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01_

INTRODUCTION

"Whatever goal architecture may have set for itself, it can only be meaningful today if it is making a demonstrable contribution towards the improvement of living conditions and circumstances."

(Mallgrave & Contandriopoulos, 2008:442)

01 | Background

Urban protected areas as defined by the International Union for Conservation of Nature (IUCN) can be classified as natural areas that "...offer experiences in nature to the large numbers of people who live near them; and they build urban constituencies for nature conservation" (Trzyna. 2014: xi) The IUCN further states that urban protected areas are distinctive due to the number of ethnically and economically diverse people they attract, their multi-influential governing structures and are subjected to urban scenarios that more remote protected areas never encounter (Trzyna. 2014: xi).

Areas with significant natural, biodiversity features have scientific, cultural, historical, archaeological interests or in need of long term protection for the maintenance of its biodiversity. In the context of South Africa urban environments¹ are classified as nature reserves (South Africa 2003, s 23). Nature reserves in South Africa tend to hold significant resources that very few urban protected natural areas in urban environments around the world have, making them contextually specific. The ecological and historical significance of these sites are unique to the urban context of South Africa and in need a higher level of protection.

Within the urban context of Pretoria, several areas have been classified as nature reserves. These areas hold many similarities in resources² and are subjected to a range of parallel challenges that are contextually specific to these urban protected areas. Urbanization, lack of awareness, untapped resource consideration and ecological decay are just some of the challenges faced.

The Wonderboom Nature Reserve (WNR) to the north of Pretoria CBD is no different. The reserve forms part of the Magaliesberg mountain range and is maintained by city of Tshwane, department of nature conservation. The reserve occupies roughly 200ha of mostly a ridge topography and has many cultural ties throughout history (City of Tshwane 2015). WNR is most recognized for its "Wonderboom"³ and the recreational spaces it provides for urban dwellers of the Pretoria North residential

areas. The specific challenges faced by this reserve are the ecological decay and eco-system threat of its southern slope, its disconnected environmental connection to the Magaliesberg mountains and the southern urban context, and its multiple untapped resources that are present on site. Another challenge faced is the management of these resources and the lack of awareness of the significance the reserve holds for the surrounding community.

1. Urban protected areas.
2. Refers to Historical and Ecological resources.
3. *Ficus salicifolia*

Fig_05 (Left Top): Fort Wonderboom - Historical resource present on site (Author 2017).

Fig_06 (Bottom Left): Natural water channel flowing through Wonderboom nature reserve (Author 2017).

Fig_07 (Bottom Right): Wonderboom nature reserve from western boundry (Author 2017).



01_2 Problem Statement

Urban protected areas, and in particular nature reserves, in the context of South African cities, are under threat from ecological decay, eco-system depletion and the loss of significance due to the lack of interaction with the urban context. With rapid urban development and the associated lack of interest towards natural enclosed areas due to more thrilling experiences, nature reserves have come under treat from self-decay. This interest lack has forced nature into self-conservation that is not preferred in urban environments. Nature conservation can only be possible by human intervention and interaction (Spear 2017). South African nature reserves furthermore hold cultural and ecological resources that cities can utilize to their advantage in socio-economic development and the conservation funding of these protected areas. With this lack of interest towards nature reserves from urban residents and the cities intervention to address this issues, these natural enclaves are at risk of becoming lost landscapes.



Fig_08 (Above): General Issue Diagram (Author 2017).

Urban Issue

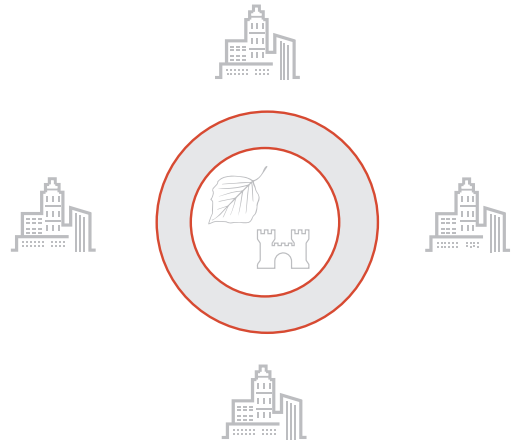
The UN-Habitat World Cities report 2016 show that 54% of the global population resides in urban environments (UN-Habitat 2016; 6). Cities in Africa showed the largest growth in the researched 10-years of UN-Habitat World Cities report. Cities within the Gauteng region of South Africa grew from the 1-5 million brackets to the 5-10 million bracket with the percentage residing in urban areas jumping from 40-60% to 60-80% (UN-Habitat 2016:8). This rise in urbanization and the rate at which urban environments need resources to cater for the growth will put nature reserves at further risk of decay and depletion. If awareness of the significance of these sites and the resources they hold are not escalated or engaged with, these reserves are at risk to be destroyed by neglect or over-exploitation. The concern however is that these reserves will not be protected from urban influences by merely putting up a fence and regulating entry. The urban context needs to interact with the significance of these sites to truly understand the advantages that these enclaves hold.



