GREEN SKILLS FOR CITIES

LTP

Shared lessons

Intro to Urban ecology, ecological connectivity & data driven design

IAAC
Mathilde Marengo & Iacopo Neri

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SECTION **ONE**

Context

Planetary Urbanization

A threat to fine ecological balances

GLOBAL HUMAN FOOTPRINT INDEX V2.

Cartography by Nikos Katsikis, based on data from the Wildlife Conservation Society - WCS, and Center for International Earth Science Information Network - CIESIN - Columbia University. 2005. Last of the Wild Project, Version 2, 2005 (LWP-2): Global Human Footprint Dataset (Geographic). Palisades, New York: NASA Socioeconomic Data and Applications Center (SEDAC).

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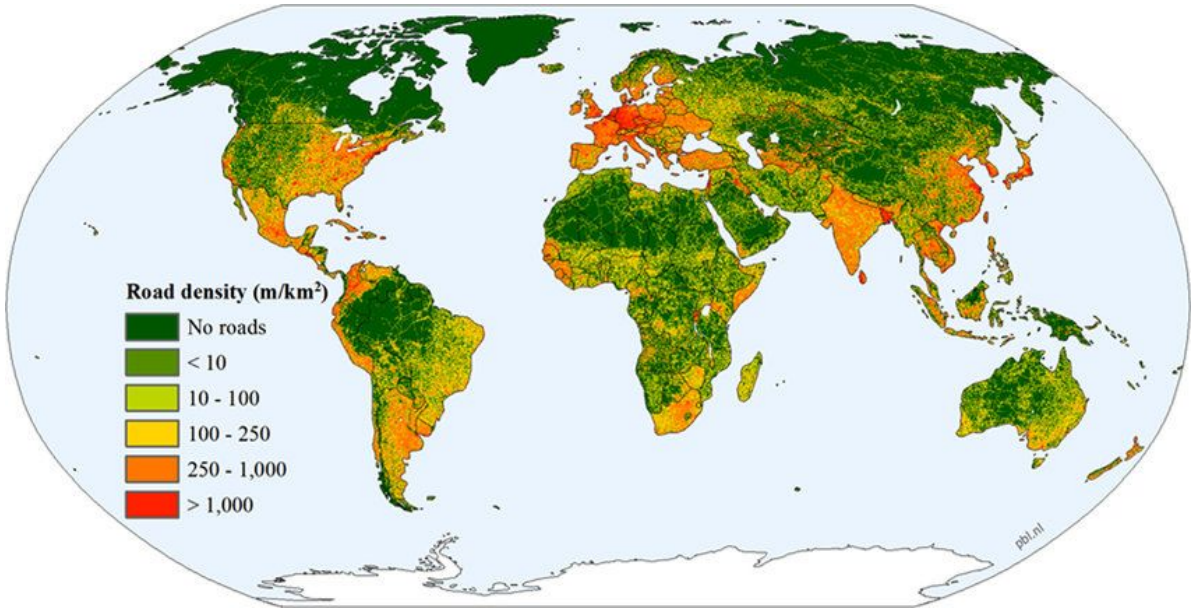
SECTION **ONE**

Questioning

Landscape Fragmentation

Urbanities as a drivers for Landscape Fragmentation



For further reading: https://www.researchgate.net/publication/274389394_Habitat_fragmentation_and_its_lasting_impact_on_Earth_ecosystems

WHO ARE WE DESIGNING CITIES FOR TODAY?

The great majority of **today's legal systems only protect the rights of humans**, often considering nature as one of the **resources to be exploited** "for the exclusive benefit of our own species."

Although this legal condition has began to shift with the emergence of several national and international conventions, [...] the modus operandi applied until this shift has created a condition whereby **land and ecology, through property laws, have been fragmented**.

A condition that is in **profound "contradiction to ecological principles of wholeness and interconnection."**

LET'S DESIGN CITIES IN SYMBIOSIS BETWEEN HUMAN AND ECOLOGICAL FORCES.

John Thackara (2015), How to Thrive in the Next Economy: Designing Tomorrow's World Today, Thames & Hudson, London, pp. 151-156.

From: Mathilde Marengo, Iacopo Neri, Eduardo Rico-Carranza (2022), Enabling design with nature through data driven processes. A methodology for the integration of nature as an active partner in design towards living cities, Joelho-Journal of Architectural culture, Issue 14, Digital Culture: What's next? in press.

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WHO ARE WE DESIGNING CITIES FOR TODAY?

LET'S DESIGN CITIES IN SYMBIOSIS BETWEEN HUMAN AND ECOLOGICAL FORCES.

Concepts such as **renaturing and rewilding** - both intended to not only restore nature, but **allow it to thrive independently** - offer an unprecedented challenge for designers: to approach landscape under a **dynamic, collective, multidisciplinary and multiscalar perspective**.

From: Mathilde Marengo, Iacopo Neri, Eduardo Rico-Carranza (2022), Enabling design with nature through data driven processes. A methodology for the integration of nature as an active partner in design towards living cities, Joelho-Journal of Architectural culture, Issue 14, Digital Culture: What's next? in press.

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SECTION **ONE**

Frameworks

Designing cities in symbiosis

Renaturing and Rewilding as more-than-human design strategies

Tempelhofer Feld, Berlin

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SECTION **ONE**

Frameworks

➔ Renaturing

From Renature:
re- + nature, coined as an opposite to denature.

https://en.wiktionary.org/wiki/renature

From Renaturation, which can mean can mean:
> the inverse process of denaturation
> ecological restoration, also sometimes called renaturization.

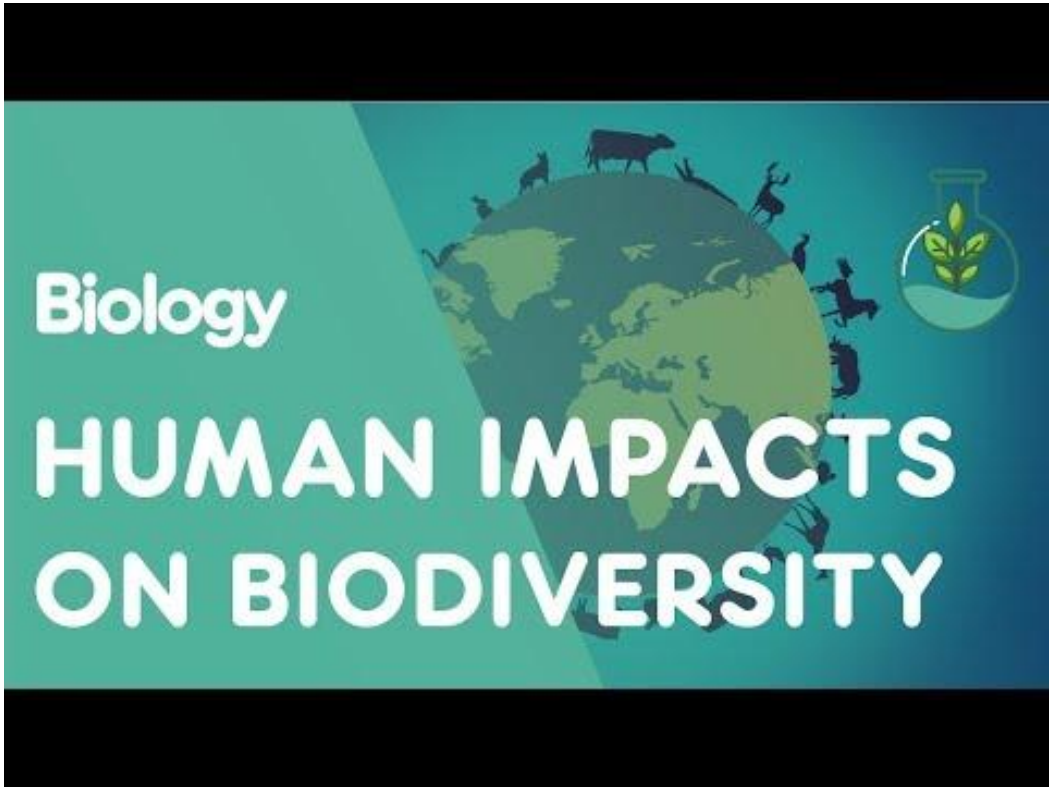
https://en.wikipedia.org/wiki/Renaturation

SECTION **ONE**

Frameworks

Renaturing

The importance of nature



https://www.youtube.com/watch?v=wXJiHr8jWBs

For further reading: https://royalsociety.org/topics-policy/projects/biodiversity/human-impact-on-biodiversity/

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SECTION **ONE**

Frameworks

➔ Rewilding

Rewilding is a progressive approach to conservation. It's about letting nature take care of itself, enabling natural processes to shape land and sea, repair damaged ecosystems and restore degraded landscapes. Through rewilding, wildlife's natural rhythms create wilder, more biodiverse habitats.

Rewilding is about:
Nature's own ways - Nature knows best when it comes to survival and self-governance.
Bringing back wildlife - Rewilding works to restore lost species guilds by giving them space to thrive.
Ensuring wellbeing - When nature is healthy, we are healthier too.
Delivering for the future - There is no defined end point for rewilding.

https://rewildingeurope.com/what-is-rewilding/

SECTION **ONE**

Frameworks

Rewilding

Initiatives

https://rewildingeurope.com/

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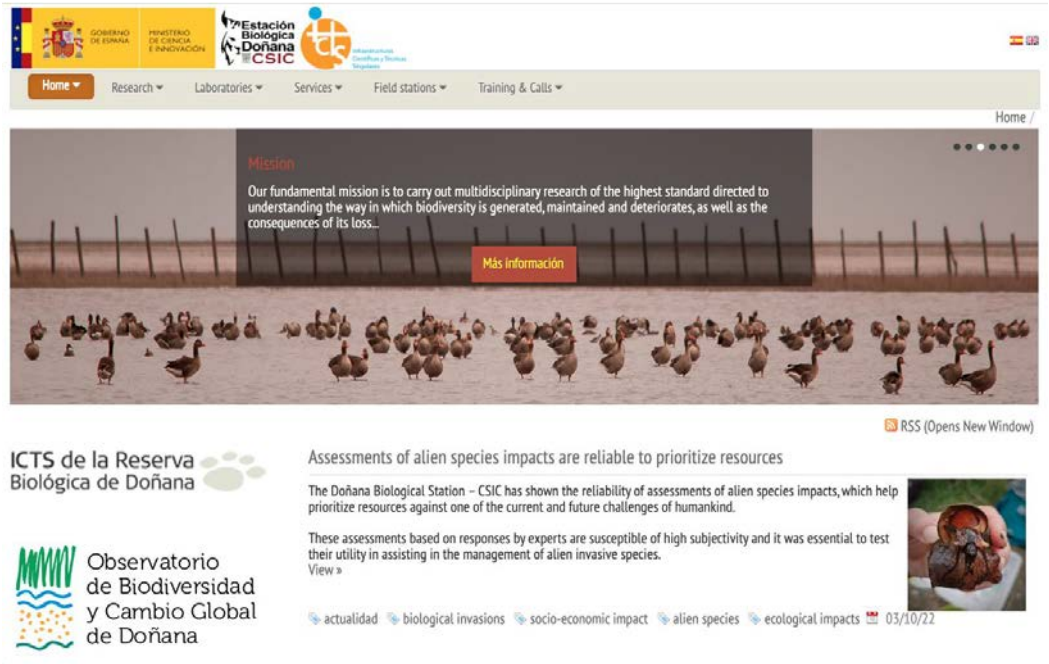
SECTION **ONE**

Frameworks

Rewilding

Initiatives



http://www.ebd.csic.es/inicio

SECTION **ONE**

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Rewilding

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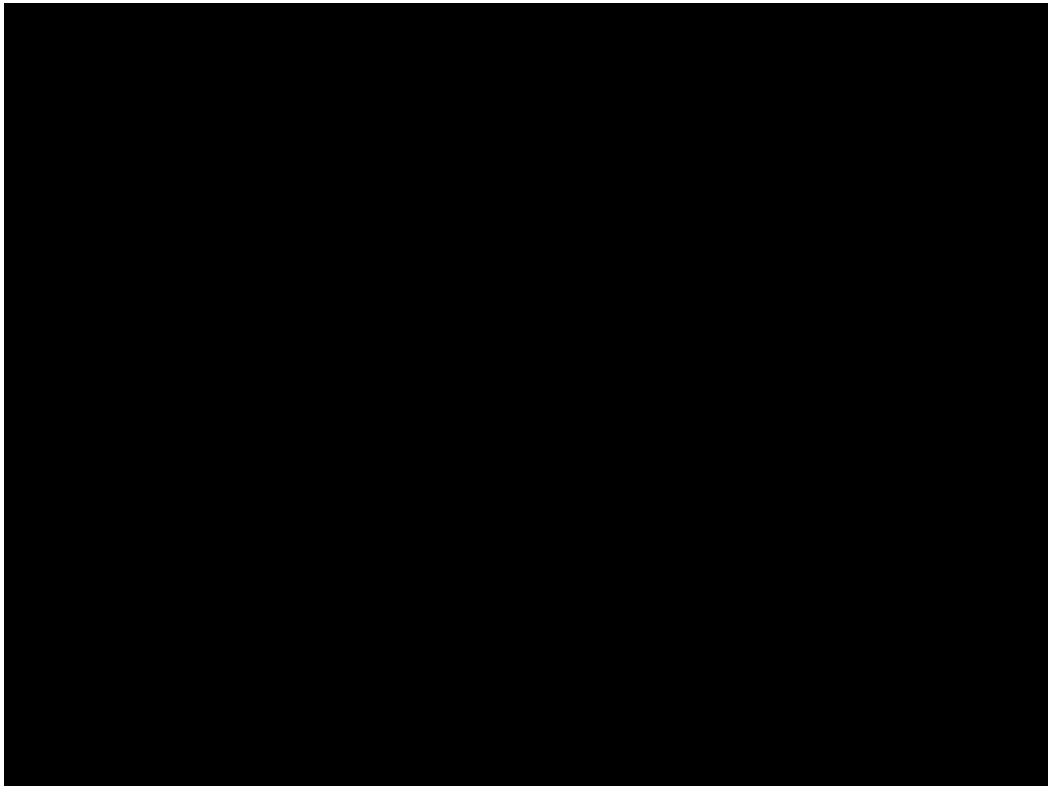

https://www.theguardian.com/environment/blog/video/2013/may/30/rewilding-animation-george-monbiot-video

