognising that these would enhance their productive land. However, the impact of these species had a major impact on the the city's water resources as well as its native Biome. Fynbos vegetation plays a critical role in enabling rainwater to replenish rivers, groundwater, and reservoirs. However, due to the spread of invasive species, 70% of this water is now absorbed by these non-native plants, significantly disrupting the natural hydrological cycle (Chadbon, 2017). Natural vegetation declined as farmers continued to expand and transform the landscape, and this remains a significant part of the reason why the landscape and its rivers are in such poor condition today (Vergelegen Nature Reserve, 2019) (Figure 48)**.

*The City of Cape Town has officially been recognised as a Ramsar Wetland City in 2022, which encourages the protection of urban wetlands as vital in the liveability of the city (CGIS, 2022). **Cape Town has established policy frameworks and strategies to protect its natural environment from further degradation (refer to a summary thereof in the Appendix D.

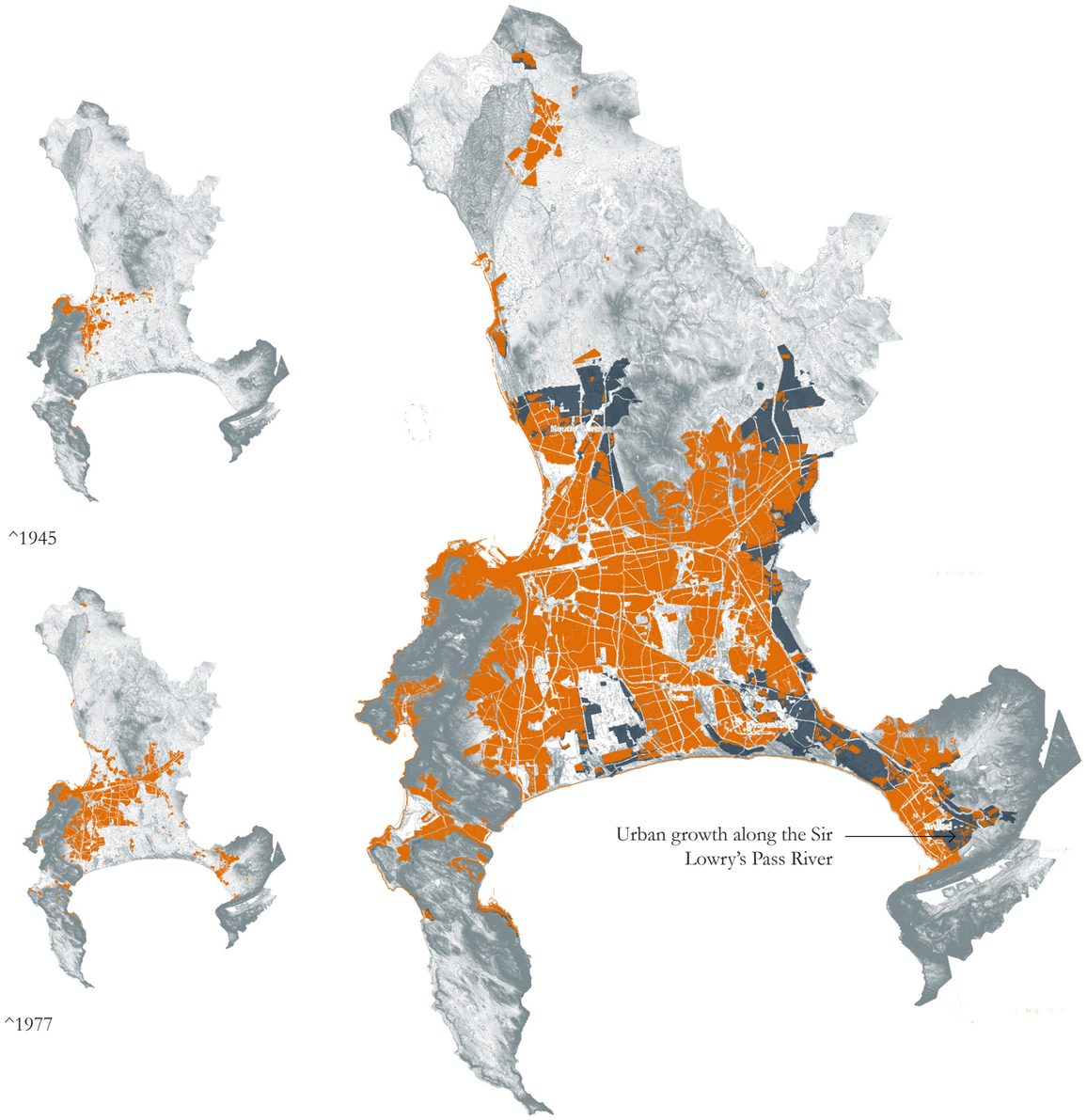




^Figure 46. Left: The most prominent specie in the Sir Lowry's Pass catchment area is the *Eucalyptus camaldulensis.* ^^Figure 47. Right: The loss of native species, coupled with the growth of invasive species that absorb a substantial proportion of Cape Town's water resources, has had a detrimental impact on the quality of both river systems and groundwater. Image by Chadbon, 2017.



^Figure 48. Right: Poor conditions of the upstream reaches of the Sir Lowry's Pass River.



Growing urban pressures

Ecological degradation continued with the rapid expansion and densification[19] of urban settlement around the mountain and rivers (Figure 49), which has increased both human and non-human vulnerability. This vulnerability due to urban growth is deeply tied to a history of racial segregation, spatial injustice, and land ownership (see Appendix B). Under apartheid, residential areas were assigned by race, restricting access to land and water for many. This enforced segregation and resulting overcrowding - especially in under-serviced areas - have directly impacted the rivers water quality.

The layered histories reveal a legacy of spatial inequality and environmental degradation, with rivers carrying the memories and scars of loss and resistance. The heritage and value of the river's quality has faded under the weight of urban growth, poverty, fear, and neglect. In response to the neglected landscape, the City of Cape Town has implemented diverse environmental policies and strategies which target these critical themes, such as the Management of Urban Stormwater Impacts Policy (2009), Floodplain and River Corridor Management Policy (2009), City of Cape Town Climate Change Policy (2017), City of Cape Town Environmental Strategy (2017), Local Biodiversity Strategy and Action Plan (2019), and the Cape Town Water Strategy ("Our Shared Water Future") (2019)(See Appendix D).

The main approaches of these policies and strategies are focused on:

- The prioritisation and protection of rivers, wetland, and ecological buffers.

- Diversification of water supply and the integration of water management in urban planning.

- Flood management and water strategies that focus on adaptation and infrastructure upgrades.

- Limit development in ecologically sensitive areas.

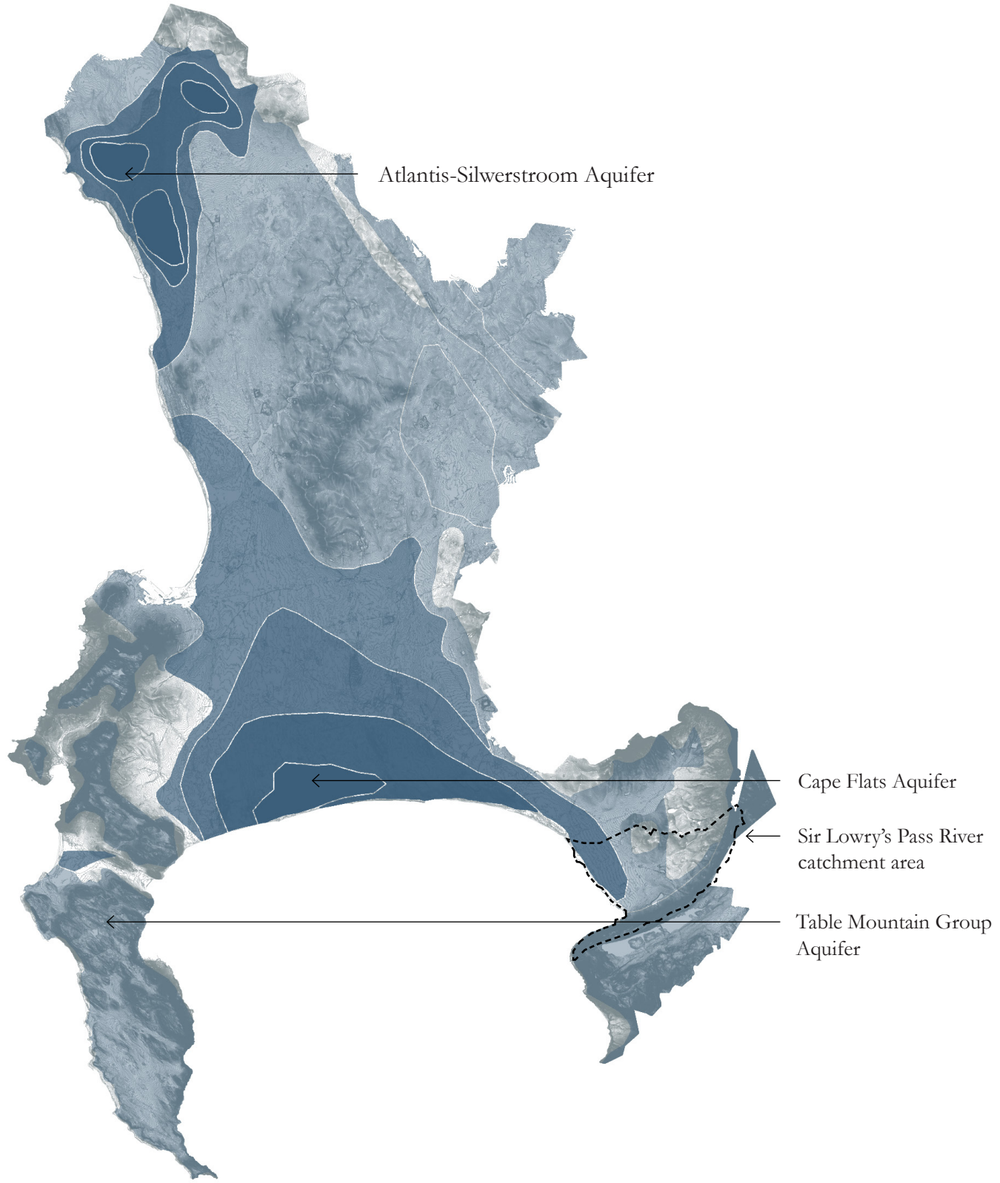
- Emphasis on public involvement, awareness, collaboration, and education.

- Regular upgrading in response to change.

However, in the case of the Sir Lowry's Pass River, the city's approach to the regions vulnerability along the river is based on large-scale mitigation strategies and the realignment of the river (See Appendix E), rather than addressing the flooding in the informal area where the community suffers under seasonal floods. This questionable approach is what largely informed the project's curiosity in alternative mitigation strategies along the river's surroundings which shifts the focus from large engineerd efforts to a more human-scaled perspective. This approach also aims to empower marginalised communities by adapting flood mitigation interventions to the needs of existing informal settlements.

Urban growth Current plans for urban expansion

^Figure 49. Mapped timeline of the urban growth in Cape Town since the 1860's until present, and incremental growth areas as allocated by the City.



^Figure 50. Existing aquifers.

Water resources

The erosion of the historical mountains has formed the strings of wetlands that once covered the Capetonian landscape (See Appendix C), which further influenced the creation of important aquifers, such as the Cape Flats aquifer (Figure 50). These naturally occurring water bodies are extremely important, considering that Cape Town is one of the global cities experiencing water scarcity. Following the threat of Day Zero between 2015 and 2017, our awareness of alternative water sources has been heightened. As Cape Town's population grows, increasing the demand for water supply, the City of Cape Town has implemented multiple strategies and programmes which aim to diversify and expand Cape Town's water supply (City of Cape Town, 2024), as referred to previously.

One of the city's strategies is groundwater extraction. Cape Town relies largely on rain-fed dams for the city's water supply (City of Cape Town, 2019), but using aquifer water can spread our reliance across more diverse options. However, this raises the question of how the City and residents can ensure that the aquifers are sustainably recharged as this is crucial to the health of the river's capacity to flow (See Appendix C). The project therefore explores how Cape Town's policies and regulations with regards to drought and water resources, can be integrated into the experienced landscape as foundational elements.

The project will take inspiration from existing recharge methods, as described by the International Association of Hydrogeologists (Dillon et al., 2022), as well as from case studies in South Africa, and other regions in Africa. The selection of appropriate methods is based on the context of Cape Town, similar approaches already in use, and strategies appropriate to the intention of the project.

The river, its health and its value within the urban context are the central themes in this project, however, equally important is understanding the native vegetation that once thrived here naturally, its value and connection in regards with indigenous knowledge and heritage, as well as its role within the future socio-economic landscape. The following pages will explore the ecological, cultural, and economical value of the native Fynbos species.

10km 250

Fynbos*

The Cape Floristic Region, which was granted World Heritage Site status in 2004, has been recognised as one of the world's hottest biodiversity hotspots (Esler, Pierce & de Villiers, 2024). It has received global priority for conservation action, yet it is currently under severe threat due to human activities (Refer to Appendix A). More than one and a half thousand species are now at risk of extinction. Large areas that were once completely covered in Fynbos have been transformed into vineyards, fruit orchards, and pine plantations. These types of agricultural transformations have threatened many ecosystems with extinction, including the Lourensford Alluvium Fynbos found along the Sir Lowry's Pass River. Even today, the biome is still threatened by growing urban areas and alien invasive species (Fynbos Biome, 2006). The landscape through which the Sir Lowry's Pass River flows is one example of how humans have completely transformed native vegetation, pushing it to the brink of extinction.

Fynbos Biome

The Fynbos Biome consists of three naturally fragmented vegetation types: Fynbos, Renosterveld, and Strandveld (Fynbos Biome, 2006) (see Appendix A). The Fynbos consists of multiple plant communities, such as the *restios, ericas,* and *proteas,* and grows mainly on nutrient-poor and sandy soils. Along the Sir Lowry's Pass River, Lourensford Alluvium Fynbos - a vegetation type with characteristics of both Fynbos and Renosterveld - was historically the dominant type. In addition, Swartland Shale Renosterveld and Boland Granite Fynbos are also prominently found in the surrounding landscape of the Sir Lowry's Pass River.

The Renosterveld is separated into four categories according to the soil on which they grow and consists of the Peninsula Shale-, Swartland Granite-, Shale-, and Silcrete-Renosterveld. It is often found within the richer lowland soils with high clay content. The City describes these species as an "open, small-leaved, low to moderately tall shrubland with succulents," and includes species such as *Elytropappus rhinocerotis, Marasmodes oligocephala, Lampranthus dilutes,* and *Babiana longiflora* (City of Cape Town, 2018). It has been reported by the City of Cape Town that Renosterveld once covered up to 562 km², and that only 56 km² currently still exists, making it one of the most poorly protected species in Cape Town (2018).

The Strandveld is usually found on calcareous sand in the coastal regions, within a flat or dune landscape, and up to 80 m above sea level. This vegetation type can be described as a "tall, evergreen, hard-leaved shrubland with abundant grasses, shrubs, small trees, herbs, and succulents" (Holmes, Wood, and Dorse, 2008), and consists of species such as *Euclea racemosa, Metalasia muricata, Olea exasperata, Chrysanthemoides monilifera,* and *Roepera* flexuosum (Holmes, Wood, and Dorse, 2008). It has been reported by the City of Cape Town that

^Figure 51. Left: Mountain Fynbos. Photograph by Parr, n.d.
^^Figure 52. Top: *Aeropetes tulbaghia* butterfly. Image by Cramer and Stoll, 1725.
*The term "Fynbos" comes from the Dutch term "*fijnbosch*" and refers to the slender and fine nature of the plants (Esler, Pierce & de Villiers, 2024), which was not suitable for construction timber nor large-scale harvesting.

Strandveld once covered up to 407 km², and that only 189 km² currently still exists, of which only 70 km² is conserved or managed (2018).

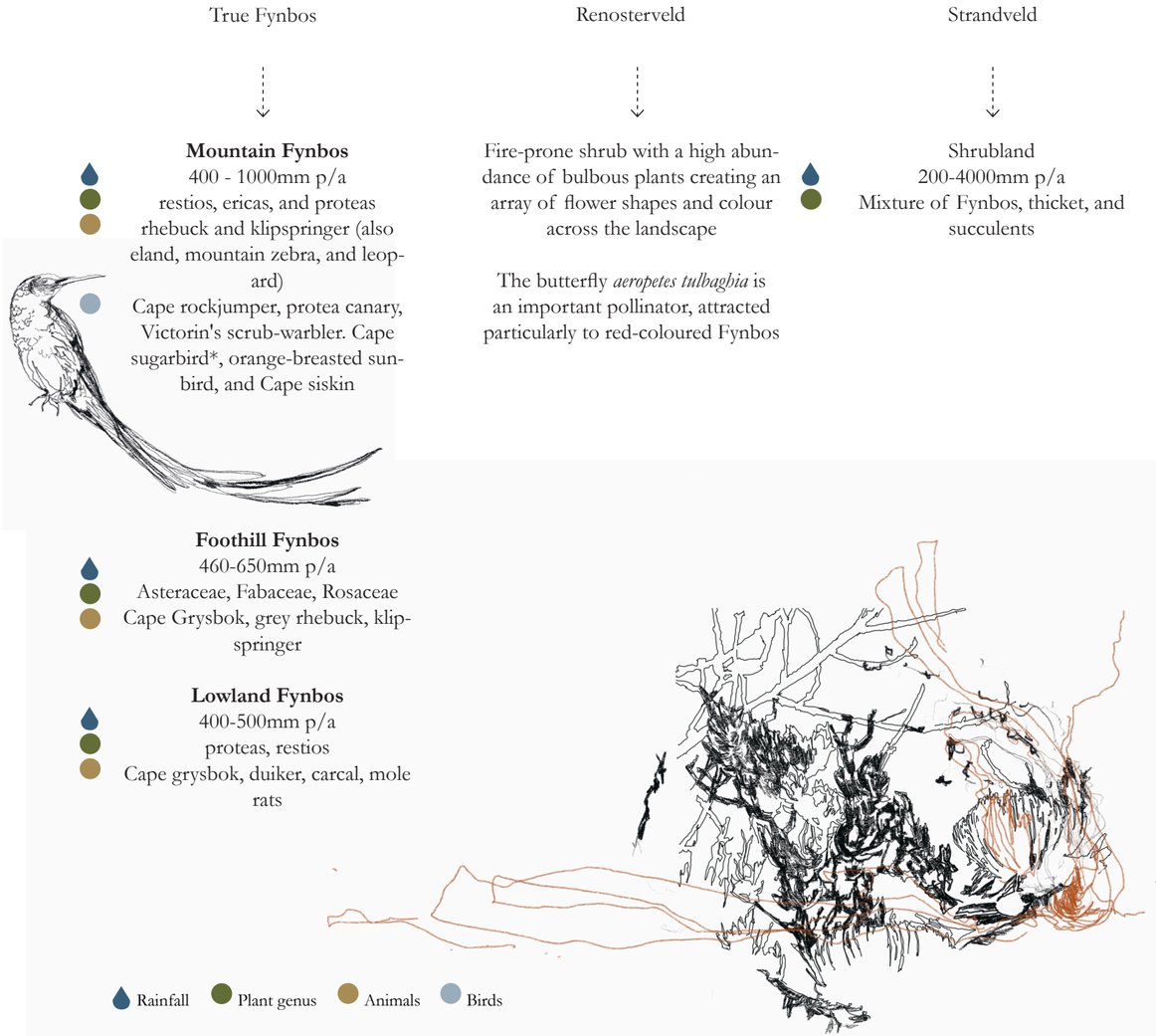
According to Esler, Pierce & de Villiers (2024), the main ecological and climatic driving forces which enable these native Fynbos species to grow is summer drought, low soil nutrients, fire, and wind (see Figure 54). This research highlights the urgent need to protect remaining Fynbos species wherever preservation remains viable. One key strategy involves reinforcing the network of "Fynbos corridors," several of which have already been prioritised by the City of Cape Town. The Fynbos Corridor Collaboration, have already illustrated potential corridors which have been strategically aligned with river systems and existing biodiversity networks - including the landscape surrounding Sir Lowry's Pass River (see Appendix A).

The projects site presents a unique opportunity to develop a Fynbos corridor along the Sir Lowry's Pass River: remnants of Fynbos vegetation still persist, portions of the land remain undeveloped, and several small protected areas are embedded within the urban fabric. In response, this project proposes a foundational framework for a biodiversity corridor - one that safeguards and connects these ecological fragments, ensuring their resilience in the face of future urban expansion. The interventions use the spatial and social quality of the driving forces, such as fire, to develop spatial experiences.

Cultural value and epistemic justice

These species are not only biologically unique, but also deeply interwoven with the indigenous knowledge systems and cultural heritage of South Africa. Traditional practices surrounding Fynbos species span the preparation of teas, powders, and medicinal remedies. Yet, the broader pharmacological value and ecological significance of many endemic species remain known only to a small number of local communities and knowledge holders. For generations, indigenous people have safeguarded this botanical wisdom through oral traditions, cultivating a nuanced understanding of both the healing properties and sustainable harvesting methods associated with Fynbos. However, with the ascendance of modern medicine, this ancestral knowledge has been increasingly marginalised, overlooked, and in many cases, forgotten.

Education plays a vital role in fostering care for our native landscapes and their ecological processes. An example is the FynbosLIFE Nursery, visited during the fieldwork, which embodies a living, outdoor library of Fynbos biome species. Functioning as both an educational space and an experiential exhibition, the nursery demonstrates how these plants grow in community. Visitors can witness the contrast between invasive reeds and indigenous riverbank grasses, or taste the sharp tang of the sour fig (*Carpobrotus edulis*) (Figure 55), gaining knowledge through direct, sensory immersion in the landscape.



^Figure 53. Top: Major vegetation types of the Fynbos Biome. Date by Esler, Pierce & de Villiers, 2024, edited by author.
^^Figure 54. Right: Driving forces are drought, low nutrients, fire, and wind.
*The Cape Sugarbird is an important pollinator for Fynbos.

The nursery hosts workshops for schools, teaching students not only how to cultivate these species, but also their cultural significance and potential uses - for instance, as herbal teas, scents, soaps, and medicinal products.

In Sir Lowry's Pass Village, schools play a central role in the social fabric, providing care and structure for children growing up in vulnerable environments. Conversations with the director of the ECD Hope and Light Centre revealed an urgent need for expanded educational infrastructure and broader community engagement (Hope and Light Community Welfare teacher, 2025). This project seeks to address the need to develop educational facilities that operate in parallel with environmental restoration - spaces where children and adults alike can learn about Fynbos ecology, traditional uses, and sustainable practices.

These facilities would include on-site nurseries, small-scale Fynbos smoking or drying operations, and workshops aimed at skill development. The intention is to interweave education, ecological rehabilitation, employment, and cultural preservation into an integrated programme - where each component strengthens the resilience of the others through their mutual interdependence.

Employment and skill developments

According to the City of Cape Town's Local Biodiversity Strategy and Action Plan (2019), Fynbos species are increasingly threatened by illegal harvesting and overexploitation. However, it is essential to recognise that such practices are often driven by the urgent need for income, food, or recreation. To respond meaningfully to this dynamic, the strategy draws on two guiding principles from the above mentioned plan:

1. Social upliftment and economic development through the conservation and restoration of biodiversity.
2. Responsible stewardship of our unique biodiversity.

These principles can be invisioned through initiatives such as:

- Creating local employment opportunities in invasive alien species removal, firebreak maintenance, and river cleanup.

- Training and employing teams to serve as dedicated caretakers of the river and surrounding ecosystems.

- Supporting sustainable local businesses that cultivate, harvest, and sell Fynbos products within defined ecological limits.

- Establishing long-term mentorship and education pathways for young learners, from early education to specialised skills development.

- Developing context-specific ecological vocations such as indigenous plant caretaking, nursery management, ecological burning, cultural facilitation, and environmental education.

^Figure 55. *Carpobrotus edulis*. Photograph by capenature_hhjnk_team1, 202*1*
The Sour fig, or also known as suurvy, ghaukum, or ghoenavy, has a strong connection to the Khoi heritage as it was used for nutritious and medicinal purposes (Malan and Notten, 2006).

These strategies inform the overall response to the socio-economic dynamics of Sir Lowry's Pass Village by enabling these processes to unfold through site-specific design interventions.

Valued landscape

Beyond its ecological and cultural significance, the Fynbos landscape holds economic potential that could be enhanced through a Geographical Indication (GI) designation. GIs are intellectual property rights that link a product to its geographical origin, conveying a sense of quality, distinctiveness, and heritage. For example, Rooibos became the first African product registered under the European Union's GI system in 2021 - substantially elevating its international profile and market value (Troskie, Biénabe & Swart, 2022).

A similar designation for Fynbos-derived products could strengthen regional identity, generate sustainable income, and amplify conservation efforts. The GI status would highlight not only the uniqueness of the landscape, but also the cultural knowledge and traditional practices tied to its flora - helping to safeguard both ecological function and human heritage. The transformative potential of such recognition is evident in cases like Darjeeling tea, which attained global acclaim and local empowerment following its GI registration in the early 2000s (Troskie, Biénabe & Swart, 2022).

^Figure 56. The Gantouw Project. Photograph by WILDARK, 2018
"The Gantouw Project is a ground-breaking research study using eland as a bush management tool, to combat bush encroachment and restore the biodiversity of the endangered Cape Flats Dune Strandveld." (Petro, n.d)

Ecological burning

When Fynbos burns. The regeneration of Fynbos and renosterveld is greatly dependent on fire. However, irregular fires can also harm the Fynbos biome - these often occur due to inappropriate fire management (City of Cape Town, 2019), including fires that happen too frequently, not at all, or those that become extreme due to the presence of dense alien invasive vegetation. While Fynbos historically burned at a natural, regenerative pace due to lightning strikes, ecological burning has become a contemporary management practice aimed at conserving Fynbos biodiversity. Further detailed information on the ecological significance of fire in supporting the growth and regeneration of the Fynbos biome is provided in Appendix H. Ecological burning is a specialised skill that requires an in-depth understanding of Fynbos diversity and its specific needs for long-term conservation and regrowth (Figure 58). For example, Fynbos burning requirements vary by vegetation type: the Cape Flats Dune Strandveld does not require ecological burning due to the dominance of succulents and thickets (City of Cape Town, 2019), whereas Renosterveld and other Fynbos types require periodic summer burns to survive. Even within Renosterveld and Fynbos vegetation, the appropriate fire frequency varies depending on the species composition (see Appendix H).

Fires are not uncommon in the City of Cape Town. They are most frequent during the dry and hot summer months, making their presence known through thick, dark clouds and the smell of smoke that hangs over the city. Wildfires burn for several days, resembling red-golden threads along the contours of the mountain (Figure 57), causing ash to rain down on the locals. Fire-induced erosion sends soil and rocks tumbling down the mountain, while unpredictable winds carry the flames across the city landscape, creating anxiety and fear. Firefighters battle throughout the night to contain the blaze, and helicopters water-bomb the raging flames (eNCA, 2025).

Even more common are fires in informal areas, which can lead to traumatic and devastating consequences. At the time of writing this, the informal settlement of Nkanini in Lwandle - located near the downstream section of the Sir Lowry's Pass River - is recovering from a devastating fire that destroyed over 500 shacks (SABC News, 2025). Strong winds accelerated the spread of the blaze over several hours, forcing residents to evacuate and abandon most of their belongings. In fear of losing their plots, many families began rebuilding amidst the debris and lingering smoke, exposing themselves to hazardous and unsafe conditions. A major issue, as reported by SABC News, is the extreme density of the settlement, which leaves no space for fire trucks or firefighters to access the blaze. Fire - even when it takes the form of ecological burns that are purposefully lit - remains a significant part of the lived Cape Town experience and can evoke fear if not properly understood or managed. This perception of fire informs the project as it acknowledges the impact of ecological fire regimes and how it can be shaped as a design element.

^Figure 57. Left: Mountain wildfire. Photograph by Birkett, n.d
^^Figure 58. Next page: Ecological burning. Sullivan Photography, nd.

Experiencing climatic conditions

Brown and Magoba (2009) illustrate how the character of rivers in this landscape is intricately shaped by the dynamics of flow and atmospheric variation - through sediment transport driven by increased discharge, the continual formation and reformation of riparian zones during flood events, and the movement of seeds, eggs, and aquatic organisms. The river thrives within this complex interplay of living systems, biological matter, and the temporal dimensions of climate - its rhythms of time, duration, and frequency (see Appendix M for further elaboration).

Yet these same atmospheric and hydrological forces also shape the way we perceive and relate to the landscape The shifts felt in the air, the arrival of the strong winds*, and the sudden downpours across the city all contribute to a sensory and cultural reading of place (See Appendix I). These climatic cues once guided how indigenous communities interpreted their environment, and they continue to inform our contemporary understanding and experience of the South African landscape. However, as previously noted, the ongoing densification and urban pressures have significantly constrained the capacity of local residents to respond to these climatic shifts. As a result, many are increasingly exposed to the direct impacts of extreme weather events - facing the possibility of their homes being flooded or their roofs torn away by strong winds.

This project seeks to explore how the urban landscape can engage with climatic and river dynamics - integrating these forces into the dense residential areas and making visible the absence of rain, the presence of the wind, or the imminent arrival of flood. The aim is to shift the perception of natural events as unexpected threats, to an understanding of the landscapes natural rhythms as a way to reduce the extremeties and unexpectedness of the flooding events.**

The following principles, as defined in the City of Cape Town Catchment, Stormwater, and River Management Strategy (2002) and the Management of Urban Stormwater Impacts Policy (2009) (refer to Appendix D for further elaboration on the policies and strategies), form the initial foundation for the design explorations:

1. On-site water retention and infiltration methods.

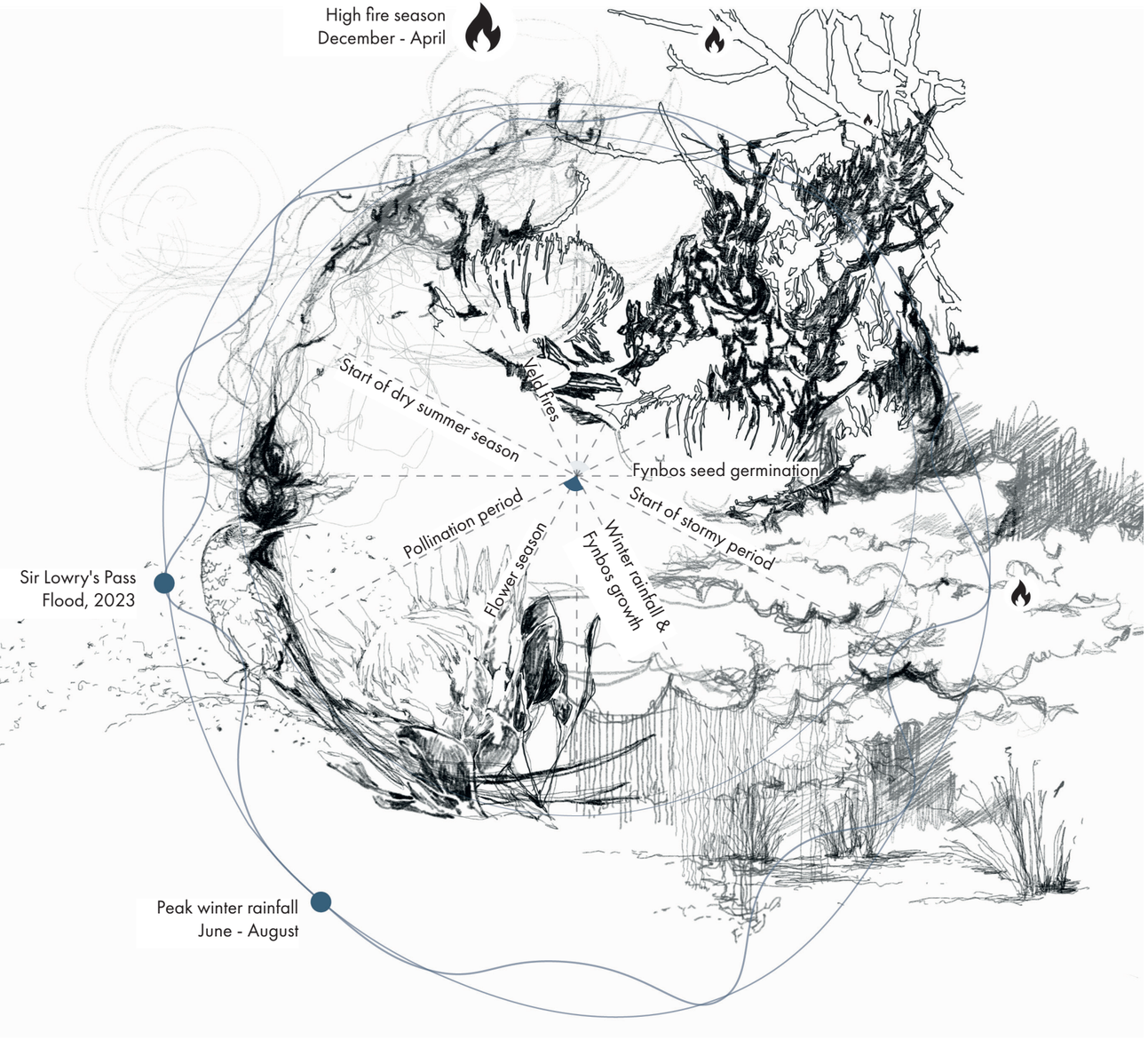
2. Linking the upstream and downstream strategies.

3. Local monitoring, involvement and maintenance.

4. Early warning systems and risk identification through an intimate understanding of the landscape patterns.

^Figure 59. The river receives water from the clouds which lie heavily on the Hottentots-Holland Mountains. Photograph by McVitty, 2024.

*Also referred to as the South-Easter wind. Refer to Appendix I **_Hier kom moeilikheid_** is a phrase often said by the local Cape Tonian when a change in atmospheric condition is felt, heard, or seen.



From contextual policies, intentions, and values to an experienced landscape composition

A growing disconnectedness from the landscape and the loss of ability to move with and respond to its natural rhythms have left urban environments vulnerable to the river's strength. At the same time, urban growth, pollution, and the overextraction of natural resources have diminished the river's dynamic quality and its capacity to diversify, adapt, and sustain its surrounding riverine landscape. The decline in native biodiversity and the erosion of indigenous knowledge have further weakened the intimate relationship between human, river, and soil. The river's value has faded - overshadowed by fear, reduced to the threat of flooding.

And yet, we still perceive the landscape around us - we feel the thick, warm air of a stormy evening, the drumming wind, the cool rush of river water. The entanglement between human and non-human cannot be undone.

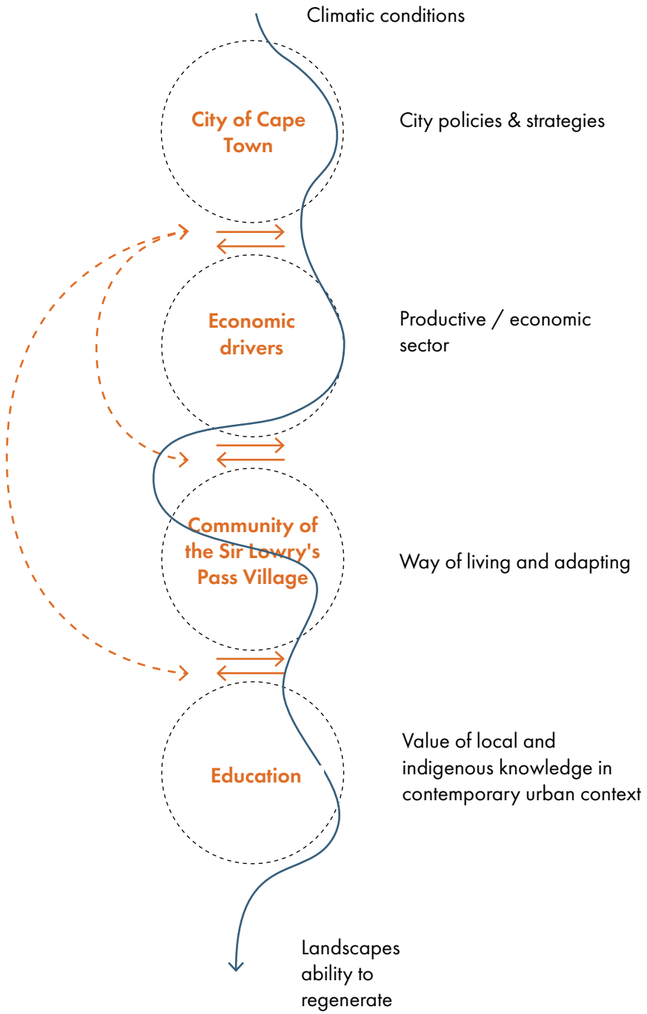
While city policies govern the physical impact we have on the river and its ecosystem, they rarely engage with the deeper question: how do we foster a sense of care and responsibility toward the river? How do we learn to value it again - not only as a resource or threat, but as a presence?

This project explores those questions. It asks how the City's policies and spatial strategies can serve as a foundation for a landscape that encourages experience, intimacy, and mutual care between human and non-human. This is essential to mitigating the impacts of urbanisation on the river, and the impacts of flooding on vulnerable informal communities.

The first part of the analysis examines the river within its broader context - its layered history and heritage - and identifies key themes and strategies. These themes are used to shape design responses informed by both contextual conditions and existing policy. Central to this is the idea of reclaiming space for the river - not merely as infrastructure, but as a living, breathing component of the urban landscape.

The second section explores how these strategies unfold spatially. It moves from the broader catchment area to the detailed design site, tracing how on-site themes are interpreted and materialised into specific interventions. Through this, the river is repositioned at the centre of both ecological and urban life.

^Figure 60. South African climatic landscape.



Stakeholders

The following non-human stakeholders represent essential ecological processes that sustain the natural life cycle of the riverine landscape, including river channel shifts, floodplain dynamics, ecosystem health, natural water quality variation, and long-term adaptation:

Non-human stakeholder groups:
- Water
- Flora
- Fauna
- Earth / soil / surrounding Land

These processes, however, often manifest in ways that are perceived negatively within the urban context - triggering fear and defensive responses to flooding, water scarcity, infrastructure failures, and limitations in resources and shelter. These perceptions are shaped by the following human stakeholders:

Human stakeholder groups:
- City of Cape Town
- Economic drivers such as agriculture / tourism / local economy
- Community members of the informal settlements / Indigenous knowledge holders
- Education sector

The interrelations between human and non-human actors extend beyond cultural storytelling and symbolism, as explored in Part One. They directly inform policy-making and shape how humans interact with rivers. Because such policies significantly impact the quality of life in informal areas, the economic stability of local agricultural and tourism enterprises, and the priorities of educational institutions, it becomes crucial to explore these entanglements.

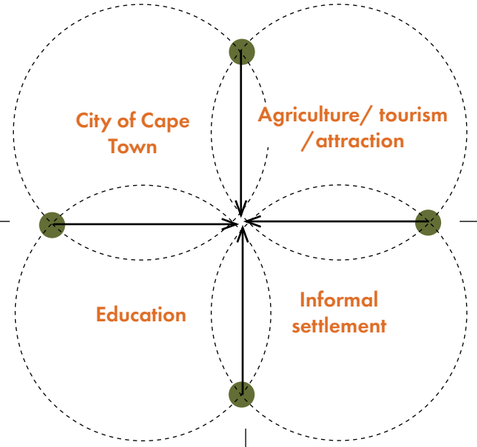
This project proposes a shift in how these stakeholder relationships are recognised and embodied - towards a relationship that benefits the river and the Sir Lowry's Pass community. The interconnectedness of stakeholders, their mutual needs and benefits, and their influence on the design process are illustrated in the following map:

The lens of this project recognises the river not merely as visible surface water, but as an ecological process - water stored in the ground, in plants, and within human bodies. The aim is not to alter the river through short-term interventions, but to shift human understanding and appreciation of the river, thereby contributing to its long-term health. In this context, policy-making, individual stewardship, and broader respect for the river's ecological and economic significance are considered equally important.

How the human and non-human value is entangled within this project is illustrated in the overlapping of the two maps x.

^Figure 61. Main human stakeholders.

Human stakeholder map



Research on indigenous knowledge informing environmental policies ↑↓ Focusing research on indigenous knowledge

Updating policies and strategies

↑↓

Space and priority for the river in an urban landscape

Design zoom-in 2

Integration of the river's presence within the urban node.

Product & implementation diversification ↑↓ Employment → Shared access and benefit ↑↓ River's ecological dynamics, and diversification

Design zoom-in 1

Spread, infiltrate and slow down

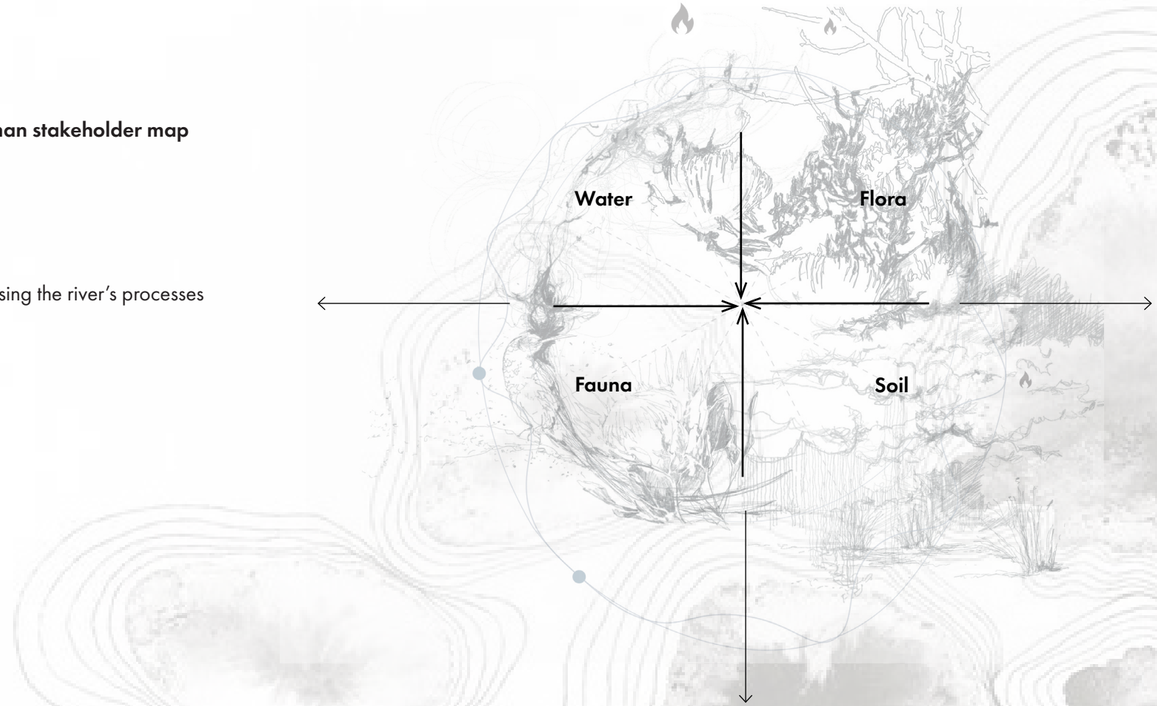
Community-based knowledge ↑↓ Indigenous value → Epistemic justice ↑↓ Awareness and recognition of the river's value

Design zoom-in 3

Involvement, care, and stewardship

Non-Human stakeholder map

Prioritising the river's processes

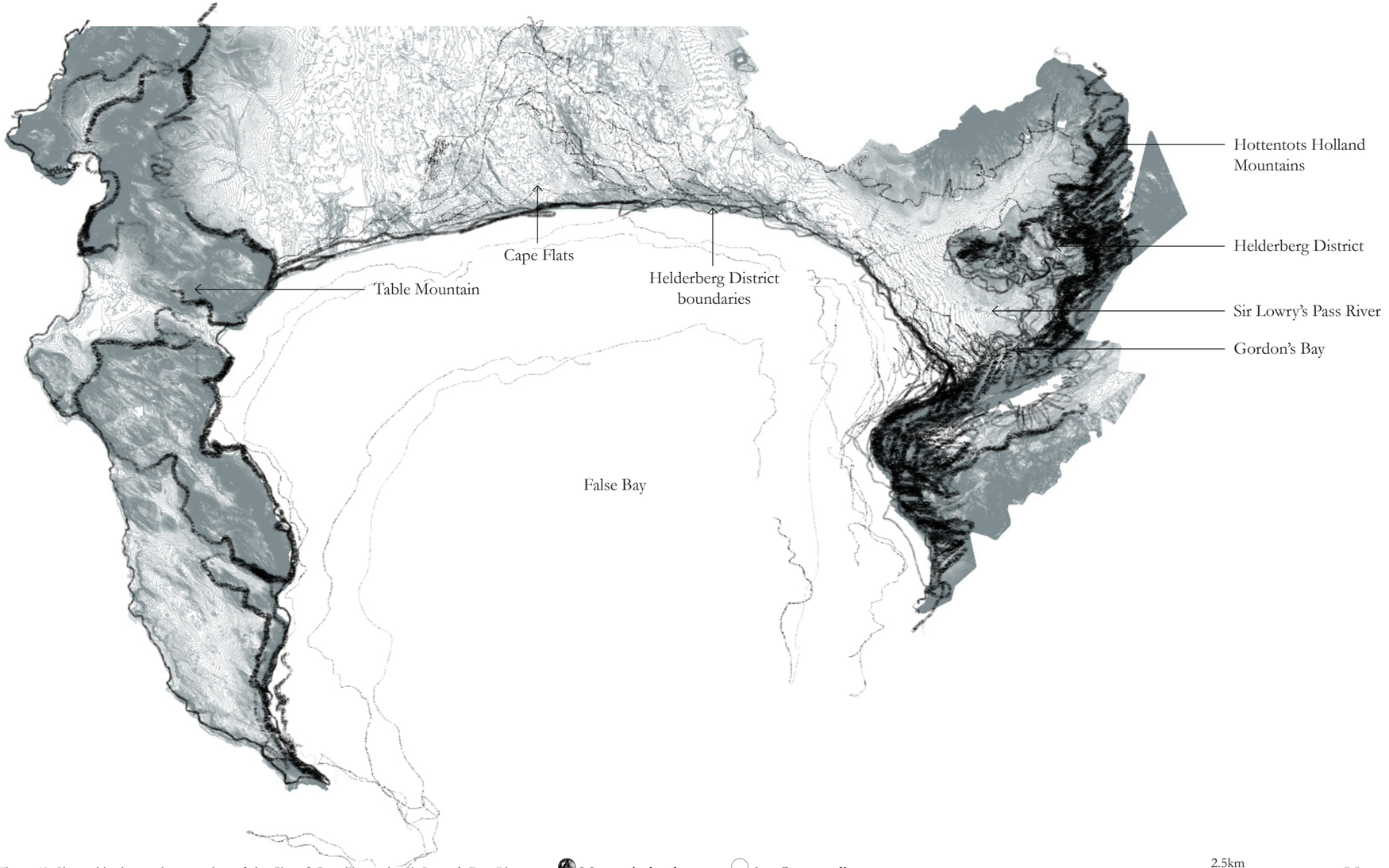


Ecological diversity and resilience - and the time to grow - supported by an infrastructure of human care

Generational appreciation for the river's health and value within an expanding urban landscape

Sir Lowry's Pass River Catchment Scale

^Figure 62. Sir Lowry's Pass Catchment Area.