Fig_09 (Above): Urban Issue Diagram (Author 2017).

Architectural Issue

Architecture has been used to address many challenges in urban environments such as edge redefining, gapping the void or defining space. These issues are faced by nature reserves but are not new to the discipline. However, the challenge of nature conservation in terms of the specific contextual influences faced, such as those faced by the City of Tshwane's nature reserves have not to date been address by architecture. These sites, due to their context are and were subjected to many diverse types of influences and characteristics that poses an opportunity for architecture to intervene and be developed into a solution for the contextual conservation challenge. Can architecture be placed in the in-between space of nature and urban to successfully address both influences and characteristics? Synthesizing the informants to enhance both environments.



Fig_10 (Above): Architectural Issue Diagram (Author 2017).

Nature Reserve Issue

WNR as protected natural urban environment holds its own specific challenges. The consideration of the protected fauna and flora; the heritage elements of site and the critically endangered eco-systems present the challenge of appropriate locations for development. The sensitivity of the site in the harsh urban environment and how it will react to development pose a further challenge. The issue relates to how to develop the site without destroying the current protected environment, taking into consideration the natural flows of water and the flood lines associated and the endangered species to guide the architecture to the correct location for intervention.



Fig_11 (Above): Nature Reserve Issue Diagram (Author 2017).

01_3 Research Questions

Main Question

- How can architecture re-define the in-between space of nature reserve and urban to enhance both environments?
- How does architecture structure itself in role and form between nature reserve and urban?
- How can architecture present the site significance in the current paradigm in relationship to the historical narrative of site?
- Can architecture develop the in-between space of nature reserve and urban without destroying nature reserve or deteriorating surrounding urban conditions?

Sub-questions

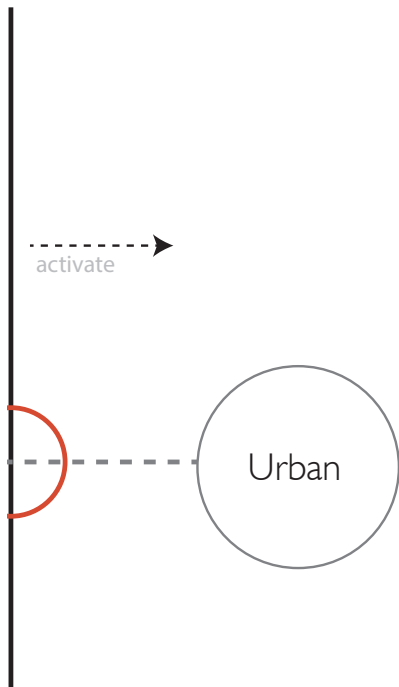
(program, context and theory)

- Can Herman Herzberger's theory of "musée imaginaire" in Homework for more Hospitable Form⁴ be applied to create an architecture that symbolizes the narrative of protection on site?
- How can nature and urban resources be consolidated into form, function and technology to achieve the enhancement of both environments?
- Can the conservation of the WNR be achieved by architectural intervention at the in-between?

01_4 Research Goal and Objectives

The dissertation will investigate if architecture in form, function and technology can aid as catalyst for nature reserve conservation while activating the edge of the nature reserve and enhancing its connection to the urban context. The objectives will include the countering of the ecological and historical resource decay by means of architectural intervention. The dissertation will study the in-between space of urban and nature as site for intervention due to the protected vegetation of nature reserves. Utilizing the resources² of the site and its surrounds as informants to design an architecture that can aid in the challenges as set out by the dissertation. The





dissertation will furthermore aim to add to the architectural discussion of the relationship between man, nature and architecture while testing if a structuring of informants under form, function and technology can be synthesized to develop an architectural intervention. Other investigations will include the consideration of a consolidated resource structuring approach as protector of resources in natural and urban areas and the notion that architecture is more effective when the program is holistic and diverse.

Main Goal

- Structure an architecture in form, function and technology at the in-between of nature reserve and the surrounding urban environment that can enhance both realms. Nature reserve in conservation and urban surrounds in economic opportunity or development.

- Enrich importance of place significance of nature reserve in urban environment.

