Colour Web Guide to the Identification of Invertebrates from Australian Inland waters

Final Progress Report

John Hawking and Lyn Smith

February 2008

Identification and Ecology of Australian Freshwater Invertebrates

An interactive guide with colour digital imagery to assist in the identification of aquatic invertebrates

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Australian Government
Colour Web Guide to the Identification of Invertebrates from Australian Inland waters: Final Progress Report to Department Environment and Water Resources

A report prepared for Department Environment and Water Resources by the Murray-Darling Freshwater Research Centre.

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Report Summary
The Colour Web Guide project (*Bug Guide*) is progressing satisfactorily with the majority of key milestones tasks completed. There are some tasks remaining, most of which are on track to be finalised by the March 2008 project completion date. One task that has been beyond MDFRC control to complete is the ministerial launch of the online version of the *Bug Guide*. The launch was placed on hold due to the organisational restructuring of the Department of Environment and Water Resources (DEWR) and the last federal election. An extra valuable educational resource has been added to the guide, through external funding from the Victorian Waterwatch program. This launch still needs to be organised and undertaken by DEWR for the completion of the project. In 2007, the *Bug Guide* was presented at the National Waterwatch conference and tested in the AUSRIVAS training course and Waterwatch training workshops. Awareness of the usefulness of the *Bug Guide* as an identification tool is increasing with the MDFRC website statistics indicating that it is a popular web site.

Project Objective
The project objective is to “Create an easy to use macroinvertebrate taxonomic reference guide to facilitate better and more cost-effective river condition monitoring.” This project is known as the “*Bug Guide*”.

Project Overview
The *Bug Guide* is an ‘online identification tool’ and an ‘interactive educational tool’ used by students through to ecologists, to be a able to identify aquatic invertebrates to family level, and it includes the more commonly used indicator taxa to generic level. This resource underpins environmental monitoring and assessment studies by aiding the identification of the macroinvertebrates used as ecological indicators of river health. The *Bug Guide* is being adopted by agencies undertaking ecological assessments using AUSRIVAS Rapid Assessment Methods, particularly state departments conducting the Sustainable Rivers Audit, as well as state community monitoring programs such as Waterwatch and Landcare.

The *Bug Guide* uses colour digital imagery of the animals and their body parts to enable easier identification. Information on life cycles, distribution and ecology is provided, as well as AUSRIVAS taxa codes and, SIGNAL pollution sensitivity ratings that are required for river health assessment. All relevant taxonomic references are provided along with sections containing downloadable taxonomic and educational resources.

As reported in the first progress report (November 2006), the *Bug Guide* is hosted within the MDFRC website at [http://www.mdfrc.org.au/bugguide](http://www.mdfrc.org.au/bugguide). Enquiries about the *Bug Guide* can be directed to Lyn Smith and John Hawking via bugsonline@mdfrc.org.au on the ‘Contact Us’ page.

Progress Overview
The *Bug Guide* is almost complete with work continuing on; the incorporation of feedback from end-users and taxonomic specialists; addition of images; and the finalisation of text. More end-users in both AUSRIVAS and Waterwatch monitoring are becoming aware of the *Bug Guide* and incorporating its use into their identification protocols.

Significant points of progress since the last report (June 2007) include:

- Addition of Victorian Regional Resources - August 2007
- Re-design of front-end pages – August 2007
- The *Bug Guide* was a significant part of the AUSRIVAS macroinvertebrate training course - University of Canberra, September 2007.
- Presentation of the *Bug Guide* at the National Waterwatch Conference – Australian National University Canberra, November 2007
- Presentation of the *Bug Guide* at North East CMA Waterwatch volunteer training workshop – La Trobe University Wodonga, December 2007
- Online stats
Addition of Victorian Regional Resources – August 2007

The Victorian Department of Sustainability and Environment (DSE) funded a small project to provide online resources for Victorian Waterwatch co-ordinators to utilise for their routine monitoring and education. Given the ongoing support of Waterwatch in trialling the Bug Guide during its development it was logical that the regional resources should be housed within the Bug Guide itself. Lyn Smith sought and supervised a graphic artist, Tiana Johannis, who was subcontracted to enhance existing MDFRC images, create html pages and downloadable, editable PowerPoint files. Links were provided to gather information for the existing resources from the existing content of the Bug Guide. These resources can be viewed online at http://www.mdfrc.org.au/bugguide/index.htm. Just click on a region of interest in interactive map of Victoria (Figure 1) then follow the links to categorized html pages for each region and/or downloadable PowerPoint files that can be edited by co-ordinators to suit their own needs (see example - Appendix 1).

Figure 1 The new Bug Guide homepage includes access to the Victorian Regional Resources
Re-design of front-end pages – August 2007

The graphic artist was also utilised to redesign the front-end pages of the Bug Guide, including the navigational menu, such that the format of the Bug Guide matches the format of the MDFRC website making it more appealing and more easily accessible. The front-end pages are crucial for enticing users into the body of the website and they contain important information about the using the website and identifying invertebrates. The front-end pages include;

1. Homepage [http://www.mdfrc.org.au/bugguide/index.html](http://www.mdfrc.org.au/bugguide/index.html) (Figure 1)
2. How to use this guide [http://www.mdfrc.org.au/bugguide/resources/howtouse.htm](http://www.mdfrc.org.au/bugguide/resources/howtouse.htm) (Figure 2)
3. How to identify bugs [http://www.mdfrc.org.au/bugguide/resources/macroinvertebratetutorial.htm](http://www.mdfrc.org.au/bugguide/resources/macroinvertebratetutorial.htm) (Figure 3)