For further reading: https://rewildingeurope.com/rewilding-in-action/

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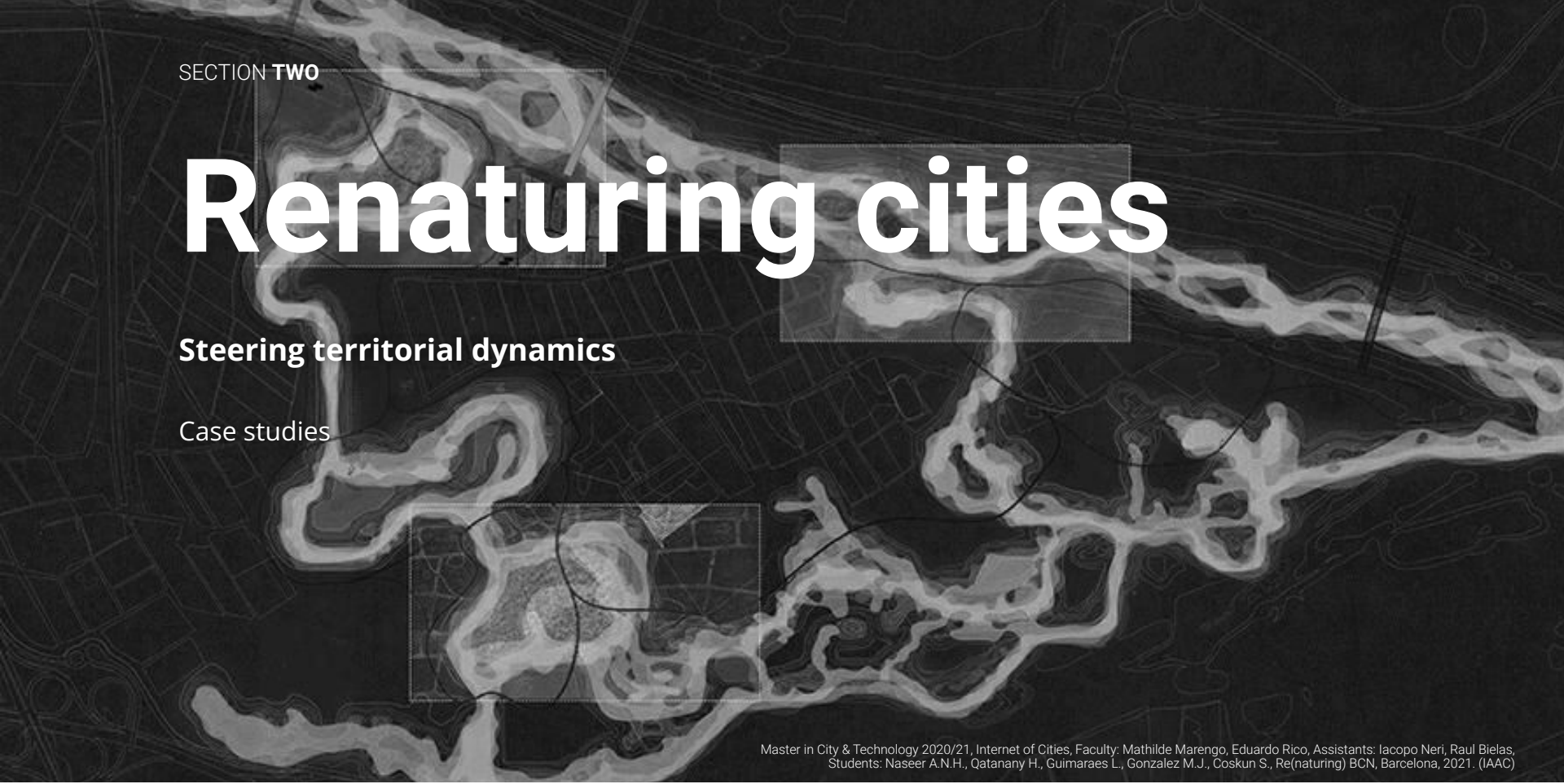
SECTION **TWO**

Renaturing cities

Steering territorial dynamics

Case studies



Master in City & Technology 2020/21, Internet of Cities, Faculty: Mathilde Marengo, Eduardo Rico, Assistants: Iacopo Neri, Raul Bielas, Students: Naseer A.N.H., Qatanany H., Guimaraes L., Gonzalez M.J., Coskun S., Re(naturing) BCN, Barcelona, 2021. (IAAC)

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SECTION **TWO**

Renaturing cities

Integrating territorial forces into urban design

Simulation and digital models can enable designers to understand, foresee, and drive territorial dynamics in order to **emphasise natural forces rather than limit them**.

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Renaturing cities

Integrating territorial forces into urban design

Simulation and digital models can enable designers to understand, foresee, and drive territorial dynamics in order to **emphasise natural forces rather than limit them**.

Alzette 2.0

Enhancing river natural state and functioning to tackle issues of floss and loss of habitat produced by human induced modifications in their river bed through a design that engages with the dynamics of river meandering.

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SECTION **TWO**

Renaturing cities

Alzette 2.0

Simulating meandering dynamics

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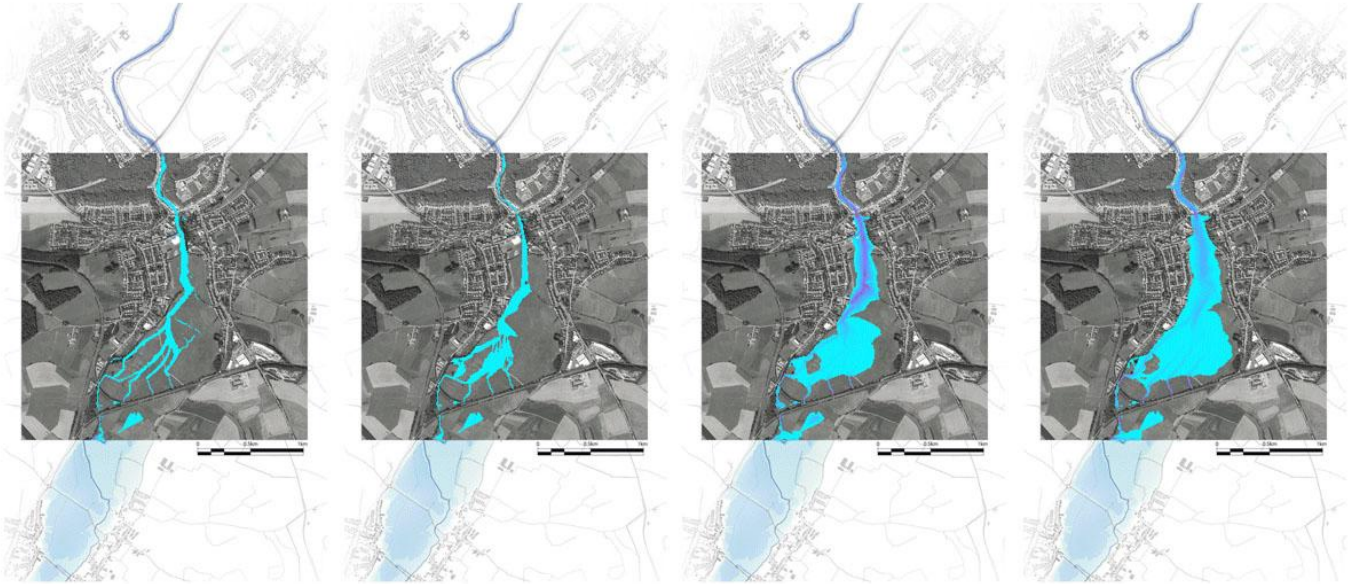
SECTION **TWO**

Renaturing cities

Alzette 2.0

Simulating meandering dynamics



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SECTION **TWO**

Renaturing cities

Alzette 2.0

Simulating meandering dynamics

Meandering Pattern

- slowing down the river
- increasing riparian zone
- open undetermined channels for water flow

Bioremediation Forest

- reclaiming polluted soil and water
- improving local biodiversity
- improving air quality

Recreation Area

- reconnecting people to the river
- rehumanizing the river
- reviving

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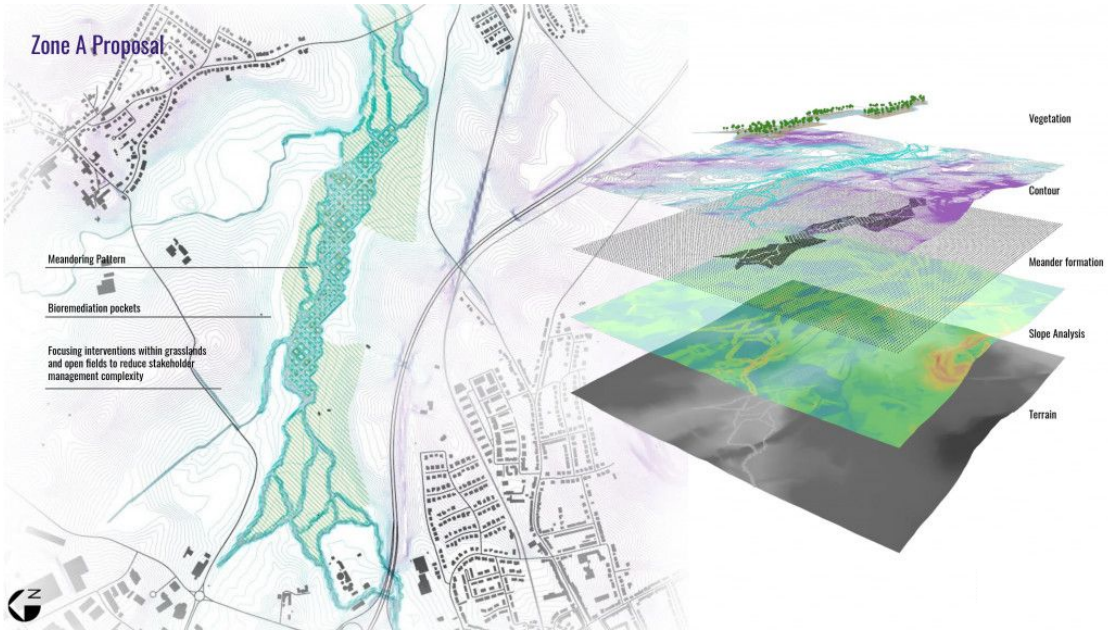

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SECTION **TWO**

Renaturing cities

Creating nature based economies and social values

Simulation and digital models can enable designers to understand, foresee, and drive territorial dynamics in order to **emphasise natural forces rather than limit them**.

Water we talking about

Reconnecting the link between the city, the citizens, and their water by creating natural, democratic flood risk management systems perpetuated by the inhabitants of Lagos, Nigeria.

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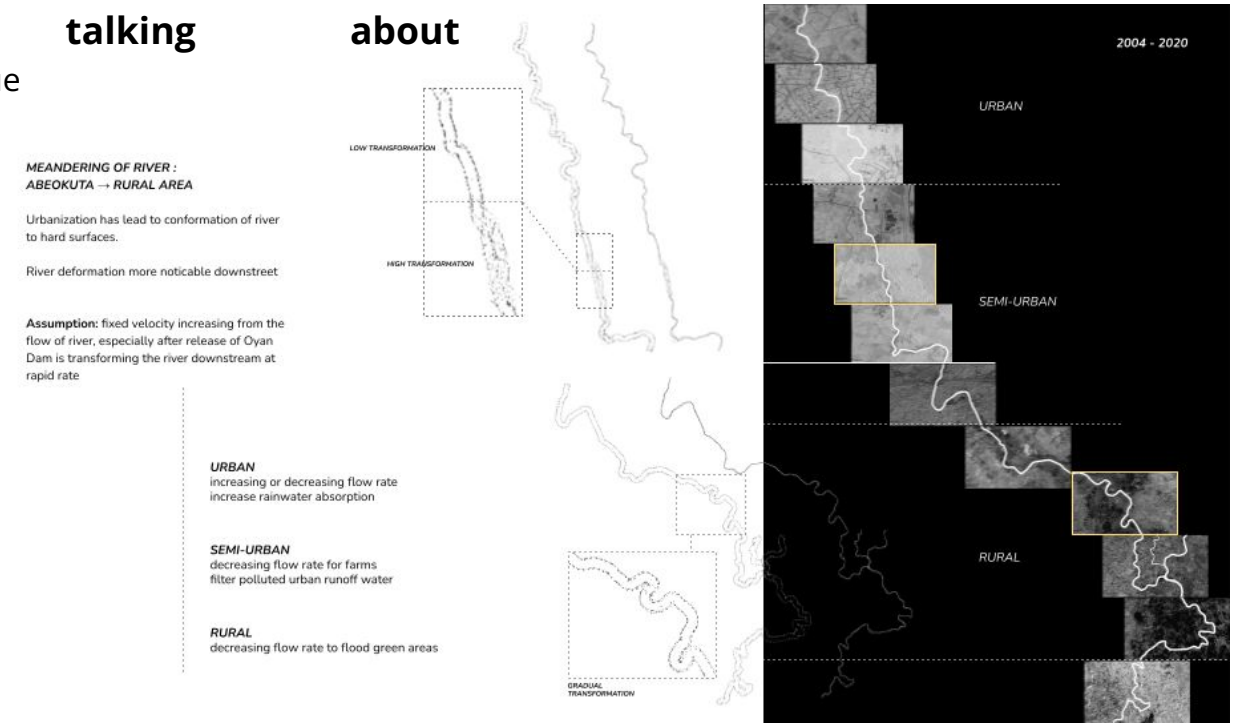
SECTION **TWO**

Renaturing cities

Water we talking about

A city-citizens-water dialogue



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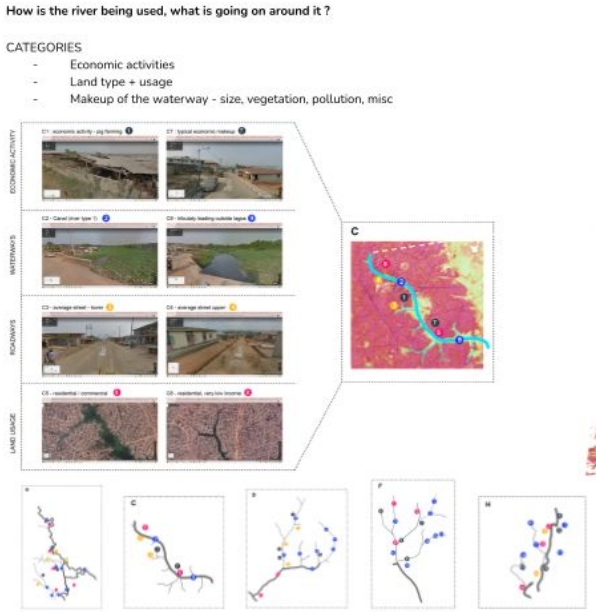

