

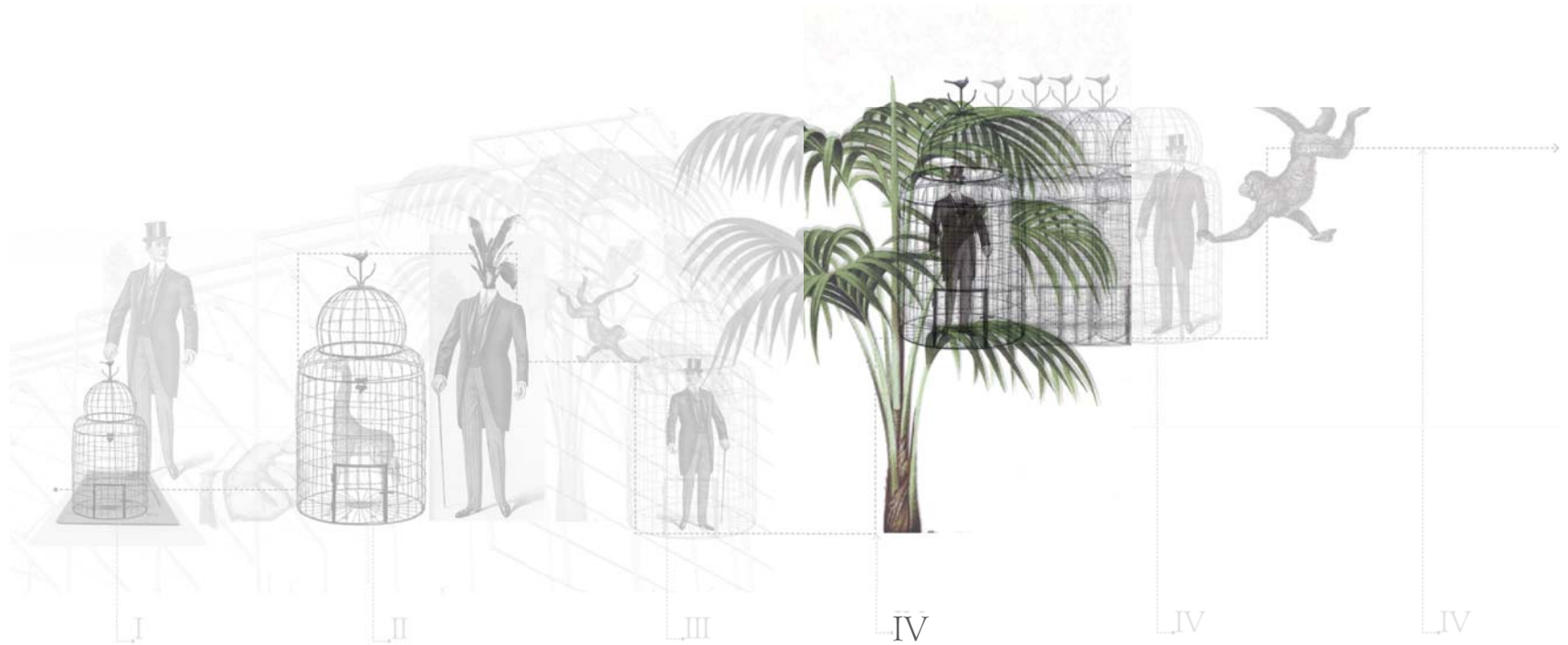


IV_1. "The zoo is the best way to learn the behavior of animals-Myth"
(Norris-Webb 2005)

CHAPTER IV

CONFINED EXPERIENCE

design generators and synthesis: master plan development



Confined experience

CONFINED EXPERIENCE HIGHLIGHTS THE DESIGN GENERATORS AND SUBSTANTIATES THE DECISION-MAKING WITHIN THE THEORETICAL PREMISE AND CONTEXT OF THE DISSERTATION. THE MASTER PLAN WILL RESULT IN THE SPATIAL IMPLICATION OF THE STRATAGEM APPLICATIONS AND PROVIDE A PLATFORM FOR SITE SELECTION OF AN INDIVIDUAL ENCLOSURE FOR SPECIE SELECTED.



Introduction

Wearied animals walking in circles, plastic wrappers flying over paved sidewalks, 'Slush Puppy' stands blocking natural views, plastic snakes, lion soft-toys, chain-link fences and trees made from epoxy resin. Dusty enclosures with steel feeding dishes, rubber tyres hanging from rope and endless lumps of artificial rock walls, followed by plants delegated to the side. Typical municipality-styled landscaping.

The zoo can be identified as a place where a child develops a love for animals and cares for their status in the world. One can almost envision the image of a child filled with fear and excitement upon his first confrontation with the majestic roar of a lion. This image is often clouded by the plastic snakes and dusty enclosures described above.

The author has observed many of these plastic snakes and dusty enclosures in the NZG. Ignorant zoo visitors throw objects at animals to trigger a reaction, and during the last hours of the day before cleaning and particularly on weekends, the site sometimes appears neglected. Some of the enclosures are impoverished and filled with a jumble of artificial objects for animal activity. This defeats the justifications for the enclosure's existence and reverts to the menagerie's base purpose of showing people the shape, size and colour of wild animals. This provokes a negative reaction in animal activists and visitors.

It is, however, perceived that zoos are reliant on these visitors as one of the contributing factors for economic development. An economy that is directly proportional to the required resources and quality of life of the wild animals.

Within the NZG, people circulate the grounds, looking at animals, birds and insects surrounded by a natural backdrop to the north, the urban backdrop to the south, a view to the industrial west and the boundary of Paul Kruger Street to the east.

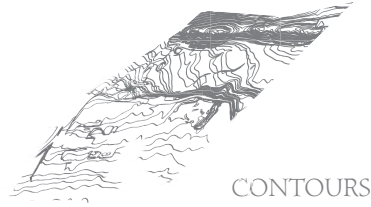
The Apies River runs through the centre of the grounds. This water is, however, very contaminated and does not feed into the enclosures. It is the only part of the Apies River that has not been canalised. This invites opportunity for lucrative habitat for indigenous trees, attracting indigenous birds and insects.



IV_2. Diagrammatic representation of base condition: NZG (Author 2014).

