



Avon Catchment Council

Report for Surface Water Management Self-Sufficiency IWM006

Skills Audit Natural Resources Management Professionals (*Community Landcare Co-ordinators*).

May 2006



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1. Introduction

A skills audit was identified within GHD's methodology for delivery management action targets associated with IWM 006, of the Avon Catchment Council (ACC) 2005 - 2006 Investment Plan. In particular, the skills audit and associated activities including review of current training programs and development of best management criteria are aimed at developing capacity for farm/catchment water management skills within the region.

These activities related to Management Action Target:

W3 MAT 6.1 More than 10 accredited people with farm water planning skills are providing services within the region by 2009;

Fourteen Community Landcare Co-ordinators (CLCs) based in the Avon River Basin were surveyed. The purpose of the survey was to determine the skills and aspirations of CLCs, with respect to surface water management and planning and implementation for water self-sufficiency.

The survey was developed and conducted by GHD, principally for the purposes of defining issues and attitudes, skills and aspirations of CLCs within the region, with specific reference to farm water planning and self sufficiency. The skills audit is considered a critical step in achieving MAT W3 6.1.



2. Overview

This audit was intended to identify and quantify the number of skilled Landcare professionals within the ARB, determine their level of technical capability, and aspirations in further developing competence in farm water planning skills.

Questions were devised to solicit responses in five categories:

1. Qualifications, skills and knowledge of technical standards in a broad range of Natural Resource Management (NRM) issues.
2. The level of importance of Surface Water Management / Self Sufficiency as an NRM issues within their geographic area.
3. Level of technical support, need for peer and professional support framework available to CLCs.
4. The expectations and drivers for landholders in achieving NRM outcomes.
5. Fields in which additional skills or training are perceived as beneficial.

The surveys were emailed to interviewees (where email contacts were available) in advance of a verbal interview, which was conducted over the phone. It should be noted that some CLCs did not feel they could respond to some questions because they did not have any experience in the area or it was not appropriate to their skill set. Consequently, the number of responses recorded in the various tables in the Appendix of this report may not always sum to the same total.

The Landcare co-ordinators in the ARB generally possess a solid background in NRM, are enthusiastic about their positions and are focused on achieving the best outcomes for the landholders in their region in an environmentally responsible manner.

Many of the CLCs (particularly those with less experience) indicated their technical skills were not at a level that enabled them to advise landholders in certain circumstances (for example, in the siting and design of a dam). In such instances, they would refer the landholder to a private contractor, or seek advice from an external agency. Therefore, they perceived themselves as facilitators rather than consultants that have direct involvement in the planning and design process.

All bar one of the CLCs that were interviewed believed that further training could improve the service they were capable of providing and were enthusiastic about undertaking training. However, most CLCs expressed a need for practical training, based on Wheatbelt experience, that would translate to on-ground results. Up-skilling in Farm Water Planning was the area most identified by CLCs for further training as it was seen to achieve multiple objectives. The majority of the CLCs that raised Farm Water Planning as a possible area for up-skilling identified that management of water resources could serve to increase the self-sufficiency of the landholder and also assist in salinity management by reducing recharge in low lying areas.

Although a lack of technical expertise was highlighted by the CLCs, they also raised the issue of funding as a prohibitive factor to NRM in the ARB. A number of Landcare co-ordinators said that assisting farmers to complete funding applications was a common task. The issue of landholders expecting someone else to pay for the works was also raised. Therefore, equipping CLCs with increased technical skills may not be the only hurdle that must be overcome to increase the effectiveness of NRM in the Avon River Basin.



3. Discussion

This section presents the major findings of the skills audit.

3.1 Qualifications and Training

CLCs were asked questions regarding their formal qualifications and additional training undertaken. Nine of the 12 respondents have a Bachelor Degree, seven of these were awarded within the science discipline with a clear focus on Environmental Management Studies. Other bachelor degrees were awarded in the fields of Natural Environment and Wilderness Studies, and Education.

One respondent had achieved a Diploma of Horticulture, and two recipients had a Certificate 3 Conservation & Land Management from TAFE.

In addition to formal qualifications, most CLCs have undertaken some form of additional training. In particular, five respondents have undertaken technical training in conservation earthworks design, one CLC had undertaken a Farm Water Planning and another a Farm Water Assessor's Course.

Four respondents have also undertaken Facilitation and Group Skills Training, and three have undertaken Strategic Planning courses.

Additional training varies from specific technical up-skilling in areas including earthworks design and set out, conservation and farm water planning to more general areas including facilitation, management and project planning. A summary is provided in Appendix A.

