

从《图解景观生态规划设计原理》 看景观生态规划设计教学中 原理与实践的转化

ILLUSTRATED PRINCIPLES OF LANDSCAPE ECOLOGICAL PLANNING AND DESIGN: TEACHING EXPLORATIONS ON BRIDGING THEORIES WITH PRACTICE OF LANDSCAPE ECOLOGICAL PLANNING AND DESIGN



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笔者之一的岳邦瑞教授于2011年起开始在西安建筑科技大学建筑学院风景园林系教授本科与研究生课程，在对2011级本科和研究生的基础课程进行梳理后，笔者发现涉及景观生态学、生态规划设计等学科的既有著作大多存在体系庞冗、内容艰涩两个明显缺

点，因此希望出版一本零基础读者也可以看懂的、注重用户体验的原理性教材。至此，笔者认真思考了景观生态规划设计的理论体系、规划设计教学与实践之间的关系，并于2017年正式出版发行了《图解景观生态规划设计原理》一书（图1）。该书的内容和呈现

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摘要

本文围绕《图解景观生态规划设计原理》一书的内容体系，阐述了作者对于景观生态规划设计的理论、教学与实践体系的思考。本文首先就将生态学（及其相关学科）基本原理应用于景观生态规划设计的理论、教学与实践方法进行了探索；随后提出了一个将理论研究与设计实践相衔接的多层次研究体系（包括基础理论研究、应用基础研究和实践应用研究）；最后，基于上述景观生态规划设计体系建立了以空间导则为核心的T-P-C途径（即原理-空间格局/空间导则-实践案例），并将其作为从生态学原理到规划设计实践的普适性操作程序。基于对书籍用户的抽样调查，本文进一步修订和深化了景观生态规划设计研究体系。

关键词

风景园林学；生态学；规划设计；景观生态学

ABSTRACT

By reviewing the structure of the book *Illustrated Principles of Landscape Ecological Planning and Design*, this article reexamines the relationship between theoretical study, teaching, and practice in landscape ecological planning and design. It first explores how to apply the principles of ecological sciences (and other relevant disciplines) into related research, teaching, and practice of landscape ecological planning and design. The authors put forward a multi-level research system that integrates fundamental theories, application bases, and practice, in order to bridge ecological principles with planning and design practice. In addition, based on this landscape ecological planning and design system, the authors developed a T-P-C Approach, a universal operating procedure that links up Theories, Patterns or Principles, and Practice Cases and centers in spatial principles. Through a reader sampling survey, the research system of landscape ecological planning and design is refined and improved based on audience's comments.

KEY WORDS

Landscape Architecture; Ecology; Planning and Design; Landscape Ecology

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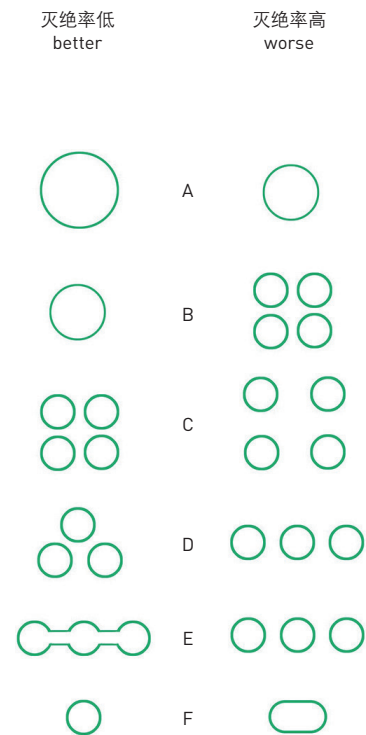
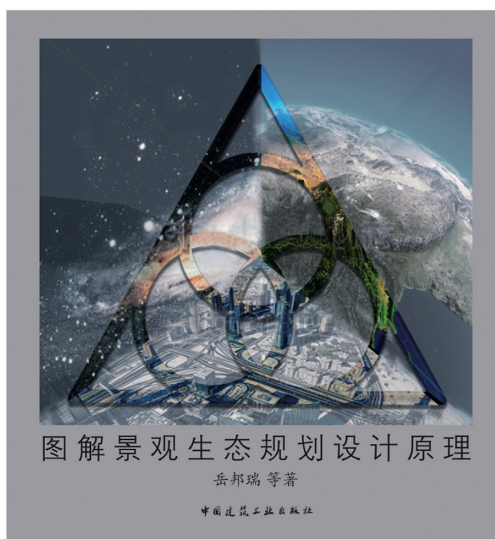
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TRANSLATED BY Tina TIAN FEI Fan

1. 《图解景观生态规划设计原理》封面
2. 杰瑞德·M·戴蒙德提出的“六大导则”探讨了保护区的几何设计对其物种灭绝率的影响，涉及面积、排列组合、距离、连通度、形状等因素。按左列模式设计的保护区内的物种灭绝率将低于右列。

1. The cover of the *Illustrated Principles of Landscape Ecological Planning and Design*
2. The six principles suggested by Jared M. Diamond discuss how the geometric factors in reserve design can impact species extinction rates, including area, permutation, distance, connectivity, shape, etc. Species extinction rates will be lower for the reserve design on the left than for those on the right.



