



Australian Government

Land & Water Australia

Knowledge for Regional Natural Resource Management

Achievements and options

Knowledge for managing Australian landscapes



April 2009

By the Knowledge for Regional NRM Team

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Australian Government

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LWA thanks the late Professor Peter Cullen, Chair of the Steering Committee for the program, for his guidance, support, and inspiration; and acknowledges the support and contribution of other Board and Steering Committee members and LWA managers and staff.

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Abbreviations and acronyms

AANRO	Australian Agriculture and Natural Resources Online
ASDD	Australian Spatial Data Directory
CEBC	Centre for Evidence-Based Conservation
CMA	Catchment Management Authority
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DST	decision support tool
IM	information management
IT	information technology
KM	knowledge management
LWA	Land & Water Australia
M&E	monitoring and evaluation
MERI	monitoring, evaluation, reporting and improvement
NRM	natural resource management
R&D	research and development
RDC	Research & Development Corporation
RSS	Really Simple Syndication

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Executive summary

The Knowledge for Regional NRM Program

Phase 2 of the Knowledge for Regional NRM Program was delivered between July 2006 and June 2008. Three packages of products and services presented in *Improving the NRM knowledge system* for regions were developed and implemented and significant successes achieved.

The three packages addressed the people and culture issues as well as the technological solutions needed to successfully manage information and knowledge in the NRM sector. These solutions give the NRM sector the information and technology platforms required to manage information effectively and also developed mechanisms and processes to build the capacity of the regional NRM staff to use these tools effectively.

Package 1: Better practice in knowledge management

- **Regional Knowledge Resource Kit (RK RK)** accessible at www.rkrk.net.au is an extensive resource for managing information and knowledge within regional NRM bodies. It includes a comprehensive guide to developing an information and knowledge strategy and an online resource library covering a wide range of information and knowledge management topics relevant to the NRM sector.
- **Regional Knowledge Strategy process** is a 5-stage process designed to take a regional NRM organisation from its current situation through to a tangible and practical knowledge strategy which includes projects and interventions which ensure action. Five pilot regions implemented this process during 2006-2008. Since July 2008 Burnett Mary Regional NRM in Queensland, all 8 regional

NRM organisations in South Australia and NRM South in Tasmania have successfully initiated the knowledge strategy process with completion expected by mid 2009.

- **Regional Knowledge Leaders Program** is designed to train staff to facilitate the Knowledge Strategy process using the RK RK. Staff from 40 of the 56 regional NRM organisations undertook training during Phase 2 of the program as well as a number of staff from State and Territory government departments and a selection of rural research and development corporations.

Package 2 : NRM Navigator

The NRM Navigator provides a set of online tools and databases that make it easier for NRM professionals to find and share information. As well as improved information access and sharing, the NRM Navigator has resulted in significant financial savings which have been achieved primarily through preventing duplication of effort, eliminating software licence costs and reducing the time taken to find relevant authoritative information in the NRM sector.

- **NRM Search Engine:** The NRM Search Engine performs a federated search across all databases which includes over 150 Australian NRM websites selected according to a content policy, four large NRM databases including the Australian Agricultural and Natural Resources Online (AANRO) database (www.aanro.net) and a number of regional NRM Evidence Bases.
- **Evidence Bases:** The Evidence Bases component gives NRM organisations and individuals free access to software that enables them to store, access and share

information and knowledge relevant to their decisions. Additional functionality includes geospatial mapping software and process diagram software. There is also an add-on which enabled the user to associate individual pieces of evidence with particular assumptions in an NRM program logic or conceptual model. This enhances regional NRM users' ability to meet Australian Government requirements for reporting their program logic.

- **Knowledge Brokers, Incentives, Events, Decision Support Tools, Newsletters and Forums, and Professional Bodies Databases:** Anyone working in NRM or a relevant field can use an NRM Navigator online form to contribute to these components. Suggestions are checked by a moderator before being added.
- **My Alerts service:** This service enables alerts to be created for particular terms or phases, with an automatic email generated when a new item matching the alert term or phrase is added to the NRM Navigator.
- **Knowledge Market Report service:** This service provides analysed statistics of user interaction with the NRM Navigator that research investors can use to assist in the identification of research priorities.
- **Australian Agriculture and NRM Thesaurus:** LWA is developing a new Australian Agriculture and NRM Thesaurus for use in the NRM Navigator, AANRO database and more widely throughout the Australian agriculture and NRM and information management sectors. The new thesaurus will assist searching as well as enabling information databases to be indexed or tagged with a controlled vocabulary of terms including a specified range of synonyms for various search terms. It will incorporate the AIATSIS thesaurus to ensure all indigenous terminology is

included. The development of the Australian Agriculture and NRM Thesaurus is expected to be completed by mid-2009. The content will be available to be used by all database developers in Australia at no cost.

Package 3 : Supporting knowledge brokering in the NRM sector

The services developed and implemented in this package are significant. They are:

- **'Gotta question?' service:** The objective of 'Gotta question?' was to identify existing information or sources of information to address requests received through an online form or a 1300 telephone number. The requests coming through 'Gotta question?' were often complex and finding information in response to them was difficult, indicating that the service is meeting a gap in the NRM information market. Feedback has been very positive.
- **Trial advisory Services to assist regions select decision-making approaches:** The outcomes of the trial advisory service were that it was highly valued as it not only assisted regional NRM bodies with particular decision-making issues, but also built the capacity of regional NRM practitioners to undertake the appropriate selection of tools the next time without assistance. Feedback has been very positive.
- **Trial of the 'systematic review' technique for NRM:** A key challenge in natural resource management is to synthesise the diversity of research on a given topic to distil clear management recommendations. Traditionally, management decisions are often based on intuition and opinion to some extent, rather than just the available data — the hard evidence. However, the approach of Systematic Review could change all of that. The LWA Knowledge

for Regional NRM Program has engaged CSIRO to conduct two systematic reviews. CSIRO and LWA are jointly funding the trials. LWA intends to use the trials to test the merits and limitations of systematic reviews as a tool for evidence-based decision making for natural resource management, and to raise awareness of the concept of systematic reviews and the processes and investments necessary to adopt evidence-based decision-making models.

The achievements of Phase 2 of the Knowledge for Regional NRM Program were highlighted by the winning of a Platinum Award in the actKM Forum 2008 Knowledge Management Awards. 'Platinum' is the highest award category and awards at this level are rarely made.

Phase 2 of the program was completed on schedule in June 2008, though some funds were able to be rolled over to enhance the program in the last half of 2008 and fund the support of products and services until June 2009. Land & Water Australia has been unable to identify a source of funding to continue the program further. Future requirements of the program are expanded in a later chapter.



The Knowledge for Regional NRM Program

Background

As a key natural resource management (NRM) research investor, Land & Water Australia (LWA) has a fundamental interest in ensuring that the outcomes of research investments inform on-ground NRM activities, and that in turn the experiences of on-ground NRM practitioners inform investment priorities. LWA explored the effectiveness of these information and knowledge relationships, finding that while there were many inspiring and innovative things happening in NRM research and on the ground, the NRM knowledge system remained highly fragmented, with its many parts rarely in harmony.

LWA found meeting the information and knowledge needs of regional NRM bodies to be one of the biggest challenges faced in improving the NRM knowledge system. Taking up this challenge, LWA initiated the 'Knowledge for Regional NRM Program' in February 2005, with funding support from the Australian Government. The program has taken a broad view of the NRM sector, looking beyond LWA's usual areas of interest. In 2006, LWA published *The Australian natural resource management knowledge system*, which identifies areas of focus for improving the NRM knowledge system as a whole.

The overarching objective of the Knowledge for Regional NRM Program has been to facilitate better linkages between regional NRM bodies and knowledge (research) providers, and to assist regional NRM bodies to better manage their information and knowledge.

Phase 1 of the program

Phase 1 of the Knowledge for Regional NRM Program, which concluded in June 2006, investigated and tested ways to improve the adoption and sharing of knowledge by regional NRM bodies and looked for ways to improve knowledge connections between regional NRM bodies and research and information providers. At this stage of the program the sector was still using the terms 'information' and 'knowledge' interchangeably with little or no understanding of the differences.

The report *Improving the NRM knowledge system for regions* presented the findings of Phase 1 and outlined a comprehensive approach to improving the NRM information and knowledge system, especially as it supports regional NRM bodies. The proposed options, designed using contributions from regional NRM bodies and knowledge (research) providers and by examining successful initiatives from outside both the NRM sector and Australia, endeavoured to – make better use of existing knowledge and information; improve access to knowledge and information; build capacity of NRM professionals to use knowledge in management decisions; increase sharing of experiential knowledge and lessons between regions improve two-way knowledge sharing between knowledge providers and regional NRM bodies; make regional knowledge needs more accessible to research providers; facilitate more effective processes for the management of knowledge and information; and, stimulate a culture that values knowledge and information. It consisted of three overarching packages with a number of products and services grounded in the real needs of regional NRM bodies and verified by those bodies.

Phase 2

Phase 2 of the Knowledge for Regional NRM Program was carried out between July 2006 and June 2008 with rollover funds used for the period July 2008 to June 2009. In Phase 2, the services presented in the report *Improving the NRM knowledge system for regions* were further developed and evolved and then implemented.

This report — *Knowledge for Regional Natural Resource Management - Achievements and options* — presents the significant achievements of Phase 2 of the Knowledge for Regional NRM Program. It also introduces options for maintaining and evolving the important products and services of the program into the future, and for maintaining momentum for the continued improvement of information and knowledge management in the NRM sector.

Knowledge for Regional NRM

Phase 2 Achievements

Overview

Phase 2 of the Knowledge for Regional NRM Program was carried out between July 2006 and June 2008, supported by funding from the Australian Government. Rollover funds were approved by the Australian Government to keep the Program running between July 2008 and June 2009 and allow the Program team to seek alternative funding into the future. In Phase 2, the three packages of services presented in the Phase 1 report *Improving the NRM knowledge system for regions* were further developed and implemented.

This report — *Knowledge for Regional Natural Resource Management - Achievements and options* — presents the significant achievements of Phase 2 of the Knowledge for Regional NRM Program. It also introduces options for maintaining and evolving the important products and services of the program into the future, and for maintaining momentum for the continued improvement of information and knowledge management in the NRM sector.

LWA established a multidisciplinary team for Phase 2 comprising information and knowledge management, NRM, research, science, science communication and administrative expertise. The diversity of the skills, experience and knowledge of the team members has contributed significantly to the success of the program. Many in the NRM sector have recognised the need for improved information and knowledge management, but the step to actively involve information

and knowledge management expertise in a nationally coordinated program had not previously been taken.