^Figure 63. Situated in the southern reaches of the City of Cape Town, the Sir Lowry's Pass River design site lies between the Hottentots Holland Mountains to the east and the Table Mountain to the west.

Zoomed-in site analysis

Sir Lowry's Pass

The project location falls under the Helderberg District (Figure 63), which is located in the southeastern part of the City of Cape Town. The values and development plans for the Helderberg District are articulated in the District Spatial Development Framework, which presents a vision for the area, outlining key development parameters, synthesising analytical and technical insights, and proposing an implementation strategy unique to the district's character. Elements of the project brief are informed by this guiding document, serving to anchor the intervention within its broader spatial and socio-economic context, and to shape strategies that may be realised, at least in part, within this framework (City of Cape Town, 2023).

The district has experienced an accelerated rate of growth - an increase of 87% over a span of just seven years (City of Cape Town, 2023). This rapid densification influences the overall strategies of the design proposal, informing, for instance, the edge conditions between spaces between the river and both current and anticipated residential developments. This approach unfolds at the scale of the downstream river reach, as well as within the context of the Sir Lowry's Pass Village, where informal settlement patterns are increasingly encroaching upon the river's edge.

*The entire Helderberg region population is estimated at 281,077, comprising a modest fraction of the City of Cape Town's 4,400,240 population count (City of Cape Town, 2023).

Sir Lowry's Pass Catchment Area

The Sir Lowry's Pass catchment area is bordered by the Hottentots Holland Mountains (Figure 63) in the north, east, and south, and opens up towards False Bay and the Cape Flats region in the west. The peak of the river is at Moordenaarskop and originates from a series of wetland seeps on the southern side of the mountains and flows subsequently through a diverse agricultural, rural, and urban landscape (Day, 2020).

The riverine landscape has been drastically altered to accommodate human growth, such as in the downstream area:

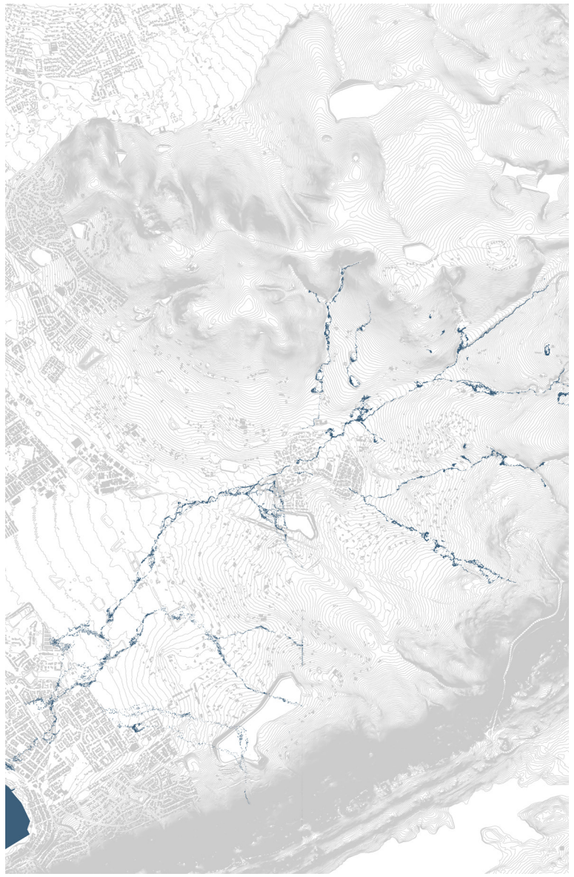
"*Under natural conditions, the flat, low-lying plains in these reaches probably received sheet flow from the upper catchment area during flood conditions, resulting in the spread of shallow water over broad expanses of alluvial plains. Moreover, the numerous off-channel dams have caused the middle reaches of the river, just below the national highway, to be extremely low in the dry summer months*" (Brown and Magoba 2009).

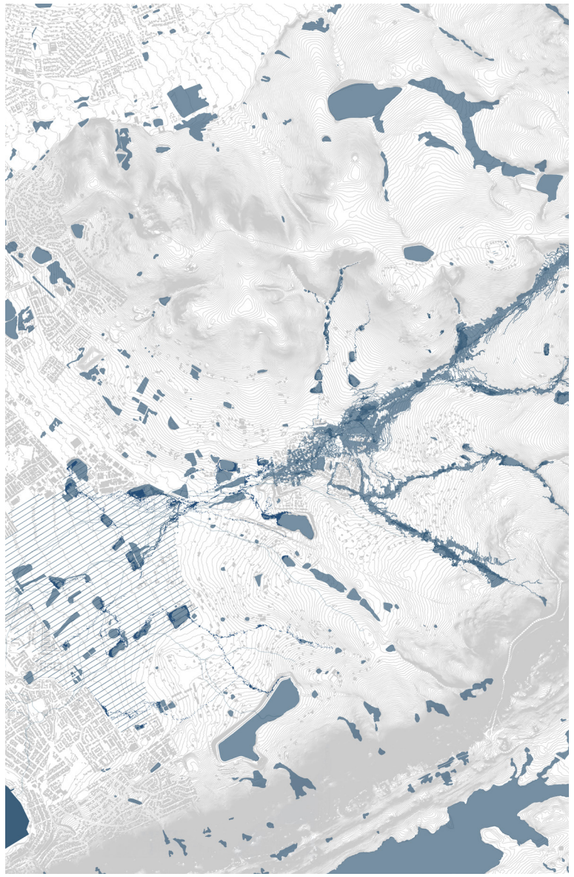
Sir Lowry's Pass Riverine Landscape

The Sir Lowry's Pass River is described by Brown and Magoba (2009) as "a fairly small stream, with an impressive ability to flood". While fair in its visible summer flow, its ability to flood during winter renders it a significant hydrological feature within the landscape.

Important to acknowledge is that despite efforts to engage with the City of Cape Town, precise data regarding the river's volume under dry, wet, and storm conditions remained unavailable for the duration of this project. However, in an attempt to measure its abilities as accurately as possible, the method of analysis included repeatedly tracing the presence of the river from satellite images spanning from 1938 to the present. These findings have led to a speculative and interpretive visualisation of the river's state in the mid-1900's and during the flooding event in September 2023 (Figures 64 and 65), and serves as the foundation for the overall design strategies. Moreover, this process has shaped the interpretation of the river's volume and spatial extent across three seasonal conditions - the dry summer period, the wet winter season, and instances of flooding - each of which informs the specific intentions and functions of the proposed interventions during the respective seasons. Refer to Appendix for an overview of the monthly rainfall in this area.

*The Sir Lowry's Pass River catchment boundaries cover an area of approximately 7,576 ha (Day, 2020).





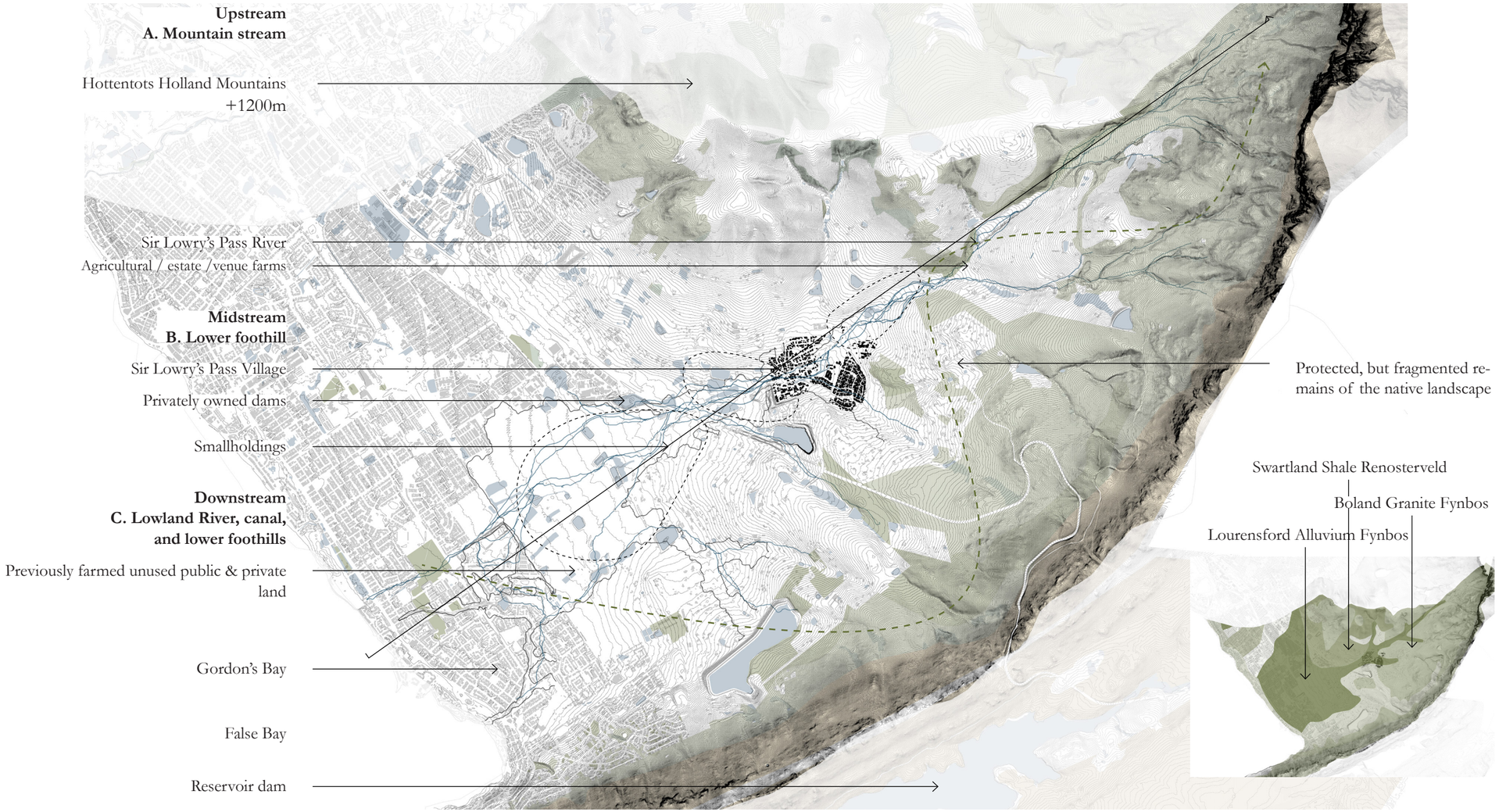
Flow / presence of river, dams and wetlands

2m Contour lines

500m 1500

^Figure 64. River movement and natural wetlands 1938

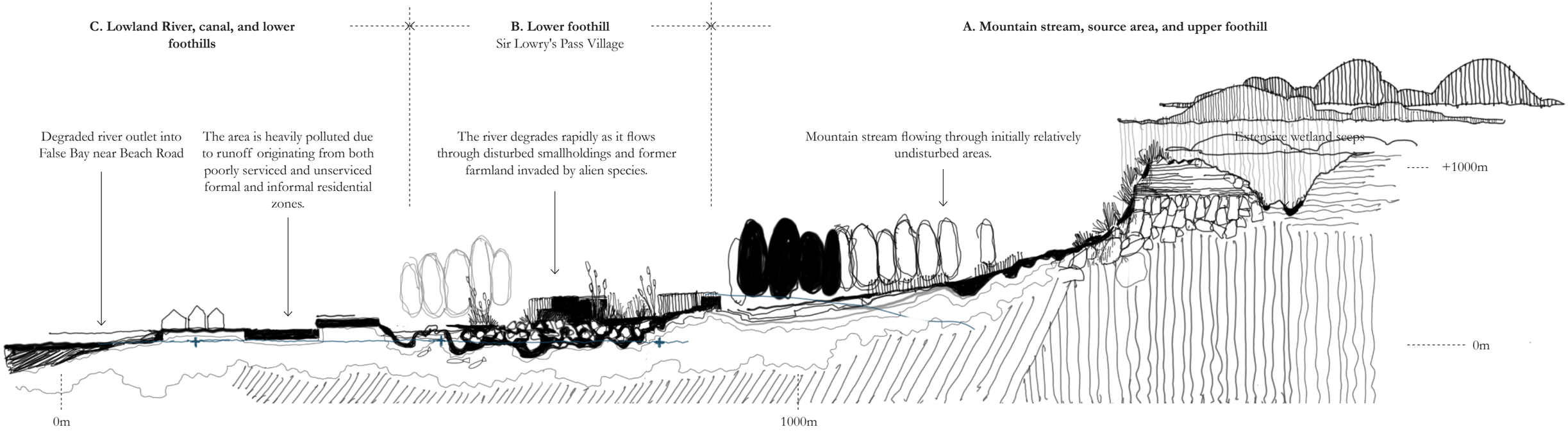
^^Figure 65. September 2023 flood, river movement, dams & natural wetlands.



The river degrades immediately as it passes from its natural state in the upstream region, into agricultural and residential areas in the mid- and downstream reaches (Figure 66). As noted by Day (2020), pollution becomes evident as the river receives runoff from both formal and informal settlements - such as Sir Lowry's Pass Village - many of which lack adequate service infrastructure. This degradation is characterised by the accumulation of litter, increased sedimentation, erosion of riverbanks, the proliferation of invasive species, and the intermittent inflow of sewage (Day, 2020). The current state of the river is illustrated in the following conceptual section (Figure 67), while the principal threats undermining its ecological functions are outlined in the accompanying Table A (Day, 2014):

As previously noted, the Sir Lowry's Pass River flows through a landscape once abundant with the Lourensford Alluvium Fynbos. Today, over 91% of the original Lourensford Alluvium Fynbos has been irrevocably altered or lost due to urban expansion, agriculture, plantations, and infrastructure development. The surrounding Biodiversity Network encompasses larger protected areas upstream, alongside isolated conservation plots scattered within the downstream residential zones (City of Cape Town, nd.). Given the evident fragmentation of the native species the project aims to strengthen the lost biodiversity corridor.

^Figure 66. Sir Lowry's Pass Catchment Area and its historical vegetation types.



C. Lowland River, canal, and lower foothills. Residues of agricultural land which is now unused, public space, or areas of urban growth.

B. Lower foothill. Dense informal and formal residential area.

A. Mountain stream, source area, and upper foothill.

^Figure 67. Top: Conceptual section illustrating the conditions of the Sir Lowry's Pass River reaches, which are sectioned into three parts for the project.

^^Figures 68-73. Bottom: Conditions of the river, its surrounding landscape, and urban conditions.

River zone	River stretch	Main issues		Project-specific zones	Project-specific scale	Project-specific strategies
A. Mountain stream, source area, and upper foothill	Source to Wedderwill boundary ca. 5km	"Threat of alien invasion, erosion of seeps as a result of paths, fires; unnatural fire regime, loss of indigenous wetland and riverine vegetation, some channelization leading to wetland shrinkage; abstraction" (Day, 2014)		Upstream river	Strategy	Alien vegetation management and recycling Flood and erosion control Indigenous Fynbos rehabilitation Controlled fire regimes Wetland rehabilitation where possible
B. Lower foothill	From Wedder-willboundary until N2 ca. 3km	**Before village:** "Extensive invasion by woody aliens (mainly *eucalyptus*); severe erosion of channels and banks; channel deepening and widening, and loss of connectivity with adjacent wetlands; dumping in places; moderate changes to water quality, worsening with distance downstream through informal settlements" (Day, 2014) **Village:** "Highly impacted water quality including on-going sewage contamination; significant encroachment and erosion in places but remnant patches of nearnatural channel morphology and wetland vegetation" (Day, 2014) **Downstream of Village:** "Poor water quality; localised bank and bed erosion and down cutting; alien invasion and loss of indigenous vegetation; persistent leaking sewers in these reaches, as well as grazing" (Day, 2014)	=	Midstream	Zoom-in design	Water quality improvement Alien vegetation management Wetland rehabilitation where possible, especially the Pennisetum macrourum wetland under the railroad Fynbos corridors and connected urban parks Controlled fire regimes Improved water relationships Flood-proof housing typologies Economic growth aligned with ecological improvement Focus on employment, skill development, and education Rehabilitation of riparian vegetation
C. Lowland River, canal, and lower foothills	From N2 until Wastewater treatment plant ca. 2.6km	"Historical channel diversion and channelisation; extensive loss of indigenous vegetation and invasion by mainly woody alien trees and kikuyu grass; abstraction; water quality impacts from upstream" (Day, 2014)		Downstream	Strategy	Protection of the river's natural morphology and meandering nature Growth of indigenous Fynbos vegetation Employment opportunities through landscape care Floodplain rehabilitation Prevention of rapid urban growth

^Table A. Principal threats of the river zones as analysed and described by Day (2014). The project strategies reflect these themes.

Policies and strategic frameworks

The development of this project's objectives and strategies has further been guided by the policies and strategic frameworks established by the City, as mentioned in Part Two, Section One. These include key priorities such as wetland restoration, the integration of socio-economic benefits with ecological enhancement, the reduction of alien invasive species, the emphasis on education and skills development related to local biodiversity, and the overall sustainability of these interventions. The City of Cape Town's Water Strategy outlines the following commitments:

1. Ensuring safe access to water and sanitation

2. Promoting the wise use of water resources

3. Securing sufficient and reliable water supplies

4. Achieving shared benefits from regional water resources

5. Advancing the vision of a water-sensitive city

These principles and policies have directly shaped the foundational interventions of this project, with a focus on groundwater recharge and ecological rehabilitation. As Purnell - whose work centres on the restoration of native Fynbos landscapes - notes, any alterations to South African rivers must remain within legally defined limits (Purnell, 2025). In response, the proposed foundational earthworks consist of two types of micro-catchment interventions distributed across the riverine landscape:

1. Diamond-shaped micro-catchment earthworks

2. Contour bunds

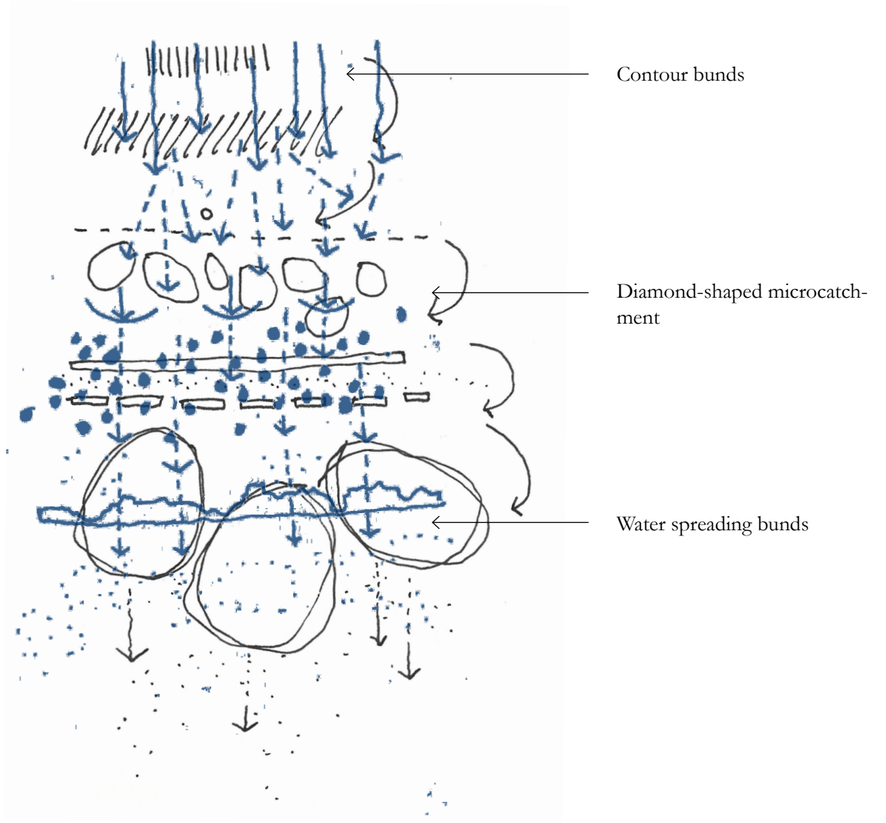
These structures are designed to disperse and slow runoff, enhancing infiltration and supporting the restoration of natural hydrological cycles. As primary fixed interventions, these earthworks are designed as adaptable tools that can be replicated across varying contexts - whether as large-scale municipal strategies or smaller, community-led or private initiatives. The visual illustrations on page 60, and further detailed at the end of the document, serve as a practical toolbox to support this adaptable approach.

Serving as a foundation for both ecological processes and human interaction, the collective aim is to:

1. Enable involvement, awareness, and steward ship.

2. Support the spreading, infiltrating, and slowing down of surface runoff.

3. Allocate space for the river.



^Figure 74. The following sketch, inspired by P. Maseko's water harvesting techniques, illustrates the flow and management of water within a permaculture-based farming system.

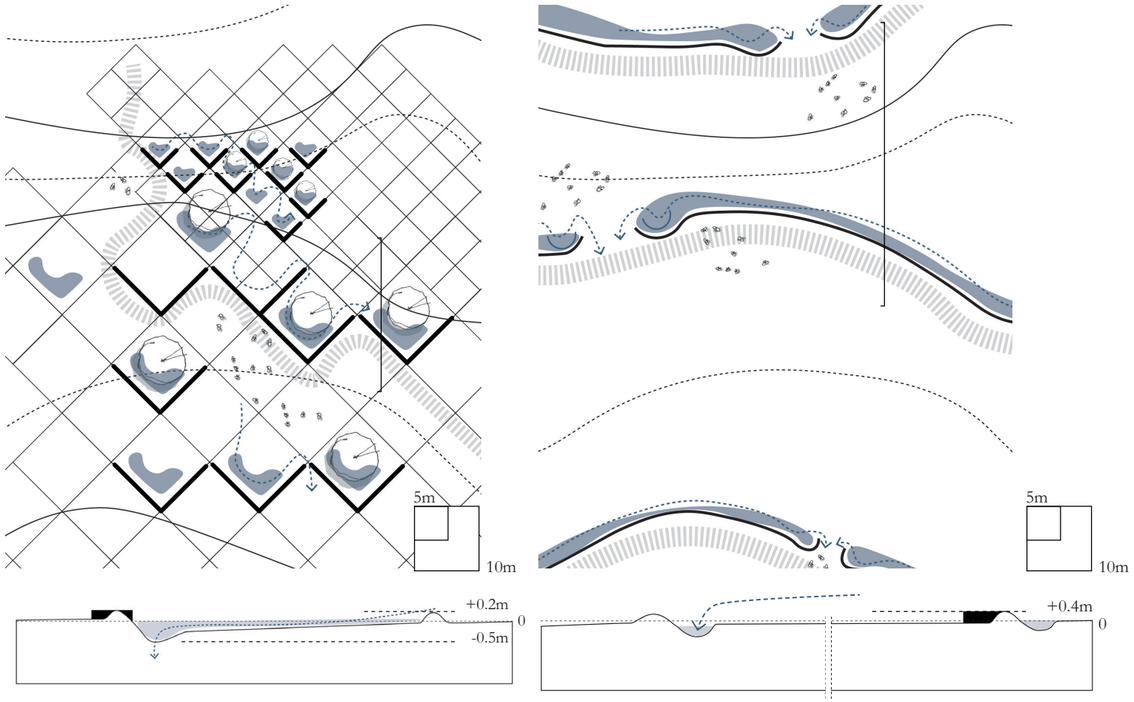
Micro-catchment strategies: Toolbox

Diversify water supply through groundwater / aquifer / wetlands

Inspired by
A Manual for the Design and Construction of Water Harvesting-Schemes for Plant Production, Rome, 199, and Percival Alfred Yeomans, Australian inventor known for the Keyline system.

Diamond-shaped microcatchment
Spread rainfall over a larger landscape and recharge groundwater

Contour bunds
Spread runoff, increase infiltration and capture sedimentation



^Figure 75. Diamond-shaped microcatchment and contour bound earthworks.

^Figure 77. Conceptual on-site spatial experimentation. This informed the design zoom-in 2 section in Part Four.

Economic benefits of indigenous species:

Tea / Oils / Medicinal:
Honeybush tea *Cyclopia genistoides* [h., e.]
Buchu *Agathosma crenulata* [f., m., h., e.]
Toothed-leaf athanasia/ Geelblombos *Athanasia dentata* [d.r., f., m., h.]

Fire resistance:
Eight-day-healing Bush *Otholobium decumbens* [m.]
Pig's ears *Cotyledon orbiculata* [d.r., b., m., h.]
Common sunshine conebush / Geelbos *Leucadendron salignum* [d.r., hd.]
Dune Crow Berry *Searsia (Rhus) crenata* [hd.]

Trees:
Wild olive *Olea europaea L. subsp. africana* [d.r., b., b.f., f., e., m., h.]

^*Psoralea decumbens.* Photograph by magrietb, 2013

^*Athanasia dentata* Photograph by San Marcos Growers, n.d.

^*Agathosma crenulata.* Photograph by Vynbos, 2018

^*Cyclopia genistoides.* Photograph by Laidler, 2021

^Edible fruits *Olea europaea.* Photograph by Clarkson, 2015.

^*Olea europaea.* Photograph by Plantbook, n.d.

^Figures 78-83. Fynbos species which can be planted in combination with the previous toolbo..

Legend: d.r. Drought resistance / h.d. Hedge / b. Birds / m. Medicinal / h. Honey / f. Fragrant / e. Edible / b.f. Butterflies

Overall strategies

Coextensive rehabilitation

The following overarching strategies spatially reflect the project's main objective which is to rehabilitate and enable life and survival coextensively, between river and human, within an urban riverine landscape. These strategies have been developed by forming conceptual conclusions, objectives, positioning, and explorations.

Strategy 1: Dedicating space to the river, flood safety, and urban water integration
Strategy 2: Fynbos rehabilitation
Strategy 3: Socio-economic integration

The three strategies are conceptualised differently throughout the site, according to the three riverine sections (Sections A, B, and C), as mentioned on pages 56 - 58. Sections A and C, the upstream and downstream areas, will be defined through conceptual strategies, while Section B, the midstream area of Sir Lowry's Pass Village, will be defined through three detailed design interventions. The conceptual intentions of each strategy, within the sections A, B, and C, is defined as follows:

Strategies 1-3, Section A:
Firstly, to enhance the upstream spread of rainwater, ensuring a steady river flow during flood events. Secondly, to mitigate flooding by strategically spreading runoff during periods of intense rainfall - slowing down the flow before it reaches Sir Lowry's Pass Village. This approach integrates established water management principles with groundwater recharge techniques, including microcatchment methods, riparian vegetation restoration, the eradication of invasive alien species where needed, and the reinforcement of indigenous plant communities. Thirdly, to guide the development of potential urban expansion areas, drawing inspiration from permaculture principles.

Strategies 1-3, Section B:
Firstly, to define Sir Lowry's Pass Village as the link between the up- and downstream riverine landscape, thereby encouraging care towards the river, allowing space for its waters to expand over the urban landscape, reducing pollution from residents, and exploring a method of living with the river's dynamism rather than against it. Secondly, encourage a give-and-take relationship between the human and non-human by developing an incentive to care for the ecological conditions, which includes the rehabilitation of native plant species. Thirdly, develop opportunities for economic growth and individual entrepreneurship related to the unique qualities of native vegetation.

Strategies 1 - 3, Section C:
Firstly, improve the health of the river by reducing pollution within Section B and using existing wetlands in Section C to store floodwaters. Secondly, protect unused public space for both river floods and Fynbos conservation and rehabilitation efforts. Therefore, reject the concept of dense urban growth and dedicate space to ecological improvement and diversity. Thirdly, dedicate this space to education, recreation, employment opportunities, and incremental and sensitive urban growth as a method to improve the overall quality of the landscape coextensively.
The strategies differ according to the three sections as the river traverses through unique landscape characteristics. The river flows through multiple spaces with distinct characteristics, influences, and landscape elements. The following model was developed to presentfour river segments and their contrasting relationships between humans, the river, and infrastructure. The model represents the materiality of each segment - such as soil, sedimentation, streets, or buildings - rather than merely the contour lines, as these elements shape the river's form and flow.

^Figure 84. Conceptual sketch representing the diverse stretches through which the river traverses.

^Figure 85. Model parts representing the unique and contrasting landscape characteristics within the river sections.

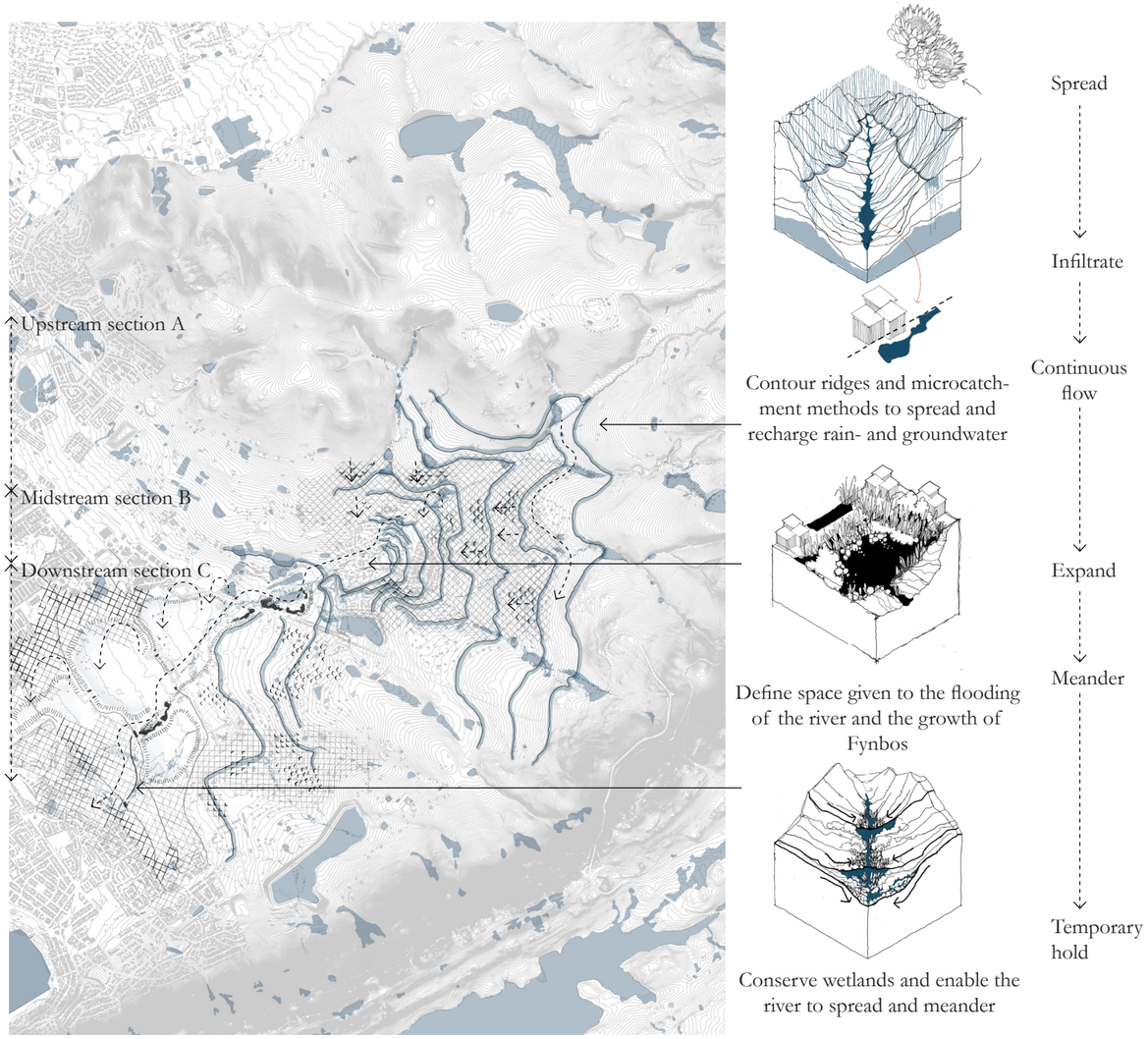


Figure 86. Strategy 1: Dedicating space to the river, flood safety and urban water integration

Strategy 1:
Urban river landscape

The primary strategy is to prioritise the value of the river within the (growing) urban landscape. This is not only to recognise the ecological importance of the river and its health, but also to develop a flood mitigation strategy for the Sir Lowry's Pass Village community. By acknowledging the river as an integral part of the urban environment, the aim is to foster a mutual relationship between people and the river - lessening the fear of flooding and addressing the sense of neglect and disregard that currently overshadows it. The integration of the river into the urban landscape is approached through three methods, based on its position within the catchment area:

Upstream:
Flood mitigation and groundwater recharge

Sub-question:
How can the principles of existing hands-on, low-tech water systems inform new flood mitigation methods in upstream urban environments?

Midstream:
The shared river landscape within Sir Lowry's Pass Village

Sub-question:
How can the river and the excess water during a flood be integrated into the urban fabric of Sir Lowry's Pass Village?

Downstream:
The meandering river

Sub-question:
How can we give a voice to the voiceless and allow the river the space to exist and thrive?

Calculations have schown that in the event of another flood, temporary upstream flood basins with an estimated area of ~100ha, would be needed to prevent similar events in the Sir Lowry's Pass Village (see full calculation in Appendix J).

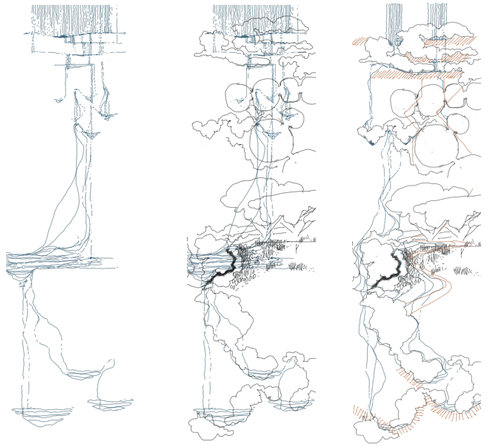


Figure 87. Strategies concept sketch.

Flow of river
Micro-catchment water harvesting

500m 1500

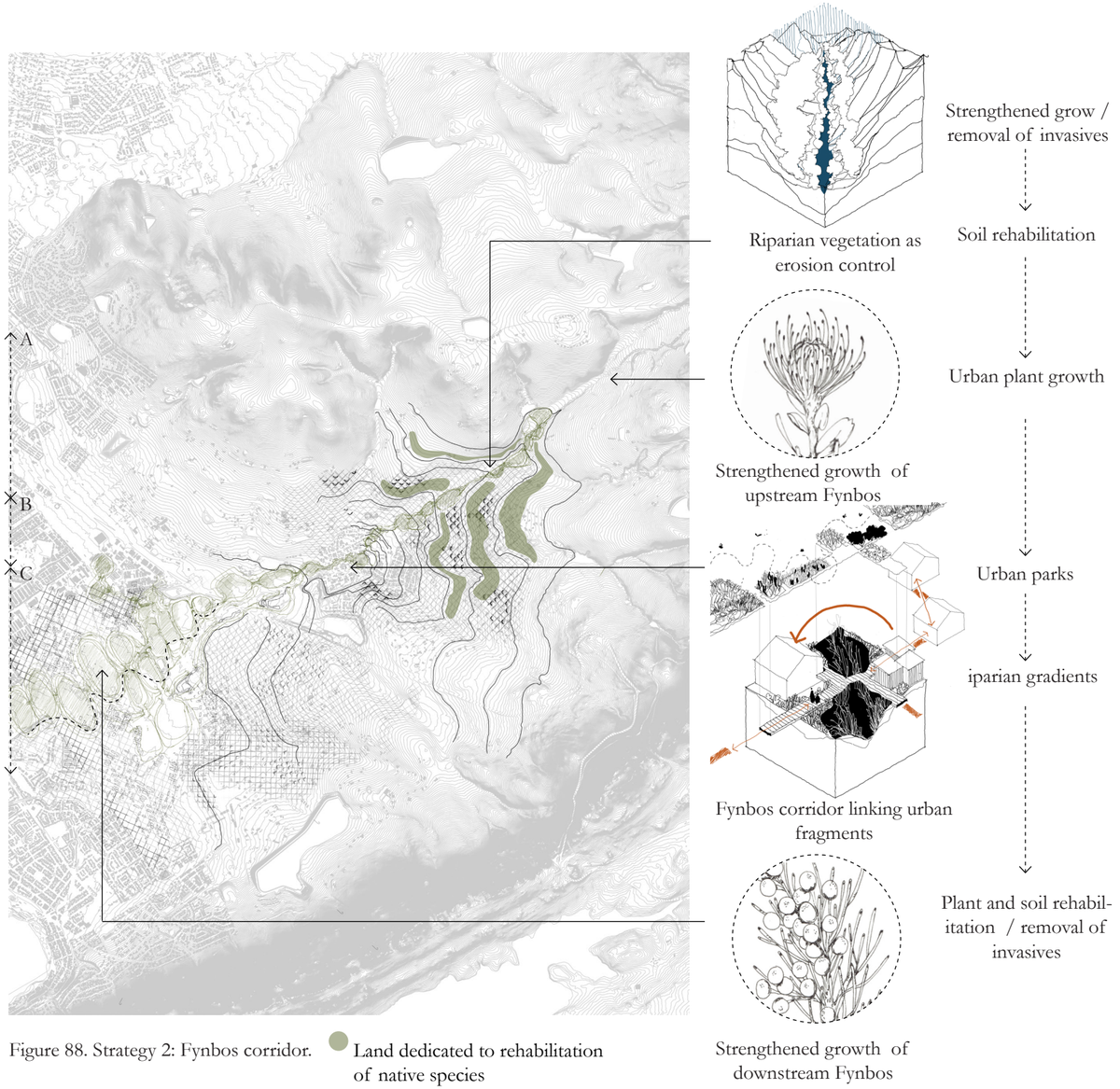
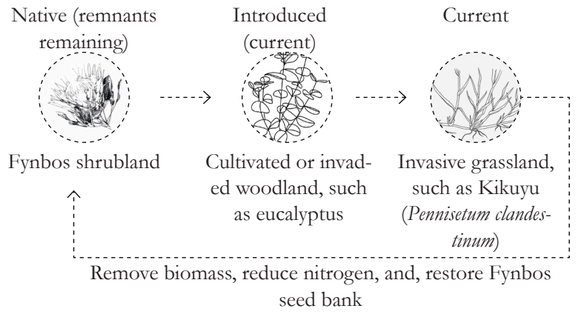


Figure 88. Strategy 2: Fynbos corridor.

Strategy 2:
Fynbos corridor

The secondary strategy is to prioritise the protection and regrowth of the Lourensford Alluvium and surrounding Fynbos, which has been largely transformed from its historical presence. To support the recovery of native Fynbos species, ecological restoration must be implemented to regenerate degraded or damaged ecosystems (Esler, Pierce & de Villiers, 2024). Figure 89 illustrates a model of lowland Fynbos degradation and restoration, forming part of the comprehensive restoration framework outlined by Esler, Pierce & de Villiers (2024). This restoration approach further aligns with the priorities outlined in the City of Cape Town's environmental strategies and policies, such as reducing degradation caused by alien invasive species, creating corridors and buffers around natural remnants, and improving pollination, infiltration, and wildlife presence.

The strategy therefore defines a Fynbos corridor within the public spaces surrounding the Sir Lowry's Pass River. This approach is informed by the Fynbos Corridor Collaboration, as mentioned earlier in Part Two. Their efforts, which align with those of this project, were initiated in response to fragmented ecological and social challenges in Cape Town, with the goal of strengthening and connecting Fynbos habitats in public spaces by developing Fynbos rehabilitation guidelines and maps (Fynbos Corridors Project, n.d.). The benefits of this strategy include enhancing the overall quality of the riverine landscape by supporting pollination processes, raising social awareness of Cape Town's unique Fynbos vegetation, conserving and rehabilitating native species, and facilitating the slow infiltration of water into the soil. Local labour will be engaged in the removal, processing, and ongoing maintenance of invasive species, thereby supporting community employment and skill development. While the removal of invasive vegetation is prioritised, the project acknowledges the historical context and origins of these species. Eucalyptus trees that do not directly interface with the riverine system will be retained due to their distinctive structural form and visual presence within the landscape. These rows of trees not only serve as historical markers of the site's heritage but also function as windbreaks and provide foraging resources for bees. Invasive tree species that are removed will be repurposed within the design framework - utilised in the development of alternative housing typologies, integrated into earthwork structures, or transformed into usable products.



^^Figure 89. Model of lowland Fynbos degradation and restoration. Image by Esler, Pierce & de Villiers, 2024, edited by author

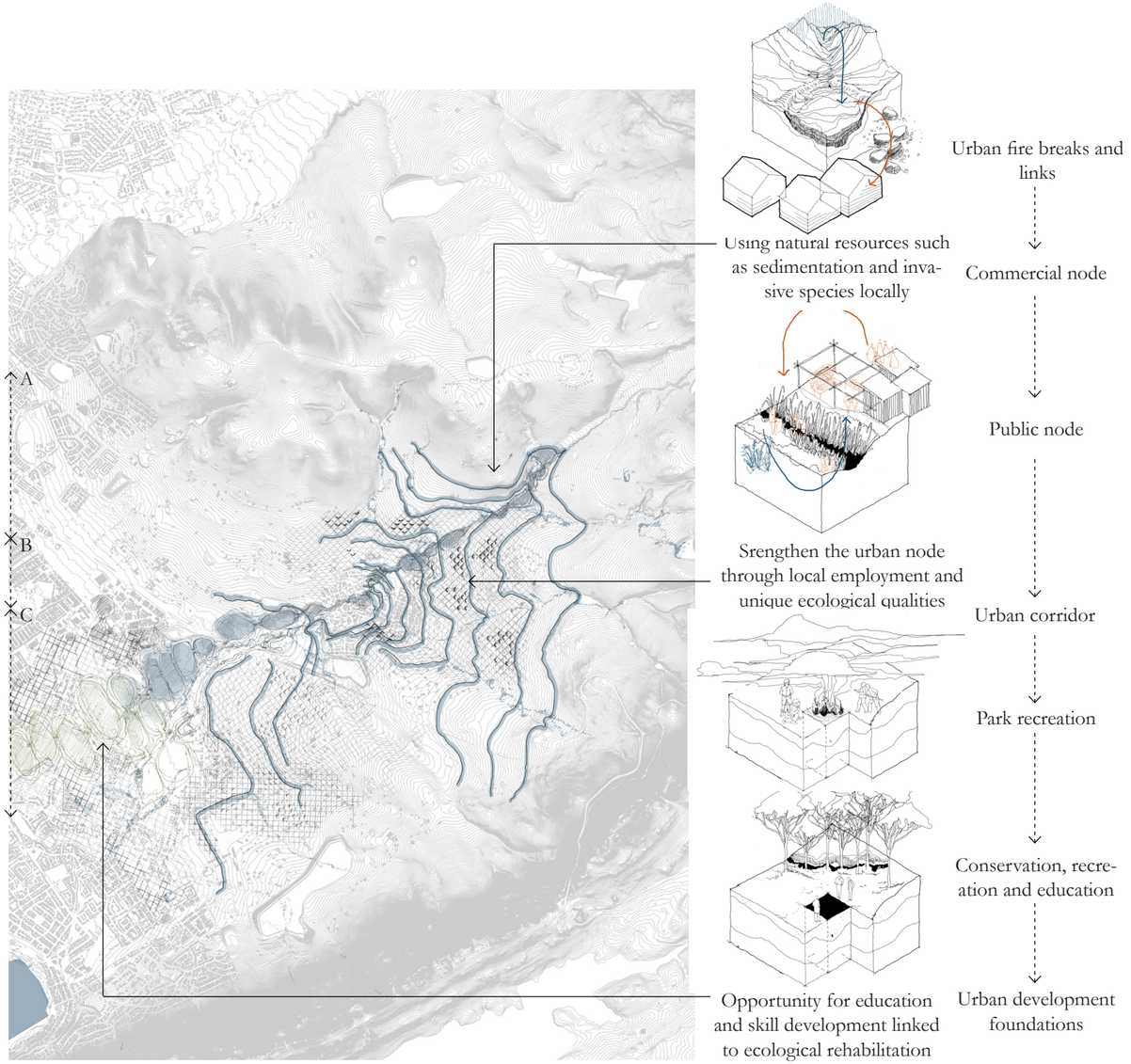


Figure 90. Strategy 2: Employment opportunities

Strategy 3:
Socio-economic integration

The third strategy focuses on the social and economic integration within ecological rehabilitation efforts, aiming to strengthen incentives and engagement in caring for the landscape. This includes valuing lower-income areas, such as Sir Lowry's Pass Village, by creating employment opportunities and encouraging small business growth to enhance the economic value of these smaller towns. Additionally, it emphasises strengthening educational and skills development facilities with a focus on landscape conservation and rehabilitation, encouraging community involvement and stewardship of ecological health.