© Jared M. Diamond

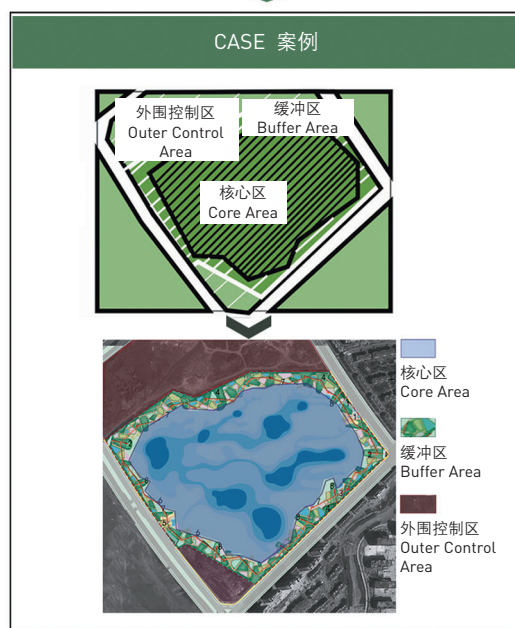
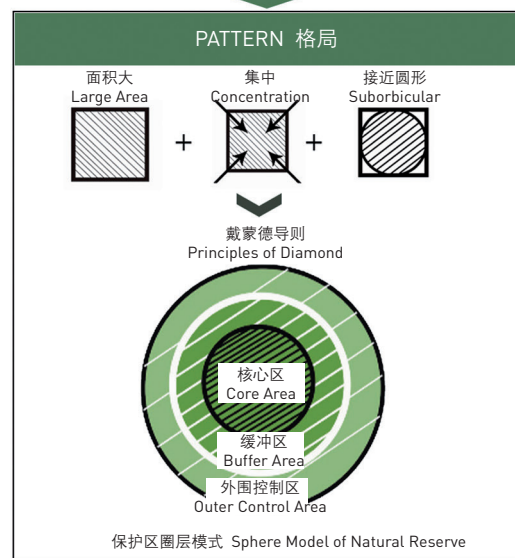
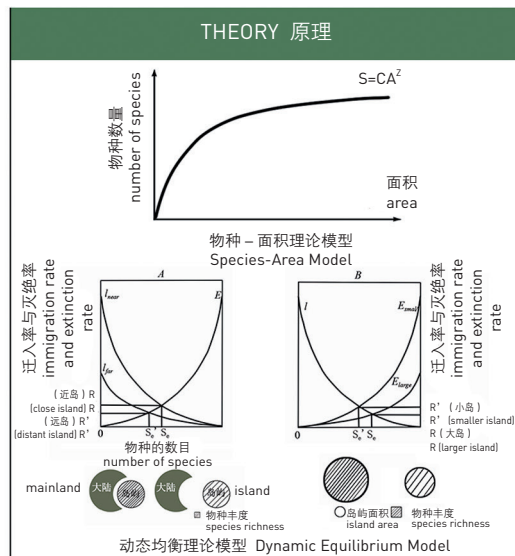
形式主要基于以下思路。

首先，笔者就将生态学（及其相关学科）基本原理应用于景观生态规划设计（Landscape Ecological Planning and Design，以下简称LEPD）的研究、教学与实践方法进行了探索。一方面，作为LEPD的科学性及基础性支撑，对生态学概念、原理与方法的理解与掌握必不可少；另一方面，由于生态学的理论体系极其庞杂且缺乏落地性，设计师和规划师无法直接应用学科知识指导LEPD实践。换言之，生态学在长期的发展过程中形成了一套“生态学语言体系”，包括大量的科学术语、定理、公式、理论、方法等；而LEPD使用的则是“空间设计语言体系”，表现为土地分区、空间布局、要素组织等内容。这种“语言形式”的差异导致了理论研究与设计实践之间的断层。

