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自然的水系与文化的传承

——美国印第安纳州拉法叶市沃巴士河道未来30年规划

Natural Water as Cultural Water

— A Thirty Year Plan for Wabash River Corridor in Lafayette, Indiana, USA

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摘要 ……

本项目旨在寻找到印第安纳州拉法叶市沃巴士河流域的文化和自然之间的平衡点，季节性的洪水、无人管理的荒地和铁道的阻隔致使项目所在区域无法被周边的居民充分使用。该项目的设计方案运用了文化再现和雨洪管理技术，旨在复原生态和社会活力。通过自发性利用和动态组织，场地能够转变为一种具有文化特色的、可带来活跃的滨水体验的可持续基础设施。

关键词 ……

洪水；转变；景观基础设施；时间；自然；文化

Abstract ……

The project seeks to find the balancing point between culture and nature along the Wabash River in Lafayette, Indiana, which is currently underappreciated because of flooding, vacancy and disconnection. The design solution is an embodiment of cultural representation and technology of stormwater management in order to achieve ecological and social resilience. With potential for spontaneous use and dynamic programming, the site can transform into a sustainable infrastructure with a cultural identity that provides active waterfront experience.

Key words ……

Flooding; Transformation; Landscape Infrastructure; Time; Nature; Culture

变化的城市：现代都市景观基础设施的改变与更新

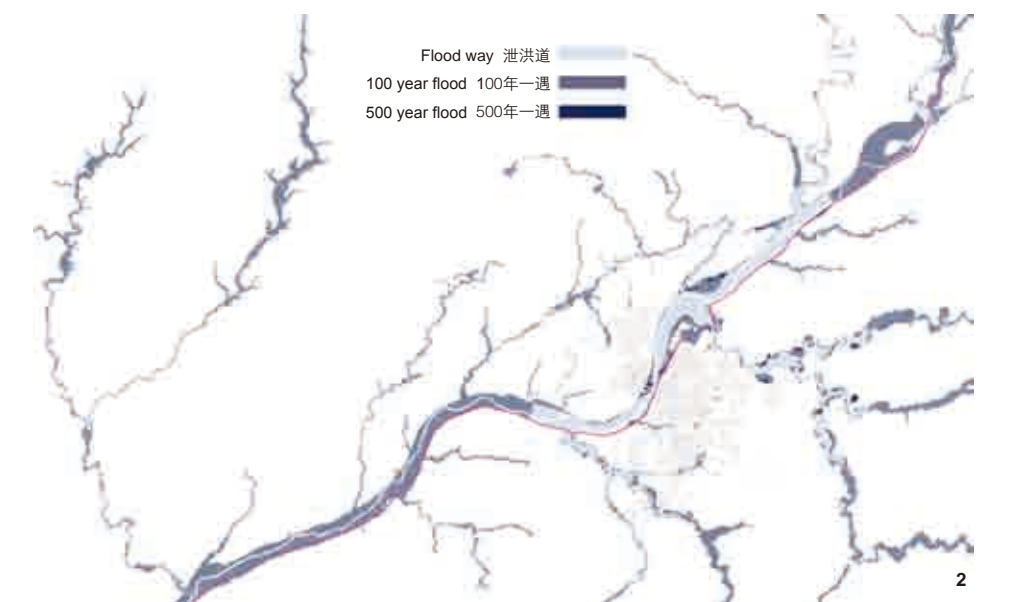
全球超过半数的人口居住在都市环境中，而我们现在所见的都市则是自然和人类上千年来相互影响的结果。随着人类社会进程的推进，我们所居住的都市空间也发生了改变。城市改变自己的形态，以接受社会意识和观念的不断变化；通过将自身变得更加多元化，以适应增长的人口；通过扩张和密集化，以适应工业和资源的兴衰。而这一系列的变化正构成了现代文明的基础。

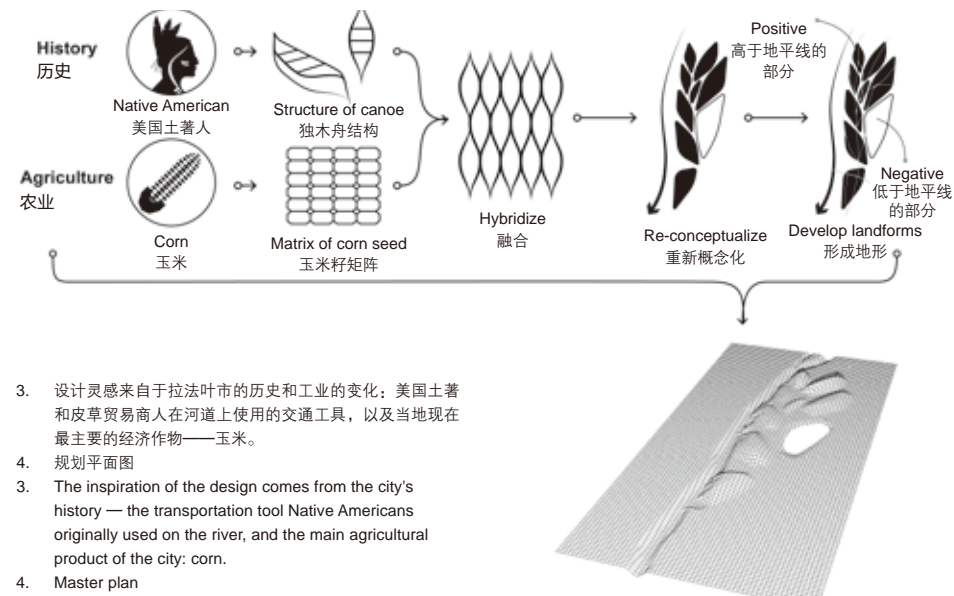
位于美国印第安纳州的拉法叶市正是这样一座典型的“变革之城”。它由美国商人威廉·迪格拜于1825年创立，作为当时皮草贸易的重要中转站之一。在此之前，这个区域主要为自然湿地，居住着美国的印第安原住民。著名的提普康诺战役^①于1811年发生在此。自城市建立之后，拉法叶市的经济和工业经历了多次转变，在300多年的历史岁月中，它曾经是一座物流运输城市，也曾被视为一座工业城市——沃巴士-厄琳运河即建造于这一时期——而现在，拉法叶市已然成为了一个手工业、商品制造业、教育产业和农业生产多元化发展的城市。但是，随着城市