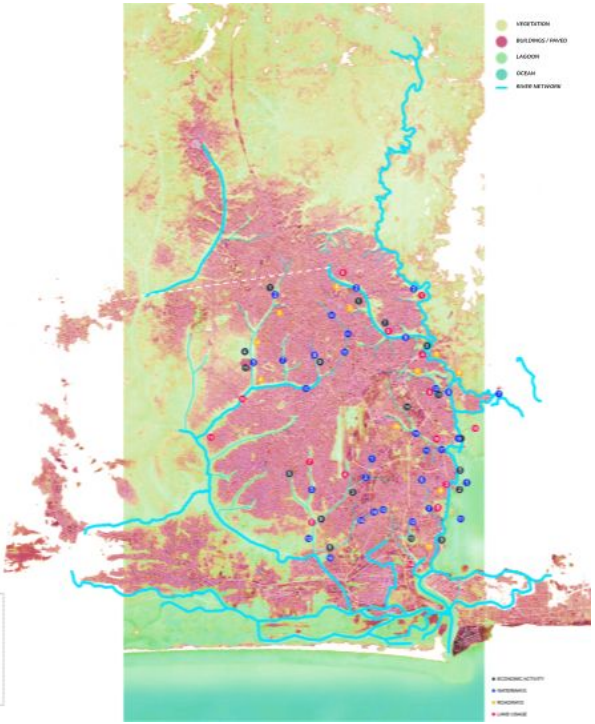

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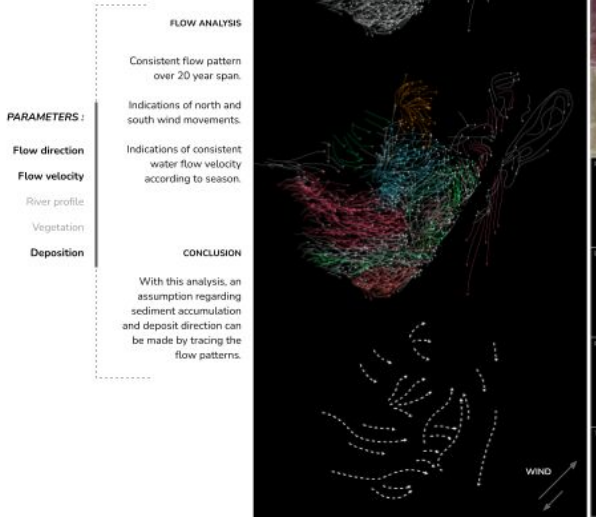

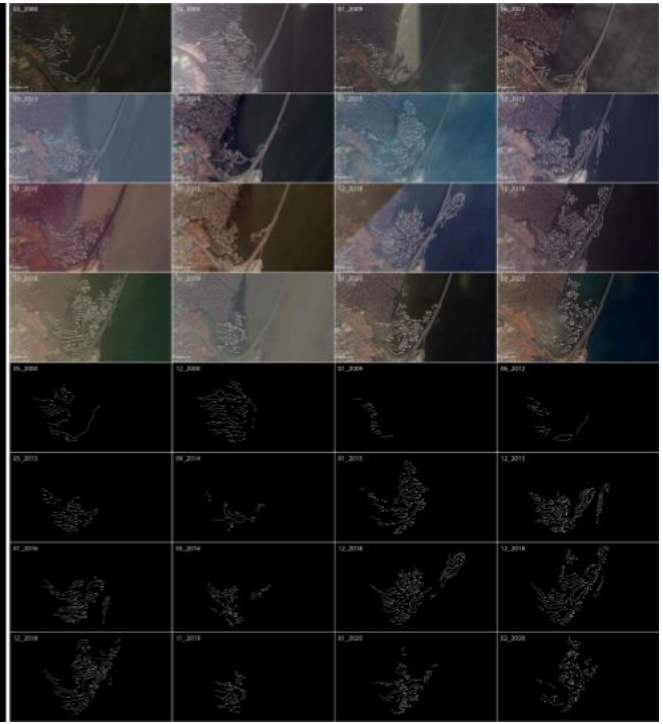

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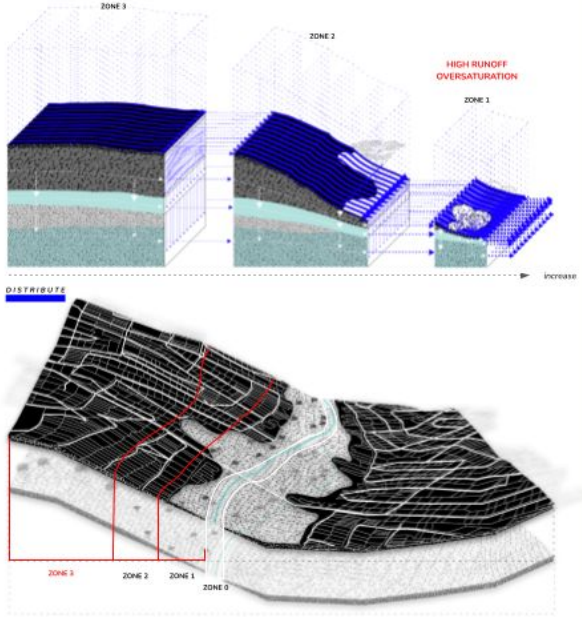

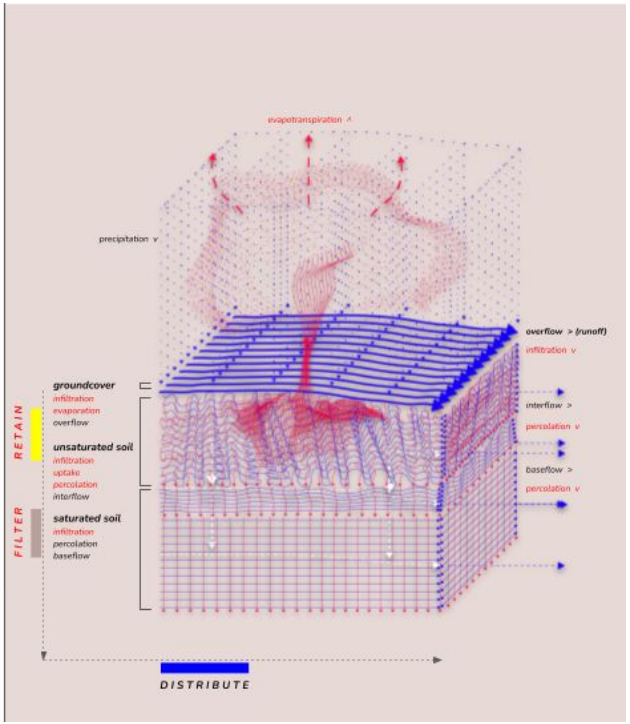

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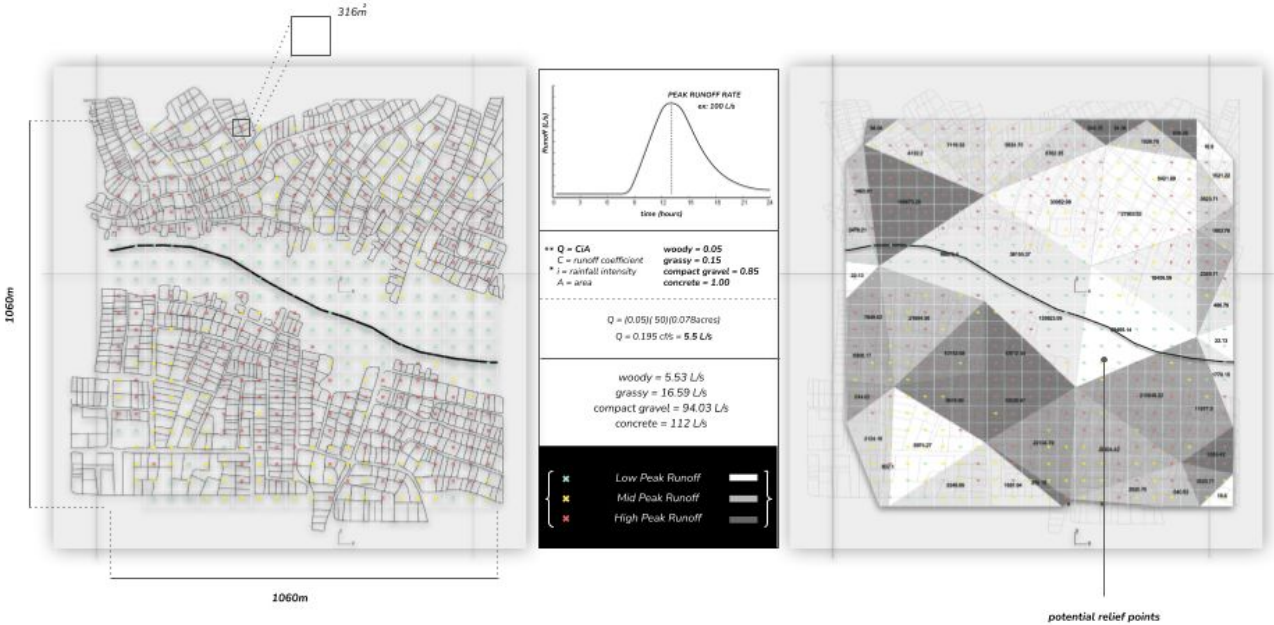

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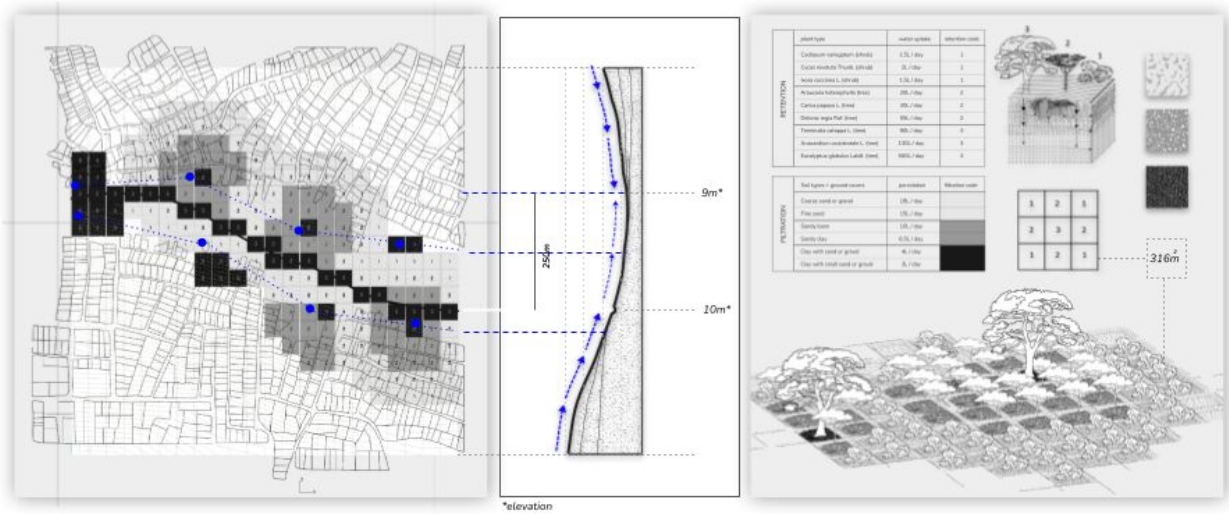

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SECTION **THREE**

Rewilding cities

Ecosystem engineers and key-stone species

Case studies

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SECTION **THREE**

Rewilding cities

Mending fragmented landscapes through ecological connectivity

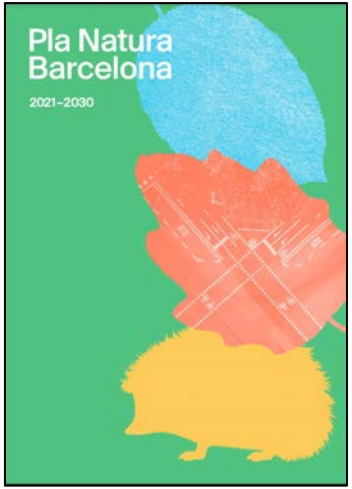
Ecological connectivity is an essential part of nature. It is **necessary** for the **functionality of ecosystems**, is key for the survival of wild animals and plant species and is crucial to **ensuring genetic diversity and adapting to climate change across all biomes and spatial scales.**

SECTION **THREE**

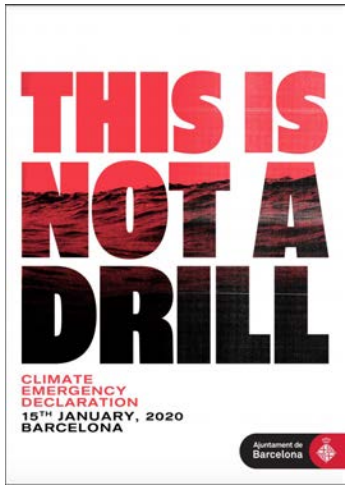
Rewilding cities

Ecological connectivity against landscape fragmentation

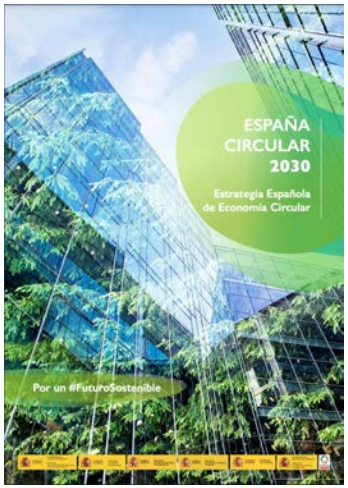
Agreement Towards a more inclusive and sustainable 22@ within Poblenou
https://ajuntament.barcelona.cat/barcelonallibres/ca/publicacions/pacte-cap-un-poblenou-amb-un-22-mes-inclusiu-i-sostenible



Barcelona Green Plan 2021 - 2030
https://ajbcn-decidim-barcelona.s3.amazonaws.com/decidim-barcelona/uploads/decidim/attachment/file/12162/Pla_Natura_Barcelona_2030_digital.pdf



Barcelona Climate Emergency Declaration - This is not a drill
https://www.barcelona.cat/emergenciaclimatica/en



España Circular 2030
http://materplat.org/wp-content/uploads/Espa%C3%B1a-Circular-2030.pdf

