

THE NSW NPWS AND THE BOARD OF THE CANRI PROGRAM

December 2002

Project number 2742

RESEARCH WITH  
INVOLVED USERS OF  
NATURAL RESOURCES  
INFORMATION

# Table of contents

<b>Executive summary</b>	<b>1</b>
<b>Background and objectives</b>	<b>6</b>
<b>2.1 CANRI</b>	<b>6</b>
<b>2.2 NPWS</b>	<b>7</b>
<b>2.3 This project</b>	<b>7</b>
<b>Research design</b>	<b>9</b>
<b>3.1 Methodologies used</b>	<b>9</b>
<b>3.2 Sample structure</b>	<b>10</b>
<b>3.3 Conduct</b>	<b>11</b>
<b>Information channels</b>	<b>12</b>
<b>4.1 Personal contact</b>	<b>12</b>
<b>4.2 Maps and GIS</b>	<b>13</b>
<b>4.3 Internet</b>	<b>13</b>
<b>Differences between audiences</b>	<b>17</b>
<b>5.1 Professionals</b>	<b>17</b>
<b>5.2 Amateur environmental leaders and students</b>	<b>18</b>
<b>5.3 Outdoor enthusiasts</b>	<b>18</b>
<b>5.4 Amateur in-the-field members of environmental groups</b>	<b>19</b>
<b>Information providers</b>	<b>21</b>
<b>6.1 Environment Australia</b>	<b>21</b>
<b>6.2 NSW Environment Protection Authority</b>	<b>22</b>
<b>6.3 NPWS</b>	<b>22</b>
<b>6.4 NSW Department of Land and Water Conservation</b>	<b>23</b>
<b>6.5 Australian Museum</b>	<b>23</b>
<b>6.6 Royal Botanical Gardens, Sydney</b>	<b>24</b>
<b>CANRI</b>	<b>25</b>
<b>7.1 Awareness of CANRI</b>	<b>25</b>
<b>7.2 Reaction to the CANRI concept</b>	<b>27</b>
<b>7.3 Reaction to the CANRI brand-name</b>	<b>29</b>
<b>7.4 Reaction to the CANRI website</b>	<b>30</b>
<b>7.5 Additions to CANRI</b>	<b>34</b>

---

<b>Appendix A: Preliminary research</b>	<b>36</b>
<b>A.1 Accessible environmental resources on the internet</b>	<b>36</b>
<b>A.2 A review article on GIS</b>	<b>39</b>
<b>A.3 Previous social policy research</b>	<b>39</b>
<b>Appendix B: Discussion/interview guide</b>	<b>41</b>

---

## Executive summary

**Background** This research was commissioned in order to deliver a deep understanding of those users of natural resources information who are within the target audience of both CANRI and NPWS. Previous NPWS research has shown that the general public tend not to seek out detailed natural resources information. Therefore, given the more specialised information provided by CANRI, the sample for this research was refined to include only the **more involved users of natural resources information** who might desire such detail. These users include professionals working in the natural resources sector, university students of environmental studies, amateur leaders of environmental groups, and outdoor enthusiasts (such as bushwalkers, canyoneers, campers and the like).

**Research design** Given the **exploratory** nature of the research, a qualitative methodology offered the most appropriate means for eliciting the required depth of understanding. Sixteen in-depth interviews were conducted with professional users of natural resources information across a broad range of professions. One focus group discussion was conducted with each of three types of non-professional users: university students of environmental studies; amateur leaders of environmental groups; and outdoor enthusiasts.

**Information channels** In discussing information channels, the following themes emerged.

There is a surprisingly strong and entrenched reliance on **personal contact** (face-to-face, phone, email) for the provision of natural resources information. Personal contact is seen as a time-effective method of gaining the required information. Personal contact is also seen to ‘cut to the chase’ of what was happening, thereby avoiding the ‘propaganda’ element. Propaganda presents more difficulties for information provided by the public sector because information users feel less able to identify the political agenda which they see as responsible for the inevitable layer of PR.

Traditional **paper maps** are considered key information tools. However, very few have taken the next step technologically to the electronic equivalent, namely Geographical Information Systems or **GIS**. Even those who are not using GIS recognise its potential benefits as tremendous, particularly the ability to overlay mapped data, which some see as leading to a “quantum leap” in the community’s ability to manage natural resources. They also recognise the potential of GIS becoming more accessible. However, their own use of GIS is still seen as some way in the future.

The **internet** is increasingly seen as the preferred source for written information. One perceived advantage is that the internet is particularly suited to providing up-to-date information. A second perceived advantage is that it provides an efficient means of providing wide access to information, because its reach can be seen increasingly as the whole community.

The internet is seen to provide increased opportunities for personal contact. Emails and emailed newsletters are important sources of personal contact, and websites providing natural resources information are expected to permit, and even encourage, personal contact from interested individuals.

There is also a recognition that the internet is not yet a mature communication channel, and that it is therefore continually improving. All research participants remain open to new developments, though few have the time and inclination to assiduously search them out. This entails the perhaps surprising consequence that an innovative internet service in the natural resources area has to be sold quite aggressively to gain wide acceptance.

Of course, research participants also have some concerns about the internet as an information channel. They are concerned about the reliability of information, about information overload, and about missing important information.

**Audience differences**

The research found that the information needs of **professionals** are currently being adequately met: they are getting what they need to do their jobs. Even so, and without exception, professionals in the natural resources sector readily acknowledge that the current situation is sub-optimal. Hence they are open to innovative solutions (which are expected to be based on technology improvements). However, to change their ways, professionals must be presented with proof of the benefits of a new information source.

Many professionals prefer personal contact for information gathering because it is so time-effective, given that they tend to have good existing networks of contacts who are experts in their various areas of interest. In turn, consulting colleagues further builds up and strengthens these important professional relationships.

**Amateur environmental leaders** and **students** feel very frustrated at being out of the professional information-loop. They lament not being able to cultivate the network of personal contacts available to professionals, complaining that they are not able to access resources available to professionals ‘on the ground’. Amateur environmental leaders feel isolated in what they are doing on a day-to-day basis. They are often aware that they are ‘reinventing the wheel’, in that they are likely to be re-doing what someone similar to them has already done, and possibly wasting time figuring out how to do their job. Students feel held back from what they really should be doing. They see their course as like an apprenticeship in which they have no experience with at least some of the tools of their trade. This situation is seen to be a lost opportunity.

These information users have an unmet demand for a better source or channel of information.

The information needs of **outdoor enthusiasts** tend to be immediate, concentrated and one-off. They are experience-seekers rather than information-seekers, and do only as much desk research as is necessary to yield the desired experience. They are surprisingly unreceptive to detailed information and are wary of shared information and sharing information.

**Information providers** Research participants were asked to give their opinions of six key natural resources information providers who all supply information to CANRI. The six are Environment Australia, EPA, NPWS, DLWC, the Australian Museum and the Royal Botanical Gardens, Sydney. Many of the comments focus on the websites of these organisations, which are found to be the most obvious and fruitful source of information.

**CANRI** Before turning to Eureka’s findings on CANRI in detail, one global finding needs to be presented. The awareness of CANRI amongst outdoor enthusiasts is virtually nil and their reaction to CANRI is generally benign indifference. Their interest in CANRI is not appreciably greater than that of average members of the general

public and so they are of secondary interest to CANRI, at least for this stage of its development. They will not be referred to in the remainder of this summary of our CANRI findings.

**Awareness of CANRI** is exceedingly low amongst the professionals, amateur environmental leaders and students that we sampled. Clearly, CANRI needs more promotion amongst potential users. Most research participants feel that they would be most likely to hear about a new development such as CANRI through personal recommendation. Forums for promotion include conferences of natural resources professionals and existing online communities of interested individuals. Relevant university departments represent another fertile source for promotion as university researchers are important contacts for current professionals and, even more so, for the students who will soon become professionals. Amateur environmental leaders will be harder to contact through personal networks as many of them are ‘out-of-the-loop’, but some success can be achieved through umbrella organisations such as the Nature Conservation Council of NSW, Landcare and WIRES to name a few. Another fruitful method for contacting amateur environmental leaders is via those professionals who have close contact with amateur environmental groups, such as some community educators and council bushland managers.

