Rivers of the Alps

Diversity in Nature and Culture
Editors’ Preface and Acknowledgements

Rivers are the lifelines of any landscape; that is especially true for the Alps. It was along rivers where humans first settled the Alpine sphere, and even today these waterways still shape our lives and economic activities in this region. Alpine rivers are diverse, dynamic ecosystems that provide habitats for a plethora of organisms and species communities.

Conjuring up an image of the Alps, most will focus on their peaks. There are a great number of books available on the mountains of the Alps, but only very few on the rivers of this region at the centre of Europe. Following a lengthy planning period, we, the editorial team, were able to include 150 authors hailing from all countries of the Alpine sphere in order to contribute their expertise and personal perspectives on Alpine rivers. Thirty-four expert chapters illuminate riverscapes from the viewpoints of natural, cultural and social sciences. There follow portraits of a selection of 54 Alpine rivers.

It was particularly important to us that this book, which is being published in a German and an English language version, will not only serve professionals as a reference work but also appeal to a wider public. The careful preparation of the texts by the editing and translation team as well as an attractive, richly illustrated book design are geared towards achieving this aim. We hope that this volume will trigger our readership’s interest and delight, thereby contributing to a greater awareness of the unique nature and value of Alpine rivers as well as the ways in which they are endangered. We hope to motivate our fellow humans to stand up for a sustainable use and the protection of these unique waters.

We want to express our gratitude to all those who have contributed to the creation of this book: the authors of expert chapters and river portraits, contributors of images as well as the competent team in charge of project organisation, comprehensive graphic design, editing and translation. This project could not have been realised without financial support. We therefore extend our heartfelt thanks to the Bristol Foundation and its director Mario Broggi. Finally, we want to thank our publisher Matthias Haupt in particular for the motivation and patience he has offered us along the way.

Susanna Muhar, Andreas Muhar, Gregory Egger, Dominik Siegrist
‘A river is a personality, it has rage and love, it has force, a destiny, ailments, and a hunger for adventures.’ This is how the renowned French author Jean Giono describes the multi-faceted nature of rivers in his 1934 novel Le chant du monde (The Song of the World). As Jean Giono originated from Manosque, a small town in the French Alps, we may assume that he had an Alpine river in mind when writing these words.

So indeed, water from the Alps and Alpine rivers do have many faces. Water is stored as ice and snow in the mountains and released to the rivers in spring and summer. Alpine rivers provide drinking water for millions of people, irrigate our fields, are a major attraction for sports and leisure and constitute a climate-friendly energy supply. And on top of it all, they are hotspots of biodiversity and living ecosystems. In short, rivers of the Alps are the defining lifelines of our society.

Against this background, the Alpine Convention, as the first international treaty for the protection and sustainable development of an entire mountain region, aims ‘to preserve or re-establish healthy water systems, in particular by keeping lakes and rivers free of pollution, by applying natural hydraulic engineering techniques and by using water power, which serves the interests of both the indigenous population and the environment alike’ (see Article 2 of the Alpine Convention).

I am intrigued to see that this book tackles so many of these important water questions in the Alps and manages to present them with research, data and views that will, I am sure, also serve as food for thought for each of you: readers, researchers, policy makers and stakeholders. For this, we owe a debt of gratitude and acknowledgement to the authors and editors of this volume; also for taking on the challenge of creating such a comprehensive and attractive publication.

I wish you all an enjoyable read; may this book be a fresh stream of knowledge for you.
The Alps are frequently called the ‘playground’ or the ‘water tower’ of Europe, reflecting their pivotal role in sustaining the social and economic well-being of an entire continent. The Alps cover an area of about 200,000 square kilometres and are home to more than thirteen million people. Moreover, a further twenty million people inhabit the area within a short distance of forty kilometres from the perimeter of the Alps, and 120 million tourists visit their valleys and mountains every year. This clearly reflects the multiple values and services the Alps provide for people and nature alike. At the same time, these values are increasingly under threat. Climate change, for example, affects the Alps more than most other regions in Europe, with an average temperature increase already exceeding the maximum 2 °C target of the Paris Agreement. In 1876, glaciers covered a total area of 1,800 square kilometres. Since then, the total glaciated area has retreated by forty per cent in Austria and thirty per cent in Switzerland, with an almost complete loss of glaciers anticipated by the end of the century.