的发展不再依赖于它最初的工业形态，这个项目中的场地——拉法叶沃巴士河道走廊正在逐渐失去它的活力：衰败的基础设施以及来自生态的压力导致河道两岸出现了越来越多的荒地，而沃巴士河也逐渐被人们所淡忘，不再是一个锻炼和休闲的去处。

时间、空间和文化对景观有着深远的影响。在都市发展的过程中，公园和城市开放空间肩负着特殊而重要的责任。它们不仅要适应都市的变化，还要成为促使城市改变的媒介——带领城市朝新的方向发展。在这个项目中，我希望能够将“景观基础设施”作为改变沃巴士河道的媒介，把这条尚未被充分利用的河道走廊改造成一个能够在为社区居民提供多种活动的同

1. 清晰的水道系统、以历史文化作为地形的设计背景、用作洪涝治理的湿地景观基础设施均为居民和普渡大学的学生提供了一个不可多得的学习平台。
 2. 沃巴士河饱受洪灾之苦。现有的休闲设施建造在洪泛平原之上，每年仅在某些特定时间才能被利用。80%的场地位于100一遇的洪泛区内，20%的场地位于500年一遇的洪泛区内。
1. Visible water system provides people an opportunity to learn about the cultural background of the river. It also creates a platform for Purdue students to operate water related experiments.
 2. Wabash River is flooding. Current recreation facilities are built on the floodplain that can only be used at certain times of the year — 80% of the site is on 100 year floodplain while 20% of the site is on 500 year floodplain.





时，将对当地生态的影响降至最低的新空间。在这里，“景观基础设施”同时受自然生态、当地文化以及社会生活方式的影响。究竟怎样的设计才能构建起生态和文化中的平衡点？如何在项目中突显当地的历史文化变化，并赋予地区新的身份？对场地现状做出怎样的改变才能恢复其原始生态面貌，并解决当地的洪涝难题？这些都是我希望能够通过这个项目——为沃巴士河道走廊的未来进行分析和规划——来解答的问题。

自然的水系与文化的传承：时间、空间及文化的三面观

这个项目的设计方向专注于改变文化和自然之间的关系。通过研究有关当地生态、历史，以及人口方面的文献资料，“把文化景观作为生态洪涝治理的基础设施”的设计大方向被确定了下来。设计的灵感来自于拉法叶市的历史和工业的变化：美国土著和皮草贸易商人在河道上使用的交通工具，以及当地现在最主要的经济作物——玉米。独木舟和汽船的形态与玉米籽的矩阵被提取出来并加以结合，再通过将其重新概念化，以作为建造正负地貌的具有启示性的模板。这样的地表形态可以减缓和改变洪水的流速及流向，成为河道和城市之间的一个缓冲地带。同时，

改造后的场地为附近居民提供了一个活动场地，也成为了当地野生动物的一个避难所。该设计方案令人们有机会了解历史，并重新认识这条曾经辉煌的河道。设计方案将场地内原有的地形特点加以利用，并设法把它们转化成对社区有利的基础设施。改造后的场地连接起河道两岸的两座城市（拉法叶以及西拉法叶），并为商业发展提供了机会。

利用洪水——一河两城三策略。最终的设计方案利用公共景观基础设施将生态发展和文化活动结合在一起。该方案并非把洪水作为一种对城市的威胁而费尽周折地去避开它。改造后的场地以三种不同的地形——山丘、台地和河溪——引入洪水，并对其加以利用。这种有“弹性”的地形景观在减少洪涝损失的同时，也为当地野生动物提供了栖息地。改造后的地形将区域内的水系向公众开放，为人们提供了了解河道历史和生态技术的机会。

自然生长——都市农业、河道湿地以及城市森林。设计方案的生态框架会随着时间来适应场地的变化——重新引入的湿地为居民提供了活动场所，还能够对水体进行净化。当前，沃巴士河的污染主要来自于现代肥料的使用，科学地利用湿地植物可以很好地解决这一问题。另外，洪水过后留下的富含养料的淤泥滩地可以成

为发展都市农田的理想场地，便捷的交通和对岸普渡大学农学院的参与也让这一设想更加容易付诸实践。

经济增长——商业建筑的发展。拉法叶是一个人口流动十分频繁的城市，随着普渡大学的扩张和本地人口的增长，整个区域出现了越来越大的住房需求。方案中在河道两旁所设想的高层混合功能组团可以有效地缓解这一问题。湿地公园也能够带动周边地产及商业的发展。沃巴士河道走廊将成为一个可供人们享受自然、悠闲购物的商业新区。

