

Managing Forest Ecosystems

Volume 30

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Aims & Scope

Well-managed forests and woodlands are a renewable resource, producing essential raw material with minimum waste and energy use. Rich in habitat and species diversity, forests may contribute to increased ecosystem stability. They can absorb the effects of unwanted deposition and other disturbances and protect neighbouring ecosystems by maintaining stable nutrient and energy cycles and by preventing soil degradation and erosion. They provide much-needed recreation and their continued existence contributes to stabilizing rural communities.

Forests are managed for timber production and species, habitat and process conservation. A subtle shift from multiple-use management to ecosystems management is being observed and the new ecological perspective of multi-functional forest management is based on the principles of ecosystem diversity, stability and elasticity, and the dynamic equilibrium of primary and secondary production.

Making full use of new technology is one of the challenges facing forest management today. Resource information must be obtained with a limited budget. This requires better timing of resource assessment activities and improved use of multiple data sources. Sound ecosystems management, like any other management activity, relies on effective forecasting and operational control.

The aim of the book series *Managing Forest Ecosystems* is to present state-of-the-art research results relating to the practice of forest management. Contributions are solicited from prominent authors. Each reference book, monograph or proceedings volume will be focused to deal with a specific context. Typical issues of the series are: resource assessment techniques, evaluating sustainability for even-aged and uneven-aged forests, multi-objective management, predicting forest development, optimizing forest management, biodiversity management and monitoring, risk assessment and economic analysis.

More information about this series at <http://www.springer.com/series/6247>

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Decision Support for Forest Management

Second Edition

 Springer

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Preface

This book has been developed to serve as a textbook of decision support methods for students and as a handbook for practical foresters and researchers. It is based on the research we have carried out, lectures we have given over the past years and also on our experiences in real-life planning and decision-making processes. We have set out to present the methods used in enough details and with examples so that they can be adopted from this book. For researchers who need additional details, references are given to more advanced scientific papers and books.

In this book, theories of decision-making and the methods used for forestry decision support are presented. The book covers the basics of classical utility theory and its fuzzy counterparts, exact and heuristic optimisation methods, deterministic and stochastic methods and modern multi-criteria decision support tools. The use of each method is illustrated with examples. In addition to decision aid methods, we present the basic theory of participatory planning. Both hard and soft methods suitable for participatory or group decision analysis are presented, such as problem structuring methods and voting. The criticism towards decision theory is also covered.

In this second edition, we have given special emphasis on the practical aspects of multi-criteria decision analysis, namely, in selecting the set of criteria and creating the alternatives for sustainable forest management. We have included descriptions of different types of real-life participatory planning situations and described how different decision support tools can be used in them. Furthermore, we have introduced more advanced problem formulations and examples of linear programming and goal programming and introduced stochastic programming as well as new local-level heuristic optimisation methods. We hope the new edition can serve as a handbook in many different planning problems in the future.

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