

Recovering river systems: A synthesis of science, politics, and policy

River Ecology and Management: Lessons from the Pacific Coastal Ecoregion. Robert J. Naiman and Robert E. Bilby, eds. Springer-Verlag, New York, 1998. 705 pp., illus. \$189.00 (ISBN 0-387-98323-6 cloth).

Do not be deceived by the title. *River Ecology and Management: Lessons from the Pacific Coastal Ecoregion* does not cover the same ground as *Upstream* (NRC 1996) or "Return to the River" (ISG 1996), which are detailed analyses of the demise of the Pacific salmon. Some of the material is similar, but the presentation is different. This is a book for graduate students and watershed managers interested in the role of science in natural resource policy.

Most of the policy issues covered in *River Ecology and Management* concern stream and watershed restoration because the Pacific Northwest has few lessons to offer on the broad topic of ecosystem sustainability. For example, since the enactment of the Northwest Power Planning Act in 1980, over \$5 billion has been spent toward the goal of doubling the salmonid runs in the Columbia Basin by the twenty-first century (Court Smith, Oregon State University, personal communication), yet now, at the turn of the millennium, the geographic extent of threatened and endangered salmonids is the largest contiguous area declared under the Endangered Species Act. It ranges from the Canadian border south into the middle of Northern California and from Montana and Idaho westward down the Columbia Basin to the Pacific Ocean. How can we explain this predicament when, paradoxically,

some of the best natural resource scientists practice in that region? Largely, the failure to stem the decline of salmonids results from the lack of integration of natural sciences into public policy and from decision-makers' poor understanding of the management of risk and uncertainty (Naiman 1992, Lee 1993). This is the major premise of the book produced by Robert J. Naiman and Robert E. Bilby.

The two editors not only are accomplished stream scientists but also participated in joint management programs such as the state of Washington's Timber/Fish/Wildlife Analysis. They are well qualified to speak to the issues of watershed science, watershed management, and human dimensions of policy formation, which are the topics addressed in *River Ecology and Management*. This book is intended to be a general text, not a niche-marketed regional description.

Research for the book focused on the Pacific Northwest for two main reasons: first, the region is a huge testing ground for natural resource research and management; and, second, the integration of watershed science and management and its human dimensions is best accomplished where the lessons are more contextual, as they are in the Pacific Northwest. In many ways, the book is an updating of Calow and Petts (1992), but with important differences. The contributors and the editors of *River Ecology and Management* place greater emphasis than Calow and Petts on the advantages of hierarchical classification for viewing temporal and spatial scales of lotic systems, for explicitly recognizing

spatial and temporal variations in research, for monitoring and management design, and for adaptive management (sensu Holling 1978, Walters and Hilborn 1978). Calow and Petts (1992) use three river systems from different parts of the globe to illustrate the variety of circumstances influencing the management of rivers, in contrast to Naiman and Bilby's (1998) sole use of the Pacific Northwest. Naiman and Bilby's more formal treatment of the human dimensions of law, sociology, and economics creates a better understanding of the cultural issues affecting river management and leads to a better concept of how to integrate science into policy.

There were no weak chapters. All contributors are well recognized in their fields (e.g., Keller Suberkropp, Michael Murphy, Anne Hershey, Gary Lamberti, Gordon Reeves, Peter Bisson, James Agee, Frank Triska, Rick Edwards, and James Karr in the natural science section). In this limited space, I can highlight only a few chapters that struck a responsive chord with me. Among my must-read chapters are those by Loveday Conquest and Stephen Ralph on statistical design and monitoring and by Leslie Reid on watershed analysis. As most stream scientists will attest, experimental and monitoring designs are fraught with pitfalls. Sites within watersheds are highly autocorrelated, spatial extents are large, independent replicates are difficult to come by, intercorrelation among factors are common, and sampling windows are small. These two chapters provide students with a broad philosophical perspective about design