Figure 2 A screen-grab of How to use this guide

Figure 3 A screen-grab of How to identify bugs
Bug Guide utilised in the AUSRIVAS macroinvertebrate training course - University of Canberra, September 2007

Each year the University of Canberra runs two AUSRIVAS accreditation courses. Module 3, “Macroinvertebrate sampling and Processing”, now contains the Bug Guide as a major macroinvertebrate identification resource. A taxonomic training exercise is undertaken by course participants where each person is expected to collect macroinvertebrates as per the AUSRIVAS protocols then identify them utilising the Bug Guide. The online tutorial, How to identify bugs, which is incorporated in the Bug Guide is used to help participants complete the exercise. Module 3 also contains a discussion board section on the comparison of the LUCID macroinvertebrate matrix key with the Bug Guide dichotomous key. In semester 2 2007, feedback was very positive in favour of the Bug Guide. The Bug Guide is also used by participants during the taxonomic accreditation portion of the 5 day on-campus workshop at the conclusion of the AUSRIVAS accreditation course.

Presentation of the Bug Guide at the National Waterwatch Conference – Australian National University Canberra, November 2007

John Hawking and Lyn Smith were invited and funded by the National Waterwatch Conference organising committee to present 4 ½ hour workshops. John Hawking presented an “Introduction to Invertebrate Ecology” and an “Introduction to Taxonomy”. During both workshops, the Bug Guide was referred to as a ready source of information for all Waterwatch coordinators, volunteers and students. Lyn Smith presented 2 hands-on workshops on the Bug Guide itself, including the Victorian Regional resources. Conference participants included regional Waterwatch coordinators from several states and employees of several state water agencies. All feedback on the day was positive with some requests for copies of the offline CD.

Presentation of the Bug Guide at North East CMA Waterwatch volunteer training workshop – La Trobe University Wodonga, December 2007

Lyn Smith presented a hands-on workshop of the Bug Guide as part of an “Introduction to macroinvertebrate taxonomy and sampling methods” evening aimed at Waterwatch volunteers. Waterwatch volunteers come from various walks-of-life with this group including farmers, a retired microbiologist and established Landcare volunteers. All feedback on the night was positive with some requests for the offline CD.

Remaining Tasks

The Bug Guide becomes more complete daily with Lyn Smith, Dee Street and Chris Davey dedicating the bulk of their time to this project. Edits and updates are available online immediately. The Bug Guide is fully operational with some ‘gaps’. A list of remaining tasks is given below.

- complete review of ecological references
- write remaining ecological sections of description pages
- complete taxonomic references on description pages
- finalise digital images for keys and description pages
- editing of the text and images of all keys, as required by expert and user feedback
- update glossary
- scans for keys and description pages, where specimens are unavailable for digital imaging
- update terminology images
- finalise proof reading
- reformat generic text
- update templates
- update taxonomic resources
- update educational resources

MDFRC has taken steps to ensure the thorough completion of this project. In December 2007, MDFRC employed Dee Street specifically to complete the review of ecological literature for the completion of the description pages. Dee has been a welcome addition to the Bug Guide team. At the end of 2007, Kathie Le Busque, who has been responsible for digital imagery since the beginning of this project, took maternity leave. MDFRC has reallocated Chris Davey to complete the remaining key and description page images.
Remaining Issues

Milestone 1b: “Colour Web Key Guide available as a CD by AUSRIVAS operators”
In the past we have reported (June 2007) that AUSRIVAS and Waterwatch end-users indicated that they would use an offline version of the Bug Guide, in the form of a CD, when it was necessary to overcome internet access issues. Again we highlight that whilst MDFRC has the ability to create CDs, there is no resource plan in place to purchase consumables or to allocate staff the time required to make CDs available on an ongoing basis, in particular post March 2008.

An up-to-date CD version of the Bug Guide can be generated online and downloaded through the MDFRC website publishing area, by Lyn Smith. This CD can be requested via bugsonline@mdfrc.org.au on the ‘Contact Us’ page. The CD version only contains the identification key but does not contain the downloadable taxonomic, education or regional resources nor is a print friendly page available. This has been done deliberately to ensure that users return to the online version where updates can be made readily at any time. A system to notify users of updates needs to be established nearer to completion of the current project.

Milestone 2: “Ministerial launch of the Colour Web Key Guide at Water Week”
As discussed in previous progress reports (November 2006, June 2007), the ministerial launch was postponed. Discussions had begun between John Hawking (MDFRC), Don Thompson (DEWR - Waterwatch) and Neal Hardy (DEWR) regarding a possible launch of the Bug Guide at the National Waterwatch conference held in November 2007 in Canberra but this did not come to fruition. A plan for the launch needs to be discussed between MDFRC and DEWR.

Online Stats
Statistics on the usage of the Bug Guide are available to MDFRC via the Content Contributor system that is used to publish the MDFRC website. Monthly summaries are sent via email. There are on average 433 visits per month to the Bug Guide homepage (Table 1).

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<th>Month</th>
<th>Visits</th>
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<tr>
<td>December</td>
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<td>April</td>
<td>289</td>
</tr>
<tr>
<td>March</td>
<td>404</td>
</tr>
</tbody>
</table>

Table 1 Monthly summaries of visits to the Bug Guide homepage
Appendix

Appendix 1 Example of Victorian Regional Resources downloadable PowerPoint file