

# Chapter 6

## Application of Research



Photo: John Hawking

### Program Technology Transfer

### Leader Prof Peter Cullen

The CRC Program was established with a philosophy of harvesting the fruits of research for use by industry. With this in mind, technology transfer has always been a core operating area of the CRC for Freshwater Ecology. Activities in this area, however, have received increased emphasis during the past year as many projects have neared completion and produced results. As the first phase of CRCFE research is winding down, the second phase is now being implemented with an emphasis on developing technology transfer strategies at the outset.

### 6.1 Highlights

- The *NSW Rivers and Fish in Stress* report provided direct input into the NSW Government's Water Reform process.
- NSW Fisheries have placed a ban on fishing for silver perch as an outcome of the *NSW Rivers and Fish in Stress* report.
- Modelling work conducted by Chaffey Dam researchers has been taken up by the CRC for Water Quality and Treatment and will be used in a large-scale experiment that will utilise an impeller to destratify a dam in South Australia.

- Staff from the Tamworth laboratory of the Department of Land and Water Conservation have improved their methods of measuring low concentrations of nutrients as a result of training conducted by members of the Chaffey Dam project.
- Fishways have been installed on three NSW rivers as a result of work conducted under the Fish Ecology program.
- The Department of Natural Resources and Environment has modified their procedures for allocating environmental flows for the Campaspe River as a result of the environmental flows project being conducted by the CRCFE.



Dave Tiller, EPA Victoria, sorting bugs with Glenelg Waterwatch regional coordinator, Cathy Wagg, who is also a member of the Glenelg Waterways Team. EPA and GWT have developed a fruitful collaboration that has resulted in a large-scale assessment of the Glenelg River catchment. Photo: Freshwater Sciences, EPA Vic



Leon Metzeling, EPA Victoria kick sampling for macroinvertebrates in a Victorian river as part of that State's monitoring efforts for the National River Health Program. Photo: Freshwater Sciences, EPA Vic

- AusRivAS web site and predictive models up and running and training courses run for the ACT Government, ACTEW, Department of Land and Water Conservation and private consultants.
- The AusRivAS models, developed for National River Health Program, have been implemented by most States and Territories in Australia. The program is being trialed in Indonesia. New Zealand has expressed interest in adopting the methods.
- Urban pond and wetland design principles adopted by water authorities in South Australia, NSW and Victoria.
- The algal sampling protocol for Australian rivers has been quoted extensively in Water Quality Guidelines developed for phytoplankton in rivers.
- Field studies of mortality in tadpoles of the endangered Corroboree frog have led to a program of pool construction and population augmentation through captive rearing. The program is being conducted jointly by the NSW National Parks and Wildlife Service and the University of Canberra.
- About 200 research, water and natural resource managers, community group representatives and students attended the international conference, *What is River Health*, held at the University of Canberra during November. The conference proceedings are being prepared for publication in the international journal, *Freshwater Biology*.
- Edited proceedings from the First Australian Diatom Workshop and organised Second Australian Diatom Workshop. Presented a diatom identification course for industry.
- Lower Basin Advisory Committee established to facilitate communication between the Lower Basin laboratory and the community. Two meetings held.
- The Urban program is collaborating with partners to develop Best Management Practice Environmental Management of Stormwater Guidelines (Melbourne Water, EPA Vic, EPA NSW).
- The Urban program has helped develop stormwater management strategies and pollution control designs for local government agencies. It has also presented courses (AWWA-CRCFE) on catchment management and pollution control pond and wetland design.
- The seeds of River Murray bank erosion work, completed last year, have germinated with *Phragmites* plantings now being routinely incorporated in revegetation plans developed by the river and catchment firm, ID&A, for the north-east and the Goulburn-Broken catchments. Trials are underway on the Mitchell River in Gippsland, also by ID&A. The work has also encouraged the acceptance of using other macrophyte species such as *Juncus*, where *Phragmites* is less appropriate.