因此，我们需要建立一个将理论研究

与规划设计实践相衔接的多层次研究体系，包括基础理论研究、应用基础研究和实践应用研究：作为根基，基础理论研究涉及的学科不仅包括生态学，还有地理学、环境科学等相关基础学科，其作用在于揭示多种生态、地理现象的本质与普适性自然规律，为LEPD提供坚实的科学理论基础；实践应用研究位于顶层，面向社会生态问题与现实需要且涵盖多个尺度、类型及领域，主要包括具体规划设计手法与实践操作程序；位于中间层的应用基础研究是衔接生态学原理与规划设计实践的桥梁，其主要包括建立在基础理论之上的、面向空间规划设计的各种应用性理论与方法，包括生态设计原理、地理设计原理、环境设计原理等。由于这些空间设计原理须面向实践，因此通常体现为模型、方法、流程、步骤，以及用于指导实践的策略、导则、格局、模式、手法与语汇。

随后，笔者基于上述LEPD体系建立了以“空间导则”为核心的T—P—C途径，并将其作为从生态学原理（基础理论研究）到规划设计实践（实践应用研究）的普适性操作程序。杰瑞德·M·戴蒙德根据岛屿生物地理学原理推导出的6类“空间导则”^[1]（图2）可进一步归纳为“同心圆模式”和“保护区网模式”这两种常用的空间格局，并应用于自然保护区的规划实践。笔者由此深受启发，并借鉴福斯特·恩杜比斯的“过渡性概念”思想^[2]，将空间导则视为从原理到实践的过渡性桥梁，并在此基础上提出一种更具普适性的空间设计途径，即从生态学原理（Theory）推导出设计的空间格局（Pattern）或空间导则（Principle），并最终通过实践案例（Case）进行应用检验与修正（图3）。《图解景观生态规划设计原理》一书也体现了这一推导过程：该书详细梳理了生态学、



景观生态学、区域与全球生态学的基础理论体系，遴选出24个可直接应用于空间设计的知识单元，并逐一对其进行解析和空间转化，形成LEPD的原理框架，进一步通过32个专题讲解、32个应用案例、100多张表格和300多张图解进行深入阐释^[3]。专题讲解按照T-P-C模式编排，将基本理论、空间格局与导则、实践案例分析展示串联起来，循序渐进地呈现了将生态学基本原理应用于规划设计实践的过程。

《图解景观生态规划设计原理》出版以来，既收获了赞誉，也收到不少批评。笔者团队通过走访、线上问卷等方式对随机选取的109位读者进行了意见调查，并依据读者身份对反馈中出现频次较高的关键词进行了分

类(表1)。综合表中意见可知，本书的逻辑体系与T-P-C途径得到了理解和支持，但学生(尤其是本科生)认为理论部分较为深奥，对案例的解析与应用有着较大兴趣；科研人员更关注理论的深度和广度，认为对部分理论的探讨浅尝辄止，以空间格局为核心的转化途径尚不够全面；规划师及设计师则注重从原理到实践的转化与实际操作方法，认为该部分存在可提升的空间。基于此，笔者团队进一步完善了对于LEPD研究层次的认识框架(图4)，对三大层次的原有内容进行修正，并在教学过程中对其展开讲解，以帮助了解研究与实践的关系，从而理解并应用LEPD原理。**LAF**

