

 同济大学研究生教材

# 景观生态规划设计案例评析

Reviews on Landscape  
Ecological Planning & Design Cases

王云才 著

 同济大学出版社  
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# 前言

## PREFACE

景观规划的过程就是帮助居住在自然系统中或利用系统中有限资源的人们找到最适宜的生活与生产途径（麦克哈格，1969年），通过土地和自然资源的保护与利用规划，实现可持续的景观或生态系统。景观是生态系统，一个好的或是可持续的景观规划，必须是一个基于生态学理论和技术的规划。在20世纪80年代后，生态规划设计已经形成了综合自然生态和人文生态为一体的整体系统规划。生态教学、科研和实践不仅仅是指对自然生态系统特有的生态关系的揭示。同时，文化作为人类适应和改造自然的有效工具，人文生态成为生态规划发展的另一个潮流，它以不同尺度规划空间内的自然与人文生态系统形成的有机整体——“整体人文生态系统”作为景观规划设计的对象，为现代景观生态规划设计指明了发展方向。无论是自然生态还是人文生态，景观作为客体，具有完整的视域范围，人在其中形成独有的认知和体验。同时，景观具有自己独特的语言，记录和述说着人与环境相互作用的关系。因此景观生态理论、人文生态理论和景观的语言成为景观生态规划设计的三大理论基础。在此基础上，经历长期的学科发展，景观生态规划设计将自己的适用范围从花园、场地、道路、广场、公园扩展到城市、风景名胜、自然保护区、资源保

The process of landscape planning is to help those who live in natural or take advantage of limited resources in system, in order to find the most suitable approach for living and production (McHarg, 1969), and to realize sustainable landscape or ecological system through the land and natural resources protection and utilization planning. Landscape is the ecological system, a good or sustainable landscape planning must be a planning based on ecology theory and technology. In the 1980 s, ecological planning and design has already formed the total system planning integrated natural ecology and human ecology together. It not only refers to the special natural ecological system of the ecological relationship revealed in ecological education, scientific research and practice; but also refers to culture, a effective tool to adapt and transform the natural for human, the human ecology becomes another developing trend for ecological planning development. Whatever the natural ecology or human ecology, landscape are objective and with a whole visional scale, and in which people can got the different cognition and experience. At the same time, landscape has an unique language, records and tells the interaction relationship between people and the environment. So the theory of landscape ecology, the theory of human ecology and the language of landscape become the three theoretical basis of landscape ecological planning and design. On this basis and through long-term development of the discipline, the landscape ecological planning and design extend its field, from the garden, site, road, square, park to city, scenic spot, nature reserve area, resources protection area, land use, greenway system, river basin, region and territory land, it becomes the bridge for landscape planning and design

护、土地利用、绿道系统、流域、区域与国土等广泛的空间，成为景观规划设计积极融于国际发展潮流和参与国家重大发展方向建设的桥梁。

景观生态规划设计的理论教材《景观生态规划原理》（中国建筑工业出版社，2007年第一版），是在同济大学建筑与城市规划学院景观学专业教学探索的基础上，广泛吸收和借鉴国内外经验的基础上完成的。在其后的教学应用中，结合景观生态规划设计研究的新进展和新成果，在第一版的基础上又进一步完成了《景观生态规划原理》（第二版，2013年）的出版。本版仍立足景观生态规划的基本理论与方法、空间类型、关键切入点和效果评价四个层面展开，形成清晰的四大板块教学体系。《景观生态规划原理》建立起了理论教学的体系和框架，是中华人民共和国住房和城乡建设部（住建部）普通高等教育土建学科专业“十一五”和“十二五”规划教材和教育部“十二五”普通高等教育本科国家级规划教材。

《景观生态规划设计案例评析》是与《景观生态规划原理》配套的进阶学习教材。在系统理论学习的基础上，重点立足理论的实际应用，从成功的实践中学习和总结景观生态规划设计的知识和技能。本教材精选河流流域与滨水景观设计、湖泊景观规划设计、绿道网络规划设计、绿色基础设施规划设计、生物多样性设计、城市公园景观生态设计、生态技术应用、景观的再生与转型、适应全球气候变化等景观生态规划设计九大领域共三十个国内外经典案例，从项目背景、条件分析、规划设计、规划总结与评价、思想拓展5个环节进行系统的研究和评析，初步构建出景观生态规划设计技能、方法和经验体系和框架。本书旨在抛砖引玉，以期更多的学子能够加入到生态规划设计的实践中，推动可持续景观的设计和健康环境的营造。

to cater for the international development trend and to participate actively in the construction of country's important development.

