Renovating Small Zoos:

Designing with the Limitation of Space

Sumatran Orangutan Enclosure Design | The Sacramento Zoo

THE PROBLEM :

In captivity, they often live in sterile, flat environments. This can be detrimental to both their physical and mental health. In order to help improve the welfare of animals in captivity, zoo enclosures must be designed to provide animals with the appropriate resources, stimuli, and space, however, a challenge to providing animals with these types of enclosures is having enough space.

THE RESEARCH QUESTION :

How can small zoos create enclosures that provide appropriate resources, stimuli, and space for their resident animals to perform their natural behaviors, when space is a limiting factor?

THE DESIGN CONCEPT :

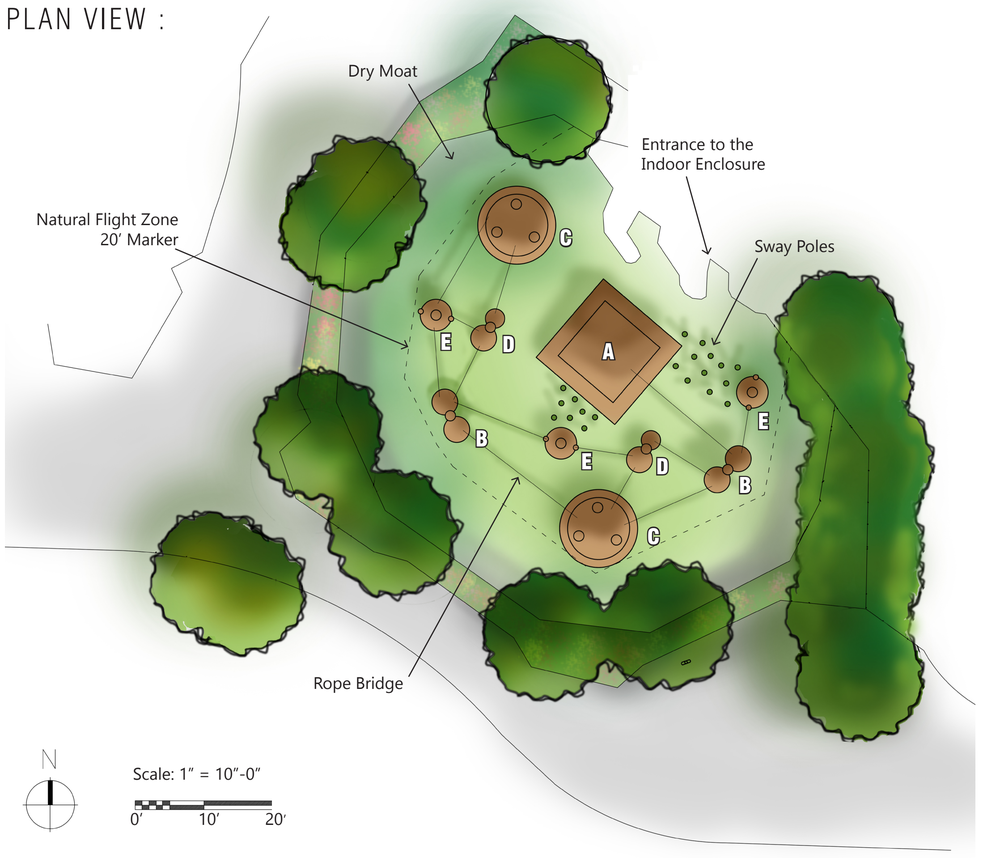
The proposed design for the Sumatran orangutan enclosure hopes to overcome the limited amount of space at the Sacramento Zoo, and create an enclosure that provides the appropriate resources and stimuli for the resident orangutans to perform their 'natural' behaviors thus benefiting their physical and mental welfare. It accomplishes this by utilizing the orangutans' natural routine in the wild to stimulate movement through the space, by providing all of the orangutans' needs in an elevated environment where they do not have to climb to the ground, and by providing a variety of spaces and routes of travel in order to give the orangutans complexity in their environment and the ability to choose the level of social interactions they want to have with visitors and each other.

