**Eco-Art Pollinators**

**Introduction**

The series of landscape and art interventions proposed for the site aims to create change within our understanding and perception of space regarding ecological issues. The strategies ask the individual to reflect on their position as an agent for behavioral change to honour the land and its flora/fauna species. Through an artful approach, our proposal makes prioritizes habitats and pollinating corridors, which bring varied and biodiverse life back to the site. Formal strategies are set in place to give visibility to environmental characteristics, becoming poetry of the intricacy of habitat preservation and presence in our rapidly densifying and growing urban contexts. Towers become a symbolic part of the landscape and the memory of the landscape. Nodding to the existing observational towers on site, the material relationship to the ground of the habitats, and their scaled modularity, brings new meaning to the idea of the tower. Together the habitats and towers propose a powerful statement on the future of Mannheim and its public perception.

Our landscape interventions address the rapid decay of the pollinator ecosystem. By making hyper habitats, the plant systems act as a productive node for pollinators in a growing network, recreating an ever-expanding pollinator network that connects beyond the currently isolated ecosystems. This pollination strategy supports the life of pollinating insects which supports the diversity of our environment, soils, food systems, and people. The insertion of pollinator environments is a step toward addressing climate change and rebuilding the interconnected systems that produce natural resources.

Pollinator pathway strips follow the existing axial relationships on site. Each habitat contains rich biodiversity, which brings a large concentration of pollinators to the area through the diverse selection of plants, fungi, and invertebrates. The insertion of plants to facilitate habitats further protects nearby / adjacent croplands from pests. The strips serve as walking, cycling, and running pathways for people to filter through for physical activity, to rest/observe, and as a passageway to surrounding contexts.

**Technology used in your design**

Our approach to technology is manifold, from harvesting solar energy, to growing structural materials, to utilizing low-tech nature-based solutions. For our low-tech approach, we are addressing climate and biodiversity challenges that exist in urban areas through the establishment of radical replanting and pollinating, facilitating new habitats for endangered species. The species can nest and procreate in their corresponding structures. The materials utilized for the structures are timber, rock/aggregate, and mycelium. The overall approach keeps the health of the local community and economy in mind – multiplying the ground plan of the site as a habitat and bee-line corridor.

The site is designed through multiple layers, keeping the ground as a living ecosystem. Our playful approach incorporates Solar Balloons to gain solar energy, which lift off the ground plane above the cloud line. The balloons can collect energy powered by the sun to feed back into the surrounding neighbourhood context. Keeping in mind their envelope material, one that absorbs solar radiation, the balloons float as the air inside is heated. As a lightweight, low-cost to manufacture, and energy-efficient solution, they can be deployed around the city, too. The solar balloon is a self-sufficient, autonomous, and symbolic infrastructure within communities.

The site becomes a place of environmental research, experimentation, and innovation. In addition to offering a wide variety of uses and activities, the sites remain as a habitat and pollination corridor, with a focus on utilizing creativity, innovation, and environmental technology.

**Description of public activities and social co-benefits your design would support**

Our proposal increases ecological connectivity by preserving four endangered species in Mannheim: The Long-eared Bat, Crested Lark, Wall Lizard, and Mauerbiene. The site becomes a learning opportunity for the public to observe the growing cycles that weave together new habitats. The plan elaborates on the site transformation to a living ecosystem according to artistic/ecological and sustainable development principles.

The ecosystems planting strategies are a visual delight and display. Wildflowers, in blue and violet colours, are attractive to the Mauerbiene, as they are nectar-rich and serve as food not only to the Mauerbiene but also butterflies, flies, and insects. Trees planted, in addition to habitat creation, sequesters carbon in the surrounding environment. The surrounding soil systems also benefit from the nutrient cycle of the increasing diversity in planting.

Ponds of water are present on-site, which provides the co-benefits of slowing rainfall run-off and increasing biodiversity to combat climate change. As a social project, the ponds can be a source of discovery and inspiration for local neighbours and the city to add future ponds to parks in a large-scale effort to rebalance ecosystems with pollination and wildlife.

The site becomes an area of reflection and relaxation. The proven social benefits of spending time in nature and connecting with nature decrease cortisol levels and increases our quality of life. Benefits include providing joy and clarity experienced alone or in groups. It is a place where people can go daily for a moment with nature. It can also be a place of events, education, or celebration.

**How your design will support UN sustainable development goals**

The site has experienced human-induced disruptions in its history, creating an unbalance of natural systems and processes. Our proposal looks at ways to creatively address a globally shared environmental crisis with site-specific interventions that respond to the UN Sustainable Development Goals.