The theory textbook of Landscape ecological planning and design The Principle of Landscape Ecological Planning (the first edition, 2007) was published first by China building industry publishing house, which based on the professional teaching exploration in College of Architecture and Urban Planning, Tongji University, and absorbed and drew lessons widely from the domestic and foreign experiences. In the course of later teaching and application, combined with new progress and new achievements of landscape ecological planning and design, The Principle of Landscape Ecological Planning (the second edition, 2013) was published on the base of first edition. The new edition set up the theoretical teaching system and framework which includes basic theory and method, space types, key points and effect evaluation. The Principle of Landscape Ecological Planning is the civil engineer education "11th five-year plan" and "12th five-year plan" planning textbook of house and construction ministry of China and high education "12th five-year plan" planning textbook of the education ministry of China.

Reviews on Landscape Ecological Planning & Design Cases is the advanced and matching teaching materials of The Principle of Landscape Ecological Planning. Based on theory study systematically and aiming at practical application of the theory, at the same time learned and summarized knowledge and skills from the successful practices. The book selected 30 cases in 9 fields which are river basin and waterfront landscape design, lake landscape planning and design, greenways network planning and design, green infrastructure planning and design, biological diversity design, urban park landscape ecological design, ecological technology application, landscape regeneration and transformation, landscape ecological planning and design adapted to the global climate change. Each case was researched and evaluated from five aspects which are project background, condition analysis, planning and design, planning summary and evaluation, thoughts develop. This book set up preliminarily the skills, methods, experience system and framework of landscape ecological planning and design. The purpose of the book is to throw out a minnow to catch a whale, and expect more students take part in the practice of landscape ecological planning & design, so can promote landscape sustainable design and the construction of healthy environment.

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# 第一章 河流流域与 滨水景观生态规划设计

## CHAPTER I RIVER BASIN WATERFRONT ECOLOGICAL PLANNING & DESIGN

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# 第一节 波托马克河流域规划

## Section I Potomac River Basin Planning

### 一、项目概述

波托马克河地区的范围是确定的，其流域是可以清晰描述勾勒出来的——由水体统一起来的固定单元。显然，流域是个水文单元，而不是一个地理单元，人们很难寻求一个更确切的土地划分，因为地理区域会呈现不同特点，其变化剧烈，而且不连续。波托马克河流域横跨一系列地理区域，规划的重点是区域内未来的土地利用。这项规划是一次关于适宜性生态规划方法的实验，是要探索并挖掘出这一流域内所有土地最好最大的使用潜力，但在不同的情况下，还要厘清这些土地利用方式结合在一起的最大可能，而大自然就是一个具有相互作用及储藏功能的价值体系。

### 二、区域环境介绍

#### 1. 自然条件

在考虑气候时，最值得注意的因素是气候和自然地理的相互关系。阿巴拉契亚山脉对阿勒格尼高原造成影响，在这个区域的东部形成“雨影区”。这里夏秋两季多雾多云，邻近的山脊和山谷气温变化很大，山谷中时常雾气缭绕。强烈的暴风雨和短

### I. Overview

In this case there was no problem of defining the area to be studied it was the Potomac River Basin. Thus, we were spared the agonies that rack the socio-economic planners whose regions are ephemeral and transitory. At least the river basin is describable it is united by water; and it is permanent. Yet, it is clear that, while the river basin is a hydrologic unit, it is not a physiographic one; and, if one seeks a more finite division of land, the physiographic region offers this character to an unequalled degree. Physiographic regions vary dramatically. They are discrete. In the Potomac River Basin there is a single hydrologic unit that transects a number of physiographic regions in which the preoccupation is with all prospective land uses. This is a fitting test for the ecological planning method. Now we have a program; we seek to find the highest and best uses of all the land in the basin, but in every case we will try to identify the maximum conjunction of these. This, then, is the image of nature as an interacting and living storehouse a value system.