In general, CLCs are well educated predominantly with tertiary qualifications, with particular emphasis on natural sciences and environmental studies, and have undertaken some job-related training, however this tends to be opportunistic and is not consistent across the CLC network.

3.2 Areas of expertise

Areas of expertise ranged broadly between CLCs and in part reflect qualifications and subsequent training. Plant biodiversity, salinity control, survey and earthworks design, farm planning to project development / management and community engagement, appeared to be the most common skills, however across-the-board CLCs do not appear to have a common set of skills. See Table 3 Appendix A for more detail.

Areas of expertise were often described as a general understanding or awareness of an issue, rather than in-depth technical knowledge. CLCs generally appeared to have background knowledge or base understanding of issues and were confident to offer preliminary advice to landholders, but generally require additional assistance to analyse and resolve more complex and detailed problems.

Response to this question appears to highlight the need for a technical support network to underpin activities of CLCs. CLCs appear generally to have good relationships with local landholders, however their level of experience and access to technical support may inhibit their capacity to offer effective technical advice. This is particularly the case for more complex technical matters, or where specialist knowledge or additional investigations are required.

Only two respondents indicated they felt confident in designing and surveying conservation earthworks however five had completed the earthworks design training course. This may indicate that CLCs lacked



guidance or supervision necessary to consolidate skills they had acquired during training courses, particularly with respect to earthworks design.

Only one CLC described proficiency in farm planning, and no respondents indicated farm water planning skills. However two respondents had completed training in this area, and two respondents indicated competency in broader surface water management skills.

With respect to other hydrologic issues, two individuals indicated skills in groundwater management, including saltland pastures and groundwater expertise.

3.3 Priority NRM Issues

When asked to consider the major issues driving NRM, CLCs regarded:

- » Salinity control,
- » Surface water management,
- » Deep drainage and
- » Protection of native vegetation as the primary issues of concern.

Other issues that rank highly included: alternative productive uses for saline land, funding, and sustainable farming systems. More detailed responses provided in Table 4 Appendix A.

3.4 Advice most commonly sought by landholders

CLCs were asked what issues they considered landholders were most concerned by, and for what issues landholders sought the most advice. Hydrological advice was most commonly sought as well as advice related to deep drainage, followed by requests for assistance in obtaining funding. More detail responses are provided in Table 5, Appendix A.

Tables 6 through 10 indicate that farm water planning, soil conservation earthworks, farm planning and economic issues were also consistently requested by landholders, although not considered to be the most requested advice or assistance.

Although the range of water management issues featured heavily in the skills most requested by landholders, relatively few CLCs indicated well develop expertise in these areas.

Soil health and soil acidity also featured in CLCs impressions of landholder issues, however landholders appeared generally not to solicit advice or assistance from CLCs on these issues.



3.5 Technical support available

CLCs mostly identify the Department of Agriculture as their primary source of technical support. Advice regarding hydrology or farm water planning was most requested but various other NRM issues including saltland agronomy were also raised. It was generally well held that it is difficult to obtain access to a DAWA hydrologist - except for those CLCs that are involved with priority catchments, who have better access to this service - to provide technical advice or to review designs and most CLCs raised the provision of dedicated hydrological support as a priority.

Primary sources of technical advice included:

- *Department of Agriculture WA - Engineering Water Management Group*
- *Private Water Planning Contractors*
- *South West Catchment Council*
- *Avon Catchment Council*
-
- *Greening Australia*
- *Department of Environment*

There appears to be well-developed collaboration between CLCs, particularly in adjacent areas. Knowledge is shared between CLCs and less experienced professionals can obtain advice from those with more experience. However, this collaboration is not formalised and a number of CLCs regarded the introduction of a formal framework for the sharing of knowledge between CLCs to be an important undertaking to improve general support and the service they provided.

Suggestions for improved technical support to service these included:

- *Improve access to (DAWA) hydrologists*
- *DAWA hydrologists require more experience to deal with specific Wheatbelt conditions.*
- *Provide engineering expertise to evaluate designs that have been developed*
- *Establish a formalised internal network between CLCs*
- *Provide dedicated CLC technical support person or a technical advisory team*



3.6 Areas identified for up-skilling and training

All but one of the interviewees expressed an interest in furthering their technical skills in one or more fields. The potential for up-skilling, as identified by CLCs, encompasses a broad range of NRM issues and was not just restricted to technical solutions relating to surface water management. Generally, CLCs were of the opinion that they could provide more effective advice to landholders if they were better equipped with the appropriate skills and were enthusiastic about furthering their technical expertise.