## 6 Strategy for technology transfer

The CRCFE will not achieve its vision of improving our inland waters unless it can convey the results of its research and its insights into how catchments and their water bodies function to a variety of audiences.

The Centre now develops Technology Transfer Plans for its major projects. Plans have been developed and are now being implemented for the Chaffey project, the Campaspe project and the Lowland Ecology project, and plans are being developed for the Sediment-water interactions project. These plans identify the key messages from the project, the important audiences to reach and the means by which they will be reached.

In addition, a technology strategy is being developed for the Urban Water Program which takes a marketing approach to identify the best means of packaging technical material for its clients.

We have been exploring ideas on how professionals receive technical information. The traditional communication model has a source, a medium or channel and a receiver and implies a one way model of communication. This is the model on which a lot of technical transfer in natural resource management is based, with reports, brochures and newsletters being sprayed out to a wide audience. There is little evidence that this model is successful; it is certainly costly.

The CRCFE has revised this model by exploring how professionals seek information. From this we have developed the following propositions which underpin our developing technology transfer strategy.

- The professionals we deal with are busy people under lots of pressure. They are receptive to information when it informs them on a topic they are dealing with and has the potential to reduce the risks of the decisions they take.
- They often have quite poor knowledge seeking strategies in terms of computer and literature searching.

- Face-to-face interpersonal communication is the preferred mode of communication for information seeking and many people will seek a source they know, trust and find non-threatening rather than one with high level expertise.
- They expect information on request rather than a promise to give them references.

This understanding has led the Centre to develop a number of new strategies for communicating its work.

- Have senior staff serve on high level committees in appropriate areas.
- Develop our World Wide Web materials to provide instant and easy access to useful information.
- Appoint two staff to serve as full-time 'knowledge brokers' to act as the interface between the CRCFE and its potential recipients. These people develop trust with the clients, can deliver a lot of useful information directly, and where appropriate bring in relevant research expertise on a limited basis.



Leon Metzeling, EPA Victoria, and Cathy Wagg, the Glenelg Waterwatch regional coordinator, sorting macroinvertebrates as part of a bioassessment project being conducted in the Glenelg catchment with Tim Bessell-Browne. Photo: Freshwater Sciences, EPA Vic

## 6.3 Technical support to resource managers and other agencies

Agency	Project/Activity	Staff involved
Australian Newsprint Mills	Analysis of water quality monitoring data to identify key triggers for algal blooms.	Helen King
	Determination of targets for nutrient management in wastewater treatment to reduce the incidence of blooms.	Helen King
	MDFRC presented results from the monitoring program to the Annual ANM Review, November 25.	Helen King Darren Baldwin
	Interpretation of water quality monitoring data from Ettamogah Dam. Identification of nuisance organisms resulting in fouling to the irrigation filtration system. Provided advice on potential management solutions and sourcing of expert specialists.	Helen King
AWQC (SA Water)	Provision of taxonomic keys for Copepoda related to water quality monitoring.	Russ Shiel
	Advice on microfaunal ecology in SA waters	Russ Shiel
Barwon-Darling River Management Committee	Served on the committee of the NSW Water Reform Process.	Peter Gehrke Craig Schiller Martin Thoms
	Member of the Committee's Research Working Group	Martin Thoms
CALM, WA	Provision of taxonomic keys and expertise on microinvertebrates for surveys	Russ Shiel
Catchment Management Authority, North East	Board member	Terry Hillman
Catchment Management Group, Far South Coast	Biological monitoring	Richard Norris
Cardross Taskforce	Scientific adviser on maintaining and breeding purple-spotted gudgeon in wetlands in the Mildura area, December 2.	Ben Gawne
Conservation Council of WA, WA Rural Waterways and ABC Perth	Advice on assessment of the proposed Swan River destratification project.	Brad Sherman
CRA Project Platypus Research	Attended meetings of the Advisory Committee on July 10 and August 6-7.	Barry Hart
Dept Natural Resources, QLD	Scientific representative on the technical advisory panel for the Water Allocation Management Plan for Condamine Balonne. Member of Border Rivers Technical Advisory Panel.	Martin Thoms
Department of Natural Resources and Environment, Victoria	Participated in Soil, Water and Nutrients workshop in Acheron, July 8. Environmental Flows and Stressed Rivers, Melbourne, November 7.	Barry Hart
	Discuss the Lower Basin Laboratory's contribution to the Sunraysia nutrient management plan.	Ben Gawne