### II. Regional Form Natural Pattern

#### 1. Natural Conditions

The most notable factor in considering climate in the basin is the marked correlation with physiography. The Appalachian Mountains affect the Allegheny Plateau and result in a "rain shadow" in the east of this region. Summer and autumn fogs and cloudy

暂的生长季节成为这一区域显著的特点。皮得蒙高原和海岸平原气候是相似的，只是海岸平原常有飓风，夏季温暖炎热潮湿，冬天温度适中，在整个流域中生长季节最长。因而这里的气候变化也仅仅是区域性的。

波托马克河流域是大西洋和海湾海岸体系中的次区域，由寒武纪之后的地质活动所形成，约有五亿年的历史。从地质学上讲，整个区域由三大地带组成：第一，皮得蒙高原的老结晶岩地区；第二，阿勒格尼高原，由较新的沉积物形成；最后，在东面是最新的海岸平原疏松沉积层。从波托马克河源头至海洋，该河共横向跨越了六个自然地理区域：从阿勒格尼高原至岭谷地区，然后到达大河谷、蓝岭和皮得蒙高原，最后到达海岸平原的河口湾。

波托马克河的流域面积大约为15 000平方英里(约38 850平方公里)：其主要支流为北支流和南支流，还包括大谢南多厄、卡卡朋、康纳康奇和莫诺卡西等河溪。和那些高原地区一样，岭谷地区的土壤层非常薄，贫瘠且易遭侵蚀；而大河谷的石灰岩土壤和岭谷地区中那些罕见的谷底滩地一样肥沃，这里是整个流域的农业核心区。流域内的矿物资源包括：煤、石灰岩、砂砾石和漂白土。

在这一望无际的流域中，由于其自然地理特点的多样性，因此能看到众多的植被种类和群落。特定的环境生长特定的植物，因此生态学家通过对植物的外观、类型和分布的了解，就能从现有的关于气候、土壤、水分状况和其他因素的资料中，推断出更确切的关于植物环境的情况和信息。这种在最广泛的范围中进行的研究，揭示了分布在由东到西的广阔地带上的三大森林群落的划分情况：第一是橡树—松树群落；第二是橡树—栗树群落；第三是神奇地躲过更新世冰盖破坏的喜温湿的混合中生林，它的中心是阿巴拉契亚山脉。

在波托马克河流域横跨的一系列地形区域中，不同的坡度对于广泛而多种多样的使用因素来说，影响是很大的。这些坡度明显地体现了区域性特征，在岭谷地区坡度富于各种变化，在海岸平原则较少。同时，皮得蒙高原和大河谷地区的斜坡被河流所划分。

conditions are found here. The adjacent Ridge and Valley has great temperature variations and frequent valley fogs. Intense storms and a short growing season mark this province. Piedmont and Coastal Plain share a similar climate, save for the proclivity of the latter to hurricanes. Summers are warm to hot, humidity is high, winters mild, and the growing season longest in the basin. There is then, a marked regional climatic variability.

The Potomac basin is a subregion of the Atlantic and Gulf Coast system and results from geological activity since Precambrian time, some half billion years ago. Geologically, the region consists of three major zones: first, the area of very old crystalline rocks in the Piedmont Plateau; and, second, the Allegheny Plateau, which is of more recent sedimentary origin; and, finally, on the east, the very recent series of generally unconsolidated sedimentary strata of the Coastal Plain. From source to ocean, the Potomac transects six physiographic regions from the Allegheny Plateau to the Ridge and Valley Province, thence to the Great Valley, Blue Ridge and Piedmont, and, finally, to its estuary in the Coastal Plain.

The Potomac drains a basin of almost 15,000 square miles; its major tributaries are the North and South Branches, the great Shenandoah, the Cacapon, Conococheague Creek and the Monocacy. Like those of the Plateau, the soils of the Ridge and Valley are thin, erodible and infertile, except in certain limestone uplands and in the valley bottomlands, which are as fertile as can be found in the entire country. Yet, with the exception of shale formations, the limestone soils of the Great Valley are as fertile as those infrequent valley bottoms in the Ridge and Valley: here is located the great agricultural heartland of the basin. The mineral resources of the basin include coal, limestone, sands and gravels, fuller's earth.

