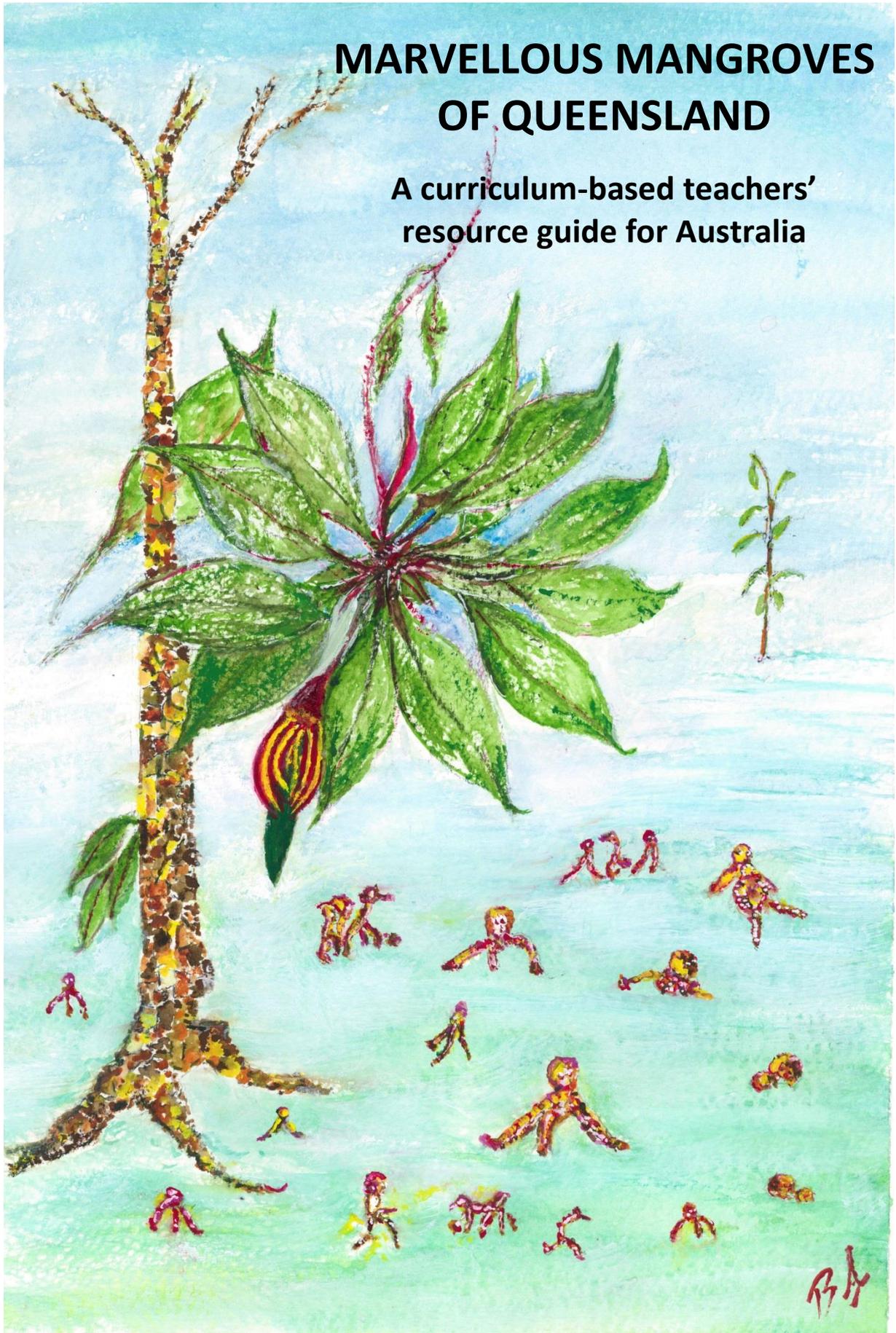


# MARVELLOUS MANGROVES OF QUEENSLAND

A curriculum-based teachers'  
resource guide for Australia



# Marvellous Mangroves Australia

## A Wetlands Education Resource Book for Australia

Funded by:



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## INTRODUCTION

### MARVELLOUS MANGROVES OF QUEENSLAND

Welcome to the Marvellous Mangroves of Queensland – a guide for teachers that will provide a complete understanding of mangrove ecology, and support the conservation of the vitally important ecosystems provided by these remarkable trees.

This workbook is aimed mostly at students aged 8 to 13 (Grade 4-8), although the materials can be made more sophisticated for older grades. It has been designed for use outside the school with, for example environmental clubs or youth groups. The book is designed primarily to provide schoolteachers with a complete resource for conducting a Mangrove Education Unit in the classroom and the field. The book contains background on the types of mangroves found in Queensland, their ecology, and the many functions that they perform. The workbook also describes what's happening to the mangroves – how and why they are being degraded and lost, and the consequences of this loss for ecosystems and, ultimately, people. Finally, the workbook addresses mangrove conservation issues that are relevant to the islands, and provides students with ideas for projects to help conserve mangroves that they themselves can undertake in their own schools and communities. These activities should help the children to become more self-confident in their knowledge of mangrove ecosystems, and committed to taking part in actions that will help to conserve the world's diminishing mangroves.

Each section of the workbook contains a number of hands-on activities and exercises to illustrate and reinforce concepts that are described, and for experiential learning. Also included is information on the most common mangrove invertebrates, plants, birds and mammals, as well as a "how-to" section for conducting a field trip to a local mangrove swamp. It is important that classwork is followed by taking students into the field, as there is no substitute for experiencing the wonders of mangroves first hand.