到达体验——为两座城市创造联系。由于铁道和河流的阻隔，简单的“到达体验”在基地内竟变得难以企及，这也是河道走廊逐渐被人们淡忘的原因之一。方案中新的桥梁建设可以有效地解决这个问题。除此之外，步道建设将连接大区域内已有的公园绿地，并且能够很好地把人流引入到这个区域。

学习机会——历史、生态、水文学习。随着项目的建设，人们对沃巴士河的看法也将发生转变。清晰的水道系统、以历史文化作为地形的设计背景、用作洪涝治理的湿地景观基础设施均为居民和普渡大学的学生提供了一个不可多得的学习平台。

休闲娱乐——河道两旁丰富的活动。通过调查问卷以及研究有关拉法叶人文的文献，一个专注于场地并结合文化背景的活动系统被融入到最初的设计当中。改造后的场地将成为一座城市中的绿洲，带给周边居民一种久违的绿色生活方式。

提升认知——营造城市文化特色。将文化景观作为提升公众对于沃巴士河自然和文化历史认知的契机，从而营造出地域特色。LAF

致谢

感谢西恩迈克尔罗塔、大卫巴拉什、罗伯特索温斯基、汪怡斐、德鲁斯坦格尔、蔡哲铭、肯努皮县地理信息部门、美国人口调查局、Stats Indiana网以及沃巴士河改善组织对本项目的共享！

注释

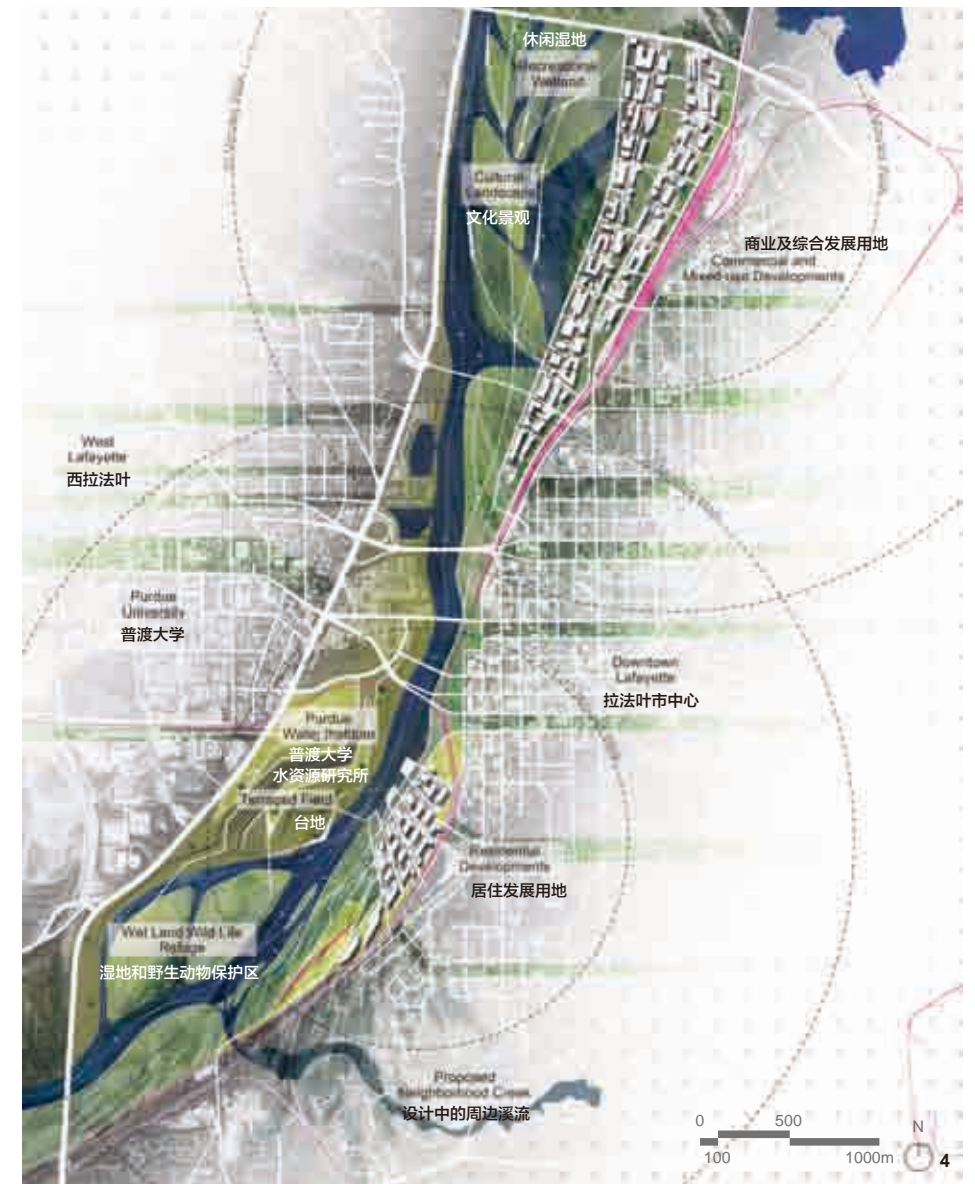
① 提普康诺战役于1811年11月发生在美国印第安纳州提普康诺县。战役双方分别为印第安土著和美国陆军。

Cities of Change: the Alteration of Contemporary Urban Landscape Infrastructure

Cities we see today are the results of centuries of natural process and human interaction. Urban spaces are constantly changing and evolving, along with the expansion of human civilization. They convey, to embrace the shafts of ideology. They diversify, with varying ethnic concentration. They sprawl and densify, to adopt the rise and fall of industry and resources. In so doing, they form the foundation of humanity's existence.