The Phase 2 team worked to develop and implement the three packages of products and services described in the Phase 1 report. To assist adoption of the services by regional NRM bodies, the Phase 2 team implemented a comprehensive range of communication activities and sought to collaboratively engage regional NRM bodies in the development of the services. The team also collaborated with a range of other key NRM stakeholders.

All Knowledge for Regional NRM Program products have been developed using 'open source' software. Open source software is computer software where the source code is available under a copyright licence that permits users to study, change and improve the software, and to redistribute it in modified or unmodified form. The use of open source software is consistent with the collaborative philosophy that has underpinned all Knowledge for Regional NRM Program products and services, and has also meant that regional NRM bodies are not affected by the additional and ongoing costs of software licences.

The achievements of Phase 2 of the Knowledge for Regional NRM Program were highlighted by the winning of a Platinum Award in the actKM Forum 2008 Knowledge Management Awards. 'Platinum' is the highest award category and awards at this level are rarely made.

The Phase 2 team

LWA established a multidisciplinary team for Phase 2 comprising information and knowledge management, NRM, research, science, science communication and administrative expertise. The diversity of the skills, experience and knowledge of the team members contributed significantly to the success of the Program. Many in the NRM sector have recognised the need for improved information and knowledge management, but the step to actively involve information and knowledge management expertise in a nationally coordinated program had not previously been taken. The inclusion of information and knowledge management professionals from outside the NRM sector led to a much better understanding of the strengths and weaknesses of information and knowledge management in the sector and the most effective solutions and implementation pathways.

Two members of the team remained with the Knowledge for Regional NRM Program beyond the conclusion of the Phase 2 funding on 30 June 2008. Their work has included wrapping up Phase 2 and exploring options for maintaining and evolving the important products and services of the Program into the future, and for maintaining momentum for the continued improvement of information and knowledge management in the NRM sector. They have also worked on delivering additional outcomes that were not originally part of the three packages, but that represented valuable additions to the products and services based on NRM professionals' feedback during Phase 2. They have not been successful in identifying a source of funding to continue the program.

Communication and engagement

The primary target audience for the products and services of the Knowledge for Regional NRM Program were the 56 regional NRM bodies around Australia. Having the products and services successfully adopted by regional NRM bodies involves both communication and

engagement. The Program team implemented a comprehensive range of communication activities and sought to collaboratively engage regional NRM bodies in the development of the products and services. Collaboration is an important aspect of knowledge sharing. Through collaboration end users can input their needs, circumstances and concerns to positively inform and influence the development process.

In recognition of the valuable role of the Australian Government NRM facilitators and staff from State and Territory government departments, regional NRM support organisations, Australian Government NRM agencies, and other rural research and development corporations (RDCs) and research providers the Program Team worked in close collaboration with these groups to develop and implement our products and services throughout the life of the Program.

Communication and engagement activities included:

- Regional participation in product and service development and evaluation: Regional NRM bodies were actively engaged in the piloting, testing and evaluation of products and services.
- Branding of products and services: Distinctive brands, including logos, were developed for key products and services. Branding assists with adoption by providing memorable naming and logos that are mentally associated with the particular product or service. Branding also assists with durability as the branding can remain consistent through changes in host organisation arrangements or funding support. Logos were developed with the assistance of Sitepoint solutions www.sitepoint.com.au.
- Newsletters, fliers and articles: A Knowledge for Regional NRM program website was developed and maintained. Regular Program e-newsletters were prepared and published. Fliers introducing



At the 2008 actKM conference receiving the platinum award – Andrew Campbell (former Executive Director Land & Water Australia), Derec Davies (Knowledge Leader Queensland), Nerida Hart (Program Manager, Knowledge for Regional NRM), Alison Carter (Research and Information Officer, Knowledge for Regional NRM, Jane Chrystal (Central West CMA, NSW Knowledge Leader), Bruce Boyes (Knowledge Strategy Officer, Knowledge for Regional NRM)

KNOWLEDGE FOR REGIONAL NRM PROGRAM WINS PLATINUM ACTKM FORUM KNOWLEDGE MANAGEMENT AWARD

Phase 2 of the Land & Water Australia Knowledge for Regional NRM Program won a Platinum Award in the actKM Forum 2008 Knowledge Management Awards. 'Platinum' is the highest award category and awards at this level are rarely made. The award was announced at 2008 actKM Forum conference dinner on 14 October 2008 at the Australian National University, Canberra, and reads:

'This award recognises the Knowledge for Regional NRM Program – Phase 2 as an outstanding cultural and technological knowledge management program that has made significant achievements in organisational capability, performance and sustainability through the application of knowledge-based projects or activities.'

On hand at the 2008 actKM Forum conference dinner to receive the award were Phase 2 team members Nerida Hart, Bruce Boyes, Melanie Randall and Alison Carter. Also participating in the awards dinner were former Land & Water



Australia Executive Director Andrew Campbell, who with the support of former Land & Water Australia Manager Knowledge & Adoption Kate Andrews was instrumental in the establishment of the Knowledge for Regional NRM Program.

key products and services were produced and distributed, and updated as the products and services developed. Articles about program products and services were prepared and included in NRM publications, including the *Landcare Journal* and *RipRap*. An innovative addition was the establishment of a program blog where team members recorded interesting updates about their work on the program and useful snippets about information and knowledge management.

- **Promotional products:** Branded pens, post-it notes, travel mugs and tote bags were produced and distributed. An innovative addition was the development and distribution of a 'web address card'. This card was the size of a business card and featured the branding and website addresses for key program products and services, as well as the main program website address. The card provided an easy-to-carry summary of key products and services that could be readily produced and passed on during workshops, meetings, conferences or other opportunities. The web address card was used by Knowledge for Regional NRM program team members and stocks of the card were also distributed to Program collaborators.
- **Presentations:** Knowledge for Regional NRM Program team members promoted the program through presentations and keynote presentations at various NRM and information and knowledge management conferences, forums, meetings and other events across Australia.
- **Conference promotions:** The Knowledge for Regional NRM Program set up displays at three key regional NRM conferences — the 2007 National NRM Facilitators Forum (Canberra), 2008 National NRM Conference (Melbourne) and the 2008 State NRM Conference in Western Australia (Bridgetown). The Knowledge for Regional

NRM Program provided sponsorship for the latter two events, resulting in additional promotional exposure. At the 2008 National NRM Conference, the Knowledge for Regional NRM Program sponsored a successful pre-dinner drinks event before the main conference dinner. Staff from key collaborating regional NRM bodies gave presentations during the pre-dinner drinks, substantially exposing the gathered regional NRM body representatives to the benefits of products and services of the Program. A conference banner was produced and used in the conference displays. At the 2006 National Regional NRM Conference (Gold Coast), the Knowledge for Regional NRM Program team also gave a breakfast presentation on the Program and assisted with the 'Knowledge Bazaar' knowledge sharing event.

Open source software

All Knowledge for Regional NRM Program products have been developed using 'open source' software. Open source software is computer software where the source code is available under a copyright licence that permits users to study, change and improve the software, and to redistribute it in modified or unmodified form. The use of open source software is consistent with the collaborative philosophy that has underpinned all Knowledge for Regional NRM Program products and services, and has also meant that regional NRM bodies are not affected by the additional and ongoing costs of software licences.

Package 1 – Better practice in knowledge management

'Better practice in knowledge management' aimed at providing NRM regions and practitioners with the skills and practices to better search, retrieve, manage and evaluate information. It also aimed to assist them to identify the gaps in their knowledge base and in Phase 1 was proposed to include:

- a **Regional Knowledge Strategy** process that enables regional NRM staff to both develop and implement an information and knowledge strategy. The five-stage Regional Knowledge Strategy process is designed to take a regional NRM body from its current situation through to a tangible information and knowledge strategy with interventions and projects and an ongoing process to ensure action and implementation. The Regional Knowledge Strategy process was developed and refined through Regional Knowledge Strategy pilots with five regional NRM bodies around Australia. The Regional Knowledge Strategy resources in the RKRK are comprehensive and have been designed to be as user friendly as possible. Since the end of June 2008, take-up of this strategy process has been significant. For example, in January 2009 the South Australian Government funded all eight regional NRM bodies in the state to undertake the Regional Knowledge Strategy process before June 2009. Burnett Mary Regional NRM in Queensland has completed the knowledge strategy process and NRM South in Tasmania will have completed the process by the end of August 2009.
- a **Regional Knowledge Leaders** training program. This program was designed to train staff to facilitate a Regional Knowledge Strategy and use the resources provided in the RKRK. Staff from 40 of the 56 regional NRM bodies participated in Regional Knowledge Leaders training. Australian Government NRM officers and NRM facilitators and staff from State and Territory government departments and regional NRM support organisations also participated in the training. Additionally, staff from a number of rural research and development corporations (RDCs) and other NRM organisations undertook the training to learn about the potential for implementing knowledge strategies within their organisations. Also, in February 2009 a refresher course was conducted for 16 participants from the South Australian

Government to enable them to run the information and knowledge strategy process for all eight regional NRM bodies in South Australia by the end of June 2009. Regional knowledge leaders are able to edit the RKRK wiki website.

The RKRK provides an extensive resource for managing knowledge and information within regional NRM bodies. It includes a comprehensive guide to developing a Regional Knowledge Strategy and an online resource library covering a wide range of information and knowledge management topics relevant to the NRM sector. The RKRK, Regional Knowledge Strategy process and Regional Knowledge Leaders training program were developed using the expertise of specialist knowledge management consultants Anecdote Pty Ltd www.anecdote.com.au.



Regional Knowledge Resource Kit (RKRK)
www.rkrk.net.au

The Regional Knowledge Strategy process was developed and refined through pilot workshops with five regional NRM bodies around Australia. These were NRM North (Tasmania), Central West CMA (New South Wales), South West NRM (Queensland), Corangamite CMA (Victoria) and Avon Catchments Council (Western Australia). The pilot Regional Knowledge Strategy workshops were completed by December 2007. The Program continued to maintain strong links with the pilot regions, with some staff from these regions participating in the Regional Knowledge Leaders training. A post-implementation review was conducted with NRM North (Tasmania) as it was the first pilot region to undertake the Knowledge Strategy process, and follow-up mentoring was conducted with all of the pilot regional NRM organisations.

In 2008-09 the Regional Knowledge Strategy process has been taken up by all South

Regional bodies that have adopted key Package 1 activities of the Knowledge for Regional NRM Program



Australian regional NRM bodies, with the South Australian Government funding the Knowledge Strategy development of all eight regional NRM bodies, to be completed by the end of June 2009. Also, the Burnett Mary Regional NRM organisation in Queensland has successfully run the Knowledge Strategy process using staff from its own region who had been trained with assistance from the Regional Groups Collective in Queensland.

In Tasmania, NRM South has initiated the Knowledge Strategy process with facilitation provided by the remaining Knowledge for Regional NRM staff with the assistance of existing trained NRM staff in Tasmania. This will be completed before the end of August 2009.