Large European rivers and their tributaries arise in the Alps, connecting mountains with lowlands and, eventually, with the Black, Northern, Mediterranean and Adriatic Seas. However, only a small number of these rivers remain in a near-natural state, and many free-flowing headwaters are facing a major threat from an unprecedented boom in small hydropower plant construction, despite the tiny contribution to overall energy production provided by these plants. This reveals the unpredictable risks and future uncertainties we may expect due to climate and land-use changes and rapidly altering socio-economic conditions. The rivers in the Alps are early warning indicators of these fundamental and long-term changes. Indeed, we have to manage freshwater systems as well-balanced hybrid systems: as an essential resource for human consumption as well as a highly valuable and fragile ecosystem.

Traditionally, the Alps form the natural and cultural backbone of Europe with their high biological diversity and strong cultural identity. For the future, we need bold visions and major steps to maintain the Alps as linked biocultural systems, as well as an advanced understanding of the underlying driving forces of the coupling and decoupling of cultural and biological diversity.

Sustainable management and political decisions, however, must be based on scientific evidence. The present book integrates the collective knowledge of 150 dedicated authors from six Alpine countries as well as different disciplines and organisations. It provides a timely and comprehensive basis for developing a shared, bold vision, setting priorities for river and ecosystem management and sustaining the unique biocultural landscapes for which the Alps are famous. In this respect, the book will increase awareness of the cultural and biological heritage of the Alps.

Klement Tockner
President of the Austrian Science Fund (FWF)
Water provides the only connected, comprehensive natural network for humans, animals and plants in the Alpine sphere. Europe is traversed by large rivers that spring from the Alpine sphere: Rhine, Rhône, Drava, Durance, Inn and Po among them. The Alps are noted for their role as the ‘water tower’ of Europe. Yet we hardly heed the Alpine rivers, brooks and streams – is it because of their apparent abundance? This oversight is even more remarkable in light of the globally vital importance of a sustainable approach to water.

We have dozens of terms to describe the noise of flowing water: it may thunder, roar, gush, splash, gurgle, or even babble. In many places, we have harnessed the force of the waters’ current in order to generate energy in power plants. Hydropower is considered a ‘clean, local and renewable’ source of energy, and therefore environmentally sound. That may be true, but the affected landscapes are not renewable. The overlooked downside of the equation is damage to landscapes and their ecosystems. The natural resource ‘water’ is being over-consumed. The energy transition, moving away from fossil fuel energy, once again exposes Alpine rivers to the great danger of complete exploitation. Water has been ‘exorcised of its spirit’ in the valleys, as well. Rivers have been channelised and brooks even culverted, thereby reducing the significant formative presence of waterways in the plains.

We have gone much too far in our exploitation and structural engineering of Alpine rivers. The straightening of rivers has greatly increased their flow power and erosive force during heavy rainfall events. In the context of climate change, we must expect even further effects. We are likely to face a scarcity of the water to which we have given too little of the space that is a prerequisite for life and its diversity. We must launch a massive effort of revitalisation.

This book depicts the natural conditions of Alpine rivers, their significance as habitats, as well as economic activities that have taken place along these lifelines. The many faces of the relationships humans have forged with rivers are detailed in it. Our primary goal must now be the protection of the few remaining untouched rivers, brooks and streams. These ‘last of their kind’ must not be sacrificed for a little more electricity production or other for-profit targets. Unless we give non-commercial ideas more scope in our civil society, our entire world will be commercialised and eventually destroyed. Nature is worth so much more than its commercial value.

Rivers fascinate and invite closer inspection; their life-giving qualities are as apparent as their endangered state. This is reason enough for the Bristol Foundation to sponsor this work. Its approach to span across the Alpine sphere is both challenging and worthwhile. We hope that this clearly written and accessible book will increase the appreciation of the Alps as a ‘water tower’.
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Frédéric Liebault

Dora Baltea
Andrea Mammoliti Mochet

Drac
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Drava
Birgit Mark-Stöhr, Michael Koschat, Michael Mark,