base condition

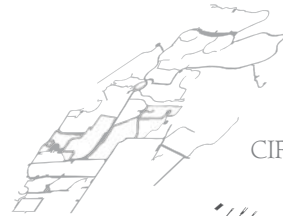
National Zoological Gardens, Pretoria



CONTOURS



APIES RIVER



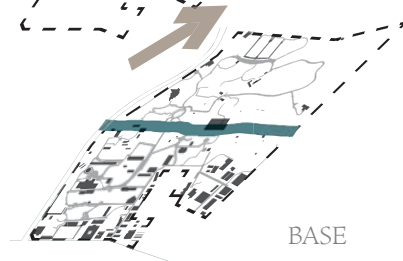
CIRCULATION



ACCOMMODATION



BOUNDARY

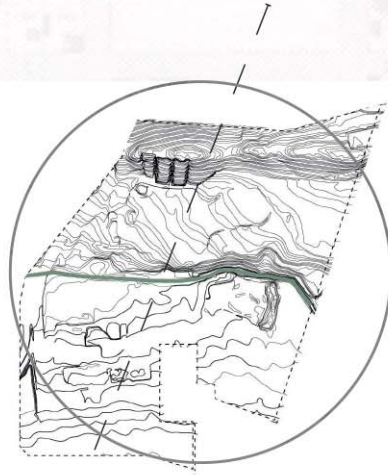


BASE

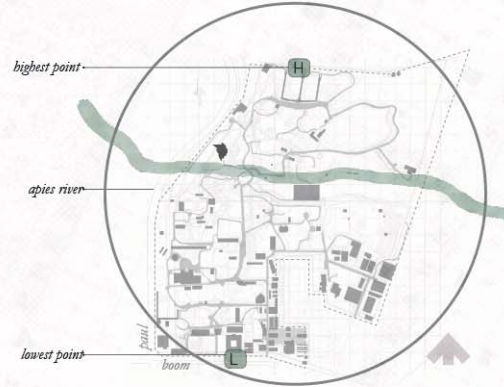
site features

landscape as medium

*IV_3. Existing site component
analysis: NZG (Author 2014)*



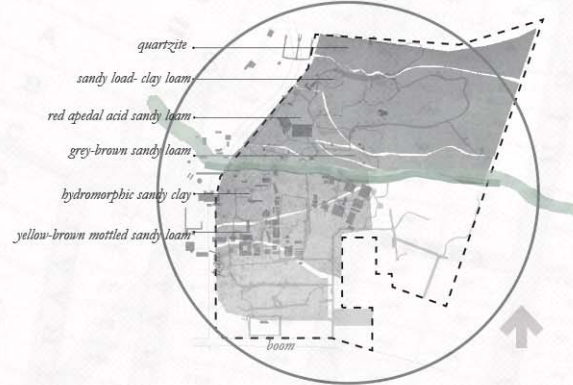
TOPOGRAPHY



HYDROLOGY



CLIMATE



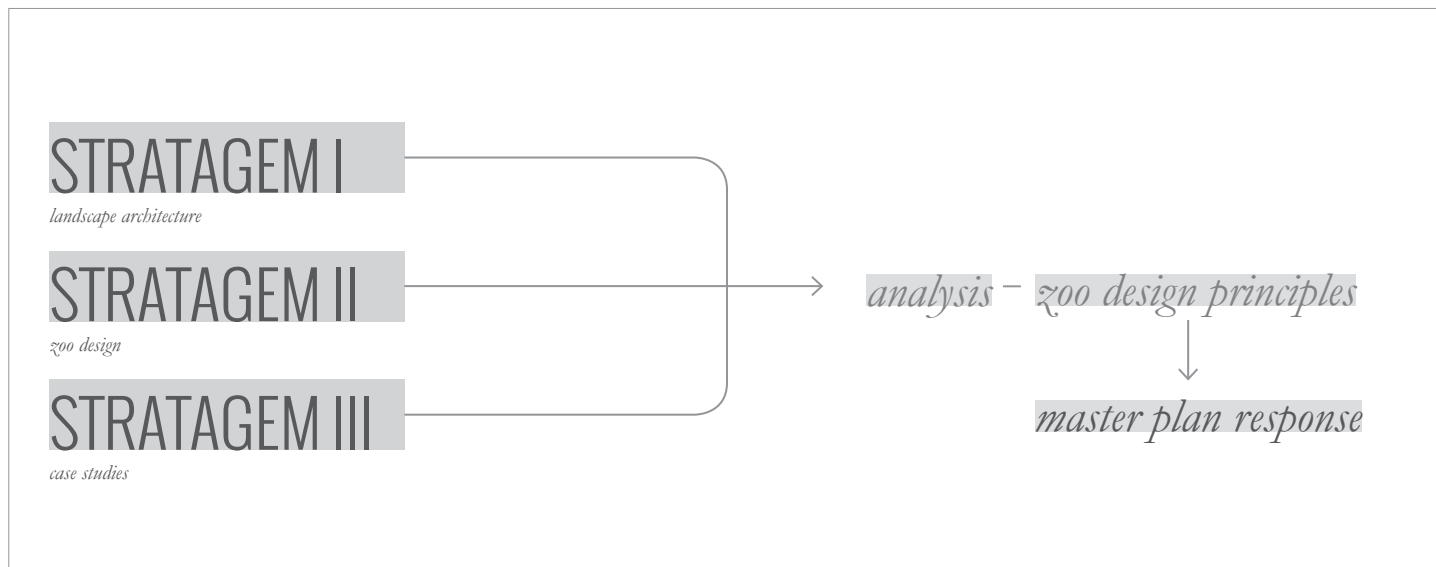
GEOLOGY

IV_4. Site analysis
of topography,
hydrology and climate
(Author 2014).

The NZG are arranged on an eighteenth century model of *Rus in Urbe*: translated as an illusion of countryside created by a building or garden within a city. The NZG make use of focal points in the form of landmarks, such as the Sammy Marks fountain, the historical lion enclosures, the cable car and the other animals. Many enclosures are still built on the old zoo model, while most of the *Unzoo* and other contemporary zoo design principles have not been applied. It therefore has room for improvement in terms of the quality of life of the animals, as well as the experiential quality for the visitors. The question to readdress for the twenty-first century zoo typology is a universal question; a rethinking of this zoological garden could be the starting point.

A design approach was established to inform decisions for master plan development. These guidelines are based on the three stratagem from Chapter II. Theoretical issues general to the discipline of landscape architecture, theoretical issues specific to zoological garden design and relevant case studies relating to zoo enclosures were addressed. Through the analyses of these three strategies, a conceptual master plan response and zoo design principles can be determined.

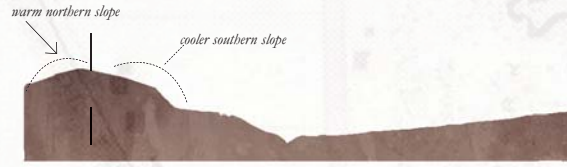
The principles will aim to inform the process of dealing with the current zoo typologies and organisation of enclosures within the NZG. Moreover, the threshold condition between man and animal within the context of the zoo can be readdressed. The new design principles will focus on the interconnectedness within natural systems and the interdependence of the exhibited animal's habitat. The design principles will lead to new standards of awareness of animals' needs, the recognition of the impossibility to replicate certain eco-systems and satisfy the needs of many traditional zoo species.



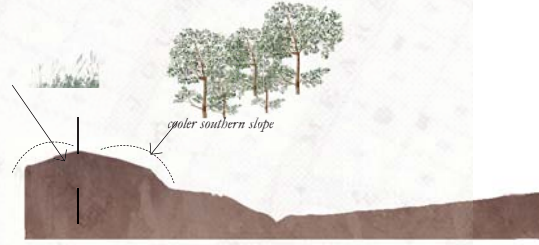
IV.5. Stratagem application for master plan response (Author 2014).



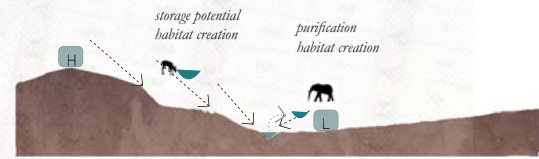
TOPOGRAPHY



CLIMATE



HYDROLOGY



IV_6. Site analysis and implications of topography, hydrology and climate (Author 2014).