The Knowledge for Regional NRM team also explored existing NRM knowledge management activities when developing the Regional Knowledge Strategy process, RKRK and Regional Knowledge Leaders training. This

included participating in the February 2007 biennial meeting of the South East Queensland Science Coordination Network, an initiative of the South East Queensland Catchments regional NRM body, and in the Burnett Mary Regional Group regional NRM body 'Farmland to Fraser – Resource Managers & Science Symposium', also in February 2007.

The RKRK documents the full process required for a regional NRM body to undertake the development and implementation of a Regional Knowledge Strategy. The resources have been designed to be as user friendly as possible, and include lists of materials required, downloadable handouts and other workshop resources, detailed instructions for setting up workshop rooms and workshop facilitation guides.

The five-stage Regional Knowledge Strategy process is designed to take a regional NRM body from its current situation right through to a tangible information and knowledge strategy,

ARE INFORMATION AND KNOWLEDGE THE SAME THING? AND ARE THEY MANAGED THE SAME WAY?

The terms 'information' and 'knowledge' have been used interchangeably in the NRM sector. But they are not the same thing. Information can be described as gathered facts that can be recorded or stored, for example, in a report or a database. Knowledge, however, exists in people's heads. People's knowledge is their understanding or interpretation of information (and of the knowledge of other people).

The information and knowledge management expertise brought into the team for Phase 2 of the Knowledge for Regional NRM Program enabled other team members to learn the difference between information and knowledge, and about the different approaches required for their management. It was realised that the 'Knowledge Management Guidelines for the NRM sector' originally proposed for Package 1 were in reality going to be 'Information Management Guidelines' as they didn't include any processes for addressing the knowledge in people's heads or the collaborative behaviours needed for sharing that knowledge. While a new database or the cataloguing of library resources will assist information management, these initiatives are unlikely to do much for knowledge management issues such as siloed organisational

management structures or staff reinventing the wheel because of poor knowledge sharing.

Fortunately, the information and knowledge management sector has developed 'narrative' knowledge strategy processes that enable a good understanding of how people are working with knowledge and how that can be improved. These knowledge strategy processes have been combined with information strategy processes to create an effective Regional Knowledge Strategy process.

But this is just the beginning of what needs to be a major cultural change in natural resource management. It will be some time before natural resource management arrives at the point where all NRM practitioners understand the difference between information and knowledge and become fully conversant with the full range of tools and processes for managing information and knowledge. Only at this point will the NRM sector be able to consider that it can properly translate research investments into on-ground outcomes, and properly use on-ground experiences to inform research priorities.

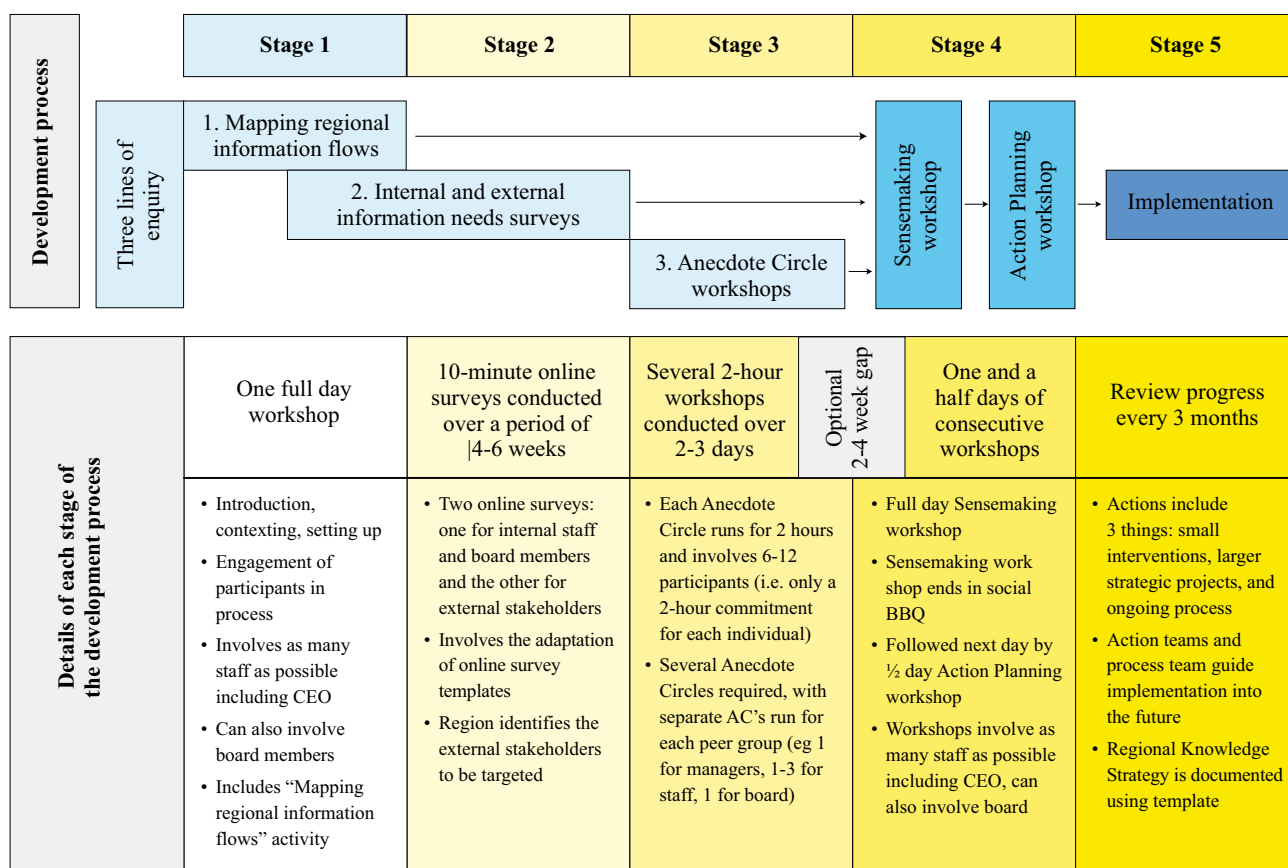
with a range of projects and actions and an ongoing process to ensure those plans are implemented. The process covers three stages of enquiry to explore the current situation:

1. **mapping regional information flows**, in which the regional NRM body gains a shared understanding of the information environment in which it operates
2. **undertaking online surveys of internal and external information and knowledge needs** for internal staff and board and external stakeholders.
3. **running anecdote circle workshops** (a narrative technique used in the business

community) to enable a richer and deeper understanding of how people are managing information and knowledge than could be achieved with just information mapping or surveys.

After the three lines of enquiry comes a sensemaking stage, also a business narrative technique, where the regional NRM body gains a comprehensive understanding of what the three lines of enquiry have revealed and develops an action plan. In the action planning stage, the regional NRM body decides on and plans two or three key projects for implementation in the first few months. Under the implementation stage, a list of small actions that staff can readily

The process for developing a Regional Knowledge Strategy



5-stage Regional Knowledge Strategy process

implement is also developed, as well as a continuous improvement process that ensures that the projects and small actions are implemented and new ones are progressively identified and enacted.

Staff from 40 of the 56 regional NRM bodies participated in Regional Knowledge Leaders training designed to train staff to facilitate a Regional Knowledge Strategy and use the resources provided in the RKRK. Ten training workshops were conducted between February and June 2008. The training locations were Brisbane and Townsville (Queensland), Adelaide (South Australia), Melbourne (Victoria), West Wyalong, Wollongong and Tamworth (New South Wales), Darwin (Northern Territory), Launceston (Tasmania) and Perth (Western Australia). Some regional NRM bodies had more than one staff member participate, and in some cases up to four staff undertook the training. Many of the participating regional staff held the position of Regional NRM Facilitator in their regional NRM body.

Australian Government NRM officers and NRM Facilitators and staff from State and Territory government departments and regional NRM support organisations also participated in the Regional Knowledge Leaders training. Additionally, staff from Land & Water Australia, Grains RDC, Cotton RDC, Cotton Catchment Communities CRC (Cooperative Research Centre), Murray Darling Basin Commission (MDBC), Meat & Livestock Australia (MLA), local government and shires associations of NSW, Sydney Catchment Authority (SCA), Charles Darwin University, Tropical Savannas CRC and Tamar NRM undertook the training to learn about the potential for implementing knowledge strategies within their organisations. The additional benefits of including staff from these organisations in the training included gaining a shared understanding of common information and knowledge management issues, building new relationships between 'knowledge users' and 'knowledge providers' and developing shared language around information and knowledge management.

In December 2007 and January 2008, two training workshops were also convened in Melbourne for a National Core Team consisting of State-based Australian Government NRM facilitators, key State agency NRM officers and representatives of regional NRM support organisations. The National Core Team then helped with the organisation and delivery of the Regional Knowledge Leaders training. They are also able to assist and support the Regional Knowledge Leaders in developing and implementing Regional Knowledge Strategies. This has already happened in Queensland where the Regional Groups Collective trainee assisted the Burnett Mary regional NRM organisation to undertake the strategy.

Two additional training sessions were conducted in South Australia in February 2009 and in Tasmania in April 2009 to enable the regional knowledge strategy to be undertaken. This was necessary as the staff turnover rate is very high in the NRM sector and many of the NRM staff trained originally had moved on to new positions.

The Regional Knowledge Leaders training covered:

- Understanding information and knowledge — what are the differences between them, how to work with them in a regional NRM context
- How to facilitate the 5-stage Regional Knowledge Strategy process
- Experiential learning of the special facilitation techniques used in the Regional Knowledge Strategy development process, including anecdote circles and sensemaking
- How to edit the RKRK wiki website and become part of the RKRK Communities of Practice
- Introduction to NRM Navigator and its information repositories, including the Evidence Base software and AANRO.

Comprehensive resources were developed for the Regional Knowledge Leaders training, including a Facilitator's Guide and Participant Pack

A 'graduation ceremony' was held at the end of each Regional Knowledge Leaders training

workshop, where training participants received certificates and branded travel mugs bearing the caption 'I'm a mug for my region's knowledge strategy'. The aim of this was to leave participants of the Regional Knowledge Leaders training with an enduring memory of the importance of the training, and to assist them to promote the Regional Knowledge Strategy process to their region or organisation.

The RKRK has been developed as a 'wiki' website, a collaborative website that can be edited by anyone who has access to it. The website content can be contributed to, continually reviewed and updated. This means that the RKRK will be maintained as a relevant resource into the future rather than one at risk of becoming a static website that soon becomes out of date. All who have completed the Regional Knowledge Leaders training or National Core Team training have access to edit the RKRK wiki website. Currently there are over 160 RKRK editors listed, and the RKRK has been continually updated since its initial development.