THE FOCUS SPECIES:

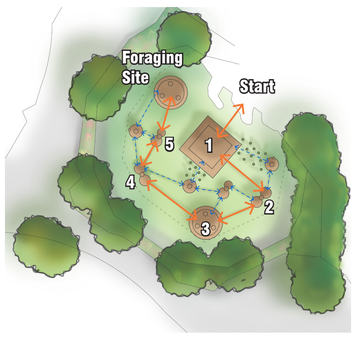
The focus species for this project is the Sumatran orangutan or ***Pongo pygmaeus abelii.*** The Sumatran orangutan is a good subject for this research project because they are a large, intelligent species that has large home ranges and live in complex environments. Designing a zoo enclosure for an orangutan that overcomes the limitation of space and meets all of their physical, mental, and environmental needs will be a challenge as well as a useful precedent for coming up with a process to approaching zoo design in a limited space.

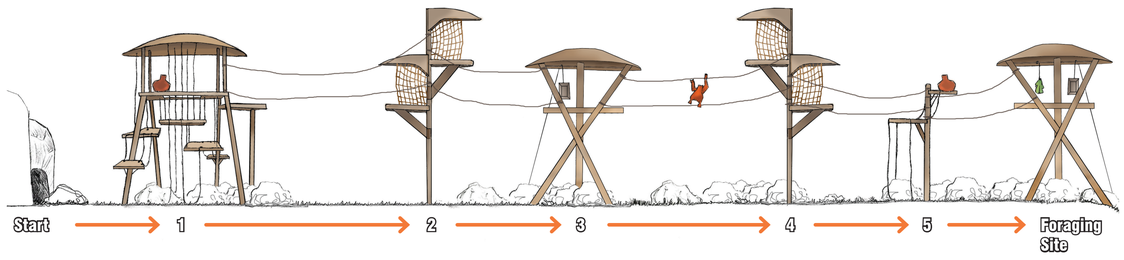
Orangutans are large, powerful, intelligent, arboreal species that travel long distances, rarely come down from the trees, and utilizing problem solving in order to survive. They are a generally solitary species, however, their level of sociality is highly varied depending on their age, sex, and resource availability. Sumatran orangutans need to be active to stay healthy due to their bodies' natural ability to efficiently convert sugar into fat. Humans have less of an affect on orangutan behavior when the orangutans are elevated above eye level, and they benefit more from complex, interactive environments rather than environments that are bigger in size.

PLAN VIEW :

