

The Ecology and Management of Wood in World Rivers

Edited by

Stan V. Gregory

*Department of Fisheries and Wildlife, Oregon State University
Corvallis, Oregon 97331, USA*

Kathryn L. Boyer

*USDA Natural Resources Conservation Service
Wildlife Habitat Management Institute, Department of Fisheries and Wildlife
Oregon State University, Corvallis, Oregon 97331, USA*

Angela M. Gurnell

*Department of Geography, King's College London
Strand, London WC2R 2LS, UK*

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American Fisheries Society
5410 Grosvenor Lane, Suite 110
Bethesda, Maryland 20814-2199
USA

Preface

Toward a Synthesis of Knowledge of Wood in World Rivers

Streamside forests provide inputs of large wood, an important element of conservation of biological diversity at landscape scales. Historically, large wood has been an important component in streams and rivers throughout the world. Research results have been applied by natural resource managers to protect and restore biodiversity, fisheries, and aquatic ecosystem functions. Wood is placed in streams as part of restoration efforts to increase channel complexity and associated ecological functions, and streamside forests are actively managed to supply large wood to river networks. Transferring research results from one region of the world to others has raised both technical and cultural questions.

To address these questions, researchers at Oregon State University, in cooperation with the USDA Forest Service and Natural Resources Conservation Service, the University of Washington, and the University of Birmingham, organized an international conference of 30 invited experts from around the world and more than 400 participants. The "First International Conference on Wood in World Rivers" was held 23–27 October 2000 on the campus of Oregon State University, in Corvallis, Oregon. The purpose of this conference was to

- (1) synthesize the status of knowledge of the physical dynamics and ecological interactions of large wood in streams and rivers in different geographical regions,
- (2) create a framework for interpreting and applying the results of research in different geographical regions and management systems,
- (3) identify different management systems for large wood in rivers,
- (4) assess physical and biological responses of large wood in stream restoration,
- (5) explore links between primary information of the physical and ecological dynamics of large wood, resource management systems, and the communities and cultures in which they are applied.

During the conference, 30 invited scientists and more than 100 contributing scientists presented current knowledge of the role of wood in aquatic ecosystems and implications for landscape planning and management. Most of the invited scientists have contributed a chapter to this book, creating a broad overview of what is known about wood in rivers and the context for applying research results from different regions, management systems, and cultures. Plenary speakers David Montgomery and Herve Piégay also co-edited a special issue of *Geomorphology* (Volume 51, Issues 1–3) entitled *Interactions between wood and channel forms and processes*. This volume presented another 12 research papers of scientists who contributed papers at the Wood Conference.

This book synthesizes worldwide research on the ecology and management of wood in world rivers. Chapter 1 provides an overview of the direction wood research has taken over time and suggestions for future research trajectories that focus on long-term river conservation needs. Chapters 2 through 6 focus on the geomorphic aspects of wood in rivers. Biological implications of river wood are treated in Chapters 7 through 13. Chapters 14 through 17 consider larger scale perspectives related to the dynamic nature of wood in rivers, including

modeling. Resource management applications resulting from wood research are covered in chapters 18–22. And finally, Chapter 23 offers a perspective on the human dimensions of wood in rivers and provides insights on how to tailor restoration and management of large wood to different landscapes, rivers, forests, regions, and countries of the world.

One of the first challenges of the conference was the plethora of names and acronyms used for wood by resource professionals. In his plenary address to the conference, Dr. Ken Gregory provided an insightful account of the numerous terms used for wood in streams and rivers and their applications in different disciplines. The term “debris” was first used to refer to the wood slash and debris left on the land and in the streams after timber harvest. Unfortunately, the term “woody debris” negatively connotes garbage or trash to the general public. One of the editors, Stan Gregory, thus discouraged further use of the terms *large woody debris*, *coarse woody debris*, *large organic debris*, etc. by conference participants. In the interest of consistency and effective communication, the editors and authors in this book use the word “wood” and encourage resource professionals to adopt this simpler and more accurate term.

Several speakers and members of the audience called for efforts to standardize definitions and methods for measuring wood in streams. Throughout this book, the authors reported the operational definitions of wood and the units of measures in different studies. These definitions and units of measure differ for different sizes of streams, ecological or physical applications, and regional conventions. Abundance of wood can be quantified as numbers, volume, mass, or surface area of wood and expressed as amount per area, volume, or length of stream. All of these measures are appropriate and offer different insights about the potential functions of wood in streams and rivers. For example, a study of fish habitat may select wood numbers per length of river as an appropriate measure of wood, a nutrient budget study may express wood abundance as mass per area of stream, and a study of microbial ecology may express the amount of wood as surface area of wood available for colonization per area of stream. All of these are appropriate when determined by the objectives of the study, characteristics of wood, and sizes of the stream and river systems. We encourage resource professionals to carefully select the most accurate and informative measures of wood, maintain consistency where appropriate, but resist mindless uniformity without regard to management applications and research objectives.

One of the most challenging and exciting outcomes of the conference was the recognition of the diversity of scientific and cultural perspectives of wood in streams and rivers around the world. This richness of world views was noted by many of the authors and explored more thoroughly in the two chapters by Ken Gregory and Geoff Petts and Robin Welcomme. The international nature of the conference and its participants is apparent in this book with authors from nine countries and four continents. Their diverse backgrounds, cultures, and native languages offer the reader a global perspective and alternative world views about river wood not previously available in one volume. Their universal recognition of the importance of large wood to the ecology and management of the world’s rivers is clear and will hopefully compel scientists, managers, and citizens to consider wood, and the forests from which it comes, an integral part of conservation and restoration at global scales.

Stan Gregory, Oregon State University
Kathryn Boyer, Natural Resources Conservation Service
Angela Gurnell, King’s College London