4.2 *Zoo design principles*

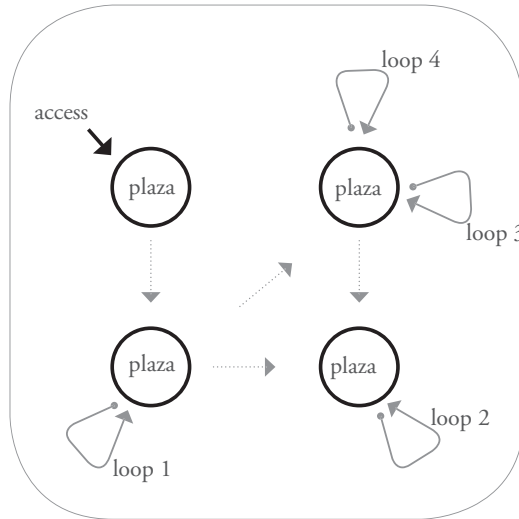
4.2.1 *Stratagem I: Sustaining beauty*

As described in Chapter III, landscape architecture is more than designed ecosystems, strategies and open-ended processes, as McHarg (1995) instructed. Landscapes provide experience that can lead to a new awareness of the rhythms and cycles generated by nature. Landscapes provide new forms, spaces and sequences, whilst preserving the memory of previous experiences and conceptions of the created space. Through the experience and the processing of the landscape, a new awareness and empathy for species and habitats around us will develop.

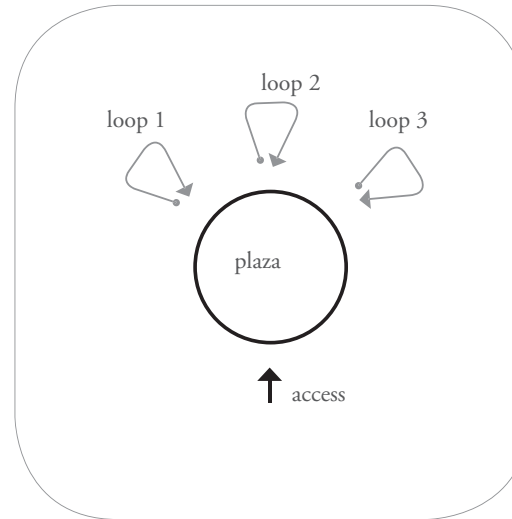
The five steps selected from Meyer's (2008) manifesto can be implemented to form part of the new design principles model within the context of the NZG in the following manner:

4.3.0.1 *Beyond ecological performance*

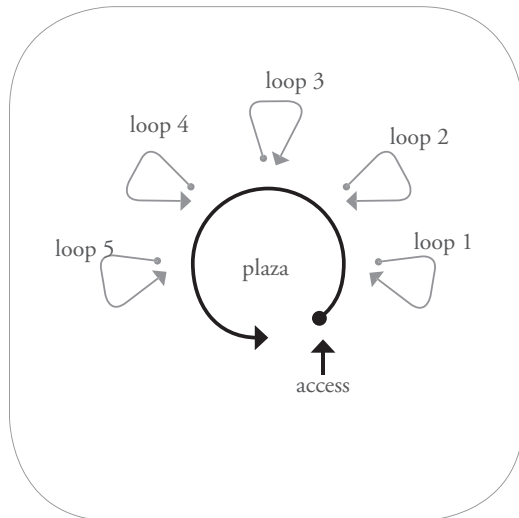
The design must acknowledge the qualities of the social and cultural aspects of the site. The proposed enclosure must perform well ecologically. However, if this is the only objective, the design will lack the human dimension that lies at the core of designing a zoo in the first place, and will obscure the essence and character of the zoological gardens. The design process must therefore incorporate a broader range of factors beyond the ecology as design generators. To achieve this, the design process must intersect the natural cycles, such as cleaning and filtering of water, with the recreational elements and spatial practices of the visitor. The natural landscape must imbue the visitors in the landscape as they encounter the animals on display. The result will be an update of the landscape immersion concept described in zoo theory. The updated immersion exhibit will serve the purpose to attract attention, increase curiosity, and thereby encourage intellectual involvement, eventually creating a memorable image in the mind of the observer.



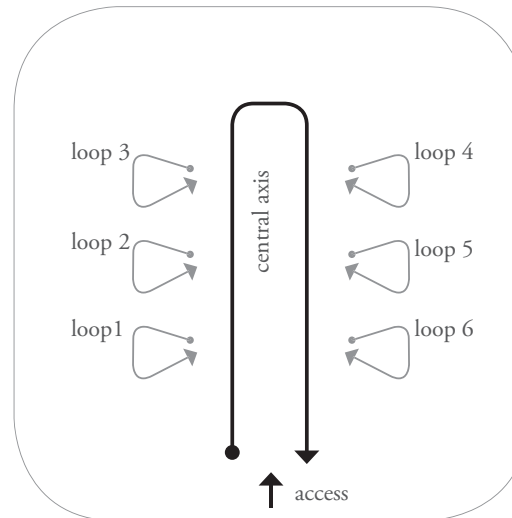
IV.7. Circulation strategies: Without Hierarchy - not efficient and quite often is an unpleasant experience. It is easy to be disoriented, one can become lost, and one can, as a result, miss many worthwhile animal exhibits (Author 2014, adapted from Harrison 2007).



IV.8. Circulation strategies: With Hierarchy, multiple loops- he visitors can select the zones they wish to visit and the sequence of visitation depending on the time and energy (Author 2014, adapted from Harrison 2007).



IV.9. Circulation strategies: With Hierarchy, central main loop- this is typical for zoos that have an icon in the middle, such as a lake or a heritage structure, or a space that provides a traditional activity (Author 2014, adapted from Harrison 2007).



IV.10. Circulation strategies: With Hierarchy, central axis- allows for greater dispersion of visitors into the various exhibit zones (Author 2014, adapted from Harrison 2007).

4.2.1.0.1 *Visitor experience*

Enclosures must do more than just display animals. They should aim to satisfy the aesthetic, educational, experiential, intellectual and emotional needs of zoo visitors. Zoo visitors have a tendency to spend a short time at exhibits, anticipating a greater experience from one enclosure to the next. By considering the approach to the exhibit, and the sequence of preceding experiences, the design is able to build a high level of anticipation.

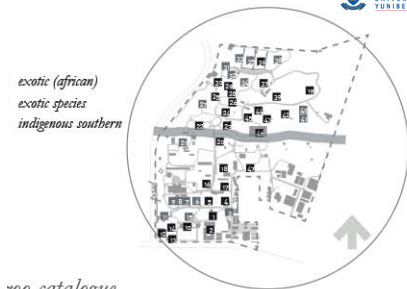
4.2.1.0.2 *Circulation*

Circulation is a key element in visitor experience. It must therefore be planned to maximise the zoo experience and provide structure for the coherent story. The central axis system as illustrated in Figure IV_10 on page 138, will help with orientation and relaxation to work against fatigue due to lengthy zoo loops (Harrison 2007).

4.3.0.2 *Natural process vs natural form*

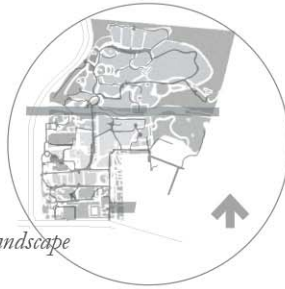
Meyer (2008) instructs the designer to replicate the natural process rather than the natural form. This principle can be applied in the enclosure design, considering the objective to replicate a certain habitat for certain species. A habitat is made up of certain natural elements, such as a stream or rocky outcrop of grassland.

When implementing these principles, the process of generating and replicating these elements must take priority over the actual form and appearance of these elements. The designer must consider the space available in the zoo grounds. To simulate actual grassland habitat based on form and appearance will be impossible. But the natural processes necessary to generate and sustain life within a grassland habitat may provide an alternative solution. In order to design and reflect the animals' natural habitat as closely as possible to the quality of the original, the natural processes must form the foundation of the design, before the insinuated image.



