FUTURE DIRECTIONS FOR INTEGRATED CATCHMENT RESEARCH IN SOUTH WEST VICTORIA

REPORT & RECOMMENDATIONS TO GLENELG HOPKINS AND CORANGAMITE CATCHMENT MANAGEMENT AUTHORITIES

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SPONSORED BY:
ACKNOWLEDGMENTS

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Thank you to the enthusiastic participants, keynote speakers and working group facilitators at the Deakin University Workshop, who collectively made the day a success. They provided an excellent starting point in the struggle to harness research and investigation for integrated catchment management.

To the people who have and continue to contribute to the research and investigation database for South West Victoria, we greatly appreciate the time and effort they put into providing information. We will do our best to ensure the results of this work are beneficial.

To the individuals and agencies who provided feedback on an earlier draft of this report, thank you for the constructive advice and suggestions.

Finally, thanks to the National Action Plan for Salinity and Water Quality, the Glenelg Hopkins CMA and the Corangamite CMA, which jointly sponsored this project. Thank you in particular to Allan Bassett for bringing the resources and expertise of NAP to bear on the project, also to Gillian Holmes, who provided the initial project direction, and Janette Lowe, who kept the project alive after Gill’s departure from the Glenelg Hopkins CMA.

We hope this document captures the vision of those who have contributed and carries Research and Investigation forward in the region.
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EXECUTIVE SUMMARY

Professor Philip Hamilton, Deputy Chancellor Research at Deakin University, presented a keynote address at the Natural Resource Management Research Directions, Needs and Priorities in Southwest Victoria Workshop at Deakin University on June 6, 2002. In his presentation, Professor Hamilton told the tale of an individual searching for a lost wallet under a streetlight. Asked if the wallet was lost in that location, the individual answered: ‘No, but I can see what I’m doing here’. ‘Under the light’ natural resource management (NRM) research will no longer suffice. Research that is not an integral part of an integrated strategic NRM response will not be supported or funded.

This document reports on several components of a National Action Plan for Salinity and Water Quality (NAP) Foundation project to review research and investigation of relevance to catchment and natural resources management in South West Victoria. The project is sponsored by the Glenelg Hopkins CMA, Corangamite CMA and the National Action Plan for Salinity and Water Quality. The Glenelg Hopkins CMA is project manager on behalf of the partners.

Part A reports on the development of a Research and Investigation (R&I) Directory, the purpose of which is to collate summary information on all NRM R&I conducted in South West Victoria over the past 15 years.

Part B reports the proceedings of the Natural Resource Management Research Directions, Needs and Priorities in Southwest Victoria Workshop at Deakin University on June 6, 2002. The purpose of the workshop was to identify research directions, needs and priorities relating to NRM in South West Victoria. The workshop brought together key stakeholders, specifically – researchers involved in managing and conducting research, resource managers involved in implementing research findings and evaluating action plans, and land users and landowners with a history of involvement in research. This process of identifying research needs and priorities emphasised integrated, sustainable catchment management through partnerships with government, research agencies and the community. Research was favoured that is achievable, cost-effective and accessible and yields economic, social and environmental outcomes. Thirty-five programs were identified around eight key challenge areas. The programs, projects and priorities are by no means comprehensive and should be viewed as a snapshot of the views of the research community with interests in South West Victoria. The programs and projects, however, offer a preliminary guide to developing investment proposals for consideration by the CMAs or research funding agencies.

This foundation project has placed the Glenelg Hopkins CMA and Corangamite CMA in a sound position to plan investment in research and investigation in the short to medium term. However, the authors recommend two key strategic actions and six enabling actions to ensure the CMAs progress the research and investigation agenda in a co-ordinated and systematic way, add value to the works already completed and remain abreast of the research and investigation required for integrated catchment management.