SECTION **THREE**

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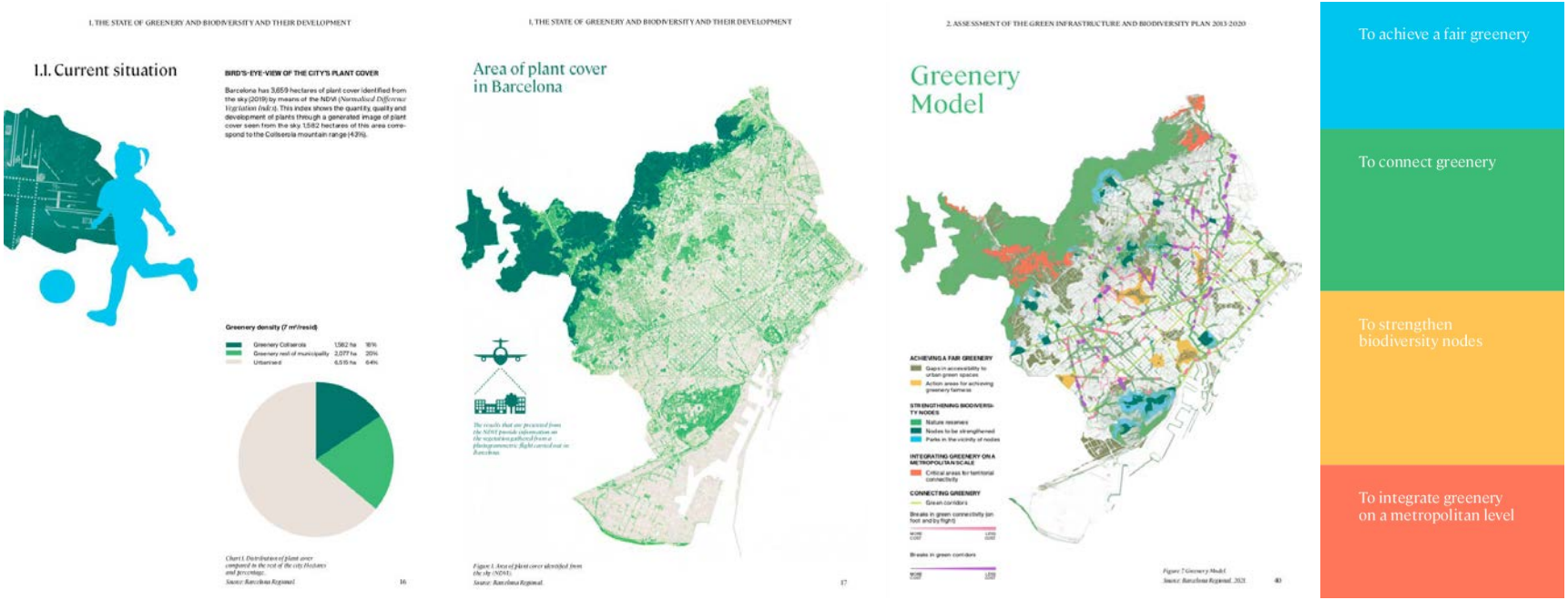
Ecological connectivity against landscape fragmentation



Barcelona Nature Plan 2021-2030
https://bcnroc.ajuntament.barcelona.cat/jspui/bitstream/11703/123630/1/Barcelona%20Nature%20Plan%202030%20WEB.pdf

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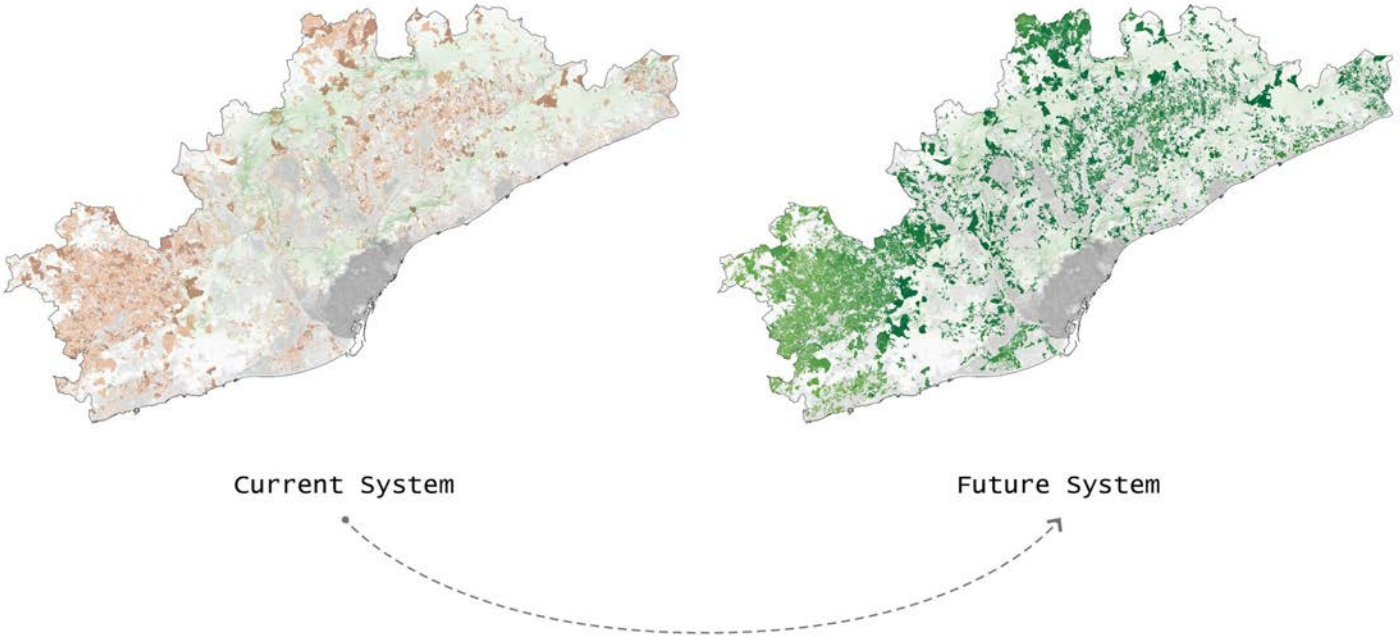
SECTION **THREE**

Rewilding cities

Towards breathing cities



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SECTION **THREE**

Rewilding cities

Partnering with ecosystem engineers in design processes

Simulating the likelihood for **ecosystem engineers to thrive** in heterogeneous territory and foresee the consequences of their living in order **to drive their produced impact towards designated solutions.**

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Simulating the likelihood for **ecosystem engineers to thrive** in heterogeneous territory and foresee the consequences of their living in order **to drive their produced impact towards designated solutions.**

FlowerPowder

Acting on agriculture-induced landscape fragmentation with the support of pollinators and a data-driven methodology.

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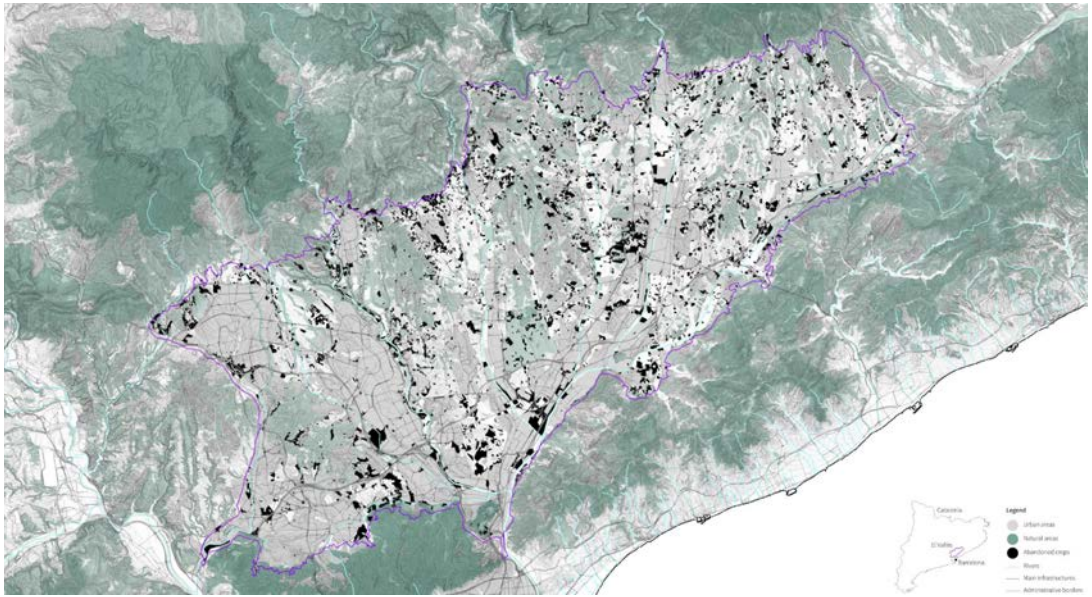
SECTION **THREE**

Rewilding cities

FlowerPowder

Supporting local communities and pollinators



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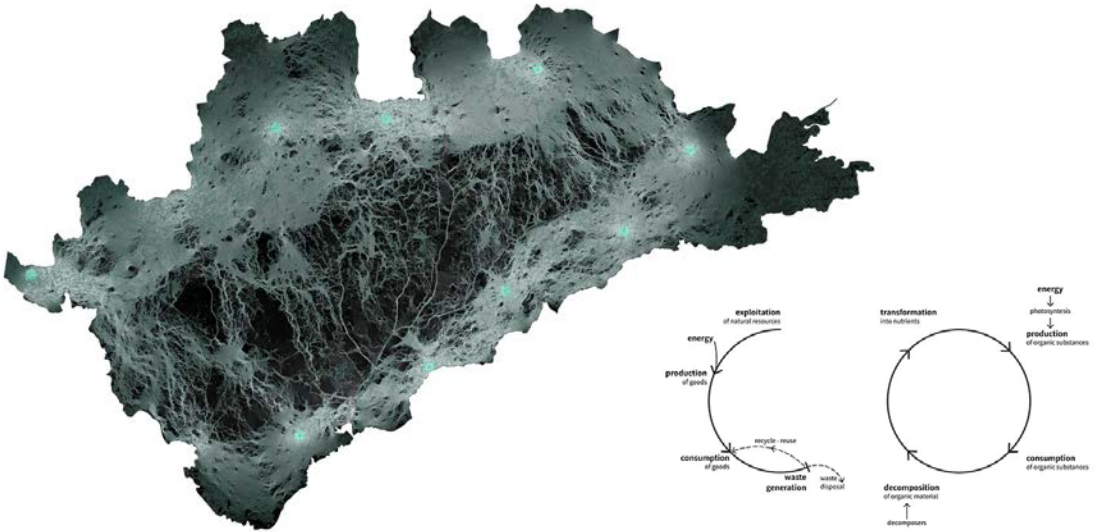

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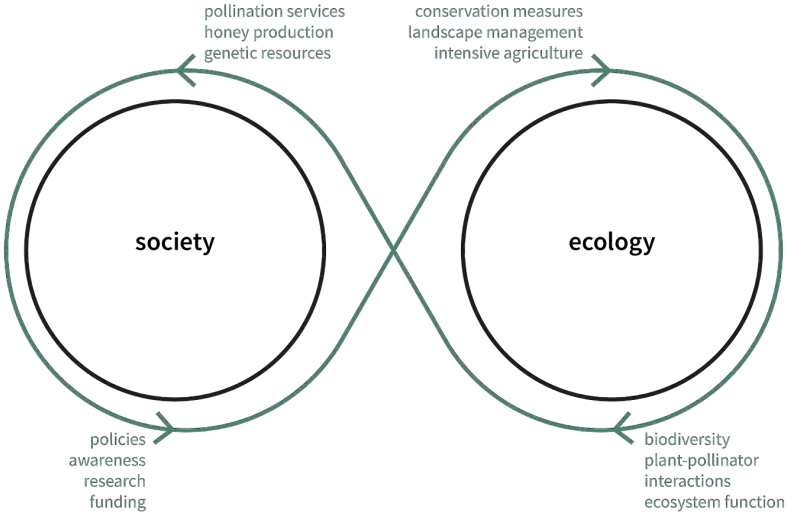

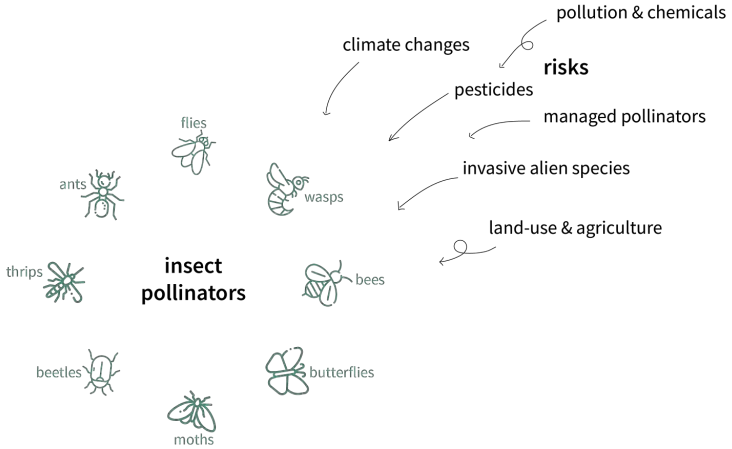

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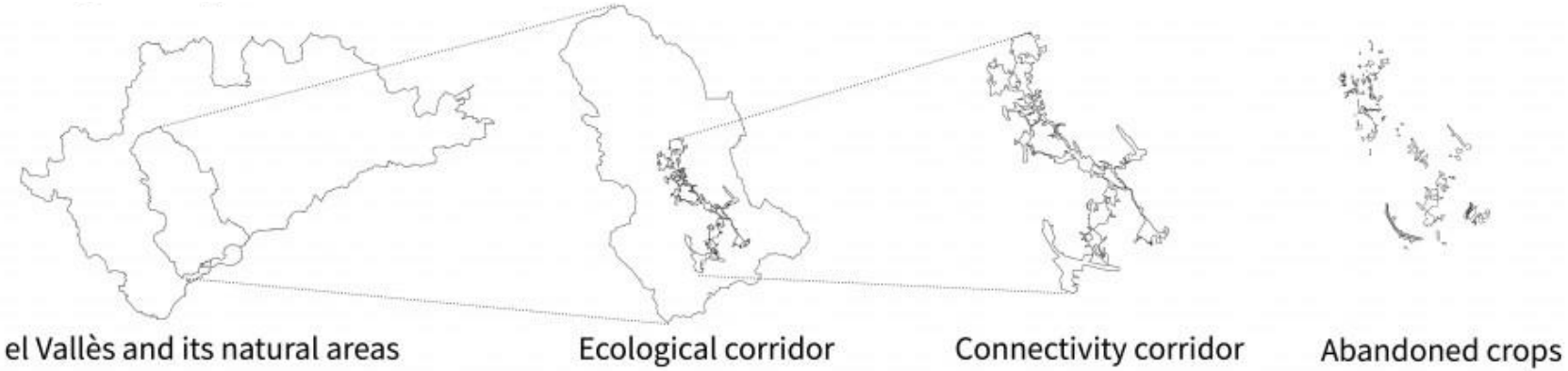