*continued over*

Agency	Project/Activity	Staff involved
Department of Primary Industries and Energy	Dr Terry Walker (Land Resources Division) visited the Centre for on-going discussions, April 1 and May 13.	David Rischbieth Terry Hillman
Department of Land and Water Conservation NSW	Advice re seacat profiles and dissolved oxygen calibration/processing.	Patrick Hatton
	Collection/processing/analysis of meteorological data and compared data sets for specific periods to see how the organisation's instruments performed relative to each other.	"
	Historical data collection methods/processing/archiving and analysis.	Brian Button
	Study using satellite imagery to identify and calculate the area and volume of water extracted for irrigation in the Richmond River Catchment.	Brian Button
	Address to first meeting of the Murrumbidgee River Management Committee, Burrinjuck Dam, November 10.	Terry Hillman
	Spoke to the Committee on "Ecology of Inland Streams".	
	Advised on sand and gravel extraction in the Namoi River.	Martin Thoms
	Joint DLWC/EPA Snowy Water Inquiry. Produced an Expert Panel Assessment of environmental flows for rivers affected by the Snowy Mountains Scheme-the Snowy, Eucumbene, Tumut, Tooma, Geehi and Goodradigbee.	Sam Lake John Harris
	Several policy and technical committee meetings on the NSW Water Reforms	John Harris
	Meeting to discuss the IPART report on water pricing, August 1.	"
	State Fishways Program meeting, October 13, February 11 and May 19. Attended a NSW Weirs Review meeting on the February 11 and May 19.	"
	Participated in a meeting to discuss Menindee Lakes water management, March 6.	Ben Gawne
	Project proposal for Menindee Lakes.	"
	Murray Water Reform Briefings at Corowa and Deniliquin on December 3. Spoke on the Murray Expert Panel.	Terry Hillman
	Workshop at the University of Canberra, March 3, to identify research that addresses the relationships between water regimes of floodplain wetlands and ecological variables.	"
	Workshop on Integrated Monitoring of Environmental Flows (IMEF), Sydney, March 10-11.	"
	Technical advice to the NSW Minister for Fisheries, Mr Bob Martin, on habitat degradation in the Cataract River resulting from mine subsidence.	Peter Gehrke
Dareton collection and identification of aquatic invertebrates, March 26-27.	Lower Basin Laboratory	