Lafayette (IN) is a typical city of change! In 1700's, the region was inhabited by native people and was mostly wetland. In 1811, the Battle of Tippecanoe took place. In 1825, City of Lafayette was founded by William Digby as an important station for fur trading. After that, the city embraced industrial development and constructed the Wabash Erie Canal in the 1840's. Through its more than 300-year history, Lafayette has been a shipping city, an agricultural city, and an industrial city. The changes of the city follow its cultural and industrial shift. Today, Lafayette has developed as a diversified community, with manufacturing, merchandising, education and agricultural production all contributing their share. But with the region no longer rely on its original industry for survival, our site — Wabash river corridor is losing its vitality — decaying infrastructure, local environmental pressure lead to vacant land and derelict river corridor.

Time, space and culture have tremendous impacts on landscapes. During the process of urban evolvement, city's park and open spaces carry an important responsibility. They do not only adapt to changes, but also have the opportunity to reshape the existing landscape condition and guide the city to new directions. For the purpose of this project, I wonder if it is possible to use



landscape infrastructure as an opportunity to transform the underappreciated river corridor into a new distention that provide programs which will fulfill pubic desires with minimum disturbance to existing natural system. “Landscape Infrastructure” hereinvokes social, cultural and natural elements as parts of the equation. Where is the balancing point between local culture and nature? How to emphasize historical changes of the region and providea new identity to the site? How to restore the original ecological integrity? I want to find answers to these questions by analyzing and planning for the future of the

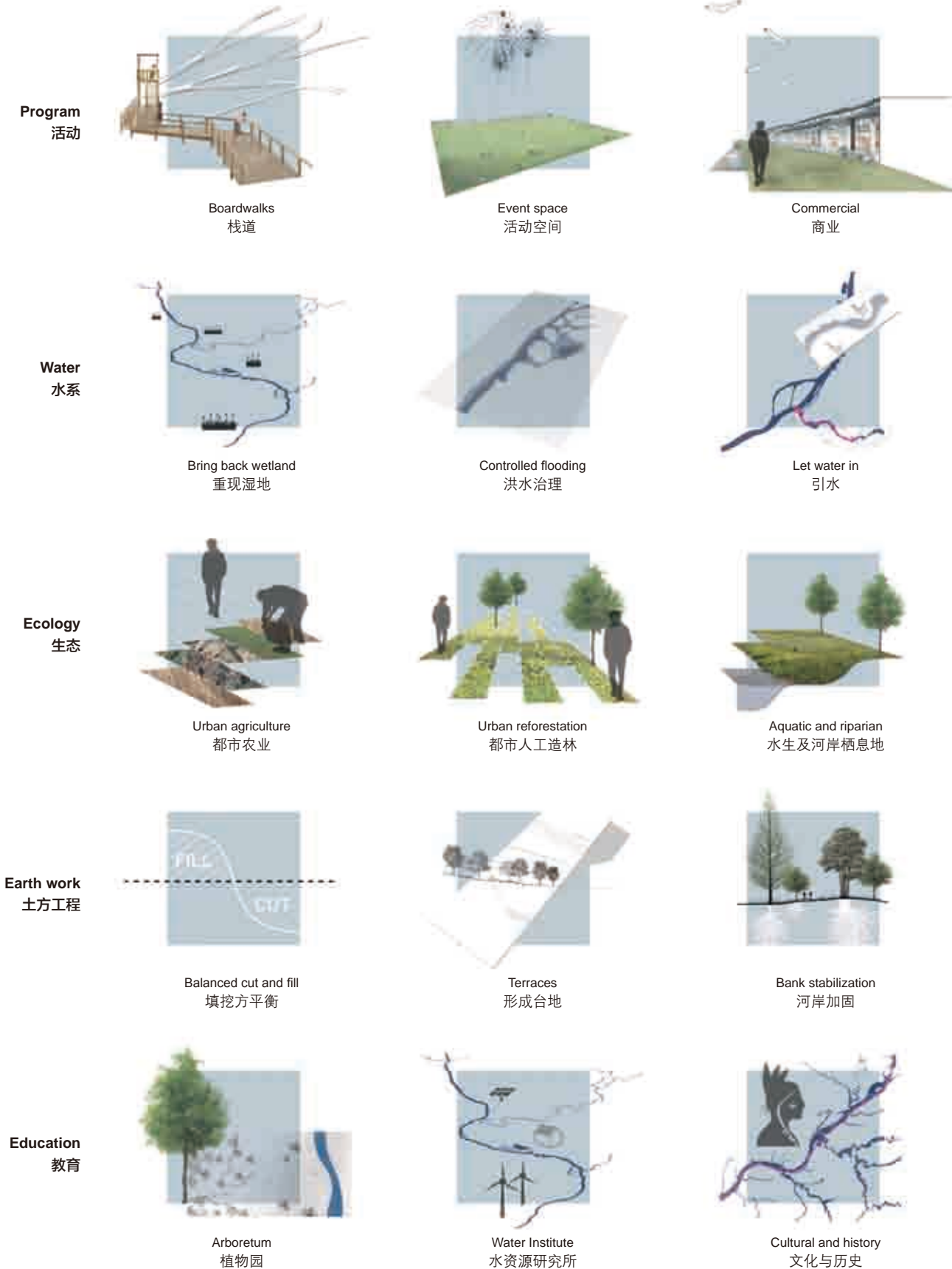
Wabash River corridor in Lafayette through this project.