Part C includes recommendations to manage the diverse, dynamic and increasingly complex R&I agenda in the Glenelg Hopkins and Corangamite catchment regions. These actions will complement existing processes, including the recommendations outlined in the Communications Strategy (2002-2007).
The two strategic recommendations are:

1. Appoint a Research & Investigation Co-ordinator
2. Establish a Research & Investigation Advisory Group.

The six enabling recommendations are:

1. Completion of the *Research and Investigation Directory*
2. Develop and maintain an online and ‘live’ *Research and Investigation Directory*.
3. Establish *Knowledge Reviews/Audits* for each Key Regional Challenge Area to be conducted on a recurrent 12-18 month basis.
4. Develop a *Research and Investigation Agenda* in consultation with stakeholders
5. Establish an *Interim Statement on Research & Investigation Principles & Protocols*
6. A statement on actioning workshop outcomes.
INTRODUCTION

Knowledge generated by research and investigation forms a basis for integrated natural resource and catchment management. In South West Victoria, a range of research projects, initiated by a multitude of research providers or management agencies, are underway or proposed. These research initiatives, the providers and sponsors form a complex research network that cuts across traditional agency responsibilities and needs.

The Glenelg Hopkins CMA and Corangamite CMA are emerging as key participants in this complex network of research. The CMAs are becoming pivotal as the Regional Catchment Strategies take shape, inter-agency relationships and responsibilities are clarified, and National Action Plan for Salinity and Water Quality (NAP) and National Heritage Trust (NHT) funds flow into the region.

This document reports on three components of a NAP Foundation project to review research and investigation of relevance to catchment and natural resources management in South West Victoria. The project is sponsored by the Glenelg Hopkins CMA, Corangamite CMA and the National Action Plan for Salinity and Water Quality. Glenelg Hopkins CMA is project manager on behalf of the partners. The broad aims of the review are to:

- Collate all research and investigation conducted in South West Victoria over the past 15 years
- Collate all management plans and strategies produced in the past 15 years
- Document key outcomes or results from the research and investment that may impact on possible changes in current best practice
- Identify future directions for research and investigation with needs and priorities identified for the next five years.

In this document, we report on three components of the review:

A. Research Directory Development
C. Recommendations for managing research and investigation to support catchment management in South West Victoria.

This report incorporates comments from workshop participants, invitees and other research stakeholders in response to a draft of the report circulated in August, 2002.
A. RESEARCH AND INVESTIGATION DIRECTORY

The purpose of the Research and Investigation Directory is to collate and précis information on all NRM research and investigation conducted in South West Victoria over the past 15 years. A comprehensive list of individuals, agencies and consultants who have been or are currently involved in research in the South West was developed. This list was generated in consultation with key research agency informants and supplemented by a thorough survey of research provider websites and library reports.

A series of letters were sent to the growing list of informants requesting information on natural resources management research initiatives and additional key informants. All individuals were followed up by telephone and, where possible, research reports were acquired. When time permitted, researchers were revisited in person to acquire reports and reference lists.

The responses were collated and the summarised information transferred to a custom designed database/directory. The database/directory includes the following fields for each research or investigation initiative:

- Title of research
- Completion and starting dates
- Status of research (in progress, incomplete, complete)
- Study location
- Description of research (aims and objectives)
- Research outcomes and proposed outcomes (less than 100 words)
- Recommendations for additional research or further investigation
- Knowledge gaps and research gaps
- Research resources
- Keywords
- Contact details for researchers
- Funding organisations
- Publication details

Two project officers commenced work at Glenelg Hopkins CMA in April, 2002, on the database/directory. During May and June 2002, the project officers assisted the Workshop Facilitator to organise and conduct the Research and Investigation Workshop at Deakin University. The project officers resumed work on the database/directory for part of July, 2002. The officers estimate the directory is 30% complete as of July 30, 2002.
On June 6, 2002, the Glenelg Hopkins CMA hosted a workshop to develop preliminary priorities for research and investigation in South West Victoria. Over 50 researchers and research stakeholders from throughout South West Victoria attended.

Workshop development and conduct

The format, style and conduct of the workshop was developed in consultation with key individuals identified by Glenelg Hopkins CMA and Corangamite CMA, this included individuals from the CMAs, Deakin University and the Department of Natural Resources and Environment. Those consulted are listed in Appendix 2.

Representatives from the CMAs, Department of Natural Resources and Environment, Cooperative Research Centres, Universities, research providers and Consultancy companies with research interests and expertise in South West Victoria were invited. Participants and the organisations they represented are listed in Appendix 3.