Table 1 *Summary of skills/knowledge that CLCs would like to improve:*

Skill / Area of Knowledge to Improve	Number of Response
Farm Water Planning	7
Technical Hydrological Skills	3
GIS – ArcView Course	3
Design of Deep Drainage	3
Knowledge of Groundwater Movement	2
Engineering Principles of Earthworks	2
Surveying Skills	1
Technical Site Assessment	1
Soil Profile / Acid Sulphate Soil Course	1
Geological Knowledge	1
Economics of NRM	1
Revegetation Practices	1
Conflict Resolution	1
Leadership	1

Whilst it is possible that the nature of questions within this survey, having been focused around surface water planning to self-sufficiency, influenced the outcome of inquiries regarding potential training and improvement of skills. Table 1 is a clear indication that there is significant interest within the CLC network to pursue additional training and skills development in the area of farm water planning.



4. Conclusion

Community based Natural Resource Management Professionals (CLCs) within the Avon River basin are generally well-educated, predominantly with tertiary qualifications in natural resource management. Five CLCs have undertaken short-course training in conservation earthworks design, and two CLCs have undertaken Farm Water Planning and Farm Water Assessment courses. However, only two CLCs indicated that they felt confident to undertake farm water planning and conservation earthworks design in the field.

Farm water planning and self-sufficiency issues, along with a range of other hydrologic issues including, salinity and groundwater management feature heavily in CLCs assessment of major NRM issues and in advice sought by landholders.

Whilst not always the case, CLCs generally have a relatively basic understanding of hydrologic issues as they relate to the natural environment and agricultural enterprises. In response to the level of inquiry by landholders, CLCs tend to rely on the Department of Agriculture for hydrologic advice. However, obtaining access to skilled hydrologists within the Department of Agriculture is difficult, both due to the level of experience and/or availability to CLCs.

CLCs solicit advice and support from a range of other organisations including the Avon Catchment Council.

In terms of suggestions made by CLCs to improve services within the region, the issues of access to experienced hydrologist, and a more formal network and general support were by far and away the most significant areas of response.

Seven of the 14 CLCs interviewed indicated that they were interested in undertaking a Farm Water Planning / Assessors Course, and three indicated interest in furthering their hydrologic and deep drainage design skills.

The relevant management action target states that: *More than 10 accredited people with farm water planning skills are providing services within the region by 2009.* Currently, there are two individuals within the catchment who have undertaken some training in Farm Water Planning / Assessing.

At this stage, it appears possible to achieve the Management Action Target *W3 MAT 6.1*, however without access to experienced professional support with hydrologic and farm water planning skills, CLCs may not successfully convert theoretical knowledge learnt in training into skills in on-ground application.

4.1 Limitations of the Audit

The main limitation of the audit was the way in which the interviews were conducted. Interviews were conducted over the phone after a copy of the survey had been emailed to the interviewee. In some cases CLCs were difficult to contact, had insufficient time to read the survey emailed to them and could only offer a limited amount of time to complete the survey. As a result, in these cases, the responses to the survey questions were "off the cuff" rather than considered answers. Having said that, is considered that the outcomes of the survey are relatively robust and form a accurate representation of the view of Landcare professionals within the region.



Appendix A
Summary Tables of Survey Results



Table 2 What are your formal Qualifications ?

Formal Qualifications	Number of Respondents
B. Science (Environmental Science)	3
B. Applied Science (Parks, Recreation & Heritage)	1
B. Applied Science (Biology)	1
B. Science (NRM)	1
B. Social Science (Geography & Environmental Mgmt.)	1
B. Natural Environment and Wilderness Studies	1
B. Education	1
Dip. Horticulture	1
Certificate 3 (Conservation & Land Management) TAFE	2

Table 3 What additional training have you undertaken?

Training	Number of Respondents
TECHNICAL	
Conservation Earthworks	5
Farm Water Planning	1
Certificate 2 Australian Conservation & Restoration	1
Master Tree Growers Course	1
Introduction to Groundwater & Modelling	1
Certificate 3 Landcare	1
Farm Water Assessor's Course	1
Equine Management	1
GENERAL	
Facilitate Development of Group Goals & Projects (TAFE)	4
Strategic Planning	3
Adult Learning (TAFE)	2
Certificate of Human Services	1
Dip. Management	1
Leadership	1
Time Management (ACC)	1
Certificate 4 – Training and Assessment (TAFE)	1

***Note:** The above table includes courses that have been commenced but to date remain incomplete. The above may not be the correct, full course names; they were the best recollection of the CLCs during the interview.*



Table 4 What are your major areas of expertise?

Respondents were asked to state their major area of expertise, without prompting of particular areas by the interviewer.