The Resource library aspect of the RKRK features a wide range of resources addressing information and knowledge management topics relevant to NRM. Topics include legislative requirements relevant to information management, such as copyright and legal deposit, and how to use information and knowledge sharing tools such as social bookmarking, blogs and RSS feeds. The 'Knowledge Providers – how to work with them' resources were developed in workshops held in Brisbane in November 2007. The range of resources and their content are continually growing and evolving through the contributions of RKRK editors.

In addition to the Community of Practice of RKRK editors, a wider community of practice has been established and called 'Friends of the RKRK'. Membership of the 'Friends of the RKRK' Yahoo! Group is open to anyone with a genuine interest in managing NRM information and knowledge, including the Regional Knowledge Leaders and National Core Team, and people can apply to join by following the relevant links in the RKRK. Members of the Friends of the RKRK Yahoo! Group can download the resources from the Regional Knowledge Leaders training.



Participants in Melbourne Regional Knowledge Leaders training

RKRK branding was developed, including a distinctive logo. RKRK branded promotional pens and post-it notes were produced. The special hexagonal post-it notes were designed for use in the sensemaking step of the Regional Knowledge Strategy process. Supplies of the pens and post-it notes were given to the Regional Knowledge Leaders to assist them to conduct the Regional Knowledge Strategy process in their region or organisation. They were also given copies of program product and services fliers and stocks of the Program 'web address card'. The size of a business card, this convenient card featured the branding and website addresses of key program products and services.

Legacy arrangements for the RKRK, Regional Knowledge Strategy process and Regional Knowledge Leaders training program were put in place in June 2008. Five RKRK Administrators, comprising people from both inside and outside LWA, were trained in the technical aspects of RKRK administration



and the responsibilities of administrators. An RKRK Administrators Guide was developed to assist them with their responsibilities. The administrators maintain contact through an RKRK Administrators Yahoo! Group, where they can also download the RKRK Administrators Guide. The proposed Better Practice Knowledge Awards were not implemented in Phase 2 of the Knowledge for Regional NRM Program. Only the pilot regional NRM bodies had completed the Regional Knowledge Strategy process prior to the end of Phase 2 of the Program. These regions may have been the only potential nominees for the Better Practice Knowledge Awards had they commenced during Phase 2, and other regions may have seen this as inequitable. For this reason the Better practice Knowledge Awards were not implemented and it is recommended that they should be considered as a future option.

WHAT PEOPLE HAVE SAID

The products and services of 'Package 1 – Better practice in knowledge management' have been well received.

The RKRK has attracted high levels of both Australian and international interest, with more than 18,000 visits to the website since it was established (as at April 2009) and positive reviews featuring on leading international knowledge management blogs. For example, on the 'Knowledge Futures' blog the RKRK has been described as '...an incredibly valuable KM resource. The work that they have done with the various regional bodies is amazing, brokering conversations amongst local practitioners to share knowledge and build connections...' <http://knowledgefutures.wordpress.com/2008/03/22/regional-knowledge-resource-kit/>

Comments from people in regional NRM bodies and other collaborating agencies and organisations include:

'The detail in the RKRK is excellent! It allows you to be able to step through the process of developing a regional knowledge strategy.'

'Having the RKRK means everything is available to be able to deliver a Regional Knowledge Strategy process with all the help easily available in this online resource.'

'Facilitators and facilitation was good. Information was relayed in a practical way.'

'It's good that the process for developing a regional knowledge strategy has already been trialled with 5 regional NRM bodies. Gives confidence for training participants.'

Participants, Regional Knowledge Leaders training



NRM Southwest Queensland Stage 4 workshop

WHAT PEOPLE HAVE SAID

'South West NRM Ltd has benefited from its association with the Knowledge for Regional NRM program in several ways. Not least is the impetus the team has given us in developing our Information Hub, a web-based index to all of the known scientific, technical and anecdotal records about our region. As part of the project developing the Hub, we have engaged a partially disabled lad who has diligently scanned and digitised hundreds of leaflets, reports, conference proceedings, booklets and even books. The full text or at least references will shortly be available on our Web subject to copyright – and the team has even helped us to manage copyright.

The team supported us in engaging a qualified Librarian to establish a catalogue for the documentary collection, to understand the

potential of the AANRO database and to run a useful knowledge management methodological session which has resulted in three good internal projects, two of which have been fully completed.

More than the specific projects which they have helped us to launch, however, has been the professional encouragement given and their ready availability through face-to-face visit, e-mail and telephone to support us as we have come to grips with the knowledge brokering role that we aspire to fulfill.'

Geoff Edwards
CEO | South West NRM
www.southwestnrm.org.au

WHAT PEOPLE HAVE SAID

'NRM North, as the regional natural resource management organisation for northern Tasmania, is acutely aware of the need to establish and utilise practices to manage relevant knowledge and information. Effective knowledge management practices are essential for the organisation to access and distribute current best available science across the breadth of activities, from regional planning through to on-ground works. To increase NRM North capacity to meet the region's knowledge needs the organisation is participating with the Knowledge for Regional NRM project undertaken by Land & Water Australia to develop means to manage the process of creation, identification, accumulation and application of knowledge.

Although the program is still in the early stages NRM North have already recognised and are taking action to implement a number of steps to improve current knowledge management practices. With the assistance of LWA, NRM North has initiated mapping the organisation's knowledge needs, have recently audited current knowledge management practices. Through these activities NRM North have been able to identify a number of areas where current Knowledge Management Practices fall short of the organisation's requirements, and with the assistance of the LWA project team have identified a range of simple interventions that will improve the organisation's current processes. The idea of a quick fix solution was never going to be appropriate for the organisation, the aim was to establish a process of continuous improvement that would enable

the organisation's staff to build on current practices and improve on the network's effectiveness as a whole.

The Knowledge for Regional NRM project has provide NRM North with means to improve the organisation's knowledge management practices. The assistance of experienced knowledge management practitioners has provided access to skills and knowledge not generally related to the field of natural resource management, and beyond the capacity of NRM North to meet. The value of effective knowledge management processes can not be overlooked, and therefore NRM North is willing to commit staff resources and effort towards maintaining the partnership with LWA and the Knowledge Management for Regional NRM project to build the organisation's skill base and develop strategies to efficiently meet organisational knowledge management needs.'

Andrew Baldwin
Science Coordinator | NRM North
www.nrmtas.org/regions/north/vision.shtml

'The engagement with the K4RNRM team helped us to examine how as an organisation, we manage our knowledge and information to make it accessible to a wide range of people; both internal as a CMA, and making that information available to external people.'

Peter Codd
Community and Partnership Program Manager
Corangamite CMA
www.ccma.vic.gov.au

Additional feedback can be found in the RKRK
www.rkrk.net.au

Package 2 – NRM Navigator (previously NRM Toolbar)

The NRM Toolbar was originally proposed in Phase 1 as an internet-based toolbar that would facilitate the sharing of knowledge between regional NRM bodies and provide mechanisms for the two-way flow of knowledge between regions and information providers. Proposed NRM Toolbar services included:

- an **NRM search engine** to enable the capacity to search Australia's largest repositories of NRM information
- **My Library** to support the sharing of references by individuals, groups and organisations through Lists that are searchable by the NRM search engine
- an **Ask a Librarian** service
- **This Worked Here!** to allow people who implement NRM practices to document and share what worked and what didn't
- searchable databases including a **Knowledge Needs Database**, an **R&D Directory** and an **NRM Funding and Events Calendar**
- **decision support tool reviews** to outline the tools available for a given purpose and provide information that will help regions decide which one is right for them
- **knowledge alerts** that are individually customised
- an **NRM Knowledge Market Report** to provide real-time reporting of knowledge market activity associated with the NRM Toolbar.

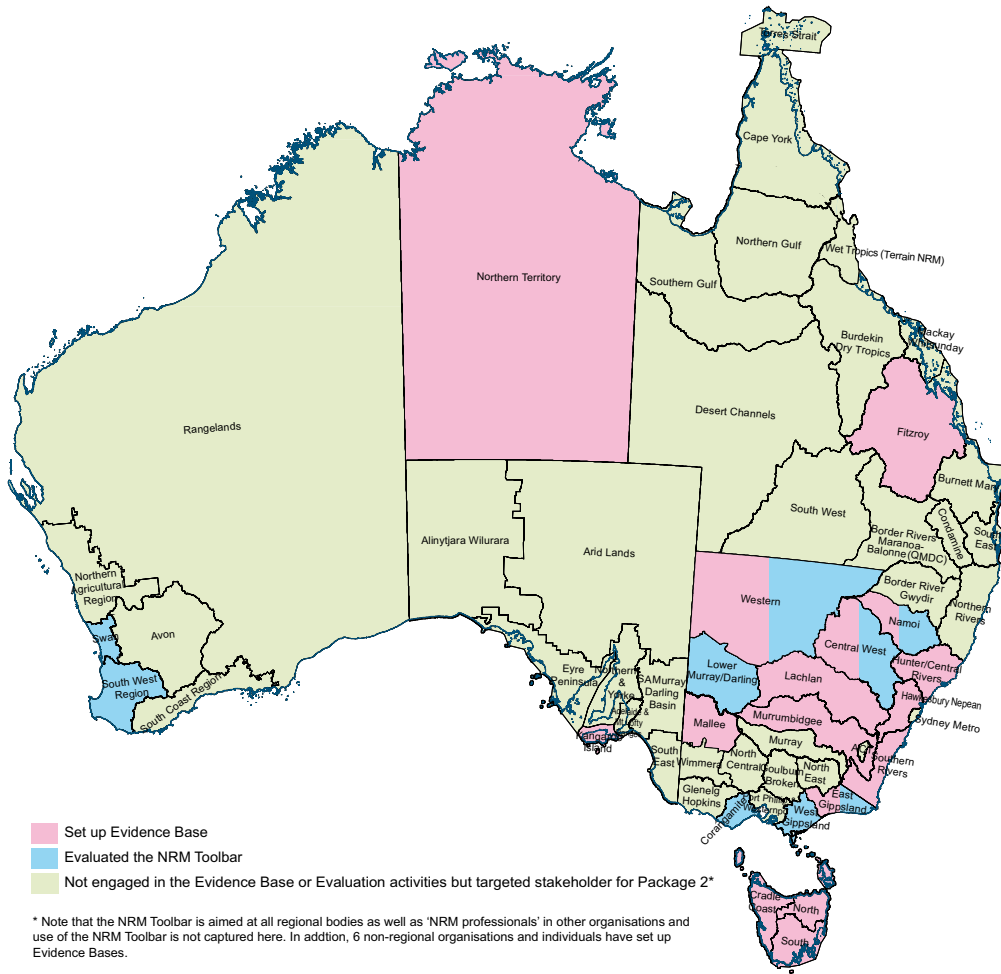


NRM Navigator, www.nrmnavigator.net.au

Late in 2008 the decision was made to change from 'NRM Toolbar' to 'NRM Navigator'.