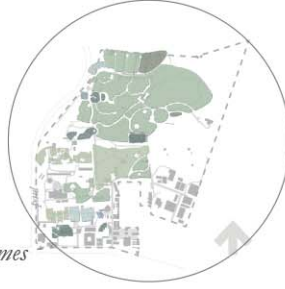
zoo catalogue

- intenance ●
- intenance ●
- intenance ●
- intenance ●



vs natural landscape

- woodland ●
- semi-desert ●
- outcrops ●
- marshland ●
- aquatic ●



enclosure biomes



functions and services

1. cape vulture, white backed vulture
2. demoiselle crane, red crowned crane, blue crane, wattled crane, egyptian goose
3. chimpanzee
4. cape fur seal
5. greater flamingo
6. caribbean flamingo, chilean flamingo
7. axis deer
8. mhorr gazelle
9. scimitar-horned oryx
10. southern ground hornbill, green-winged hornbill, blyth's hornbill
11. orange-winged amazon, brown necked parrot, african grey parrot, red-sided eclectus parrot
12. leopard, lion tailed macaque, patas monkey, baboon, hamadryas baboon
13. reptile park
14. penguin
15. lemur
16. african elephant
17. giraffe
18. black rhino
19. cheetah
20. african buffalo
21. farmyard
22. hippopotamus
23. wild dog
24. blue duiker
25. owl
26. hog deer
27. kangaroo, emu, koala bear
28. gorilla
29. okapi
30. seal
31. kodiak bear
32. nubian ibex
33. siberian tiger
34. okapi
35. siberian tiger
36. african lion
37. blesbok
38. mountain goat
39. white rhino
40. red river hog
41. bongo
42. dazie
43. zebra
44. ostrich
45. kudu
46. hyena
47. waldtrapp ibis, sacred ibis, yellow headed conjure, sun conjure, little corella, goliath heron, great white pelican

- 1 zoo entrance
- 2 parking
- 3 old museum
- 4 offices
- 5 conservation centre
- 6 aquarium and reptile park
- 7 restaurant
- 8 armifora house exhibition
- 9 entertainment hall
- 10 braai shelter
- 11 farm shop
- 12 cable car ground station
- 13 cable car upper station
- 14 restaurant 2
- 15 animal hospital
- 16 animal feed
- 17 storage
- 18 nursery
- 19 waste disposal

IV_11. Analysis of existing enclosures on site: catalogue, biomes and functions (Author 2014).

4.3.0.5 *The performance of beauty*

Beauty, as defined by Meyer (2008), in the landscape can influence our psyche. This principle must focus on a design experience with sensory and haptic quality that can reconnect the zoo visitor with the animal and its habitat. It has the potential to restore and refocus our views of wild animals and the wild. The beauty will be unveiled in the design through a process of discovery, as described by Danto (1999:192-193): “. . . seeing and touching, smelling and hearing, between reason and the senses, between what is known through past experiences and what is expected in the here and now”. Materiality is therefore an important consideration in order to build landscape experience in subtle and unique ways.

The visitors rely on all their senses for the opportunity to identify with the animal. Hence the need for active comparative identification can be exploited in conveying conservation and cultural messages. The design approach therefore requires innovative ways for the visitor to interact with the animal and its environment. Eye-level sight develops a sense of respect, and different strata of interaction, such as _____ in turn enhance the experience of the user, as well as the animal. It develops an understanding of the animal and its habitat.

According to Dry and Joubert (1991), the viewers must be encouraged to experience the zoo beyond the mere level of reacting to physical sensations. They must be enticed to interact at a perceptual level, where storing mental images are formed through the processing and organisation of all the sensations that they experience. The goal is thus to produce an intellectual reaction that can reinforce and contribute to the visitors' total learning experience.

4.3.0.6 *Dynamic beauty*

The dynamic beauty design principle focuses on observation and manipulation of the landscape as a temporal medium. Landscape architecture's medium is material and tactile; it is spatial. The user will circulate through the enclosure, while the landscape moves, changes, grows and declines as a designed ecosystem. These changes are multiple and overlapping, operating at different scales and rhythms. The temporal landscape is based on moments of spontaneous successional vegetation growth, the tidal rhythms of water ebbing and flowing next to smooth, constant, gently sloped grass mounds, or the seasonal changes of temperature and plant growth. The designed animal enclosure must reveal, enable and regenerate ecological processes in order to become temporal and dynamic.



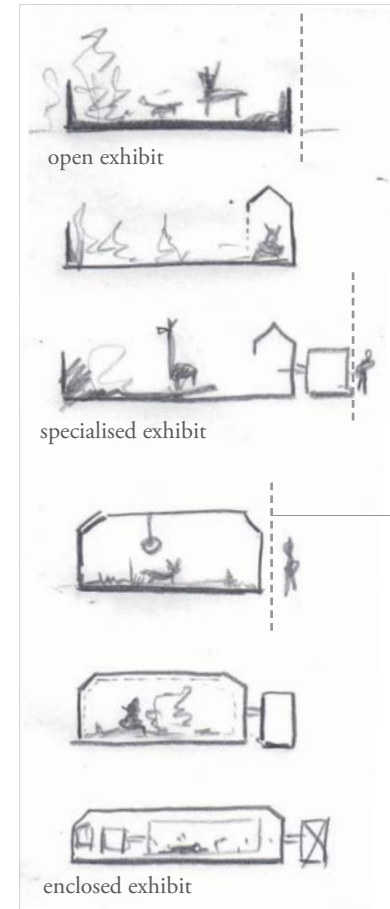
*IV_12. Barrier
analysis in the
NZG (Author
2014)*

4.1.1 *Stratagem II & III*

This study further identified one component from the zoological theory strategy and another from the case study analysis to form part of the new design principle model. The elements include: *The Unzoo revisited* and the *Biozone Proposal*.