Areas of Expertise	No. of CLC responses
TECHNICAL	
Earthworks design & survey	2
Farm Planning	1
Soil type and landscape identification	1
NRM – general	2
Salinity Control	2
Saltland pastures	1
Groundwater	1
Plant Biodiversity	4
Remnant vegetation management	1
Environmental Impact Assessment	1
GENERAL	
Project planning, development & implementation	4
Community engagement	2
Policy Development	1
Leadership	1



Table 5 In your opinion what are the vital areas / issues in NRM?

Respondents were asked to state the most important NRM issues in their area, without prompting a particular issues by the interviewer.

Key NRM Issues	Number of Responses
Salinity control	7
Groundwater management (incl. Deep drainage)	4
Surface water management	4
Protection of remnant vegetation and biodiversity	4
Alternative productive uses for saline land	2
Funding	2
Sustainable farming	2
Chemical Use	1
Wildlife management	1
Integration of tree cropping	1
Erosion control	1
Water logging	1
Water self sufficiency	1
Soil health	1

Table 6 What key NRM issues do you think landholders are interested and what skills are most sought?

Respondents were asked to identify areas that they think that landholders are most interested in, and areas where skills were most sought, without prompting by the interviewer.

Landholder NRM Issues t	Number of Respondents	Skills Most Sought	Number of Respondents
Salinity	8	Deep Drainage Design	4
Soil health and acidity	4	Hydrology	3
Soil Fertility	2	Funding assistance	2
Fragmentation in landscape	2	Farm Water Planning	1
Water supply	2	Technical advice	1
Decline in profitability	2	Contacts – Contractors etc.	1
Sustainable Agriculture	1	Surveying	1
Water logging	1	Mapping	1
Biodiversity	1	Geophysics Interpretation	1
		Vegetation Advice	1



Table 7 Self Sufficiency

In this section, respondents were asked the relative importance of issues with respect to surface water management, the frequency advice sought, and skills used in the area for particular issues including self-sufficiency, soil conservation, salinity and groundwater, farm planning, and economics. Results for individual issues are presented in separate tables.

	Importance					Frequency of Requests for Advice			
	High 5	4	3	2	Low 1	Yearly	½ Yearly	Quarterly	<Monthly
Number of Responses	6	4				1	2		2
WATER HARVESTING & SELF-SUFFICIENCY	Application of Surface Water Management					Skills Used in the Area			
	Enables proper design of catchment for a given storage volume.					Surveying			
	Enables integrated design of systems to reduce reliance on water carting					Funding Applications			
	Increases water storage capacity					Determination of Runoff Potential			



Table 7 Soil Conservation

SOIL CONSERVATION		Importance					Frequency of Requests for Advice			
		High 5	4	3	2	Low 1	Yearly	½ Yearly	Quarterly	<Monthly
	Number of Responses	3	4	2	1		1	1	3	2
	Application of Surface Water Management					Skills Used in the Area				
	Erosion Management					Observatory Skills				
	Improvement of Soil Structure					Aerial Photo Analysis				
	Prevention of Groundwater Recharge					Surveying				
	Prevention of Waterlogging					Map Interpretation				

Table 8 Salinity Control

SALINITY CONTROL		Importance					Frequency of Requests for Advice			
		High 5	4	3	2	Low 1	Yearly	½ Yearly	Quarterly	<Monthly
	Number of Responses	5	1	3	1		1	1	1	2
	Application of Surface Water Management					Skills Used in the Area				
	Improving Water Flow					EM 38 Interpretation				
	Prevention of Groundwater Recharge					Surveying				
	Prevention of Waterlogging					Map Interpretation				



Table 9 Farm Planning & Improvements

		Importance					Frequency of Requests for Advice			
		High 5	4	3	2	Low 1	Yearly	½ Yearly	Quarterly	<Monthly
FARM PLANNING & IMPROVEMENTS	Number of Responses	1	3	4	1		2	1		1
	Application of Surface Water Management					Skills Used in the Area				
	Improvement of Access on Farm					Interpretation of Soil Tests				
	Protection of Earning Potential					Research Skills				
	Reduction of Waterlogging					Yield Mapping				
						Funding Applications				
						Aerial Photo Analysis				

Table 10 Economics

		Importance					Frequency of Requests for Advice			
		High 5	4	3	2	Low 1	>Yearly	½ Yearly	Quarterly	<Monthly
ECONOMICS	Number of Responses	4		3	1		2			
	Application of Surface Water Management					Skills Used in the Area				
	Improve Productivity					Budgeting				
	Drought Proofing					Draws upon Local Experience				
	Reduction of Waterlogging									

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