Natural Water as Cultural Water: an Axonometric View of Time, Space and Culture

The general design of this project focused on the relationship between culture and nature. By studying reports about people's view of the river, local geographic and demographic information, the concept of “cultural landscape serves as sustainable storm water management infrastructure” was formed. The inspiration of the design comes

Page of Ideas 理念

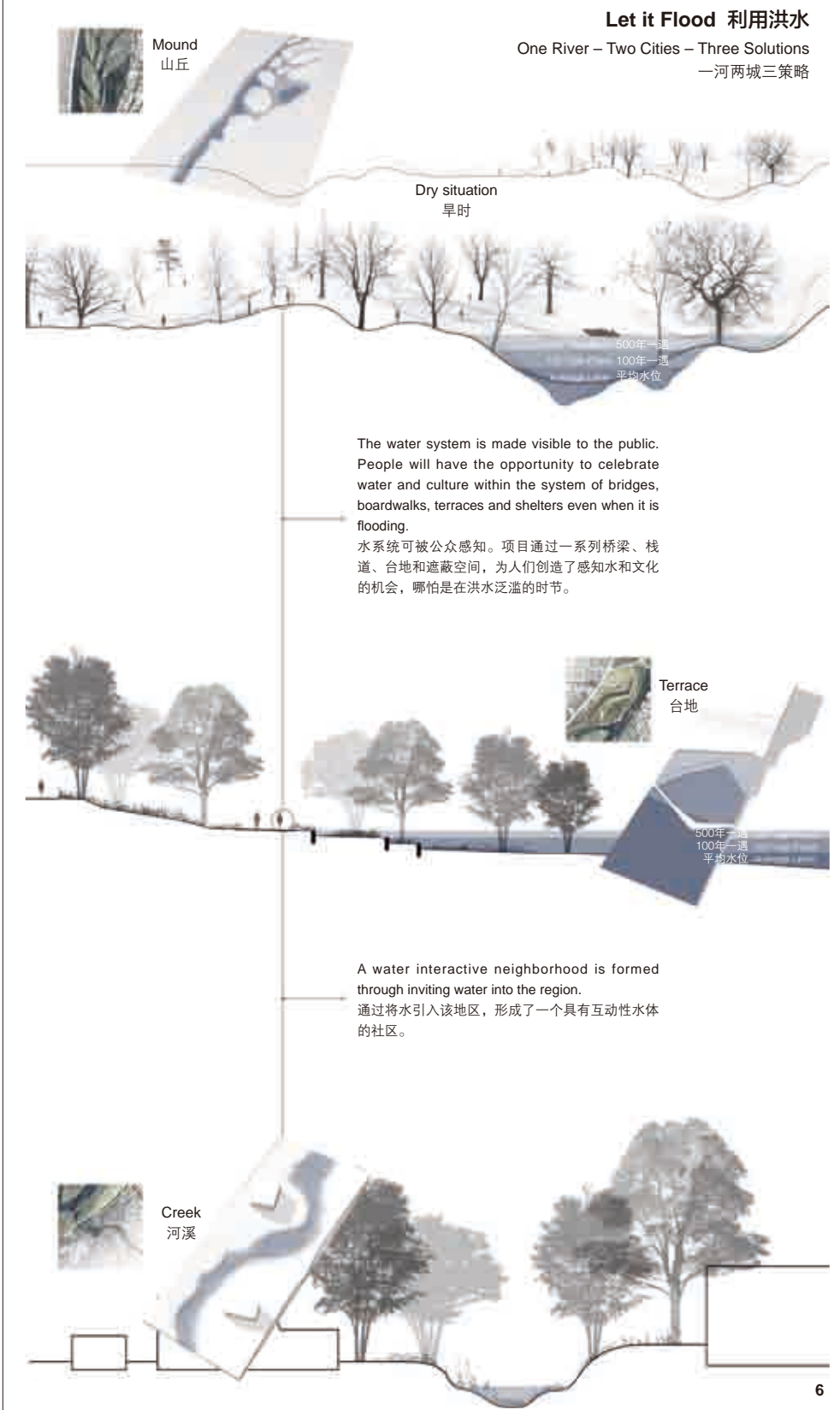
The site has the potential to be transformed into a sustainable infrastructure that provides dynamic waterfront experience and cultural identity. 场地拥有转变为一种可持续基础设施的潜能，将会为该地区带来充满活力的滨水体验和文化特色。



from the city's history — the transportation tool Native Americans originally used on the river, and the main agricultural product of the city: corn. The morphological structure of the canoe and the matrix of the corn seed was taken, hybridized and re-conceptualized into revelatory shapes to create positive and negative landforms. It reroutes and collects water and serves as a buffer between the river and the city during flooding seasons. The plan provides a refuge for wetland plant and animal species. It also creates a platform for water related recreational activities. In this way, people have the opportunity to change their perspective about the river. The city of Lafayette will have its new cultural identity. Also, this concept takes advantage of the existing site condition and problems as opportunities for storm water management. It creates connections between cities. A water institute, recreational facilities, urban agriculture field, and commercial developments are also adapted into the project with site-specific design.

Let it flood — one river, two cities, three solutions. The final proposal is composed with a public infrastructure of water systems that brings ecological developments and cultural activities together. Instead of treating water as a major threat to the city and avoiding it, the plan welcomes water with three different landforms: mound, terrace, and creek. They all exist with the purpose of minimizing the harm of flooding, creating programs along the river, providing habitat for endangered species and making the water system visible to the public. People will have the opportunity to celebrate water and culture within the system of bridges, boardwalks, terraces and shelters even during flooding. Seasonal flooding also naturally fertilizes soil, makes urban agricultural production easier to establish.