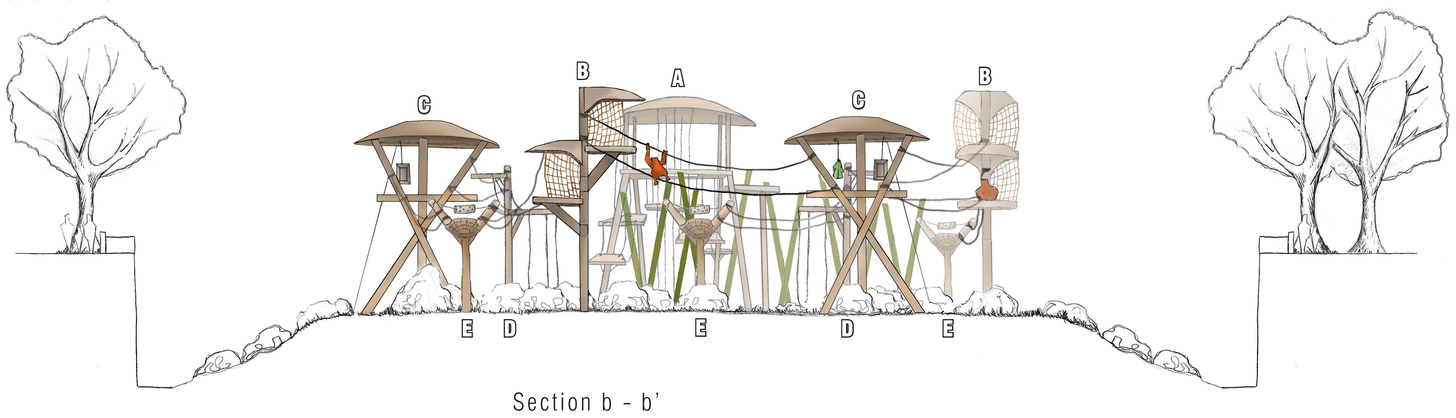


MOVEMENT THROUGH THE SPACE :

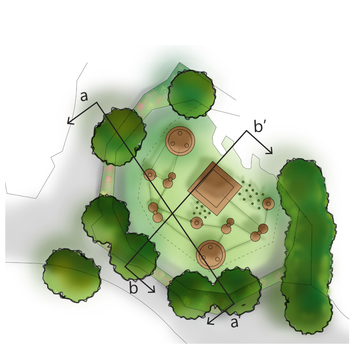


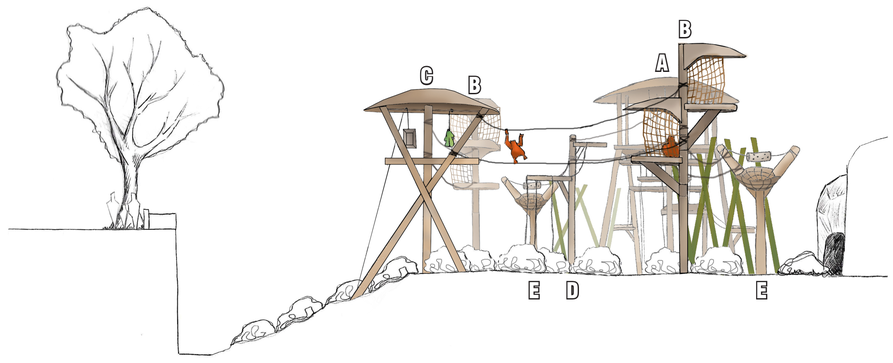


Section a - a'



Section b - b'





In the wild, orangutans have a natural routine. They wake up between 6 and 9 in the morning. They sit and observe the rainforest. Then they forage and slowly move through the trees until 12 in the afternoon. At this time they typically build a day nest and rest for several hours. After their nap, the orangutans will travel faster through the rainforest and forage as they go. Then at night, they will build a new nest and sleep here until the next day.

The proposed design for the Sumatran orangutan enclosure at the Sacramento Zoo is based off of this routine in the hopes of stimulating the orangutans to move through the space. The orangutans would start at their indoor enclosure and would have to travel along a path to get to their foraging site. Along the main path, shown in orange, there would be alternate routes, shown in blue, to side destinations such as nesting sites and treat dispensers, however, the overall path would lead to their main foraging as this would be their destination in the wild.

STRUCTURES :

A

The Lookout Tower :
28' tall, the top platform is 10'x10', elevated 20'. It is intended to be a place for the orangutans to sit and look out over the zoo. It also has 6 smaller platforms that vary in size, elevation, and movability.

B

The Nesting Towers :
32' tall with the height of the first nesting platform at 20' and the height of the second at 26'. Each nesting platform is 5'x5'. For privacy, cargo netting will be added to the sides facing visitors.

C

The Foraging Centers :
28' tall with each platform elevated 20' high. These structures are intended to facilitate natural foraging behaviors. Food will be placed on the platforms or elevated from the roof for the orangutans to find and eat.

D

The Elevated Platforms :
The platforms are 15' and 20' off the ground and are each 5'x5'. These uncovered platforms help to provide connections between other structures. They also serve as areas where visitors can clearly see the orangutans.

E

The Foraging Nests :
The hammocks in these structures are 10' off the ground, each has a food dispenser located above them. They are intended to provide the orangutans with opportunities to forage and will allow each individual access to food at all times.