Unemployment is a pressing issue in Sir Lowry's Pass Village, where, according to the 2011 census, 22.16% of the labour force is unemployed. In contrast, the unemployment rate in the Gordon's Bay area is estimated at 6–10%. Sir Lowry's Pass is therefore one of the poorest areas in the Helderberg District (City of Cape Town, 2023). The Helderberg plans highlight the need to enhance economic opportunities in areas like Sir Lowry's Pass. Research and interviews with local residents reveal that public transport connectivity within the village is limited. The aim is to shift the focus of connectivity towards these areas, rather than already economically developed areas like Gordon's Bay. The goal is to develop Sir Lowry's Pass as a destination by enhancing its unique characteristics. Whereas the surrounding estates and wine farms are established destination points, Sir Lowry's Pass Village currently functions as a barrier between them.

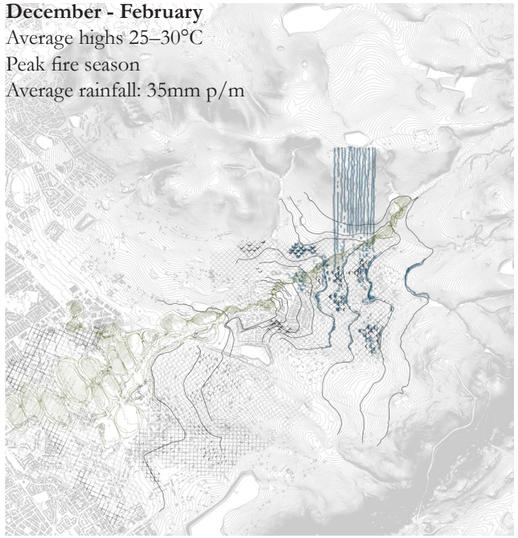
Urban growth (downstream)
As previously mentioned, the Helderberg area faces considerable pressure from urban expansion driven by city growth and population increase. To accommodate this growth while respecting the protected Fynbos areas and the space needed for the river's natural flooding and meandering, the project applies landscape-based urban principles. These combine groundwater retention methods with potential urban development zones, reflecting similar micro-catchment techniques implemented upstream (see page 60). These principles of allowing urban growth within floodplains are also reflected in the design approach for Sir Lowry's Pass Village (page 113).

Seasonal dynamics

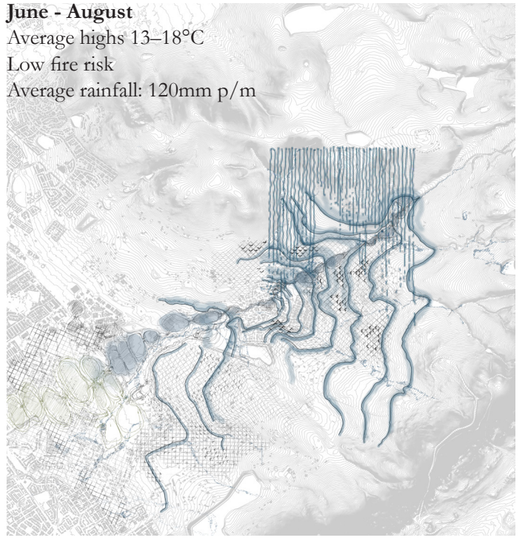
The three landscape strategies are designed to respond dynamically to seasonal variations, enabling communities to adapt their practices in tune with the patterns of climatic conditions. Rather than imposing fixed infrastructures, the strategies embrace variability and encourage responsive interactions (page 66).

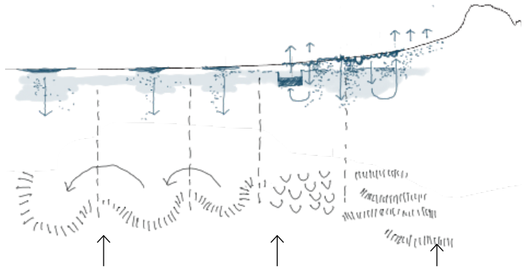
Buchu seed harvested by hand, propagation ----> seed sown, smoke-treated, and cultivated ----> Flowering & cuttings

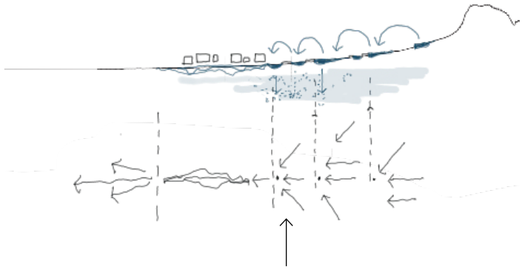
December - February
Average highs 25–30°C
Peak fire season
Average rainfall: 35mm p/m



June - August
Average highs 13–18°C
Low fire risk
Average rainfall: 120mm p/m





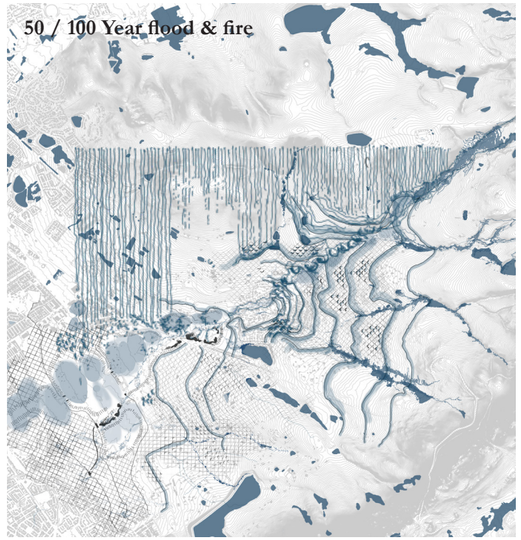


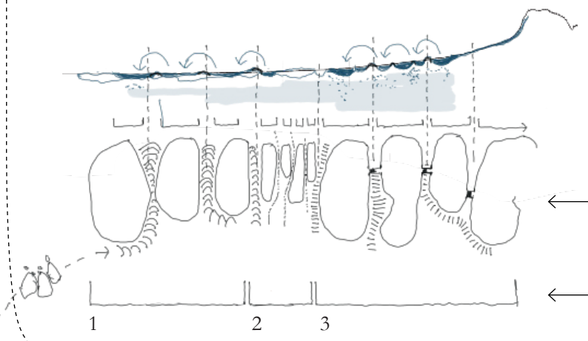
Local harvesting, water saving, and maintenance ----------> Active engagement with the landscape interventions

1. Dry summer season with low rainfall

2. Wet winter season with steady river flow

Ecological burning by blocks & temporary floodiing





Basins / fire blocks / fire resistant vegetated zones seperated through raised berms / dikes which funtion as walkways

Types of Fynbos vegetation with different burning regimes:

1. Veg. type: Lourensford Alluvium Fynbos
2. Veg. type: Lourensford Alluvium Fynbos
3. Veld type: Coastal Renosterbosveld, Veg. type: Boland Granite Fynbos / Cape Winelands Shale Fynbos

Landscape as performer & locals as guides

3. Flood and fire regime scenario

The interventions therefore "perform" differently across seasonal cycles:

1. Dry Summer Season (Low Rainfall):
During periods of drought and low river flow, the design emphasises slow water infiltration, retention, and conservation, enabling groundwater recharge and localised water harvesting for small-scale use.

2. Wet Winter Season (High Rainfall):
In the rainy season, the interventions function as active conduits and storages for flowing water. The interventions slow down and direct runoff to reduce erosion while enabling accumulation and filtration.

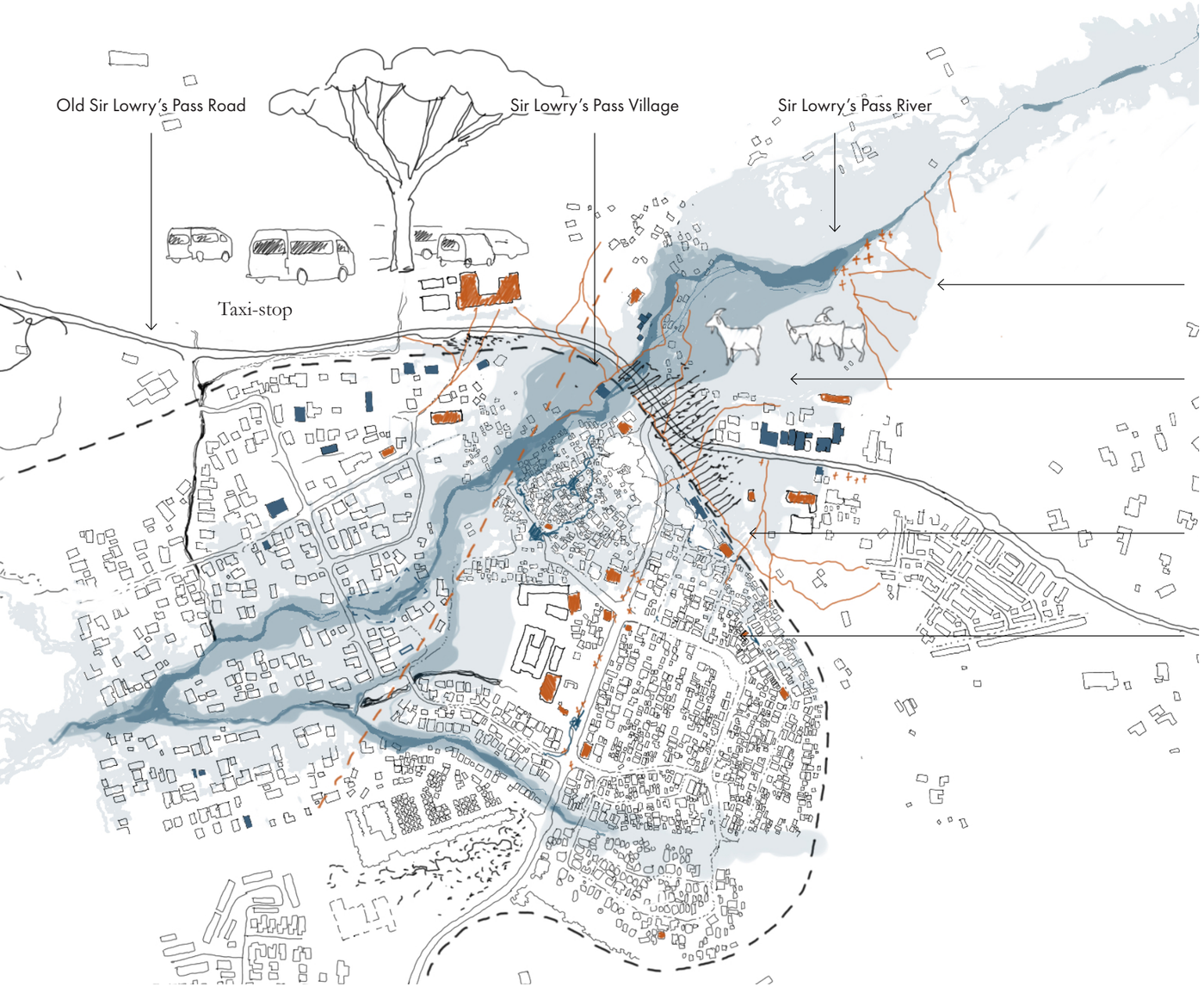
3. **During periods of flood or fire**, the landscape shifts beyond human control. In these moments, the design guides and absorbs these events through spatial strategies and local engagement. Through engagement and knowledge-sharing, locals are able to understand, anticipate, and work with these dynamics.

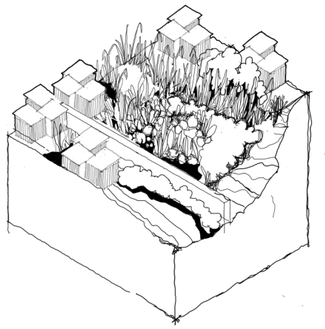
^Figure 91. Seasonal rainfall and flooding event strategy

Groundwater
Rain
Water accumulation
Swales, berms, micro-catchments & temporary flood basins

Sir Lowry's Pass Village Scale

^Figure 92. Sir Lowry's Pass Village railway and public space.





^Figure 93. Sir Lowry's Pass Village illustrating a conceptual representation of the on-site observations, the extent of the river during dry, wet, and flood seasons,. Extent of the river during various seasons. Community nodes

Zoom in design location: Section B

Sir Lowry's Pass Village

Elands' trail

The original name of Sir Lowry's Pass Road - around which Sir Lowry's Pass Village later developed - was Gantouw, a translation of its original Khoi name. The Eland, or the T'kana Ouwe (which translates in English to Gantouw), was the first animal to make the tracks now known as Sir Lowry's Pass Road. The Eland and the San hunter-gatherers of South Africa shared a sacred relationship, and was present in the their rituals and spiritual experiences and beliefs (Lewis-Williams, 1987). The Khoi followed these tracks, made by the Eland, and passed over the mountains with their cattle (Artefacts, n.d.).

During the 1700s and 1800s, the trail was followed by the Dutch settlers, who called it the Hottentots-Hollandkloof, but the journey left their ox wagons severely damaged. By 1821, a toll system was enforced by the British authorities, and it was recorded that around 4,500 ox wagons crossed the mountain (Coetsee, 2017). The grooves of these ox wagon wheels left in the rocks can still be seen today. The trail was especially important for farmers from the Overberg, as it was their only way to sell their goods at the Cape Market.

The trail was pressed into the mountain for many years until 1823 when instructions were given by Sir Galbraith Lowry Cole (who acted as the British Governor of the

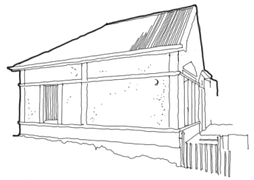
50m 250

Cape Colony until 1833) to improve and realign the pass. Convicted laborers were brought in to execute the work at low cost. The ruins of the toll house still stand along the original trail (Artefacts, n.d.) The new pass, Sir Lowry's Pass, commemorating the name of its commissioner, was opened in 1830 and sits slightly to the south of the original trail (Coetsee, 2017). In 1846, there was a post office and six farms in the area. By 1890, a branch rail line of the Cape Government Railways (Artefacts, n.d.) had been extended to Sir Lowry's Village. Today, this trail is known as the Old Sir Lowry's Pass Road. Many of these historically significant landmarks are slowly vanishing due to a lack of protection, maintenance, and increasing urban growth.

Alongside these changes in urban structures and social dynamics, the river, which we today refer to as the Sir Lowry's Pass River, also crossed the Sir Lowry's Pass Road, once winding through a historically Fynbos-dominated landscape, and now through the dense fabric of both informal and formal settlements. This invites on to wonder how the river itself might narrate the unfolding of human history. The river's presence has become constrained and fragile due to ongoing human pressures. To ensure its ability to breathe and survive within this context, it is essential to recognise and uphold the rights of the river in contemporary planning practices.

^Old Church

^Original farm sheds, now used as housing



^First post-office

^Railway station

^Figure 94. Historically important buildings in Sir Lowry's Pass Village.

Research methodology

The Sir Lowry's Pass Village is where the river first encounters the residential area. This section differs from other residential parts along the river in that the individuals living here are significantly impacted by the river's dynamics, while simultaneously contributing to notable changes in the river's condition as it flows through.

The research conducted in Sir Lowry's Pass Village draws partially from data published by the City of Cape Town and various scientific reports. However, it is primarily informed by site visits, personal interviews, news coverage, social media content, historical articles, travellers' diaries, and other non-formal sources. This is due to the fact that much of the area's unique character remains undocumented or underrepresented, largely because of its informal nature. To gain an in-depth understanding of the landscape's qualities, it was essential to repeatedly trace and map the fabric of the site - such as informal dwellings, public ablution facilities, water points, water flow patterns, visible desire lines, and social nodes. Through this research methodology, the often-invisible structures and movements within the landscape became more legible.

The effort to document and represent this information with sensitivity - within the constraints of limited time and financial resources - was both sincere and as thorough as possible. However, for further development of the project, extended on-site fieldwork and deeper collaboration with local residents will be essential.

^^Figure 95. Top: Early satellite image showing the initial agricultural settlements along the river. Middle: A significant transformation in land use, shifting from agriculture to residential development. Bottom: The river has undergone spatial reduction and increasing pressure from development.

Urban growth of Sir Lowry's Pass Village

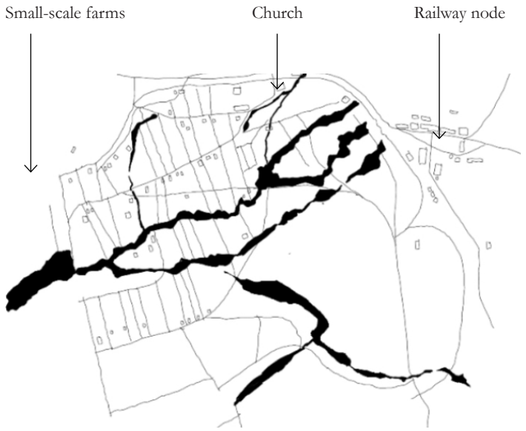
The following section summarises the most significant site-specific factors identified during the research process and explains their relevance to the development of the design interventions.

A clear reduction in the river's spatial extent is visible when comparing historical maps to current conditions. In the 1930s, the land east of the river remained unused, possibly due to unsuitable conditions for formal development. Yet, it became the starting point for informal expansion. As shared by a local resident, the community historically relied on the river for drinking water and laundry, which may explain why initial settlement occurred near the southeastern tributary (Hope and Light Community Welfare teacher, 2025). From this analysis, it appears the village has evolved through infill and appropriation of residual agricultural land. Houses were built in areas where invasive trees had been removed, and people increasingly settled near the river's flow path. This pattern of incremental growth has significantly reduced the space available for the river to expand during periods of rainfall, contributing to flooding. As a result, this project aims to explore strategies for returning space to the river, while still enabling continued incremental growth of both formal and informal areas.

^Figure 96-98. Mapped timeline illustrating the significant changes within the village since 1930 - present.

1930s

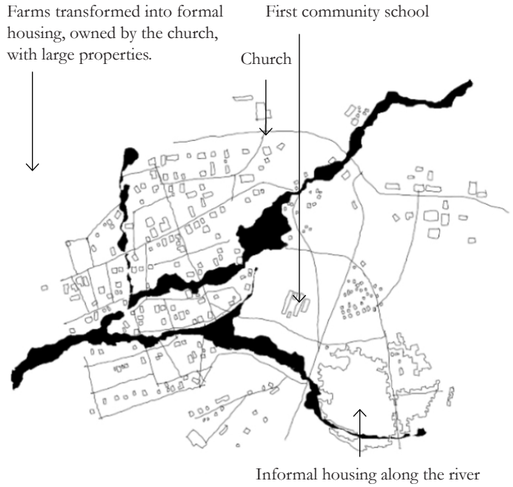
The landscape character of Sir Lowry's Pass Village has transformed from a predominantly agricultural setting into a dense mix of formal and informal residential areas. The 1933 map reveals the presence of small-scale farms along the Sir Lowry's Pass River, in contrast to the neighbouring large-scale commercial farms. These smaller plots, some of which remain legible in the current urban fabric, reflect an earlier phase of land occupation. During this time, the river displayed more visible tributaries and the land surrounding it - particularly south of the Sir Lowry's Pass Road - remained largely undeveloped.



^1930
Small farms and commercial growth along the railway

1990s

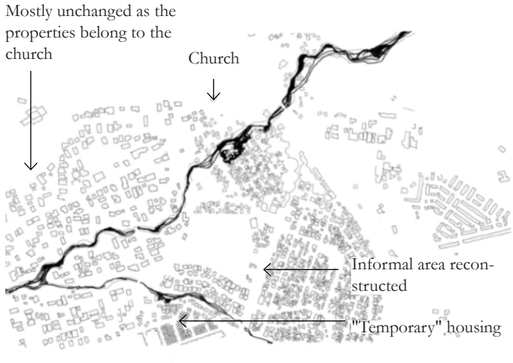
By 1996, informal settlements had emerged on the southeastern edge of the village. According to local accounts, the plots to the west were owned and rented by the Methodist Church (Hope and Light Community Welfare teacher, 2025). In these informal areas, a scattered pattern of small structures became evident, accompanied by dense vegetation, including a large tree cluster north of the school.



^1996
Growth of the informal area along the river

Present

Comparing the maps from 1996 to the present day reveals a rapid expansion of informal housing to the east of the Sir Lowry's Pass River, suggesting a lack of formal land allocation and infrastructure planning in these zones. Throughout this transformation, the school has remained a spatial and social anchor within the village. Its central location and public function present a valuable opportunity for integration into educational and ecological strategies proposed by the design, supporting its multifunctional role in the community.



^Present
Urban expansion

Fieldwork observations

As illustrated in Figure 93, on-site observations (marked in orange) reveal spatial and social dynamics that are not apparent through remote or desk-based research alone. The most significant findings include:

- Community gathering nodes

- Movement patterns and desire lines across the site

- Signs of soil degradation and compaction

- Grazing animals in multiple locations

- Unidentified activities occurring along the river edge

- Recognisable informal social hierarchies and group structures

- Use of vegetation and decorative planting near dwellings

- Indicators of unemployment, alongside small-scale businesses operating along main roads

These observations form a key part of the site's narrative and have informed both the spatial logic and social sensitivity of the design interventions.

^Open public space along the railway.

^Small stream in the formal residential areas.

^Unsafe riverbanks along public nodes, such as playgrounds

^Figure 99. On-site images during fieldwork.

The presence of the Sir Lowry's Pass River

A significant portion of the information regarding the river was informed by river and wetland specialist and consultant Liz Day (2020). As previously noted, the exact volume of the river throughout the seasons remains unknown. However, its spatial presence within the landscape was traced and interpreted through a combination of site visits and detailed analysis of satellite imagery. The method of drawing as a means of engaging with and understanding the river was inspired by landscape architect Antoinette de Beer (2025), during a personal interview.

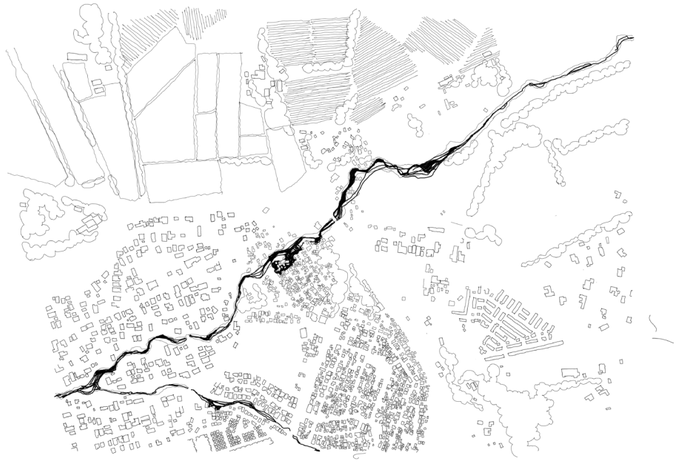
According to Day (2020), the Sir Lowry's Pass River suffers from high levels of pollution. This includes the periodic inflow of sewage, litter from surrounding urban areas, sediment build-up, and infestations of invasive alien plant species. During site visits (see Appendix K), visible pollution included litter, runoff, and waste emanating from public ablution facilities, which accumulated on the streets and ultimately entered the river. Additionally, the river was observed to be obscured by dense vegetation, including invasive trees such as eucalyptus. City-employed workers were seen removing bags of waste from the canalised sections of the river.

Downstream of Sir Lowry's Pass Village, the river flows through expansive open land that was formerly agricultural. Day notes that, under pre-development conditions, these areas likely consisted of hillslope seep wetlands. These wetlands formed "on a layer of clay just below the soil surface, resulting in the shallow spread of flows downslope, over this layer" (Day, 2020). A remnant of such a wetland can still be clearly identified on the upper, outer edge of Sir Lowry's Pass Village. As Day further explains, the river has become disconnected from these wetland systems. The project will therefore prioritise the conservation and rehabilitation of these wetlands where feasible.

Figures 100 and 101 illustrate the seasonal variability in the extent of visible water - comparing the dry summer period with the wet winter season. During a site visit in February (Summer), a small but consistent flow of water was observed. Figure 101 represents the flood extent during the 2023 flooding event. This was constructed using a combination of photographic and satellite evidence, analysis of the 50-year flood line, and a local resident's testimony. The large quantity of debris transported by the river during the flood made it possible to clearly trace the flood's path across the urban area via satellite imagery.

The design project responds to these three hydrological scenarios - dry, wet, and flood - by allowing the river's presence or absence to be meaningfully experienced within the public spaces.

^Figure 100. Dry summer period in Sir Lowry's Pass Village



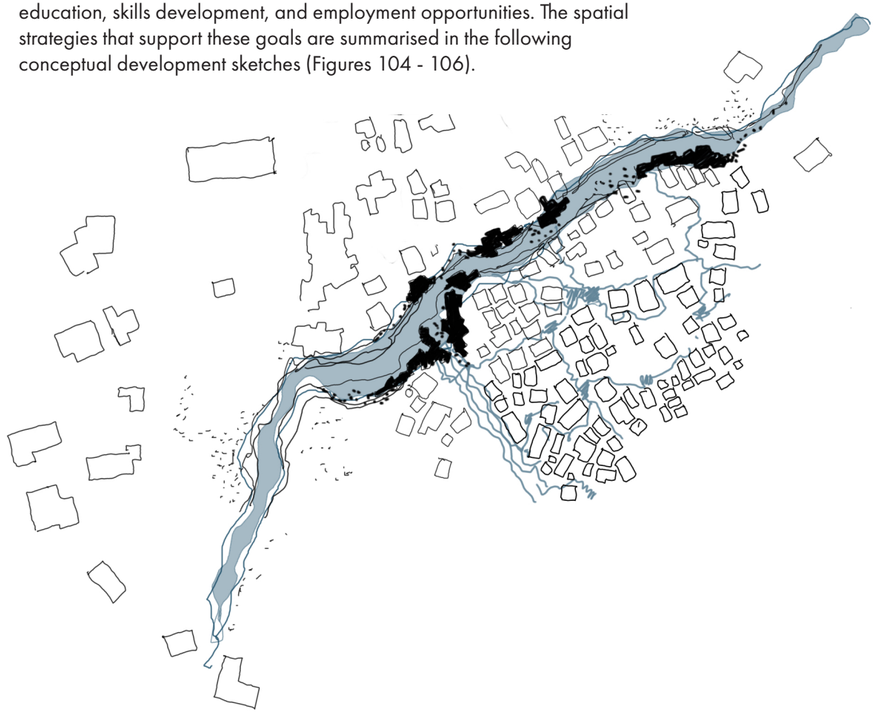
^Figure 101. Winter rain period in Sir Lowry's Pass Village

^Figure 102. Extreme flooding scenario in Sir Lowry's Pass Village, as in 2023.

Flood waters (black)

Strategy 1: Dedicate space back to the river and its floodwaters.

The overall strategy - outlined in the earlier sections of the report and embedded in the overarching strategic framework - is to prioritise spatial provision for the river, integrate both floodwaters and drought conditions into the urban fabric, and establish the foundations for a coextensive relationship between residents and the river. This approach includes efforts to rehabilitate native Fynbos vegetation as a means of enhancing the ecological quality of the riverine landscape, while simultaneously linking these efforts to education, skills development, and employment opportunities. The spatial strategies that support these goals are summarised in the following conceptual development sketches (Figures 104 - 106).

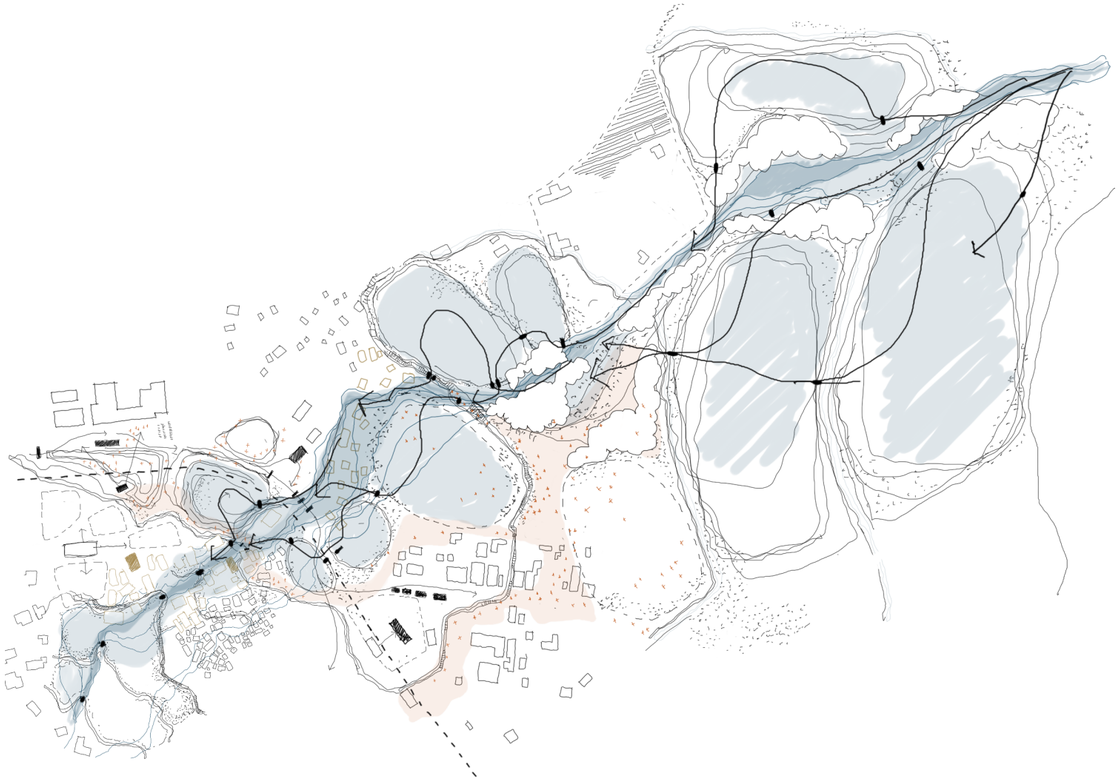


^Figure 103. Widening of the Sir Lowry's Pass River, whilst allowing residents to stay within their original location. Floodwaters Informal dwellings

Strategy 2: Flood mitigation

How can community-led design interventions temper floodwaters to minimise their destructive effects on vulnerable communities?

Define protected areas for Fynbos rehabilitation, as well as temporary flood basins in the case of extreme flooding to allow residents to evacuate safely.



^Figure 104. Temporary flood basin concept sketch. Floodwaters Main public nodes New flood-proof housing

Strategy 3: Urban water integration

In what ways can spatial strategies integrate water into the urban fabric of informal communities to become a meaningful part of residents' daily lives and experiences?

Allow gradual floodwater integration into the residential areas by connecting public pocket parks.

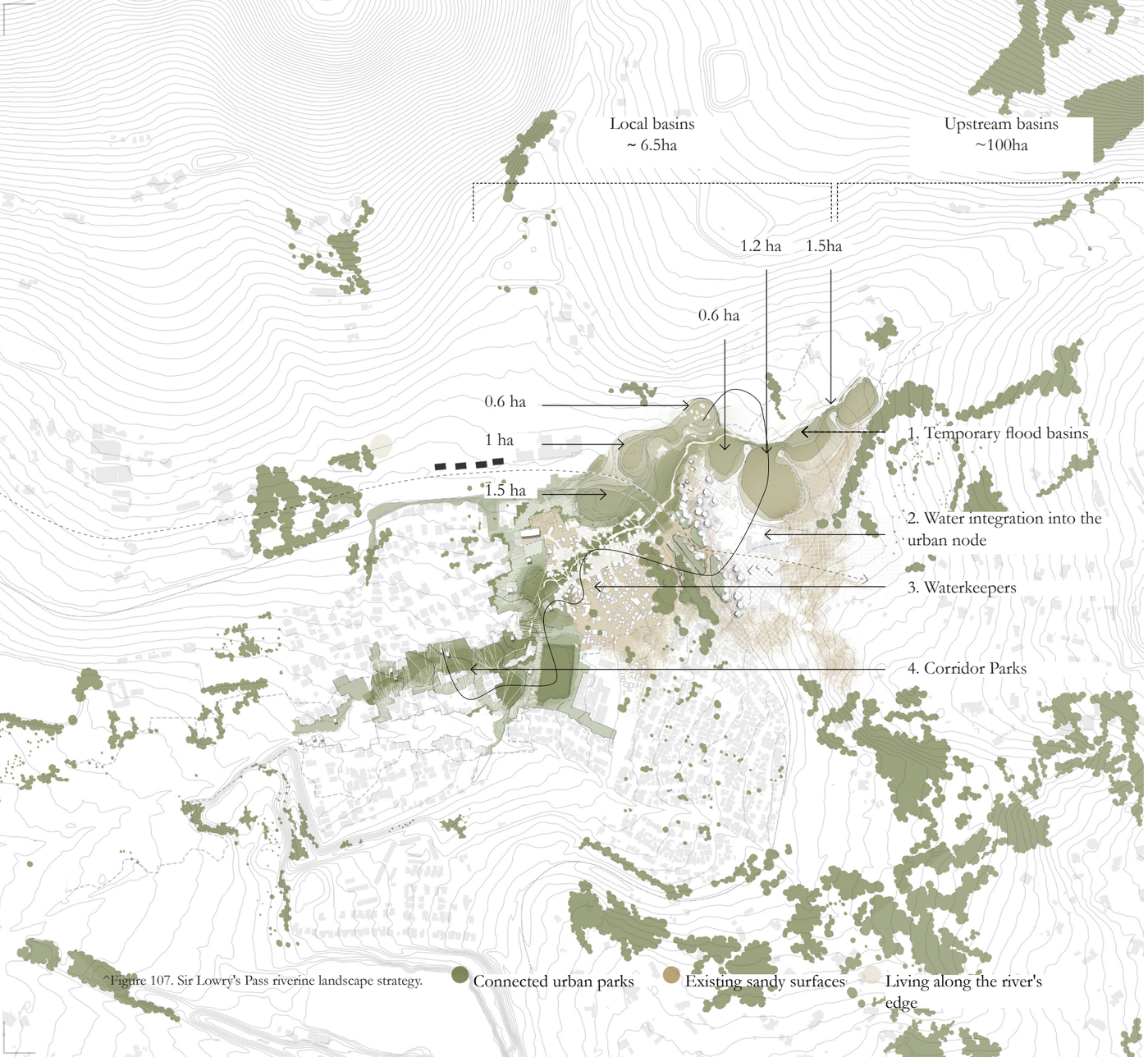
^Figure 105. Connected urban pocket parks alongside or effected by the river. Floodwaters Schools and dwellings Community nodes

Strategy 3: Relationship between river and human

In what ways can design enhance intimate, human-scaled interactions to strengthen residents' sense of care and responsibility toward the river?

Develop means to service the river, such as litter removal, by employing infrastructure which is hands-on and manageable by the locals.

^Figure 106. Living on the river's edge concept sketch. Floodwaters Litter accumulation New flood-proof housing



^Figure 107. Sir Lowry's Pass riverine landscape strategy.

Sir Lowry's Pass River Corridor Strategy

The spatial strategies developed for Sir Lowry's Pass Village - shaped by the broader upstream and downstream river-scale considerations - have informed the following design framework. This scheme comprises four primary interventions, three of which are detailed in Part Four of the report. The main interventions reflect the overarching conceptual strategies illustrated on pages 63 - 65, but further develop specific thematic focuses, summarised as follows:

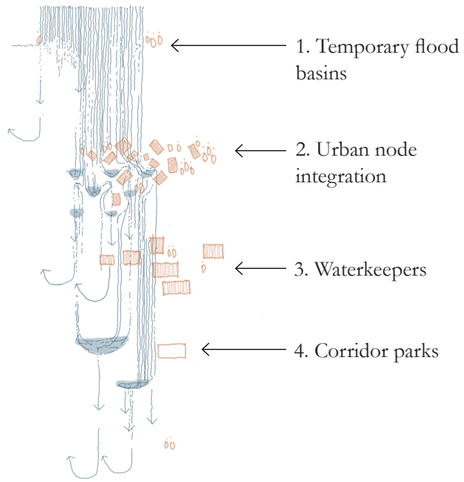
1. Temporary flood basins
The focus of this study includes:
- Encouraging community and individual ownership of the riverine landscape
- Enhancing the social and economic value of the community
- Implementing a Fynbos rehabilitation strategy
- Developing recreational and public spaces, including the existing sportsfield
- Strengthening connections to nearby farms, shops, vineyards, tourism, and produce distribution networks

2. Water integration into the urban node
- Establish defined, fixed elements to enable flexibility and adaptability
- Integrate the river in form of rain, runoff retention, groundwater infiltration, and day-to-day interaction with the rivers being.

3. Waterkeepers
- Develop a spatial and strategic foundation that functions as an infrastructure of care.
- Enable an intimate river and human relationship.

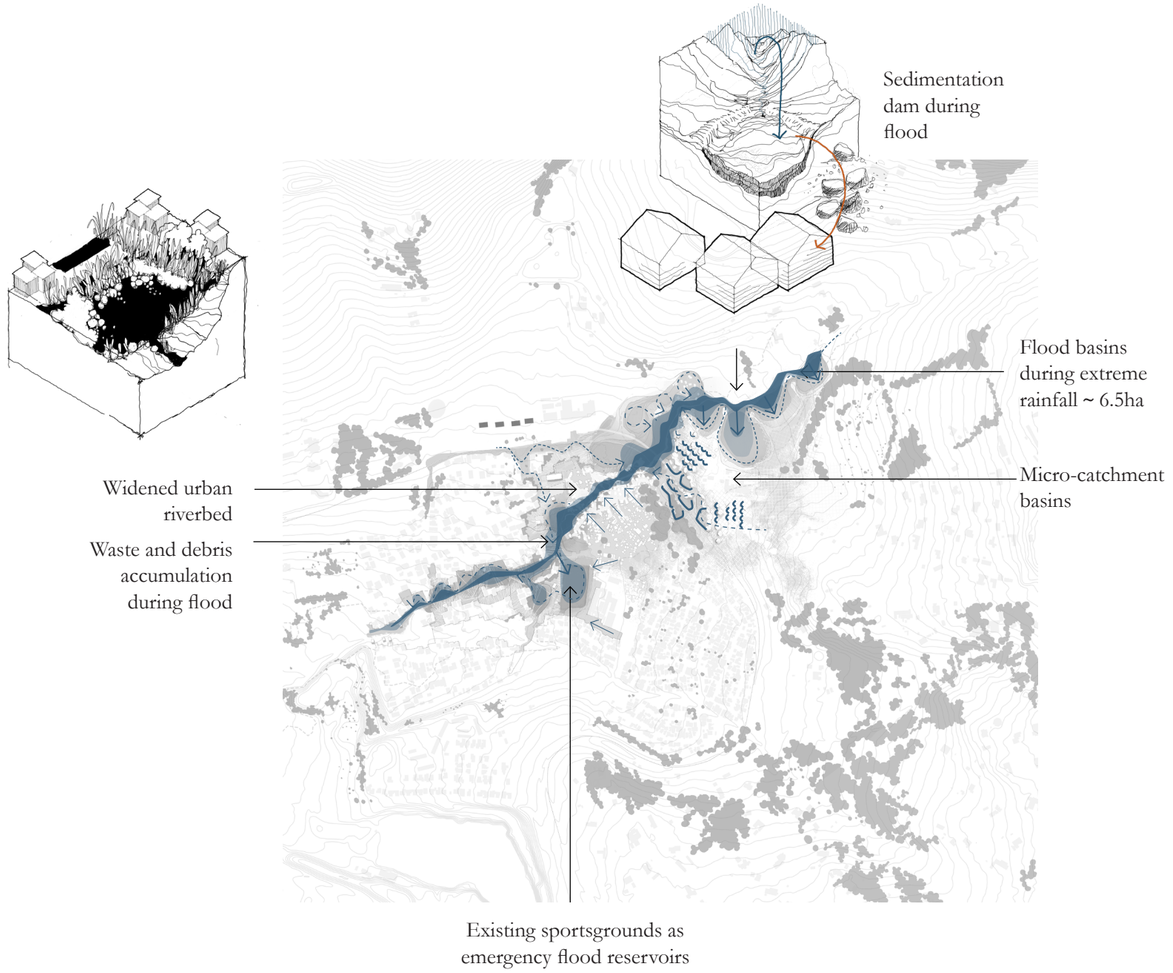
4. Corridor Parks

- Connect social and public nodes by developing a river corridor. The parks within this corridor are defined by distinct spatial elements such as riparian vegetation, pathways, and public structures. This corridor is vital for Fynbos regeneration, facilitating pollination and the ongoing management of invasive species.

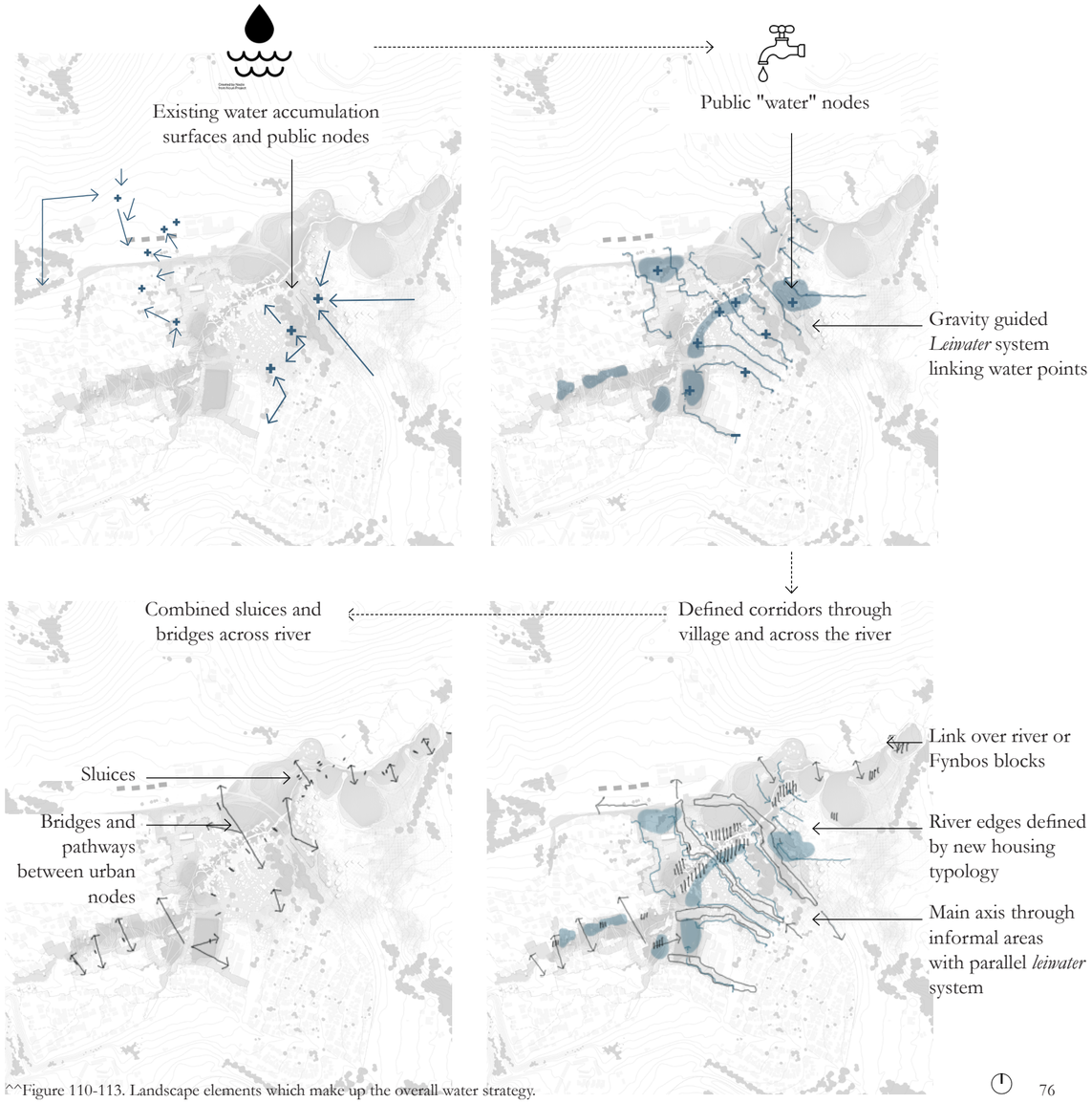


^^Figure 108. Concept diagram of the detailed interventions.

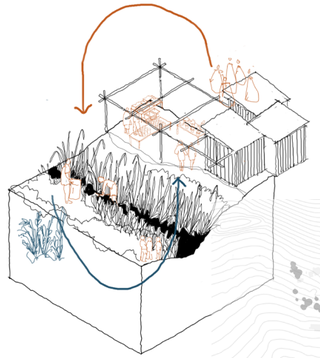
50m 250



^Figure 109. Primary temporary flood basins, as well as secondary micro-catchment basins.



^^Figure 110-113. Landscape elements which make up the overall water strategy.