* **Goal 2.** Providing space for pollinators, the transfer of pollen helps the reproductive system of flowering plants. These plants can bring countless fruits, vegetables and nuts. By increasing the ecosystem, surrounding food systems become more resilient and abundant. Pollinators are responsible for one in 3 bites of food. To ensure our food systems are sustainable, pollinator habitats must be preserved, protected, and promoted.
* **Goal 3**. The site promotes ecological tourism, generating learning for our approach to design to interact with all age groups and species. Attention to giving back green space can provide a quality of life to all – as we not only benefit from nature but are obligated to be stewards of nature to fight the current state of our global condition.
* **Goal 4.** The corridor contributes to the health and well-being of citizens while enriching biodiversity and the quality of the environment. It also acts as a platform for citizen engagement, in which the design facilitates increased awareness and stewardship.
* **Goal 7.** The site acts as a multiplier for energy capture and release. Solar energy can be stored and fed into the surrounding neighbourhood network. The increase in tree cover also provides a local cooling effect, reducing heat loads.
* **Goal 11.** Optimizing the site with a robust planting strategy increases the biodiversity and tree canopy. The land becomes a connector of eco-territories, parks, and green spaces. We aim to bring human/non-human communities together on-site to provide a nurturing environment for body and soul.
* **Goal 12.** Utilizing wood, found stones, and mycelium, each is a material that is biodegradable and stores carbon. Our proposal is aware of the waste produced in the construction industry, and our structures look to provide material stability without exhausting our resources. The towers can be disassembled and recycled after their lifecycle to reduce waste and pollutants.
* **Goal 13.** Our approach is more than providing nature-based solution reflections but about bringing back balance in our cities, environment, and living spaces – thinking ahead of future climate change outcomes.
* **Goal 15.** Gray long-eared Bat: This particular species of bat live in environments that are small yet open and resemble woodlands, gardens, grasslands, and green edges. They can be found in small urban contexts too. Our habitat includes a tower that is an open volume for the bats to rest. They eat moths, flies, and small beetles, which reside in their corresponding grassland habitat.

Crested Lark: As a vegetarian species, Lark’s surrounding habitat includes grains, seeds, insects, beetles, and other food found on the surface of the earth’s floor. The habitat structure hovers as a plane off the ground, inside small openings composed of mycelium blocks for the Lark to nest comfortably.

Wall Lizard: The omnivorous Lizard feeds on insects, spiders, crickets, grasshoppers, caterpillars, and fruits. Its environment contains plants that house the various invertebrates, including lush greenery and rocks. The gabion wall structure, housing rocks, becomes a nest for the Lizards to rest, jump, and climb through.

Mauerbiene: Consuming both nectar and pollen from the surrounding planting and bee-line corridor, the Mauerbiene can retain enough energy to make honey and re-populate. Proximity to the ponds of water allows the bee to gain extra energy and fuel for their required intakes. The structure is composed of timber blocks with small perforations for the Mauerbiene to go into rest and create honey.

**MWh generated per year**

The artwork has 1,200 solar balloons with potential for growth. The balloons capture solar energy with balloons floating above the clouds. Latitude is set to Mannheim’s annual sun coverage of 1735 hours. Therefore, the energy collected on site is 2082 MWh.

**Environmental Impact Summary (300-words)**

Our proposal’s key intervention aims to provide an action-based experience, that increases human awareness of the delicacy of ecosystems while creating a tactful approach to increase resilience and mitigate climate change on site. Climate change encapsulates new opportunities and challenges – designers need to re-imagine cities using nature-based solutions to protect, create, improve, and mitigate the urban realm and enhance the capability to adapt. Utilizing both nature-based solutions and technology, we mitigate risk, through tested approaches to improve pollution in the air, soil, water, and biodiversity. The habitats are developed to facilitate inter-species growth, capture greenhouse gases, enhance air quality, reduce stress, wind and sound levels, infiltrate and control runoff water, support biodiversity, cool the city and enhance the urban experience. The addition of habitats becomes observational spaces that highlight the natural qualities of the context. Elements can be implemented in phases, independently of each other. With the site’s long and storied past, minimizing the environmental degradation of the site boundary and re-naturalizing the area is conducive to engaging in activities on-site related to the environment, education, leisure and culture, community participation and enhancement of notions of transformation, evolution, and recycling. Natural and renewable materials are present throughout the towers, which aligns with the Spinelli Masterplan. Prefabricated modules ease the installation process and impact the ground. With sustainable material management, we are future-proofing our built intervention's lifespan, the materials proposed store carbon, and can be recycled in their afterlife. The site becomes a place of environmental research, experimentation, and innovation. In addition to offering a wide variety of uses and activities, the sites remain as a habitat and pollination corridor, with a focus on utilizing creativity, innovation, and environmental technology.