continued over

Agency	Project/Activity	Staff involved
Environment Australia	Prepared paper on <i>Status and trends of inland water ecosystems and options for conservation and sustainable use</i> for the Conference of Parties to the Convention on Biological Diversity in Slovakia, May 4–5.	Terry Hillman
	National meeting of lead agency representatives on management and running of the National River Health Program, February 16–18.	Richard Norris
	Contribution to EnviroNET web site with case study on AUSRIVAS.	Richard Norris Karen Markwort
Environment Protection Authority NSW	Advised on urban stormwater management guidelines and water quality models for assessment of estuaries and setting catchment land use and management pollution control targets.	Ian Lawrence
	Identified gut contents of <i>Asplanchna</i> (Rotifera) from the Hawkesbury-Nepean River September 17.	Russ Shiel
	Scientific advice on microcrustacea in rivers.	Judy Frankenberg
	Attended a workshop to discuss the Murray River wetlands (NSW side).	Russ Shiel
	Provided information on cladocerans for litigation; and liaised on a study of zooplankton interactions, dynamics, water quality indication in the Hawkesbury-Nepean River.	"
	Community meeting at Holbrook, Setting Environmental Objectives for our Rivers (on the unregulated parts of the Murray catchment) March 19.	Judy Frankenberg, Jane Grows
	Meeting State Water Monitoring Committee, July 24.	John Harris
	River Management Committee meeting, March 6.	John Harris
	River flow objectives.	Martin Thoms
Fisheries Research & Development Commission (FRDC)	Freshwater research priorities project meeting December 8.	John Harris
	Contributed to report to provide strategic advice on FRDC's policy for funding carp projects.	Peter Gehrke
Gippsland Water	Strategic Planning Workshop for Gippsland Water, Traralgon, September 4.	Peter Cullen
	Technical Advisory Committee, June.	"
Griffith University	Provided catchment pollutant and export models and rates.	Ian Lawrence
Gungahlin Development Authority	Several meetings.	Peter Cullen
Lake Eyre Catchment Management Advisory Council	Meeting, Birdsville.	Peter Cullen
Lake Eyre Basin Transition Task Force	Chair	Peter Cullen

continued over

Agency	Project/Activity	Staff involved
Lower Murray Catchment Board	Chaired and addressed meeting on opportunities for regional TCM groups.	Peter Cullen
LWRRDC	Membership National Committee to set R&D priorities for environmental flows.	Martin Thoms
Land and Water Resources Research and Development Corporation	Coordinated local activities for the National Wetlands R&D Program, Wetlands in a Dry Land: Understanding for Management workshop held in Albury after ASL (29 and 30 September) and a workshop at MDFRC on 1 October (Principal researchers who have attained grants under the Program).	Rhonda Sinclair
	Paper on Billabongs: Management Issues for Floodplain Wetlands submitted. This follows on from a workshop held in Albury in late September 1997.	Terry Hillman
Mt Hotham Management Committee	Discussions regarding a possible water quality project.	Barry Hart
Murray-Darling Association	Annual Meeting of the Association, August 4	Ben Gawne
National Farmers Federation	Addressed Environmental Committee on the CRC and its activities, and approaches to environmental allocations.	Peter Cullen Terry Hillman
National Planning Authority	Condition and monitoring of Lake Burley Griffin. Assisted with review of the results of monitoring in recent years.	Peter Cullen Ian Lawrence
North East Catchment Management Authority	Board Member.	Terry Hillman
NSW Healthy Rivers Commission	Member of Scientific Panel for the Shoalhaven	Martin Thoms
NSW State Fishways Program	Meeting.	John Harris
NSW Weir Review Committee	Meeting, February 10.	John Harris
Olympic Coordination Authority	Several meetings of the Landscape and Open Space Committee. Several jobs relating to water quality monitoring and the management of the Olympic Rowing Course have arisen as consultancies.	Peter Cullen
Queensland Department of Natural Resources	Advised on development of that State's water resources.	Craig Schiller
River Basin Management Society Symposium	Keynote paper at the Symposium, July 7.	Barry Hart
Riverlink	Meeting to discuss setting Riverlink's funding and research priorities.	LBL rep
Robo Bank	Addressed the Agricultural Advisory Board of the Dutch based Robo Bank on water reforms and their implications for Australia, Sydney, November 24	Peter Cullen
Snowy Water Inquiry	Provided unpublished fisheries data to the inquiry into environmental flow allocations.	Mark Lintermans

