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Introduction

About This Book

This publication is intended to provide creative inspiration and guidance toward the implementation of successful outdoor classrooms for integrated learning. Designers of these spaces might consider art, mathematics, science, or, more specifically, native wildlife and plants as opportunities for learning. The text describes design processes and offers useful ideas for all garden types, particularly wildlife habitats and gardens of the Southwest. In recent years, much interest has arisen in obtaining information regarding the use of native plants to attract wildlife to backyards and schoolyards. Interaction with wildlife in a garden not only provides a venue for learning basic ecology but affords opportunity to study subjects as diverse as music and math. The need for a book such as this has arisen from a national movement in gardening with native plants. Thus the book, with its regional focus on the arid Southwest, is an essential tool for teachers in the Southwest who wish to initiate natural learning landscapes. Descriptive coverage of the subject also makes this text an ideal reference for landscape architecture students or home garden enthusiasts.

Making Outdoor Classrooms a Reality

The best outdoor classroom gardens are created with an overarching concept that is used toward the development of a schoolwide vision. This book contains ideas and necessary information for the design and implementation of successful outdoor classrooms. Several topics, including a history of playground design, nature and play, and learning in the natural outdoor classroom, provide a good overview. Other sections, such as schoolyard garden types and design theory, help designers develop strong design concepts, and information on site research and program development, with logical approaches to creating outdoor classrooms, will assist designers with approaches aimed at helping schools

develop an individualized planning process for their unique goals. Special focus is given to ecological principles and garden requirements for pollinators and other wildlife of the Southwest, as these provide a good basis for integrated learning. Throughout the text are creative ideas on design features and materials, as well as thoughts on student activities that aid in the creation and utilization of outdoor classrooms. Sidebars, illustrations, photographs, and captions within the book can be used as helpful hints and overviews, with more detailed information contained within the main body of the text. The regional plant tables in the appendix provide a concentrated source of information useful in planning southwestern gardens of any type. Each table focuses on plants most suitable for a particular bioregion, with helpful comments, traits, and benefits for wildlife.

The Need for Wildlife Habitat and Native Gardens

With continued rapid growth of western cities, planning for the future needs of residents is reaching a critical stage. Every day, wild lands are removed to make way for human development. Habitat destruction creates an ever-increasing struggle for the wild creatures to survive and reproduce. Nevertheless, responsible planning could preserve our richest habitats and most critical wildlife corridors within cities and subdivisions. Schoolyard wildlife habitats might serve as design models for the community. Additionally, while some cities are already in a water crisis, others may have time for improvement. Cities such as Tucson, Arizona, have become exemplary models for desert living, as they have been successful in reducing residential water needs through the use of native and drought-tolerant plants. For some cities, however, there is room for improvement in the area of water conservation, particularly with regard to the ongoing implementation of high-water-use landscapes. Creating gardens and wildlife habitats with native plants is an important way to educate citizens and children alike about the necessity to conserve water. As they learn about the natural environment in general, they will also be exposed to specific information on regional ecology and natural resources. Within the context of desert environments, this will undoubtedly lead to better understanding about water resources. Therefore, contact with these outdoor classrooms will empower them to make a difference and become stewards of our environment throughout their adult lives.

Bioregions of the Arid Southwest

This book discusses creating outdoor classrooms and wildlife habitat gardens within the arid Southwest. A number of bioregions exist within this region, each with its own temperature and rainfall patterns, topography, and geologic history (see map in appendix). Each of these bioregions possesses attributes that differ from the others. This affects the types of plants that will grow or thrive there. From east to west and north to south, differences in temperature and rainfall patterns define many of the adaptations observed in wild communities regarding how they cope with conditions in their environment. Geology also influences these patterns greatly.

In the Southeast, high rainfall influenced by the Gulf of Mexico tapers off

in the hill country west of Austin, Texas. To the west of that area, arid Desert Grasslands begin to reign. In the plains of Texas, sporadic surges of Gulf moisture bring primarily summer rain to the region, a region that extends in several bands from Texas through New Mexico to central Arizona. Characterized by bunch grasses, it also commonly contains yucca, agave, mesquite, and juniper species.

Southwestern Texas, southern New Mexico, and a small portion of southwestern Arizona are the northern limits of the Chihuahuan Desert. Rainfall in this bioregion is primarily in the late spring and late summer and is influenced by moisture from the Gulf of Mexico and the rain shadow effect of mountains. The Chihuahuan Desert bioregion occurs at higher elevations than the Desert Grasslands and is characterized by low shrubs and leaf succulents such as creosote, yucca, and ocotillo.

Abutting the western edge of the Desert Grasslands is the Arizona Uplands subdivision of the Sonoran Desert. Studded by iconic saguaros and leguminous trees, it is the wettest of southwestern deserts, with rain being distributed in both the summer, from the Gulf of Mexico, and the winter, from the Pacific Ocean. Most of the region is on slopes or sloping plains at lower elevations than the Desert Grasslands and the Chihuahuan Desert.

As the influences of summer rains diminish in southwestern Arizona and southeastern California, the Lower Colorado subdivision of the Sonoran Desert takes over. It is characterized by very wide, low-elevation valleys containing expanses of creosote and white bursage, with saguaros and small trees being limited to washes and low mountains.

To the north of the Lower Colorado lies the Mojave Desert, which receives only a small amount of rain during the winter. The wide plains and rugged mountains making up the Mojave share much of the flora and fauna with other North American deserts. It is hot in the summer and rather cold in winter. The Joshua tree is the hallmark plant of this region, and annual plants are abundant; other vegetation is sparse.

To the west of the Lower Colorado subdivision of the Sonoran Desert lies the Southern California Inland Valleys bioregion. Fire-adapted chaparral plants such as chamise constitute the native vegetation. Good rainfall occurs mostly in winter within this biologic community situated on mostly steep mountain slopes.

Nestled between the Southern California Inland Valleys and the Pacific Ocean is a narrow strip of land constituting the Southern California Coastal Edge bioregion. Although it receives less rainfall than the Inland Valleys in winter, it is influenced greatly by the ocean and benefits from higher humidity and almost no frost. Low-growing shrubs such as sage and buckwheat make up what little is left of the native vegetation.

In all cases, soils influence the performance of plants through their physical and chemical makeup. Particle size of the soil determines how quickly water drains through it and dictates the frequency of watering. A clay soil with small particle size will hold on to water much more than sand. Minerals within the soil can also influence plant growth.

The tables in the appendix address the characteristics of plants that tend to perform well within these diverse bioregions. Some of the same plants may have varying horticultural needs in different areas, and may be referred to with different common names in other parts of the country. The reader is invited to try plants from other regions if they seem to fit within the parameters of the

garden site. None of the tables are all-inclusive, and although it can be difficult in some communities to find native plants, there are people who grow them. A great science activity for children might be an experiment in which they determine the best way to germinate and grow native plants. This could involve Internet research combined with hands-on activities. Commercial growers may lend their expertise and even benefit from the information. For example, the tables in this book are actually the work of many people who, over the years, have provided information on their plants to others.

Creating Outdoor Classrooms

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