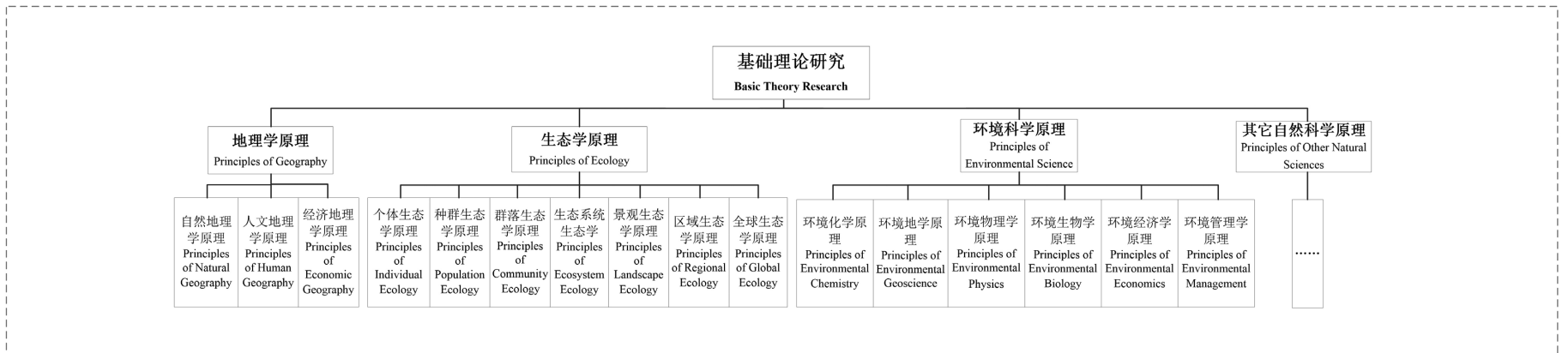
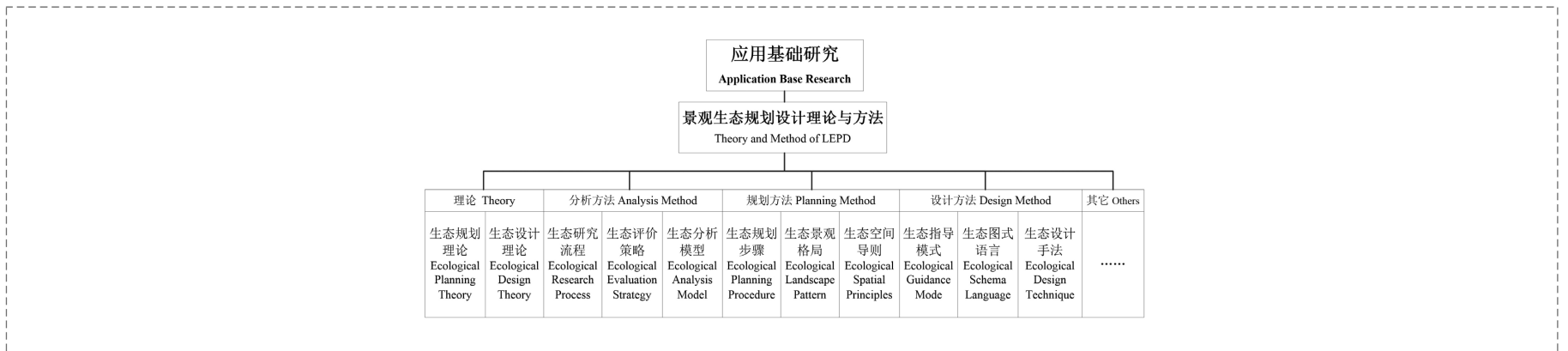
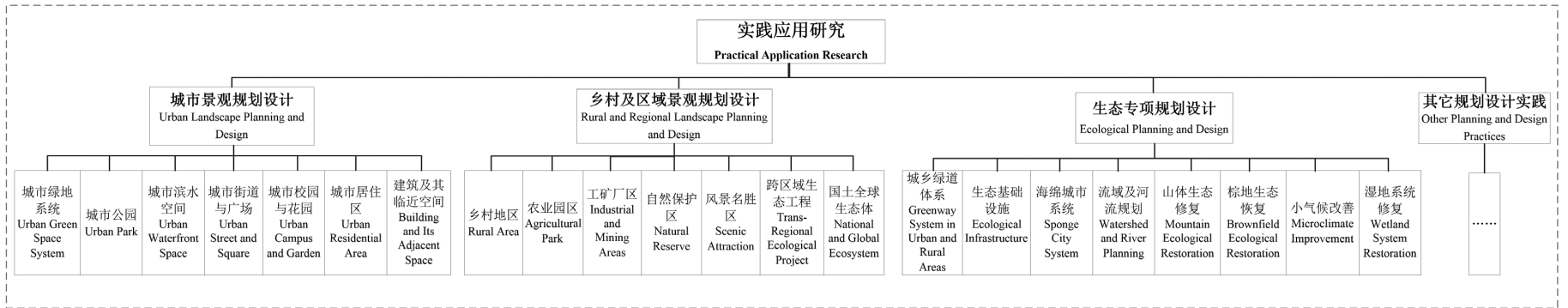
表1: 《图解景观生态规划设计原理》读者意见调查
Table 1: Readers' Comments on the Illustrated Principles of Landscape Ecological Planning and Design

意见 Comments	“理论较难理解” “The theoretical narrative is abstruse”	“理论深度/广度不足” “The Spatial Pattern related exploration is not comprehensive enough”	“应用途径单一” “Narrow applications”	“案例涉域较窄” “The range of practice cases is insufficient”	“案例剖析较浅” “Case reviews need to be improved”
在校学生 College Students	●			●	●
科研人员 Academic professionals		●	●	●	
从业人员 Practitioners	●	●	●	●	●

注: 表中●表示调查项目提及频次, ●越大表示提及频次越高, 空白表示抽样中未提及。

Notes: The dots represent the mentioned frequency of the comments. The larger a dot is, the more the item is mentioned. Blank indicates no mention in sampling.