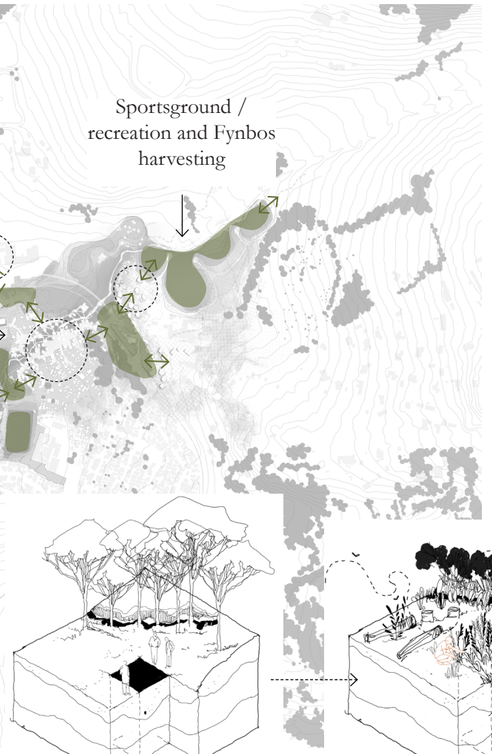
Summer rain catchment and small-scale Fynbos growth - products crafted and sold on-site

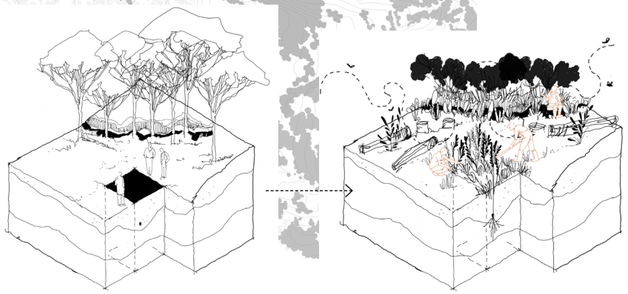
Sportsground / recreation and Fynbos harvesting

Economic node

Residential node

Parks as links between informal areas and urban nodes



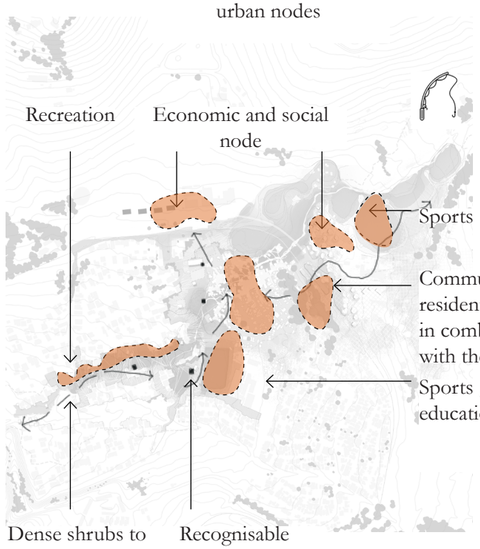


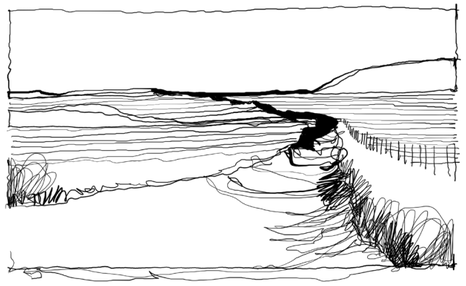
Removed and reused alien invasive spaces

Growth of native species instead of alien invasive species, incl. maintenance

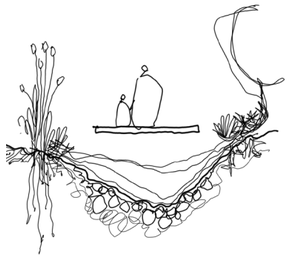
^Figure 114. Fynbos corridor and economic opportunities.

River as corridor between urban nodes





Low earthberms to define the Fynbos blocks



Recreational river edges, basins, and social nodes are connected through walkways

^Figure 115-117. Programmatic and spatial elements defining the spatial characteristics of the corridor.

14. City of Cape Town

Also referred to as the City or the City Council, the City of Cape Town represents the highest level of local government in the metropolitan area. It consists of an executive body responsible for making strategic decisions regarding the governance of the city. As key stakeholders, they play a crucial role in determining the allocation of the city's budget and in addressing local issues.

15. Employers

In this context, the term "employers" refers to the primary economic drivers located in the upper reaches of the river, adjacent to Sir Lowry's Pass Village. These include sectors such as tourism and hospitality, as well as agriculture and wine production. Integrating these industries into the design strategies presents an opportunity to promote local employment and strengthen the community's economic node.

16. Grond

Grond can be translated within the South African context as the ownership of land - a question of who is the rightful owner of one area of land.

17. Water

Water - drought - survival. Access to water, and the right to drinking water, reflects the enduring consequences of generations of discrimination and injustice that continue to affect many individuals today. While water shortages are occasionally experienced by South Africans due to failing infrastructure and imposed water restrictions, vulnerable communities endure the impacts of water scarcity far more profoundly.

18. Spatial injustice

Race and class are central to the understanding of spatial injustice in South Africa. The legacy of apartheid continues to shape the contemporary city, where many areas remain inaccessible to the majority of previously discriminated racial groups. Spatial injustice has resulted in communities living in unsuitable and vulnerable locations, which in turn restricts their ability to commute and access employment opportunities (Centre for Human Rights, Faculty of Law, University of Pretoria, 2021). Sir Lowry's Pass Village clearly illustrates the lingering effects of spatial injustice and historical discrimination.

19. Densification

The City of Cape Town defines densification as the increased utilisation of space aimed at enhancing the sustainability of the city and its urban precincts (2012). While this project acknowledges that densification can improve transportation efficiency and help connect fragmented urban areas, it also recognises that densification can lead to overcrowding within a specific area - an effect that can negatively impact non-human rightsholders. In informal settlements, densification may lead to weakened community cohesion, further degradation and overuse of resources, and a distancing from the non-human entities.

Conclusion

Roots

Part Two has traced the complex interplay of geography, ecology, and human development that defines the Sir Lowry's Pass River and its surrounding landscape. Through an in-depth investigation of the Cape Town region - its layered history of spatial inequality, ecological degradation, and cultural erasure - this section contextualises the current conditions of the river within broader socio-political and environmental systems.

By exploring themes such as invasive species management, Fynbos biodiversity loss, hydrological transformation, indigenous knowledge, and urban pressure, the project frames the river not merely as a resource, but as a living being. It recognises rivers as carriers of memory, deeply embedded in local heritage, and vital to ecological continuity.

This part illustrates the overall design strategies that seek to restore these fractured relationships: rehabilitating wetlands, integrating floodwaters into the urban fabric, reintroducing native vegetation, and reactivating the cultural significance of the landscape. By layering ecological restoration with socio-economic interventions - such as education, employment, and skill development- the project outlines a vision for regenerative coextensive landscape that is rooted in care and grounded within the context.

Within the Sir Lowry's Pass community-scale scheme, three zoom-in design interventions are introduced and elaborated in Part Four. The development of these interventions - including their materiality, functions, and sense of intimacy and care - has been informed by the case studies presented in the following Part Three.

Part three

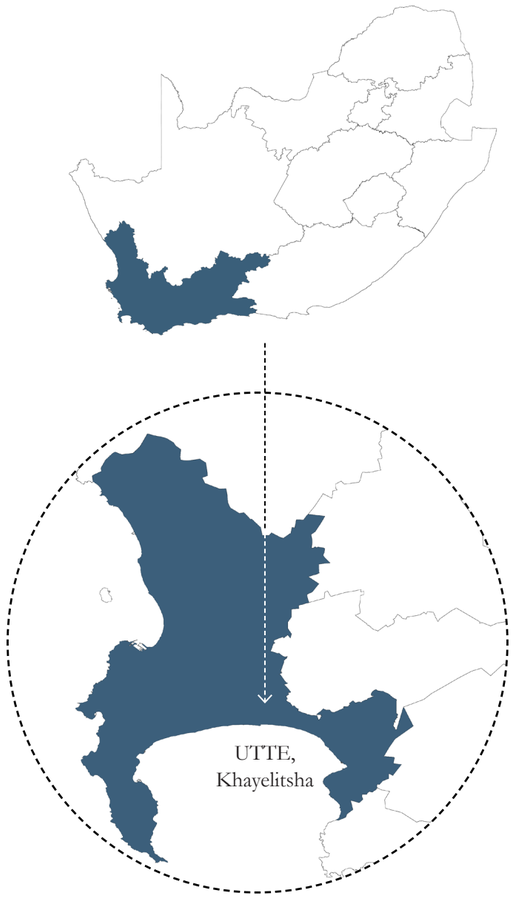
The Riparian Dweller

Case studies

The Riparian Dweller

Part Three, The Riparian Dweller, explores how Capetonians live in and alongside the city's river landscapes. It draws on fieldwork studies of several rivers in Cape Town that are currently being restored through the city-led Liveable Urban Waterways programme. These efforts show how once-overlooked waterways are becoming central to more liveable, connected urban spaces. The section further analyses case studies focused on improving living conditions in informal settlements, especially those in the Cape Flats, where seasonal flooding poses ongoing challenges - similar to the conditions of the Sir Lowry's Pass Riverine Landscape. Lastly, this part turns to traditional water systems such as the Saaidamme in the Northern Cape. These hands-on and low-tech methods of managing water reveal a close, practical relationship between people and their landscapes.

These existing practices and case studies, drawn from both urban and rural contexts, have informed the concept of coextensive sharing of the urban riverine landscape. Overall, this section explores how the presence, absence, or quality of water shapes the ways in which people live, build, and envision their futures.



^Figure 117. Location of the case study UTTE project in Khayelitsha, Cape Town.

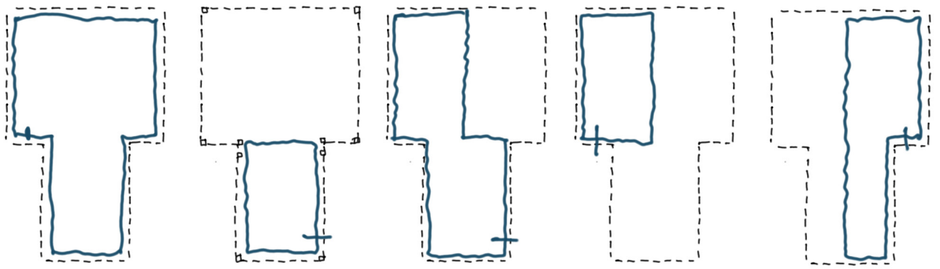
Informal living in flood plains

This section examines selected elements from case studies that share comparable urban conditions, strategies, or goals - particularly those involving informal settlements located on floodplains. It asks: how have improvements been made in such settings without displacing the communities who live there? By focusing on in-situ upgrades and context-sensitive approaches, the aim is to understand how resilience can be built without erasing the social and spatial fabric of these neighbourhoods.

Architectural prototypes

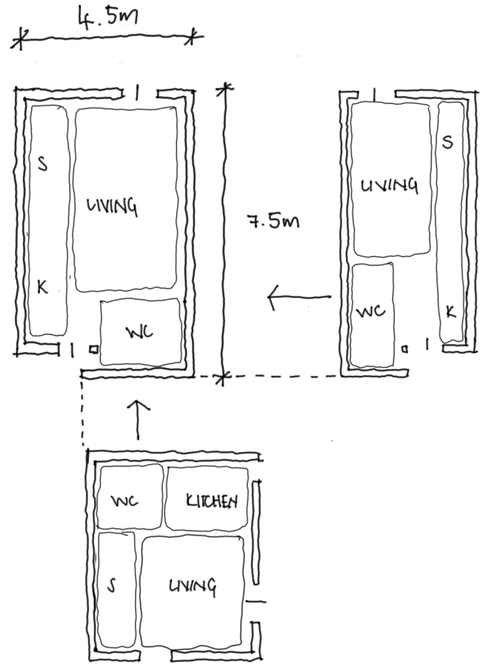
Urban-Think Tank Empower (UTTE) is a non-profit organisation dedicated to planning and delivering social infrastructure solutions across South Africa, including within the City of Cape Town. UTTE's work responds to the country's ongoing housing challenges by developing adaptable housing prototypes designed to fit the diverse conditions of informal settlements nationwide. In areas such as Khayelitsha, spatial development cannot be approached in isolation from the complex political and social dynamics at play. Similar conditions exist in Sir Lowry's Pass Village, where cultural practices, community values, internal social structures, local participation, and economic constraints all play a vital role in shaping the built environment.

^Figure 118. The previous size and location of the informal dwelling, before the construction of the UTTE houses. Photograph by Empower-Shack, nd.



This project is examined as a precedent to explore how the riverine landscape of Sir Lowry's Pass might be shaped to support UTTE's housing prototypes. The aim is to draw lessons from the spatial logic and adaptability of these prototypes and to develop a framework along the Sir Lowry's Pass River that can serve as a foundation or future interventions.

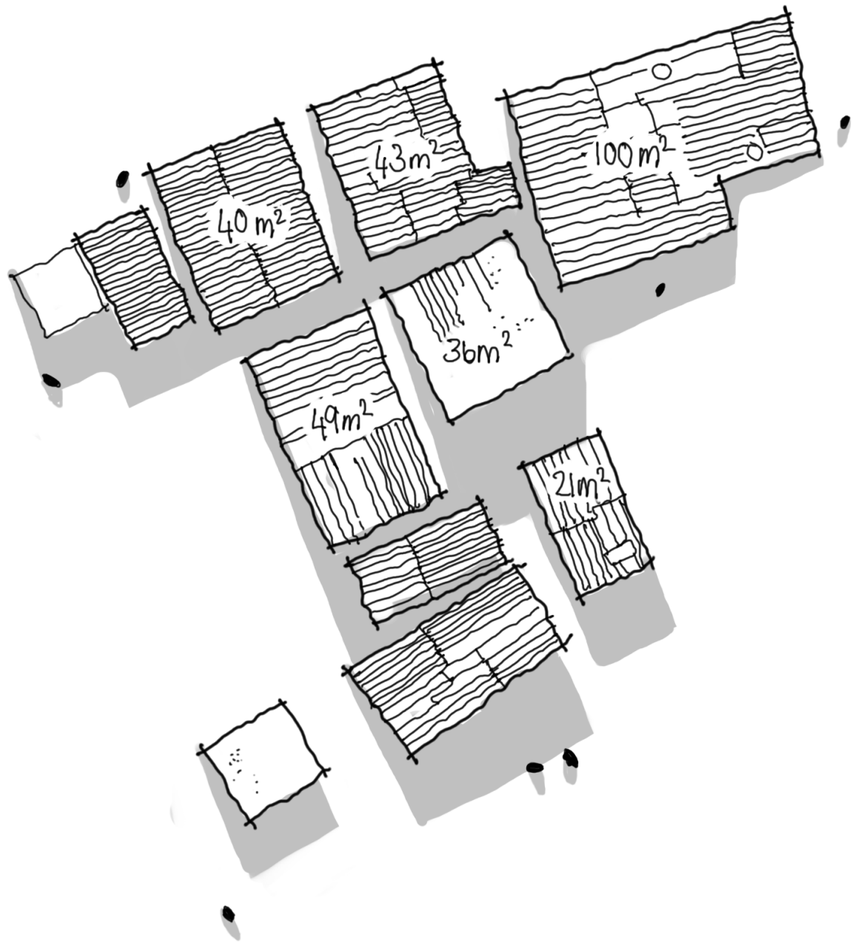
The principles emphasise an adaptive approach to upgrading informal settlements. Key strategies include working within the existing shack footprint to respect established spatial patterns, involving the community actively throughout the design and building process (Figure 118), and embracing incremental development that allows for ongoing adjustment and resident-led modification. The housing prototypes promote vertical densification through double-storey units, increasing living space without expanding the ground footprint (Figure 119). Designed for flexibility, these structures accommodate a variety of spatial arrangements within a standard shell. Importantly, the structural design responds thoughtfully to financial, political, and spatial constraints, ultimately shaping both the placement and the form of each intervention. The following sketches illustrates the size and placement of such prototypes (Figure 120).



^Figure 119. Left: The construction of the UTTE houses has actively involved local residents and community members. The use of lightweight materials supports ease of assembly and allows for future expansions. Photograph by Empower-Shack, nd.

^^Figure 120. Top and bottom: Multiple spatial organisation options are possible within the same footprint.

PUT A
RING
ON IT!



Landscape as the foundation

South African landscapes are shaped by ongoing spatiotemporal dynamics. As Cinnamon and Noth (2023) observe, the spatial and temporal dimensions of informal areas are often obscured or undocumented, giving rise to a sense of mysticism around their evolution and layered complexity. Changes within these settlements are rarely visible at first glance; they emerge through subtle traces - variations in material, typology, orientation, and occupation - that reveal themselves only through close, attentive observation. These settlements are largely absent from official maps, making the act of reading the urban fabric an intuitive process of discovery and interpretation.

Rather than resisting the growth of informal area, such as in the Sir Lowry's Pass Village, where urban pressures are visible and expected to intensify, the project argues for an alternative approach: to prioritise and prepare the landscape itself. To design frameworks that can safely absorb and adapt to its growth - if settlements are to form regardless of municipal planning efforts, then the landscape should be ready to receive them.

The systems proposed in this project consist of simplified, flexible elements that can be tailored to the diverse conditions of South African landscapes, forming a kind of prototype for informal landscapes. The aim is to test this concept by developing a riverine landscape framework along the Sir Lowry's Pass River - one that can host informal housing while protecting and enhancing the ecological and social functions of the site and river. In doing so, this project seeks to shift the focus from a housing-first approach to a landscape-first strategy - where architecture follows the logic of terrain, water, and ecology.
The housing footprints will be informed by the UTTE precedent study, while the prototype landscape will prioritise aspects often overlooked due to financial constraints: **stormwater management, flood prevention, pollution control, ablution infrastructure, access to drinking water, and the creation of communal and social spaces.** These landscape elements will form the essential groundwork into which housing can be integrated.

Design considerations extracted from the case study:

The proposed spatial strategy for developing a responsive landscape system along the Sir Lowry's Pass River unfolds through a series of steps, illustrated in Figures 121-127. A further exploration of how this strategy has shaped the design interventions is presented in Part Four.

Figure 122: The process begins with the identification and mapping of the existing shack footprints. In addition to spatial dimensions, this step also documents surrounding activities and social nodes - such as water access points, communal gathering spaces beneath trees, informal ablution zones, and circulation paths (Figure 123-125).

^Figure 121. Previous page: The placement of the UTTE houses is guided by the original footprints of the former informal dwellings. Photograph by Empower-Shack, nd.
^^Figure 122. Identifying existing position and size informal houses in Sir Lowry's Pass Village.

^Figure 123-125. Identified public nodes and facilities, including shared water sources and ablution blocks.
Images sourced from Google Maps Street View, 2025.

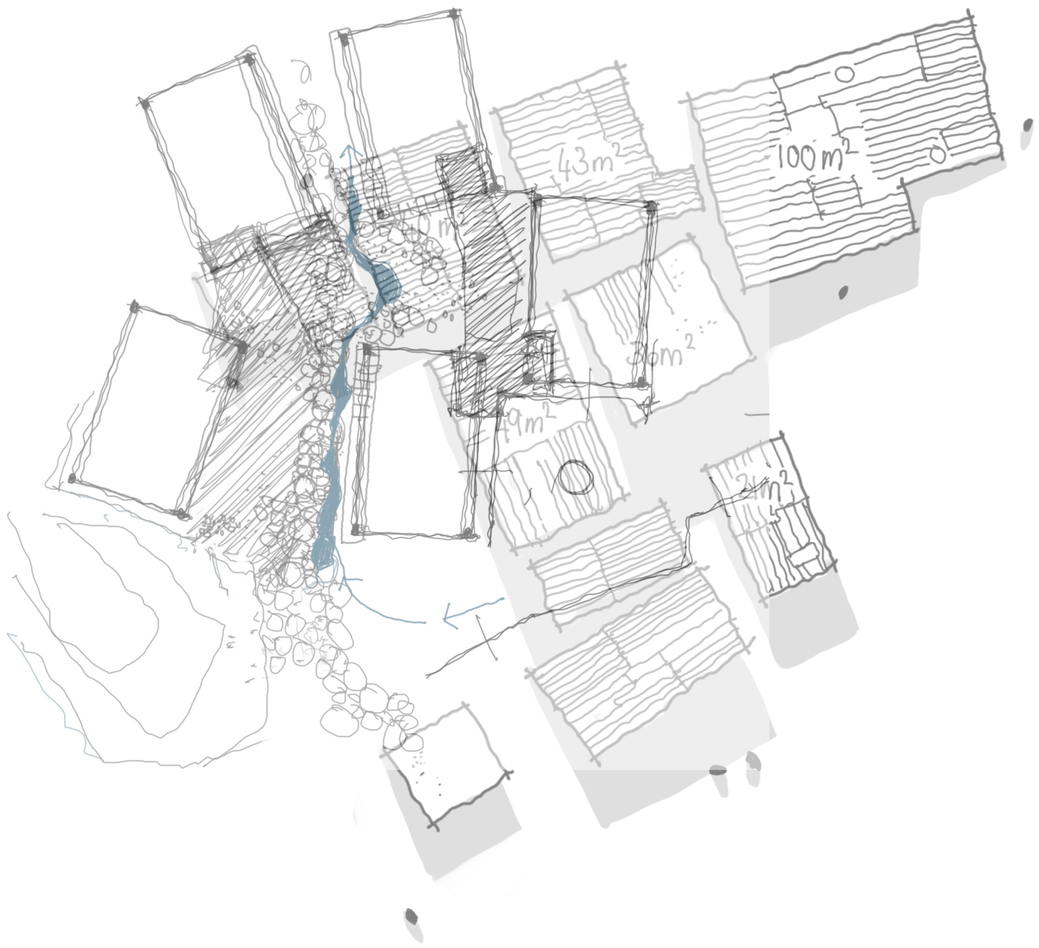


Figure 126: Based on this mapping, the number of dwellings and their required dimensions are calculated to adequately accommodate the families currently residing in the area. These spatial allocations are informed by topographical conditions - ensuring safe placement relative to flood risk, water flow, and ecological sensitivity.

Figure 127: Fixed landscape elements are then designed and embedded within the framework. These include infrastructure for stormwater management, sanitation, pollution control, and communal spaces. Their placement is carefully coordinated with that of the housing prototypes to ensure human usability and possible expansion.

This approach integrates architecture and landscape architecture as interdependent systems. Rather than treating the house as an isolated object, it is considered part of a broader, living framework - one shaped by water, terrain, ecology, and human activity. Through this process, which will be tested throughout the design development, the project highlights the landscape as an active agent in shaping future informal urban environments.

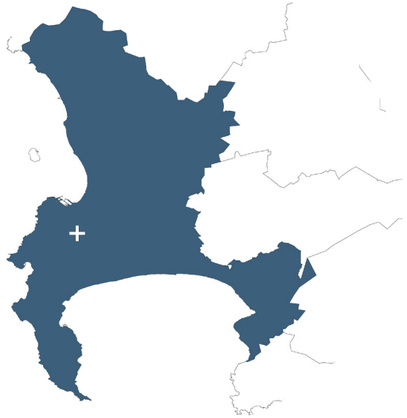
^Figure 126. The prototype blocking is dependent on the estimate amount of people and their current space in the affected area.
^^Figure 127. Once the amount and placement of the new housing is estimated, the foundational/fixed landscape elements are designed within the in-between spaces

^Figure 128. The rehabilitation project of the Liesbeek River involved the removal of dense invasive plant species, creating space for the river to meander more naturally.

Local Water Strategies

Case study of the Liveable Urban Waterways programme, led by the City of Cape Town

A site visit to several rehabilitated rivers in Cape Town revealed a range of outcomes in riparian landscape rehabilitation projects. While some rivers have been successfully transformed into biodiverse, community-supported spaces, others have struggled due to limited maintenance, financial constraints, crime, pollution, and drought.



Community Involvement: Upper Liesbeek River Garden.

The Upper Liesbeek River Garden (Figures 130-132) serves as a informative precedent, illustrating how neglected urban rivers can be revived through community-led initiatives. Once overrun by invasive species and associated with crime and neglect, this section of the river was rehabilitated through volunteer efforts, indigenous planting, subtle bank stabilisation, and active fundraising (McDonald & Aziz, 2022). Its ongoing success is largely attributed to local stewardship, financial coordination by the Residents' Association, and the employment of a garden manager and maintenance team.

Design considerations extracted from the case study:

This case explores the importance of combining ecological restoration with social infrastructure. It informs the design approach for the Sir Lowry's Pass River by reinforcing the need for local involvement, long-term community strategies, and landscape systems that provide both ecological and social value. Moreover, this project identifies the need to encourage local communities to see value in taking care of the river. The materiality and intimacy between humans and the river have directly shaped the design of the edges between human settlement and the Sir Lowry's Pass River (page 116).

^^Figure 129. Location of the Upper Liesbeek river garden case study.

^^^Figure 130-132. Next page: On-site photographs showcasing community-initiated landscape elements.

Neglected upkeep / Lack of intervention: Water Street Garden

This river rehabilitation project appears to have declined due to both design limitations and a lack of ongoing community involvement. Although there are signs of earlier engagement, the area has largely reverted to its previous state—"underused, overgrown, and not somewhere people would want to spend their time" (McDonald & Aziz, 2022).

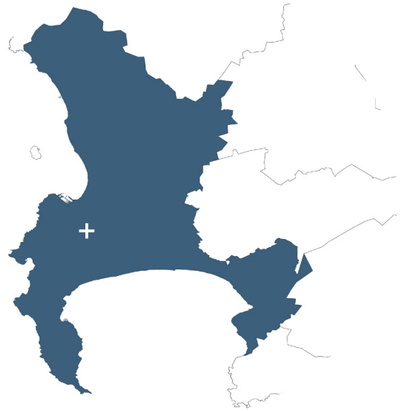
The canalised structure, with its steep concrete walls, functions as a physical and symbolic barrier. It prevents meaningful interaction between people, wildlife, and the river itself, creating a sense of separation. This disconnectedness likely contributed to reduced maintenance and public interest over time.

An observed groundwater outflow into the canal suggests potential for ecological restoration. By returning the river to a more natural state, its hydrology, biodiversity, and usability could be significantly improved.

McDonald & Aziz (2022) identify several challenges that affected the project's long-term success, such as the dependence on donations and volunteers, vandalism and theft, pollution and downstream blockages, poor water quality due to the canal structure, and difficulty maintaining stormwater outlets.

Design considerations extracted from the case study:

A section of the Sir Lowry's Pass River also features a similar concrete canal. This case study demonstrates that minor surface-level improvements to canal edges are unlikely to be effective. Instead, the design approach should aim for more substantial ecological and spatial transformation, improving both environmental function and public use.



^Figure 133. Left: Groundwater seeping into the canal in the foreground, with evidence of neglected maintenance efforts in the background.

^^Figure 134. Location of the Water Street Garden case study.

Guided by historical water values: Green Point Urban Park

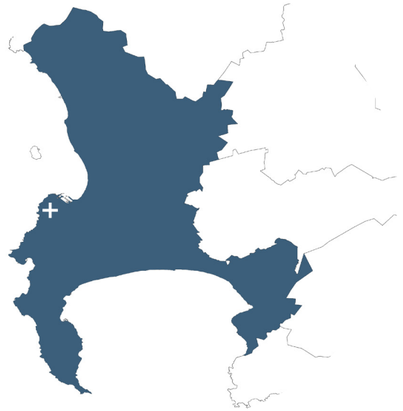
The Green Point Urban Park site was once a seasonal vlei used for cattle grazing, later filled in and converted into a sports field during the 20th century (McDonald & Aziz, 2022). Between 2008 and 2011, it was transformed into a public park guided by ecological design principles. During a recent site visit, a high diversity of indigenous vegetation was observed alongside expansive recreational lawns.

Central to the park's layout are constructed waterways that reflect the site's natural heritage and the historical role of springs in Cape Town. While these features contribute meaningfully to the park's identity, they also present challenges - particularly stagnation risks when water flow is not carefully managed.

The long-term sustainability of the park is dependent on ongoing maintenance, which is increasingly strained by drought and resource limitations.

Design considerations extracted from the case study:

Despite these challenges, the project demonstrates how urban biodiversity and landscape rehabilitation can be meaningfully integrated into dense city environments. It is especially successful in offering accessible public space while reconnecting people with native ecological systems.



^Figure 135. Indigenous Fynbos in the foreground of Green Point Urban Park. Photograph by Dolphin Inn Guest House, nd.

^^Figure 136. Location of the Green Point Urban Park case study.

^Figure 137. The Riverwardens. Screenshots of video by cityofct, 2024

^Figure 138. The Litterboom Project. Photograph by the_litterboom_project, 2025.

Mayors Priority Programme (MPP) River Wardens work

The River Wardens initiative is a environmental program launched by the City of Cape Town, and aims to improve the health of the city's rivers and wetlands through active community involvement. River Wardens are local residents trained and employed to monitor and maintain the cleanliness of rivers and wetlands. Their responsibilities include removing litter, reporting pollution incidents, and educating the public about the importance of preserving aquatic ecosystems (City of Cape Town, 2023) (Figure 137).

The Litterboom Project is a innovative strategy aimed at reducing plastic pollution in South Africa's waterways by addressing the issue from its origin to its endpoint. The project employs floating barriers, known as litterbooms, across rivers to capture plastic waste before it reaches the ocean. Local community members maintain the infrastructure and collect (and recycle) the accumulated debris (The Litterboom Project, 2024) (Figure 138).

Design considerations extracted from the case study:

These case studies inform the project's strategies to create employment opportunities while improving the health and sustainability of the Sir Lowry's Pass River. Refer to the concept of The Riverkeepers in Part Four.

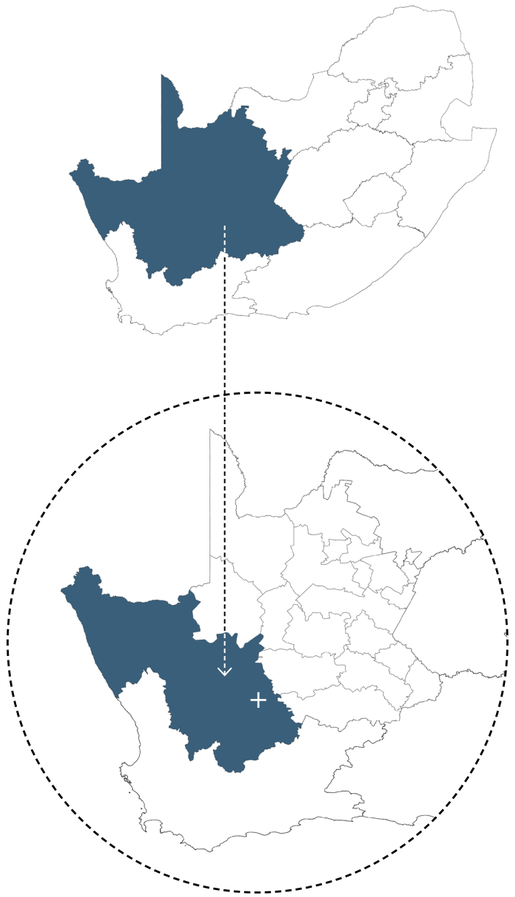
Traditional water systems

Saaidamme

The Hantam Region is known for its extremes: intense heat, cold, drought, and a lack of colours punctuated by seasonal bursts of colour and life. In this challenging landscape, infrequent yet powerful river floods occur. For generations, residents have sought to survive here by capturing rain and groundwater. The *saaidamme* - a flood-irrigation system - emerged from this need, enabling farmers to harness flood-waters to sustain their crops during extended dry periods. This practice of slowing, diverting, and storing flood-waters has improved agricultural productivity, by turning floods into a resource rather than a threat.

Low-tech, hands-on system

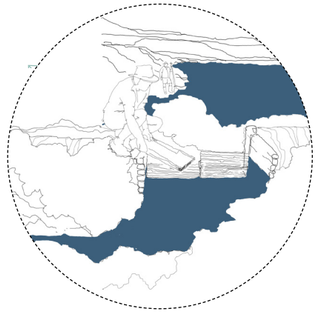
The Saaidam water strategy makes use of low-tech, hands-on methods (see Appendix L for further photographs of the landscape). It requires the effort and care of human hands - farmers and workers must actively guide the waters through earthen walls, canals, and sluices to fill the dams. The intuition and knowledge is shaped by generational understanding and observation of the landscape, the river, the climatic patterns, and the strength and physical ability of humans - without relying on engineered and mechanised systems. This study draws on the spatial and functional qualities of such low-tech systems to inspire flood mitigation strategies for urban areas like the Helderberg Region.



^Figure 134. Left: Local, Ouma Any, praying for rain. Photograph by Nakkie van Wyk, 2016.

^^Figure 135. The studied Saaidam farms are located in the agricultural Hantam region of the Northern Cape, nearly 500 km from the design.

^Figure 136. The dry Saaidam basin in the foreground shows small sprouts of invasive and highly destructive Mesquite trees. In contrast, the basin in the background display young crop sprouts that are sustained by the soil's retained moisture.



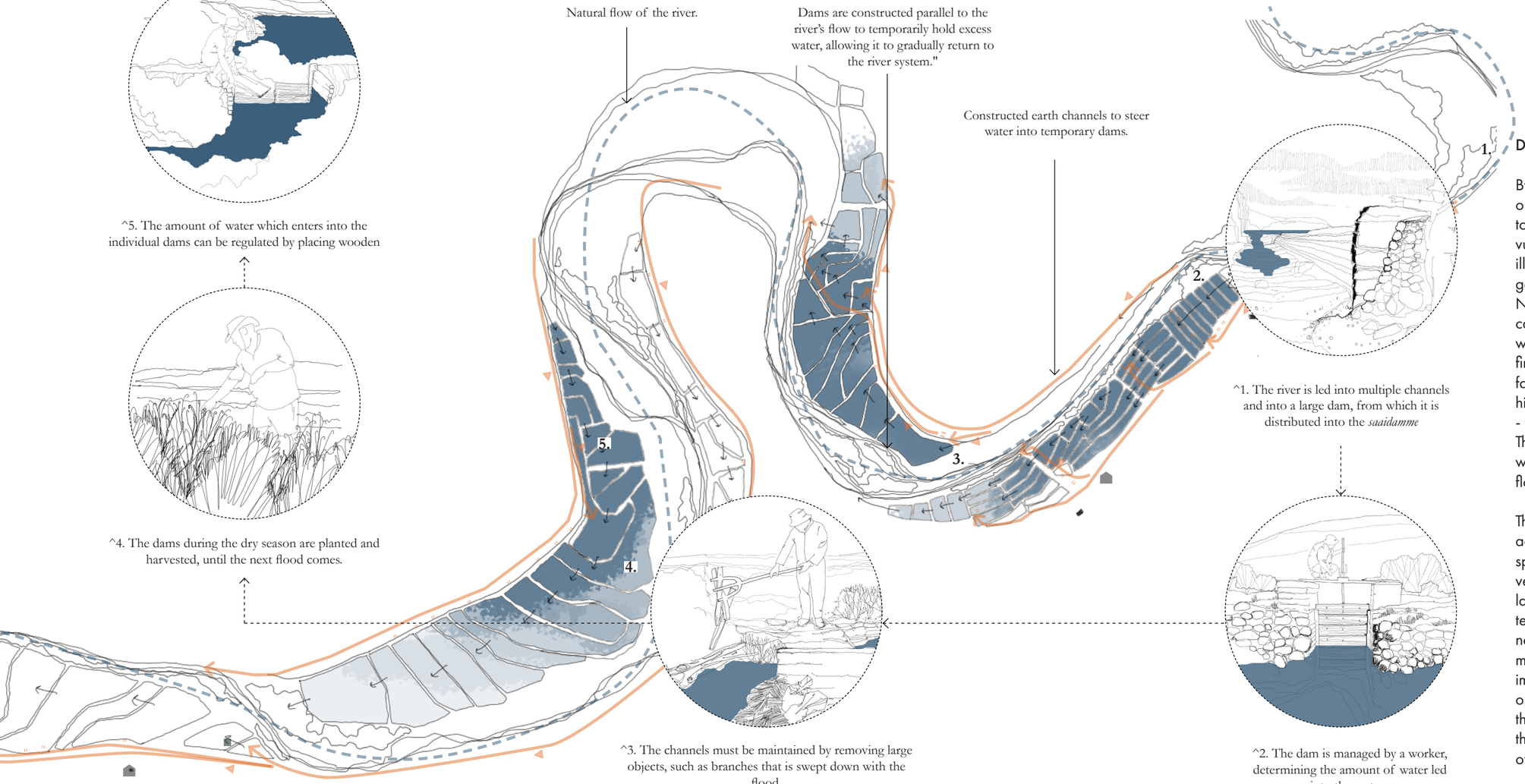
^5. The amount of water which enters into the individual dams can be regulated by placing wooden

^4. The dams during the dry season are planted and harvested, until the next flood comes.

Natural flow of the river.

Dams are constructed parallel to the river's flow to temporarily hold excess water, allowing it to gradually return to the river system."

Constructed earth channels to steer water into temporary dams.



^3. The channels must be maintained by removing large objects, such as branches that is swept down with the flood.

^1. The river is led into multiple channels and into a large dam, from which it is distributed into the *saaidamme*

^2. The dam is managed by a worker, determining the amount of water led into the system

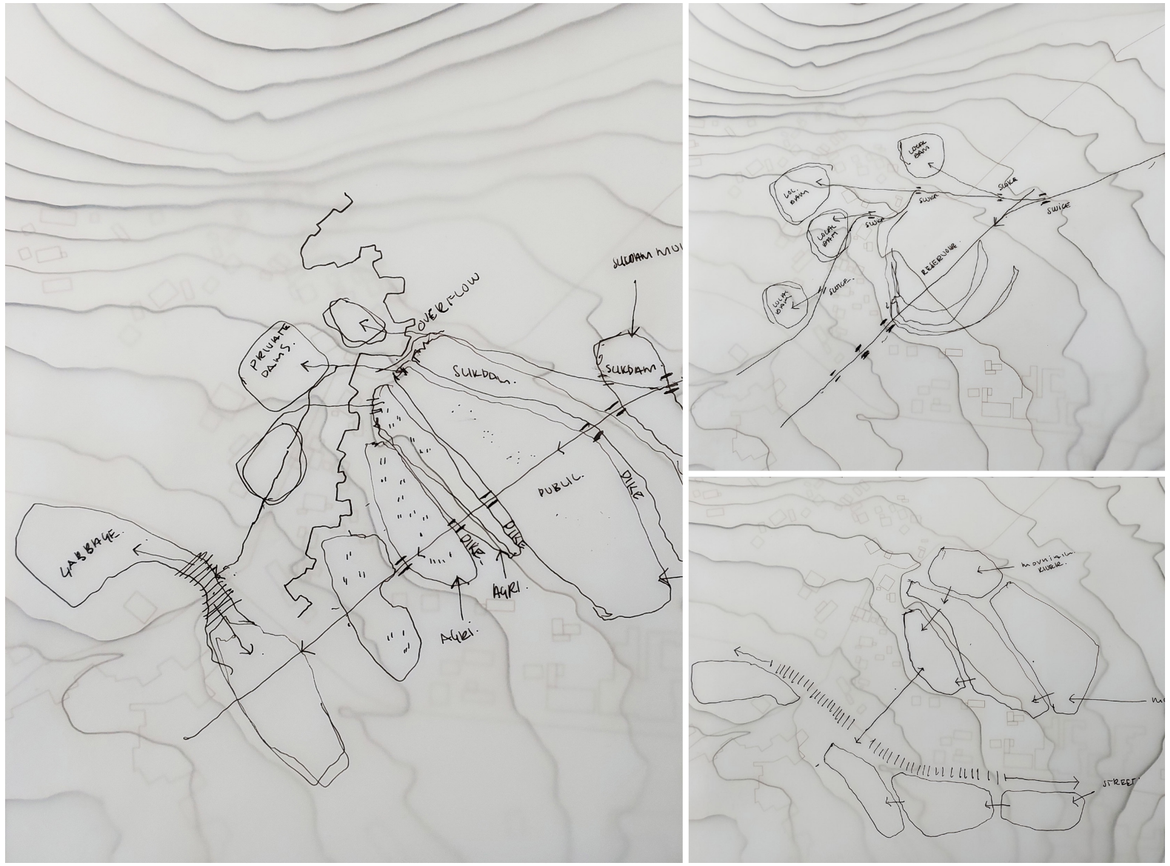
^Figure 137. Map of the Saaidamme built on Witkleigat farm in the Northern Cape, South Africa, illustrating the flow of water and the filling of Saaidam basins during the Hantam River flood.

Design considerations extracted from the case study:

By valuing these existing and site-specific methods, originally crafted for agriculture - there is potential to adapt them for densely populated urban areas vulnerable to flooding. The following Figures 137 illustrate such a Saaidam system on the farm Witkleigat, visited and observed during the fieldwork in the Northern Cape of South Africa (de Klerk, 2024). To capture floodwaters from the river, farmers build earth walls that channel water into constructed canals and finally into dams. While the layout of each saaidam farm adapts to its surrounding landscape - whether hidden between valleys or spread across open land - the core principle remains consistent across all sites. The accompanying images illustrate both the earthworks and the hands-on effort needed to guide the floodwaters.

The hands-on technology, methods and human actions studied in this case study inform the overall spatial character and essence of this project's interventions. It embraces the slowness of learning the landscape, observing its patterns, and responding by testing, changing, and adapting o the communities needs. It further informs the importance of involvement to make such systems work, along with the importance of employment and skill development opportunities. The experience of touching the soil of the earth, feeling the cold of the river, and listening to the coming of the rain informs the experiential intents of the project.

0.1km 0.5



^Figure 138. Preliminary design sketches exploring the principles learned from the Saaidam system, applied directly to the site context with careful consideration of elevation changes and available open space.

Conclusion

The Riparian Dweller

Part Three, The Riparian Dweller, explores the relationships between people and riparian landscapes, within urban Cape Town and rural parts of the Northern Cape, with a particular focus on informal settlements and hands-on water management systems. Through case studies, including the adaptive housing prototypes of Urban-Think Tank Empower and the community-led rehabilitation efforts along the Liesbeek River, the section highlights the role of context-sensitive, participatory approaches in rehabilitating and living alongside urban waterways. Furthermore, the exploration of the Saaidam system informs the low-tech, and flexible water strategies in contemporary urban landscapes The studies emphasise the need for a balance between ecological restoration and social infrastructure.

This part of the report sets the stage for Part Four, The Waterkeeperss, which will translate these insights, as well as the defined overall strategies developed in Part Two, into defined design interventions within the Sir Lowry's Pass Village.

Part four

The Waterkeepers

Design Zoom-ins

The Waterkeepers

Part Four: The Waterkeepers presents three focused design interventions that reflect the project's theoretical ideas, research, and spatial development at the scale of Sir Lowry's Pass Village (Figure 142).

Zoom-in 1: Temporary Flood Basins (page 101) shows the importance of linking economic opportunities to the site and its surroundings. This approach supports the idea of creating an infrastructure of care - where both people and the environment benefit.

Zoom-in 2: Water integration into the urban node (page 111) looks at how public spaces respond to rain, river flows, floods, and groundwater. It considers how people interact with changing weather patterns - not just across seasons, but on a daily basis.

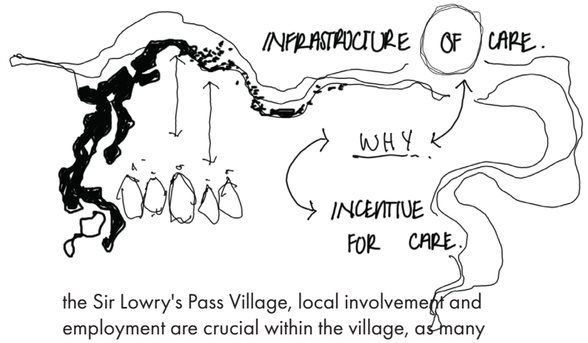
Zoom-in 3: Waterkeepers (page 115) brings together the need to care for natural systems and the needs of the local community. It suggests a long-term approach that supports both people and the environment, rather than offering short-term solutions.

These zoom-ins express the project's goals at different scales. All of the proposed interventions are guided by the idea of growth through uncertainty[20] - to acknowledge and integrate the individuality and adaptability of the people who live here and the river that follows its own course.

As stated in the introduction of this thesis, landscape architecture holds the potential to tell stories - stories written not only by the designer, but by the land itself. The project's interventions therefore enables / acts as the catalyst[21] for ecosystems to inscribe their presence, express their character, and allow the unexpected to unfold. The narratives revealed in the following interventions are therefore shaped by both fixed and designed elements and the openness of uncertainty. This "voidness" of uncertainty is represented as an imagined unfolding of events - representing possibilities for occupation and transformation, yet remains inherently unpredictable.

As discussed in Drawing as a Methodology (page 29), the drawing style represents the interplay between the fixed and the fluid: the defined and the undefined; the designed and the emergent; the intervention and its unfolding consequences.

^Figure 139. Litter builds up in the rivers and in the streets of informal areas due to the absence of basic service provision.



Infrastructure of Care

Infrastructure of care, as already explored in Part One, is an underlying theme that supports the argument that the quality of the riverine landscape can be improved not by only relying on high-tech infrastructure, but rather through long-term[22] local engagement - on human intimacy[23] and care. However, considering the socio-economic context of the projec there is an urgent need to also develop an incentive[24] or "profit" *for* care.

As expressed in Part Two, a large part of the inhabitants of the Helderberg region suffer under poverty, neglect, and a lack of basic infrastructure, such as clean drinking water. Why, therefore, should the residents sacrifice their limited resources to care for their surroundings? To develop an incentive for care, the project prioritises three aspects: employment as an economic motivation to take care of the river; and education and skill development as the means to support the understanding, motivation, and ability to take the health of our surroundings into one's own hands. By developing an infrastructure of care, the river is given the opportunity and space to heal. This infrastructure is rooted in the relationship between giving and receiving.