Eight key catchment and natural resource management challenges were developed for consideration at the workshop based on the draft Glenelg Hopkins Regional Catchment Strategy and advice received during pre-workshop planning. These included:

1. Protecting and enhancing biodiversity
2. Improving waterway health and water quality
3. Pest plants and animals
4. Improving soil health and reducing salinity
5. Achieving sustainable land use
6. Best management practices
7. Indigenous issues
8. Communications/education

Workshop participants were invited in advance of the workshop to join expert working groups to consider these key challenge areas. Materials for guiding participants were provided before the workshop and participants were asked to bring any maps, reports or other documents they considered important.

Each expert working group was required to complete four tasks at the workshop.

**Task 1.** Identify research needs.

**Task 2.** Select overarching programs of research that addressed these research needs. **Research programs** were defined as a concentration or cluster of linked or related research projects, which complemented and informed other activities of on-ground works, community capacity building, monitoring and evaluation.

**Task 3.** Identify the specific research projects that might comprise these research programs, (refer to Appendix 4). **Research projects** were defined as a discrete, research action or initiative with defined outcomes and outputs taking place in a defined period with dedicated funding. Projects may be large collaborative endeavours addressing most of a research program’s objectives or smaller discrete activities by specialist research groups. The CMAs are
moving toward the former, but recognised that a mix of research project sizes will be required to meet the objectives of the research program.

**Task 4.** Prioritise research programs and projects. Workshop participants were guided by a set of criteria for determining priorities, distilled from NAP, NHT, R&D agencies, Glenelg Hopkins CMA and Corangamite CMA priority setting processes. The guiding criteria were:

- Does it inform and add value to practice and on-ground works
- Is it integrated into the broader picture (catchment-wide strategies and operational plans)
- Is it achievable in terms of technical feasibility, resources available and the minimisation of risks
- Is it cost-effective
- Is it collaborative and involve partnerships with key stakeholders across disciplines and agencies
- Does it create and enhance regional structures
- Does it close knowledge gaps in ways that are accessible to all
- Does it contributes to the ‘triple bottom line’.

Appendix 5 encloses four documents circulated to invitees and group leaders: Advice to participants, the workshop program, workshop conduct and the guidelines for group leaders.

**Workshop outcomes – research programs and projects**

The current NRM context in which research and investigation occurs was provided in the keynote addresses by Professor Philip Hamilton, Deputy Chancellor Research at Deakin University, and Mr Ted Rowley, from AMRON Consulting and senior advisor to the Corangamite CMA.

The research programs, possible projects and priorities that are presented below are derived primarily from the workshop, with only minor paraphrasing, aggregation and reordering. Where priorities were not clearly expressed or expressed at multiple levels, clarification was provided by key CMA managers and some workshop leaders.

The workshop proceedings provide a snapshot of research and investigation required for integrated catchment management in South West Victoria. The outcomes of the workshop are not an exclusive, definitive or comprehensive list of research and investigation required for the region. It is important to remember the programs and possible projects reflect the perspectives of researchers involved in NRM research in South West Victoria who attended the workshop and, therefore, does not represent the definitive list of projects that could address current and future research needs. The programs and the projects identified in the proceedings, however, serve as a useful preliminary guide to developing research proposals for consideration by the CMAs (Refer to Enabling Action 6).

Programs and projects were rated high (H), medium (M) and low (L).
### CHALLENGE AREA – PROTECTING AND ENHANCING BIODIVERSITY

#### Program – Functional relationships between flora & fauna communities and ecosystem interactions.

**Projects**
- Identify the relationships among systems of wetlands and their surrounding environments.  
- Assess the value and ecological role of different types of wetlands.  
- Identify the species and communities of estuarine and marine wetlands.  
- Explain the relationships between different flora and fauna communities.  
- Identify and define the key functional relationships in ecosystems in South West Victoria.  
- Explain how natural communities vary over space and time.

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#### Program - The economic value of ecosystem services

**Projects**
- South West Victorian flora, fauna and ecosystems inventory.
  - Assess the population dynamics of keystone species in relation to ecological processes.  
  - Define and identify the long-term effects of fragmentation and change on different taxa, communities and biodiversity values.  
  - Assess and investigate the management of grasslands and grassy woodlands.  
  - Investigate the effects of different grazing regimes on flora and fauna species.

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#### Program – Habitat biota for ecosystem condition.

**Projects**
- Demonstrate and quantify ecological benefits for restoration activities.  
- Develop an index to enhance habitat for a broader range of biota.