While awareness of CANRI is low, many more have used services provided by CANRI but accessed from the websites of other agencies. More prominent CANRI branding on these sites, together with links to the homepage, would be an effective means of promoting CANRI. CANRI could then be seen as building on its current successes rather than starting from scratch. There are strong reasons to suggest that it would be preferable if the branding presence included a short user-focused description of what CANRI aims to do.

The reaction of research participants to the **concept of CANRI** is very positive. CANRI is seen as offering a unique service to users of natural resources information in NSW. Many are so positive about the concept that they are disappointed, in fact ‘hurt’ to admit their ignorance of it. The motto of the ‘power of shared information’ holds strong appeal. CANRI is seen as a means of avoiding the territorial disputes which have arisen in the natural resources sector (though others note that CANRI itself would need to have overcome these disputes before becoming successful). Those with some experience of CANRI feel it is already beginning to deliver the benefit of integration.

CANRI’s catalogue of metadata, the Natural Resources Data Directory, is praised as a means of retaining knowledge. With regard to CANRI-facilitated data, such as the interactive atlases (the

Natural Resources Atlas and the Coastal Atlas), there are equal measures of interest and scepticism. On one hand, research participants recognise the tremendous potential of overlaying mapped data. On the other hand, they raise doubts such as that web-based GIS will promise more than it can deliver, that it is next generation.

The **brand-name** or acronym CANRI is perceived negatively because it is not memorable and because both “Community Access” and “Natural Resources Information” are misleading. These difficulties do not entail that the brand-name must be changed. But they do entail that CANRI must be alert to the misinterpretations which they engender, and act to mitigate them.

In relation to the CANRI **website**, redesign of CANRI’s homepage should be a priority. The homepage is felt to be too cluttered. It needs to be simplified to avoid the possibility that a user may miss the information they are looking for. One suggested improvement is that the information currently listed under the headings Land, Air, Water, etc. could instead be contained within pop-up menus (i.e., menus that appear when the cursor is stationary over the relevant heading). The homepage also needs to better explain CANRI and its purpose so the user quickly understands what the site has to offer. It needs a carefully-worded and user-focused description of what CANRI aims to do, the first part of which is on the home page, functioning as a bit of a teaser, with further links for those who desire more information. It needs to convey what is meant here by “Community Access” and “Natural Resources Information”, as well as the benefits which flow from integrating multiple sources of information. Also, if CANRI is a portal, it needs to clarify what it is a portal to. Other suggested website improvements include a user-focused manual, adequate descriptions of each dataset, an annotated index of data layers available on the interactive atlases and a few minor changes to the CANRI newsletter.

Research participants made a number of suggestions about wholesale **additions to CANRI**, as well as the suggested improvements to the website. These suggestions include: a grant inventory; a host site for maps, datasets and reports from environmental organisations whose websites are not sophisticated enough to handle such information; and a list of useful links, including a “key to the Federal maze” and an explanation of how CANRI does and does not fit in with Commonwealth Government initiatives and initiatives in the other states.. Research participants are also very keen for CANRI to use various means to facilitate personal contact because they see the internet as more than just a data repository (however tailored or interactive it may be).

## Background and objectives

The term ‘natural resources’ is used to cover “the naturally occurring components of the environment, including land, soil, water, flora, fauna, minerals and energy sources”<sup>1</sup>. Consistent with the breadth of this definition, natural resources information encompasses a range of material (including maps, spatially-referenced datasets, aerial photographs, identification keys, reports, fact sheets, articles and the like). The research program described in this report was conducted for the following two organisations which are both significant providers of natural resources information.

### 2.1 CANRI

NSW Government agencies and other organisations have created the Community Access to Natural Resources Information (CANRI) Program as a shared framework - an internet round table - to bring together all stakeholders' information and then present it in a meaningful way. The slogan of CANRI is ‘the power of shared information’, which summarises the intent and purpose of the program. CANRI seeks to facilitate online access to key environmental information from NSW Government agencies and other organisations.

Thus, CANRI has established the Natural Resources Data Directory which is an online register of natural resource datasets held mainly by NSW state and local government agencies, with each listing in the directory summarising the dataset's content, quality, currency and availability. Some of these datasets are themselves available online, on either the CANRI website or the websites of participating organisations, and almost all of those available are indexed on CANRI's homepage (<http://www.canri.nsw.gov.au/>). Mapped datasets use CANRI-standard spatial applications which provide the opportunity of overlaying numerous datasets. The most powerful overlaying mapping facility is that provided by CANRI's own interactive atlases: the

---

<sup>1</sup> Sydney Harbour Catchment Management Board. (April 2002). Draft Catchment Blueprint, p. 31. Available at [http://www.dlwc.nsw.gov.au/care/cmb/blueprints/pdfs/sydh\\_blueprint.pdf](http://www.dlwc.nsw.gov.au/care/cmb/blueprints/pdfs/sydh_blueprint.pdf).

NSW node of the Australian Coastal Atlas and (to an even greater extent) the Natural Resources Atlas, which currently provides a choice of 150 datasets from 16 participating organisations.

## **2.2 NPWS**

The NSW National Parks and Wildlife Service (NPWS) has the following six functions, and each of them requires the provision of information:

- managing protected areas;
- conserving nature outside parks and reserves;
- researching and protecting diversity;
- conserving cultural heritage;
- educating and promoting conservation; and
- licensing.

Consistent with these information provision functions, NPWS is one of the organisations participating in CANRI: it provides numerous entries to the Natural Resources Data Directory, a Wildlife Atlas (of NSW flora and fauna) using a CANRI-standard spatial application and it contributes 11 datasets to the Natural Resources Atlas.

Of course, a significant proportion of the information provided by the NPWS has not been facilitated by the CANRI project. This includes much of the information NPWS provides for the general public (such as information on park conditions and facilities, information for school projects and the like) as well as information for managers of natural resources (such as Threatened Species determinations, research publications and the like).

## **2.3 This project**

This research was commissioned in order to deliver a deep understanding of those users of natural resources information who are within the target audience of both CANRI and NPWS. The research was informed by a preliminary review, outlined in Appendix A, of previous research and current environmental resources available on the internet.

Who falls within the target audience of both CANRI and NPWS? Previous NPWS research has shown that the general public tend not to seek out detailed natural resources information. Therefore, given the more specialised information provided by CANRI, the sample for this research was refined to include only the **more involved users of natural resources information** who might desire such detail. These users include professionals working in the natural resources sector, university students of environmental studies, amateur leaders of environmental groups, and outdoor enthusiasts (such as bushwalkers, canyoners, campers and the like).

The topics which were covered in the research include:

- usage of different information channels;
- differences between groups of information users on the basis of needs, behaviours and channel preferences;
- usage of specific information providers; as well as
- awareness of, and reaction to, CANRI.

Given the **exploratory** nature of the research, a qualitative methodology offered the most appropriate means for eliciting the required depth of understanding. Qualitative research is oriented towards open discovery, permitting an in-depth examination of the research issues. Qualitative research is less structured than quantitative research. This flexibility is advantageous, in that it allows research participants to discuss issues **in proportion to the significance they perceive them to have**, as well as to **spontaneously** raise issues that may not have been expected. Using qualitative methodology, a skilled moderator can also test possible interpretations of how the research participants are reacting to issues and ideas. In sum, qualitative research has the capacity to provide more **profound** insights. A detailed description of Eureka's methodology is outlined in the next section.

## Research design

### 3.1 Methodologies used

Two qualitative methodologies were used in this research project.

**In-depth interviews** In-depth interviews were used for the professional users of natural resources information. In-depth interviews were used because they result in greater candour on topics which involve professional sensitivity, such as the performance of various organisations in the provision of natural resources information. They also allow for customised probing on specialised areas of concern. Finally, these professionals are busy, dispersed and (relatively) hard-to-find people, so fitting into their schedules provides a better quality sample.