Existing employment and community initiatives

As mentioned earlier, the unemployment rate is extremely high in Sir Lowry's Pass Village. According to a teacher at the ECD Hope & Light Centre in the Sir Lowry's Pass Village, local involvement and employment are crucial within the village, as many residents - even those with learned skills - spend their days unemployed, either on the streets or within the confined spaces of their homes (Hope and Light Community Welfare teacher, 2025). This situation contributes to rising rates of crime and domestic abuse, which can be especially traumatic for children who do not have access to schools or daycare facilities. The aim to develop employment within the village is inspired by diverse initiatives that have been implemented in the area. One example of this is the non-profit community project Paint Sir Lowry's Pass Village, initiated by internationally renowned artist Charlie Vettori, who started the mural project when she relocated to Cape Town in 2022 (Vettori, 2025). According to Vettori, the project has had a positive impact on the community, as the opportunity to employ, educate, and develop certain skills grew with each mural, making the village more colourful and unique. This project not only empowers the voiceless within the community, but also contributes to its identity.

Other initiatives that have contributed to the employment of locals, as well as the care and education of children within the village, include the Hope and Light Community Welfare Organisation, Rainbow Kids, Mila's Angels, and Joyce's Soup Kitchen, among others. These initiatives are committed to improving the well-being of local residents and

^^Figure 140. Top: Incentive andn outcomes is shaped by the connection between the needs of the river and those of the local residents.

enhancing the overall quality of life within Sir Lowry's Pass Village. Inspired by these existing efforts, this project aims to explore the possibilities of **employment which are connected to the well-being of the ecological values** of the landscape and Sir Lowry's Pass River.

Learning with the Landscape

A major constraint of this project lies in the uncertainty of whether it is even possible to rehabilitate a landscape that has been so heavily transformed. With this in mind, the process of discovery, learning, and developing site-specific knowledge is proposed as a central part of the design interventions. The landscape itself becomes a testing ground for assessing the area's potential - such as the presence of seed banks[25] within the soil, or determining which Fynbos species are most likely to thrive under current conditions. The process of learning with the landscape allows local community members to develop a unique and place-based understanding of the land. Furthermore, as Ziervogel (2014) emphasises, strong collaboration between local communities and the non-human landscape is essential in addressing urban challenges such as flooding. Building on this perspective, the project argues that dedicating space for community-led river rehabilitation - rather than defaulting to rapid, engineered, and high-density urban development - offers a more sustainable path toward a shared urban existence within the riverine landscape.

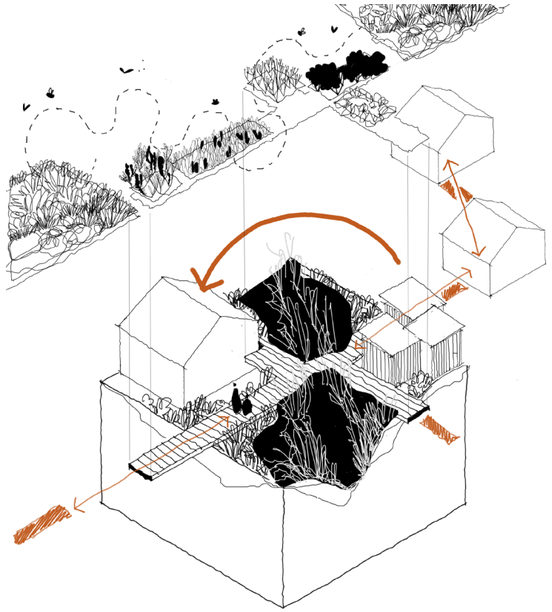
Overarching spatial concept:

Fixed & sculpted

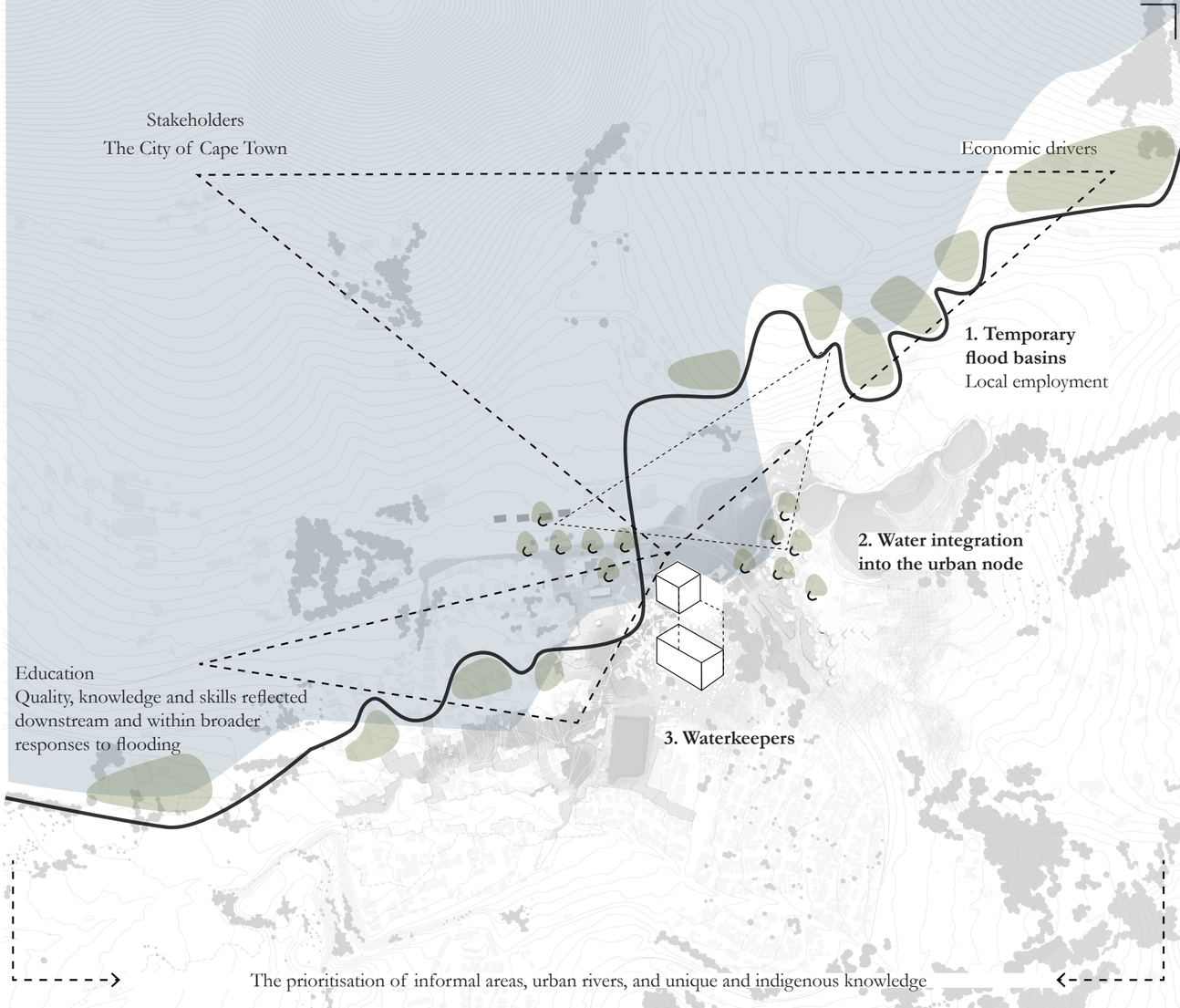
=

foundations for

River's waters, natural process, climatic patterns, human nature, unpredictability, flexibility



^Figure 141. Urban corridor concept sketch.



^Figure 142. Link between small-scale interventions within the local community, its relation to the larger up- and downstream interventions, and to the huma stakeholders.

Design Zoom in 1
Temporary flood basins

Employment linked to ecological restoration was reinforced during a site visit to the catchment area with Andrew Purnell. He described a local Nature-based Solutions Teams initiative, focused particularly on involving women in managing landscapes through tasks such as clearing invasive alien species (Purnell, 2025). Combined with the City of Cape Town's Expanded Public Works Programme, this approach forms the basis for establishing a Sir Lowry's Pass Nature-based Solutions Team. The team would be responsible for ecological stewardship within the riverine landscape, developing skills in Fynbos fire management, rehabilitation, and flood mitigation.

Figure 143 shows a series of flood basins - or Fynbos blocks - which serve as both temporary flood buffers and zones for native Fynbos restoration. Shallow and divided by low berms, these basins double as firebreaks and pathways reconnecting fragmented urban areas. Their defined, visible role helps protect them from informal development and destructive activity, while remaining accessible public spaces - similar to Green Point Urban Park (page 91).

Local employment in maintaining these areas - through clearing, ecological burns, or firebreak upkeep - helps assign value and function to the space without the need for fencing. In flood events, the interconnected basins also act as emergency buffers, diverting water to reduce damage to nearby informal settlements.

Inspired by the Saaidamme case study (page 93), they are designed to store water temporarily, without significantly altering downstream flow.

The function of these basins is further strengthened by integrating surrounding agricultural and business activities. Nearby enterprises - such as organic farming at Sans Souci Farm, olive cultivation and farm shops, vineyards that attract both tourists and locals, and surrounding protea and honey farms - offer valuable opportunities for collaboration. Allowing these existing businesses to expand into and around the basins, while employing local residents, reinforces the area's economic potential. One example is Fynbos honey: by restoring endemic Fynbos species once native to these riparian zones, the landscape supports both ecological regeneration and the development of local products which add to the value of this unique landscape and its native species.

Figure 143 further illustrates the identified alien invasive tree species surrounding the various rivers and streams feeding into the Sir Lowry's Pass River. According to the Conservation of Agricultural Resources Act (43 of 1983), invasive species are prohibited within 30 meters of the 1:50 year flood line of watercourses (Esler, Pierce & de Villiers, 2024). These identified trees will be cleared and repurposed - either incorporated into the construction of local housing (Design Zoom-in 3) or utilised within earthworks interventions (Design Zoom-in 2).

^Figure 143. Temporary flood basin zoom-in.

Berms act as low dikes, and function as walkways, as well as fire breaks between the burning Fynbos blocks

Cape Sugarbird pollinator

Sluice managed by the caretakers

Local harvesting to produce products unique to the Sir Lowry's Pass riverine landscape

Boland Granite Fynbos

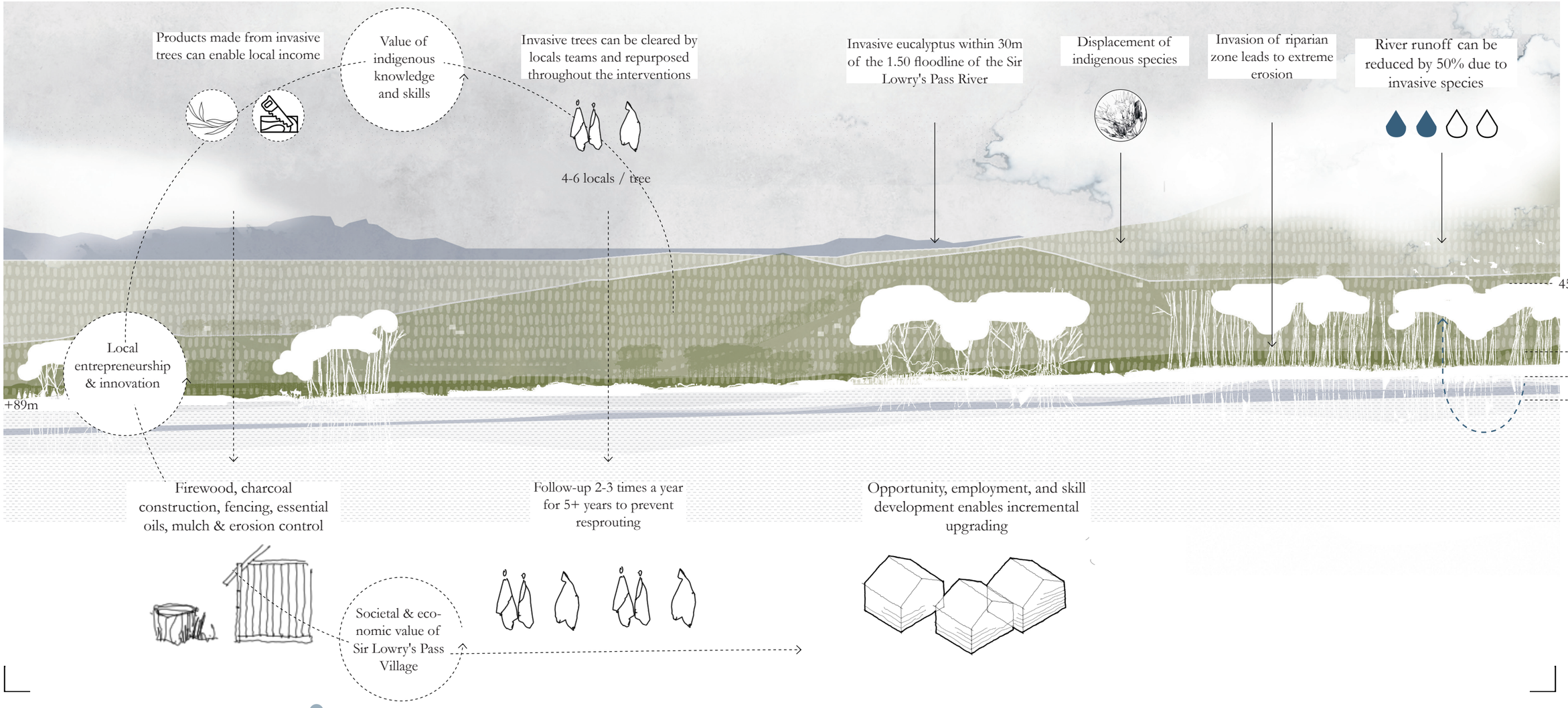
Lourensford Alluvium Fynbos

Abundance of shapes, colours, and fragrances attracts visitors and adds to the experienced value of this particular landscape

^Figure 144. Landscape caretakes and natural processes bloom within the fixed parts of the landscape.

Current landscape section

Transparent overlay



^Figure 145. Existing scenario section showing the presence of invasive species and their reintegration into the landscape.

Current threat of invasive species burning

Transparent overlay

Effects of invasive tree fires:

- Fires fueled by invasive tree species burn hotter and are more difficult to control, leading to an increased frequency of fires.
- These burns destabilise the soil, resulting in accelerated erosion and uprooting of trees.
- The soil's capacity to absorb rainwater is reduced.
- The proximity of invasive vegetation to informal dwellings raises the risk of structural fires.
(Esler, Pierce & de Villiers, 2024)

^Figure 146. Severity and consequence of invasive species burning.

Fire, heat, and smoke

Socio-economic opportunities

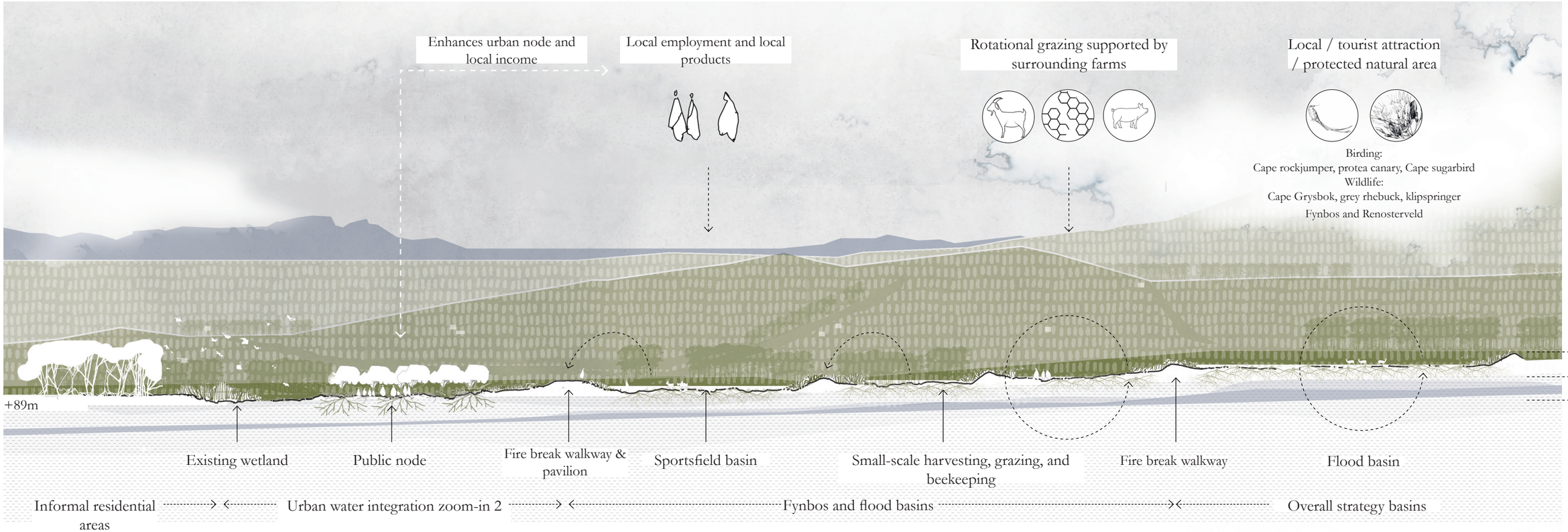
As mentioned at the beginning of the report, Fynbos was widely used by indigenous people, who understood its applications for food, medicinal purposes, and more. According to Street and Prinsloo (2013), many cultures in South Africa still rely on indigenous medicinal plants for their primary healthcare. However, the informal trading of traditional herbal medicine has increased the risk of extinction for certain species (Williams, Victor & Crouch, 2013). Fortunately, the current investment by the government in indigenous knowledge, literature, and research - especially regarding the medicinal uses of Fynbos - has led to increased validation and biotechnical approaches to gaining insight into non-destructive and sustainable ways of using our unique Fynbos resources (Makunga, 2025).

This project explores the possibility of combining the entrepreneurial opportunities of local Fynbos trade while simultaneously building the infrastructure to harvest these resources sustainably. By encouraging the growth of Fynbos species with specific uses, locals can harvest and sell them within their communities as well as to a broader market, contributing to the economic significance of the village. The spatial interventions include an extension of the existing commercial areas as formal market spaces where locals can establish small-scale businesses.

An important spatial consideration is that Fynbos rehabilitation can be a slow process that requires patience and time. According to Purnell (2025), one method to initiate this rehabilitation is to limit the initial planting to approximately 10 species. This planting phase can take up to two years and includes the processes of stabelising the existing soil, and collecting, storing, and spreading seeds on-site. The diversity of the Fynbos will slowly increase through pollination and distribution by non-human actors (Purnell, 2025).

Proposed landscape section: Temporary flood basins

Transparent overlay



^*Hymenolepis crithmifolia* Rebelo, 2017

^*Muraltia heisteria* Forshaw, 2015

^*Drosera cistiflora* Magrietb, 2017

^*Protea nitida Mill.* Rossouw, 2019

^*Wurmbea recurva* Lochner, 2015

^*Crassula fascicularis Lam.* Lochner, 2012

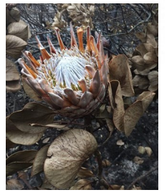
^Figure 147. Proposed strategy section: rehabilitating the degraded landscape by integrating local employment and diversification of products

xm x

Proposed landscape section: Ecological Fynbos burning regime

Transparent overlay

7-25 Year fire interval



^Fynbos after fire. Baard, 2018

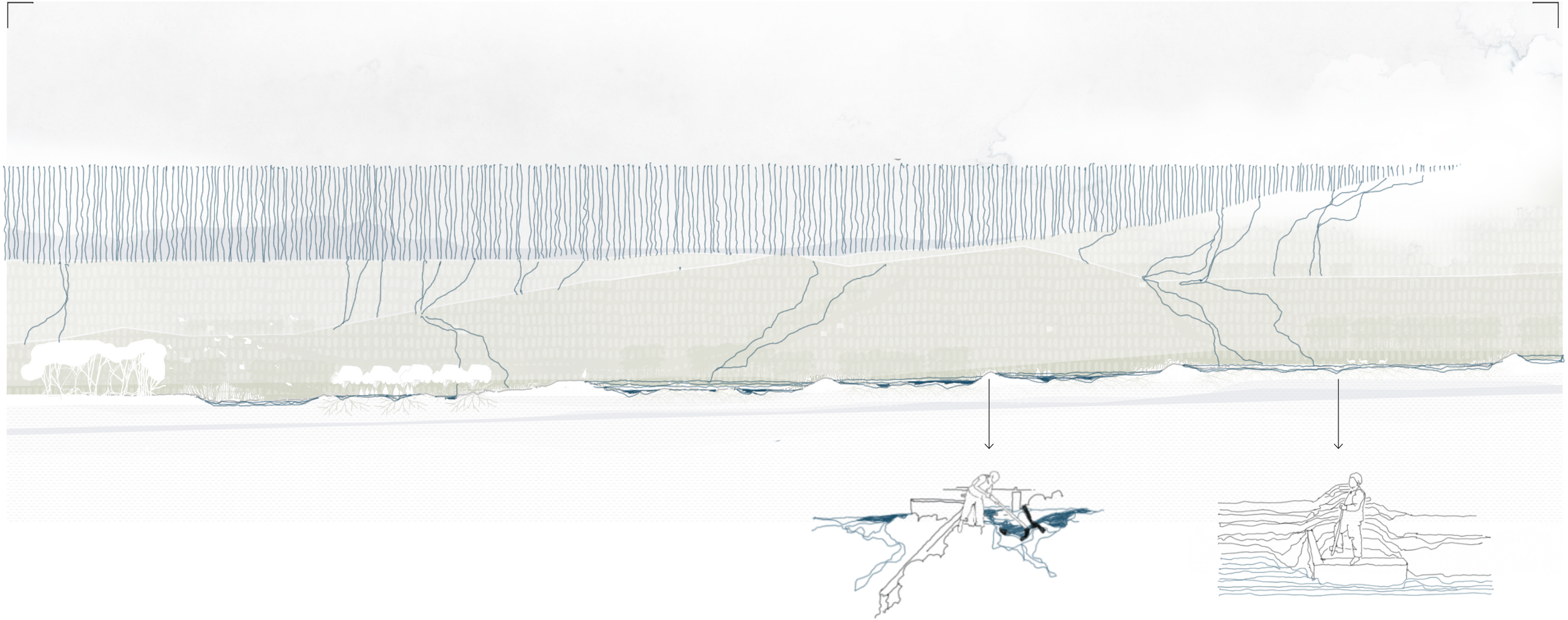
^Cape Trekking, nd.

^Dixon, 2018.

^Figure 147. Ecological burning regime

Proposed landscape section: Slowing down floodwaters in temporary flood basins

Transparent overlay



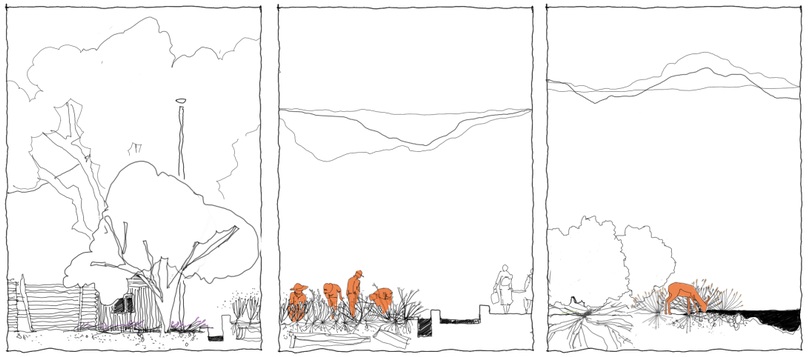
^Clearing sluice openings during flood

^Opening and closing sluice

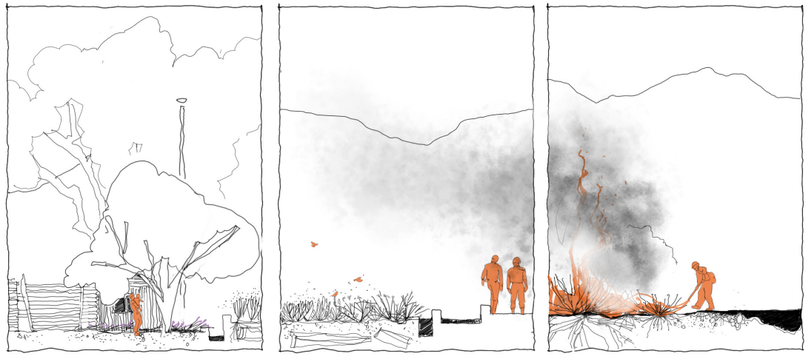
^Figure 147. Sir Lowry's Pass River flood

Wonder of fire

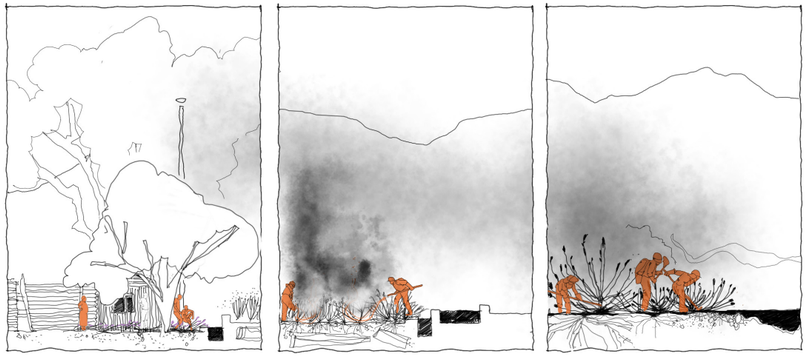
As outlined in Part Two, fire is a defining element of the South African landscape and has shaped the perceptions of local Capetonians in complex ways. For vulnerable communities, both ecological and accidental fires often result in trauma. However, within the context of this project, Fynbos - a key spatial and ecological component - depends on fire for regeneration, making the relationship between human and non-human perceptions of fire a critical design consideration. The following sections (Figures 148-15) illustrate the contrasting spatial impacts of fire. The design seeks to promote community participation in managing controlled fire regimes, recognising and responding to accidental fires, and cultivating a broader curiosity and engagement with the phenomenon of fire. The goal is to shift ecological burning from an event associated with fear to one experienced with anticipation and understanding. By enabling a more intimate connection to burning landscapes, residents may develop an intuitive awareness of the ecological processes intrinsic to the Fynbos biome. The accompanying drawing visualises these simultaneous, yet scale-specific processes: the human act of observing and sensing fire, alongside the burning plant's release of seeds through various dispersal mechanisms. Ultimately, both the landscape and the human gaze are met with a vivid carpet of orange-hued seed dispersal - symbolising renewal, transformation, and growth.



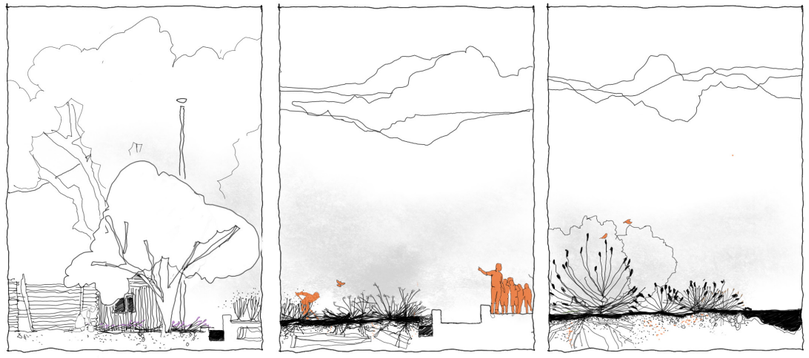
^Figure 148. Before controlled block burns



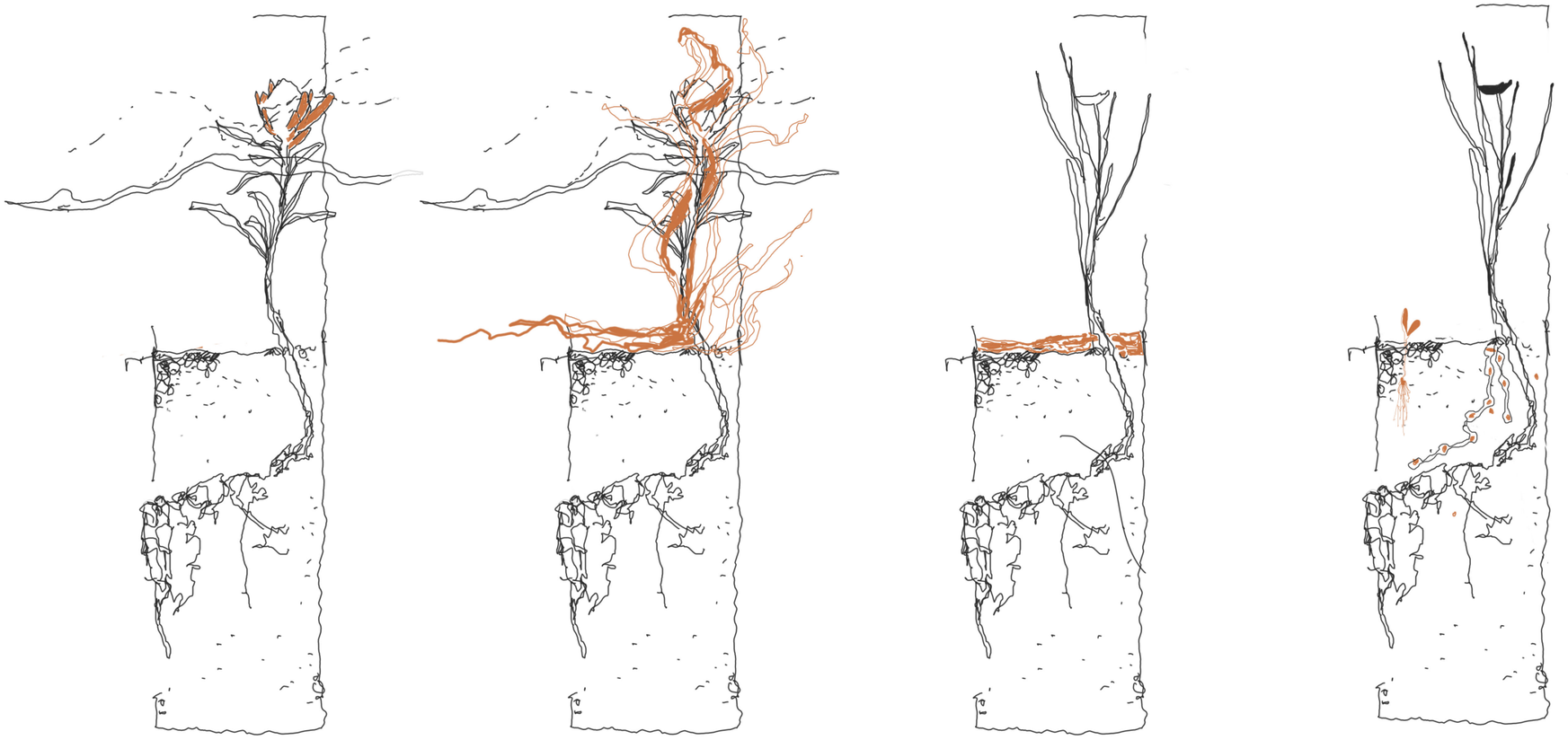
^Figure 149. First controlled block burn



^Figure 150. Burn clean-up & second block burn



^Figure 151. After-burn

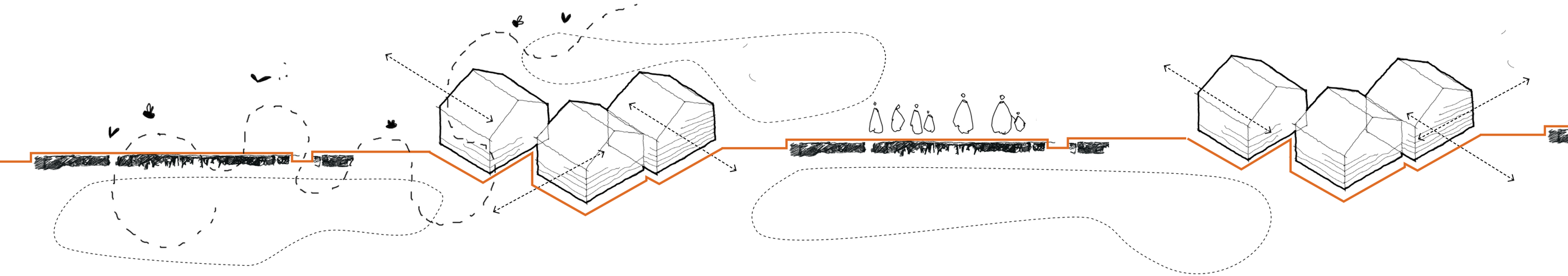


^Figure 152. Process of Fynbos releasing its seeds during smoke and heat.

Design Zoom in 2

Water integration into the urban node

The second zoom-in illustrates the integration of the river's presence within the urban node. As previously discussed, the river manifests not only as a visible stream but also through rain, puddles, and groundwater. These varied expressions of water are embedded in the design through the following interventions:



^Figure 153. Concept sketch.

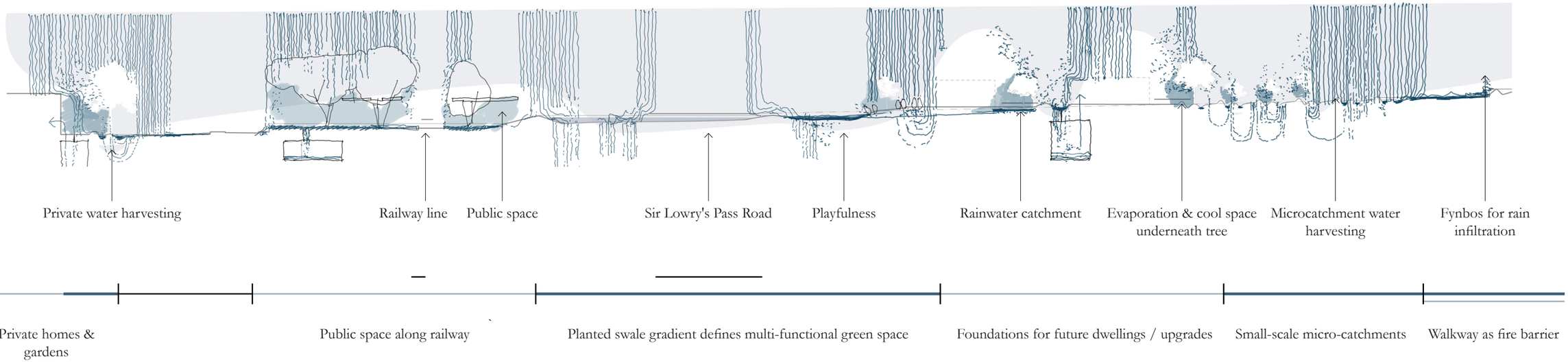
^Reference plan Sir Lowry's Pass Village

^Current landscape condition.

^Current landscape condition.

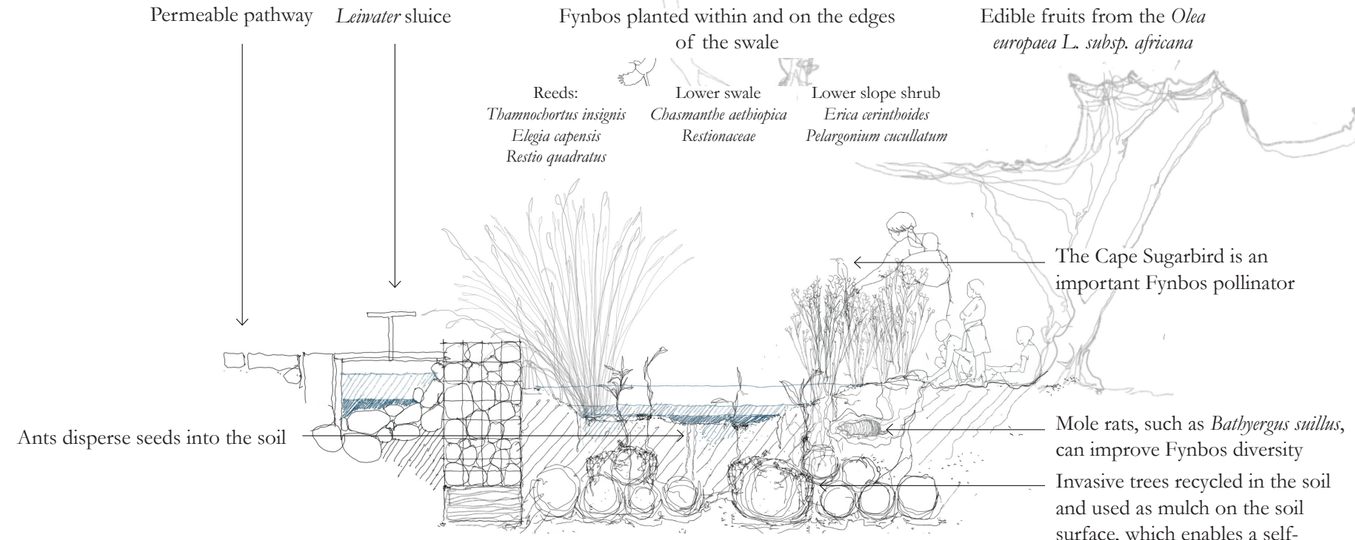
^Current landscape condition.

Detail section A (page 113)

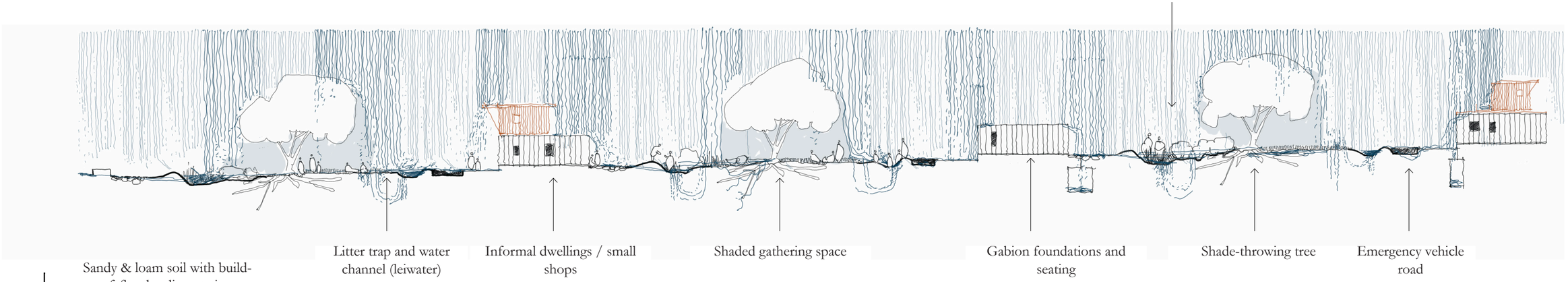


^^Figure 154. Proposed conceptual strategy aimed at connecting the needs of both the riverine landscape and the communities residing within it.

^Reference plan Sir Lowry's Pass Village



^Figure 155. Swale detail illustrating swale, *leiwater* and rehabilitation of the soil. Diverse Fynbos species can be planted as soil stabilisator and can be harvested for human uses, such as medicinal uses.



^Figure 156. Detail section A illustrating the transformed public node.

Rain

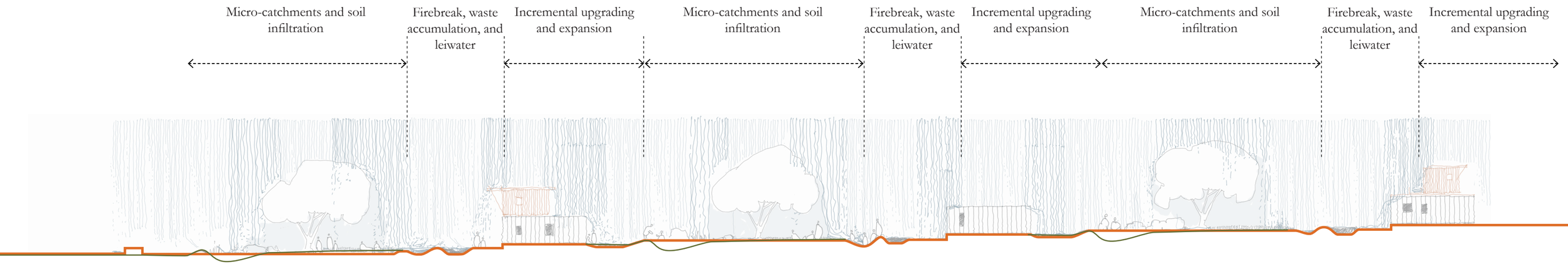
Incremental dwelling upgrades

New housing typology

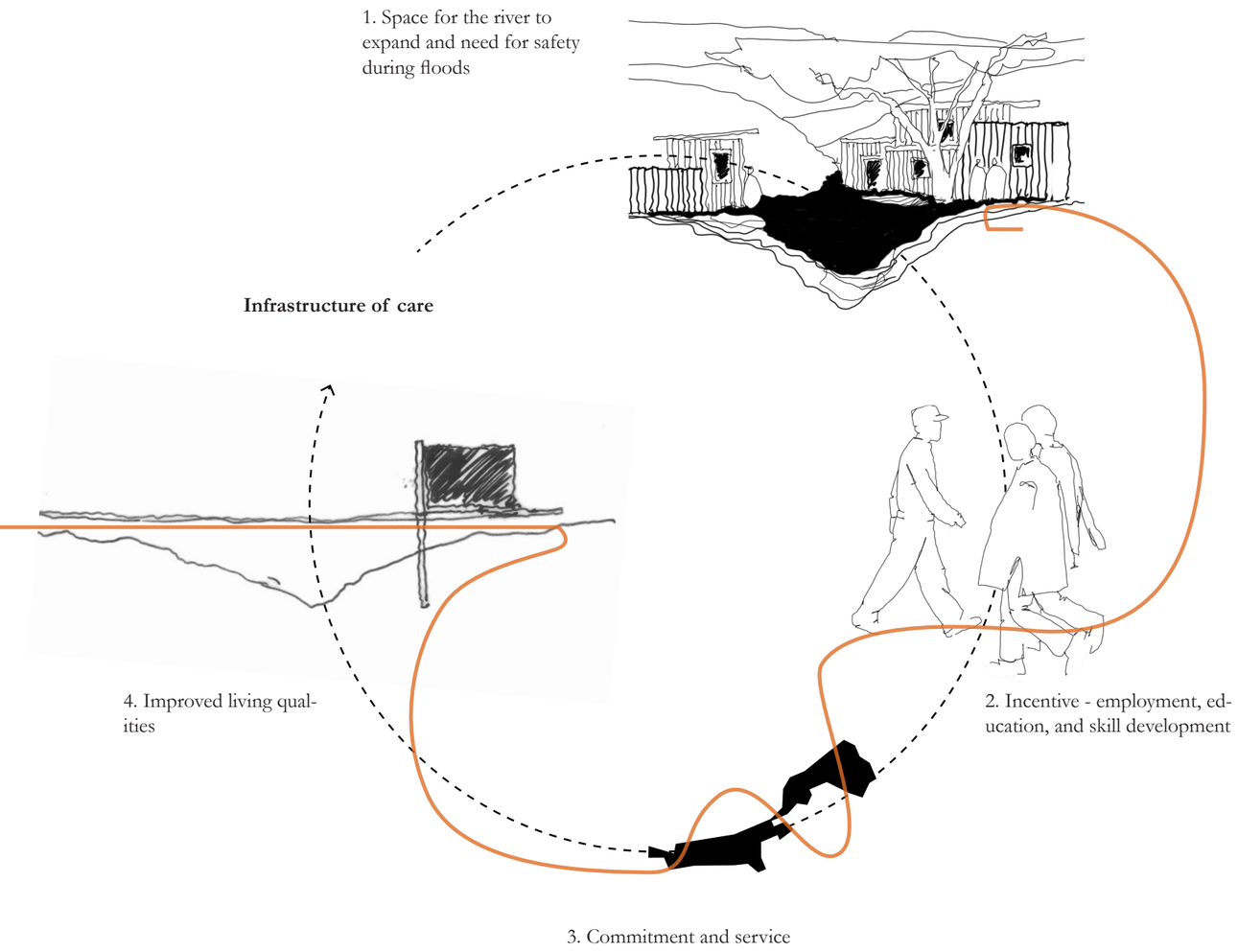
Runoff accumulation

2.5m

Transparent overlay



^Figure 157. Unpredictable / imagined within the fixed and designed.



^Figure 158. A conceptual strategy aimed at connecting the needs of both the riverine landscape and the communities residing within it.

Design Zoom in 3
Waterkeepers

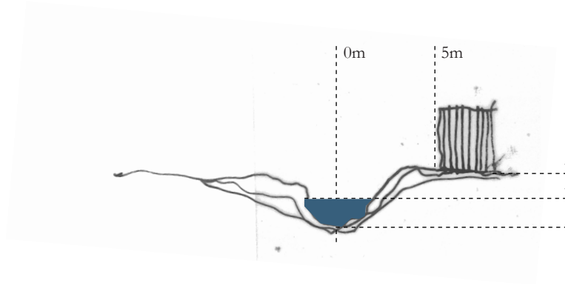
Litter and waste as design considerations

Pollution plays a significant role in shaping the Sir Lowry's Pass riverine landscape (Figure 139). While it cannot simply be designed away, what can be influenced is the way it is perceived. This raises the question: what role might litter and waste play in the landscape interventions? Can these inanimate materials be integrated into a broader incentive to care? The movement of waste - driven by the river, wind, and human activity and its visible accumulation points have been critically examined and incorporated into the design strategy (Figure 165).