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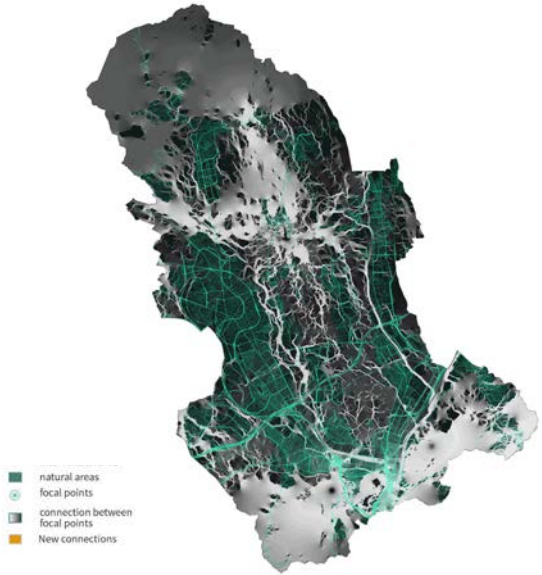

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SECTION **THREE**

Rewilding cities

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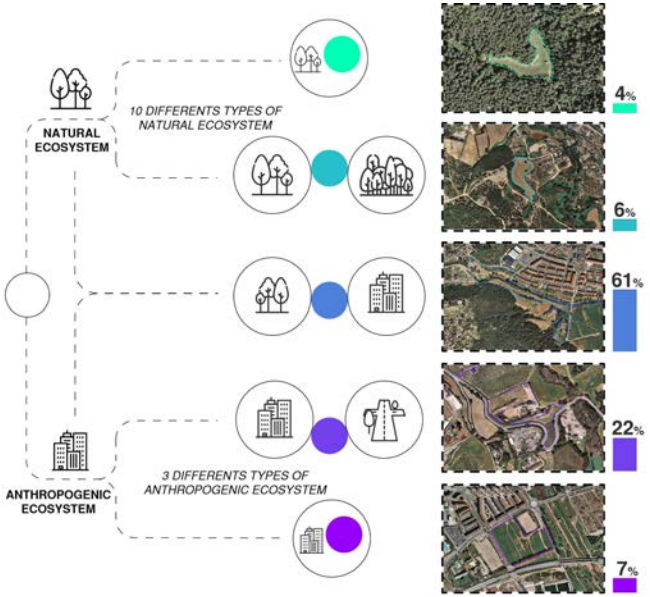
Supporting local communities and pollinators



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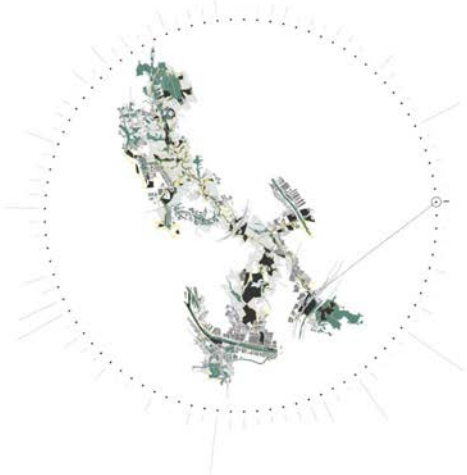

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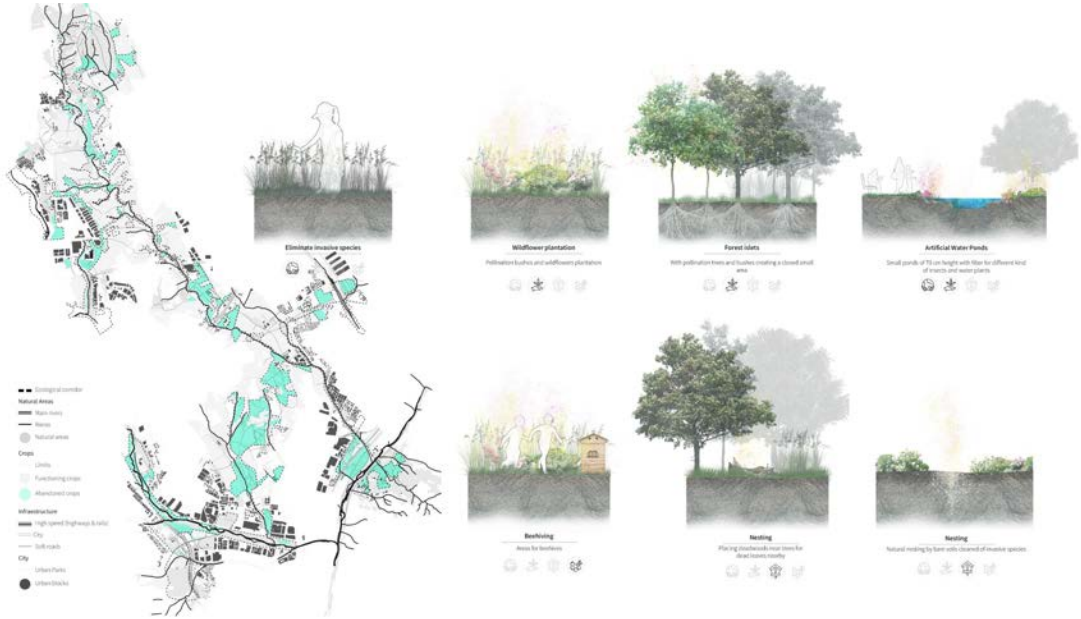

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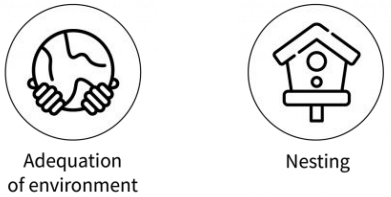

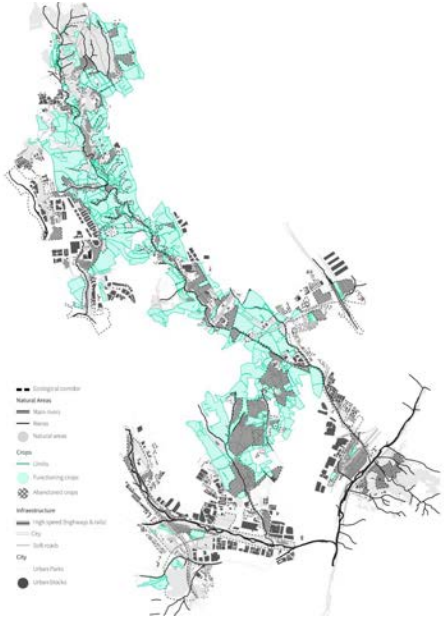

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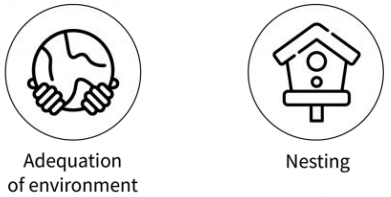

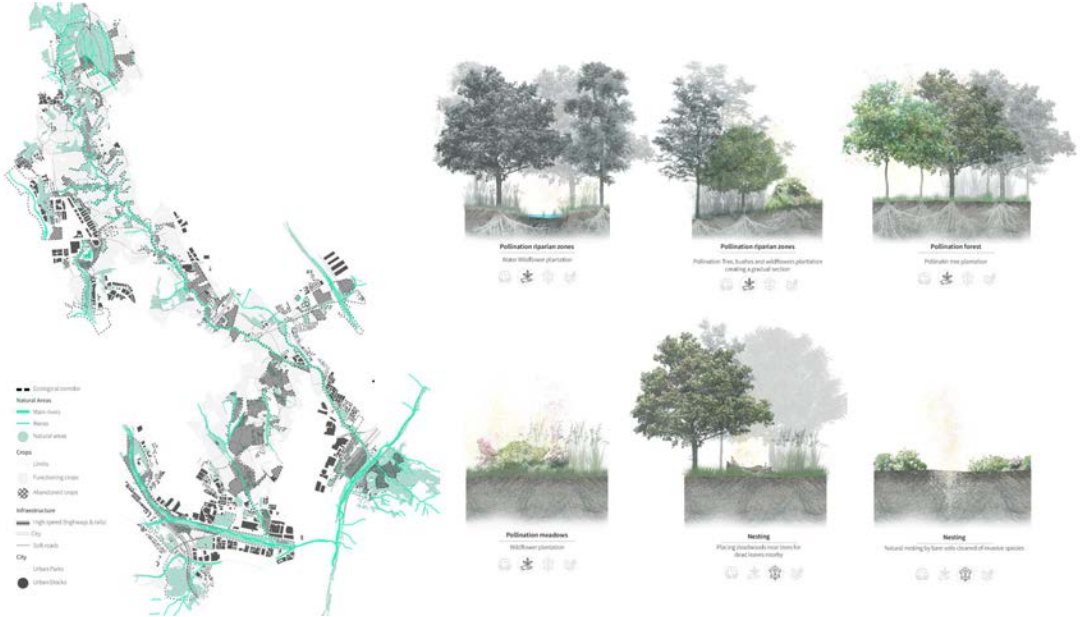

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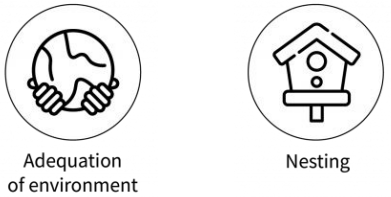

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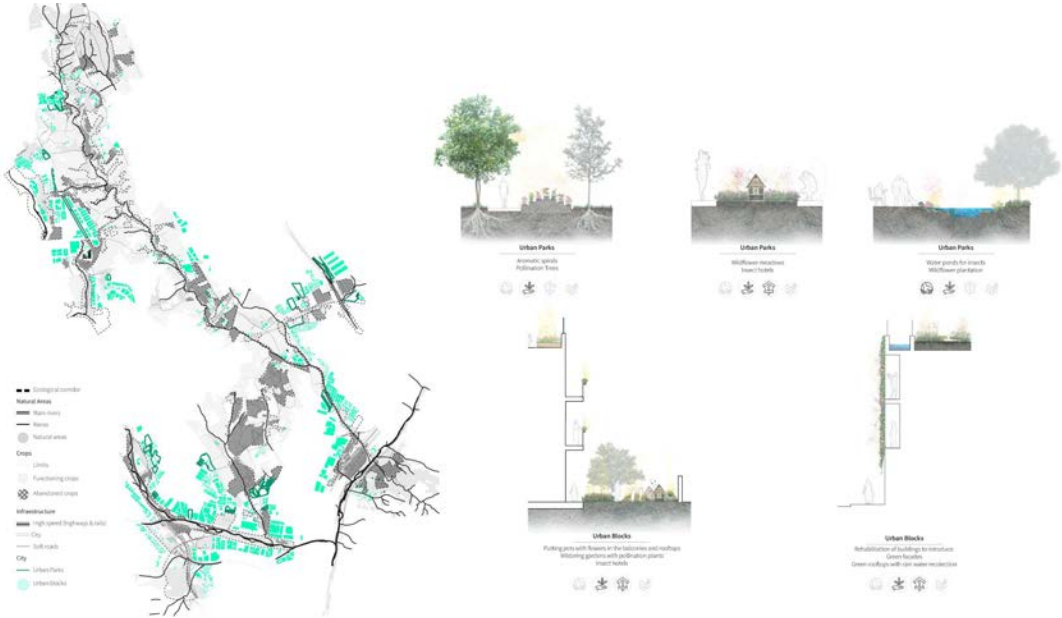

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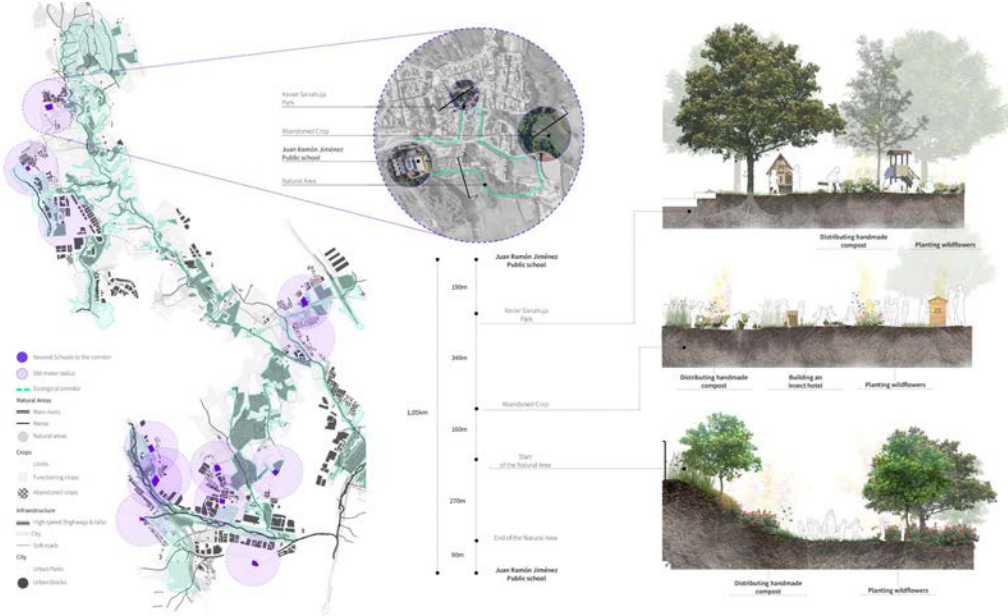