- 用T-P-C途径阐释岛屿生物地理学原理应用于哈尔滨群力公园生态规划的过程
- 修正后的景观生态规划设计研究体系图
- Application of Island Biogeography in the ecological planning of Harbin Qunli Wetland Park interpreted by T-P-C Approach.
- Revised research system of landscape ecological planning and design



As an instructor for undergraduate and postgraduate programs of Department of Landscape Architecture in School of Architecture, Xi'an University of Architecture and Technology since 2011, Yue Bangrui, one of the authors, argues that most current press works on Landscape Ecology and Ecological Planning and Design involve vast complicated knowledge and are difficult to be understood. With a hope of compiling an entry-level textbook that is intelligible enough for new learners, the authors published the book *Illustrated Principles to Landscape Ecological Planning and Design* (Fig. 1) in 2017, to reexamine the relationship between theoretical study, teaching, and practice in landscape ecological planning and design. The structure and representation of the book is reviewed in this article.

The authors first explored how to apply the principles of ecological sciences (and other relevant disciplines) into related research, teaching, and practice of landscape ecological planning and design (LEPD hereafter). On one hand, LEPD must be based on ecological sciences, which means that our understanding of ecological concepts, principles, and methods determines how we could apply them; on the other hand, the complicated theoretical system of Ecology makes

it difficult to directly instruct LEPD practice. In other words, Ecology itself has developed a “language” that interprets the science with a large number of terms, principles, formulas, theories, and methods; but, LEPD employs another “language” that interprets physical spatial planning and design through territorial zoning, spatial arrangement, element organization, etc. The inconsistency of the both languages results in a series of gaps between theoretical research and real practice.

To bridge LEPD theoretical research with its application, the authors established a multi-level research system that integrates fundamental theories, application bases, and practice. At one end, the level of fundamental theoretical research involves a spectrum of disciplines such as Ecology, Geography, Environmental Science, to reveal the essential principles and universal laws of all kinds of ecological, geographical, and other natural facts, which offer a solid scientific ground for LEPD. At the other end, practice research is to respond to social and ecological problems and demands in reality, which involves specific tangible techniques and procedures in planning and design in a variety of scales,

types, and fields. Application basis research, as the intermediating level of the system, is expected to bridge ecological principles with planning and design practice by developing theories and methods for spatial application with principles for ecological, geographical, and environmental planning and designs. These principles often see models, methods, processes, and steps, as well as strategies, principles, patterns, approaches, and vocabularies that can be easily translated and applied in spatial planning and design.

Based on this LEPD system, the authors developed a universal operating procedure that combines the principles of Ecology (fundamental theoretical research) with practice of spatial planning and design (practice research) through a T-P-C Approach. Inspired by Jared M. Diamond, who derived six geometric principles from Island Biogeographic studies^[1](Fig. 2), which were further applied in the planning practice of nature reserves by evolving into the “concentric circle pattern” and “network pattern,” the authors, by adopting the “transitional concept” by Foster Ndubisi^[2], regard spatial principles as bridges to combine theories with practice, and develop a more universal approach to spatial design, which studies theories (T) to derive patterns or principles (P) and then test

and revise them through practice cases (C) (Fig. 3). This T-P-C Approach is also reflected in *Illustrated Principles to Landscape Ecological Planning and Design*. By reviewing the principles of Ecological, Landscape Ecology, Regional and Global Ecology, the book selects 24 knowledge units that can be directly applied in spatial design and translated and reinterpreted into a series of LEPD principles in 32 topics, with 32 cases, over 100 tables, and more than 300 illustrations^[3]. Among them, these topics are organized in line with the T-P-C Approach, articulating the process that effectively links up fundamental theories, spatial patterns and principles, and practice cases.

The book *Illustrated Principles to Landscape Ecological Planning and Design* receives both praise and criticism. The authors sampled 109 readers through visits, surveys, and online questionnaires, and extracted hot words and analyzed the comments according to different reader profiles (Table 1): Generally, the logical structure and the T-P-C Approach that the book adopted are commented as “easily understood,” but its theoretical narrative is commented as “profound or abstruse” by student audiences (especially undergraduates), who showed a greater interest in the cases parts; Academic professionals commented

the theoretical part as “not profound enough” and regarded the spatial pattern related exploration as “incomplete or not comprehensive enough,” while showing a greater interest to learn more; Practitioners paid more attention to operational methods that translate principles into practice and commented this part “can be improved.” Thanks to such feedbacks, the authors refined and improved the knowledge framework of LEPD research system (Fig. 4). By combining teaching activities, this LEPD system has been explained in details to help students holistically examine and understand the relationship between research and practice to better apply LEPD principles. **LAF**

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