In order to incorporate the information and activities in this workbook into the Australian science curriculum, just check the charts on page vii for learning objective tie-ins. Other parts of the workbook/curriculum cover knowledge and skills in geography, civics and citizenship, English and the arts.

## HOW THIS BOOK CAME INTO BEING

Work began on this book in 1998 when writer/teacher Martin Keeley moved permanently to Cayman Brac. During the previous eight years, Mr. Keeley was intensively involved in the development and implementation of curriculum and teaching resources in British Columbia, Canada. The focus of these educational activities was wetlands – their importance as vital, yet little understood, ecosystems. Many of the resource materials in this workbook were adapted from hands-on activities that were included in two teachers' resource guides: *Discover Boundary Bay* (1993) and *Exploring Estuaries and Wondrous Wetlands*. The development and implementation of these workbooks was carried out by a team of educators under Mr. Keeley's direction in his position as executive director of the Friends of Boundary Bay.

Mr. Keeley, with initial funding from the Canadian International Development Research Centre and the Mangrove Action Project, began to adapt these resources for use in Cayman Islands schools. An initial month of teaching at Spot Bay Primary School on Cayman Brac was followed by summer school. The following fall, more of the materials were adapted for an ecology course that he developed for Year 7 through 10 at Cayman Brac High School. In the fall of 1999, he began working full-time with the Cayman Islands Department of Education to teach hands-on ecology to the three primary and one high school on Cayman Brac, with trips to Grand Cayman to work with primary school teachers there. This work has continued through to 2007, with annual trips to each of Grand Cayman primary schools sponsored since 2002 by the Caribbean Utilities Company Ltd. (CUC). The final result of these teaching programmes is this workbook which was first published in 2000.

During the development and implementation of these resources, Mr. Keeley also worked on a similar, region-wide workbook, *Wondrous Wetlands of the West Indies*. This book was published by the West Indian Whistling Duck Working Group of the Society of Caribbean Ornithology in 2001 with a second edition in 2004. Through the international NGO, the Mangrove Action Project (MAP) – of which Mr. Keeley is Education Director – the book has been adapted and translated for use in Colombia (the San Andres/Old Providence Archipelago and Cartagena), Honduras, Guatemala, Sri Lanka, Brazil, China, Belize and Indonesia. This work was carried out in conjunction local non-governmental agencies, teachers, educators and scientists in each of these countries so that the contents could relate to specific flora and fauna as well as social and teaching conditions in each country.

The long-term goal of MAP is to introduce this mangrove curriculum to every country in the world that has mangroves. Many people helped in the production of this resource guide. They are all listed in the credits. They all believe, as does the author, that exploring the world around us is FUN—and that schools should incorporate hands-on learning as much as possible to reinforce what is learned from books.

## HOW TO USE THIS BOOK

This workbook is designed with Year 4 to 8 children in mind, but most of the activities can be modified for use with upper and lower years as well. The book is divided into five sections. Supplemental resources for areas such as species identification in the field are recommended throughout the book and in the Resources Section at the end, which contains a complete bibliography listing further resources as well as where to obtain them. Each section deals with a major topic relevant to Queensland mangroves and contains three kinds of material: one or more informational sections, activities and worksheets ready for students to use.

It is important to incorporate environmental studies with disciplines other than science (scientific topics are obviously comprehensively covered in this book) and the chart on page vii outlines the specific tie-ins with primary and lower secondary science curriculum. However, other disciplines are also included: Humanities and Social Sciences (Geography, History and Civics and Citizenship), Language Arts (English) including Drama and Written Arts) as well as Mathematics and Visual Arts.

The recently revised Australian Curriculum is designed to meet the needs of students by delivering a relevant, contemporary and engaging curriculum that builds on the educational goals of the Melbourne Declaration. The Melbourne Declaration identified three key areas that need to be addressed for the benefit of both individuals and Australia as a whole. In the Australian Curriculum these have become priorities that provide students with the tools and language to engage with and better understand their world at a range of levels. The priorities provide dimensions which will enrich the curriculum through development of considered and focused content that fits naturally within learning areas. They enable the delivery of learning area content at the same time as developing knowledge, understanding and skills relating to two of the three priorities: Sustainability and Aboriginal and Torres Strait Islander Histories and Cultures.

*Marvellous Mangroves of Queensland* follows the same set of criteria by integrating several curriculum strands in each learning experience.

As an educator, you are the best judge of the abilities and interests of your students. Activities within this guide can be adapted or used in part to suit the needs of students at any age level. (To help with this, options for activities based on age level are offered throughout the book.) You can also choose activities from anywhere in the guide to meet your needs. These activities can be integrated into themes or topics that you are studying in class. The duration of each activity is shown, but, again, this can be adapted to suit your own classroom needs and the learning skills of your students.

In the book, students are taken from the discovery of mangroves to awareness of environmental issues relevant to mangroves, and are encouraged to take individual or class action to positively affect the environment. To maximize comprehension of topic, it is recommended that the book be used as a unit, but activities can be used separately or to enhance other sections. The first two sections provide an in-depth look at what wetlands are, what lives in them, and how they work. Section 3 deals with what is happening to mangroves – primarily their destruction – and the final

two sections give students an understanding of how they can help change this situation by taking action and exploring mangroves in the field.

Because the book is based on the concept of implementing classroom learning in the field, a field trip is a must. This book gives teachers a complete guide to the “dos and don’ts” of running a field trip. It also supplies detailed instructions and the data collection work sheets that will be needed. Good luck, and please let us know if you have any suggestions for changing or adding to the material found in the book.

*Martin A. Keeley, Cayman Brac, 1 August 2014.*