The first version of the NRM Toolbar had the option of a downloadable toolbar that could be installed on the Internet Explorer or Firefox web browser. However, the frequent upgrading of web browser software by their providers created the need to also frequently update the software for the downloadable toolbar. This meant a significant ongoing software development costs that would be an impediment to the future viability of the NRM Toolbar website. Additionally, many people in government departments were unable to download and install the toolbars because of IT security issues. In response, LWA decided to abandon the downloadable toolbar and to replace the NRM Toolbar website with the 'NRM Navigator', with this new name reflecting the purpose of the website as a single access point for navigating what is otherwise a maze of NRM information. A primary purpose of providing the downloadable toolbars had been to facilitate ready access to the NRM Search Engine from the web browser rather than by having to go to a particular website. However, abandoning the downloadable toolbars does not mean that people are unable to integrate the NRM Search Engine into their web browser. The latest versions of both the Internet Explorer and Firefox web browsers feature a search bar/box to which the NRM Search Engine can be added, and if desired set as the default search engine.

Regional bodies engaged through key activities of Package 2 of the Program



These changes were completed in early 2009 so now there is a new NRM Navigator website with all the functionality of the original NRM Toolbar without the issues of changes to Internet Explorer or Firefox.

The NRM Navigator provides a set of online tools and databases that make it easier for NRM professionals to find and share information. As well as improved information access and sharing, the NRM Navigator has resulted in significant financial savings which have been achieved primarily through preventing duplication of effort, eliminating software licence costs and reducing the time taken to find relevant authoritative information in the NRM sector. Also, the Evidence Base software has been made available free of charge, whereas the 18 Evidence Bases would have cost between \$30 000 and \$100 000 each to establish with commercially available

software. There have also been hundreds of viewings of the decision support tools database, offering the opportunity to maximise the use and prevent the reinvention of tools that commonly cost more than \$250,000 to develop.

The NRM Search Engine delivers more relevant search results than generic search engines because it searches only selected Australian NRM websites and databases, including information repositories that are not indexed by generic search engines. The websites and databases include:

- Over 150 Australian NRM websites selected according to a targeted content policy
- databases specifically compiled for the NRM Navigator which list relevant decision support tools, events, incentives, professional bodies, knowledge brokers and newsletters and forums (these databases can be browsed as well as searched)

- four large databases, being the Australian Agricultural and Natural Resources Online (AANRO), Australian Spatial Data Directory (ASDD), Australian Bibliographic Database (Libraries Australia) and Livestock Library information repositories
- Evidence Bases which NRM organisations and professionals can use to store, access and share their NRM information. 18 Evidence Bases have been developed since the implementation of the Evidence Base software.

The NRM Navigator has been well received by the NRM sector. Between November 2008 and March 2009 when the site changed from the NRM Toolbar:

- users made over 1,200 searches using the NRM Search Engine
- there were over 2,500 visits to the NRM Navigator website with over 3,500 page views, with 63 per cent of visits from new visitors

To assist uptake, NRM Toolbar (Navigator) branding was developed, including a distinctive logo. NRM Toolbar (Navigator) branded promotional pens and post-it notes were produced. The special hexagonal post-it notes were designed for use in the 'sensemaking' workshop step of the Package 1 Regional Knowledge Strategy process. In June 2008 at the end of Phase 2 of the Knowledge for Regional NRM Program, the following NRM Navigator components had been delivered:

- **NRM Search Engine**

The NRM Search Engine performs a federated search across all components of the NRM Navigator (including the services listed below), over 150 Australian NRM websites selected according to a targeted content policy, and four large NRM databases. The user has the option to select the type of content they wish to search for within the NRM Search Engine. Content types include spatial data, publications and decision support tools with content type icons displayed next to the title with the search results. Author and

A SIGNIFICANT INFORMATION TECHNOLOGY ACHIEVEMENT

The NRM Navigator was an ambitious vision of systems integration that has now been realised, and the NRM Search Engine is a leading technological development.

The NRM Search Engine uses Apache Solr and Nutch to perform a live search on a number of databases, as well as indexing a selection of hand-picked Australian NRM websites and the databases on the NRM Navigator website. Development of the NRM Search Engine was made possible through the engagement of Education.au Limited (www.educationau.edu.au). Funded by all Australian governments, Education.au develops and provides innovative technology solutions to support Australian Government priorities in education, training and careers.

Agileware Pty Ltd (www.agileware.net) was engaged to assist with the development of NRM Navigator browsing filters and Evidence Base functions and mapping. Technical oversight of the NRM Navigator development was provided by a Technical Advisory Group with representation from a number of National R&D organisations. Kaz Group Pty Ltd (www.kaz-group.com) conducted a feasibility assessment and costing estimate of the NRM Search Engine. Many regional NRM bodies participated in the evaluation of the concept prior to development.

publication date information are included with each search result, and more detailed metadata can be accessed by following a link at the bottom of the search result. The NRM Search Engine has been continually improved since October 2007 from user feedback and input from the Knowledge for Regional NRM Program team.

- **Evidence Bases (Incorporating My Library and This Worked here!)**

The Evidence Bases component was not one of the services originally proposed for the NRM Navigator; however, a significant need was identified during the

NRM Navigator development phase. This component gives regional NRM bodies and other NRM organisations and individuals free access to software that enables them to store, access and share information and knowledge relevant to their decisions. In June 2008 there were 16 operational Evidence Bases and this has grown to 18 as at March 2009. Previously, NRM organisations had to independently invest in siloed information databases that cost between \$30 000 and \$100 000 each to establish, as well as untold opportunity costs related to the lack of information sharing — for example, from reinventing information that had already been produced by other people.

The Evidence Bases support the sharing of references by individuals, groups and organisations through lists that are searchable by the NRM Search Engine, and so includes the functions of the 'My Library' service originally proposed for the NRM Navigator. One of the Evidence Bases has been established as a shared space for video and audio information, implementing the proposed 'This worked here!' service.

- **Ask a Librarian**

The proposed 'Ask a Librarian' service became the 'Gotta question?' component of Package 3. Further information can be found in the Package 3 section of this report.

- **Knowledge Brokers Database**

When the Knowledge Needs database originally proposed for Package 2 was further investigated, it was found that many regional NRM bodies were not in a position to be able to populate a knowledge needs database with effective research questions. It was determined that a 'Knowledge Brokers Database' and 'Trial advisory service to assist regions select decision-making approaches' were more appropriate to the current needs of regional NRM bodies. The Knowledge Brokers Database

lists individuals and organisations that can provide information in response to NRM questions. Some services are free and some services charge a fee. The 'Trial advisory service to assist regions select decision-making approaches' is a component of Package 3, and further information can be found in the Package 3 section of this report.

- **Searching the AANRO Database**

The Australian Agricultural and Natural Resources Online (AANRO) Database includes information on current and completed NRM research, which was the aim of the R&D Directory originally proposed for Package 2. Linking the AANRO database to the NRM Search Engine means that this R&D information is now accessible. AANRO has, however, previously been a metadata database, meaning that it has summary information about research but not the published research itself. Recognising the limitations of this, LWA is managing the redevelopment of AANRO, for the AANRO partners, into a full text repository as a separate program to, but linked with, the Knowledge for Regional NRM Program. Once the AANRO redevelopment is complete, people using the NRM Search Engine will be able to access these enhanced full text AANRO records.

- **Incentives Database**

The Incentives Database addresses one aspect of the Funding and Events Calendar Database that was originally proposed for Package 2. Rather than waste resources to create a completely new service, the Knowledge for Regional NRM Program team collaborated with the Queensland Government to use and build on their existing NRM Incentives Database. This database lists Australian and Queensland Government funding available to the NRM sector, enabling regional NRM bodies to easily identify potential grants and other incentives.

Ongoing negotiations between the other States and Territories with the Queensland Government will see the Incentives Database progressively expanded to include the NRM funding programs available across Australia. There are many individuals (often NRM Facilitators) who already compile this information. The Queensland Department of Environment & Resource Management will quality assure and process the funding information provided by the other States and Territories. LWA has been pleased to collaborate with the Queensland Government in this way, and commends the staff of the Queensland Department of Environment & Resource Management for their leadership.

- **Events Database**

The Events Database addresses the other aspect of the Funding and Events Calendar Database that was originally proposed for Package 2. It provides a list of NRM conferences, seminars and other events available across Australia, including events in rural areas.

- **Decision Support Tools Database**

When the 'decision support tools review' service originally proposed for Package 2 was further investigated, it was found that the proposed reviews had the potential to be subjective and lead to possible litigation. As an alternative, the Decision Support Tools Database has been developed to provide an up-to-date list of providers of decision support tools relevant to the NRM sector. Each tool is listed with a description of the function of the tool and contact details for the provider.

- **Newsletters and Forums Database**

The Newsletter and Forums Database was not one of the services originally proposed for the NRM Navigator; however, the need for it was identified during the NRM Navigator development phase. It lists e-newsletters, online forums and other similar groups that are relevant to the Australian NRM sector.

- **Professional Bodies Database**

The Professional Bodies Database was not one of the services originally proposed for the NRM Navigator; however, the need for it was identified during the NRM Navigator development phase. It lists professional organisations that are relevant to the Australian NRM sector.

Also, during Phase 2, the following component was developed and implemented based on the user requirements of regional NRM staff:

- **Monitoring, evaluation, reporting and improvement (MERI) add-on to Evidence Bases**

From consultations with staff working on Australian Government NRM Monitoring and Evaluation, a MERI add-on for the Evidence Bases software was developed and released in February 2008. The MERI add-on assists regional NRM bodies to use the information in their Evidence Bases for users to associate individual pieces of evidence with particular assumptions in an NRM program logic or conceptual model.

The NRM Navigator relies on user contributions. Anyone working in NRM or a relevant field can use an NRM Navigator online form to contribute suggested content for the Knowledge Brokers, Decision Support Tools, Events, Newsletters and Forums or Professional Bodies Databases. These suggestions are checked by a moderator before being added to the NRM Navigator. Contributors can take the optional step of registering as an NRM Navigator member, which enables them to update their items and keep track of postings. NRM organisations and individuals working in NRM can also apply to set up an Evidence Base.

A comprehensive 'Help' section assists users with NRM Navigator features and functions, and an Evidence Base User Guide is also available.

WHAT PEOPLE HAVE SAID

'Success!! I found a specific piece of information on the NRM Toolbar that I had looked for everywhere else without success!'

