

Preface

Vegetation is likely the most natural, self-sustaining, and cost-effective method for protecting exposed soils, slopes and, streambanks from the erosive forces of raindrops, the tractive forces of flowing water, and the exfiltration of subsurface water.

Vegetative measures for stabilization purposes have developed rapidly during the past three decades, and have been applied frequently in practice to stabilize stream banks and restore watersheds so too have the use of related measures to stabilize upland slopes. Several guidance manuals and “how to do it” books have been published during this time period. However, to date no detailed compilation of the results of projects has been published. **Bioengineering Case Studies: Sustainable Stream Bank and Slope Protection** addresses this need. The book describes many different types of case histories of biostabilization projects and their outcomes including the restoration and maintenance of geomorphic and ecological functions.

In this book two experienced practitioners along with the principal author of two prior books on biotechnical engineering have collaborated to share a diverse set of project case studies from several regions of the USA. These projects were developed for different purposes and by project owners with distinct needs, constraints, and preferences. The projects described in this book were selected in order to reflect not only sound application of typical treatments but also to convey some more nuanced variations and innovations that reflect the practice of bioengineering in the twenty-first century.

The main purpose of **Bioengineering Case Studies: Sustainable Stream Bank and Slope Protection** is twofold, namely, to build upon the wealth of information provided in prior guidance manuals (such as the 2005 report 544, Environmentally Sensitive Channel and Bank Protection Measures, by the National Cooperative Highway Research Program (NCHRP)), and to describe different types of projects using functional living vegetation and evaluate their performance. The original NCHRP 544 report provided a detailed literature review of available knowledge and methods relating to environmentally sensitive channel and stream bank protection practices and their use by different practitioners and agencies. The NCHRP report mainly targets highway design engineering criteria. This book, on the other hand, focuses more on short- and long-term performance history, maintenance issues, and lessons learned from actual projects.

This book is a retrospective compilation of case studies. It is not intended to provide design procedural descriptions nor does it attempt to train practitioners on the many disciplines of science, engineering, construction, horticulture, and regulatory compliance that underlie each project. The objective is to help people visualize how projects have been configured in the past, and to understand precedents and examples so the approach will come across as both attractive and manageable. There are many guidance manuals for the reader to refer to; several are listed in the appendices or in the references at the end of each case study.

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Redding, CA
Ann Arbor, MI
Salem, MA

John McCullah
Donald Gray
Wendi Goldsmith

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Goldsmith, W.; Gray, D.; McCullah, J.

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