- Contribute to architecture in addressing the challenge of contextual conservation with an in-between relationship of nature and urban.

Objectives

- To conserve the ecological and historical significance of the WNR.

- To utilize the resources of site to enhance urban surrounds in attraction of interest.

- To add new facilities to WNR that hold meaning and relevance in the current context and paradigm.

4. Refer to Mallgrave & Contandriopoulos (2008).

Fig_12 (Center): Diagrammatic explanation of research questions (Author 2017).

01_5 Locality

Context

The dissertation context is located within the municipality of the City of Tshwane, Gauteng, South Africa. The area of focus will be to the north of Pretoria CBD where the WNR Reserve is situated as part of the Magaliesberg mountain range. The investigation will focus on the surrounding urban environment of Wonderboom, Wonderboom South, Mayville, Mountain View and Florana as well as the the WNR and the Magaliesberg mountain range.

Site

The proposed site for intervention is situated at the south-western edge of the WNR where the reserve borders Lavender Road. The Apies River is situated to the west of the intended site and the WNR's existing entrance is to the east off Lavender Road.



South Africa



Gauteng



City of Tshwane



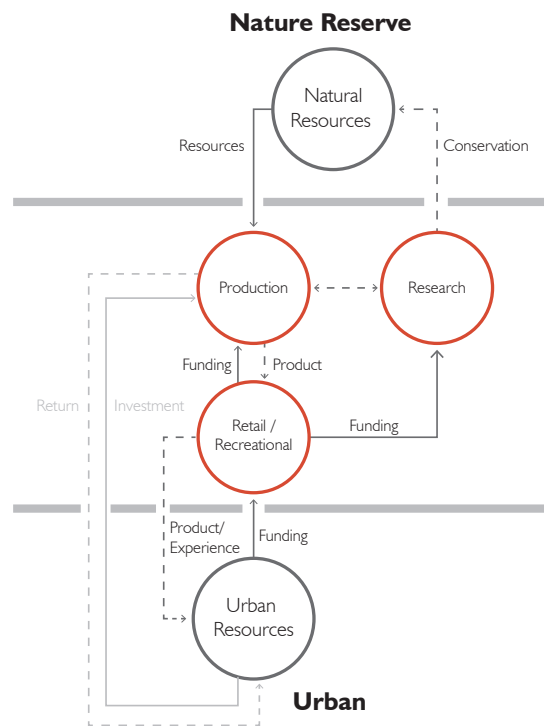
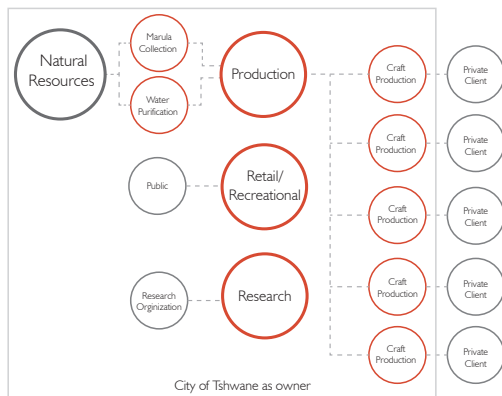
01_6 Program & Client

Program

The proposed program for the architectural intervention is a nature reserve conservation facility that can aid the reserve in revenue generation or other forms of conservation strategies.

Client

The proposed main client will be the City of Tshwane and South African National Parks (SAN Parks) as caretakers of the WNR and possible funders for the project. Other partnerships with private tenants and ecological conservation organizations, such as the Magaliesberg Biosphere & the Magaliesberg Protection Association will also be considered



Fig_13 (Left Top): Locality of context for research proposal (Author 2017).

Fig_14 (Left Bottom): Locality of proposed site (Author 2017).

Fig_15 (Left Top): Diagrammatic explanation of proposed program (Author 2017).

Fig_16 (Left Bottom): Diagrammatic explanation of proposed clients (Author 2017).

01_7 Research Methodology

Chapter 1: Introduction

Stating the context of the dissertation regarding the challenges and issues related to urban protected areas and WNR. Also, outlining the methodology to explain how this dissertation will go about to address these challenges within the continuum of architecture.

Chapter 2.1 Argument

Setting out the argument in terms of the challenges faced and how these challenges will be approached by means of architecture as contextual conservator. Explaining the nature of the landscape and how this poses an issue. Also, explaining the argument in terms of the continuum of architectural thinking. The argument will further be explained in terms of context, theory, function and precedent and will be considered as informants to the design. These informants together with the conceptual consideration will develop into the architecture.