**Focus group discussions** Unlike professional users of natural resources information, non-professional users do not find the topics covered particularly sensitive and are not too difficult to recruit to attend a discussion at a central location. Therefore, focus group discussions were used for the non-professional users. They are more cost-effective and the group environment creates a more natural and free-flowing discussion, which has numerous benefits, including:

- research participants do not feel that they must justify their answers to the moderator, allowing them to put forward opinions they may not be able to defend rationally, but which may nonetheless have significant impact for marketing and communications strategies;
- research participants are stimulated by the group environment to clarify and challenge their thinking, enabling issues to be developed and followed up, in an interactive manner, as they arise; and

- a skilled moderator can immediately test hypotheses about how certain people interpret, and react to, various issues and ideas.

### **3.2 Sample structure**

A total of 16 in-depth interviews were conducted with professionals, distributed across various professions in the natural resources sector as outlined in the table below. Each interview lasted approximately one hour.

<b>Profession</b>	<b>Number of interviews</b>
Consultants	2
Researchers	3
Community educators	2
Policy makers from State agencies	3
Council bushland managers	3
Council planning officers	3

A total of three focus group discussions were conducted, with one group for each of the three types of non-professional users of natural resources information outlined in the table below. Each focus group discussion lasted between 1 ½ and 2 hours.

<b>Type of non-professional user</b>
University students of environmental studies
Amateur leaders of environmental groups
Outdoor enthusiasts (bushwalkers, canyoners, campers and the like)

### 3.3 Conduct

A guide for the discussions and interviews was designed by Eureka in consultation with NPWS, and was adapted slightly according to the nature of the group or, to a lesser extent, the individual we were interviewing. (See Appendix B for a copy of the discussion guide.)

We used notepads for the main questions relevant to this research: for example “When thinking about information that does/can assist me with my specific interest, my main frustrations are ...”. For these questions, research participants are asked first to jot down their initial ideas in the notepad before the questions are thrown open to discussion. As well as providing an extra data source in which all opinions are recorded, the use of notepads ensures the ‘anchoring’ of each respondent’s *a priori* opinion ... that is, a belief that has not been ‘contaminated’ by other, perhaps more dominant members of the group. Also, by referring to these answers in the course of discussion, we can ensure that all research participants feel that their opinions are valued equally to all others.

To maximise the research effort from the available budget, the geographic scope of the project was limited to greater Sydney. The in-depth interviews were conducted at the research participant’s place of employment. While research participants for the focus group discussions were recruited from all across greater Sydney, the discussions were conducted at dedicated facilities in either the Sydney CBD or Crows Nest. This meant that the discussions could be video-recorded unobtrusively. The resulting video tapes have been supplied to the NPWS.

The next four sections report the findings of the research project under the following headings:

- Information channels;
- Audience differences;
- Information providers; and
- CANRI.

## Information channels

In discussing information channels, the following themes emerged.

### 4.1 Personal contact

Eureka found a surprisingly strong and entrenched reliance on personal contact (face-to-face, phone, email) for the provision of natural resources information. This is not due to a lack of computer literacy. Rather, personal contact is seen as a more time-effective method of gaining the required information (at least to ‘get the ball rolling’ on finding other relevant information).

Personal contact is considered particularly important for local on-the-ground knowledge where it is often considered the only possibility. Research participants feel that such location-specific knowledge is not necessarily written down anywhere.

Personal contact is also seen to ‘cut to the chase’ of what was happening, thereby avoiding the ‘propaganda’ element. Propaganda is an issue with all information, whether provided by the private, public or community sectors. But it presents more difficulties for information provided by the public sector because information users feel less able to identify the political agenda which they see as responsible for the inevitable layer of PR.

Research participants also feel they have to rely on personal contact because many of those who hold natural resources information are felt not to be proactive about its dissemination.

“Some key information is being held up by political decision making” (state policy maker)

All four groups (professionals, students, amateur environmental leaders and outdoor enthusiasts) have this strong reliance on personal contact, though only the professionals feel satisfied with the quality and quantity of information obtained through this channel.

## 4.2 Maps and GIS

Traditional paper maps are considered key information tools. They are used by all research participants, usually with a great deal of enthusiasm. However, very few have taken the next step technologically to the electronic equivalent, namely Geographical Information Systems or GIS.

Even those who are not using GIS recognise its potential benefits as tremendous, particularly the ability to overlay mapped data, which some see as leading to a “quantum leap” in the community’s ability to manage natural resources. Most consider that they would only be able to use GIS after a significant amount of training. Some feel that they could rely on the GIS skills of others within their organisation (particularly those professionals whose work was team-based such as council officers). Others know they should learn, but just have not been able to find the time.

“I haven’t done the training” (amateur environmental leader)

“We have a GIS unit that I can call on” (council bushland manager)

“That’s the obvious next step” (researcher)

Finally, mention was made of an operational barrier to the more widespread use of GIS. Many research participants want to be able to print out the map which would result from their GIS session. However, a normal printer would not be able to deliver either sufficient resolution or size (A4 being too small for many mapping requirements, though one university researcher found his A0 colour printer entirely satisfactory!).

## 4.3 Internet

The internet is increasingly seen as the **preferred source for written information**. One perceived advantage is that the internet is particularly suited to providing up-to-date information. Whereas a printed report cannot be updated, there is hope and expectation that material on the internet will be edited regularly if current data are relevant to its subject. A second perceived advantage is that it provides an efficient means of providing wide access to information, because its reach can be seen increasingly as the whole community.

Importantly, we found that amongst research participants the internet is more than just a competitor channel to personal contact and maps. In its own right, it is expanding these other channels.

The internet is thus seen to provide increased opportunities for personal contact. Emails and emailed newsletters are important sources of personal contact, and websites providing natural resources information are expected to permit, and even encourage, personal contact from concerned individuals.

Similarly, the internet is seen as a useful means to find and order the map you want. The internet is not seen as a direct means for the provision of maps because, as mentioned above, a normal printer would not be able to deliver either sufficient resolution or size. Web-based GIS was not mentioned spontaneously, but when raised, some express additional technology-based doubts about its usability. It is thought that current computers and internet connections would simply not be up to the task.

There is also a recognition that the internet is not yet a mature communication channel, and that it is therefore continually improving. All research participants remain open to new developments, though few have the time and inclination to assiduously search them out. This entails the perhaps surprising consequence that an innovative internet service in the natural resources area has to be sold quite aggressively to gain wide acceptance.

Consistent with the newness of the internet, research participants expressed a number of concerns about this information channel.

First, there is a concern about information reliability. This leads many information users to favour only 'reputable' sites. Community-generated sites are subject to the greatest scrutiny. Even though government sites are held to include propaganda, they are still found to be the most dependable.

"I trust government websites more because there is a screening process involved"  
(council planner)

Also related to this concern is a tendency to rely on site recommendations from trusted people in the natural resources sector. A recommendation acts as a vetting procedure, which is important to ensure a level of reliability.

Second, there is a concern about information overload, and the time taken (or wasted as the case may be) sifting through an internet search. Many research participants deliberately avoid broad searches for this reason.

“The internet can be a black hole if you were to simply scan for information”  
(state policy maker)

Therefore, the first experience of a site needs to be positive in order to earn a repeat visit. Sites offering cutting-edge information products and services need to be up-front if something is not quite fully developed, so that the site is not prematurely ruled out.

Third, there is a concern about missing important information. In part, this is due to not knowing what information there is in general, as well as not knowing how much of it is available on the internet. This leads many to fear that what can be found on the internet is only part of what should be available, though often research participants had little idea what might be missing.

“I don’t even know what I don’t know” (amateur environmental leader)

To some, it can seem that you must know what information is available in order to find it! There may be a report, for example from a neighbouring council, which might be of great use. Not knowing that such information exists, or where it exists, is a major source of frustration.