Let it grow — wetland restoration,



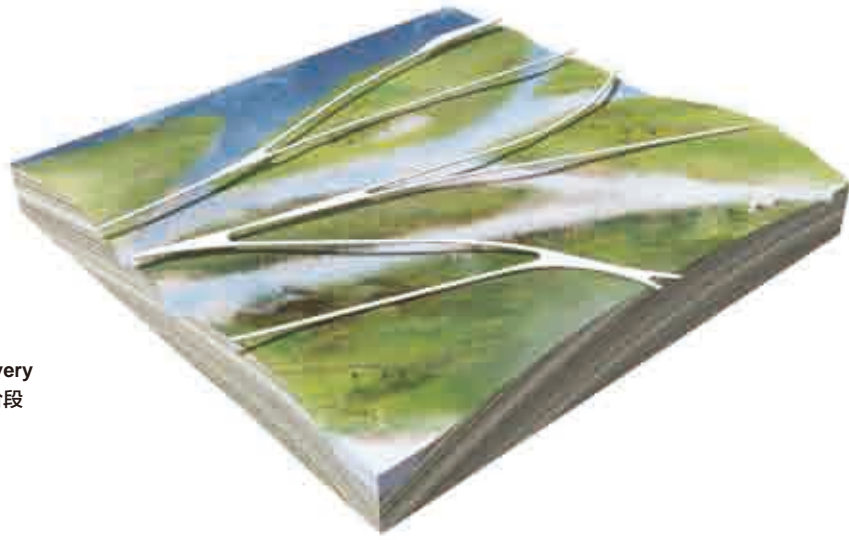
- 5. 理念展示：场地拥有转变为一种可持续基础设施的潜能，将会为该地区带来充满活力的滨水体验和文化特色。
- 6. 利用洪水——河两城三策略。
- 5. Page of ideas: the site has the potential to be

- transformed into a sustainable infrastructure that provides dynamic waterfront experience and cultural identity.
- 6. Let it flood — one river, two cities, three solutions.

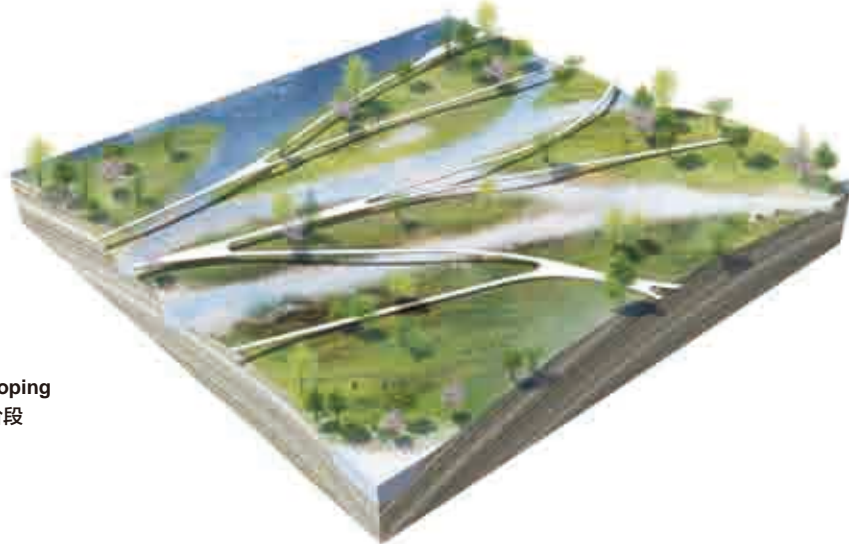
Let it Grow 自然生长

Plant community developing phases 植物群落发展阶段

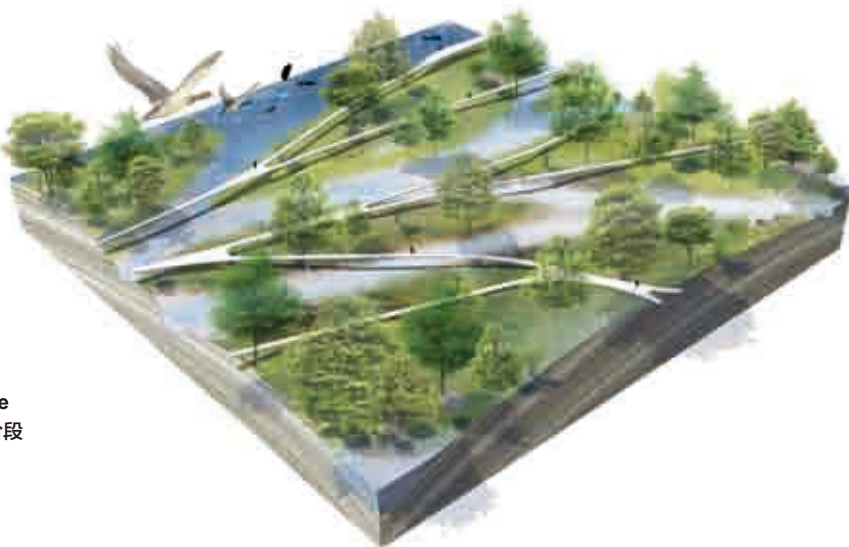
Recovery
恢复阶段



Developing
发展阶段



Mature
成熟阶段



Stage 1
阶段1

0 ~ 5 years
0~5年

Environment starts to recover from constructional activities. Moss and other herbaceous plants start to grow. 停止建筑活动以恢复环境。苔藓和其他草本植物开始生长。



Stage 2
阶段2

5 ~ 15 years
5~15年

Environment is left undisturbed. In this period natural systems are healthy and work harmoniously. 环境不受干扰。在这期间，自然系统健康、和谐地发展。