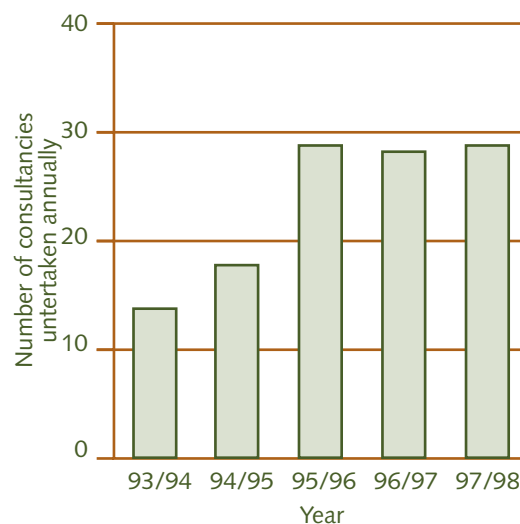
*continued over*

Agency	Project/Activity	Staff involved
South Australian Department of Natural Resources	Workshop, August 26 where Minister Wotton released details of the new catchment management structure in South Australia.	Peter Cullen
South Australian Water	Advice on Copepoda: Cyclopoida systematics	Russ Shiel
South Coast Catchment Management Committee	Advice on water quality monitoring and assessment, September.	Richard Norris
SunRISE 21	Annual meeting, October 9.	Ben Gawne
	Aided in the selection of Artists for the 'Artists in Industry' project	Shaun Meredith
Tamworth Environmental Laboratories	Demonstrated meteorological and hydrological instrumentation and measurement at Chaffey Dam.	Patrick Hatton
Victorian Catchment and Land Protection Council	Several meetings Discussions on developing a state-wide water quality monitoring network.	Barry Hart
	Briefing on the CRCFE and its activities and achievements.	Peter Cullen
Victorian Water Quality Monitoring Review Committee	Meetings of the Committee, June 6, July 9, September 3 and November 3.	Barry Hart
Victorian Department of Natural Resources	Meeting of the Victorian Water Quality Committee and the Nutrient Management Strategy Implementation Committee, February 16.	Barry Hart
	Meeting of Stressed Rivers Project, March 11.	"
Wellington Shire STP	Advice on carp control, 19 September.	John Harris

## 6.4 Technical support to consultants

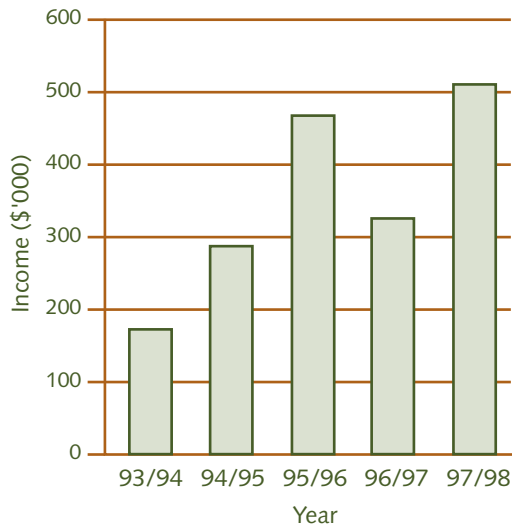
An overview of the CRCFE's consulting work has been conducted which looks at the markets the Centre has serviced through consulting work and further opportunities for technology transfer through this avenue. The following figures provide an overview of the CRCFE's consulting activities. Consultancies completed during the year are included in Chapter 8, *Publications*.

Consultancies are an important technology transfer tool which provide the CRCFE with an additional revenue source as well as a means of informing other interested organisations of new knowledge and techniques being generated through research.