This concern about missing important information is also due to a belief that with the increasing role for the internet, what is not on the internet can sink without trace. Research participants feel that whereas some information is available on the internet, the rest is lost in someone’s filing cabinet, and they are not confident that the information they need is definitely in the former category. This is particularly true if the information has a narrow geographic focus.

Further, some research participants said that, whereas in the past there might have been several reports available to the public, today what is instead available on the internet is often limited to

extracts or summaries. This comment came especially from research participants outside the public sector who wish to read publicly available information.

“They’re actually producing less information ... we’ve gone from having volumes of information to limited information on the web which is quite hard to go through” (community educator)

It is as if the wider reach of the internet has caused some providers to restrict the depth of information. In other words, providing shallow information for all has occurred at the expense of providing deep information for those who need it most.

On occasion, the decision not to put material up on the internet may be warranted, in order to manage the dissemination of sensitive material. However, research participants feel that for those who had legitimate reason to access such material, it can be more difficult than it used to be to gain that access. For example, a local council may put more energy and resources into providing limited natural resources information on the internet than it does into implementing a protocol for legitimate access to sensitive material.

## Differences between audiences

### 5.1 Professionals

Across all the job categories we covered, professionals in the natural resources sector are surprisingly consistent with respect to natural resources information. They are all heavy users of a wide range of information. All of them **require** information about natural resources and all of them **provide** information about natural resources. The information they need tends to be specialised. Professionals are particularly wary about the veracity of the information they use due to the fact that it is part of their job that such information is put to the test, whether in the course of a planning decision, a court case, or peer-review for publication.

“Information is extremely important ... for example, when you’re going to court - you really want that information to be correct” (environmental consultant)

Eureka found that the information needs of professionals are currently being adequately met: they are getting what they need to do their jobs. There is no overwhelming demand for a better source or channel of information. Even so, and without exception, professionals in the natural resources sector readily acknowledge that the current situation is sub-optimal. Hence they are open to innovative solutions (which are expected to be based on technology improvements). However, to change their ways, professionals must be presented with proof of the benefits of a new information source. These professionals are extremely time-poor so there is little inclination to go exploring for, and experimenting with, new information sources.

As mentioned, professionals feel satisfied with the quality and quantity of information obtained through personal contact. Many professionals prefer personal contact for information gathering because it is so time-effective, given that they tend to have good existing networks of contacts who are experts in their various areas of interest. In turn, consulting colleagues further builds up and strengthens these important professional relationships.

A few professionals complain that, while a report or important information is available via the internet, it is often not available in complete form. They also complain that information available on the internet is often too general for their needs.

## **5.2 Amateur environmental leaders and students**

These two groups of non-professionals are considered together because of their many similarities in relation to natural resources information.

Like professionals, amateur environmental leaders and students proved to be heavy users of a wide range of natural resources information. Unlike professionals, however, their information needs are **not** being met via existing channels.

Amateur environmental leaders and students feel very frustrated at being out of the professional information-loop. They lament not being able to cultivate the network of personal contacts available to professionals, complaining that they are not able to access resources available to professionals 'on the ground'. Amateur environmental leaders feel isolated in what they are doing on a day-to-day basis. They are often aware that they are 'reinventing the wheel', in that they are likely to be re-doing what someone similar to them has already done, and possibly wasting time figuring out how to do their job.

Students feel held back from what they really should be doing. They see their course as like an apprenticeship in which they have no experience with at least some of the tools of their trade. They feel that the information they need while studying will only become available to them once they have finished studying. This situation is seen to be a lost opportunity. Students also recognise that there is a certain guarding of intellectual property amongst natural resources experts, which works against wide dissemination.

Amateur environmental leaders and students have an unmet demand for a better source or channel of information.

## **5.3 Outdoor enthusiasts**

Outdoor enthusiasts were the only group in the research drawn from the general public and so represent a more mainstream audience. It was found that their recreation interests did create a

need for natural resources information. However, while outdoor enthusiasts were found to be involved users of natural resources information, their information usage is fairly light. Their information needs tend to be immediate, concentrated and one-off. For example, an outdoor enthusiast planning to go bushwalking on the weekend would likely want information on camping facilities, weather forecasts and the like. Outdoor enthusiasts are experience-seekers rather than information-seekers. They do only as much desk research as is necessary to yield the desired experience. They do not use the internet a great deal in pursuing their interest. Instead, they rely most on word-of-mouth tips though they also enjoy the challenge of trying to obtain information from standard topographic maps.

Outdoor enthusiasts are surprisingly unreceptive to detailed information, almost to the point where it becomes an issue of bravado.

“I’m not trying to learn about it - just take it as it comes - hope you’ll see something unusual” (outdoor enthusiast)

Outdoor enthusiasts are most interested in pursuing their preferred activity in a purely experiential sense, and tend not to be interested in exactly **what** it was they see whilst bushwalking/camping/skiing. Some admit to being interested, but not to the extent that they would research it when they got home.

Outdoor enthusiasts are also wary of shared information and sharing information. They feel that by sharing the information that “this is the place to visit”, the area will lose its charm and be overrun. So they do not trust such claims, and do not want to share their own secret locations.

## **5.4 Amateur in-the-field members of environmental groups**

While amateur in-the-field members of environmental groups were not directly sampled in this research, we did learn about them from discussions with the leaders of these environmental groups as well as to professionals who had involvement with them (particularly council bushland managers and community educators). Based on these sources, we believe that amateur in-the-field members of environmental groups share with outdoor enthusiasts their preference for experience-seeking rather than information-seeking. We consistently received the message that

these in-the-field members have a keen interest in protecting the environment, and want to be proactive in this area. Their focus is on **getting their hands dirty**, on feeling that they are **doing** something for a worthy cause.

For those who do not aspire to join the leadership of such groups, detailed natural resources information is of peripheral interest. However, they do have information needs. They desire information that will enrich their experience. Most importantly, they desire very concrete training in what they do. This would include interpreted data such as case-studies from which they can learn.

## Information providers

In this section we describe research participants' opinions of six key natural resources information providers who all supply information to CANRI. Many of the comments focus on the websites of these organisations, which are found to be the most obvious and fruitful source of information.

### 6.1 Environment Australia

Research participants generally praise the information provided by Environment Australia (EA). EA's website is seen as the best government site on natural resources. Particular praise is given for the breadth of available information and the simplicity in cataloguing. The system of colour coding information along the lines of 'marine = dark blue', 'soil =brown' etc seems intuitive, and improves the accessibility and navigability of the site.

“To make recommendations look at the EA site and see how nice it is ... in comparison to others” (researcher)

The breadth of available information is seen to be very good, and a couple of research participants made positive mention of the Environmental Resources Information Network (ERIN) feature of the website.

The Federal State of the Environment Report is used regularly by many research participants, and viewed as a benchmark of best practice.

There is an acknowledgement by several research participants that the Environment Australia “could afford to be good”, largely due to greater funding and the number of staff available to improve the service.

## 6.2 NSW Environment Protection Authority

There is a tendency amongst some research participants to typecast the NSW Environment Protection Authority (EPA) as a ‘regulator’. Regulating pollution and rubbish is the ‘first to mind’ impression of what the EPA does.

However, those who utilise the EPA’s information on a regular basis were keen to acknowledge that it provides a much more extensive range of information than the ‘regulator’ tag might suggest.

“Well-researched, detailed” (amateur environmental leader)

Some research participants praised the EPA for the State of the Environment reports for NSW state and local governments. Some also commended its education initiatives.

## 6.3 NPWS

Research participants made mention of NPWS’s pamphlets, the Wildlife Atlas and the website. The pamphlets received praise as a simple resource available to all members of the community. The Wildlife Atlas is viewed as an indispensable resource, and the paper version is used more often than the online version.

According to all four groups of research participants, the NPWS website is excellent at providing up-to-date information on park conditions and facilities. Such information is highly appreciated by all users of natural resources information, whether the information is used in their work, the pursuing of their interest, their study or their recreation. (For example, a researcher may wish to know whether they can conduct field-work in a particular national park.)