PRIVACY & TRANSPARENCY :

In order to increase the privacy for the orangutans, this design proposes to add vegetative screening in strategic locations. Shrubs or bamboo will be placed to screen the first Foraging Center (i), and the second Nesting Tower (ii). Visitors will still be able to view these structures, and the orangutans that use them, from the side. The design also proposes to have areas of high visibility where the orangutans will be highlighted (iii & iv). These areas will be purposely left exposed so visitors can view the orangutans, and the orangutans can watch the people.

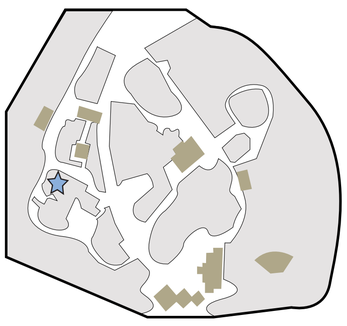
THE NEXT STAGE :

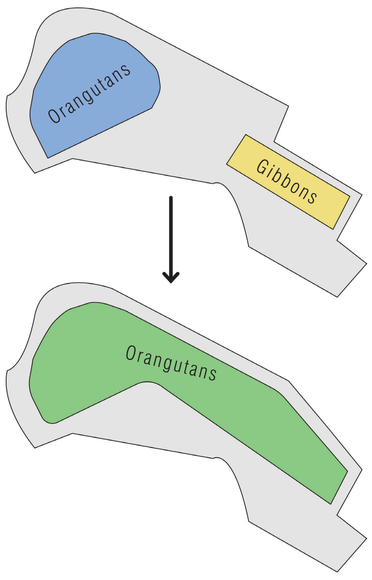
The next phase of this design would be to create an enclosure that is circular or linear, since the Sumatran orangutans naturally move from one location to another and build new nests each night.

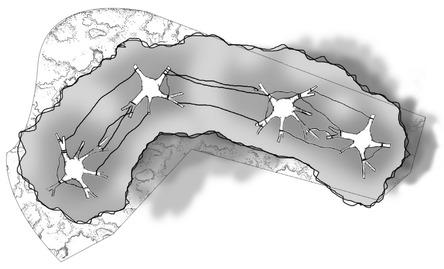
My proposed design for the Sacramento Zoo to consider while working on their master plan, would be to relocate the Gibbons and to expand the orangutan enclosure into that space. The two enclosures could be connected by physically combining the two spaces, or by adding an elevated rope bridge that allows the orangutans to move from one area to the other.

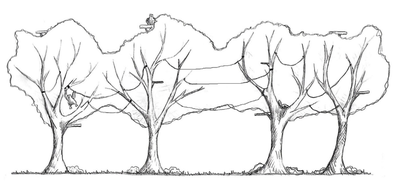
The next phase would learn from the success and failures of the first design, and would integrate all the successes with a more natural environment. Existing trees or artificial trees could be used to replace the built structures and provide the orangutans with a much more natural space that is better suited to their needs.

The Sacramento Zoo









THE PROCESS :

The process developed through this project to approaching any species-specific design that deals with the limitation of space is as follows:

Step 1 : Broadly research current zoo design trends and literature to get an idea of what is happening in the field today.

Step 2 : Research the site, and its goals, and resources. Identify the needs of the people that will be maintaining the site and caring for the focus species.

Step 3 : Research the focus species. Learn about the species' needs and how it interacts with its environment as well as with others animals.

Step 4 : Identify the needs of the focus species that are in conflict with living in a limited space.

Step 5 : Synthesize all the information gathered so it can be easily referenced.

Step 6 : Come up with a set of design goals that address the needs of the focus species and the zoo staff, and also attempts to solve the conflict between the animal's needs and the limited space.

Step 7 : Create several designs using the goals that were established until one design is the most successful.

Step 8 : Continue to improve and strive for a design solution that is best suited to meet the needs of the focus species.

Hannah Malboeuf | Spring 2017