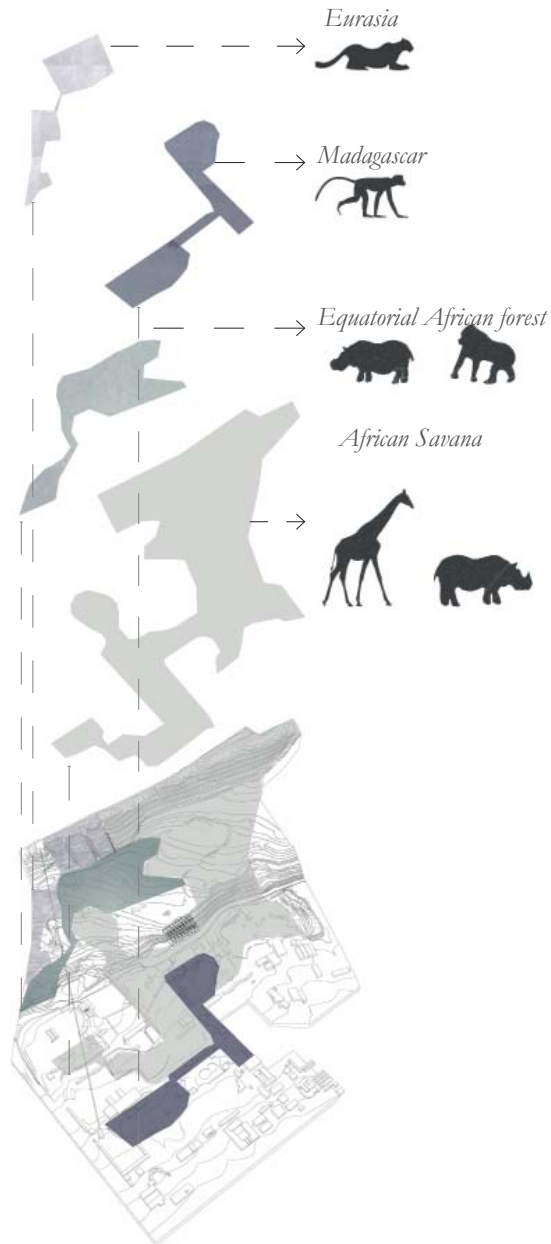
4.3.0.7 *Unzoo revisited*

The *Unzoo* model would be the most applicable for animal species well-adapted to local climate and vegetation. New attention must be afforded to smaller species that do well in captivity. Free access shelters could extend the possibility of displaying a wide range of animals with minimum containment, maximum choice and self-determination without coercion. The zoo should therefore focus on display and conservation of animals from native biomes. The principle will place emphasis on providing memorable encounters with native species, making them as entertaining as the better-known exotic animals. As the *Unzoo philosophy* emphasises, the principle will further aim to implement a sense of no barriers between visitors, the animals and the landscape. The barriers must therefore be eliminated in-between the enclosures where animals have been grouped together and visitors are in turn immersed in the landscape through means of skywalks and boardwalks. Natural scenes can also be employed as barriers, such as fallen trees, earth slippages, streams, mud-banks and wetlands.



confined experience

IV_13. Barrier analysis in the NZG of the confined experience (Author 2014)





IV_15. Proposed savannab biozone vision (Author 2014)



IV_16. Photographic presentation of existing primate cages at the NZG (Author 2014)

4.3.0.8 *Mixed species exhibition*

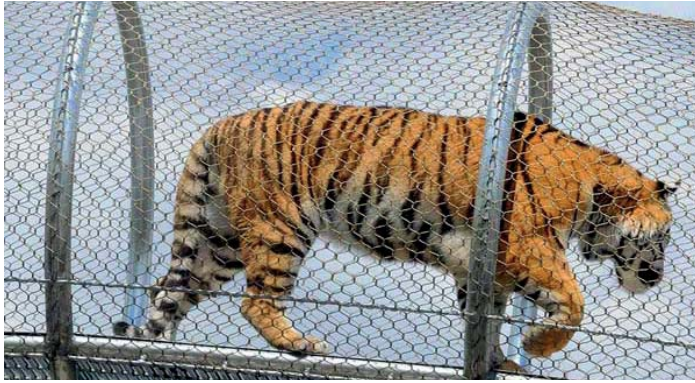
Mixed species exhibits form part of the *Unzoo philosophy*. Mixed species exhibits can be developed by the addition of new species to pre-existing enclosures and by incorporating smaller enclosures into larger areas.

Mixed species exhibits offer educational, entertainment and experiential value over comparable mono-specific mammalian exhibits (Veasey & Hammer, 2010). Zoo studies have shown considerable interspecific play between primates, carnivores and ungulates in mixed species enclosures (Freeman & Alcock, 1973). Chosen species can exploit different resources within the enclosure; thus, there is the potential to increase the stocking density without compromising animal welfare or resource usage. According to Veasey and Hammer (2010), combining arboreal and terrestrial species reduces the likelihood of negative interspecific interaction, ensuring that visitors can always observe an occupied enclosure, and offers considerable interpretive possibilities and experience.

4.3.0.9 *Biozone Proposal:*

Each biozone is characterised by its topography, fauna and flora, as well as the specific features of the different ecosystems it comprises. A mosaic of landscapes will therefore recreate natural environments through the elimination/concealing of barriers and the immersion of visitors through the enclosures.

The landscape will shape as a result of process design implementation, as mentioned in principle 2, and not through the mere replication of natural shape or artificial landscape elements. The landscape must shape as a result of sophisticated, meticulous design in which every shape and colour has been considered. Vegetation, soil types, positioning of rocks, hydrology, waterfalls, shelters and troughs will be designed accordingly to create the illusion of intended biome, while offering optimal views of the animals.



*IV_17. Zoo 360 at
philadelphia Zoo. big
cat crossing and primate
crossing (philadelphiapzoo.
org 2014)*

4.3.0.10 *Connecting the zoo*

The *Biozone Proposal* will, however, in essence still create barriers between the enclosures itself. The threshold between the *biozones* can be bridged with the *Zoo360* concept. The *Zoo360* concept has been implemented in the Philadelphia Zoo and currently consists of three trails: Treetop Trail, Great Ape Trail and the Big Cat Crossing. The trails link existing animal habitats so that animals with similar habitat requirements can use one another's spaces in a time-sharing system and take advantage of more room to roam. The trails are constructed of flexible stainless steel mesh elevated as a passageway through the treetops and over the visitor ways. The implementation of a treetop trail will provide monkeys and lemurs the opportunity to travel long distances and move high in the trees, exposing them to a wide variety of new and changing visual stimuli. Different species from the different biomes can 'timeshare' the system at different times of the day (www.philadelphiazoo.org, 2014).



IV_18. Johannesburg zoo Gibbon enclosure (Author 2014).



IV_19. Johannesburg zoo Madagascar primate enclosures (Author 2014).

4.1.2 *Local case study:*

Johannesburg Zoo

The Johannesburg Zoo forms part of the local case studies conducted. The zoo is situated in the northern suburbs of Johannesburg, Gauteng. The Johannesburg Zoo houses over 320 species of animals, totalling approximately 2000 animals. It is much smaller than the NZG, occupying only 55 hectares of land. The author's main objective with this case study visit was to compare the monkey cages and the visitors' experience of these specific cages.

As part of its efforts to build specific geographic zones for its inhabitants, the Johannesburg Zoo implemented new Madagascar enclosures filled with its natural foliage and housing animals that are endemic to the island.

The newly renovated enclosures were initially designed for and inhabited by brown bears and Asiatic black bears. According to Van der Spuy (2013), the bears had been relocated as part of the new geographic zoning of the entire zoo.

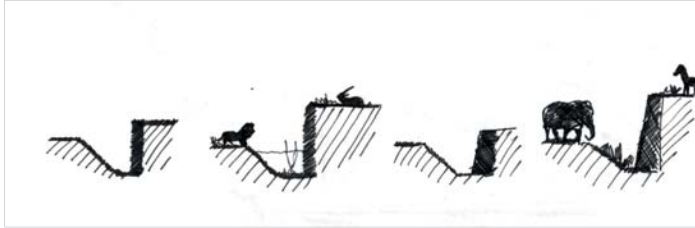
The Madagascan enclosures are encircled by plants, mostly palms, ornamental grasses and philodendrons, as well as shrubs from the Madagascan tropical rainforests. These plant species are used to accommodate the animals in the enclosure because of their tropical forest natural habitat (www.joburg.org.za, 2014).

The gibbons and lemur species in the NZG are held in significantly smaller enclosures with hardly any natural vegetation. Gibbons live in the upper story of forests and hardly descend to the ground. Their long limbs are adapted for a particular suspensory form of locomotion known as "brachiation, in which they swing from branch to branch" (Petter & Desbordes, 2013).

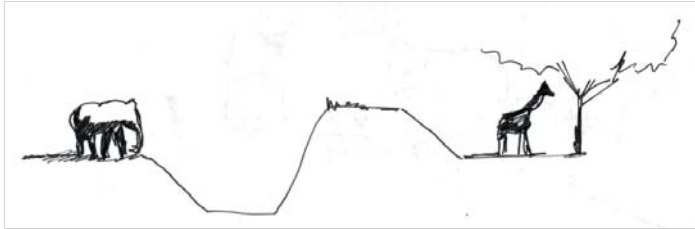
It is evident that the NZG did not apply the AAC theory with the gibbon enclosure (see Figure IV_29 on page 158). The Johannesburg Zoo precedent, however, succeeded in supplying these species with a sufficient life history volume for 'brachiation' to occur.