The Threatened Species determinations are referred to by many of those with a relevant interest, professional or amateur. The determinations available on the website are praised for always being up-to-date. However, some people suggest that a better and more proactive strategy would be for the Threatened Species Unit to email its circulars to interested professionals. This would allow them to know about a new listing - without having to constantly check the website.

Much of the rest of the website is seen as aimed at the general public, where it is held to be good at what it does. It is particularly useful for the outdoor enthusiasts, but even they would like the

site to be more interactive. For example, one can find out about tours offered online, but then one still needs to ring to book. The professionals, students and amateur environmental leaders think some of the general information is pitched too low to interest them. Many amateur environmental leaders desire more detailed information at the national park level, such as details on particular flora and fauna. A few commented that it was difficult to navigate through the generalist information to the scientific reports. To combat this, the site could funnel to the specific in a more consistent manner (though some research participants suggested that one front-end for the general public and a different front-end for others would be more appropriate.)

## **6.4 NSW Department of Land and Water Conservation**

The NSW Department of Land and Water Conservation (DLWC) does not appear on the radar of quite a few users of natural resources information simply because they are unsure of DLWC's role in the natural resources sector, particularly in the urban context.

Amongst those who did use DLWC, some made positive mention of the pamphlets available from the Information Centre at Bridge Street. Others use the website to obtain relevant information such as:

- guidelines for natural resources management such as catchment blueprints, vegetation plans and water sharing plans;
- monitoring data such as salinity data, river height and flow information; and
- information on available grants and funding from DWLC.

Those who use such information are generally happy with the quality of information and the way it is presented on the website. Those involved in planning also use DLWC's information regularly, and appreciate its forward planning orientation. Some research participants praised spontaneously the mapping capabilities available on the website, particularly for vegetation.

## **6.5 Australian Museum**

Research participants enjoyed the simple, clear explanations provided on the Australian Museum website. A few research participants said they would like other organisations to adopt a similarly

uncluttered approach to providing information. Community educators were particularly pleased with the site's simple explanations and easy-to-follow information aimed at students.

Aside from the website, some complained that the Museum tended to charge too much for some information (such as in-house publications and copyrighted photographs), and that cost prevented them from using the Museum's information as frequently as they would otherwise.

## **6.6 Royal Botanical Gardens, Sydney**

The Royal Botanical Gardens, Sydney (RBG) is seen as a repository of invaluable raw data, but many are frustrated that this information is not available on the internet. Those who complained do not want to blame the Garden's staff, who they see as dedicated to the job. Rather, the problem is seen to be one of funding.

“They have a lot of information that should be online” (researcher)

“They're passionate - they try to generate love and interest in plants” (amateur environmental leader)

Those interested in flora visit the physical gardens regularly, which are seen as useful for exploring issues on a practical level. Students spoke about visiting the Gardens regularly and they find the staff most helpful.

## CANRI

In this section, we report findings on CANRI under the following headings:

- awareness of CANRI;
- reaction to the CANRI concept;
- reaction to the CANRI brand-name;
- reaction to the CANRI website; and
- additions to CANRI.

Before doing so, we need to present one global finding. The awareness of CANRI amongst outdoor enthusiasts is virtually nil and their reaction to CANRI is generally benign indifference. They are quite content that such information is available on the internet but they have little personal interest in it themselves. Their interest in CANRI is not appreciably greater than that of average members of the general public and so they are of secondary interest to CANRI, at least for the duration of its development within the present configuration. While it is possible to design specific information services for outdoor enthusiasts, that would be a fundamentally different endeavour, both from current CANRI projects and from the suggested additions discussed in Section 7.5. Consequently, they will not be referred to in the remainder of this section.

### 7.1 Awareness of CANRI

Awareness of CANRI is exceedingly low among the remaining three groups of participants: professionals; amateur environmental leaders; and students. Indeed, only a few of the professionals and a few of the amateur environmental leaders were aware of CANRI. Professionals working within government (policy-makers and council staff) are more likely than

others to have heard of CANRI, sometimes because they were responsible for contributing data. None of the research participants from the academic community, researchers and students alike, knew of CANRI which is particularly surprising given their high levels of internet usage. Some even expressed a level of embarrassment on admitting their ignorance of it.

“It’s terrible that we haven’t heard of it” (student)

“I’m actually quite surprised that I haven’t hear of this site - disappointing that I’m not aware of this site” (amateur environmental leader)

Clearly, CANRI needs more promotion amongst these groups of potential users.

“Why hasn’t it been publicised?” (researcher)

“It would be good if the word can get out into the community - so they are aware of it” (amateur environmental leader)

Most research participants felt that they would be most likely to hear about a new development such as CANRI through personal recommendation. Given our finding that professionals rely heavily on their strong networks of contacts and colleagues, and given that the community of such professionals in NSW is relatively concentrated, there is potential to gain access to many new users via this method. Forums for promotion include conferences of natural resources professionals and existing online communities of interested individuals. Relevant university departments represent another fertile source for promotion as university researchers are important contacts for current professionals and, even more so, for the students who will soon become professionals. Amateur environmental leaders will be harder to contact through personal networks as many of them are ‘out-of-the-loop’, but some success can be achieved through umbrella organisations such as the Nature Conservation Council of NSW, Landcare and WIRES to name a few. Another fruitful method for contacting amateur environmental leaders is via those professionals who have close contact with amateur environmental groups, such as some community educators and council bushland managers.

The low level of awareness of CANRI does not entail that very few had used information services provided by CANRI. Many have used services provided by CANRI but accessed from the websites of other agencies (such as the Wildlife Atlas). There is generally no recognition that

CANRI is involved in the provision of these services. This explains the strange situation in which many more people currently use CANRI than are aware of CANRI!

The fact that so many had not heard of CANRI indicates that these agencies are not advertising the CANRI branding prominently enough for even regular users to notice. More prominent CANRI branding, together with links to the homepage, would be an effective means of promoting CANRI. It would build awareness and increase the number of visits to the site. CANRI could then be seen as building on its current successes rather than starting from scratch.

(As discussed below, there are strong reasons to suggest that it would be preferable if the branding presence included more than just the acronym and logo, and better still if it included more than the acronym, logo, full name and motto. What is really needed is a short user-focused description of what CANRI aims to do.)

## **7.2 Reaction to the CANRI concept**

The reaction to the concept of CANRI is very positive. CANRI is seen as offering a unique service to users of natural resources information in NSW. Many are so positive about the concept that they are disappointed, in fact 'hurt' to admit that they were unaware of its existence. The majority of research participants are excited about the possibilities CANRI offers and feel it provides a service relevant to them. The list of participating agencies impresses them, and they see CANRI as a valuable addition to their decision-making tools. Research participants are keen on the ability to tailor information down to the local and regional level. They also see CANRI as a means of encouraging best-practice in the natural resources sector by comparing what people are doing across similar fields of study or across similar geographic locations. Research participants are positive about the inclusion of data from community groups, but worry about the reliability of such data, and hope that such data provided by CANRI would have been checked in some form or other.

The motto of the 'power of shared information' holds strong appeal with all research participants. There is a strong appreciation for the need for better integration of information. While integration across government and non-government sources would be useful, the most glaring issue is thought to be the difficulties integrating information across government agencies. CANRI is seen as a means of avoiding the territorial disputes which have arisen in the natural resources sector (though others noted that CANRI itself would need to have overcome these

disputes before becoming successful). Those with some experience of CANRI feel it is already beginning to deliver the benefit of integration.

“I think CANRI has actually been a bit of a breakthrough for that ... has alleviated some of the fear” (state policy maker)

Indeed, many question why the integration of information should stop at the State level when the logic of integration calls out for an Australia-wide service: if this were to happen, CANRI might become a victim of its own success!. (This issue could be partially addressed by adding to the website an explanation of how CANRI does and does not fit in with Commonwealth Government initiatives and initiatives in the other states.)