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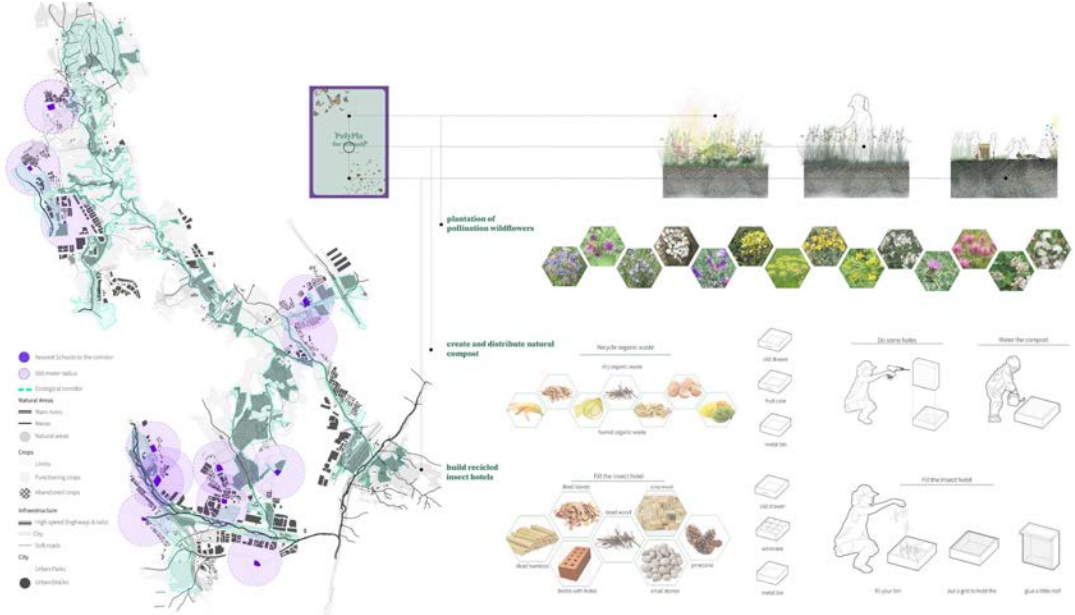

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SECTION **THREE**

Rewilding cities

Partnering with ecosystem engineers in design processes

Simulating the likelihood for **ecosystem engineers to thrive** in heterogeneous territory and foresee the consequences of their living in order **to drive their produced impact towards designated solutions.**

Rewilding Luxembourg

Mapping micro mobility pattern to support processes of community engagement in the deployment and monitoring of rewilding projects

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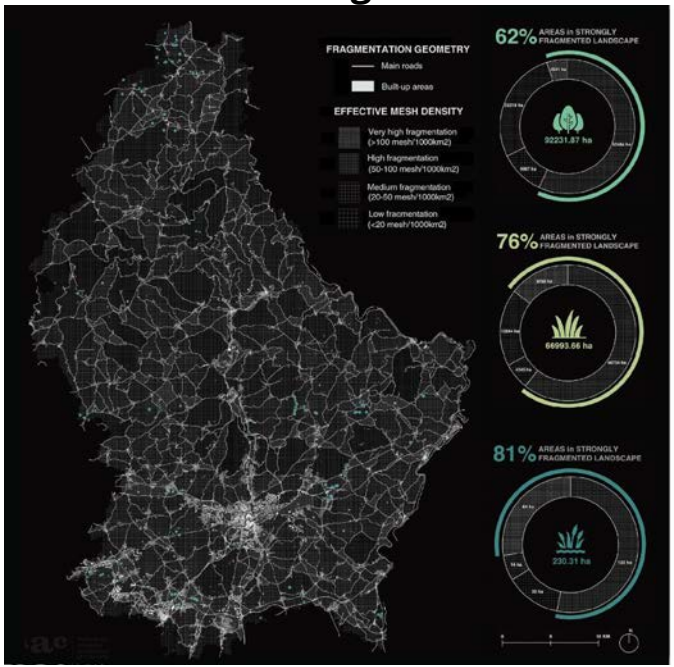

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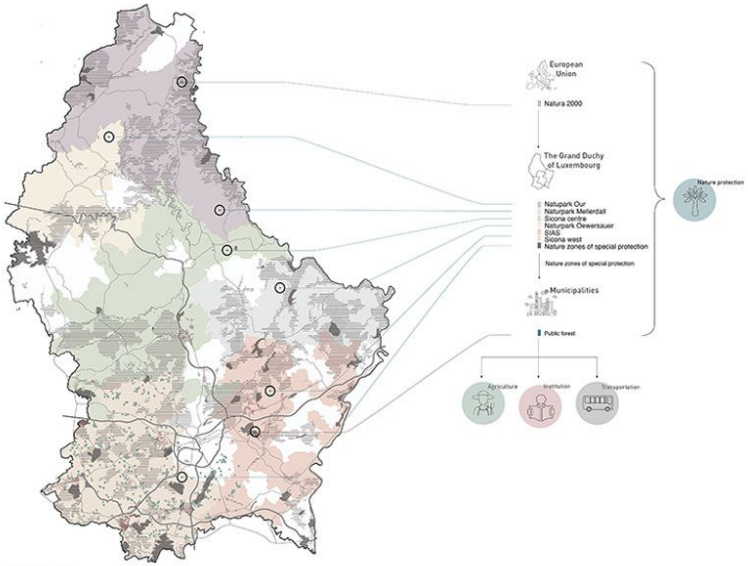
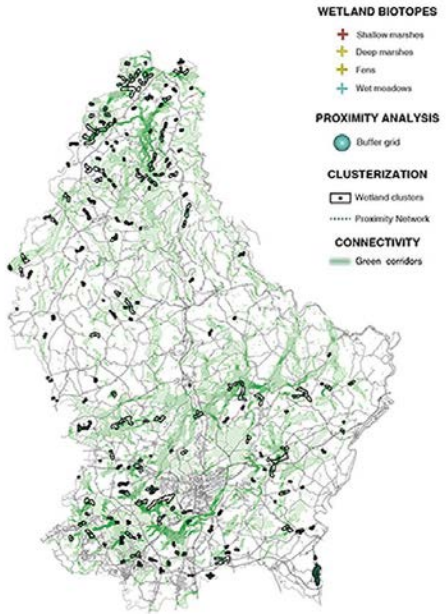


Luxembourg



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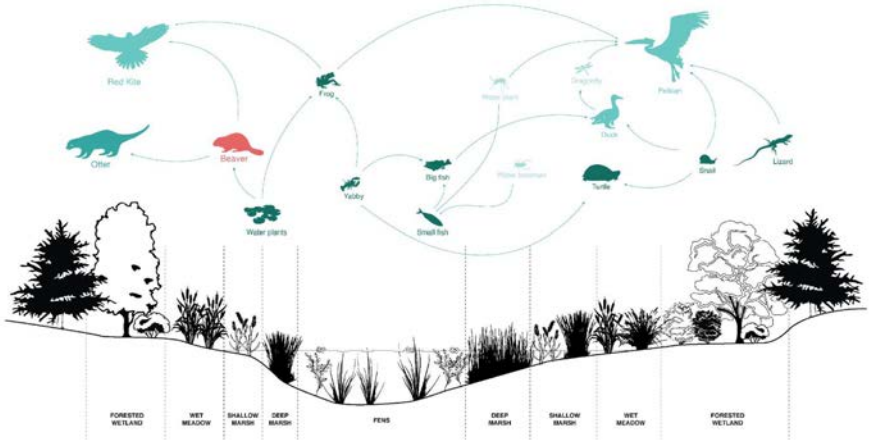

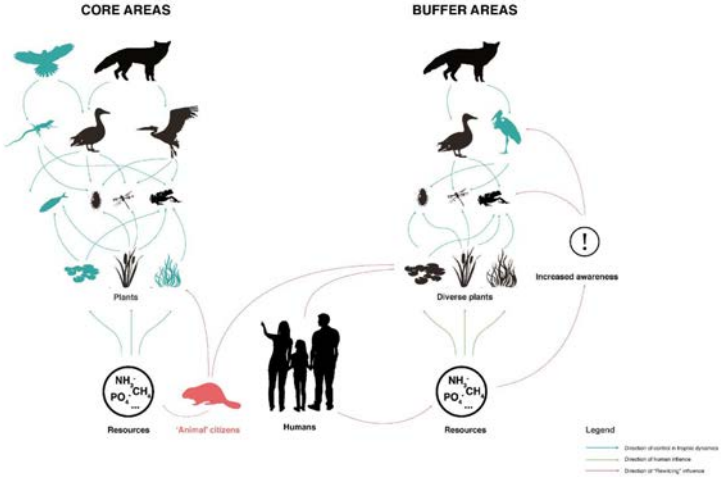

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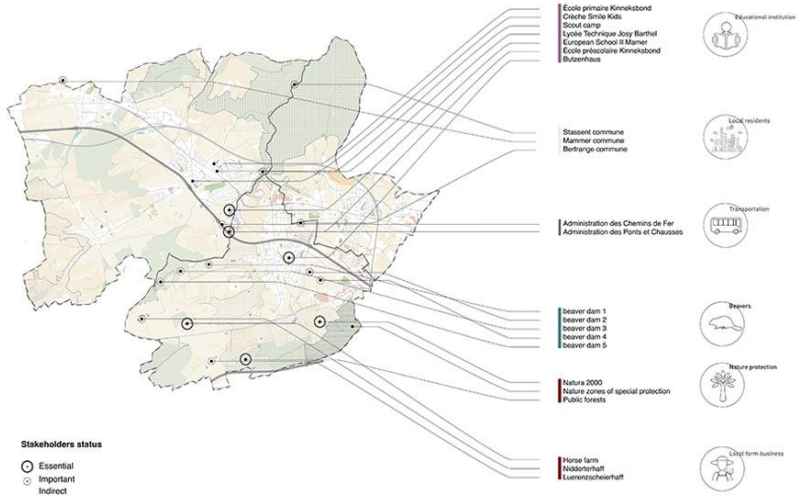

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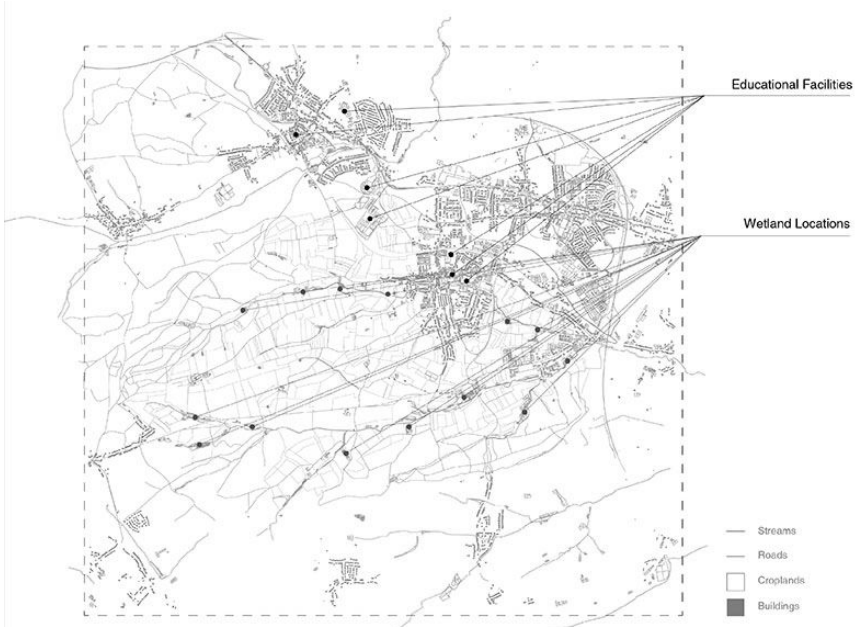

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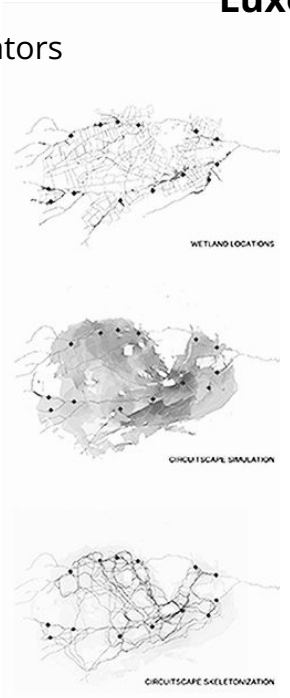

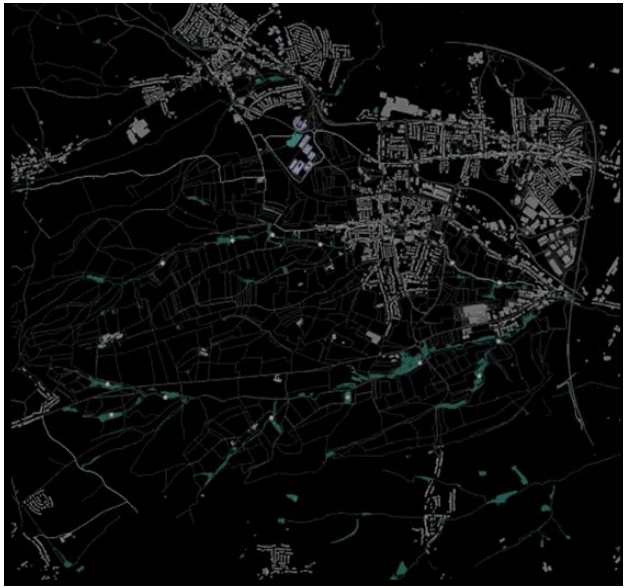

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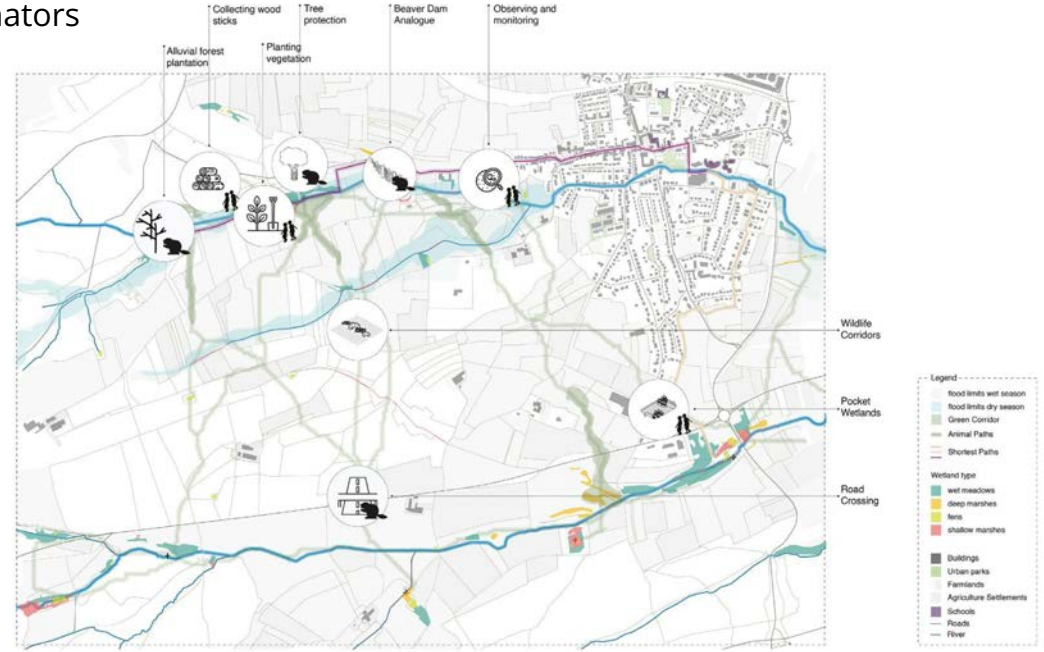