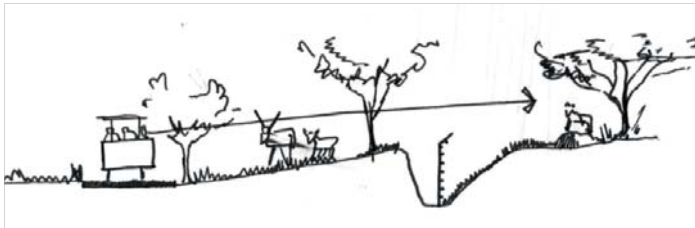
IV_20. Ecosystem creation: Animals attracted vs confined (Author 2014)



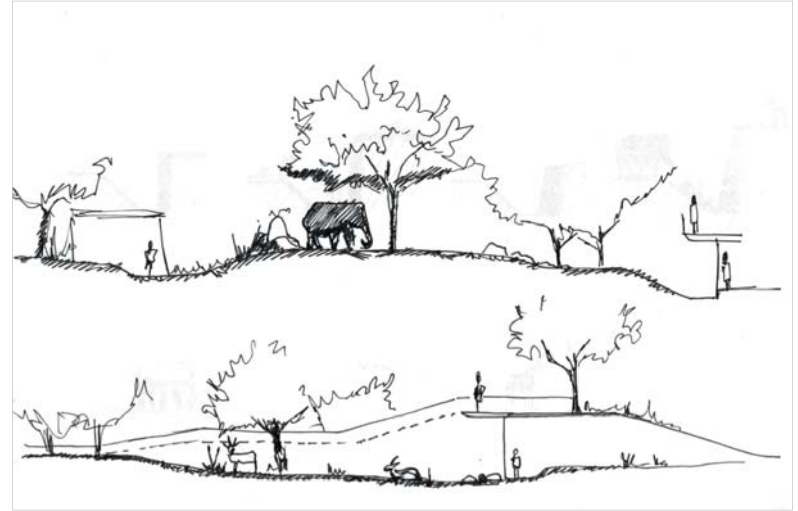
IV_23. Deep fence exploration (Author 2014).



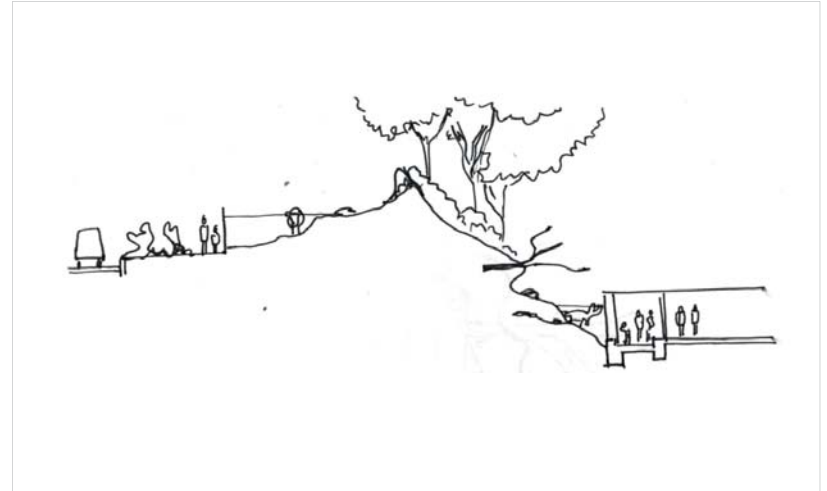
IV_24. Mixed specie exhibition (Author 2014).



IV_25. Safari rides (Author 2014).



IV_21. Hidden barriers, landscape immersion (Author 2014).



IV_22. Use existing topography as design driver (Author 2014).

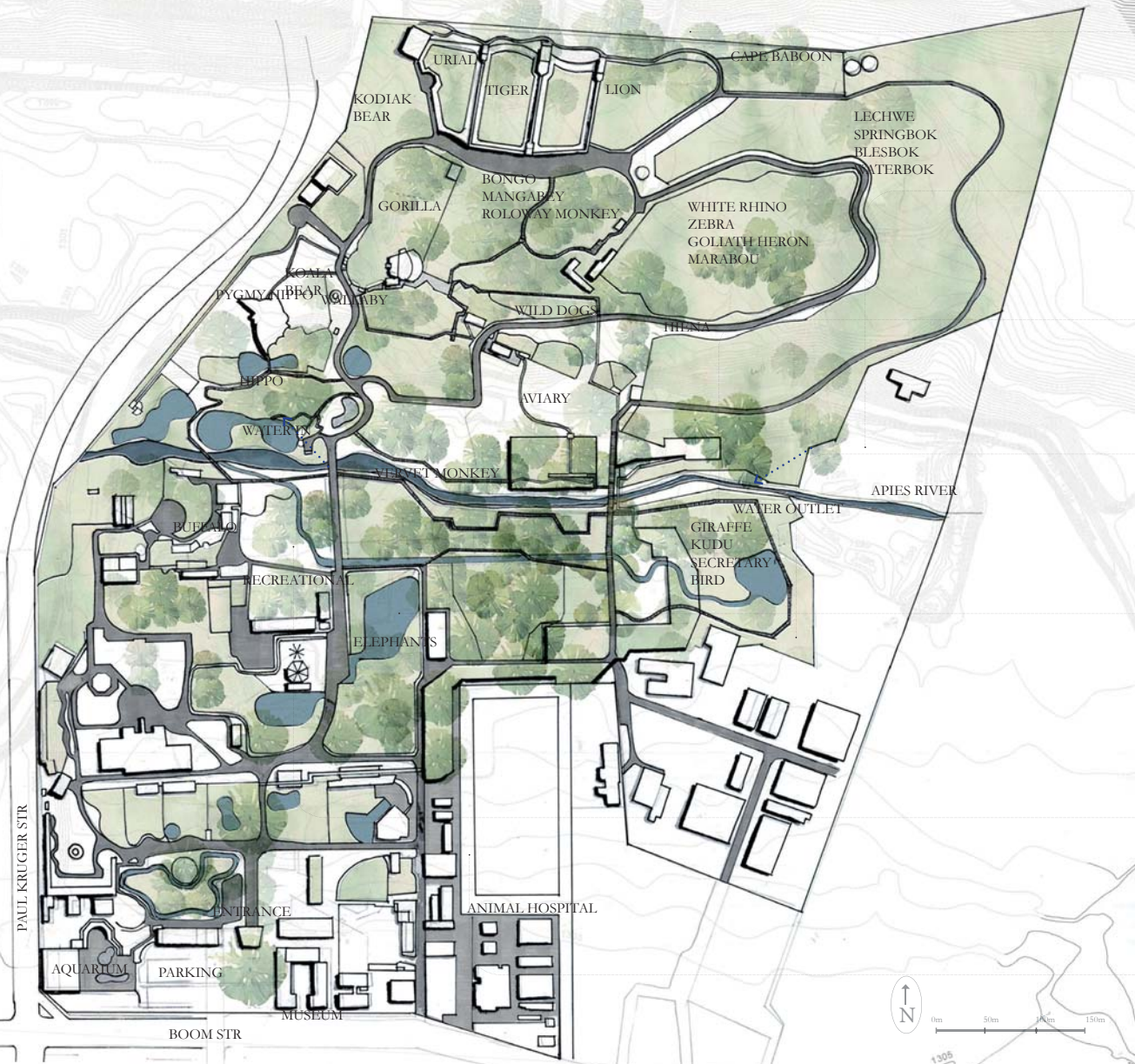
4.1 *Master plan*

The design principles established from the three stratagems contributed to the conceptual intentions for the master plan development. The implemented principles predominantly comprise the *Unzoo revisited* and the *Biozone Proposal*. The *sustaining beauty principles* must be used as a guide but will have more relevance dealing with design decisions at sketch plan level.