Most research participants are quite aware of the difficulties of the task that CANRI is undertaking and are happy to make appropriate allowances. There is widespread recognition that the natural resources information is itself complex and that integrating information adds another layer of complexity. Research participants feel strongly that it would be counter-productive to over-simplify the information: one can't convey information simply if it is not simple information.

“It needs mapping, needs new technology – this makes it pretty cutting-edge stuff” (council planning officer)

CANRI's catalogue of metadata, the Natural Resources Data Directory, is praised as a means of retaining knowledge. Such a comprehensive online directory of all the information resources available within NSW is of real value to professionals, students and amateur environmental leaders alike.

“Pleased that it's there, I'm only sorry that I haven't found it before” (researcher)

“It'd be really nice, if you could just go in there ... search and it would bring up stuff from all the different government departments on one page” (student)

“Everything is sitting somewhere electronically - with careful vetting it has great potential” (researcher)

The Directory is seen as a means of reducing the problem of reports becoming inaccessible because of the difficulty finding out about their existence. Further, having an entry in the Directory is seen by those who had published their own work as a way of keeping that work in circulation.

“Very happy to have any of my reports for consulting to be available, I think that would be terrific” (researcher)

“I would love to put all our information up on the website” (community educator)

With regard to CANRI-facilitated data, such as the interactive atlases (the Natural Resources Atlas and the Coastal Atlas), there are equal measures of interest and scepticism. On one hand, research participants recognise the tremendous potential of overlaying mapped data. On the other hand, they raise doubts on a number of fronts. Those who have GIS applications in their workplace want to be assured that the CANRI application would be compatible so that, for example, CANRI-facilitated data could be loaded into their own applications. There is also some feeling that web-based GIS will promise more than it can deliver, that it is **next generation** (or in ‘beta’ to use a technical term). Further, it is believed that current computers and internet connections could not cope with the memory requirements of web-based GIS.

### **7.3 Reaction to the CANRI brand-name**

The reactions of participants to the brand-name or acronym CANRI were gauged at numerous points in the discussion: before describing the concept; after describing the concept; and after touring the website. However, it is best to discuss the findings here.

One reaction to the CANRI offering, which in part explains the low awareness, is that the brand-name is not memorable. It is generally felt that ‘CANRI’ is a poor acronym, because it holds no easily remembered association with the environment, or an everyday word (in the way that AABR does, pronounced like ‘arbour’ and standing for the Australian Association of Bush Regenerators).

“Not a very catchy name, but it sounds like an excellent idea” (student)

“Its acronym doesn’t help the situation” (researcher)

Apart from that, however, there are two misleading features of ‘Community Access to Natural Resources Information’ given the concept it is meant to describe. They are ‘Community Access’ and ‘Natural Resources Information’!

The use of ‘**Community Access**’ is misleading for numerous reasons:

- it can suggest that CANRI is for the general public rather than a more select audience;
- it can suggest that CANRI is focused on the community sector to the exclusion of the government sector; and
- it can thereby raise scepticism about the quality of the information if it is seen as community-focused because many doubt that community-generated information is audited or vetted sufficiently.

Critically, neither professionals nor students identify their needs as those of the community. There is an expectation that their information needs require a more scientific leaning.

The use of ‘**Natural Resources Information**’ is misleading because CANRI does not seem to cover all such information. For example, CANRI does not currently provide broad coverage of legislation and policy documents. Therefore, there is a danger of over-promising, of creating an expectation that remains unfulfilled, if the information provided by CANRI is not as all-encompassing as the brand-name might suggest.

These difficulties do not entail that the brand-name must be changed. But they do entail that CANRI must be alert to the misinterpretations which they engender, and act to mitigate them. For example, if possible, the credit to CANRI on the websites of partner agencies would involve something more than just the brand-name and logo which alone do not contain enough information to regularly earn a ‘click’. As discussed in the next section, what is really needed is a short user-focused description of what CANRI aims to do.

## **7.4 Reaction to the CANRI website**

Having discussed the CANRI concept, research participants were given a very brief tour of what is available on the website. Some research participants had a chance to test-drive the site on a

notebook computer. Others emailed comments once they had visited the site. At minimum, all were shown the homepage and the “About CANRI” page.

**A simple homepage**

While a homepage should be simple and straightforward, the CANRI homepage is considered too crowded and cluttered. When it comes to a homepage, most potential CANRI users feel that ‘less is more’. One should not be confronted with too many choices or too much information at this entry-level. Too much information just tends to get lost - and there is the real possibility that one might not be able to find the area they wanted in the first instance.

“I’d rather there was less - and you could click on it for more information”  
(community educator)

Given these users tend to be time-poor and rather sceptical, it is important that their early experiences of a new website are positive. It was widely acknowledged that the current CANRI homepage is too daunting for the first-time user. It needs to be simplified to avoid the possibility that a user may miss the information they are looking for.

One suggested improvement is that the information currently listed under the headings Land, Air, Water, etc. could instead be contained within pop-up menus (i.e., menus that appear when the cursor is stationary over the relevant heading), leaving the page less cluttered. This would also result in the homepage appearing in full on an average screen at an average resolution, thereby avoiding the need for scrolling which people regularly do not bother doing (i.e., if it does not appear automatically, it does not get read).

Another suggested improvement is that CANRI borrow the Environment Australia idea of using colour coding to distinguish between air, land, water and other areas.

A final suggestion which has wide appeal amongst research participants is the possibility of having a very simple homepage offering two levels of entry. This would include two options along the lines of ‘this is the first time I’ve used CANRI’ and ‘I am a regular CANRI user’. First time users could then be guided through the site with an introductory spiel on what CANRI hopes to achieve, and practical instructions on how best to use the site. Regular users might be encouraged to bookmark the index, so that they could skip this step. A less sweeping alternative

would be to have a prominent “I’m a first-time user” button on the homepage as a means of entry.

**An explanatory homepage**

Ideally, the user will understand quickly what the site has to offer them. If a homepage fails to ensure this, potential regular users may not bother to continue. Research participants feel strongly that the homepage does not adequately explain CANRI and its purpose which is doubly problematic given the misinterpretations which the brand-name can engender.

Most research participants claimed they were glad to have the concept explained to them, as a basic description of what the service provided was not readily available anywhere on the website. The DIY manual has some such information but is not written for the basic end-user. There is also scattered information to be found across various web pages, including the homepage, the “About CANRI” page, the “Get involved” page and the “CANRI Technology” page.

Further, while the homepage contains an index of “CANRI sites”, without an explanation people do not realise that they are being directed to CANRI-facilitated data on other websites. Instead, it comes across as a rather thin and unimpressive portal, inferior to the Environment entry in ServiceNSW (<http://www.nsw.gov.au/environment.asp>) which itself is far from optimal. If CANRI is to function as a portal, it needs to make clear what it is a portal to. Is CANRI a **competitor** to the Environment entry in ServiceNSW? Or is it the portal for **involved** users of natural resources information, or is it a portal to **spatial** natural resource information?

In sum, without a good explanation, CANRI will remain significantly undersold. What is needed is a carefully-worded and user-focused description of what CANRI aims to do, the first part of which should be on the homepage, functioning as a bit of a teaser, with further links for those who desire more information. The short description should aim to convey the following:

- what is meant by ‘Community Access’:
  - that CANRI encourages broad participation and consultation;
  - that CANRI includes, but is not limited to, data from community groups;
  - that CANRI is not just for community groups;
- what ‘Natural Resources Information’ is available on the website; and
- that information may be accessed and integrated with other information, thereby increasing its usefulness.

**Other website improvements**      The research process uncovered the following additional suggestions to improve the CANRI website.

Given the difficulties experienced by research participants in grasping how the CANRI website functions, a **user-focused manual** may be required (in addition to the explanation on the CANRI homepage with links to further orienting information).

Another common complaint amongst those who had used the site is that it takes the user straight from a heading to a detailed dataset or map too quickly.