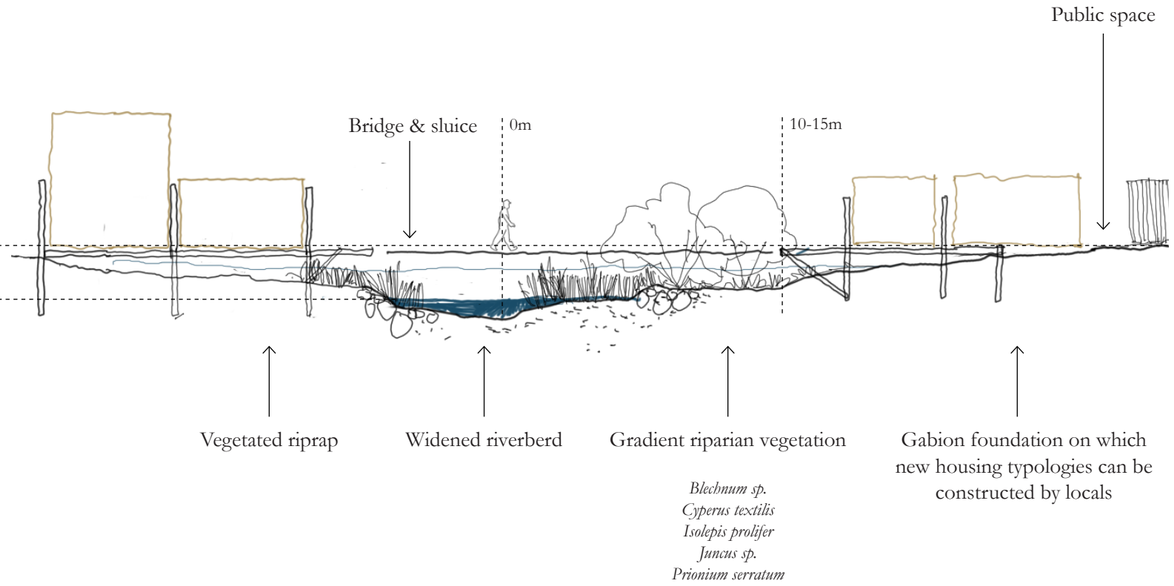
Zooming into Sir Lowry's Pass Village, the spatial application of the Waterkeepers strategy is illustrated. As previously outlined, Waterkeepers brings together employment creation, riverine protection, and community engagement as part of a cohesive care model. The first layer of this strategy addresses the urgent need for employment, education, and skill development among local residents. However, the goal is not merely to propose Waterkeepers as a theoretical framework; it must also be materially and spatially embedded within the fabric of the village. The aim is to rekindle the community's historical connection to the river by enabling residents to see and experience the tangible outcomes of their labour.

This approach draws from key theoretical underpinnings -specifically, the concept of shared ownership and the value of permanence, discussed earlier in the report, alongside the legacy of spatial injustice detailed in Part Two. Another critical spatial rationale is the necessity of allowing the river room to expand and regenerate, particularly as a means of mitigating the severe impacts of flooding on vulnerable residents. To achieve this, the project proposes the development of a new flood-resilient housing typology, located along the river's edge. These homes are intended for individuals already living informally in this area, and/or those employed as caretakers of the riverine landscape. They would be responsible for the ongoing care, protection, and monitoring of the river's ecological condition.

Importantly, this strategy does not advocate for displacement. Rather than relocating residents to unfamiliar areas - which often leads to further informal development elsewhere - the project allows them to remain rooted in place, recognising the social ties and community networks they have already established. Figure 158 illustrates how these multiple dimensions converge to form a cycle of care, offering a conceptual and spatial foundation from which the Waterkeepers initiative can grow.



^Figure 159. The current conditions of the Sir Lowry's Pass riverbed show that informal dwellings are situated within the river's floodplain, making them vulnerable to collapse in the event of flooding.



^^Figure 160. Proposed concept section of the widened riverbed and the elevated new housing typologies.

^Figure 161. Overlaying the existing riverbed conditions, including the location of informal dwellings, onto the envisioned space for the river.

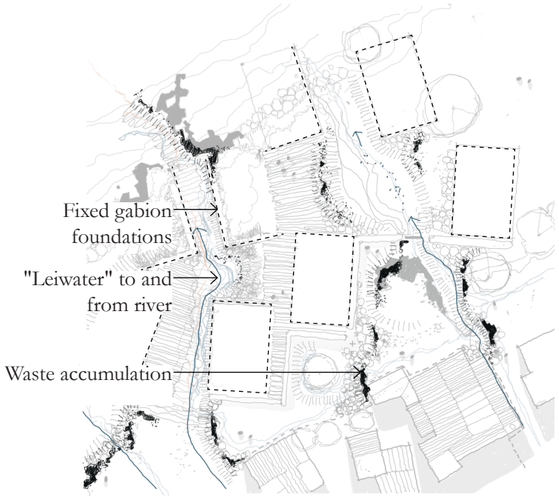
^Figure 162. Waterkeepers strategy plan with design interventions.

Existing water accumulation surfaces and public nodes

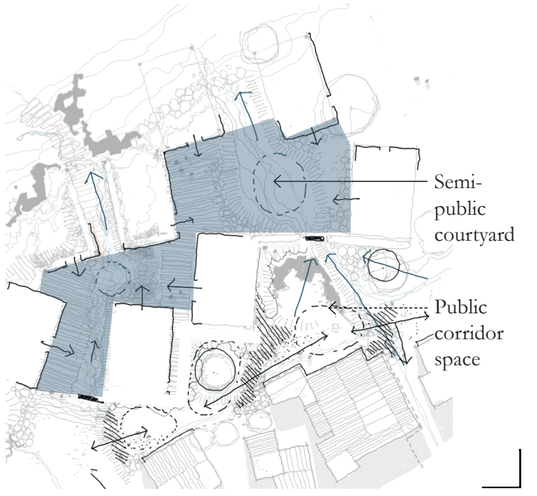
^Figure 163. Identifying existing public nodes, water flow, waste accumulation, edges, etc. (see Appendix K).

Public "water" nodes

^Figure 164. Defining swales and berms to accumulate water in public space

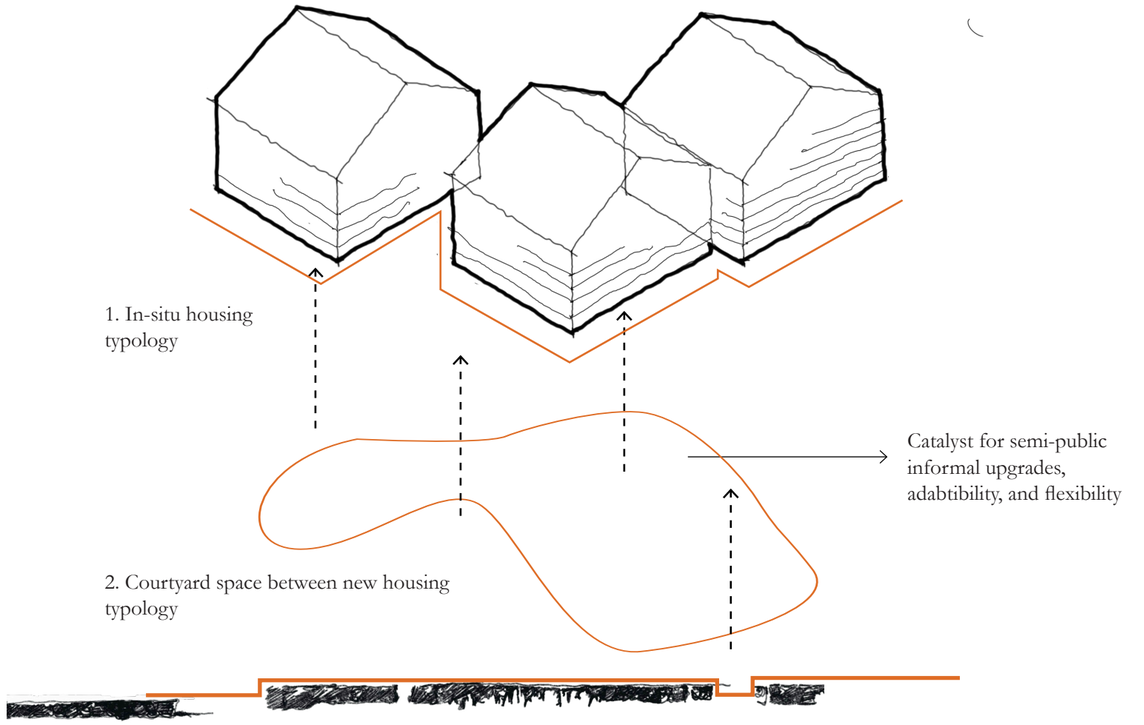


^Figure 165. Fixed gabion foundations for new housing typologies, which also serve as river edge elements



^Figure 166. Public space defined by swales, trees, low shrubs, permeable surfaces, and seating

^Figure 167. Unpredictable / imagined within the fixed and designed Fixed & defined



1. In-situ housing typology

Catalyst for semi-public informal upgrades, adabtibility, and flexibility

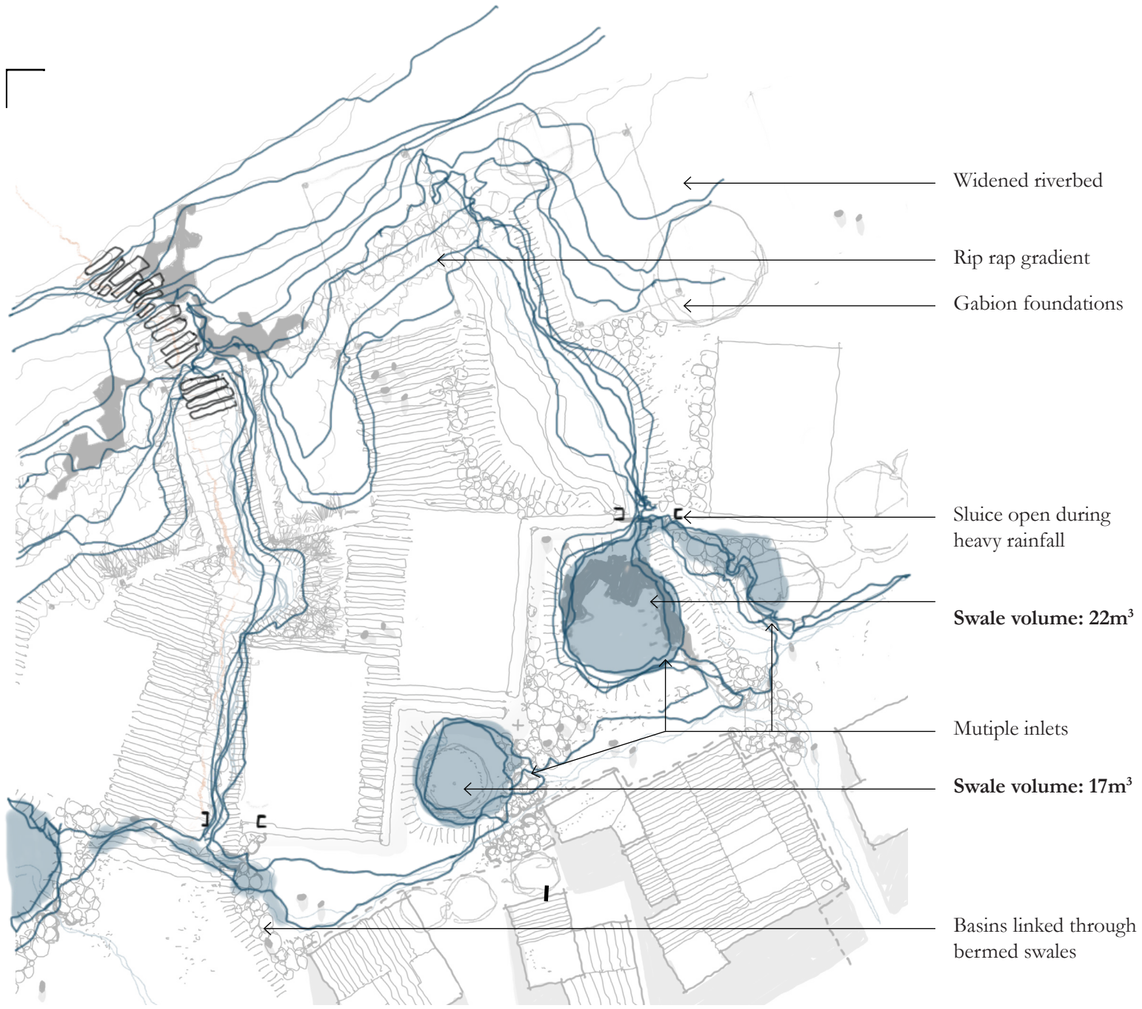
2. Courtyard space between new housing typology

3. Gabion foundations defining the edges of public space and enabling incremental growth

Catalyst for public informal upgrades, adabtibility, and flexibility

4. Public space between existing informal dwellings and new housing typologies

^^Figure 168. Concept diagram.

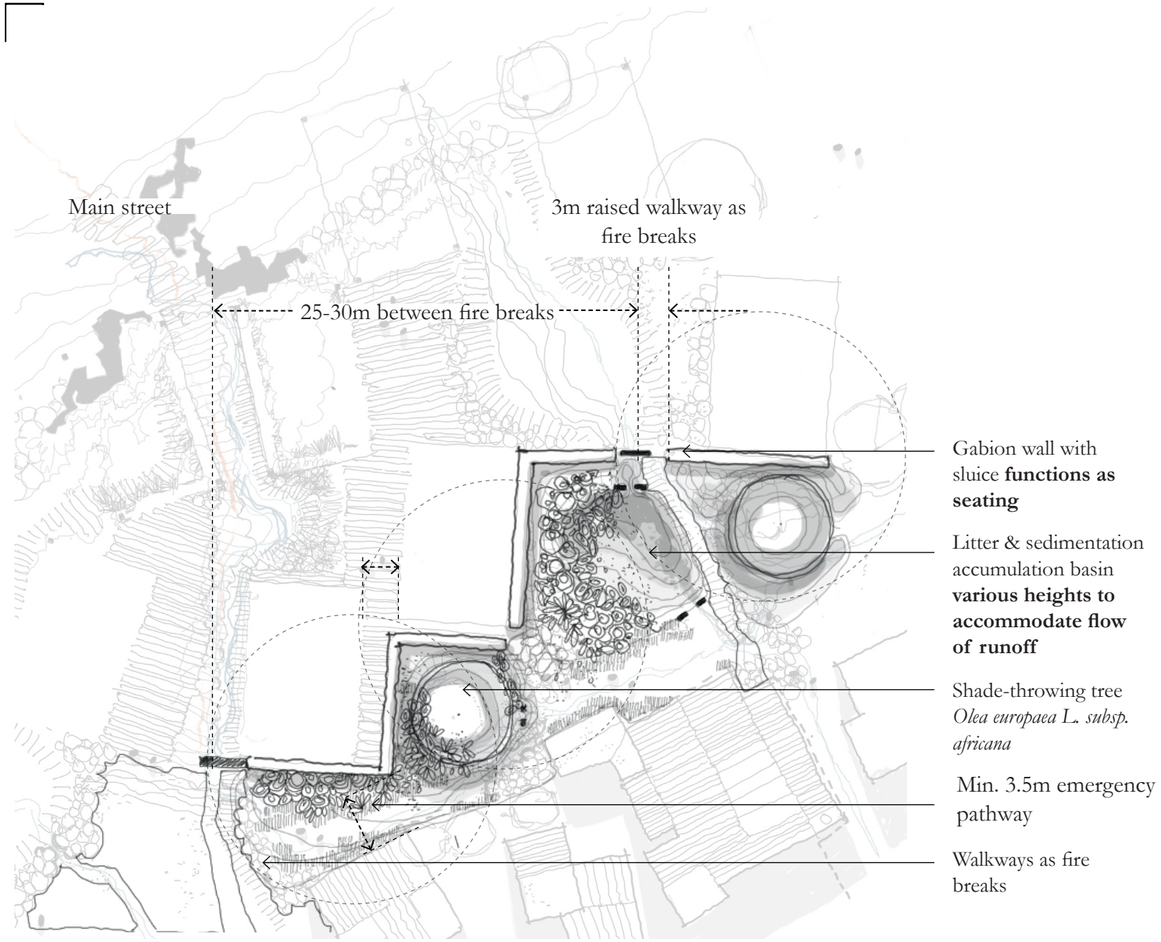


^Figure 169. Sir Lowry's Pass River flood scenario.

Water accumulation during rainfall

Flow of runoff

2.5m 12.5



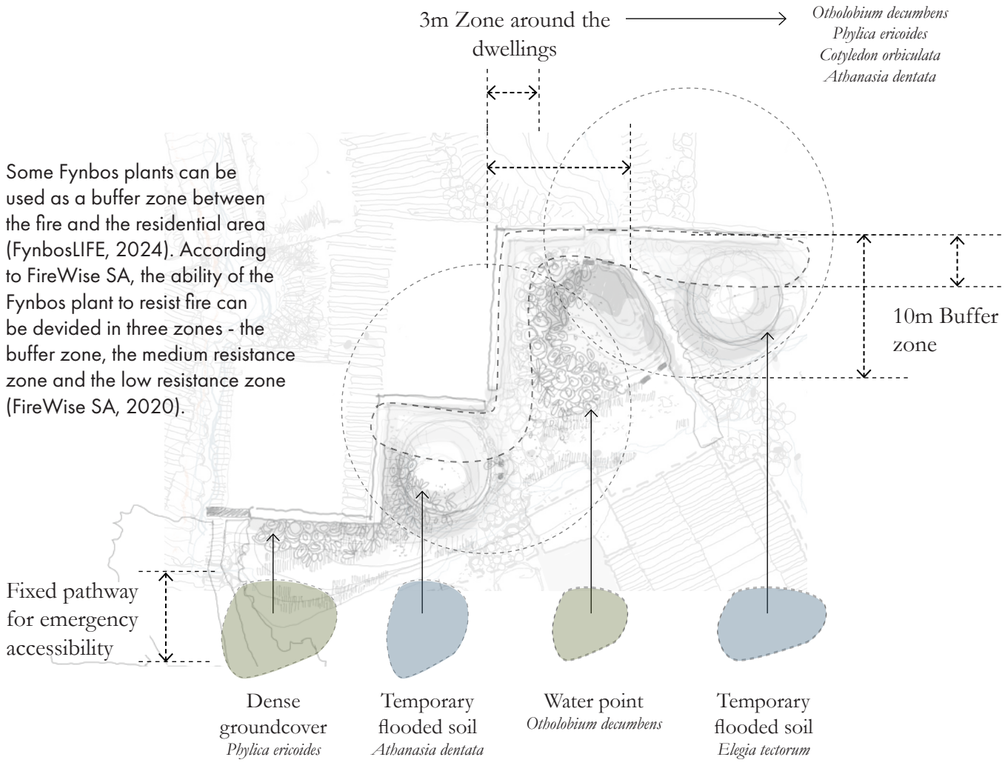
^Figure 170. Growth of Fynbos in public space.

Swales

Fynbos planting

Transparent overlay

Some Fynbos plants can be used as a buffer zone between the fire and the residential area (FynbosLIFE, 2024). According to FireWise SA, the ability of the Fynbos plant to resist fire can be devided in three zones - the buffer zone, the medium resistance zone and the low resistance zone (FireWise SA, 2020).



Uses of species:

- Honeybees
- Cut flowers
- Medicinal
- Thatching reed
- Fragrance

^Goosen, 2008 ^Rebelo, 2013 ^Magrietb, 2013 ^Rebelo, 2018

^^Figure 171. Fire-resistant buffer zone planting, fire-breaks and emergency pathways as fixed elements.

2.5m 12.5

^Figure 172. Local skill development and employment. Photograph by U-TT, 2019

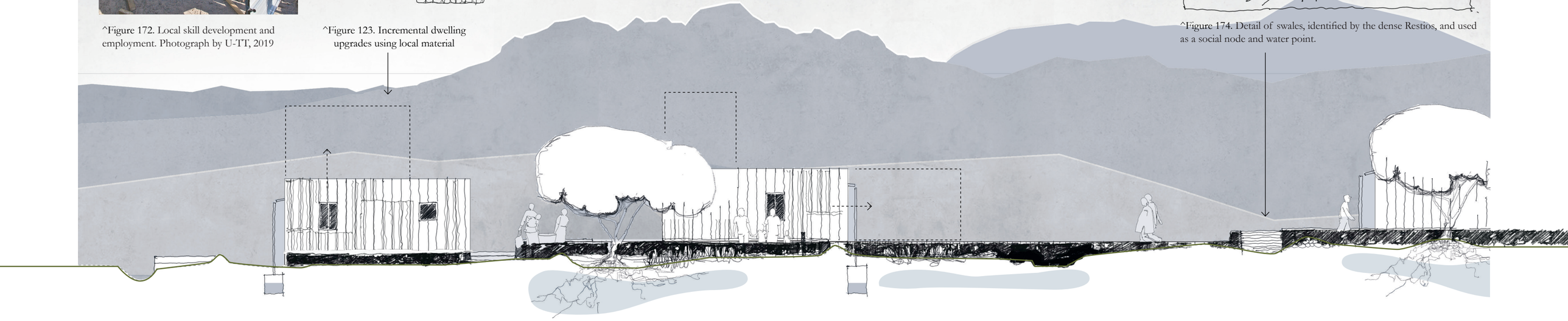
^Figure 123. Incremental dwelling upgrades using local material

Materiality

Reusing local material

Existing informal dwellings in the area are typically constructed using timber frames clad with lightweight corrugated metal sheeting. To support informal upgrading, the proposed housing typologies retain this familiar materiality while introducing the use of locally-produced sandbags and earth bricks. Additionally, local skills can be expanded through the production of woven fences and cladding using locally available Fynbos Restios, such as Cape thatching reed (*Elegia tectorum*). These golden-brown Restios gracefully mimick the movement of the wind. Reaching heights of up to 1.5 metres, they form prominent edges, particulary in urban areas with moist soil (The Gardener, 2021).

^Figure 174. Detail of swales, identified by the dense Restios, and used as a social node and water point.

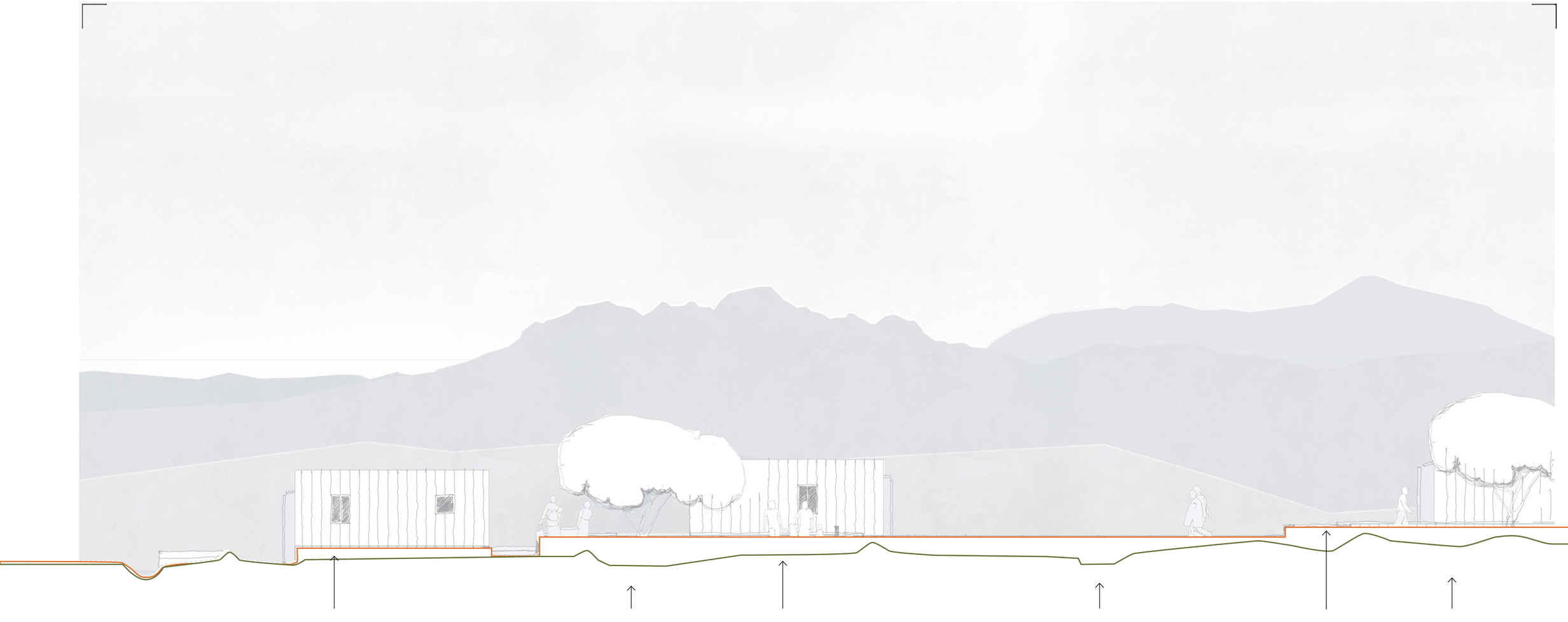


^Figure 173. Section through public space illustrating the water retention swales and new housing typologies.

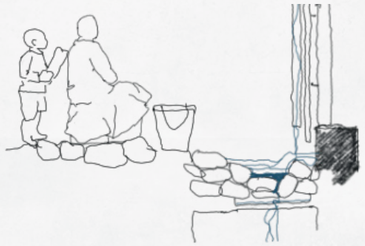
Sedimentation and litter accumulation

2.5m

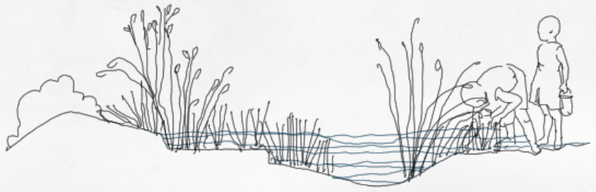
Transparent overlay



^Figure 175. Unpredictable / imagined within the fixed and designed Fixed (foundation) Fixed landscape

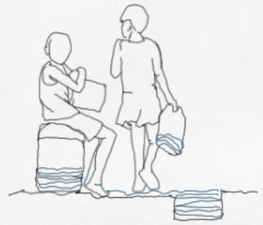


^Rooftop rainwater harvesting

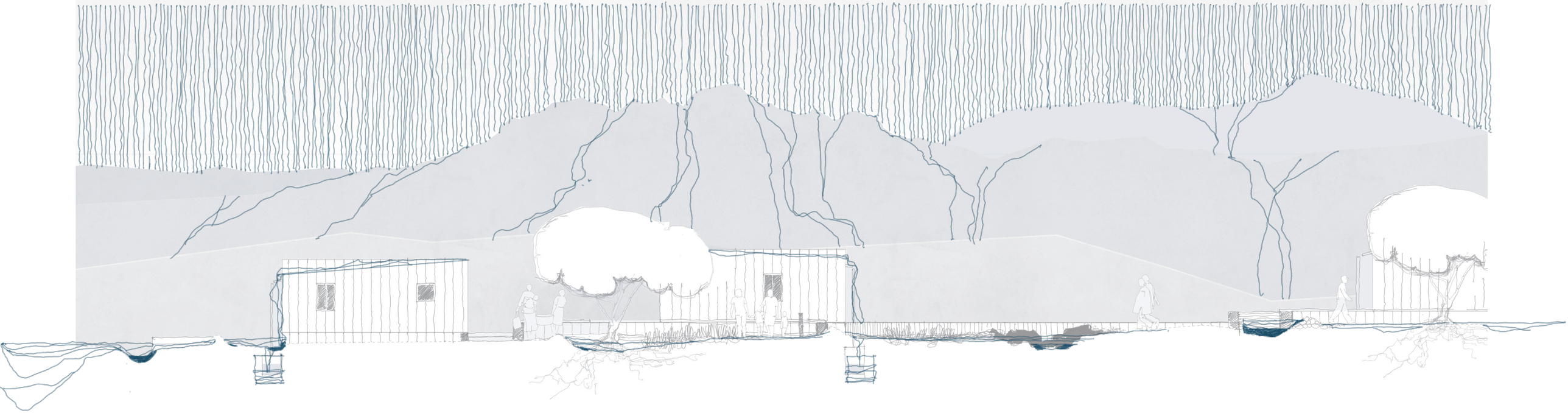


^Water accumulation in swales

^Waste accumulation in swales



^Urban water distribution through *leiwater* system



^Figure 176. Sir Lowry's Pass River

Water accumulation

Rainfall

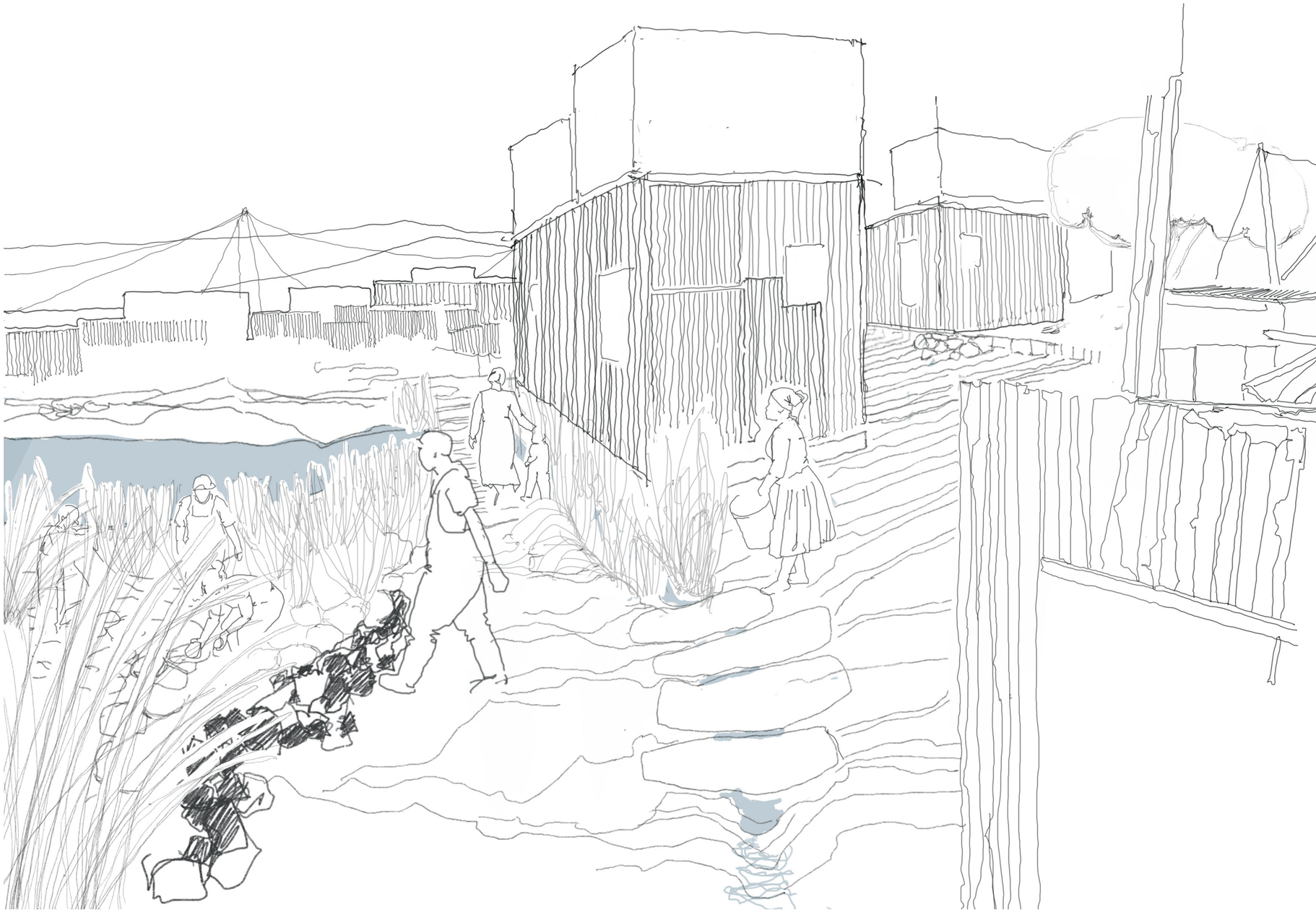
Experience, intimacy, and the human scale

Shared spatial and temporal scope

Part One explored the theoretical lens through which the design is developed. This includes concepts such as the entanglement between human and non-human, the idea of generational rootedness within the landscape, behaviours and interactions shaped by memory and instinct, and the role of affect. While this theoretical grounding has informed the overall development of the project, it is particularly emphasised in specific parts of the interventions - often where there is a direct dialogue between human and non-human elements and processes.

The following illustration indicates the dynamics of changing water levels, experienced both visually and physically as water is allowed to penetrate the swales, leiwater system, and riparian edges. The transitions between water and permeable urban surfaces are defined by native vegetation, the use of local materials such as river stones, and low-tech waste accumulation points. The spatial relationship between river and human is moderated through raised gabion walls, which reduce the threat of floodwaters, yet are counterbalanced by the sensory experience of engaging with the river's presence within the urban fabric - through swales, river edges, or occasional flooding. The individuality of the community is embodied in the adaptability of the landscape elements. Although the gabions are fixed and act as foundations, the processes and changes that occur within and around them are unique.

^Figure 177. Waterkeeper houses on ther river's edge



20. Uncertainty and adaptability

Uncertainty is closely tied to temporality, yet it also introduces the need for adaptability and user-specific responses within design processes. Observations and interviews conducted in Sir Lowry's Pass Village revealed that, despite the inherent precarity of informal settlements, there exists a strong sense of structure and social cohesion. Neighbours are familiar with one another, and community-defined norms and expectations shape everyday interactions. In this context, external design interventions must acknowledge and respect these existing social frameworks. Design should "leave space" for community-led adaptation - allowing shared spaces to evolve in response to shifting needs and the uncertainties of time.

21. Catalyst

A key challenge in discussing the decentralisation of the human, or post-dualism, is that these concepts are still approached solely from a human perspective. While it is impossible to fully express the voice of the river, insight from landscape architect Antoinette de Beer during a site visit offers a valuable perspective: the landscape and its ecological elements cannot simply be restored to an ideal state, but humans can serve as catalysts for ecological growth and natural processes. This principle applies to non-human elements such as the river, Fynbos, and wetlands, as well as to human nature. While the project cannot create perfect living conditions for the inhabitants of Sir Lowry's Pass Village and River, it can provide opportunities - catalysts - for positive development and growth to occur.

22. Long-term local engagement

This approach is grounded in the relationship of belonging and responsibility toward the landscape. If communities rely on the river for drinking water, as was historically the case with the Sir Lowry's Pass River, there is a natural incentive to prevent pollution upstream. The project emphasises multi-scalar care - a cycle of stewardship that begins upstream, manifests downstream, and then influences actions back upstream. Consequently, all intervention elements requiring care and maintenance are designed to be physically managed by local residents who depend on the river themselves, thereby reinforcing an awareness of the landscape's interconnected and circular nature.

23. Human intimacy

Intimacy relates, among other aspects, to the sensory perceptions and relationships between human - human and human - non-human interactions. It may be as fleeting as a human hand touching a wisp of Fynbos, lasting only a moment, or as enduring as a child growing up alongside the gradual growth of the same tree. It encompasses the subtle transformation from fear of fire to awe of its flames, as well as the slow development of understanding and empathy toward the river's ecosystem. Landscape architecture serves as a tool to create platforms that foster intimacy between humans and the non-human world.

24. Incentive

In the context of the Anthropocene, it is important to recognise that the broader human community is unlikely to take necessary actions to reduce ecological impact unless there is a tangible benefit. In communities facing poverty and severe shortages of basic services, income and stability are critical to daily survival. This project therefore embraces this reality by integrating employment opportunities with strategies aimed at improving the ecological health of the river and surrounding landscape. Providing economic incentives becomes a key motivator for sustaining the essential environmental work.

25. Seed bank

According to Purnell, it is possible that within this landscape - transformed since the 1600s - Fynbos seeds remain dormant in the soil. These seed banks could enable the survival and regeneration of indigenous species if appropriate conditions, such as exposure to smoke and heat, are created. However, in some areas, dense invasions of alien species may have depleted or prevented the survival of these seeds.

26. Human scale

The human scale refers to the capacity to relate to a space as a human being. It allows one to imagine oneself within the environment, experiencing its textures, degrees of exposure or seclusion, and qualities of heaviness or lightness, diversity or monotony. It invites one to hear the sounds of the river, feel the coolness of pebbles, enjoy the warmth of the sun, or sense the danger posed by the proximity of fire.

27. Disregarded public space

These spaces are marked by scattered litter, informal desire lines crossing open land, patches of wetland, and a groundcover of dry kikuyu grass. They are occasionally used for grazing or lighting fires. Often perceived as sites of potential crime - whether at night or in daylight - these areas are typically hurriedly passed through or avoided. Lacking clear purpose or function, they exist as ambiguous in-between spaces, leftover fragments awaiting development by the surrounding towns.

Part five:

Conclusion & reflection

Conclusion

The research question, *how can hands-on water management principles inform flood mitigation and rehabilitation strategies to foster a coextensive urban riverine landscape?* informed three essential themes and hypotheses of the project.

Firstly, **the value of human perception and experience of a landscape is crucial to the river's being and quality** (*How can hands-on water management principles...*).

The fascination with the human experience and its effect on the landscape was initially influenced by the study of the traditional water systems, Saaidamme, in South Africa. The interwoven correlation between the human-made system - designed in response to seasonal flooding - and the resulting human understanding of the land, the situated knowledge, as well as the relationship locals have developed with the land, inspired a fascination with human rootedness within a place, despite its harsh living conditions. This fascination extended to exploring the effects of unexpected floods on vulnerable urban communities, and how the value of perception and experience might be employed as a design methodology to alter the way humans engage with their surroundings. Through theoretical exploration, the historical research of Cape Town's hydrological heritage, and a closer understanding of the unique characteristics of informal areas such as Sir Lowry's Pass Village, the analytical grounding of the project has informed the conclusion that low-tech, hands-on management principles, which prioritise experience and involvement, would have a more resilient impact on how humans respond to the river, as well as on the reciprocal relationship between the river and its people, than high-tech and inflexible responses.

Secondly, **within a context where formalised and inflexible solutions often fail, landscape architecture can serve as a platform to encourage or enhance specific ecological and social processes** (*inform flood mitigation and rehabilitation strategies to foster...*).

This definition of landscape architecture emerges from research into how to design upgrading processes within informal areas, where temporality, situated knowledge, adaptability, and incremental growth are essential factors. It also responds to the lens of perceiving the site from the river's perspective - acknowledging that what the river needs and wants cannot be predefined, but rather, we can enhance the conditions that allow it to claim space, define its own course, and develop its unique characteristics. Two overarching themes explored in the design development were the mitigation of flood impacts and the rehabilitation of the river's native surroundings, both made possible through active human involvement.

Thirdly, **to foster an urban condition in which human and non-human life coexist within the same boundaries (referred to as the riverine landscape) and within a momentarily shared timeframe, albeit with contrasting lifespans, there should be an interconnected and intimate entanglement or interdependency between them** - a relationship of give and take - an infrastructure of care (*foster a coextensive urban riverine landscape?*).

This hypothesis arises from an understanding of South Africa's socio-political context - where the luxury of care is neither affordable nor manageable for all individuals. From this understanding, the research examines educational and employment opportunities that contribute directly to the enhancement of the ecological qualities of the landscape. The concept of an infrastructure of care is explored alongside the theories of ecofeminism, the role of responsibility, and the ethics of care.

This project proposes an alternative view on vulnurable urban flood mitigation strategies, in which the value of situated knowledge within informal settlements and the opportunity for communities to adapt according to their needs and incremental growth is valued as the foundations for growing a resilient infrastructure of care, where the incentive to take care of the long-term quality of the riverine landscape is interwoven within the real need for socio-economic opportunities.

Furthermore, the project encourages future interventions within informal settlements to acknowledge the importance of landscape-based principles - such as the relationship between residents and the river, the presence of water within the urban fabric, the role of native species as spatial elements, and the provision for incremental urban growth - as a foundational layer for subsequent urban or architectural developments.

This project aims to contribute to two critical themes. Firstly, it seeks to add value to reference project's such as the city-led Liveable Urban Waterways initiative - which prioritises the improvement of South African rivers - as well as to initiatives operating within informal areas. Secondly, and most importantly, it aims to give a platform to those who are often neglected and undervalued: both the individuals living in informal settlements and the "small but powerful" Sir Lowry's Pass River.

Reflection

Methodology and academic relevance

The contextual research regarding Capetonian rivers and the site conditions have illustrated a clear image of how the rivers have come to be in the neglected state in which many are still found today. The site location shows the effect of a long history of injustice and how this has effected the river quality as well. The intuitive and indigenous understanding of the rivers value has gotten lost under poverty and urban pressures, whcih has resulted in polluted and disregarded rivers in Cape Town. This has led to the simple, but extremely complex aim to reinstate a sense of value and a respectful relationship between human and river. The purpose of the site analysis of the broader Cape Town scale, as well as the zoomed-in Sir Lowry's Pass Village scale, has provided many clues as to how the river has been treated and become as it is presently experienced. It has also given an insight into why it is treated in such a way. This investigation is unique to the Sir Lowry's Pass River and has grown from a wide variety of research and waterbody reports. This investigation takes the mere data a step further by trying to understand what the future of the riverine landscape could look like. This embodies the assumed needs and wants of the river, the demands and plans of the city, and the individual needs of the communities that live alongside the river. Only through this process of researching, investigating, imagining, was the project able to define a strategy which aims to reinstate the value of the river. Each design intervention, within each scale, is reflected against this initial aspiration - does the design decision reflect the initial position? Does it speak within its own scale the concept of the project? This multi-scalar process of reflecting the design development against the landscape problematique and the projects position and conceptual strategy, has slowly sculpted the final design interventions and narrative.

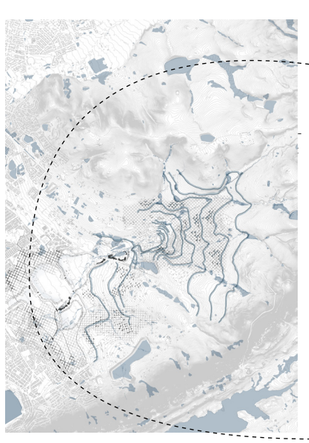
The following is an example of reflecting whether, and in what ways, a design responds to the initial position of the project:

Design zoom-in 2 example (Figure 177):

In the introduction, the value of the freshwater springs was presented as fundamental to the survival of both humans and animals, forming the original life-giving essence of the landscape. Over time, however, this natural resource became degraded due to poverty and the absence of time and space needed for ecological regeneration. In Part Two, this degradation was further linked to the forced densification along watercourses and the marginalisation and racial segregation of communities. Spatial injustice, therefore, emerges as a core theme - impacting both the river and the communities living alongside it. The introduction also outlined a critical interest in the nature of informal areas and the often unseen values embedded within them. This project thus calls for the development of urban spaces that promote spatial justice by reinforcing the visibility and value of informal communities within the broader urban network.

This design intervention explores the place-making potential of the urban node by integrating water systems into the built fabric. The interventions aim to support the growth of an economic hub and a communtiy gathering by integrating implementation of micro-catchments, swales, *leiwater* systems, and small-scale Fynbos rehabilitation into the every-day space. These ecological infrastructures make the river's presence tangible within the urban fabric, transforming it from a hidden or obstructed feature into a central, functional

component of space. The intention is to establish this node as a catalyst for local entrepreneurship - as a midpoint that physically connects upstream and downstream Fynbos rehabilitation efforts. In doing so, Sir Lowry's Pass Village is not only spatially linked to the wealthier Gordon's Bay area, but also symbolically repositioned as central to the ecological and spatial transformation of the Fynbos corridor. Through this approach, the river and the community is both acknowledged and prioritised as part of the urban value.

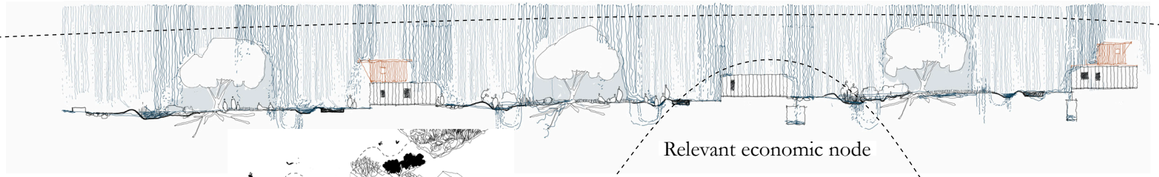


Overall intention of the project

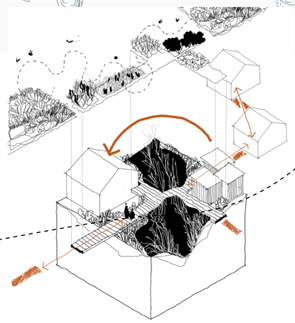
Historical and current condition:
Enhanced awareness and prioritisation of the urban value of the Sir Lowry's Pass Village and River

Strengthening the connection between marginalized communities and city opportunities through a physical and symbolic corridor

Design zoom in 2:
Need for spatially just urban development, recognising poor communities as valued entrepreneurs.



Relevant economic node



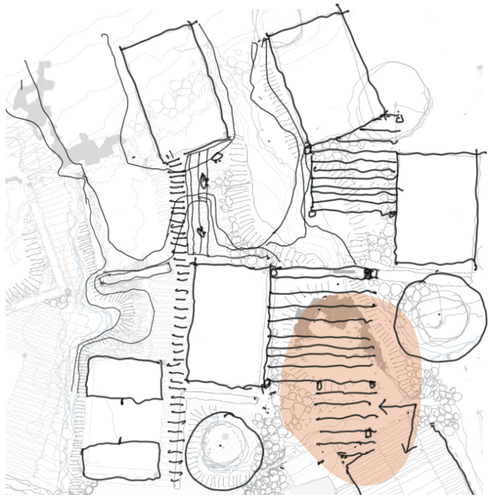
Down and upstream strategy

Design zoom-in 1:
Developing on-site production opportunities, further strengthening the uniqueness of the product.