4.1.1 *Biozone*

The *Biozone Proposal* led to the development of four *biozones* within the NZG: Madagascar, Eurasia, Savannah and Equatorial Africa. The Savannah and Equatorial Africa biomes will occupy most of the master plan to support an increase of local and African species, more suited for the climate of Pretoria.

Animals were grouped together according to their *biozone* requirements. The current animal catalogue (see figure IV_7 on page 140) and site analysis of topography, hydrology and climate (see figure IV_3 on page 131 and IV_6 on page 134) served as a guide to re-connect animals that are indigenous to the proposed biome. As a result, enclosures of these animals were enlarged and connected, following the *Unzoo* principle of mixed species exhibition, enlargement of enclosures and animal habitat creation supported by the site topography, hydrology and climate of the site. See figures IV_20 on page 150.



IV_26. Proposed conceptual master plan of NZG and its components (Author 2014).

vegetation



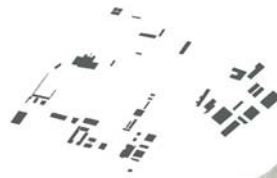
apies river



additional water bodies



buildings



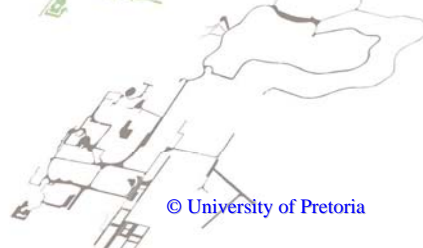
animal exhibition space

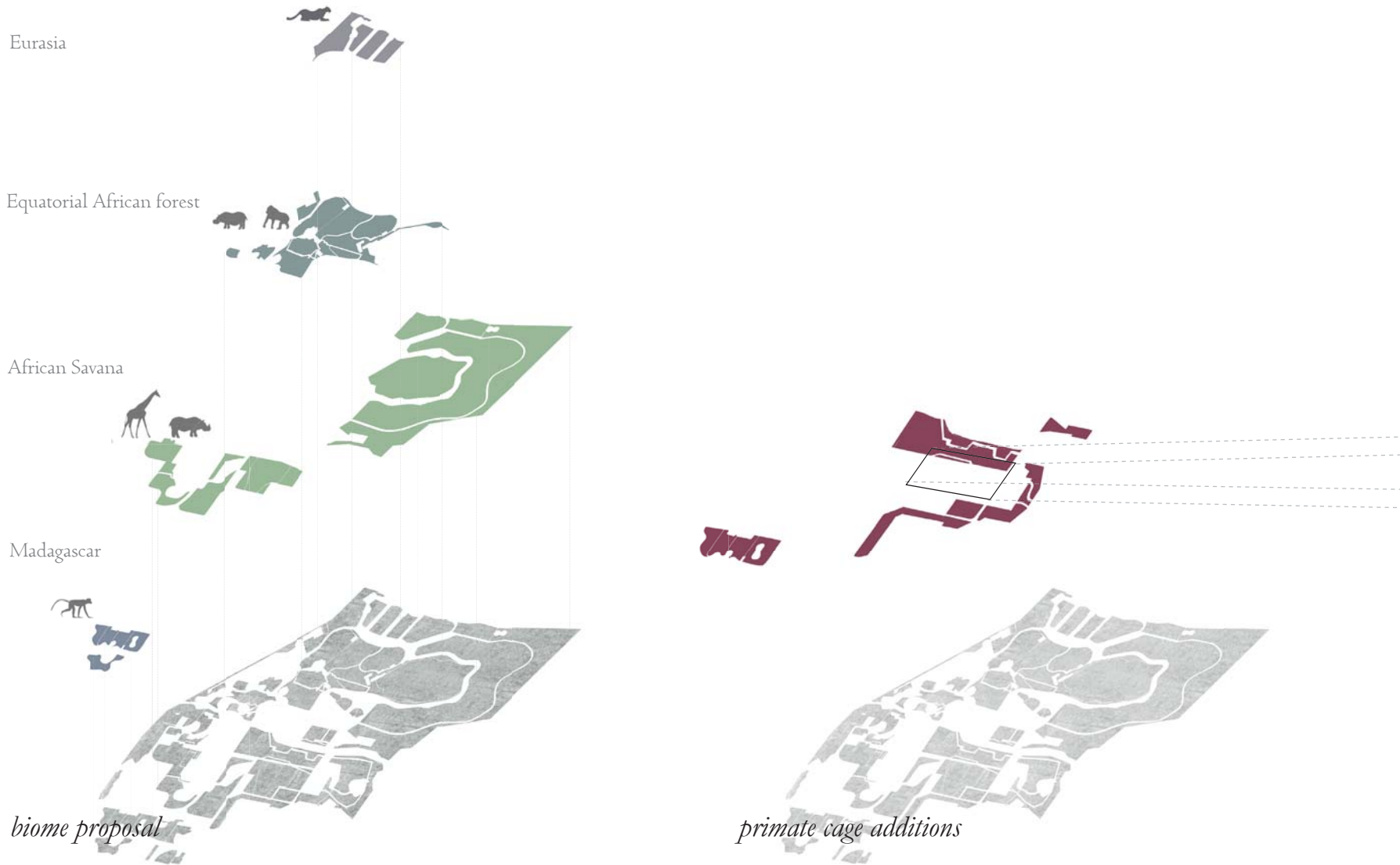


public soft space



hard space

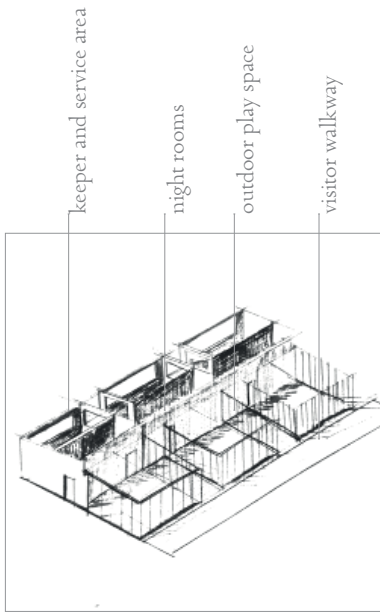




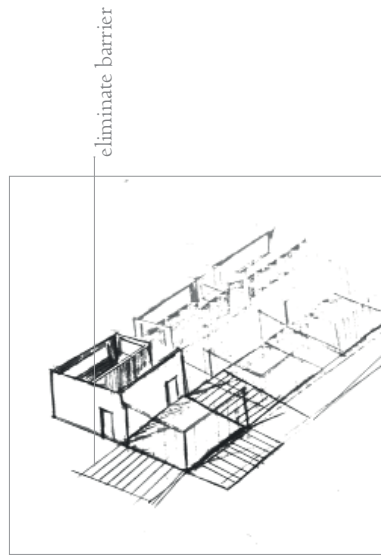
IV_27. Biozone proposal, primate 'elevation' and vervet monkey enclosure (Author 2014).