Participant in Regional Knowledge Leaders training

'I have been working to catalogue the information held across 3 different regional offices. The Evidence Base software helps in the important area of sharing knowledge. I am hoping that once the Evidence Base is populated it will enable those in the Fitzroy (NRM Regional Organisation) access to new information with the knowledge that it will not disappear.' **Bronwyn Fryar, Fitzroy Basin Association**

'Taking on the Evidence Base software means that we weren't being backed into a corner with purchasing expensive software. The Evidence Base software, with no initial software costs, provides an opportunity to get something up and running quickly and to make our own changes in the future, if needed.'

'[The Evidence Base software's ability to automatically search for metadata records also] makes it all a lot easier – think of the time required entering metadata for 10–15 000 records'. **Sean Dwyer, Mallee Catchment Management Authority (CMA)**

The following additional NRM Navigator components and enhancements have been developed from 1 July 2008 using funding committed from Phase 2 of the Knowledge for Regional NRM Program:

- **Redevelopment of NRM Navigator front end**

The aim of this redevelopment, which was completed at the end of 2008, has been to enhance the useability of the NRM Navigator website. Page layout has been simplified and made more logical, and navigation to the various parts of the website improved.

- **Evidence Bases enhancements**

These enhancements, which were completed at the end of 2008, involved the addition of mapping software to facilitate the better identification of geographic areas relating to particular evidence, and a process diagram feature to enable conceptual models to be uploaded and cause/effect assumptions linked to evidence.

- **My Alerts service**

This service was described as 'knowledge alerts' in the original proposed NRM Navigator services. The aim is to enable alerts to be created for particular terms or phases, with an automatic email generated when a new item matching the alert term or phase is added to the NRM Navigator. This will enable users to keep up to date with new information without having to regularly search the NRM Navigator as once your user profile is set up the new information is pushed out to the user.

- **Knowledge Market Report service**

The aim of the Knowledge Market Report is to provide analysed statistics of user interaction with the NRM Navigator that research investors can use to assist in the identification of research priorities. If particular search terms are being used frequently but yielding little information, then this may mean that there is an information gap that can be filled.

- **Information sharing enhancements**

This involves investigating the use of tagging, RSS feeds, and other 'Web 2.0 technologies' to enhance the use and distribution of the information in the NRM Navigator. Any enhancements identified through the investigations are anticipated to be completed by mid-2009.

- **Australian Agriculture and NRM Thesaurus**

When searching for information, users will often use slightly different search terms to look for the same item. To address this, information databases can be indexed or tagged with a controlled vocabulary of terms

including a specified range of synonyms for various search terms. The NRM Navigator and AANRO database currently use CAB Thesaurus which has been developed by the Centre for Agricultural Bioscience International (CABI), a not-for-profit organisation specialising in scientific publishing, research and communication (www.cabi.org). While very useful, the CAB Thesaurus does not adequately cover Australian agriculture and NRM terminology. In response, LWA is developing a new Australian Agriculture and NRM Thesaurus, based on the CAB Thesaurus, for use in the NRM Navigator, AANRO database and more widely throughout the Australian agriculture and NRM, indigenous and information management sectors. The development of the Australian NRM Thesaurus will be completed by mid-2009.

Package 3 – Supporting knowledge brokering in the NRM sector

At the end of Phase 1, the aims of Package 3 'Supporting knowledge brokering in the NRM sector' were to:

- identify the knowledge needs of regional NRM bodies that can be met by existing information and provide this in an appropriate format
- link R&D providers with regional NRM bodies to meet their knowledge needs
- support region-to-region sharing of knowledge and experience.

The proposed services included:

- brokering **existing knowledge and information** to enable regional NRM bodies to get a better grasp on what knowledge and information is available and how it meets their knowledge needs

- initiating **collaborative and multiregional investments** in new research and information to address regional knowledge needs
- supporting **regional innovators** to share their innovative NRM management practices and processes with other regions
- producing a series of audio and video **NRM stories** for sharing good news stories and lessons within the NRM community
- introducing **sister regions** to trial and support mentoring partnerships between regional NRM bodies.

Once Phase 2 had started it became clear that some of the proposed services would not be viable in the given time frame.

- brokering existing knowledge and information was achieved through a range of Knowledge Sharing Events and delivering information through the NRM Navigator
- initiating collaborative and multiregional investments was achieved on a small scale through the collaborative building of shared Evidence Bases in 3 regional NRM bodies in Victoria
- supporting regional innovators was achieved through the piloting of the regional knowledge strategies in 5 regional NRM bodies. These pilot regions implemented a variety of innovative activities such as using narrative techniques with stakeholders in NRM North Tasmania
- NRM stories were absorbed into 'This Worked here' in the NRM Navigator databases as they were both trying to achieve the same outcome using an almost identical format
- Sister regions were unable to be implemented as the regional NRM bodies at the time were not yet ready to undertake this proposed service

When starting the development of the services originally proposed to meet these aims, the Knowledge for Regional NRM Program team found that some of the services could not be implemented because the regional NRM body model was in the early stages of development, and also because there were other services that could better achieve the aims. Recognising the time and resource limitations of the Knowledge for Regional NRM Program, the team focused on trialling activities with the potential to be adopted as large-scale programs across Australia and make an immediate difference to the work being undertaken by regional NRM organisations.

The services developed and implemented are significant. They were:

- **‘Gotta question?’ service**

This proposed name for this service was originally ‘Ask a Librarian’, but consultation with regional NRM bodies revealed ‘Gotta question?’ to be a more appropriate title. The objective of ‘Gotta question?’ is to identify existing information or sources of information

to address requests received through an online form or a 1300 telephone number.

As the target audience for the Knowledge for Regional NRM Program has been regional NRM bodies, ‘Gotta question?’ has been available only to NRM professionals employed in or working directly with regional NRM bodies. The online form and telephone enquiry response have been developed to ensure that only enquiries from the target audience are followed up. A disclaimer covering liability, use of personal information, and contact in relation to the service has been included on the Knowledge for Regional NRM Program website and is also sent with all correspondence relating to an enquiry. People who submit an enquiry using the online form receive an automatic email to confirm receipt of their enquiry.

To identify information to address requests, the Knowledge for Regional NRM Program team has liaised with the Greening Australia’s exchange service, Australian Government NRM staff, State government

EXPLORING REGIONAL KNOWLEDGE NEEDS

One of the proposed services of the NRM Toolbar was a ‘Knowledge Needs database’.

The Knowledge for Regional NRM Program first sought to populate a Knowledge Needs database from an analysis of the information gaps identified in regional NRM plans. However, the information gaps identified in the regional plans did not readily translate to research questions, making it difficult to populate the Knowledge Needs database with useful information.

The Knowledge for Regional NRM Program team explored the problem through a series of team meetings, and came to the conclusion that it was likely that the unclear information gaps in the strategies resulted from regional NRM bodies needing help earlier in the NRM

planning process — at the decision-making approach step.

To further explore the problem, the Knowledge for Regional NRM Program team hosted a ‘Building regional capacity to select decision approaches’ workshop in Melbourne in June 2007 involving key academics and regional NRM body representatives and State government department representatives who had been working on issues relating to regional knowledge needs. From the outcomes of the workshop, the Knowledge for Regional NRM Program Team proposed to the Program Management Committee that under Package 3 we develop and implement the ‘Trial advisory service to assist regions select decision-making approaches’ service.



Building regional capacity to select decision approaches' workshop in Melbourne June 2007

departments and LWA staff. Examples of requests received include:

- [I am] seeking information on all types of funding available to CMAs to build sustainability of NRM service provision as/in case government funding is reduced over time.
- What is the proper density (per square metre) required for establishing a new riparian vegetated zone compromising a diversity of trees, shrubs and groundcover?
- Are there any arid regions that are creating biodiversity hotspots or biodiversity rich areas for focusing resources on? If so what criteria are you using to define these areas?

The requests coming through 'Gotta question?' were often complex and finding information in response to them was difficult, indicating that the service was meeting a gap in the NRM information market. Those using the service were asked to provide feedback, and the feedback received was very positive — for example, 'Yes I was pleased with the service that I got, a couple of replies direct to me that was good.' Harvey Morrell, NRM, Shire of Brookton).

• **Trial advisory service to assist regions select decision-making approaches**

When the Knowledge Needs database originally proposed for Package 2 was further investigated, it was found that many regional NRM bodies were not in a position to be able to populate a knowledge needs database with effective research questions. It was determined that a 'Knowledge Brokers Database' and 'Trial advisory service to assist regions select decision-making approaches' were more appropriate to the current needs of regional NRM bodies. Further information on the Knowledge Brokers Database can be found in the Package 2 section of this report.

The objectives of the trial were:

1. to provide regional NRM bodies with independent advice on the selection of decision making approaches
2. to examine and gather evidence of the value in providing regional bodies with access to an independent advisory service for the selection of decision making approaches

3. to mentor and guide regional NRM staff through the process of selecting decision support tools and processes and build their capacity to do so into the future.

The conduct of the trial was contracted to RMCg (www.rmccg.com.au) and Symbolix (www.symbolix.com.au). The outcomes of the trial were that the service was highly valued as it not only assisted regional NRM bodies with particular decision-making issues, but also built the capacity of regional NRM practitioners to undertake the appropriate selection of tools the next time without assistance. Feedback has been very positive — for example ‘...it was useful to be able to get impartial expert advice...’ (Andrew Baldwin, NRM North). The consultants successfully assisted NRM North to select a modelling platform for sediment load calculations under different management scenarios.

Insights from the final report on this trial include:

- Regional NRM decision makers face a number of common decision making contexts that serve to both inform and constrain their capacity to adopt and utilise decision support advice, including a lack of time and resources – and an emphasis on utilising existing networks.
- There are also a number of common decision support tool requirements, particularly including prioritisation and investment decision support tools that incorporate a range of NRM factors and triple bottom line aspects.
- An advisory service that simply attempts to supply tools without providing consulting advice will fail to deliver to the real needs and expectations of NRM decision makers.
- Decision makers can learn and practice useful problem exploration frameworks through decision support advisory services. This builds skills and knowledge within regional bodies.
- A broader scope for provision of advice may be required to ensure that the desired knowledge and skills are gained by decision makers. However, the nature of liability and responsibility that accompanies this advice must be clarified.
- The development of a generic decision support tool selection tree would not only be so complex as to be impractical, it may also be misleading due to the way in which it may be used by decision makers.
- A general trend toward ‘evidence-based’ prioritisation and investment from state and federal governments is creating a demand for decision support technology that is currently unavailable. In lieu of this, tools may be used that are unhelpful or provide misleading evidence.
- Increased uptake of an Advisory Service could occur as part of a word-of-mouth, relationship building exercise rather than through website or other more generic promotional activities. However, participation will only increase as the real needs of decision makers are addressed through a consultative, flexible approach to service delivery.

A significant outcome of this Trial Decision Support Advisory Service is the development of a suite of Principles of Good Practice in Decision Support. These principles are intended to reflect the insights from this Trial, and to subsequently guide future practice in improving the quality of NRM decision making.