Stage 3
阶段3

5 ~ 30 years
5~30年

The ecological system reaches mature stage. The landscape begins to incorporate human activity through cultivation and modification of the land for survival. 生态系统达到成熟阶段。景观开始容纳人类活动，包括农耕等土地利用活动。



Let it Grow 自然生长

Bring back wetland / create a sustainable future for greater Lafayette 重现湿地，为拉法叶市创建一个可持续的未来

Grove 树林



Partially transport through both wind and water 部分种子依靠风和水传播

Aquatic / riparian 水生/河岸环境



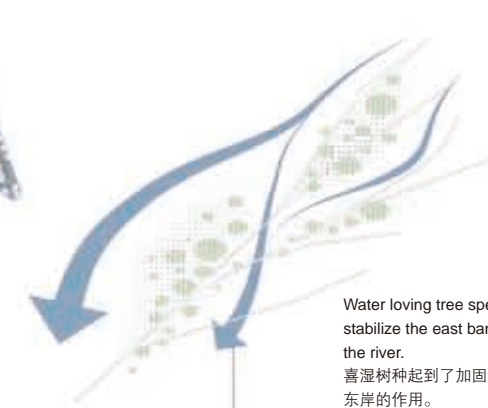
Seed transport through water 种子依靠水传播

Prairie 陆上环境

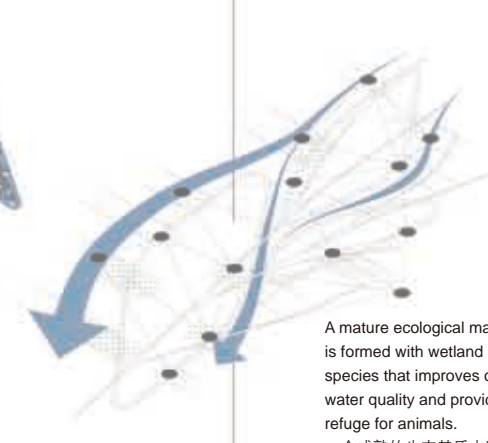


Seed transport through wind 种子依靠风传播

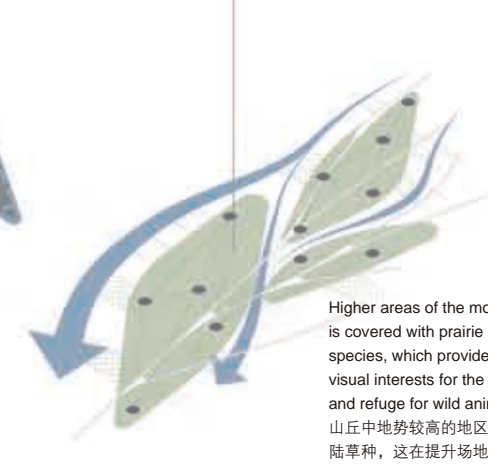
Site condition in typical flooded situations 场地条件中洪泛特征明显



Water loving tree species stabilize the east bank of the river. 喜湿树种起到了加固河河东岸的作用。

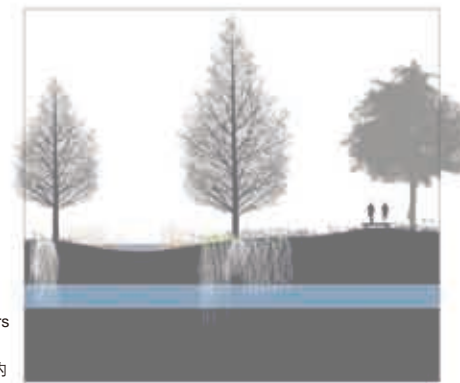
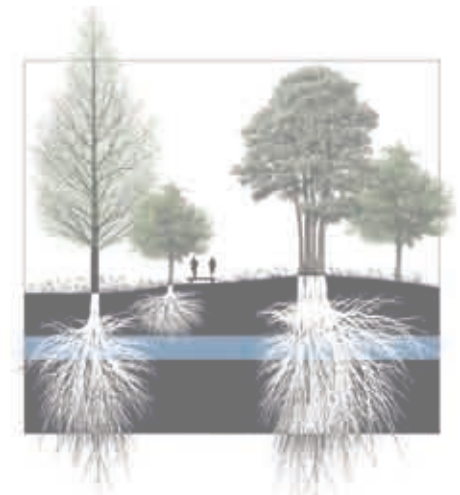