In this enormous basin with its range of physiographic expression, it is to be expected that a wide range of vegetation types and communities will be observed and, indeed, this is so. As plants are very specific to environments, the ecologist who knows the presence, pattern and distribution of plants can infer more accurate information about their environments than is generally available from existing information on climate, soils, the water regimen and other factors. The broadest level of examination reveals the presence of three major divisions of forest associations distributed in broad bands from east to west. The first of these is the oak-pine association; the second, the oak-chestnut; and the third is the legendary mixed mesophytic forest that escaped the Pleistocene ice sheets and whose very center is the Appalachian Mountains.

## 2. 历史人文

波托马克河汇集了整个流域的各种文化，从上游的西弗吉尼亚州的煤矿工人到美国首都的城市居民，以及波托马克河下游的弗吉尼亚州最北端的船夫。由于河流位于美国历史和文化遗产比较丰富的地区，波托马克河被称为“民族之河”。据调查，美国第一任总统乔治·华盛顿，就出生于波托马克河流域，并在此居住了很久。美国首都华盛顿特区，也坐落于该流域内。而1859年在河流交汇处发生的战役就是美国南北战争的起始点。波托马克河位于马里兰州段内的切萨皮克-俄亥俄运河于1831年至1924年开通，连接了坎伯兰和华盛顿特区，实现了波托马克河大小急流险滩的货物运输。华盛顿渡口于1864年开放，从此华盛顿开始使用波托马克河水作为饮用水的主要来源，饮用水的取水口建于大瀑布。1998年，美国总统比尔·克林顿将波托马克河定为美国河流遗产之一。

## 三、波托马克河流域规划设计

### 1. 单项规划

#### 1) 农业规划

地表地质、气候、土壤、坡度及朝向，可以作为确定整个流域中农业发展类型的衡量标准。在流域中，上述因素是变化多端的，但它们在自然地理区域和次区域中展现出一定的连续性，因此，我们能根据区域的特点来预示其适应性，并能够依据大河谷明显的特征变化预测其适宜性。皮得蒙高原呈现出广阔的农业生产区域，这是整个岭谷地区狭窄的山谷中所稀缺的；而阿勒格尼高原几乎没有农业用地。海岸平原的土壤虽然贫瘠，但施加足够的肥料，就能生长出有价值的蔬菜（图1-1-1）。

#### 2) 森林规划

规划将森林分为三类用途：商业类森林、非商业类森林以及不可采伐的森林。适宜作为商业用途的森林分成两类：第一类，其地理条件需位于纸浆厂25英里(约40公里)半径内，坐落在一条五级河流或更大的河流旁，处在实行宽松的分区管理或非

## 2. Historical Context

The Potomac River brings together a variety of cultures throughout the watershed from the coal miners of upstream West Virginia to the urban residents of the nation's capital and, along the lower Potomac, the watermen of Virginia's Northern Neck. Being situated in an area rich in American history and American heritage has led to the Potomac being nicknamed "the Nation's River." George Washington, the first President of the United States, was born in, surveyed, and spent most of his life within the Potomac basin. All of Washington, D.C., the nation's capital city, also lies within the watershed. The 1859 siege of Harper's Ferry at the river's confluence with the Shenandoah was a precursor to numerous epic battles of the American Civil War in and around the Potomac and its tributaries. The Chesapeake and Ohio Canal operated along the banks of the Potomac in Maryland from 1831 to 1924 and also connected Cumberland to Washington, D.C.. This allowed freight to be transported around the rapids known as the Great Falls of the Potomac River, as well as many other, smaller rapids. Washington, D.C. began using the Potomac as its principal source of drinking water with the opening of the Washington Aqueduct in 1864, using a water intake constructed at Great Falls. President Bill Clinton designated the Potomac as one of the American Heritage Rivers in 1998.

## III. Potomac River Basin Planning and Design

### 1. Special Planning

#### 1) Agriculture Planning

Subsurface geology, climate, soils, slope and thus drainage together with exposure, determine the appropriate types of agriculture that should, or can, be practiced in the entire basin. These factors are variable in the basin but exhibit some consistency within the physiographic regions and subregions, so we can predict suitabilities according to characteristics. Immediately the primacy of the Great Valley is apparent. The Piedmont reveals extensive productive areas; these are sparse in the narrow valleys of the Ridge and Valley Province and all but absent in the Allegheny Plateau. While the soils of the Coastal Plain are poor and infertile, with abundant fertilizer these can be made to produce valuable vegetable crops(Fig.1-1-1).

#### 2) Forestry Planning

Planning divided forestry into three categories: commercial forestry, noncommercial forestry and