These principles are:

- Adequately defining success of the support
- Learning to abstract the problem to allow cross comparison
- Developing a supportive network of experience
- Making Decision Support an accepted component of Management

- Recommendations from the trial to support further work in this area are:
- Provide a context for decision support tools that enables understanding through building networks with others who have used tools;
- Rather than a one-stop-shop for tools, create a network around decision making;
- The current support model is unlikely to work in the current environment due to reticence on behalf of NRM managers to seek advice;
- Frameworks at a federal level need to incorporate decision support requirements to ensure that they cascade properly to the field officer level;
- An audit of the current decision support situation should be undertaken to identify who is using what, where and when. Use direct contact techniques rather than self nominated response.
- Recommendations for a future service delivery model – particularly related to incentives or a changed service delivery model.

• Trial of the Systematic Review technique for NRM

A key challenge in natural resource management is to synthesise the diversity of research on a given topic to distil clear management recommendations. But when multiple studies give different conclusions, how can we decide what to believe and which management actions to adopt? Traditionally, these difficulties have meant that management decisions are often based on intuition and opinion to some extent, rather than just the available data — the hard evidence. However, the relatively new approach of Systematic Review could change all of that.

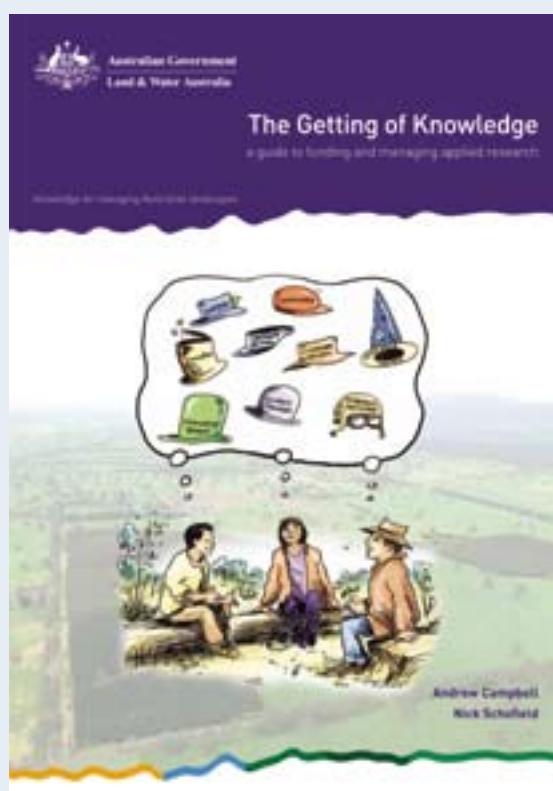
Originally developed for medical research (where decisions MUST be evidence based), Systematic Review in environmental science differs from a traditional review of published research in that it:

1. always has a practical focus — by asking whether or not specific management actions achieve their desired aims

SOME GOOD ADVICE FOR RESEARCH INVESTORS

In 2007 LWA published the 2nd edition of *The getting of knowledge – a guide to funding and managing applied research*. Written by Andrew Campbell and Nick Schofield, this 'how-to' guide aims to capture, distil and make accessible some of the knowledge LWA has gained about the business of investing in, and managing, applied research for sustainable agriculture and natural resource management.

For further information visit the publications section of the Land & Water Australia website www.lwa.gov.au





How to work with knowledge providers workshop, Brisbane, November 2007

2. develops thorough and explicit search protocols for finding information, including the difficult-to-find sources like unpublished honours' theses and state government reports
3. uses a technique called meta-analysis to actually analyse data across multiple studies, rather than just providing a synthesis of different researchers' ideas
4. is well supported and coordinated through the Centre for Evidence-Based Conservation (CEBC) in Wales (www.cebc.bangor.ac.uk), so land managers, planners and policy makers can easily access the results of these reviews anytime at no cost.

The LWA Knowledge for Regional NRM Program has engaged CSIRO to conduct two Systematic Reviews with the support of the CEBC and using the CEBC guidelines. The two topics are:

1. **Does structural connectivity facilitate effective dispersal of native species in Australia's fragmented terrestrial landscapes?** This Systematic Review will have implications for how land restoration plans are developed. The draft review was completed in February 2009. The Systematic Review process proved to be a transparent, inclusive and robust approach for evaluating and synthesising data from many studies to address a question of practical importance for natural resource management. The review found there were insufficient high-quality data on the topic to perform meta-analysis, but the detailed exploratory analysis was useful for revealing broad patterns, particularly across studies examining different types of structural connectivity, which have never been synthesised before. The review found that all forms of structural connectivity, for which there were sufficient data for

- CSIRO has contributed over \$100 000 to the

In addition to both reviews being made publi

1 test the merits and limitations of Systematic

2. raise awareness of the concept of Systematic Reviews and the processes and investments necessary to adopt evidence-based decision-making models.

Knowledge Sharing Events

In addition to implementing these knowledge brokering services, the Knowledge for Regional NRM Program made significant contributions to a number of knowledge sharing events. Some of these were sponsored and organised by the Knowledge for Regional NRM Program. The events and contributions included:

- Delivering a breakfast presentation on the Knowledge for Regional NRM Program and assisting with the 'Knowledge Bazaar' knowledge sharing event at the 2006 National Regional NRM Conference (Gold Coast, November 2006).
- Facilitating a 'Building regional capacity to select decision approaches' workshop (Melbourne, June 2007)
- Presenting on the Knowledge for Regional NRM Program to a meeting of the Natural Heritage Trust (NHT) Advisory Council (April 2007).
- Presenting on the Knowledge for Regional NRM Program to representatives of the Victorian Department of Sustainability and Environment and Department of Primary Industries (May 2007).
- Facilitating a 'How to work with knowledge providers workshop' (Brisbane, November 2007), which covered three major aspects of the knowledge provider sector — research providers, community knowledge providers and Indigenous knowledge providers.
- Presenting on the Knowledge for Regional NRM Program and hosting a Program information stall at the 2008 State NRM Conference in Western Australia (Bridgetown, March 2008).
- Hosting a Knowledge for Regional NRM Program information stall and pre-dinner drinks session at the 2008 National NRM Conference (Melbourne, April 2008). Staff from key collaborating regional NRM bodies gave presentations during the pre-dinner drinks, substantially exposing the gathered regional NRM body representatives to the benefits of products and services of the Program.
- Multiple presentations on the progress of the Knowledge for Regional NRM Program to the Knowledge Management Forum of the Victorian Catchment Management Council (VCMC).
- Delivering a keynote presentation that included information on the Knowledge for Regional NRM Program to the 2007 Queensland Rainforest Forum (Brisbane, June 2007).
- Presenting on the Knowledge for Regional NRM Program to the South West NRM 'Giving Effect to Science' Symposium (Charleville, September 2007).

Future Options for the Knowledge for Regional NRM Program

At May 2009, LWA has been unable to source funding to continue the Knowledge for Regional NRM program. Implementation of the options below is dependent on funding being identified for an organisation to continue the program.

Package 1 – Better practice in knowledge management

The Regional Knowledge Resource Kit (RKRK) is a comprehensive resource that has been established in a way that can enable it to continue to evolve into the future. The establishment of a group of six RKRK administrators, comprising people from both inside and outside LWA, assists security and durability. If administration was left in the hands of just one person or organisation it would place the RKRK at risk of being a lost resource should that person or organisation have to suddenly abandon RKRK administration due to changed circumstances. However, there are costs for the ongoing hosting of the RKRK website and continuation of the RKRK domain names www.rkrk.net.au and www.rkrk.com.au, and as time passes gradual attrition in the ranks of RKRK administrators is likely. The RKRK uses Mediawiki software which is open source and does not require licence costs

The RKRK is currently hosted by LWA, with hosting costs covered until mid-2009 and the domain names registered until September 2009. The RKRK needs to be supported beyond this through another organisation taking up the hosting with its own existing resources or additional external resourcing. A not-for-profit hosting arrangement is currently being investigated and expected to be implemented before June 2009.

The Friends of the RKRK and RKRK Administrators groups are hosted on the free Yahoo! Groups platform; however, an ongoing moderation presence is needed, particularly to manage spam.

Following the completion of the Regional Knowledge Leaders training program, the trained Regional Knowledge Leaders are able to move forward on developing and implementing Regional Knowledge Strategies with the support of the members of the National Core Team. A number of Regional Knowledge Leaders have done so. Many of the Regional Knowledge Leaders held the position of Regional NRM Facilitator in their region. Government funding support for these positions has been discontinued. Many regions have found themselves unable to retain these positions, leading to the loss of some Regional Knowledge Leaders who were in a position to implement a Regional Knowledge Strategy in a regional NRM body.

Only people who have participated in the Regional Knowledge Leaders training and knowledge management consultants who are skilled in narrative techniques and information management tools can effectively use the RKRK resources to successfully lead the Regional Knowledge Strategy process because of the special narrative techniques used. Similarly,



Western Australian NRM Conference 2008



National NRM Conference in Melbourne, March 2008

successful delivery of the Regional Knowledge Leaders training requires either an in-depth knowledge of, or exposure to, the Regional Knowledge Strategy process or high-level specialist information and knowledge management professional expertise.

Attrition in the numbers of trained Regional Knowledge Leaders and National Core Team members should be addressed through the provision of further training. This has already become an issue with the last of the Knowledge for Regional NRM Program staff members being called on by the South Australian Government and NRM South in Tasmania to run the knowledge leaders training in early 2009 so they can implement their information and knowledge strategy processes.

In addition to staff from regional NRM bodies, staff from State and Territory government departments, rural research and development corporations (RDCs) and other NRM organisations also participated in the Regional Knowledge Leaders training. Because regional NRM bodies were the focus of Phase 2 of

the Knowledge for Regional NRM Program, only a small proportion of this wider NRM sector interest could be addressed. Further development of the Regional Knowledge Strategy process and Regional Knowledge Leaders training and extending them to the whole of the NRM sector is now an imperative. This needs to include a range of communication and engagement activities, recognising that the while its outcomes have been significant, the Knowledge for Regional NRM Program has really only just begun what is a major cultural change in the NRM sector. The re-branding of Package 1 products and services to NRM Knowledge Resource Kit (or similar), NRM Knowledge Strategy process and NRM Knowledge Leaders training is desirable.

The Better Practice Knowledge Awards originally proposed for Package 1 can also be considered as a future option. Such an awards program would increase awareness of information and knowledge management as issues for NRM sector organisations and recognise those organisations achieving better practice.