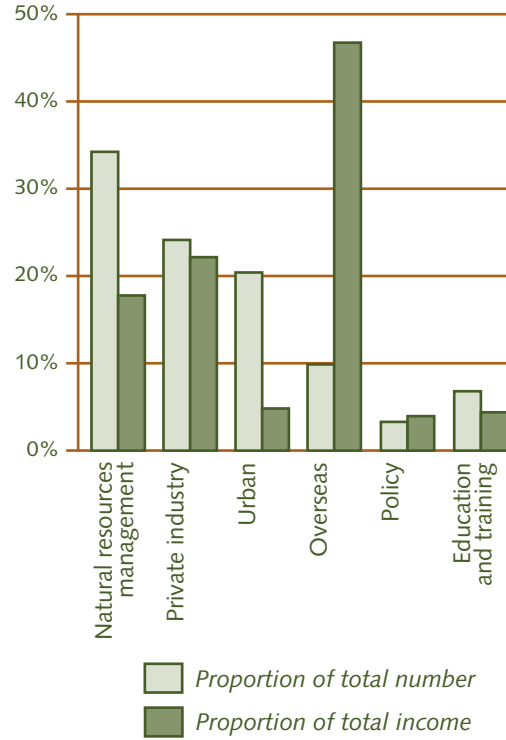


**Figure 1** Number of consultancies undertaken annually

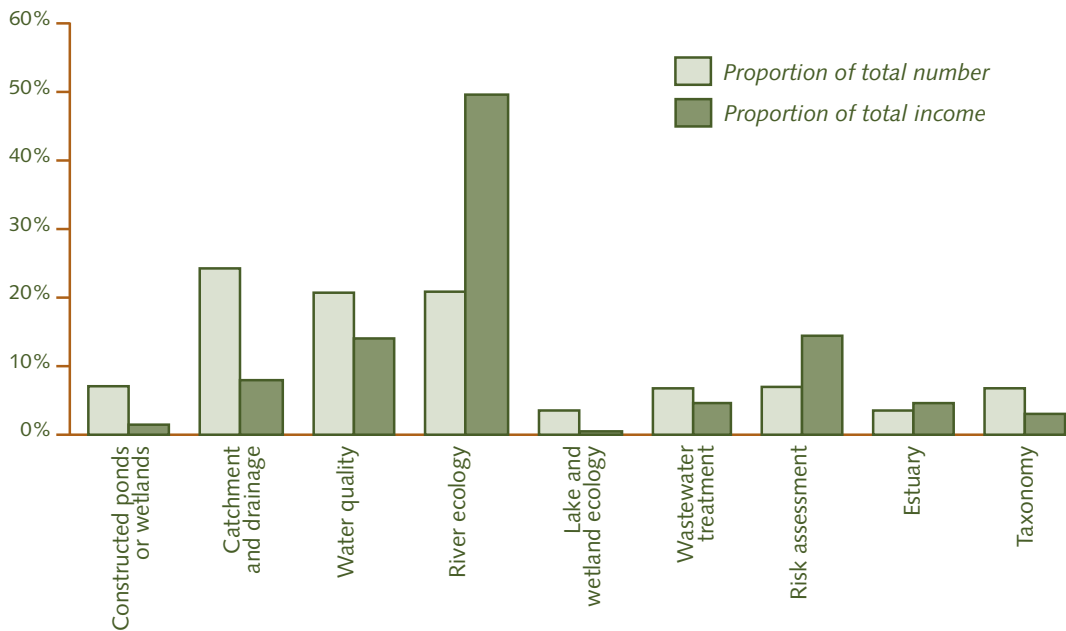




**Figure 2** Annual income from consultancies



**Figure 3** Market segment comparison for current CRCFE consultancies



**Figure 4** Work category comparison for current CRCFE consultancies

## 6.5 Technical support to community groups

Agency	Project/Activity	Staff involved
Angling Catch Database	Address to a Clients' Workshop, Nov 30 and Annual Participants' Review Workshop 30 Nov.	John Harris
Artists in Industry	Talk to artistic curators involved in the project, 17 April	Shaun Meredith
Australian Conservation Foundation	Policy implications of the SoE report	Peter Cullen
Bird Observers Club	Presentation on carp, blue-green algae and river health, Septemeber 2	Shaun Meredith
Cudgewa and Koetong Catchment Plan	Provided foreword, June	Terry Hillman
Culcairn Landcare group	Visited MDFRC laboratory	Terry Hillman
Greening Australia, Victoria	Spoke at the workshop, Floodplain and Lowland Vegetation Management, June 25, Yarram. This was attended by more than 40 Landcare and agency representatives, as well as farmers.	Judy Frankenberg
Hunter Native Fish	Presentation on the Angling Catch Database project, July 7.	John Harris
Inland Rivers Network	Presentation to a workshop of members preparing themselves for the catchment committees to review River Flow Objectives in NSW, October 11–12	John Harris Peter Cullen
Institute of Freshwater Anglers	Scientific advice	John Harris
Macquarie Land Care Group	Meeting to revise a carp information sheet, Feb 11	Ben Gawne
Mildura Field and Game Association	Snail identification at meeting, March 16	LBL REP
Murray-Darling Association	Member, National Executive	Terry Hillman
Murrumbidgee River Corridor group	Resnagging the Murrumbidgee Environmental flows	Martin Thoms
Museum of Victoria	Steering committee member for a forthcoming travelling exhibition <i>Future Harvest</i> .	Rhonda Sinclair
National Centre for Excellence for Freshwater Education and Interpretation Committee	Representation for MDFRC at meetings	Mike Copland
NEMP in the Namoi Catchment	Presentations and discussions on outcome of Chaffey Dam Project with stakeholders	Phillip Ford Brad Sherman
NSW Inland Commercial Fishermen	Attended annual meeting to discuss the NSW Rivers Survey, October 2	John Harris
Nyah West Field Naturalists	Presentation on research at the Lower Basin Laboratory, October 17	Ben Gawne

continued over

Agency	Project/Activity	Staff involved
Purple-spotted Gudgeon National Recovery Team	Meeting attendance, March 23	Ben Gawne