Local identity and unique knowledge

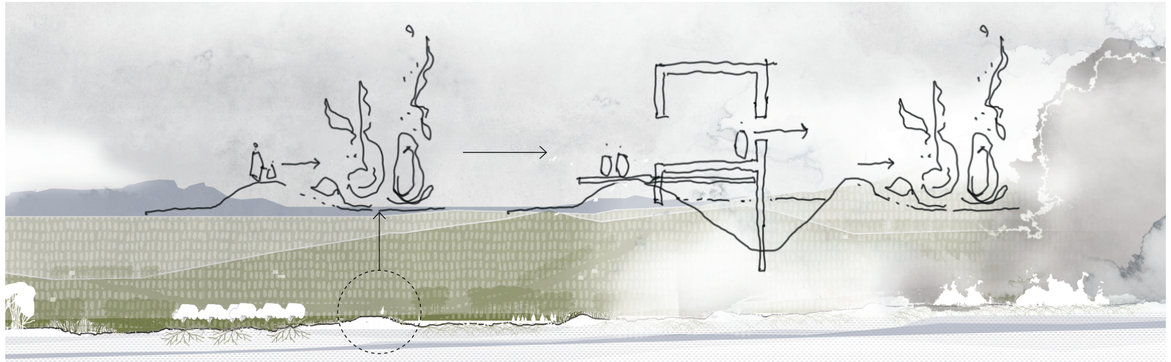
The lack of knowledge is what makes this an exciting project to engage with. This absence of certainty is a common theme within Cape Town's diverse landscape. I refer to it as a vague understanding - not in a negative sense, but as a reflection of the richness and complexity that defines South Africa. The unique character of informal areas, for example, lies in their lack of clear definition or formalisation, which is precisely what roots them so deeply in their surroundings. It is a knowledge passed down through storytelling, shaped by beliefs and rituals carried from generation to generation. It embodies the mysticism of rivers - what they have witnessed, how they perceive the land, and the people who dwell alongside them.

There is value in vagueness. There is value in allowing rivers to meander freely, unrestricted by human imposition, finding their own paths. And there is value in allowing communities to voice their needs and shape their living conditions on their own terms, without rigid formal structures. This project therefore encourages curiosity in the face of the unknown, and embraces the idea that there is beauty in not knowing - in not formalising. Spatially, the aim is for this to evolve into unique spatial arrangements, discovered improvements, and unexpected innovations - outcomes that can only unfold over time. Yet, one can imagine the possibilities (Figure 177):



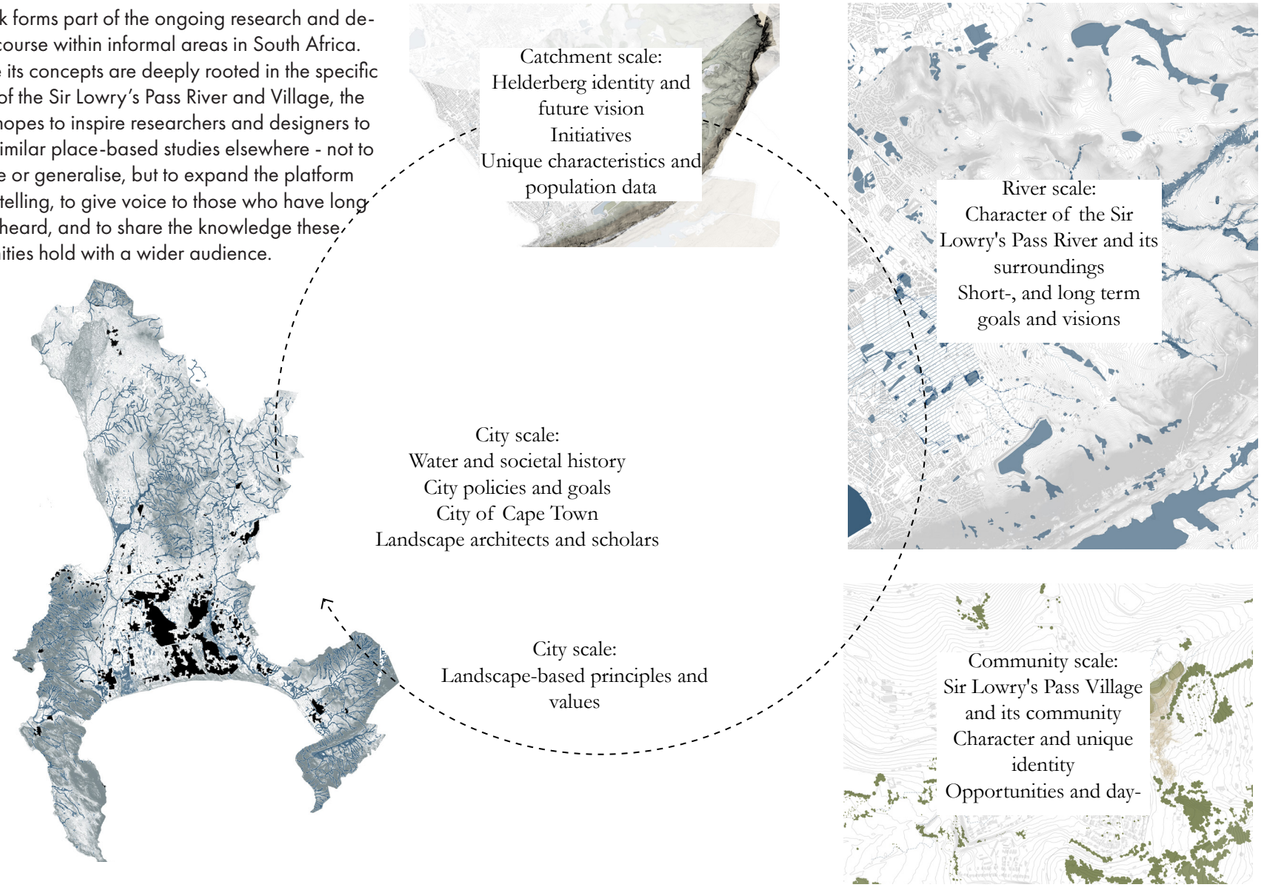
^Design zoom in 3: Individual rearangement of public space or built form, whilst fixed foundations stay the same. For example: from residential dwellings to community nodes, or improved public ablutions and water points.

^Figure 175. Instead of isolated urban expansion, as recently built along the Old Sir Lowry's Pass Road, the urban fabric grows on the foundations of the landscape foundations, such as the micro catchment infrastructure.



^Figure 175. Extended academic or touristic interests shifts City budget to prioritise upgrades in Sir Lowry's Pass Village.

This work forms part of the ongoing research and design discourse within informal areas in South Africa. Because its concepts are deeply rooted in the specific context of the Sir Lowry's Pass River and Village, the project hopes to inspire researchers and designers to pursue similar place-based studies elsewhere - not to scrutinise or generalise, but to expand the platform for storytelling, to give voice to those who have long been unheard, and to share the knowledge these communities hold with a wider audience.



^Figure 22. Potential research areas where there is an overlay of rivers and informal areas. Rivers, dams, and wetlands Informal areas

Community involvement is a crucial methodology in projects where residents are closely intertwined with the non-human landscape. For the continued development of this work, deeper and more sustained engagement with the community is essential. While the scope and time constraints of this master's thesis limited the extent of interaction, valuable insights were gathered during fieldwork, underscoring the richness of local knowledge and the potential for meaningful collaboration. At its core, this project embraces learning, adaptation, and transformation. It is not a finished product, but a starting point - one that seeks to evolve through scrutiny and engagement. Its purpose is to act as a catalyst for dialogue and innovation among Capetonian communities, policymakers, and experts alike.

Refer to Appendix N for a further reflection on the graduation project.

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Part six
Appendix

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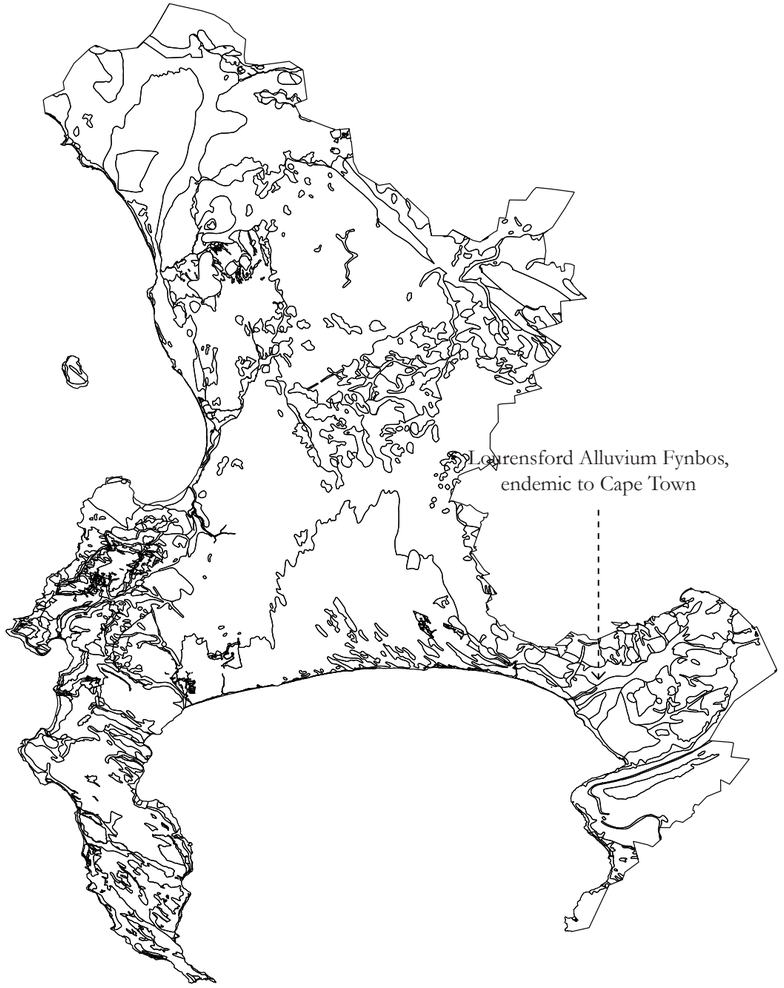
Appendix A.

Fynbos Biome



Historical extent

^Figure. 1 Indigenous vegetation: Historic extent: Image edited from QGIS

Current extent

^^Figure. 2. Indigenous vegetation: Current extent: Image edited from QGIS

FYNBOS

^Figure 3. Photograph by Lascaris, nd.

^Figure. 4. *Aulax cancellata*. Photograph by Arnelia, 2025

^^Figure. 5. *Vexatorella amoena*. Photograph by botaneek, 2018

RENOSTERVELD

^Figure. 6. Renosterveld in the Overberg region. Photograph by Curtis-Scott, nd.

^Figure. 7. *Babiana.* Chadbon, Photograph by 2018

^^Figure. 8. *Disperis* orchid. Photograph by Chadbon, 2018

STRANDVELD

^Figure. 9. Strandveld vegetation. Photograph by Chadbon, 2020

^Figure. 10. *Papo ursinus* Baboons foraging in the Strandveld.
Photograph by Chadbon, 2020

^^Figure. 11. *Ferraria crispa*. Photograph by Chadbon, 2020

^Figure. 12. *Coleonema Pulchellum* or "white confetti bush" is used as an essential oil. Photograph by Chadbon, 2018

^^Figure. 14. *Sutherlandia frutescens.* Photograph by Chadbon, 2019

Fire resistant species

Buffer Zone:
Searsia (rhus) crenata (also as wind buffer hedge)
Pterocelastrus tricuspidatus
Osteospermum moniliferum
Tulbaghia violacea

Low fire resistance around house:
Otholobium decumbens
Phylica ericoides
Cotyledon orbiculata
Athanasia dentata

Medium resistance & prevent mud slides after a fire:
Leucadendron salignum
Chondropetalum tectorum
Kiggelaria africana

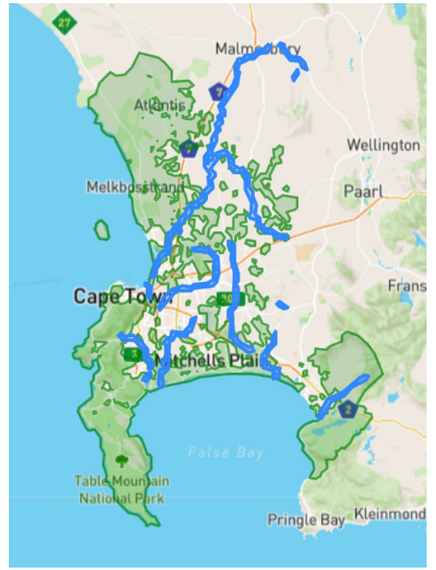
The edges and transitions between residential and Fynbos blocks are informed by these Fynbos types.

Species list

Project species	Common name(s)	Uses
Cyclopia genistoides	Honeybush	Leaves used for tea in South Africa and increasingly overseas.
Cyclopia maculata	Genadentaltee / Vleitee	Leaves used for tea in South Africa and increasingly overseas.
Agathosma crenulata	Ovalleaf buchu	Oils and medicinal treatment.
Otholobium decumbens	Carpet Pea	Low fire resistance around house.
Phylica ericoides	Heath phylica	Low fire resistance around house.
Cotyledon orbiculata	Pig's Ear	Low fire resistance around house.
Athanasia dentata	Kouterbos	Low fire resistance around house.
Leucadendron salignum	Sunshine conebush	Medium resistance & prevent mud slides after a fire.
Chondropetalum tectorum	Small cape rush	Medium resistance & prevent mud slides after a fire.
Kiggelaria africana	Wild peach	Medium resistance & prevent mud slides after a fire.
Searsia (rhus) crenata	Dune crowberry	Hedge, wind breakers and large screening shrubs.
Pterocelastrus tricuspidatus	Candlewood	Buffer zone furthest from house.
Osteospermum moniliferum	Bietou	Buffer zone furthest from house. Slow burn.
Tulbaghia violacea	Society garlic	Herbs used in salads and medicinal uses.
Brabejum stellatifolium	Wild almond	Hedges, screening.

Historical vegetation type

^Figure 15. Historic vegetation within the Sir Lowry's Pass catchment area



^Figure 16. Map by the Fynbos Corridor Collaboration (online) illustrating the possible corridor extent surrounding the rivers in Cape Town.

Appendix B.

Elaborated contextual research of Part Two: Roots: Disconnectedness towards the natural landscape

Cape Town's political, social, and technological histories have profoundly shaped its waterbodies, influencing both their ecological resilience and the services they provide to local communities. Rivers, wetlands, and lakes are embedded in the Capetonian landscape; however, these systems once spanned much larger areas. For instance, the wetlands that once extended across the Cape Flats were eliminated and the land stabilised by the early 1900s, a process exacerbated by ongoing urban expansion (Brown & Magoba, 2009).

Caron von Zeil (Reclaim Camissa), reflects:

"Journeying through the 'lost spaces' associated with Cape Town's waterways, a global story of water, land and humankind unfolds. When one uncovers the history of a 'place', it is through means of title deeds - ownership and power; however, when one uncovers the history of a 'place' through its water - one uncovers the popular history of that place. As one follows the path of these waters from mountain to ocean, the fact that water follows the path of least resistance and has no boundaries, is revealed."

Water has played a central role in the history of Cape Town since the Stone Age (Brown & Magoba, 2009). Indigenous groups such as the San, Strandlopers, and Khoi were nomadic pastoralists who migrated seasonally between the Swartland region and Cape Town, drawn by abundant streams and grazing lands. According to Nienaber and Raper (n.d.), Khoi landscape descriptions centred around waterbodies, highlighting their deep-rooted significance.

Colonial settlement, beginning in 1652 with the Dutch, marked a radical transformation of the landscape. Influenced by Dutch hydraulic knowledge, many natural watercourses - such as the Varsche (Fresh) River - were canalised to irrigate settler gardens. The resulting canals - Heerengracht, Keizersgracht, Buitengracht - remain etched in Cape Town's urban fabric (Brown & Magoba, 2009). Agriculture, driven by the need to supply passing ships, expanded rapidly, necessitating the clearing of native vegetation and accelerating ecological change.

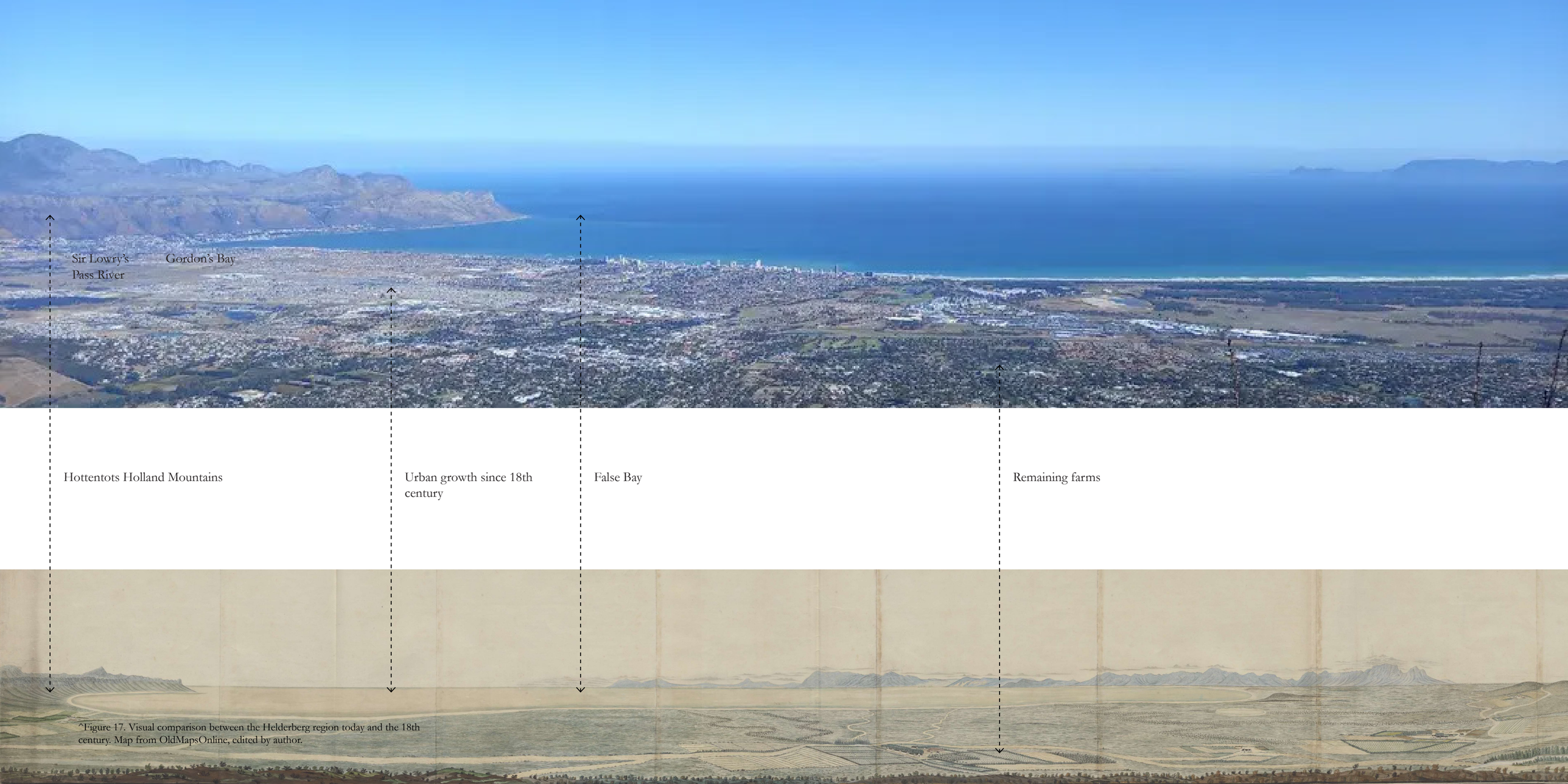
Water, once respected and used with restraint, became a managed resource - controlled, diverted, and ultimately degraded. The following proclamation by Jan van Riebeeck reflects early attempts at regulating a rapidly strained system:

"Nobody shall turn sheep into the water, nor wash, nor stir up the water above the flow of the beck and fountain where the ships draw water... People may wash only at the proper place... Every one of the inhabitants shall clear away the mess, dirt, and dung heaps in front of their houses" (Thom, 1954).

This shift marked a deeper rupture: the dispossession of the Khoik. Numbering around 50,000, they were denied access to both *grond* (land) and water. Their transhumant pastoralism - seasonal movement shaped by rainfall and veld regeneration - was replaced by fixed, settler-centred land ownership (Guelke & Shell, 1992). McGuirk and Nunn (2024) describe transhumance as a system of co-existence attuned to ecological rhythms. In contrast, the colonial imposition of borders and title deeds severed the reciprocal relationship between people and land. As settler farms expanded, often centred around springs, the exclusion of indigenous groups intensified. In Stellenbosch, by 1685, access to riverbanks and open land had diminished, forcing the Khoi into labour for Dutch farmers. Agricultural intensification further transformed the landscape, and by the eighteenth century, trekboers' search for permanent water sources privatised increasing amounts of land, pushing the Khoi and San ever farther.

The importance of water in settlement naming practices reflects its foundational role: De Langefonteijn (The Long Fountain), Brakkefontein (Brackish Fountain), Droogevallei (Dry Valley), Klaarstroom (Clear Stream), and Soebatsfontein (Beg-for-Fountain) are but a few examples (Guelke & Shell, 1992). These names testify to how deeply water shaped not only the ecology but also the identity and memory of place.

A panoramic drawing by Colonel Robert Jacob Gordon (c. 1780) illustrates the spread of settler farms along water sources (Figure 17). Gordon, who spent two decades in service of the Dutch East India Company, documented the shifting landscape with precision - revealing how profoundly the Cape was being reshaped (Robert Jacob Gordon, n.d.).



^Figure 17. Visual comparison between the Helderberg region today and the 18th century. Map from OldMapsOnline, edited by author.

^Figure 18. Historical map of the Sir Lowry's River Catchment Area. Map from OldMapsOnline, edited by author.

Invasive alien tree species

The opportunity to develop the landscape within the catchment area into productive farmland was already explored in the early 1700s. European settlers discovered that the fertile ground was suitable for timber supply, crops, and vines; sheep and cattle could also graze on the extensive areas available (Vergelegen Nature Reserve, 2019). Highlighted in the following diary entry of Colonel Robert Jacob Gordon, some of the new actors introduced into the landscape under Dutch influence can be identified.

Translated excerpt from Gordon's travel diary
11th October 1777

"This district, about four hours in diameter, has eleven farms; some of which are very beautiful. However, there is too much water at the mountain range, which makes it cold in winter. The changes of season come about two weeks later than at Cape Town. It produces wheat, very good fruit and, on some farms, good wine. East and south-east winds blow violently here, but nevertheless, camphor and oak trees flourish greatly north of the Schapenberg at Vergelegen. One could try to make better use of this... In addition, the inhabitants of Hottentots Holland make a living from agriculture, vines, fruit, fishing and by burning lime from limestone which they find on the shore."

The invasive alien species - once regarded as extremely useful and promising, as evidenced by Gordon's proposal to "make better use of this" - alongside the eradication of native vegetation and extensive landscape transformation, remain significant factors contributing to the poor condition of the landscape today. According to Brown and Magoba (2009), the area - particularly along the river - was once well-wooded with native species such as the Wild Almond. As these were rapidly depleted for cooking, construction, and brick burning, the demand for timber grew among farmers, leading to the introduction of the pine tree shortly after Van Riebeeck's arrival (Brown & Magoba, 2009). Other introduced trees still found along the Sir Lowry's Pass River include the long-leaved wattle (*Acacia longifolia*), the black wattle (*Acacia mearnsii*), and the river gum (*Eucalyptus camaldulensis*) (Brown & Magoba, 2009).

The Cinnamomum camphora (*Lauraceae*), commonly known as the camphor tree (English), kanferboom (Afrikaans), and ulosilina (isiZulu), is another invasive species introduced from East Asia (Invasive Species South Africa, n.d.). This tree, in particular, has many uses that remain prominent in South Africa, such as for medicinal purposes, timber, shade, ornamental value, and honey production (Halile, 2024). Similar to this species, many other invasive trees are popular among locals who utilise them for personal needs or commercial profit. Sometimes, they are even regarded as prominent landmarks within the landscape - such as the linear wind barriers formed by rows of Eucalyptus in the Helderberg region. However, these invasive species pose serious threats to water resources and native plant species in South Africa, especially through the loss of riparian biodiversity (Brown & Magoba,

2009).

"Runoff from catchments with dense stands of aliens is about 30% to 80% lower than for uninvaded Fynbos, with the variation due to differences in annual precipitation and the age and density of the alien vegetation stands. During the dry summer months, when water needs are greatest, runoff in invaded catchments may be reduced to zero, converting perennial streams to seasonal ones" (Brown & Magoba, 2009).

According to Rebelo et al. (Fynbos Biome, January 2006), invasive species threaten native species for the following reasons:

- The abundance and diversity of native plants are reduced due to dense stands of alien invasive trees and shrubs.

- The decline of seed banks of native plants stored in the soil, potentially leading to local extinction of native species.

- An increase in biomass, altering litter-fall dynamics and nutrient cycling.

- An increase in biomass and fuel loads, affecting fire regimes, with significant consequences for the ecological integrity of the catchments.

- Disturbance and alteration of native ant communities, which are crucial for seed dispersal of native plants.

Eucalyptus camaldulensis

Common names
Red river gum; Rooibloekom
Origin
Australia
Threat to native biodiversity
Competes and replaces indigenous riverine species.
Significant reduction in stream flow.
Uses
Timber, firewood, wind barriers, and honey.

^Olgache, 2021

***Acacia mearnsii* (Fabaceae)**

Common names
Black wattle; swartwattel
Origin
South-eastern Australia and Tasmania
Threat to native biodiversity
Competes and replaces native grassland and riverine species.
Reduces grazing area for animals due to its density.
Drains water from waterways
Uses
Firewood

^Navie, n.d

Acacia longifolia

Common names
Long-leaved wattle; Langblaarwattel; Port Jackson Willow; Golden Wattle
Origin
South-eastern Australia and Tasmania

^Figure 19-21. Prominent invasive species along the Sir Lowry's Pass River. Photograph by Navie, n.d

Appendix C.

Historical mountain landscape and its wetlands

The position of the rivers and wetlands in present-day Cape Town results from three major geological events spanning millions of years: the merging of the super-continent Pangaea, the formation of Gondwana, and the erosion of the Table Mountain Group Sandstone. This sandstone once covered a much larger area but has eroded over the last 400 million years, eventually forming the Cape Flats region (Brown & Magoba, 2009) (Figure 23). Meadows and Compton (2015) explain the formation of the mountain range as follows:

"During the break-up of Pangaea, erosion gradually removed the overlying rocks to leave Table Mountain and its peninsula mountain chain as isolated erosional remnants of a previously larger Cape Fold Belt."

The dashed lines in the section below illustrate the possible evolution of the mountain landscape and demonstrate how Table Mountain and the Hottentots Holland Berge once shared a continuous layer of earth. The Cape Flats is the remnant of this eroded historical landscape.

The complex layers of earth on which the city stands are identified as follows (Brown & Magoba, 2009; Hartnady & Rogers, 1990):

13 million - 6 thousand years ago: Sandveld Group

130 million years ago: False Bay Dolerites

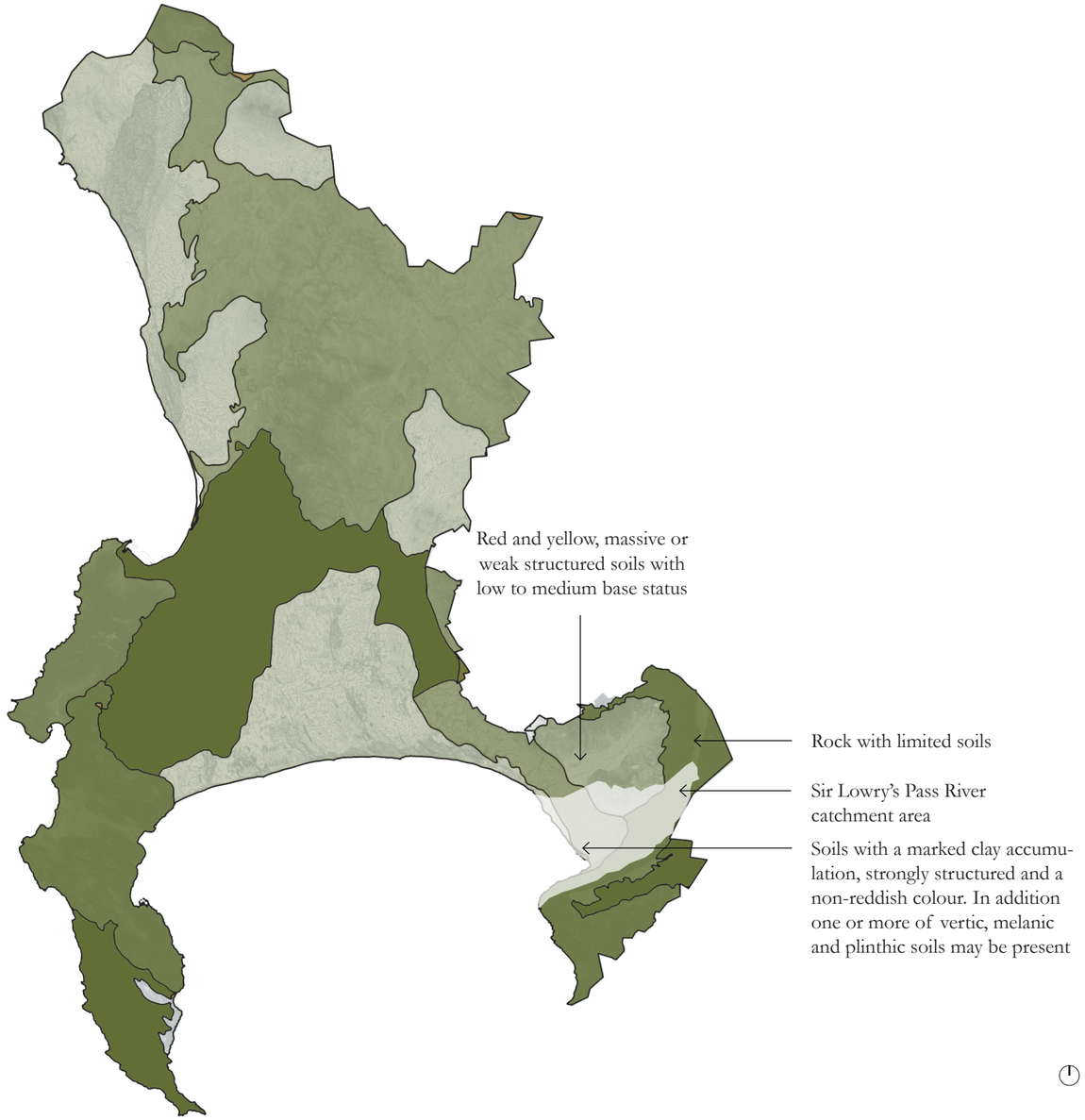
510 - 480 million years ago: Table Mountain Group

520 million years ago: Cape Point Intrusive

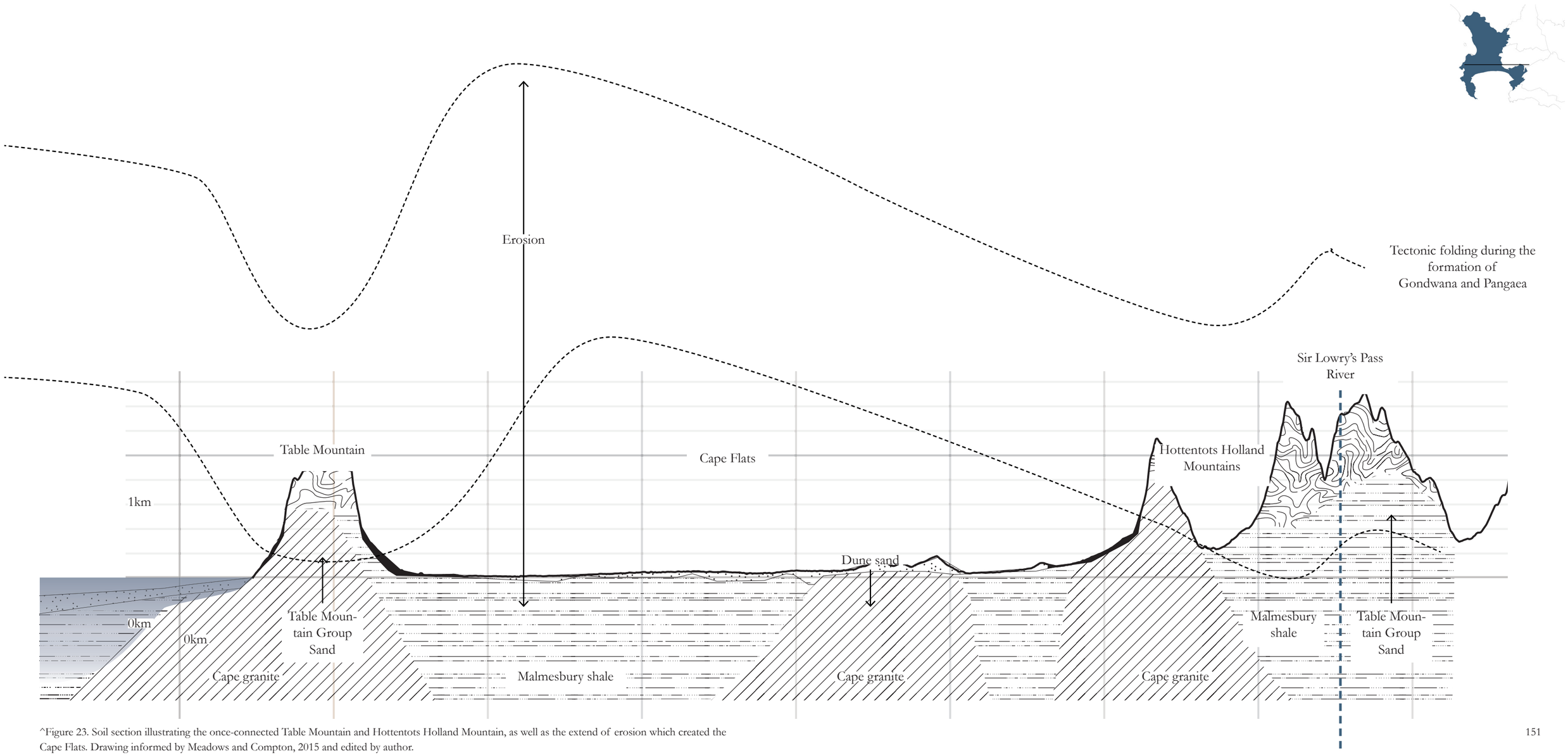
540 million years ago: Cape Granite Suite

560 million years ago: Malmesbury Group

The Malmesbury Group underlies most of the Cape Flats region, as well as the Sir Lowry's Pass River area, and is characterised by soft, fine mud- and sandstones (Meadows & Compton, 2015).



^Figure 22. Soil description of the Sir Lowry's Pass catchment area.



^Figure 23. Soil section illustrating the once-connected Table Mountain and Hottentots Holland Mountain, as well as the extend of erosion which created the Cape Flats. Drawing informed by Meadows and Compton, 2015 and edited by author.

Wetlands

Wetlands once dominated much of Cape Town's land, particularly in the lower Cape Flats, where large areas became seasonally inundated marshes due to rising water tables above the soil surface. Brown and Magoba (2009) note that hundreds of depressions filled during winter months to form a mosaic of land and water. Names such as Swartvlei, Blouvlei, Diepvlei, Moddervlei, Rietvlei, and Tumbleweedvlei reveal their true nature. Unfortunately, these wetlands have been almost entirely eliminated or irreversibly altered due to infilling and drainage for urban and agricultural development (Day, 2023), such as in Khayelitsha on the Cape Flats. Remaining wetlands can still be identified in the project area, but rapid urban expansion threatens their survival.

Rehabilitating Wetlands

Many wetlands in Cape Town have become disconnected from their natural surroundings and severely degraded due to urban and agricultural development, often resulting in permanent loss (Day, 2023). According to aquatic ecologist Dr Liz Day (2023), some wetlands still have potential for rehabilitation, which would improve ecosystem connectivity and habitat quality. Key factors determining rehabilitatability include the potential to improve water quality, the wetland's hydroperiod and topography, connection to groundwater, remaining indigenous vegetation, ease of alien invasive species removal, and links to natural ecosystems. A crucial step is the removal of alien vegetation to enable water table recovery (Day, 2023). Several wetlands within the City of Cape Town - such as Van Blommestein Park wetlands, Moddervlei, and Skilpadsvlei - have already been successfully rehabilitated. These serve as precedent studies to guide potential rehabilitation methods for wetlands in the project location.

Case Study: Paddavlei Ecosystem Wetland (Greenheart, 2017)

- The restoration aims to improve the ecosystem and surrounding environment through:

- Removal of alien invasive species to increase water flow and improve native plant resilience.

- Remedial work to remove pollutants and debris.

- Development of a catchment grid to prevent debris inflow.

- Ensuring protection of the area.

Aquifer (recharge)

Groundwater extraction, as described by the City of Cape Town, involves drilling a borehole deep into the ground, fitting a pump, and drawing water which is then filtered and treated to national water standards (City of Cape Town, n.d.). The City currently utilises three aquifers, with the Cape Flats aquifer nearest the project area. To ensure sustainable use and prevent over-abstraction, the City plans to recharge the Cape Flats aquifer through managed aquifer recharge (City of Cape Town, n.d.).

This recharge process, also known as groundwater replenishment, includes treatment and injection of recycled water into strategic aquifer zones to maintain long-term sustainability (Water Services Association of Australia, n.d.). Methods include riverbank filtration, water spreading, streambed weirs, rainwater harvesting, infiltration ponds, and recharge wells to increase groundwater storage (International Association of Hydrogeologists, n.d.).

Permaculture principles

"Holistic philosophy that aims to create self-sufficient and regenerative systems inspired by natural ecosystems" (Shah, 2019). Permanent agriculture, developed by Mollison and Holmgren in the 1970s, is also known as permanent culture (Manchee, 2023).

Principles:

-Relative location
- Multifunctionality
- Efficient planning
- Biological resources
- Energy cycling
- Stability through diversity
- Edge effects

Zimbabwe Case Study:

Manuals have been written and illustrated to disseminate knowledge on techniques to increase water availability. These techniques are characterised by being low-risk water harvesting and conservation methods, typically aimed at agricultural production. The manuals target resource-poor farmers who depend on locally available materials (Denison et al., 2011). The purpose of researching these methods is to understand their success due to their low-tech nature, which allows users to adapt and apply them according to their specific needs.

Challenges:

- Deforestation
- Low rainwater infiltration
- Fragile soils
- Soil erosion
- Land degradation

Climate:

Semi-arid, dry area with frequent floods and erratic rainfall. Average annual rainfall: 500 mm.

Method:

Capturing water in the soil to nourish crops and trees.

Techniques:

- Low stone walls constructed along contours to slow down and spread stormwater, reinforced by indigenous vegetation.

- Dams situated below these stone walls capture water and allow it to seep slowly into the ground.

- 4 x 2 metre pits are designed to control and store runoff from streets.

- A network of pipes and canals irrigates crops during drought.

- A natural wetland forms at the lowest point of the landscape (Denison et al., 2011).

Sediment accumulates behind the walls and can be repurposed for other uses such as building projects (Lancaster, 2016).

Relevant Terms (Lancaster, 2016):

- Fertility-harvesting earthworks
- Stormwater runoff
- Living sponge
- Sediment deposits
- Check dams
- Drainage swells
- Fruition pits
- Well and hand pump

Appendix D.

City of Cape Town policy frameworks

Response to Biodiversity Degradation: City of Cape Town's Local Biodiversity Strategy and Action Plan

In response to the degradation of native biodiversity, the City of Cape Town has implemented a Local Biodiversity Strategy and Action Plan (LBSAP). This plan aligns with the National Development Plan 2030, which outlines national and provincial policies and legislation for environmental management (City of Cape Town, 2019).

Policies and Strategies for Protecting Riverine and Water Landscapes

The City of Cape Town has adopted several key policies to protect its riverine and water landscapes:

- Floodplain and River Corridor Management Policy (2009)

- Local Biodiversity Strategy and Action Plan (LBSAP)

- Cape Town Spatial Development Framework (SDF)

- Stormwater and Integrated Water Management Policies

- Cape Town Water Strategy: "Our Shared Water Future"

These local policies are supported by national legislation, including:

- National Environmental Management Act (NEMA, 1998)

- National Water Act (1998)

- National Environmental Management: Biodiversity Act (NEMBA, 2004)

- National Environmental Management: Protected Areas Act (NEMPAA, 2003)

Cape Town Water Strategy (February 2020)

Theme: Water and water restrictions
Cause: Droughts and low dam levels

The City of Cape Town is vulnerable to drought, with water resources requiring urgent protection (City of Cape Town, n.d.). The three-year drought caused dam levels to plummet to critical lows, exposing Cape Town's vulnerability to climate change, notably through decreased and unreliable rainfall (Dan Plato, 2018).

In the foreword to the Water Strategy, Executive Mayor Alderman Dan Plato acknowledges the city's commitment to addressing the economic and social marginalisation of its residents, aiming to improve "the daily lived experience of all our people."

Analysis: Cape Town Water Strategy & Sir Lowry's Pass Village

This study explores the Cape Town Water Strategy's values and principles alongside their spatial reflection in the marginalised Sir Lowry's Pass Village. Key themes in the strategy - support for informal settlements, flood risk management, and employment creation - are highly relevant to the project.

The strategy explicitly links water management to deeper issues such as racial segregation, discrimination, crime, poor living conditions, and unemployment.

City of Cape Town Commitments:

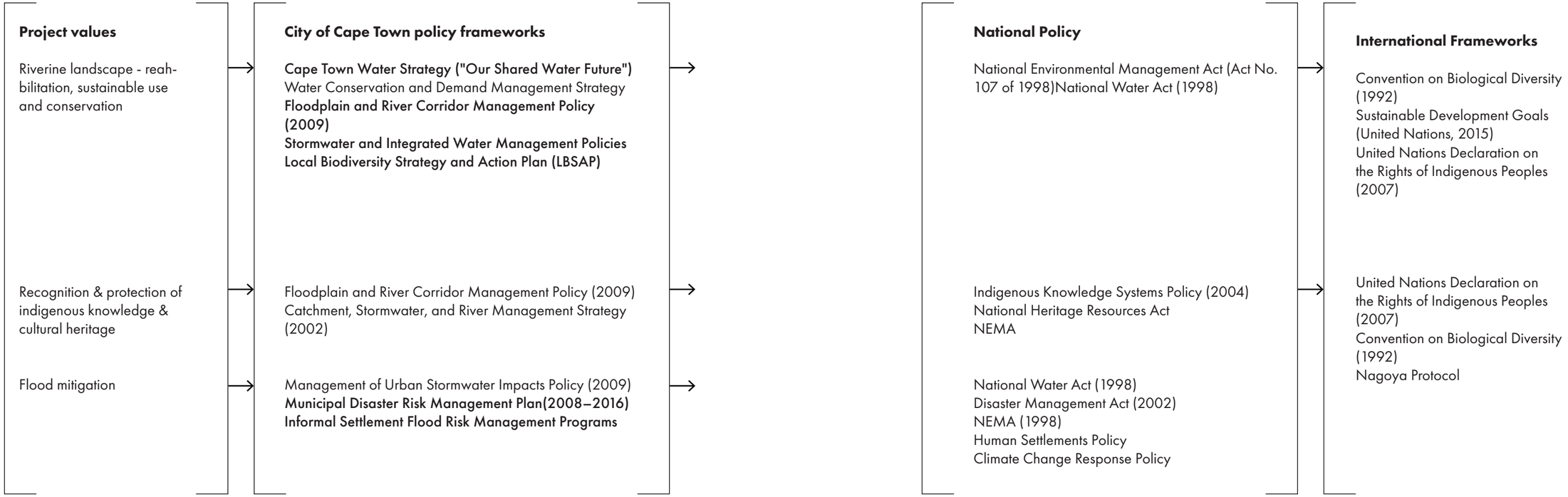
- Safe Access to Water and Sanitation
- Improve daily water and sanitation access experiences.
- Wise use
- Promote water conservation behaviours.
- Sufficient, reliable water
- Ensure a diverse, adaptable, and robust water supply.
- Shared benefits from regional water resources
- Collaborate with stakeholders to balance economic, social, and ecological interests.
- A water-sensitive city
- Develop incentives and mechanisms to transition Cape Town towards a water-sensitive city, addressing flood control, aquifer recharge, water reuse, recreation, and ecological enhancement.

Project Alignment with the Cape Town Water Strategy:

This project is an earnest exploration of landscape-based principles as vital to Cape Town's vision of becoming a water-sensitive city by 2040. Interventions are designed in response to the strategy's guiding principles, including:

- Recognising diverse community values and relationships with water.
- Managing water transparently, inclusively, and equitably.
- Employing landscape architecture tools informed by context and diverse stakeholders.
- Emphasising collaborative and partnership approaches.
- Enhancing water management resilience through flexibility and adaptability.
- Rehabilitating waterways to support flood management, water supply, and recreation.
- Protecting natural environments that filter, store, and transport water, integrating these within the urban fabric.
- Improving surface permeability, reducing pollution, and increasing local water storage.
- Strengthening urban resilience against environmental challenges.