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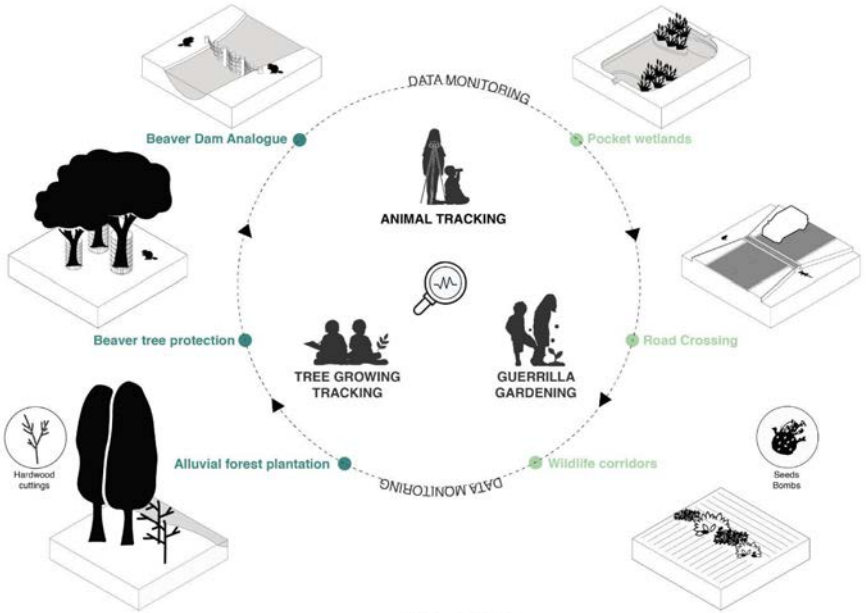

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Rewilding cities

Partnering with ecosystem engineers in design processes

Simulating the likelihood for **ecosystem engineers to thrive** in heterogeneous territory and foresee the consequences of their living in order **to drive their produced impact towards designated solutions.**

The Green Ally

Working together with red squirrels and fostering their behavioural traits and the role they play in ecosystems to reforest the Madrid area collaboratively.

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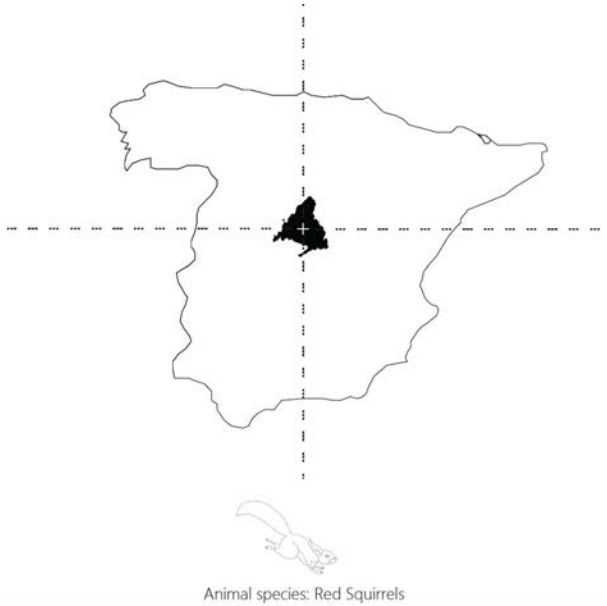
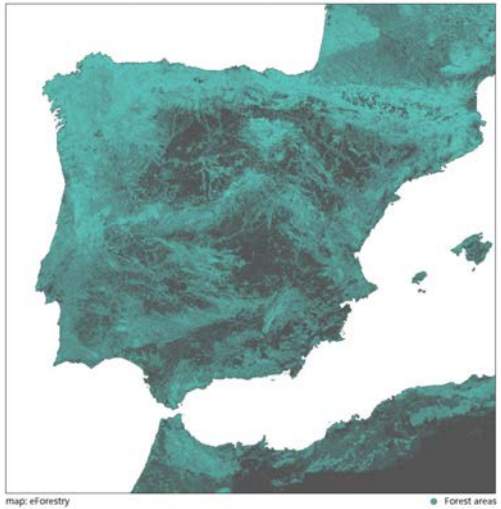
The Green Ally

Rewilding urban centers





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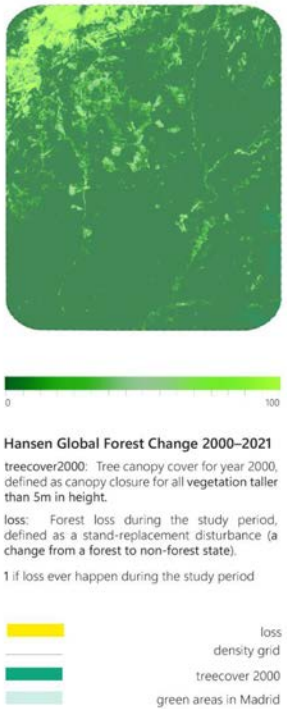
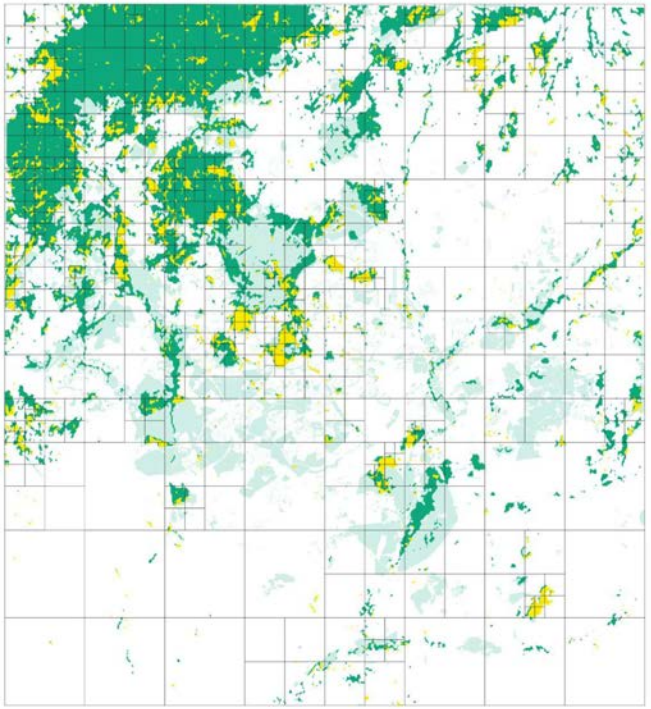
Rewilding urban centers





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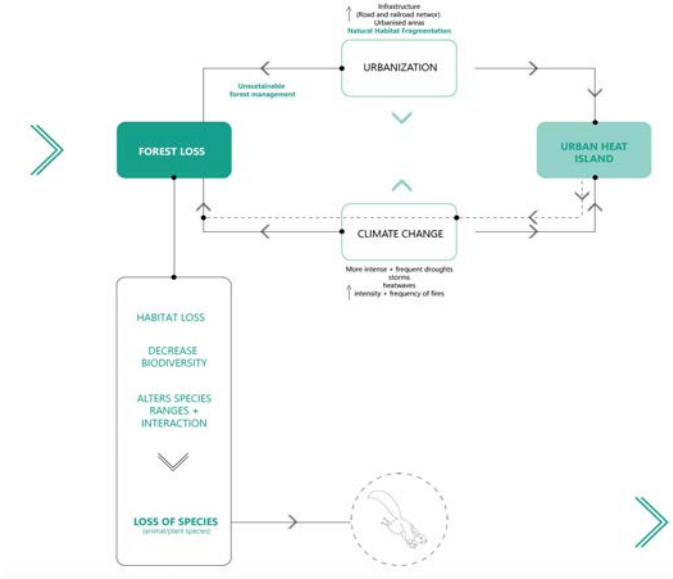

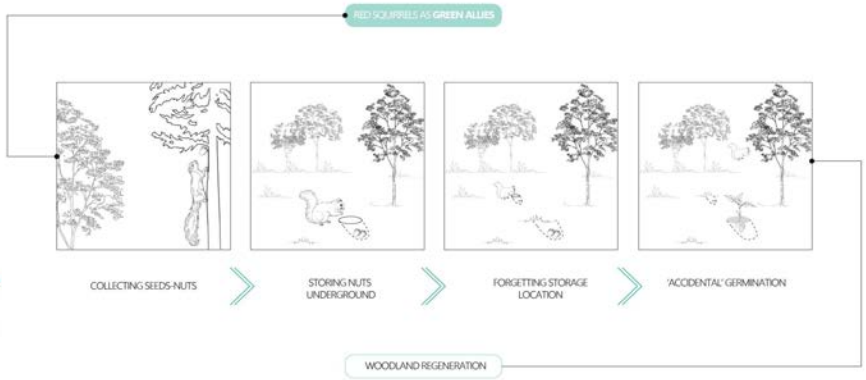

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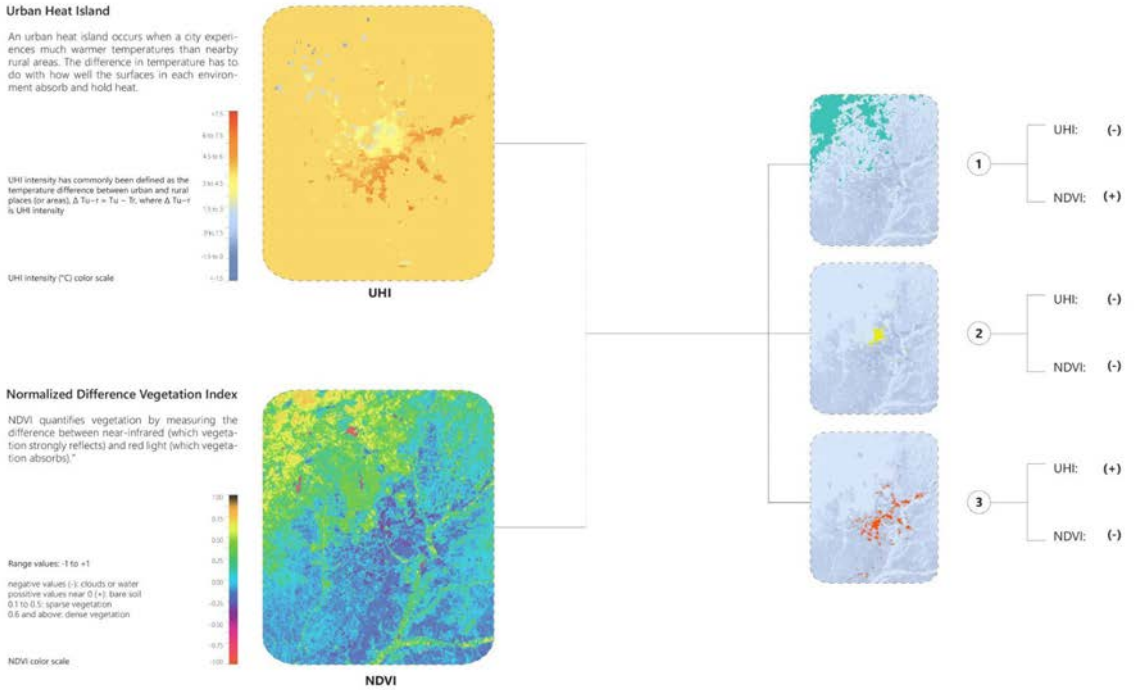

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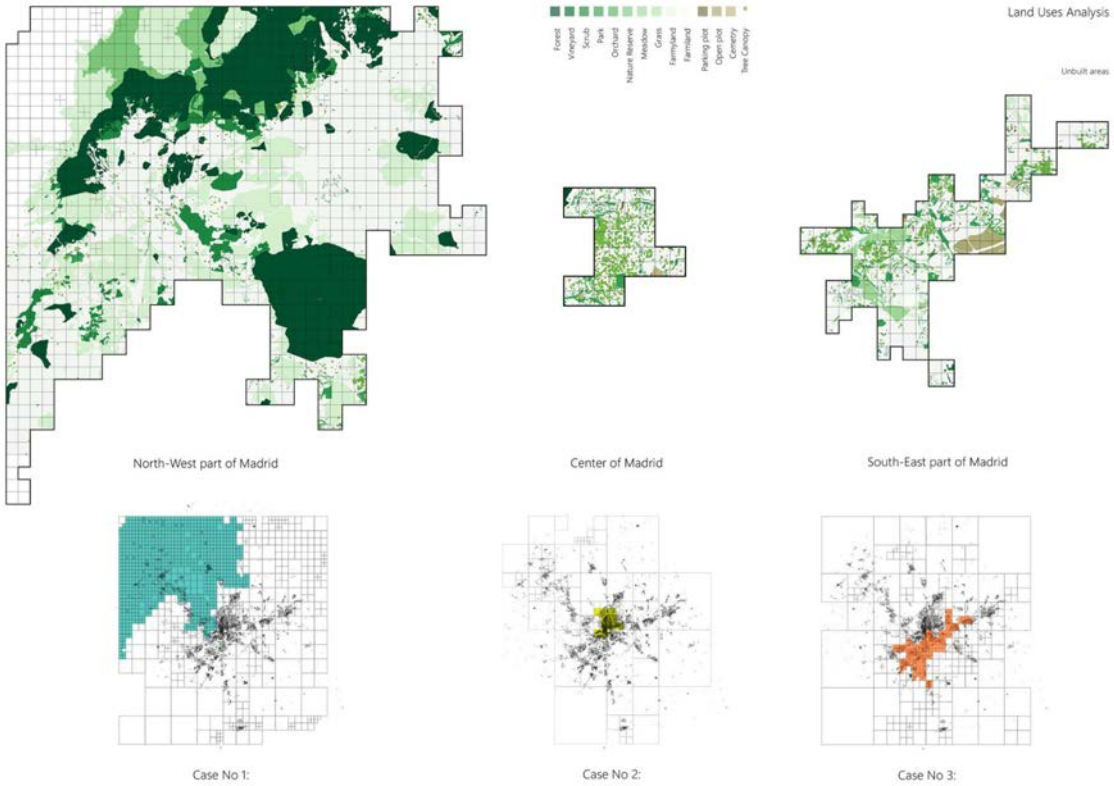