Renmark to the Border Local Action Planning Group	Public lecture at AGM	Peter Cullen
Rotary Club of Albury	Talk about research in the Murray-Darling Basin and the role of the Murray-Darling Freshwater Research Centre, September 8	Peter Cullen
Rotary Club of Lavington	Presentation on blue-green algae, August 26	John Whittington
Rotary Club of Merbein	Talk on carp in the Murray-Darling Basin, January 19	Shaun Meredith
Sunraysia Community Salinity Action Plan	Provided advice on environmental flows and indicators to a meeting on November 18.	Ben Gawne
Yarrawonga		
Tasmanian Environment Centre	Foodweb biodiversity graphics	Russ Shiel
Water Quality Strategy Working Group, Upper north east Victoria	Meeting at MDFRC and tour of the laboratory	Terry Hillman, John Whittington, Paul Humphries
Wyndham Land Care Group	Meeting to discuss possibilities for constructing fish traps on regulators in Darling anabranch, Jan 18	Ben Gawn

## 6 Project reviews

Feedback is an important component of the communication model cited in 6.1. In line with this model, the CRCFE has sought feedback, in the form of project reviews, on its major projects to ensure both its scientific excellence as well as its ongoing relevancy to industry.

### *Campaspe River environmental flows*

The project was reviewed from May 4–6 by a panel of six, including Prof Nancy Millis (chair) from Melbourne University, Prof Angela Arthington from Griffith University, Dr Bob Banens from the Murray-Darling Basin Commission, Dr Peter Davies from the LWRRDC and Dr Jenny Davis from Murdoch University. Prof Jim Gore from Columbus State University, Georgia, provided international expertise. The assessment report had not been released at June 30.

### *Chaffey Dam*

Internationally-regarded phytoplankton expert, Dr Colin Reynolds, Freshwater Biological

Association, NERC Institute of Freshwater Ecology, UK, reviewed the Chaffey Dam project last September. In addition to speaking with project members individually, Dr Reynolds attended a presentation by the team in Canberra. His comments and interpretations of the data provided valuable contributions to the Chaffey Dam report, which is currently being written. In a written report, which provided specific recommendations, Dr Reynolds commended the scientific excellence of the project and as well as its collaborative nature.



Leon Metzeling, EPA Victoria, sampling macroinvertebrates in a Victorian river as part of that State's monitoring efforts for the National River Health Program. Photo: Freshwater Sciences, EPA Vic



The Murrumbidgee River, ACT.  
*Photo: Karen Markwort*