“CANRI’s homepage didn’t seem to provide much context - it just shot into sets of data ... how would you know which dataset you wanted?” (state policy maker)

What is needed is an **adequate description of each dataset**. Without them, it can be difficult to decide which information is most relevant. It is particularly important to have descriptions that distinguish between files or datasets when they take a long time to download when chosen.

Thus, one possible improvement would be for a window to come up after one of the datasets on the homepage is chosen. This window would contain a description of the dataset and the option of either returning to the CANRI home page or being transferred to the dataset in question. An alternative approach would be to ensure that the page to which the user is transferred (whether provided by CANRI or a partner agency) begins with a description of the dataset.

On a related matter, users who delve deeper into the site are surprised and disappointed that there is not an **annotated index of the data layers available on the interactive atlases**.

Finally, it is worth emphasising that research participants are impressed by the option to subscribe to a monthly **CANRI newsletter**. This service is an important one in developing greater awareness of the service and allowing users to know about ongoing projects. It also chimes with the notion of ‘Community Access’, helping to create that community. The newsletter could be even more useful with a number of minor changes. Users appreciate the time saved by being able to scan through an email, and click on a hyperlink to the report in question having read a short description of it. The newsletter also needs to signal whether an entry is relevant to end-users or only certain specialists (such as data custodians of website developers).

## **7.5 Additions to CANRI**

Research participants were asked for suggestions about what else CANRI needed to provide to satisfy their needs for natural resources information. This inspired the following wish-list that merits consideration, whether these things are provided by CANRI or by some other government agency.

**Grant inventory** Many research participants would like to see a natural resources grant and application inventory. Many complained that they do not know about the relevant grants they could apply for, and often find out about available funding by chance rather than by design. In order to ensure the quality of the field applying for grants, research participants suggested that CANRI provide a central listing of available grants, with a brief description and the necessary dates and contact people. A list of current grants, their nature and who holds them, would also be appreciated.

**Online means of personal contact** Research participants are also very keen for CANRI to use various means to facilitate personal contact because they see the internet as more than just a data repository (however tailored or interactive it may be). They see potential for CANRI to provide online means of personal contact, of linking up individuals with a similar interest in natural resources. Some want the ability to initiate contact with someone in the field in which they were interested. This level of sharing of information is seen to be more

personal than just a system that allows reports and datasets to be available. The following suggestions were made to increase personal contact:

- a directory of news groups related to natural resources;
- an interactive map of all field work being conducted in a geographical area (whether by professionals or amateur groups), similar to that already in existence for Landcare;
- one means for community involvement and consultation (by posting comments on reports or providing feedback); and
- most ambitiously, the host of online communities of interest, which could provide the forum for the exchange of ideas.

The demand for a service to facilitate personal contact and improve personal networks is particularly strong amongst those non-professionals who desire to be part of the community of environmentally-minded individuals. Amateur environmental leaders and students alike want to know what others are doing ‘on the ground’.

**Host site** Some working in councils and amateur environmental groups feel that their organisations do not have access to a sophisticated enough website to host maps, datasets and reports. They see CANRI as potentially meeting this need.

“I’d like to direct some of the community’s enquires to the CANRI site” (council planner)

**Useful links** Research participants requested that CANRI provide a list of useful links for natural resources information so that they could obtain a complete picture or determine best practice. This list would include reference to information from competing perspectives from the private and community sectors. It would also include a ‘key to the Federal maze’: research participants noted that different departments or agencies had carriage of a particular subject matter in different states, and they would like a guide to allow them to compare how each state deals with a particular natural resources issue. It would also be helpful here to include an explanation of how CANRI does and does not fit in with Commonwealth Government initiatives and initiatives in the other states.



## Appendix A: Preliminary research

### A.1 Accessible environmental resources on the internet

In general, it has been difficult to source any similar initiatives to CANRI on the internet. What follows is a selection of the sites most similar to, or relevant to CANRI.

**Australian Resources** <http://www.erin.gov.au/sdd/erin/index.html>: The **Environmental Resources Information Network** (ERIN) is a service provided by Environment Australia which is useful to a range of researchers, including students, policy developers and decision makers. The system attempts to use the latest computing technology to provide access information on the Australian environment, and the analytical tools to interpret it. The site is quite similar to CANRI, in that it draws information from many sources - including maps, species distributions, documents and satellite imagery, and covers topics such as endangered species, drought and pollution.

[http://audit.ea.gov.au/ANRA/data/docs/national/Data\\_Community.html](http://audit.ea.gov.au/ANRA/data/docs/national/Data_Community.html): The **Australian Natural Resources Atlas and Data Library** (ANRA) is also provided by Environment Australia. It has published reports, maps available for ordering, summaries of assessment reports, and online information services that provide access to national and regional scale information products and data. The atlas gives the public access to information not previously available to them. Its content and coverage comes from data from agriculture, fisheries and forestry departments in Australia and from other agencies. The aim is to supplement the Australian Natural Resources Data Library with documentation and data from projects including the National Forest Inventory and the Agricultural Land Cover Change program. This will increase the value of the Australian Natural Resources Data Library to a wider range of users and Australia-wide collaborative programs such as the National Action Plan for Salinity and Water Quality.

<http://www.wrc.wa.gov.au/ribbons/data.html>: **Ribbons of Blue** is a program in Western Australia run by Waterwatch. This initiative allows school children to explore their water resources and learn about conservation, and for community organisations to monitor their local area and report their data and findings.

<http://www.nsw.gov.au/Environment.asp>: The **Environment entry in ServiceNSW** effectively acts as a portal to NSW government agency sites concerned with the environment. As previously mentioned in the report, CANRI developers should take note of this site in order to avoid unnecessary overlap. The environment section of this site displays a link to CANRI quite prominently.

**North American Federal Government** <http://www.usda.gov/>: The **US Department of Agriculture** has a resource section with links to conservation services.

[http://www.nrcan-rncan.gc.ca/inter/databases\\_e.html](http://www.nrcan-rncan.gc.ca/inter/databases_e.html): The **Canadian Department of Natural Resources** has a good site, including a database library of publications called GEOSCAN.

<http://geoconnections.org/english/index.html>: Part of the Canadian government site, 'GeoConnections' is a scheme which runs with **Canadian Geospatial Data Infrastructure**. This site contains data sets accessible via internet, and utilises GIS technology. Online free data, including maps and imaging from a range of government agencies is accessible to the public.

**US State/ Local Government** Various US counties or states have their own internet resources available to the public. Some of these sites are more extensive than others, but many include maps for recreational as well as professional purposes. Local government, for example, water boards have quite a lot of information online. Most have links to community resources as well as federal agencies.

<http://www.wa.gov/dnr/htdocs/fr/nhp/refdesk/gis/nhp-metadata.html>: Washington State Department of Natural Resources is a good example of state-level natural resources information being available to the community via internet. The site includes a '**natural heritage GIS Metadata**' page.

<http://www.asgdc.state.ak.us/homehtml/pubaccess.html>: Alaska Department of Natural Resources similarly has initiative called **Public Access to Geographic Data**. There is a charge for this information (US\$150- \$600, depending on the information requested, for a CD ROM).

<http://www.state.me.us/dep/blwq/homepage.htm>: The **Maine** Government's internet site allows users useful information through their **Bureau of Land and Water**.

<http://ceres.ca.gov/>: The **Californian Environmental Resources Evaluation System** is an interesting government service, in that it attempts to offer interested parties filtered information on the State's natural resources. The site incorporates information from NGOs, educational institutions, state and federal government.

While some of the US state government sites contain accessible natural resources information, we have not come across a site with the same focus as CANRI on natural resources information tailored community-based local and regional environmental management.

**International Agencies** <http://www.fao.org/ag/guides/subject/p.htm>: The **UN Food and Agricultural Organization (FAO)** has a website of informative and detailed resources. There is a database on soil (including maps etc), livestock issues, information on genetically modified crops. AQUASTAT is an on-line database of statistics on freshwater availability in agriculture/rural development, with emphasis on irrigation and drainage, livestock geography. The reach of such a site is international, and yet contains data sets and geographic information specific to particular geographic areas

**Non-government Agencies** NGOs such as the **World Resources Institute** (<http://www.wri.org/>) have information for the purposes of allowing environmentalists relevant resources. However, the veracity of NGO information can at times be subjective according to the organisation's focus.