South African and international policies and legal frameworks



Appendix E

Sir Lowry's Pass Flood Mitigation Project

The following excerpts are taken from a progress article on the "R292 million Sir Lowry's Pass River project" (IOL, 2024):

Water and Sanitation MMC Councillor Zahid Badroodien states:

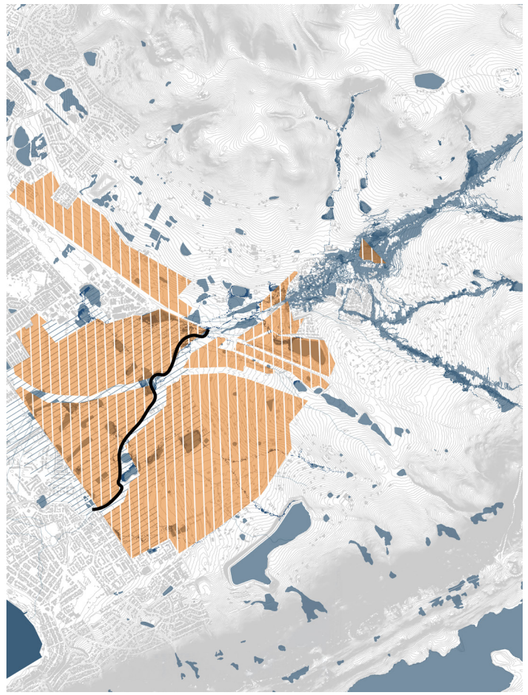
"Because of the kind of mountains that surround the river, the region experiences concentrated downpours for brief periods of time, which leaves the river vulnerable to severe flooding."

The approach taken by the City includes:

"The extensive upgrades include berm construction, grade levelling, and rectification of the Sir Lowry's Pass River's alignment between the N2 in the north and False Bay (Indian Ocean), which will open up land for development and drastically lower the risk of flooding." (IOL, 2024)

The proposed solution is aimed at:

"By upgrading the area, the Gordon's Bay community will be protected from future flooding and significant tracts of undeveloped land will become available for residential development," said Badroodien.



100-year floodline

Current flood mitigation project

Current urban expansion plans for the downstream area surrounding the Sir Lowry's Pass River

Sir Lowry's Pass River and surrounding waterbodies

^Figure 24. The planned area for incremental urban growth within the design location. ^^Figure 25. The city is currently building large flood mitigation infrastructures in order to redirect the Sir Lowry's Pass River.

Appendix F.

Secant by Carl Andre, 1977

"With a line of timbers, Andre expresses the dimension of a field in a way that you would not normally see. He imposes a kind of geometry on the field that makes you not only look at the object but also become acutely aware of the place that it is in" (Godinez, 2014).

The sculpture reminds of the writing The Poetics of Space by French philosopher Gaston Bachelard: Landscape architecture can create spaces in which individuals experience a "being in the presence of immediate immensity" (1964).

^Figure 26. Secant by Carl Andre. Image by Godinez, 2014.

Appendix G.

eerste* river
Stellenbosch

Dr. Pieter Odendaal, 2020

i.
here where the *eerste* river rises at the first waterfall in jonkershoek the water chants
an ode to gravity
the wind-swept mist caresses my face,
algae and grass cascade
like suspended rain down the ridge
here an ecosystem is born
that flows through the valley
coils through stellenbosch
and in macassar ultimately
empties itself into
the ancient source of the sea

up here there is a silence without signal in the sluicing, swift water
that you don't find in town
follow me
turning my back on the waterfall
sauntering with the stream
it's october and the ericas bloom compositely pink in the sun
a trio of hadedas fly past
hear the wind sounding mountain-old stories
weathering them away in the crags

ii.
we forget time and catch our palaeolithic ancestors
strolling beside the river: the hairy man drapes a dead duiker
across his shoulders
his daughter dragging patterns
with her stick in the sand
we flow forth
past the unmarked khoi graves
their spirits seep into the river
the water remembers everything

simon named you *eerste* river
because he obviously saw you first
the people from the *ganga* had to flee inland
gables bloom dismissively white in the morning
a slave is hanged for arson on the *braak***
we flow forth

iii.
once you streamed
the town together like neurons
churned the mills fed the farms
now the farms feed you pesticide

river-dwellers sleep all along the banks
exuberant backyards extend onto the river
the history of dehumanisation reeks of *bergie** shit
cyclists and joggers speed past on either side

now we are properly in town
and the sound of man displaces your song
under the bridge at bosman's crossing
you merge with the plankenburg river
here you can clearly
see the difference in colour
kayamandi's filth and faeces troubles the water
even the unifying waterfall
attests to our unique inequality
we flow forth

iv.
at dusk I lay down my ear on your bank
downstream *bergies* hang their washing
the day's human sounds the cutters the cars
the spades the trains fade
hoor die rivier die rivier was eerste hier
hear the river the river was here first

she carries the stories of generations
our pasts spume over stones
we are always under way
one day we'll return to the sea
to remind the waves of the gravity
that guides all currents into rivers

Translated from the Afrikaans by Frances Strooh and Dr. Odendaal. Footnotes by Dr. Odendaal:

*"Eerste" means "first".

** A historic town square where slaves used to be traded and executed.

***bergie literally means "mountain-person" and is an Afrikaans term widely used to refer to homeless people, especially in the Cape region, often with derogatory undertones.

eerste rivier **- written by South African poet Dr. Pieter Odendaal**

Through his poem eerste rivier, Odendaal reflects on the entangled relationship between spoken word poetry and social-ecological change in South Africa. As he writes, "The study is located within a relational understanding of our embeddedness in the more-than-human world, in recognition of the indelible, interdependent connections that exist between the social and ecological spheres of life" (Odendaal, 2020).

The poem emerged from two Cape Town-based projects: one focused on land conflict in Mangaung (grond), and the other on water memory (What the Water Remembers). Land and water - *grond and water* - remain central to the South African struggle for justice, as symbols of both dispossession and hope. Spatial injustice, as Botha (2020) notes, involves the unequal distribution of socially valued resources, rooted in a long history of segregation and displacement that persists today in the urban challenges of fragmentation, mobility, and marginalisation.

Botha argues that the foundation of spatial justice lies in land governance: the systems and structures that define land rights, land use, and development. In this context, Odendaal's poem becomes both a reflection and a response to the enduring politics of land and water, which remain deeply contested, particularly in light of the recent water crisis (2016–2018) and the unresolved promise of land redistribution.

Odendaal's study thus becomes a poetic inquiry into how South Africans relate to these elemental forces - not only as material resources, but as carriers of memory, struggle, and possibility.

The spoken Afrikaans version can be listened to through the following link:

https://soundcloud.com/user-780961127/eerste-rivier-2

Appendix H.

Fire regimes

Vegetation Type	Minimum fire return intervals per annum	Maxium fire ·eturn interval per annum	Season
Arid mountain Fynbos	10 - 20	50	Jan - Apr
Dune Fynbos	20 - 30	N /A	Jan - Apr
Foothill Fynbos	7 - 15	20	Jan - Apr
Grassy Fynbos	5 -8	15	Jan - Apr
Limestone Fynbos	8 - 20	30	Jan - Apr
Mesic mountain Fynbos (Boland Granite Fynbos)	**7 - 15**	**25**	**Jan - Apr**
Renosterveld	**3 - 10**	**15**	**Jan - Apr**
Sand Fynbos	8 - 20	25	Jan - Apr
Strandveld	N /A		

^Figure 27. Fire regimes of the Fynbos Biome. Table and information by Esler, Pierce & de Villiers, 2024, edited by author.

The following insights are informed by the comprehensive book *Fynbos: Ecology and Management* (Esler, Pierce & de Villiers, 2024).

FTo maintain the biodiversity of the South African Fynbos biome, fire plays an essential ecological role. Regular burning is crucial for the survival and regeneration of many Fynbos species. Without periodic fires, numerous species face the risk of local extinction, as fire helps to stimulate seed germination.

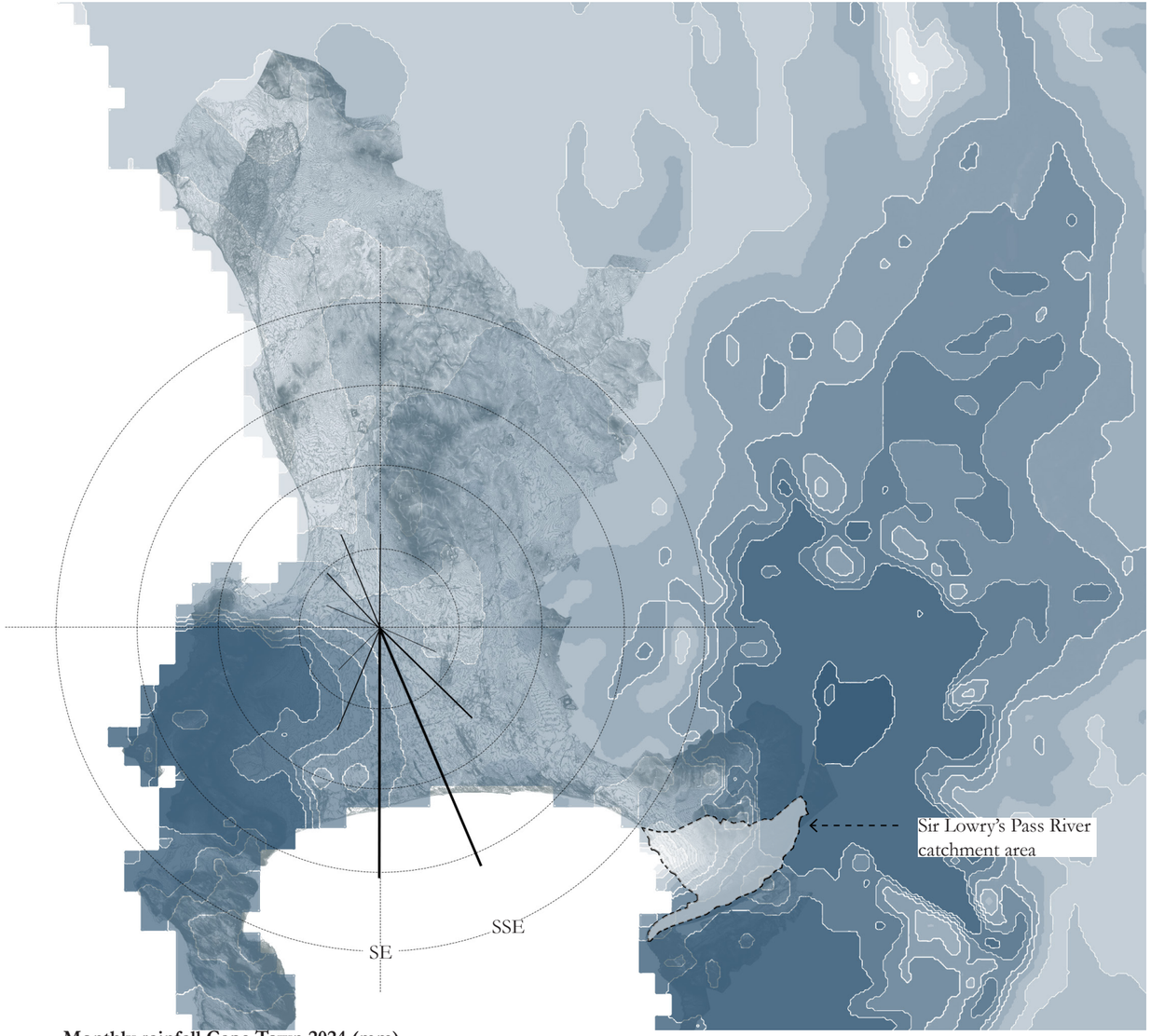
Fynbos and Renosterveld vegetation have evolved various adaptations to survive fire. One key survival strategy is resprouting. Resprouters survive fires by producing new shoots from underground rootstocks, bulbs, or lignotubers. These underground structures are insulated from the heat of fires, allowing the plants to regenerate post-burn. Additionally, some species have thick bark or protective coverings on their stems or branches, which shield dormant buds from fire, enabling them to resprout from surviving tissue.

Other Fynbos species are seeders rather than resprouters. These plants rely on producing large quantities of seeds. After a fire kills the mature plants, these seeds germinate in the fire's aftermath. This post-fire germination is triggered by heat and smoke.

Some species employ a strategy of fire evasion, growing in microhabitats that burn infrequently, such as rocky outcrops or riverbanks. These areas act as natural refuges during fires, allowing these plants to survive periods between burns.

The timing and frequency of fires are critical. Fires that occur too frequently may prevent plants from reaching maturity and producing viable seeds, while very infrequent fires can lead to the dominance of old vegetation, loss of biodiversity, and the decline of fire-dependent species. Thus, fire regimes - meaning the pattern, frequency, and intensity of fires - must be carefully balanced to maintain the health and diversity of the Fynbos biome.

Overall, fire acts as a natural ecological process that promotes regeneration, maintains species diversity, controls invasive species, and sustains the unique character of the South African Fynbos and Renosterveld ecosystems.



Monthly rainfall Cape Town 2024 (mm)

November	December	January	February	March	April	May	June	July	August	September	October
29	16	10	9	19	34	68	124	93	88	50	23

Appendix I.

Climatic influences

Cape Town's climate is classified as Mediterranean-type, characterised by warm, dry summers and mild, wet winters, often accompanied by strong, gusty winds (Brown & Magoba, 2009). Annual rainfall within the boundaries of the City of Cape Town range from 400 to 2000 mm, with the highest precipitation levels recorded upstream of the project area, particularly in the Hottentots Holland Mountains (Figure 27). According to Brown and Magoba (2009), this heightened rainfall is attributed to cold fronts - specifically mid-latitude cyclones - that are channelled through False Bay and forced to ascend the mountainous terrain, resulting in orographic rainfall as moisture is released.

South-Easter wind

The atmospheric conditions significantly influence how individuals read and interpret the Cape Tonian landscapes. Local residents speak of the South-Easter wind with a familiarity akin to that of an old friend, often demonstrating an ability to anticipate atmospheric shifts based on changes in wind speed or the formation and density of clouds in the sky. These perceptual experiences are supported by hydrological observations and meteorological mapping. For instance, as meteorologist Heyneke explains, prior to the arrival of a cold front, a north-westerly wind typically flows perpendicularly over Table Mountain, Palmiet, and the Hottentots Holland Mountains, generating mountain waves. In line with local predictions, the cold front is generally experienced the following day, accompanied by "a strong South Atlantic high-pressure system ridging behind the cold front by the afternoon" (Heyneke, 2023). Over subsequent days, this wind pattern shifts from a north-westerly to a south-easterly direction - known locally as the South-Easter. This wind has become emblematic of Cape Town, playing a distinctive role in shaping both the identity and perception of the Cape Tonian landscape. As Lyster (2017) poignantly observes:

"The wind is intimate... the wind follows you."

An understanding of such climatic rhythms forms part of the environmental knowledge long held by indigenous transhumant pastoralists. So do inhabitants within and around the riverscape experience these atmospheric changes - the flow of the river mirrors both the winter rainfall and the wind patterns, as in the case of the Sir Lowry's Pass area. The high amount of rainfall in the Hottentots Holland Mountains, which lasted several days and was brought along by the cold front, created an unexpected flooding event that the citizens were not prepared for. This project seeks to explore how design can engage with these atmospheric dynamics - making visible the absence of rain or the imminent arrival of flood - by spatialising climatic change as an experiential and interpretive layer within the landscape.

^Figure 28. Rainfall and windrose of Cape Town, illustrating the most prominent climatic conditions which influence the locals understanding of the landscape.

Appendix J.

Calculations for temporary flood basins

(calculations made with the help of ChatGPT, 2025)

Temporary Flood Basin Sizing for Sir Lowry's Pass Village – 2023 Flood Event
Location: Sir Lowry's Pass Village, Helderberg Region, Cape Town
Catchment Area: 7,911.21 ha (79.11 km²)

The calculations estimate the volume of runoff generated during the September 2023 flood event and determines the required number, size, and configuration of temporary flood basins needed to mitigate flooding in the Sir Lowry's Pass River catchment. It incorporates existing dam storage in the area.

Parameters
Catchment Area: 7,911.21 ha = 79,112,100 m²
September Normal Rainfall: 62 mm
September 2023 Rainfall: 124 mm (2× normal)
Runoff Coefficient (assumed average): 0.5

Note: The exact runoff volume presented here is an estimation and should be verified through precise hydrological data, which was not available at the time of this calculation.

1. Runoff Volume Calculation
Runoff Volume
=0.5 × 0.124m × 79,112,100m²
=4,905,563 m³

Assumed Flood Control Design Target: 50% of runoff to be detained

Required Storage
= 0.5 × 4,905,563
= 2,452,782m³

2. Existing Storage Capacity
Total Dam Area: 20 ha = 200,000 m²
Average Depth: 3 m
Storage Volume: 200,000 × 3 = 600,000 m³

Net Storage Required
= 2,452,782 – 600,000
= 1,852,782 m³

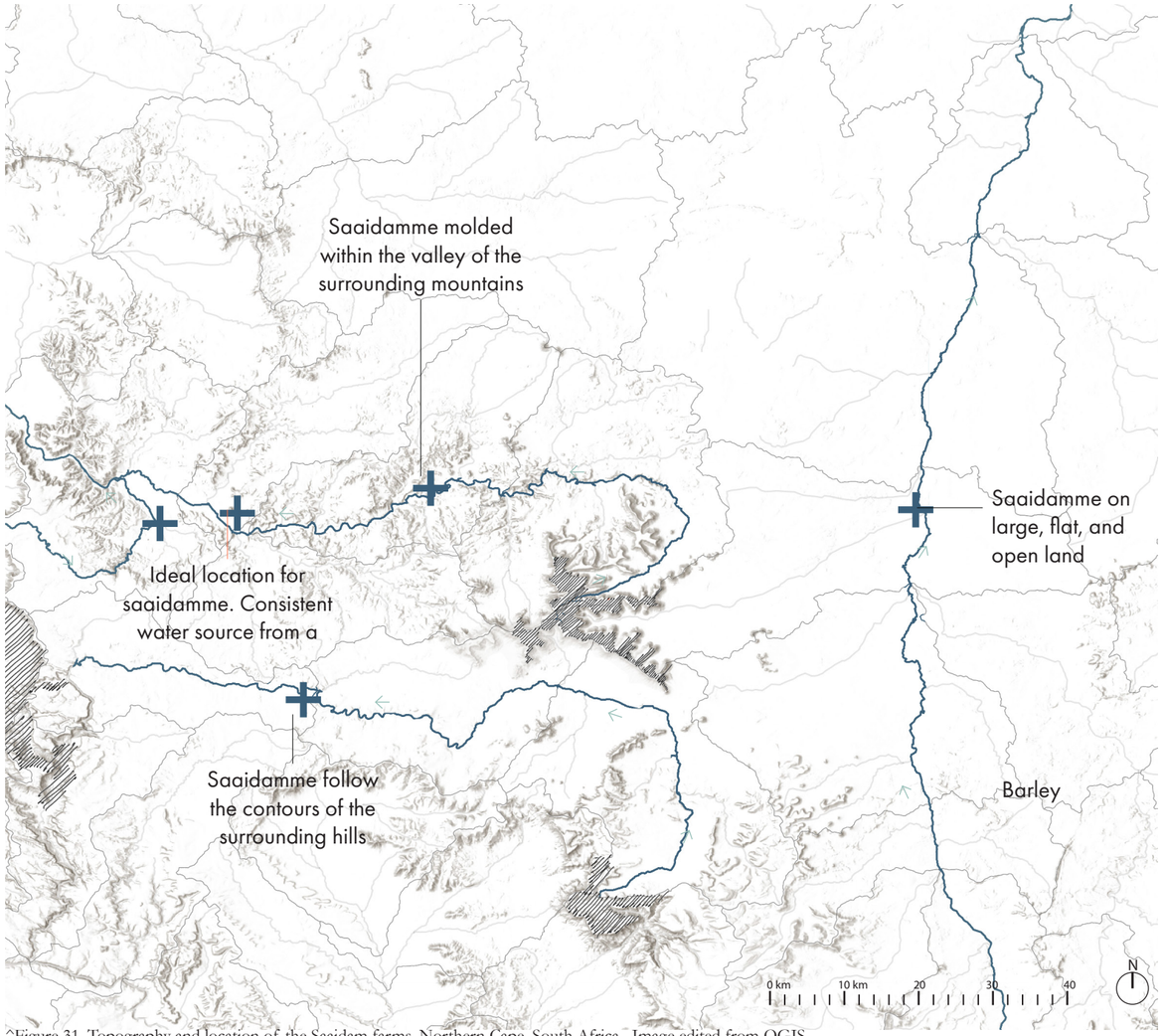
3. Flood Basin Design Assumptions
Basin Dimensions: 150 m × 200 m
Volume (m³): 60,000
Area (ha): 3.0
No. of Basins: 31

Therefore, 1.85 million m³ of storage is needed and about 100ha of basins.

Appendix K.

Site photographs by author, 2025.

^Figure 29-31. Fieldwork images illustrating the condition of the river, water accumulation in the street, and soil degradation within the public in-between spaces.



^Figure 31. Topography and location of the Saaidam farms, Northern Cape, South Africa. Image edited from QGIS.

Appendix L.

Saaidam location, poem, and photographs.

Hantam-Karoo gedig:

Ouma Any van Gannabos bid vir reent

More my Jirre,
Vandag is ou Any vroeg op;
ek sien daar ver agter die berg
kom wys die son sy kop.
Die vlaktes is droog
dit soek water, my Jirre,
die son brand
daar op my draad se klere.

My Jirre, die laaste reent
het vir Any trane gebring,
maar ek het weer opgebou
en my hart het aanhou sing.
Die land bid vir reent,
die boere kry swaar.
Jirre, skud daai hemel
dat die reent neer kan daal!

My Jirre, die son brand
hard op die droe aare,
maar ou Any, my Jirre,
sy maak nie besware.
Sy los die werke van die groot Man
in sy eie hande,
maar ou Any bid saam die boere
vir bietjie water vir hul lande.

Seën ons boere, my Jirre,
en seën hierdie land;
doen U die werk daarbo
en ou Any sal bid aan hierie kant.

^Afrikaans prayer for rain during the drought in 2016. van Wyk, n.d

^Crops grown in the *saaidam* farms

Hantam-Karoo poem:

Granny Any from Gannabos Prays for Rain

Good morning, my Lord,
Today old Any is up early;
I see, far behind the mountain,
the sun peeking its head up.
The plains are dry,
they need water, my Lord,
the sun burns
on the clothes on my line.

My Lord, the last rain
brought Any only tears,
but I rebuilt again,
and my heart kept singing.
The land prays for rain,
the farmers struggle hard.
Lord, shake that heaven
so the rain can fall down!

My Lord, the sun burns
harshly on the dry veins,
but old Any, my Lord,
she raises no complaints.
She leaves the work of the Great Man
in His own hands,
but old Any prays along with the farmers
for a bit of water for their lands.

Bless our farmers, my Lord,
and bless this land;
You do the work up there,
and old Any will keep praying on this end.

^English translation of prayer. van Wyk, n.d, tr. ChatGPT, 2024.

Figure 32. Photograph of a flooded Saaidam basin seperated by a *voor* and a *voorsluis* on the farm Gannabos. Photograph by Nakkie van Wyk, n.d.

^Figure 33. A photograph of a temporarily flooded Saaidam reservoir following the overflow of the nearby river. Photograph by Nakkie van Wyk, n.d.

Appendix M.

River characteristics

Water flowing from the mountains to the sea passes through diverse landscape features and consequently changes along its course. These changes in the river are reflected in the surrounding animals, plants, soil conditions, and even the people. To better understand the riverscape, Cape Town's rivers have been categorised into six zones, which help classify their reaches. The organic matter present - such as algae or leaves - in these zones provides an indication of the surrounding conditions and river communities (Brown & Magoba, 2009). Of course, these conditions have been drastically altered from the rivers' natural states due to agriculture, urban expansion, human impact, and alien invasive species. Brown and Magoba (2009) describe a typical river extent in Cape Town as follows:

Mountain source
Rivers start at their source - clear, sometimes peat-stained, with high oxygen saturation and fast-flowing waters passing through boggy areas with sponge vegetation and humic turf.

Mountain-stream source
Mountain streams flow through narrow, defined channels along steep gradients, with occasional small waterfalls and rapids. The stream may include rock pools, shallow but fast flows over cobbles, boulders, and bedrock, before slowing in natural pools. A closed canopy of riparian trees may obscure the clear, algae-free stream.

Foothill zone
Channels widen and gradients decrease, with slower flow over boulders and cobbles. Riparian tree canopies open where the river widens. Rock pools and stony riffles are common.

Transitional zone
The stream trickles slowly through wetland vegetation, spreading into multiple channels and flowing steadily over cobbles, sand, and bedrock. Dense marginal vegetation lines the banks alongside stony riffles, deep runs, and backwaters.

Lowland zones
Characterised by stony reaches, shallow gradients, and depositional areas. The turbid stream is surrounded by reed beds with only a few trees.

Estuary
Flow is slow, intermittently influenced by tidal fluctuations from a few centimetres to over a metre. Riverbed vegetation is dominated by salt marshes, reeds, and sedges.

Appendix N.

Further reflection.

What is the relation between the graduation project topic, the Landscape Architecture master track, and the MSc Architecture, Urbanism and Building Sciences master programme?

Untold Waters aligns closely with the Landscape Architecture (LA) track and the broader MSc Architecture, Urbanism, and Building Sciences (AUBS) programme through its multiscalar and interdisciplinary investigation into the social, cultural, and economic relationships embedded within ecological patterns, systems, and characteristics. These relationships are explored through spatial concepts and strategies, developed from initial analysis through to final design and narrative. Rooted in the Flowscapes Studio, the project draws from its emphasis on hydrological heritage, knowledge, and methods. It engages with these themes to explore how landscape architecture can reframe the relationship between humans and dynamic water systems - particularly in fragile, urbanised environments such as the informal settlement of Sir Lowry's Pass Village, situated along the Sir Lowry's Pass River in Cape Town, South Africa. The thesis prioritises both ecological concerns related to the state of urban rivers and the complex social dynamics of existing and future informal settlements. Given the urgency of these issues in Cape Town's contemporary urban landscape, the project also identifies the potential to extend its insights to similar riverine conditions across the city and broader South African context.

How did the research influence the design/recommendations and how did the design/recommendations influence the research?

Research and design were deeply intertwined throughout this project. Investigations into local water practices, historical narratives, and ecological systems directly shaped the design strategies, which are intentionally low-tech, hands-on, and grounded in community knowledge and participation. Case studies and interviews informed approaches that value existing practices rather than imposing new ones.

At the same time, the design process - through sketching, modelling, and on-site exploration - revealed new ways of understanding and researching informal landscapes. It challenged how one, as a third-person designer, responds to the ambiguity of such places and the quiet presence of the river. The ongoing act of observing the site, listening to its rhythms, engaging with local residents, and developing spatial responses created a feedback loop that made the work both adaptive and grounded.

The final design reflects this alternative mode of research - one rooted in presence, attunement, and the value of uncertainty. It emphasises the importance of noticing hidden systems, embracing ambiguity, and allowing the landscape to guide both process and outcome.

How do you assess the value of your way of working (your approach, your used methods, used methodology)?

The methodology of this project was deeply informed by the local context and continuously adapted as the landscape gradually revealed itself through research and fieldwork. It drew from a combination of methods, but the most valuable proved to be interviews, photography, and on-site observation - methods that allowed patterns, behaviours, and hidden connections to emerge over time. Drawing, as a methodology, became more than a tool for representation; it acted as a way of holding onto the essence of place, prompting reflection during the act of drawing itself.

Over time, the project's approach evolved into a tapestry woven from both formal and informal strands - balancing factual data with lived reality, intended interventions with actual capacities, the spoken with the unspoken. This required a way of working that valued both structure and vagueness. The methodology, in this way, shaped a deeper understanding of what coexistence between human and non-human might mean. Its strength lies in its flexibility and responsiveness - qualities essential for navigating the complexity of informal, shifting, and ecologically fragile landscapes.

How do you assess the academic and societal value, scope and implication of the graduation project, including ethical aspects?

The thesis offers a reframing of the relationship between informal communities and riverine landscapes as co-living agents in urban design. It challenges conventional, engineered flood mitigation approaches by emphasizing ethics of care, entanglement, and perception - contributing meaningfully to the discourse of landscape architecture.

The project is relevant in the societal challenges experienced in the contemporary City of Cape Town, as it addresses urgent issues such as spatial inequality, informal settlements, and the need for community-driven, site-specific adaptation strategies. Within the context of a climate-vulnerable city like Cape Town, it advocates for alternative water management frameworks that are grounded in local knowledge and responsive to lived realities. Ethically, the work is rooted in reciprocity and responsibility - toward land, people, and the more-than-human. It repositions rivers not as problems to be controlled but as living systems to be listened to and lived with. Importantly, the project recognizes and values the livelihoods of communities like Sir Lowry's Pass Village, which are often overlooked or excluded from formal urban planning processes. It calls for a shift away from top-down, engineered solutions that prioritise formal urban areas, toward flexible, community-based strategies that respond to the needs and conditions of more vulnerable informal landscapes.

How do you assess the value of the transferability of your project results?

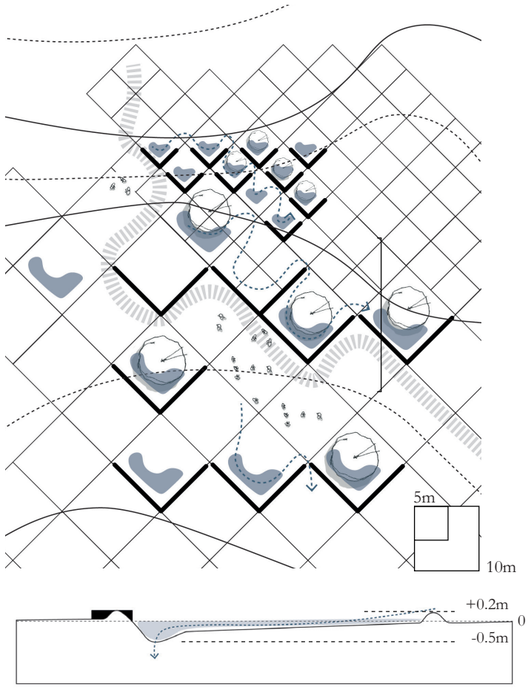
The conceptual framework - centred on coextensive landscapes, hands-on water systems, and care-based design - offers a transferable approach to urban environments grappling with informal development, hydrological stress, and social fragmentation. While the specific interventions in this project are rooted in the cultural, ecological, and spatial conditions of the Sir Lowry's Pass River, the underlying methodology of listening, engaging, and being taught by place holds value across diverse geographies and disciplines. This framework encourages context-specific responses while promoting adaptable, grounded practices in landscape architecture.

Micro-catchment strategies: Toolbox

Diversify water supply through groundwater / aquifer / wetlands

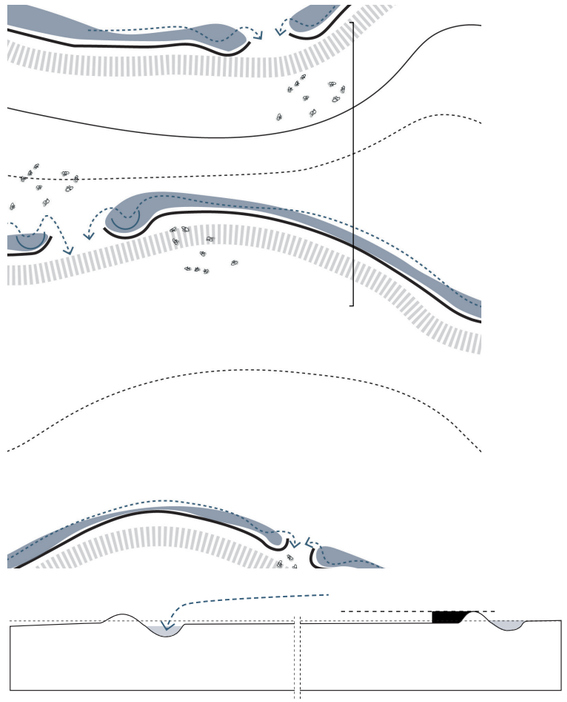
Inspired by
A Manual for the Design and Construction of Water Harvesting-Schemes for Plant Production, Rome, 199, and Percival Alfred Yeomans, Australian inventor known for the Keyline system.

Diamond-shaped microcatchment
Spread rainfall over a larger landscape and recharge groundwater



^Diamond-shaped microcatchment and contour bound earthworks.

Contour bunds
Spread runoff, increase infiltration and capture sedimentation



1. Diversify water supply through groundwater / aquifer / wetlands

Diamond-shaped microcatchment foundation

Spread rainfall over a larger landscape and Recharge groundwater

Conditions & specifications:

Terrain:
Coarse - medium textured soils (Sandy-loam soils)
Slope 0.5 - 5.0%
Infiltration rate of soil ca. 25 mm / hours

Measurements:
Microcatchment size per unit 10m2 - 100m2
Soil depth 1.5 - 2m for root development and water storage
Bund height 25 - 55cm

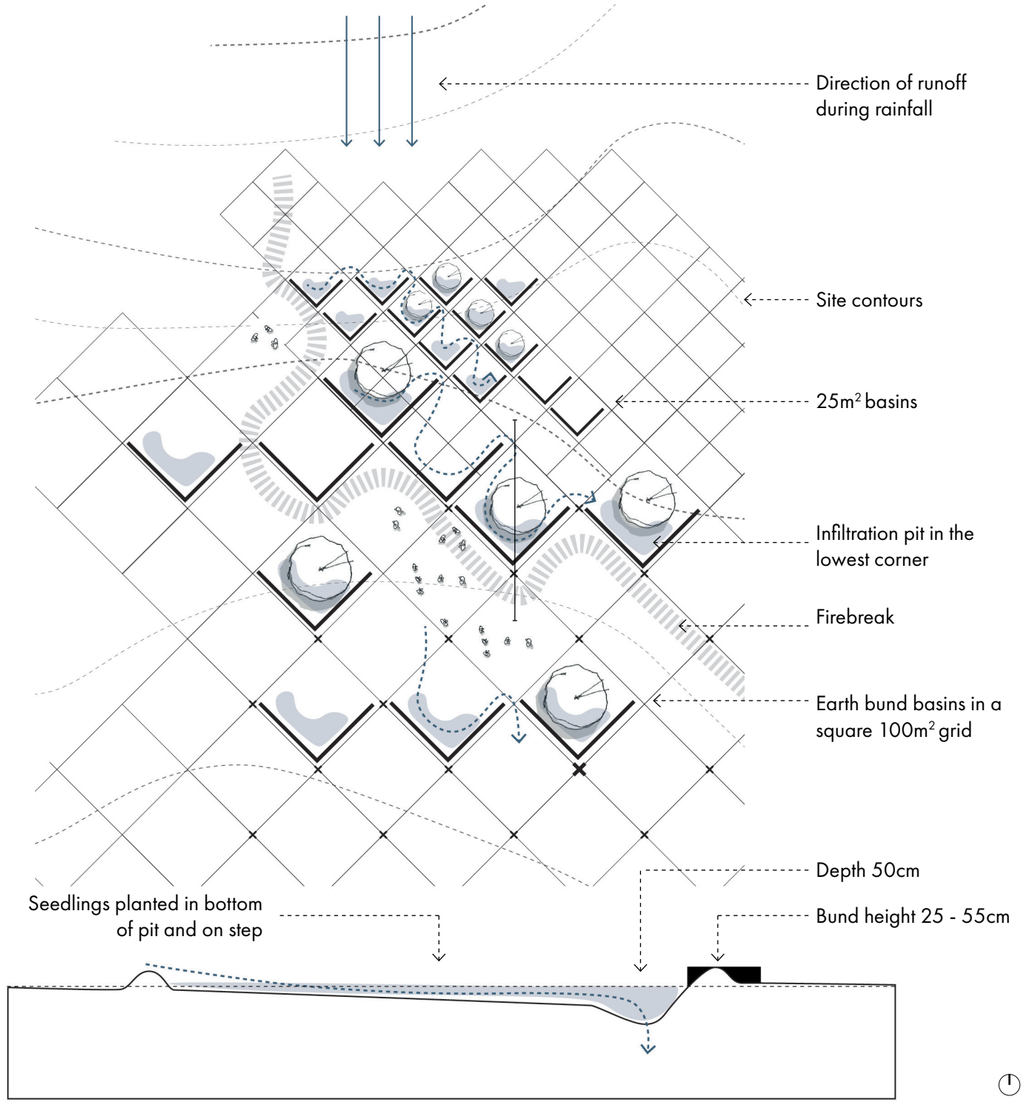
Problematic conditions:
Soil compaction can lead to low infiltration rate
High proportion of clay or poor sandy soil can cause construction of earth bounds to fail

Possible upgrading:

1. Ecological diversity:
Use gradients to plant range of native species
Tree planting in basins

2. Urban place making:
Integrate existing desire lines as walkways, seating or firebreaks
Define plots and urban nodes

3. Economic benefits:
Defined plots for individual markets
Fresh prduce from trees / bushes / Fynbos shrubs
Social node, attracting buyers and tourists



1. Diversify water supply through groundwater / aquifer / wetlands

Contour bunds

Spread runoff, increase infiltration and capture sedimentation

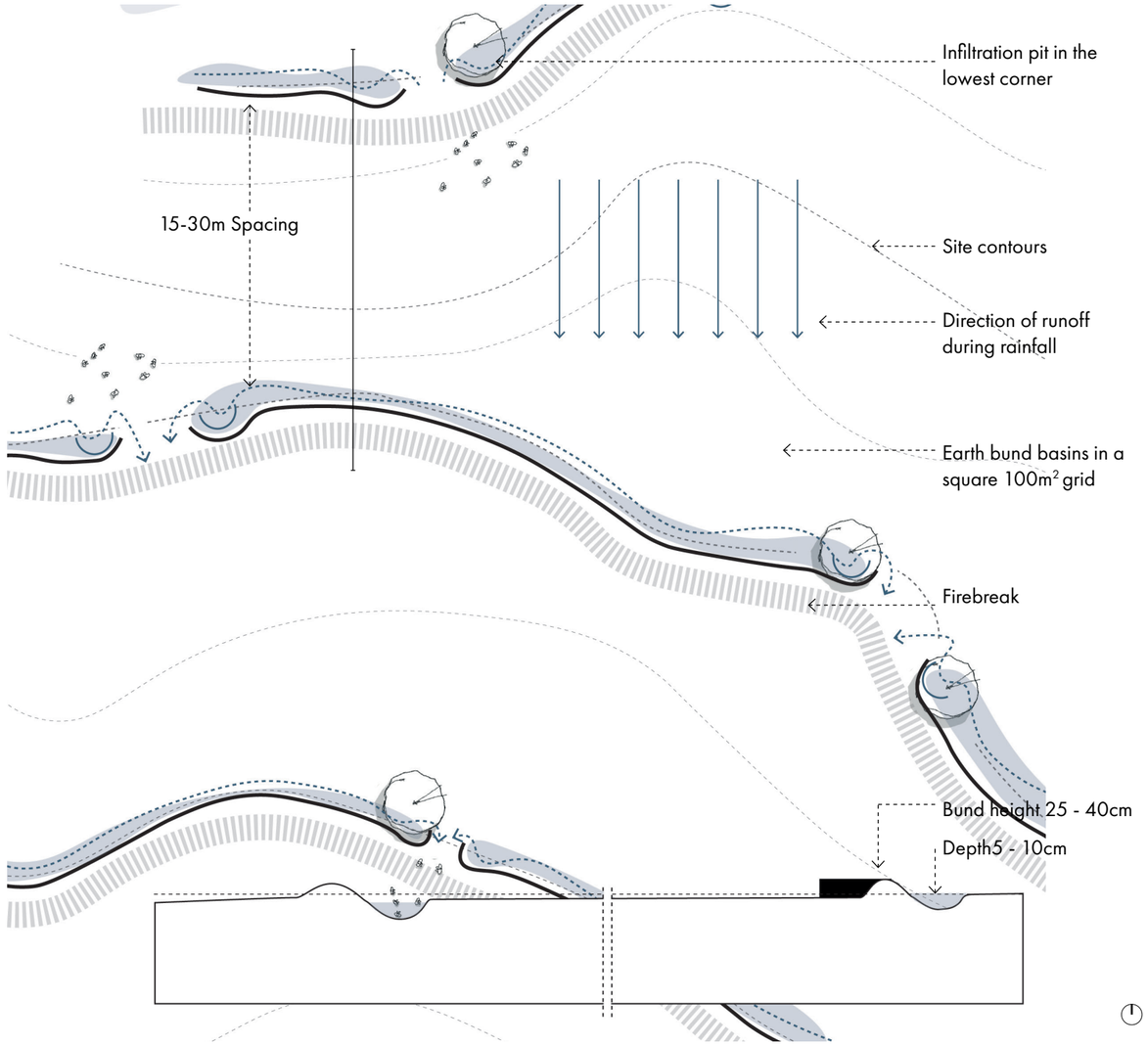
Conditions & specifications:
Terrain:
Slope 2%
Infiltration rate of soil ca. 25 mm / hours

Measurements:
Spacing between bunds 15 - 30m
Bund height 25 - 40cm
Trench depth 5 - 10cm

Possible upgrading:
1. Ecological diversity:
Native species along bunds
Increase growth strengthe of Fynbos
Addition of shallow pits for rehabilitation of degraded soil

2. Urban place making:
Bunds as firebreaks and walkways

3. Economic benefits:
Maintenance employment
Grasses used for woven products
shrubs
Social node, attracting buyers and tourists



1. Diversify water supply through groundwater / aquifer / wetlands

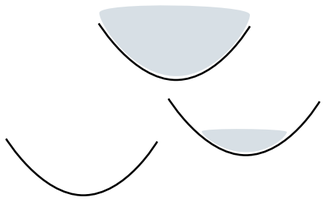
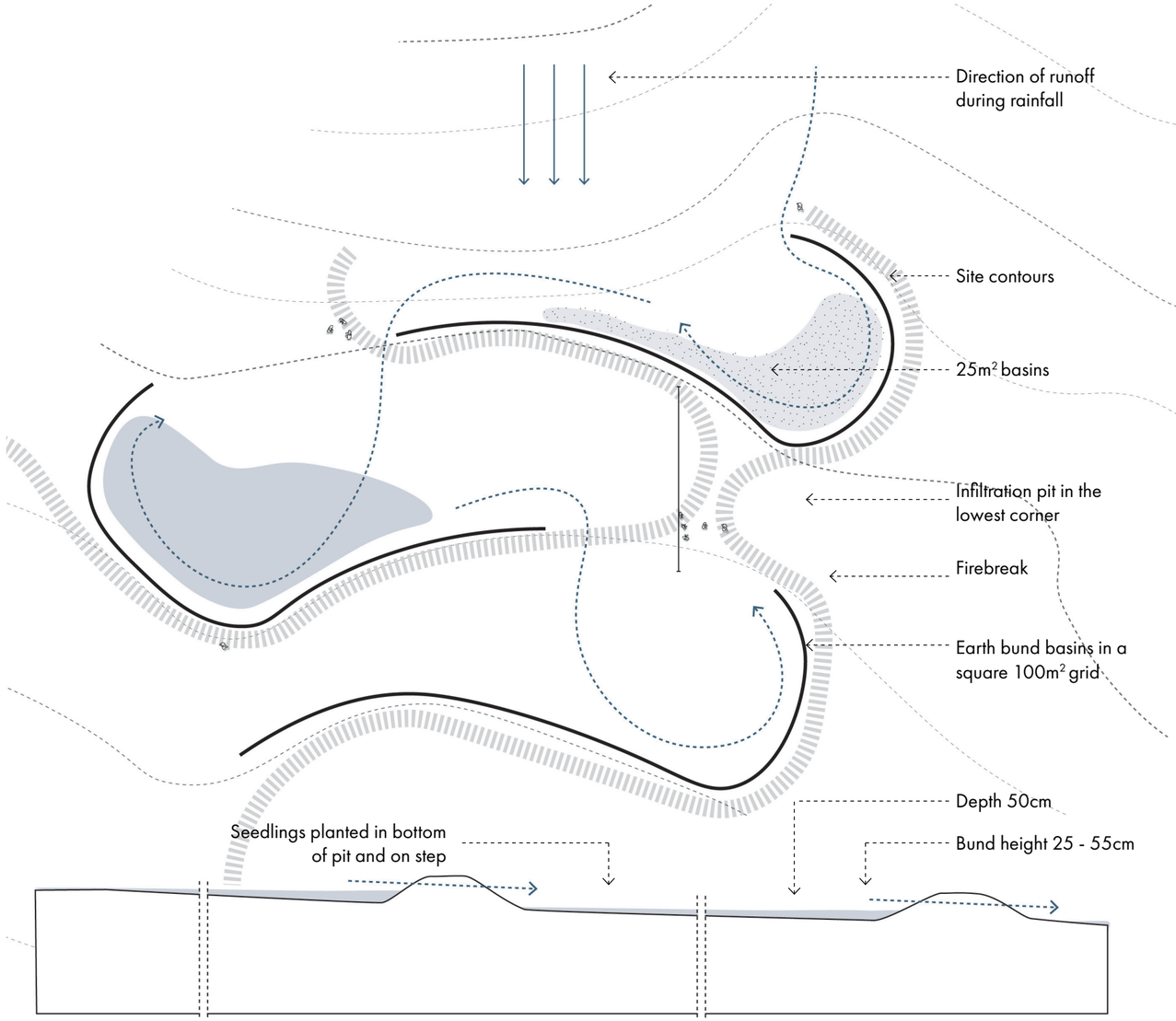
Water spreading bunds

Spread rainfall over a larger landscape and Recharge groundwater

Conditions & specifications:
Terrain:
Floodplain with alluvial soils and low slopes
Even topography

Measurements:
Staggered bunds spaced at circa 50m intervals

Possible upgrading:
1. Ecological diversity:
Use gradients to plant range of native species
Ecological block burning

2. Urban place making:
Park-like integration and multi-functionality of basins during dry periods

3. Economic benefits:
Maintenance and small scale harvesting of Fynbos