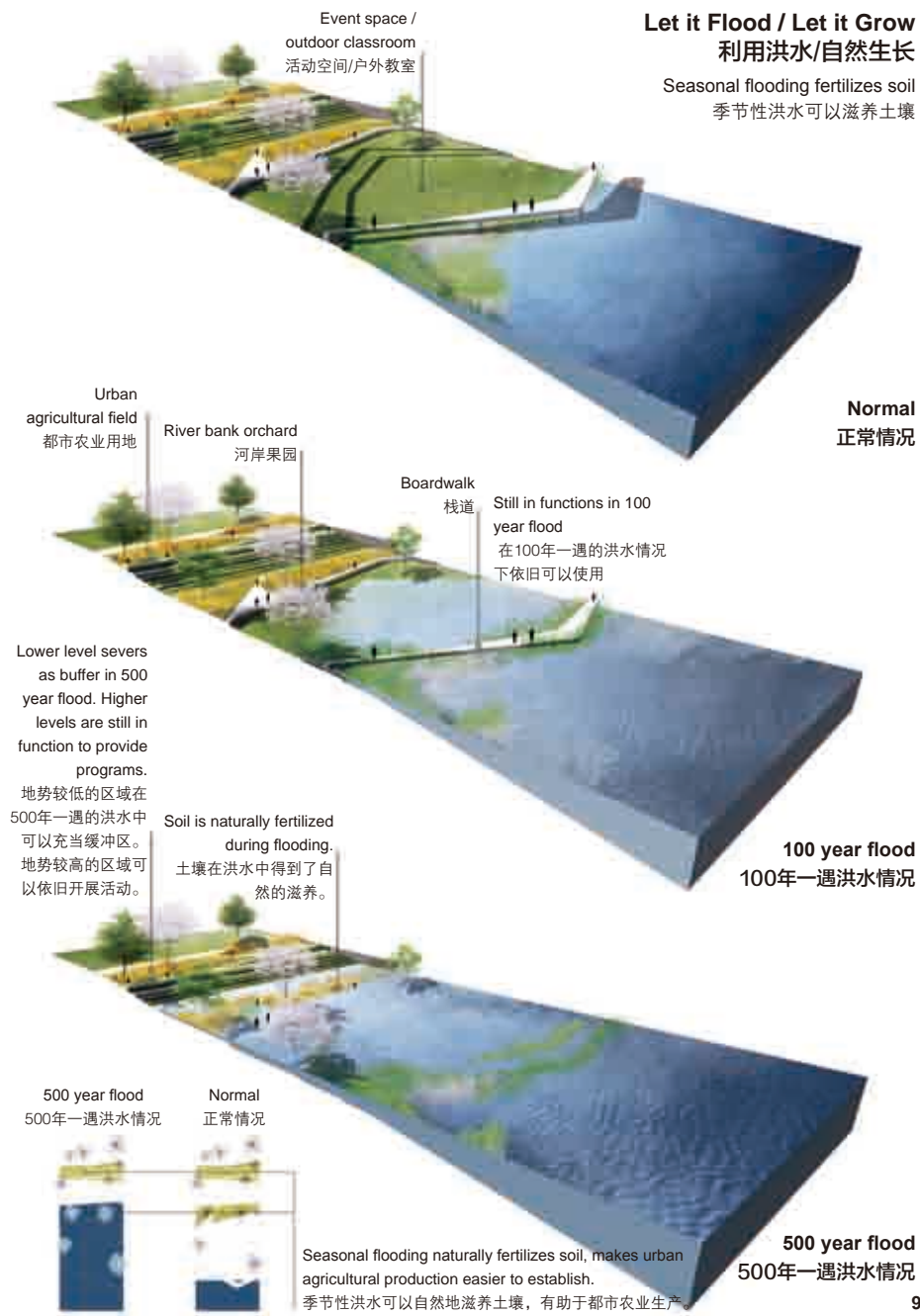
A mature ecological matrix is formed with wetland plant species that improves overall water quality and provides refuge for animals. 一个成熟的生态基质由既能够改善总体水质，又能够为动物提供栖息环境的湿地植物物种构成。



Higher areas of the mounds is covered with prairie grass species, which provides visual interests for the visitors and refuge for wild animals. 山丘中地势较高的地区遍植内陆草种。这在提升场地的观赏价值的同时，也为野生动物提供了栖息地。

7, 8. 自然生长——重现湿地、都市农业以及城市森林。
7, 8. Let it grow — wetland restoration, urban agriculture and reforestation.





urban agriculture and reforestation. The proposed ecological framework will adapt to the site condition over time. Bringing back wetlands that clean and improve overall water quality while providing refuge for animal species. Promoting Urban Agriculture in the neighborhood will establish healthy and sustainable food access to populations in needed.

Let it raise — commercial developments.

Propose high density residential, commercial and mixed-use buildings along the river as the solution for the expanding of Purdue University and the increasing population in Greater Lafayette. The site itself becomes a district that creates job opportunities; a money generating landscape where people can shop, play and relax.

Let us go — creating connection. Reconnecting the site to cities. Several

bridges are proposed on the river and above the railroad which connects two cities and Happy Hollow Park to form a complete trail system, making the riverfront more accessible to public.

Let us learn — water related education. With the development of the water system, people's perspective about the river will be simultaneously changed. Visible water system provides people an opportunity to learn about the cultural background of the river. It also creates a platform for Purdue students to operate water related experiments.

Let us play — creating program along the river. By studying local residents' desire about the river, a system of site-specific designed programs with social context can be merged into the site. An oasis of urban recreation and healthy life style will be formed. Once again, the Wabash corridor will become the critical link between two cities with walkable and bike-able environments and year-round interests.

Let them know — creating identity, educate the city. Using cultural landscape as an opportunity to increase public awareness about the natural and cultural history of the river, creating identity for the region. **LAF**

ACKNOWLEDGEMENTS

I would like to appreciate the helps and contributions from Sean Michael Rotar, David Barbarash, Robert Sovinski, Wendy Wang, Drew Stangel, Taro Cai, Tippecanoe County GIS, United States Census Bureau, Stats Indiana Website and Wabash River Enhancement Corporation to this project.

NOTE

Battle of Tippecanoe was fought in November, 1811, between Native American warriors and the United States forces.

- 设计方案的生态框架会随着时间而适应场地的变化——重新引入的湿地为居民提供了活动场所，还能够对水体进行净化。
- 经济增长——商业发展。
- The proposed ecological framework will adapt to the site condition over time. Bringing back wetlands clean and improve overall water quality while providing refuge for animal species.
- Let it raise — commercial developments.