Educational institutions have varying amounts of available data on their internet sites, although it is generally less accessible to the public.

The **American Library Association** (<http://www.ala.org/acrl/resmar99.html>) has an extensive list of useful internet resources. This includes links to several sites which have GIS data.

## A.2 A review article on GIS

Carver, Evans, Kingston & Turton (2000)<sup>2</sup> pose an interesting argument about public access to GIS information. They argue that the use of GIS on the internet has great potential for popular involvement. This seems correct but Eureka's research suggests that we are only just beginning to harvest that potential. It is not as if there is an explicit demand for web-based GIS. That demand needs to be created and the 'early adopters' can be expected to be those who use natural resources information the most. Research participants from the 'general public' as such are generally not keen to use GIS. They tend to be more interested in using traditional maps.

## A.3 Previous social policy research

The **Performance Technologies Group** reports to NPWS (June 2001, July 2001) on the NPWS website includes some results relevant to the CANRI offering. The results of these qualitative studies suggested various ways in which the NPWS website could be improved. Most of these findings relate to general users, and so are not of direct relevance to a more involved audience. Given that the NPWS website was acknowledged by several research participants to be quite good for a general audience, it fulfils its purpose as such. Professional users in our research have noted their preference for more scientific and research-based information. This need is one that CANRI can seek to better provide for.

The **Hitech Marketing Services** report to ServiceNSW (2000) on the Environment entry (<http://www.nsw.gov.au/environment.asp>) has covered off some of the research groundwork. Some of Hitech's recommendations are echoed in Eureka's recommendations for providing a suitable portal for professionals wanting to access environmental information via the internet. Recommendations such as 'links which go beyond government are desired' is equally true of current and potential CANRI users. Also 'links to database information for community groups' was reiterated in the finding. This report also mentioned mapping and GIS facilities as an important resource for those wanting natural resources information, which Eureka's research confirms. Although, as mentioned previously, GIS is a resource of interest only to high-end users.

---

<sup>2</sup> Carver, S., Evans, E., Kingston, R. and Turton, I. Accessing Geographical Information Systems over the World Wide Web: Improving public participation in environmental decision-making. *Information Infrastructure and Policy*, 6, 157-170.

The present study grew out of the **Woolcott Research** report to NPWS (2002) and extends the insights found therein about the role of information. That report concluded that providing access to information was of great value to the most “keen and knowledgeable” segment of the general public. However, for the rest of the general public, the key task is one step back, providing motivation to seek out the information (which must then be presented in a manner relevant to their interests).

The Woolcott Research report focused on urban users’ understanding of the outdoors, gardens and their relationship with nature. Chapter eight ‘urban conservation within the broader range of environmental concerns’ illustrated a community-wide concern about the environment, but found that the vast majority of the general public tend not to be interested in the specifics of environmental management (even within their local area). This research provides strong support for Eureka’s conclusion that the general community with a passive interest in the environment are not within the primary target audience of CANRI, at least for the duration of its development within the present configuration.

## Appendix B: Discussion/interview guide

Do not reveal project sponsorship (if respondent is particularly concerned, say that it will be revealed in second half of interview/discussion)

### Introductions

- Groups – introduce group rules
- Respondents to introduce themselves and briefly describe their studies/position/interest(s)

### Natural resources ‘behaviours’

- Re-emphasise that respondents have been selected because of their relationship with natural resources

The naturally occurring components of the environment, including land, soil, water, flora, fauna, minerals and energy sources. Natural resources may also be the interactions between those things. Natural resources may have a direct economic value, such as fish or timber, or indirect value, such as the landscape amenity provided by forests. Resources may be renewable, non-renewable or continuous. (From the Sydney Harbour Catchment Blueprint April 2002, DLWC)

- Ask respondent(s) to describe the way information contributes to their studies/position/interest(s). Probe fully. Note: terminology used in subject area, behaviours, info sources etc
- Think about the term ‘information sources’ and how it relates to your studies/position/interest. What sources do you immediately think of? Explore
- (Probe on associated media used & preferred for the sources mentioned)
- (GROUPS: try to incorporate preferred terminology into discussion)

Natural resources information includes such things as water quality data, soils maps, soils descriptions, topographic maps, vegetation maps and vegetation descriptions, fauna distribution data, plant and animal identification keys, meteorological data, hydrological data, etc.

### Information preferences – general

Define purpose of research – how information does or can potentially assist research participants in (1) their studies (2) professional capacity or (3) pursuit of their interests

- EXERCISES [NOTEPAD (for groups), SENTENCE COMPLETION (for interviews)] – Emphasise that at this stage we’re talking about **general** information needs (i.e. will talk about specific info providers later)
  - (OUTDOOR ENTHUSIASTS) in thinking about information that relates to my outdoor activity, I think of...(LIST SOURCES)”
  - How important was that information to your activity?
  - (ALL) “My main frustration, when thinking about information that does/can assist me with my natural resources interests, is ...”

### **Information preferences – in detail**

- How often do you have the need to source information for your natural resources interest?
  - What happens following this ‘need arousal’? Probe fully. Go through a recent need experience. (Groups – probe for variance.)
- EXERCISES – **specific** sources of information/specific info providers
  - (ALL) “The first place I do/would go to for information on my natural resources interest is ...”
  - (ALL) “An information source, that COULD be relevant to me, but isn’t at present is ... This is because .....
  - **Information providers**
  - (ALL) “The information provided by (Environment Australia, NSW EPA, NPWS, Dept. Land and Water Conservation, Australian Museum, Royal Botanical Gardens) is (likely to be) ADJECTIVE. The main reason I feel this way is...”
- Discuss answers.
  - What makes an information source a ‘pleasure’ to go to/deal with/consult? Why? Explore in detail.
  - Any other sources a ‘pain’ to go to? Why? Explore in detail. What are the barriers which prevent information provision?
  - How do you decide whether an information source is trustworthy?
  - If their information practices are pretty much set, also ask about how they have dealt, or would deal, with a need for a new category of information, one out of their comfort zone. Probe in detail how they trawled their way to this information.

### **Channel issues**

- Discuss preferences on information search in broadest sense. Probe on phone, internet, white/yellow pages, mail and other channels
- internet – thinking about the internet- to what extent do you feel it is the ‘central’ information search vehicle? Probe reasons/barriers/drivers
  - To what extent does broad search (e.g. via google) take place versus direct access to source (e.g. repeat visitation via a browser bookmark)?
  - What does it take to get a site bookmarked? Probe fully.
  - What about for natural resources? Probe most recent natural resources bookmarking experience in detail? (Groups – probe for variance.)
- How do you find out about new sources of natural resources info? Probe.

- What happens following a successful search experience? Probe fully (e.g. extent of recommendation to others)
  - What about an unsuccessful search experience?
- Professionals and amateur environmental leaders:
- What do you think Community Access to Natural Resources Information Program (CANRI) is?
- What does the Community Access to Natural Resources Information Program (CANRI) mean to you? (Describe via one para summary if respondent is unaware)  
Discuss
  - What would a site like this need to be more attractive to you?
  - How do you feel about sharing/ pooling information on the internet?
  - Do you feel positive about the development of online communities of interest? (such as groups and individuals interested in conservation/ environment)
  - Do you have any concerns (e.g. privacy issues, potential plagiarism) about sharing information over the internet?
  - How much do you trust the reliability of information you have gathered from (reputable) internet sites?
- All others: Presentation of CANRI via test-drive / a one para description.  
NOTEPAD/SENTENCE COMPLETION EXERCISES “My initial reaction to CANRI is ...” “For CANRI to be relevant to me, it would need to ...”
  - What would a site like this need to be attractive to you? Explore in detail

### **Conclusion**

- Any thoughts on how the provision of natural resources information could be better?
- Thank and close