proposed site location: Vervet Monkeys



existing primate cage condition



unzoo approach



replicate natural habitat



immerse in original habitat

4.3.0.11 *Unzoo revisited*

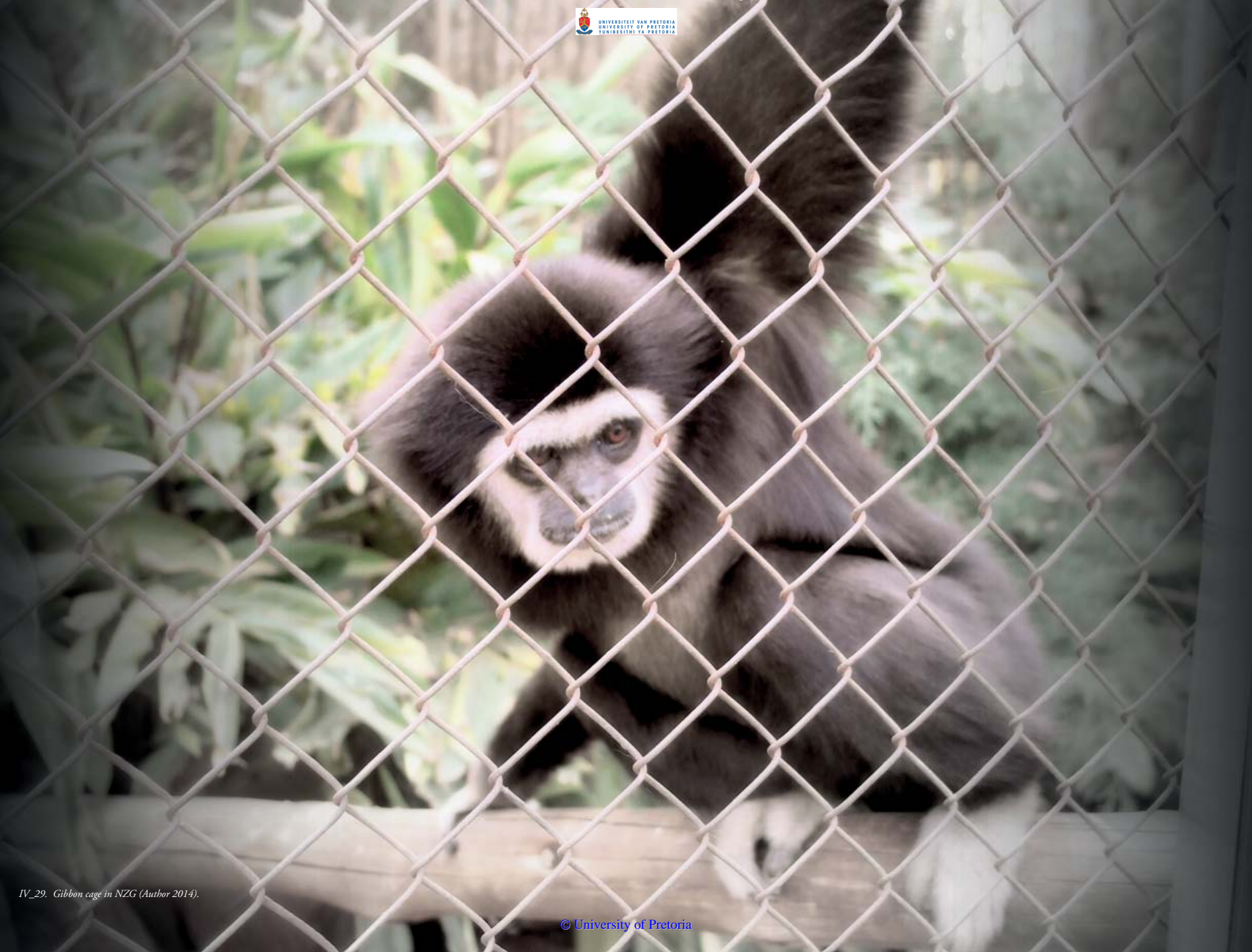
Enclosures of the animals relocated to the *biozones* were as a result enlarged and connected, following the *Unzoo* principle of mixed species exhibition and enlargement of the enclosures and landscape immersion of the visitor .

4.3.0.12 *The primate 'elevation'*

As a reaction to the small monkey enclosures, the master plan proposes to enlarge the primate enclosures according to the AAC theory (See figure IV_27 on page 154). The primates will be categorised according to the proposed biomes and dispersed throughout the zoo grounds. The master plan will aim to display and implement conservation of animals from native biomes where possible, but will not disregard the species from the other proposed *biozones*. This principle places emphasis on providing memorable encounters with native species, making them as entertaining as the better known exotic animals. According to Allenby (2011), historically the animal collection was managed on an *ad hoc* basis, but the unsuitable growth is bound to change under a new animal collection plan. The new plan will dictate an increase of local and African species to 70% and a decrease of exotic species to 30%. The primate elevation strategy will therefore propose the introduction of native primates, specifically the vervet monkey, which is not presently exhibited in the NZG. Figure IV_28 on page 156 illustrates the conceptual enclosure development.

4.3.0.13 *Zoo 360*

The master plan will finally propose to bridge the thresholds between the *biozones* with the *Zoo360* concept. The trails will link the proposed primate enclosures so that animals with similar habitat requirements can use different enclosures on a time-sharing system.

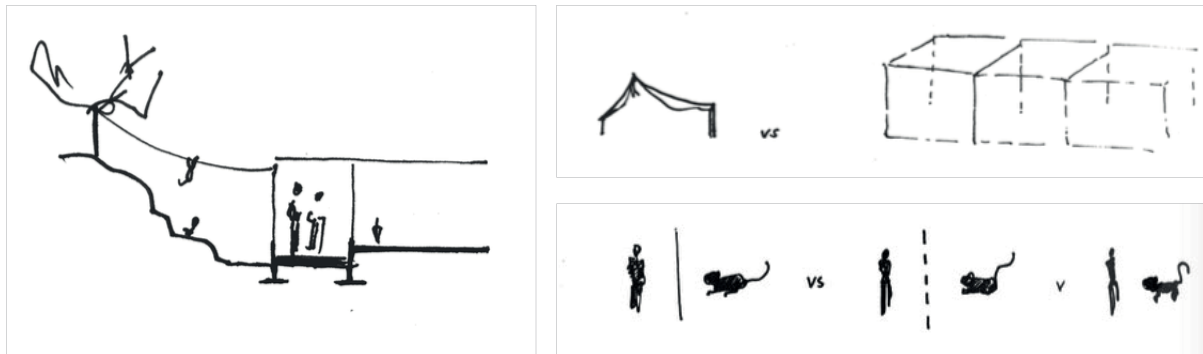


4.2 Conclusion

The final master plan proposal will provide the visitors with an improved, meaningful and educational experience. The *Biozone Proposal* will showcase the diversity of the animal kingdom by evoking the natural habitats in which the animals thrive and reside in enlarged enclosures.

The mixed species exhibition will offer interpretive possibilities and experiences for both the animal and the zoo visitors. Landscape immersion will redefine the current circulation of the visitors and elevate them into the enclosures, where possible, through means of skywalks and boardwalks. Primate elevation and the Zoo360 concept will bridge the thresholds between the *biozones* and in turn provide an amplified experience to the zoo visitor.

These conceptual master plan strategies will serve as an experiment for the proposed principles and provide a base for sketch plan development. The master plan site analysis and design principle synthesis will guide the dissertation to a final response of the proposed detail design.



IV_30. Primate cage threshold exploration (Author 2014).