

# Preface

The late 20th century and the early 21st century has been characterised by an unprecedented deterioration of the environment of the Earth and the throes of one of the major extinction events of all time. Unmitigated deforestation, desertification, erosion and salinisation of soil, pollution of water and air, and thinning of the UV-protective ozone layer constitute dire ecological threats for life on the planet. Fossil carbon is being returned to the atmosphere at an accelerated rate with a concomitant change in the Earth's climate that is making serious inroads into ecological stability.

The human population now exceeds the long-term carrying capacity of the Earth and subsists at its present level only because it is sustained by fossil resources of energy, soil, fresh water (laid down in aquifers in the Pleistocene) and even oxygen (produced by photosynthetic organisms over a few billion years). With continuing decrease in biodiversity, progressive destruction of essential habitats, degradation of major ecosystems, and contamination of life-support systems, it is likely that the carrying capacity of the Earth will decline below present levels – while at the same time the human population continues to rise exponentially. The outstripping of even the fossil resources, predicted to occur within the present century, presents a bleak outlook for our own species. We may well become victims ourselves of this most recent mass extinction.

While it is undisputable that many aspects of environmental degradation and loss of biodiversity is directly attributable to unwise human activities, other aspects are deemed to result from natural forces beyond the control of mankind. It is important to be able to distinguish between the two, so that attention can be focused on mitigating those effects over which we do have control. It is important to ascertain the causes of particular declines and extinctions as soon as possible, so that steps can be taken to preserve what diversity we can.

Amphibians, by virtue of their thin, moist, permeable skins, are poorly protected from harsh environments and are especially susceptible to chemical changes, desiccation, disease, and to alteration of their habitat. The biphasic lifestyle of most amphibians also exposes them to threats both on land and in water. Accordingly, it is not surprising that they manifest proportionately high

extinction rates and more severe declines than do most other organisms. They are especially important to study because they serve as an early warning system portending changes that may soon impinge upon more resistant species, including ourselves, and because they are an important part of many ecosystems: driving flows of nutrients and the transfer of energy.

The series *Amphibian Biology*, as its name implies, treats the entire biology of amphibians, but because of the extreme importance of the decline and conservation of this taxon, four volumes are devoted to these topics. Volumes 8 and 10 contain a topical elucidation of the myriad factors responsible for amphibians' demise and an assessment of measures that can be taken to conserve them. Volume 9 (Western Hemisphere) and 11 (Eastern Hemisphere) assess the worldwide status of the decline, extinction, and conservation of amphibians in several Parts (see Table of Contents) organised on a country-by-country basis; the present one (Volume 11, Part 6) deals with Australia, New Zealand, and the Pacific Islands.

Although the various Parts of Volume 11 have been produced by different publishers, the chapters are numbered consecutively across the entire volume. CSIRO Publishing, however, required that the present Part be numbered separately as Chapters 1–14. Consequently, in the Table of Contents that sequence is followed (in parentheses) by the corresponding designation for Part 6 (Chapters 68–81) relating to consecutive numbering across the entire volume.

The taxonomic nomenclature of amphibians is in a state of flux and is controversial. In this book, we retain use of the generic names *Litoria* and *Cyclorana* (following the taxonomy of AmphibiaWeb, <http://amphibiaweb.org>) pending a comprehensive resolution of phylogenetic relationships.

There are various websites that estimate the current vulnerability of amphibian species to extinction and the present status of their decline. These websites change as status changes. *Amphibian Biology* does not compete with those, but rather is a 'time capsule' providing a perspective by present-day experts on the conservation of amphibians and the challenges faced by this taxon in each Australo-Pacific region. Because species are declining or going extinct while chapters are being written and put to

press, in one sense the present treatise already will be out of date by the time it is published. In another sense, however, it is timeless because one can return to it for information on status at a specific time as a means of assessing subsequent extents and rates of change.

Harold Heatwole  
Raleigh, North Carolina  
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Jodi J. L. Rowley  
Sydney, New South Wales  
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