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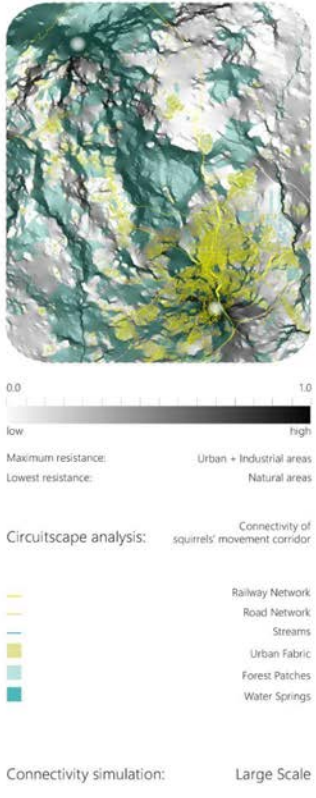
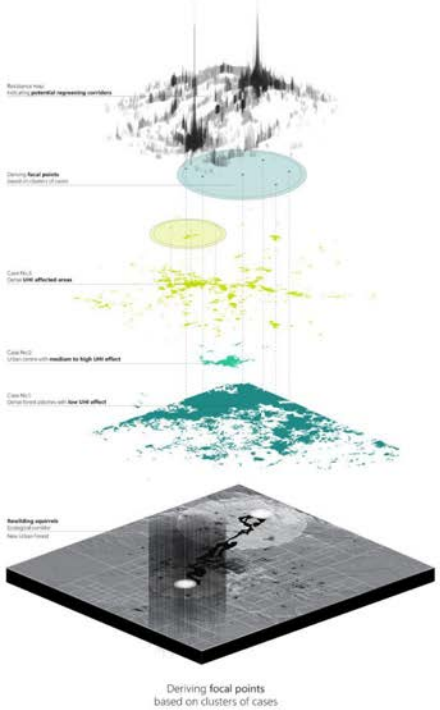


Connectivity simulation: Large Scale

Ecological Corridor



Axonometric Conceptual Drawing

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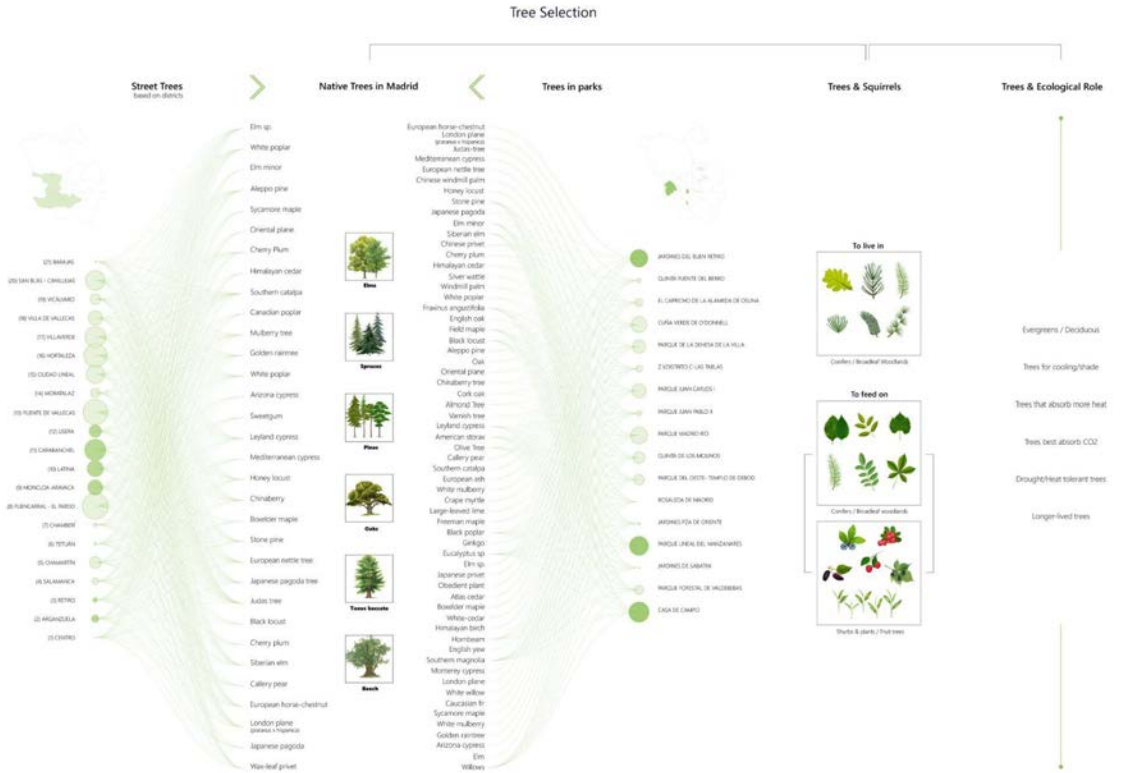

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SECTION **FOUR**

Productive ecologies

Co-designing green urban elements that produce food and energy

Co-Mida

iaac.net/project/co-mida/

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SECTION **FOUR**

Productive ecologies

CO-MIDA is an intelligent vertical modular system for the cultivation of edible plants, co-designed together with the citizens.

The system, thanks to the bacteria present in the earth, also produces the necessary electrical energy for its own operation and monitoring.

Funded by: BIT-Habitat, Ciutat Proactiva, Ajuntament de Barcelona

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Productive ecologies

Co-Mida

Green urban elements for the co-production of food and energy

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Co-Mida

Green urban elements for the co-production of food and energy

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Productive ecologies

Co-Mida

Green urban elements for the co-production of food and energy

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Productive ecologies

Co-Mida

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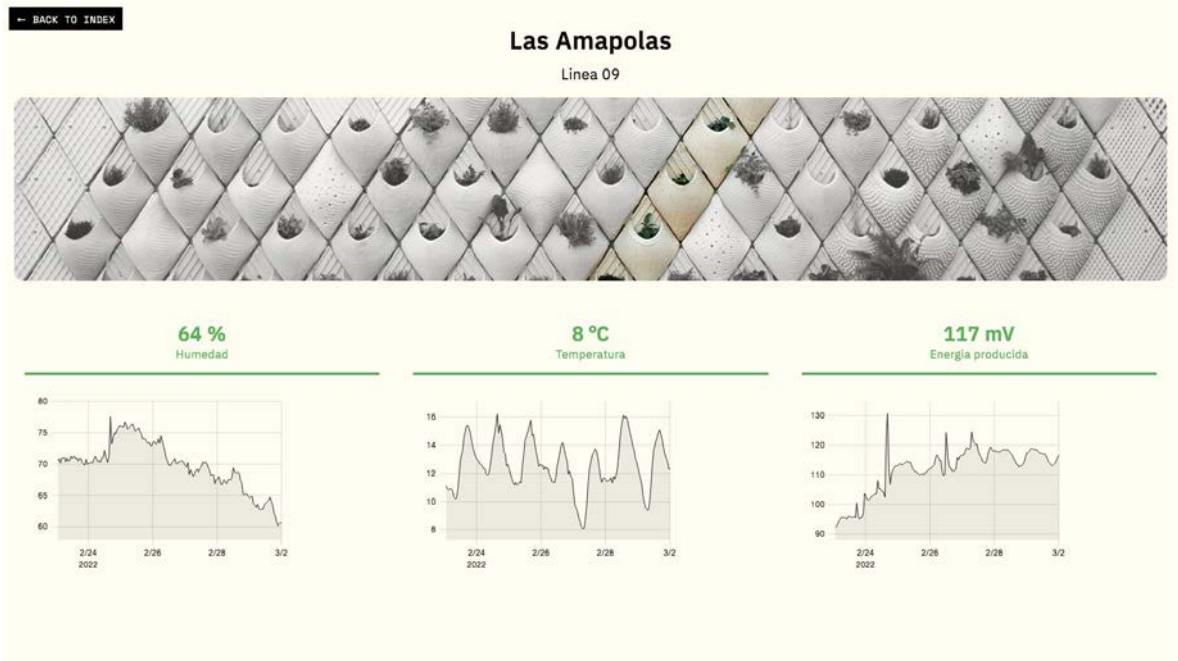

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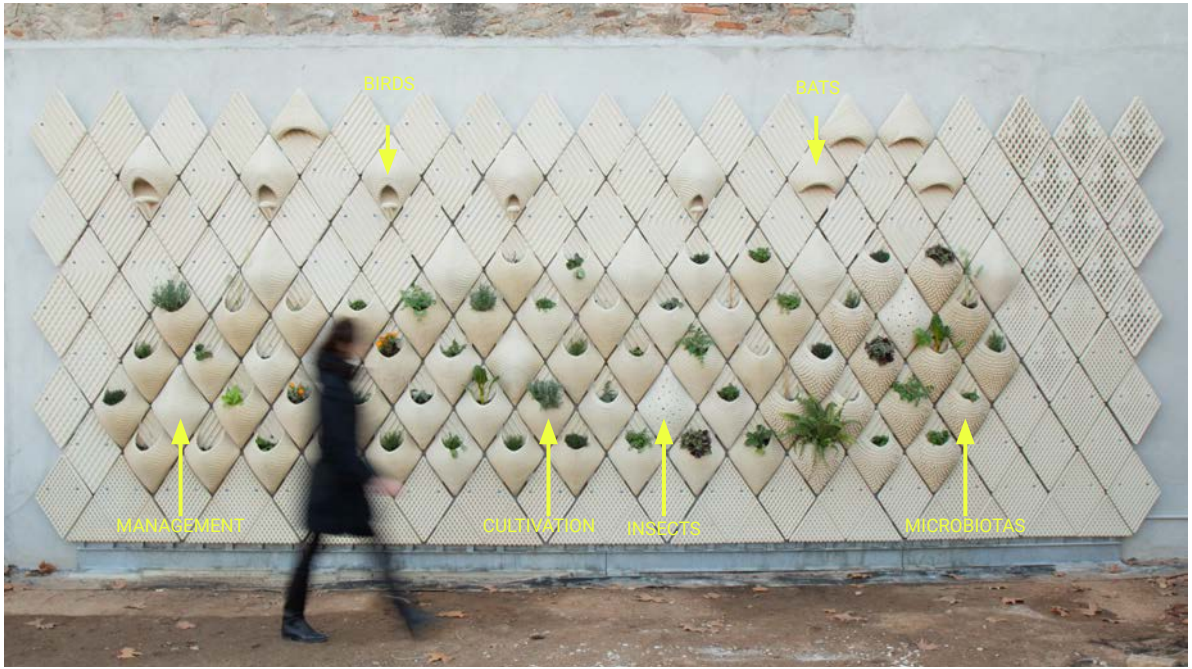

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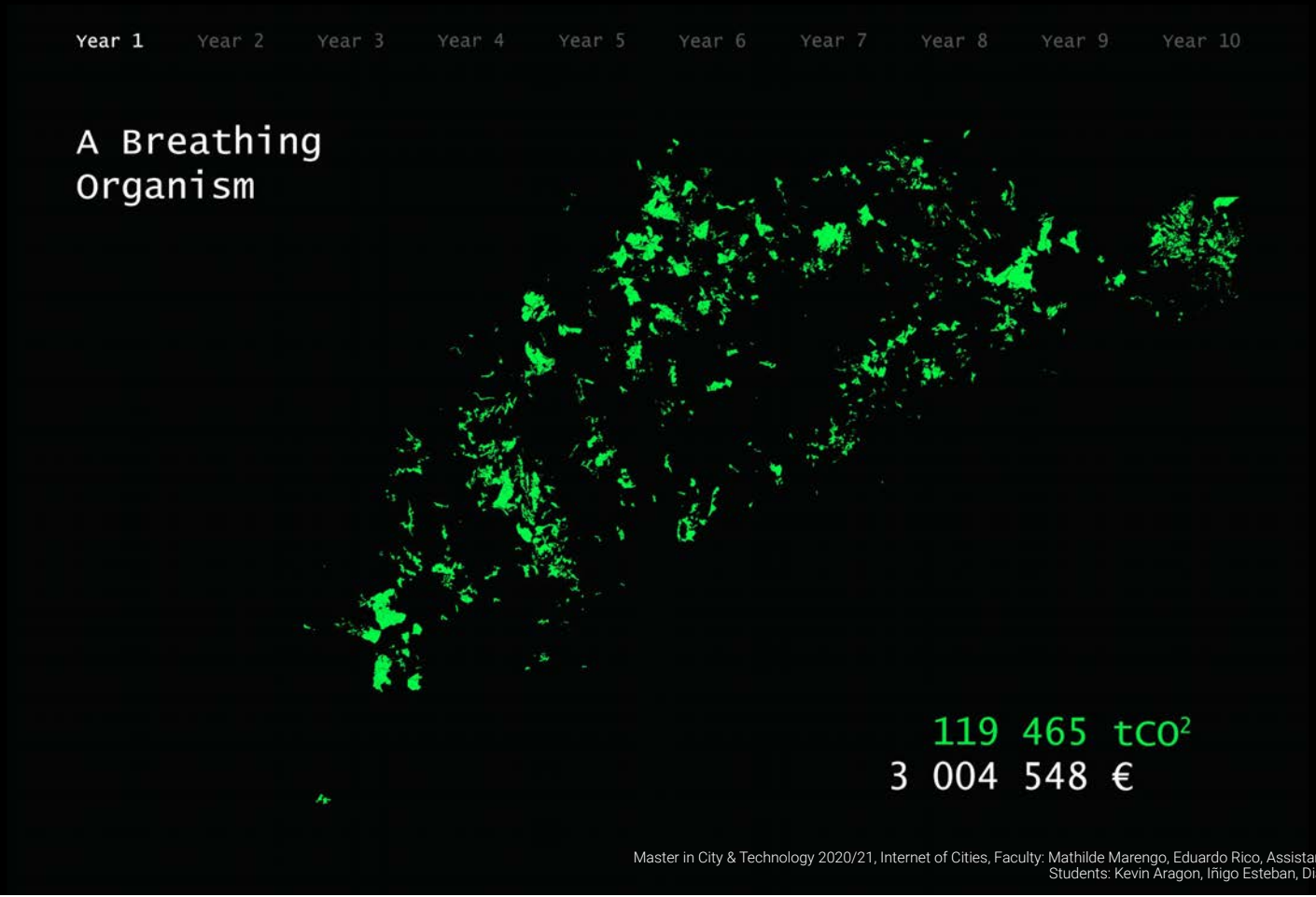

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