How to work with knowledge providers workshop, Brisbane, November 2007

Key issues for Package 1 – Better practice in knowledge management

1. **Resourcing the RKRK website:** The Regional Knowledge Resource Kit (RKRK) website hosting and domain names and Friends of the RKRK and RKRK Administrators Yahoo! Groups need ongoing support, possibly through another organisation taking up the hosting with its own existing resources.
2. **Providing external support for leaders:** Regional NRM bodies need to be assisted in developing and implementing Regional Knowledge Strategies through the provision of external support in the form of people who can help and mentor the regionally based Regional Knowledge Leaders.
3. **Training more leaders:** Attrition in the number of trained Regional Knowledge Leaders and National Core Team members needs to be addressed through the provision of further Regional Knowledge Leaders training.
4. **Extending the process sector-wide:** The Regional Knowledge Strategy process and Regional Knowledge Leaders training need to be extended to the whole of the NRM sector. This needs to include a range of communication and engagement activities, recognising that the while its outcomes have been significant, the Knowledge for Regional NRM Program has really only just begun what is a major cultural change for the NRM

sector. The re-branding of the Package 1 products and services to NRM Knowledge Resource Kit (or similar), NRM Knowledge Strategy process and NRM Knowledge Leaders training is desirable.

5. **Implementing an awards program:**

The Better Practice Knowledge Awards originally proposed for Package 1 can also be considered as a future option. Such an awards program would increase awareness of information and knowledge management as issues for NRM sector organisations and recognise those organisations achieving better practice.

Package 2 – NRM Navigator

The NRM Navigator is a set of online tools and resources that is vital to the successful management of information and knowledge in the Australian NRM sector. The NRM Navigator has been established in a way that can enable it to continue to evolve into the future, including using open source software, which does not require ongoing licence costs. However, website hosting needs to be maintained along with the continued registration of the domain names www.nrmnavigator.net.au and www.nrmnavigator.net.

NRM Navigator is currently hosted by LWA, with website hosting costs and domain name registrations covered until mid-2009. NRM Navigator needs to be supported beyond this possibly through another agency as LWA is being abolished, with normal operations ending on 30 June 2009.

An NRM Navigator manager is also required to maintain NRM Navigator content, including the moderation of user contributions, and to continue working with users and the information management community to identify and implement further enhancements over time. Resources are needed to employ a manager on an ongoing basis. Information technology develops at rapidly, and user needs and requirements continually evolve. By keeping pace with these changes, LWA has been able to develop the most effective and relevant tools

and resources for the NRM Navigator. Failure to keep pace with these ongoing changes would see the NRM Navigator tools and resources gradually become irrelevant or obsolete, and as a result information and knowledge management in the NRM sector would take a significant step backwards.

Resources are also desirable for the ongoing promotion of NRM Navigator tools and resources throughout the NRM sector, and for Evidence Bases training for regional NRM bodies and a wide range of other NRM sector organisations and individuals. With the Australian Government Caring for our Country funding program open to a wider range of stakeholders than just regional NRM bodies and emphasising the development of partnerships, promoting the NRM Navigator tools and resources throughout the NRM sector is an imperative. The Evidence Bases software includes a wide range of features, and the provision of training will enable users to make the most of these features.

In particular, the Evidence Base software has been connected to the mandatory Program Logic processes within regional NRM bodies. This is a requirement of the Australian Government and enables the regional NRM bodies to meet this obligation. The Evidence Base software is also all open source software and will need maintenance over time.

Key issues for Package 2 – NRM Navigator:

1. **Resourcing the NRM Navigator website:** The NRM Navigator website hosting and domain names need ongoing support.
2. **Employing a website manager:** Resources are needed to employ an NRM Navigator manager. This person is required on an ongoing basis to maintain the NRM Navigator content, including the moderation of user contributions, and to continue working with users and the information management community to identify and implement further enhancements over time.

3. **Promoting the website:** Resources are also desirable for the ongoing promotion of NRM Navigator tools and resources throughout the NRM sector, and for Evidence Bases training for regional NRM bodies and a wide range of other NRM sector organisations and individuals.
4. **Extending evidence bases:** Use of the Evidence Bases is growing as more regional NRM organisations are ready to take the opportunity to improve their management of information and knowledge using these open source tools. Often NRM staff are unfamiliar with information management tools and practices and require support to start and continue contributing valuable research information into the public domain. The Evidence Bases may be the only means by which this research becomes accessible to the general public and our policy makers.

Package 3 – Supporting knowledge brokering in the NRM sector

The requests that came from the trial of the ‘**Gotta question?**’ service indicate that the service has met a gap in the NRM information market, and the feedback from those using the service has been very positive. Resources are needed to continue the ‘Gotta question?’ service, and to expand it from assisting just regional NRM bodies to helping a wider range of NRM organisations.

The outcomes of the **Trial advisory service** to assist regions select decision-making approaches’ was that the service was highly valued as it not only assisted regional NRM bodies with particular decision-making issues, but also built the capacity of regional NRM practitioners to undertake the appropriate selection of tools the next time without assistance. Feedback has been very positive. Resources are needed to expand on the trial, with a view to building the capacity of regional NRM bodies across Australia to



Knowledge Leaders training, Perth, June 2008

select appropriate decision-making approaches. Expanding the service to a wider range of NRM organisations is also desirable.

The **Systematic Review** approach has the potential to significantly improve the way in which research is used in decision making in the Australian NRM sector. When completed, the Systematic Review trials being conducted by CSIRO need to be evaluated and decisions taken on the conduct and resourcing of further Systematic Reviews and the future role of Systematic Reviews in NRM policy and practice in Australia.

Key issues for Package 3 – Supporting knowledge brokering in the NRM sector:

1. **Extending the 'Gotta question?' service:** Resources are needed to continue the 'Gotta question?' service, and to expand it from assisting just regional NRM bodies to helping a wider range of NRM organisations.
2. **Expanding advisory services:** Resources are needed to expand on the 'Trial advisory service to assist regions select decision-making approaches' with a view to building the capacity of regional NRM bodies across Australia to select appropriate decision-making approaches. Expanding the service to a wider range of NRM organisations is also desirable.
3. **Reviewing the program:** When completed, the Systematic Review trials being conducted by CSIRO need to be evaluated and decisions taken on the conduct and resourcing of further Systematic Reviews and the future role of Systematic Review in NRM policy and practice in Australia.

Glossary

Adoption — acceptance and use by the target audience of a new concept, tool or practice (LWA, 2005:16).

Communities of practice — groups of people who develop competence and good practice in a defined area. Also known as enabling or knowledge networks, they bring together and attract people who do not normally work together to share their knowledge and create better working practices... They act as mechanisms for increasing tacit knowledge and also for transforming tacit knowledge into explicit knowledge (SAI, 2004:4).

Evidence-based practice — practice that is informed by empirical research and critical appraisal of validated knowledge... Evidence based decision making is now being fostered in government, education, and other sectors to ensure that decisions and working practices are based on relevant, current and comprehensive knowledge (SAI, 2004:8).

Information — data that has been analysed and interpreted to tell a story about a situation — for example, water levels are rising in region X (LWA, 2005:16).

Knowledge — the synthesis of facts, information, opinion, learnings and interpretation according to one's own experiences (LWA, 2005:16).

Knowledge base — the body of knowledge available to an organisation. It comprises organisational competences and the knowledge within teams and individuals, and is supported by organisation collections of information and data. An organisation may build specific knowledge bases to collate information on key topics or processes (SAI, 2004:13).

Knowledge brokering — focuses on connecting people interested in an issue, it helps build relationships and networks for

sharing existing research and ideas and for stimulating new work. Knowledge brokers provide links between different entities or individuals that otherwise would not have any relationship. It is a dynamic activity and is not simply focused on moving information from a source to a recipient (LWA, 2005:16).

Knowledge management — a multi-disciplined approach to achieving organisational objectives by making best use of knowledge. It involves the design, review and implementation of both social and technological processes to improve the creation and application of knowledge, in the collective interest of stakeholders (SAI, 2004:15).

Knowledge management systems — a systems approach to knowledge management involves a holistic and integrated use of people, processes and technology to automate or support various types of activities. While knowledge management is much more than a technical issue, most knowledge management systems will inevitably involve some aspect of information and communications technologies (SAI, 2004:16).

Knowledge management strategy — the plans, processes and actions by which an organisation achieves its desired objectives for knowledge management. A knowledge management strategy is the critical link between organisational strategy and knowledge management initiatives, articulating how an organisation can support business achievement by utilising its knowledge-based resources (SAI, 2004:17).

Knowledge market — comprises organisations or individuals that produce information and undertake research and those that use or buy it.

Metadata — structured information that describes and/or enables finding, managing, controlling, understanding or preserving other information over time (SAI, 2004:18).

Narrative — the capture, interpretation, distribution and stimulation of knowledge through story. It includes the capture of anecdotal material in the field through a broad range of techniques, including those drawn from anthropology as well as story circles, virtual story telling and many others. Narrative databases hold knowledge in its original form, often without formal interpretation, allowing users to encounter stories in the system as they would encounter stories through casual questioning. Narrative techniques also focus on interpreting and representing culture in the formal communication of knowledge through story telling (SAI, 2004:18).

Open source software — computer software whose source code is available under a copyright licence that permits users to study, change and improve the software, and to redistribute it in modified or unmodified form (en.wikipedia.org).

Regional NRM bodies — the Australian Government, in association with State and Territory governments, identified 56 regions across Australia to facilitate integrated delivery of NRM priority issues. A regional NRM body has been established in each region. Refer to www.nrm.gov.au for more information on the regions (Australian Government, 2009).

Thesaurus — when searching for information, different people will often use slightly different search terms to look for the same item. To address this, information databases can be indexed or tagged with a thesaurus, which is a controlled vocabulary of terms including a specified range of synonyms for various search terms.

References and further reading

Websites

Knowledge for Regional Natural Resource Management www.lwa.gov.au/regionalknowledge. Web site for the Knowledge for Regional NRM Program gives an overview of all the Packages developed by the Program as well as the history.

NRM Navigator, www.nrmnavigator.net.au. The NRM Navigator provides a set of online tools and databases that make it easier for NRM professionals to find and share information. It includes the NRM Search Engine which delivers more relevant search results than generic search engines because it only searches selected Australian NRM websites and databases, including information repositories that are not indexed by generic search engines.

Regional Knowledge Resource Kit (RKRK), www.rkrk.net.au. The RKRK provides an extensive resource for managing knowledge and information within regional NRM bodies. It includes a comprehensive guide to developing a Regional Knowledge Strategy and an online resource library covering a wide range of information and knowledge management topics relevant to the NRM sector.

Networks

actKM Forum, www.actkm.org. The actKM Forum is a not-for-profit learning community dedicated to building and sharing knowledge about public sector knowledge management.

Publications

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Land & Water Australia is a statutory corporation of the Australian Government within the Agriculture, Fisheries and Forestry portfolio, established under the Primary Industries and Energy Research and Development (PIERD) Act 1989. We invest in knowledge, partnerships, innovation and adoption to underpin sustainable natural resource management in Australia.