Chapter 2.2 Informant - Context

Investigation into the urban context surrounding the WNR and the relationship to site. Documenting the urban challenges by means of mapping to identify the challenges that are faced by the site and related sites in the urban context of South Africa. Analysing, investigating and presenting an approach to the existing challenges associated with the urban environment in the form of an urban strategic vision. Presenting the urban strategy in context of the WNR as a conceptual representation of possible implementation.

Chapter 2.3 Informant - Theory

Architectural theories will be utilized in terms of literature reviews as bases for structuring function and form to address the challenges presented by the problem statement. This chapter will explain how architectural theories can be utilized to form the formal and functional considerations of the architecture as response to the dissertations problem statement and additional challenges presented.

Chapter 2.4 Informant – Program

The functional considerations as set out by the architectural theory will detail the extended program and functional requirements in terms of visual diagrams to create a brief for the architectural intervention. This chapter will be an extension of the functional requirements as set out in chapter 2.3.

Chapter 2.5 Informant - Precedent

Chapter 2.5 will investigate and analyse existing precedents in terms of form, design influence and function to formulate a deeper understanding of ways to achieve challenges presented. Precedents presented will give a broad view as introduction to the architecture achieved by the company or architect and focus will only be placed on elements of the buildings that relate to the investigation.

Chapter 3 Concept

All investigations, informants, studies and relationships will be incorporated into a design concept to inform the architectural design. The design concept will inform the design development considering all the informants as stated.

Chapter 4 Design Development

The design development chapter will show the process of developing the argument, informants and conceptual scenario into an architectural response to the challenges presented. Showcasing the design development from conceptual stage to final design resolution. This chapter will categorize the design development into milestones that represent considerable changes in the design.

Chapter 5 Technology

The technology chapter will develop and demonstrate the design in terms of the technological aspects related to the response. Displaying the rational elements of the architectural design such as the materials, systems and structural elements. This chapter will show the architectural intervention in terms of the technical elements investigated.

Chapter 6 Conclusion

The dissertation will be concluded in this chapter to summarize the problem statement and how the dissertation addressed these problems. Critically evaluating the outcome in terms of the successfulness of the study and the objectives/goals set out. Stipulating the possible improvements and or other studies that can be considered to improve on the study as presented.

Delimitations

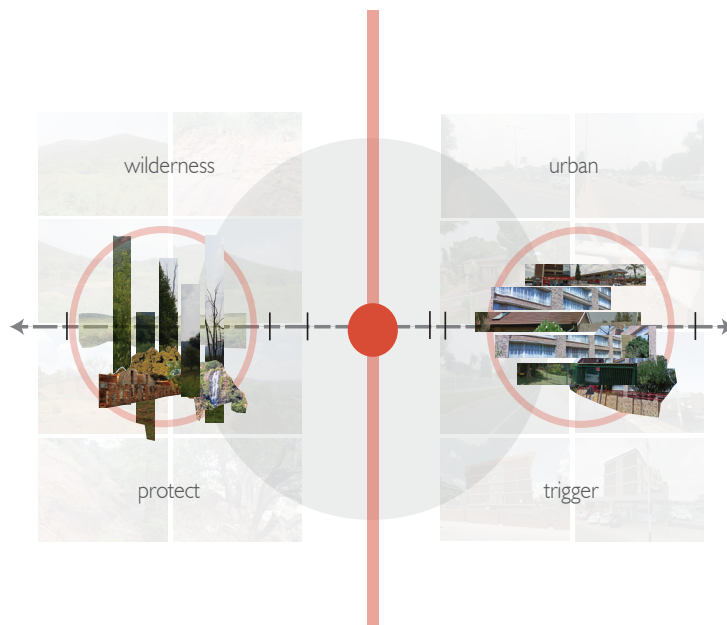
- Due to the size of the WNR the architectural intervention will only be resolved for a segment of the protected area where a part of the reserve boundaries with the urban context.
- The urban masterplan for the WNR and the surrounding context will only be taken to a conceptual stage from where the specific selected site will be developed further.
- The intervention will not consider an in-depth investigation into the specific species of fauna and flora currently on site but will consider environmental and cultural studies previously done in this regard.

Limitations

- The investigation will not extend into the residential or commercial property boundaries due to the ownership and restricted access to these sites.
- The proposed site for intervention will only be on property owned by the City of Tshwane and where areas are shared between commercial owners and the municipality.

Assumptions

- The dissertation will consider the contour maps as provided by the Department of Geography at the University of Pretoria as the correct contours.



Fig_17 (Above): Diagrammatic explanation of intention (Author 2017).