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, inteligent, arboreal species that travel long distances, rarely come down from the trees, and utilizing problem solving in order to survive. They are 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.

THE NEXT STAGE:
The next phase of this design would be to create an enclosure that is circular or linear, since the orangutans will benefit from having 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 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 attempt 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.