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Waterway Management Program

Program Leader: Dr Peter Hairsine

Project W2: Stream restoration

Introduction

While the first three years of the Waterway Management Program focused on stream degradation, the final three years were spent developing principles and procedures to reverse that degradation and begin the process of stream rehabilitation. Stream restoration or rehabilitation attempts to re-establish faunal habitat and environmental flows, as well as restore water quality, stream shape, stability, and vegetation. In Australia recently, the National Heritage Trust allocated more than \$250 million for stream rehabilitation, and many millions more are spent annually by State and Commonwealth agencies and catchment groups.

The aim of this CRC project was to provide practitioners across Australia with sound technical information to improve environmental and economic returns from their investment in stream rehabilitation. CRC Researchers collaborated with LWRRDC to publish the first Australian Stream Rehabilitation Manual for use by those responsible for rehabilitating degraded streams.

Other studies have included assessing the impact of drawdown below reservoirs and dams on stream-bank erosion and failure; monitoring environmental flows in the Campaspe River (Vic.); monitoring the effects of stream rehabilitation works in the Broken River (Vic.); and developing a 'recovery model' for streams disturbed by heavy sedimentation ('sand slugs'). Significant initiatives from the W2 program will be followed through in the new CRC's Stream Restoration Program, which will focus on the physical aspects of streams – hydraulics, geomorphology, and hydrology - which provide a foundation for stream rehabilitation.

Project's Intended Outcomes

- A stream classification approach showing stream types', supposed original condition and present stability
- Information on existing stream restoration techniques and the limits of their applicability
- Review of urban and rural stream restoration techniques
- Stream restoration demonstration site with evaluated performance
- Assessment of impact of environmental flow regimes on the morphology and sediment behaviour in a test stream.
- Stream restoration handbook
- Improved understanding of the effects of river rise and fall on bed and bank erosion.





Completed Projects

1997-1999

Project W2:

Stream restoration

Key Project Achievements

- Published Australian Stream Rehabilitation Manual (with LWRRDC) on the web and CD-ROM.
- Began trials of '12-step procedure', developed in the manual, at various sites around Australia.
- Contributed to planning and running of the Second National Stream Management Conference in Adelaide, February 1999. Published and edited over 140 papers in the conference proceedings.
- Completed research on river drawdown and bank erosion in the Mitta Mitta River (Victoria) below the Dartmouth Dam. Findings were incorporated into reviews of operating rules at some of Goulburn-Murray Water's storages.
- Completed monitoring of a stream rehabilitation project in northeast Victoria (Broken River catchment), the first comprehensive biophysical evaluation of stream rehabilitation carried out in Australia. Findings have been summarised as a CRC report.
- Completed monitoring surveys of environmental flows in the Campaspe River, in collaboration with the CRC for Freshwater Ecology and Goulburn-Murray Water. Researchers have mapped habitat units to describe the effects of environmental flows and developed a hydrological model for use in biological monitoring.
- Commenced research into understanding of fundamental physical processes in streams, including recovery after disturbance by heavy sediment pulses (sand slugs) and processes initiating pools and riffles. The aim of this work is to better understand natural recovery processes in streams in order to help set priorities for stream rehabilitation.

Staff Involved:

Project Leader

Dr Ian Rutherford (Monash University)

Researchers

Dr Chris Gippel (The University of Melbourne)

Assoc Prof Bob Keller (Monash University)

Nick Marsh (Monash University)

Kathryn Jerie (Monash University)

Postgraduate Students

Nick Marsh (Monash University)

Rebecca Bartley (Monash University)

Mike Stewardson (The University of Melbourne)

Sam Green (Goulburn Murray Water)

Renuka Savaratnam (Monash University)

Participating Organisations

CRC for Freshwater Ecology

Department of Natural Resources and Environment, Vic

Goulburn-Murray Water

Land and Water Resources Research and Development Corporation (LWRRDC)

Melbourne Water

Monash University

The University of Melbourne