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#### Program - Impacts of land use/habitat change on rural environments and biodiversity.

**Projects**
- Assess the effects of blue gum plantations on other environmental values.  
- Assess the effects of blue gums on salinity, wetland and habitat values.  
- Identify the residual and rotational effects of blue gums.  
- Identify and define the biodiversity value of blue gums, their value/s as habitat and values for connectivity. *  
- Investigate the optimum pattern of habitat and/or vegetation at landscape scale for continued biodiversity.  
- Develop adaptive management techniques for naturally productive systems.  
- Investigate the negative and/or positive effects of firewood harvesting (dead trees and fallen timber) on flora and fauna.  
- Investigate the negative and/or positive effects on species and/or populations effected by rock removal. *  

*Charles Sturt University, Northern Victoria, has undertaken a similar study.

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#### Program - Impacts and outcomes of landscape restoration and rehabilitation.

**Projects**
- Assess the ‘triple bottom line’ value of revegetation and restoration work for site, farm and landscape values. *  
- Investigate the relative benefits of revegetation v. regeneration in South West Victoria v. benign neglect. 

*Charles Sturt University, Northern Victoria, has undertaken a similar study.
## CHALLENGE AREA – WATERWAY HEALTH AND WATER QUALITY

<table>
<thead>
<tr>
<th>Program - Incremental value for investment in rehabilitation for river health.</th>
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<tr>
<td>Project</td>
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<tr>
<td>• Develop an index to assess the best threshold for rehabilitation for river health.</td>
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<tr>
<th>Program - Impacts of rural drainage on natural water bodies.</th>
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<td>Projects</td>
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<tr>
<td>• Understand and assess the impacts of rural drainage schemes on wetland and floodplain systems.</td>
<td>M</td>
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<tr>
<td>• Understand and assess the impacts of rural drainage discharge on river health.</td>
<td>H</td>
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<tr>
<td>• Invest and incorporate aspects of managing run-off from raised bed cropping.</td>
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<tr>
<th>Program – Water and pollutant transport processes</th>
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<tr>
<td>Projects</td>
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<tr>
<td>• Understand and assess pollutant and nutrient transport pathways between surface and groundwater systems.</td>
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<tr>
<th>Program – Impacts of land-use change</th>
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<td>Projects</td>
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<tr>
<td>• Model the impact of land-use change scenarios on the quality and quantity of surface and groundwater resources</td>
<td>H</td>
</tr>
<tr>
<td>• Model the scale, timeframe and impact of on-ground works on resource condition targets.</td>
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<tr>
<th>Program – Nutrient movement in the catchment</th>
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<td>Projects</td>
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<tr>
<td>• Further develop and support the current nutrient program on nutrient loss from pastures.</td>
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<tr>
<td>• Investigate the apparent increase in nutrient loads in Brucknell and Stony Creeks and the Crawford, Moyne and Merri Rivers.</td>
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<tr>
<td>• Investigate the impact of raised bed cropping on nutrient combinations.</td>
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<tr>
<td>• Investigate the impact of blue gum plantations on nutrient concentrations.</td>
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<tr>
<td>• Develop a greater understanding of the availability of nutrients to fuel algal growth.</td>
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<th>Program - Instream environmental flows.</th>
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<td>Projects</td>
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<tr>
<td>• Understand the relationships between flow and instream communities.</td>
<td>H</td>
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<tr>
<td>• Develop and implement a basis for instream environmental flow optimisation.</td>
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</tr>
<tr>
<td>• Demonstrate and quantify ecological benefits for instream environmental flow.</td>
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</table>
**CHALLENGE AREA – CONTROLLING PEST PLANTS AND ANIMALS**

Note: * These projects come with Very Important classification priority, indicating they ought to be conducted as soon as possible. More detailed explanation of projects meanings concerning pest plants and animals can be found in the detailed background information developed for the workshop.

**Program – Incorporation of pest management into NRM programs.**

**Project**
- Develop an understanding of pathways to acceptance and adoption of pest management as an integral component to all NRM programs.  

**Program – Environmentally friendly control options.**

**Project**
- Develop and assess improved pest models for environmental weeds and cost-benefit analysis (triple bottom line).

**Program – Management options for pests in ecosystems.**

**Projects**
- Develop and assess management options for weeds in riparian ecosystems impacted by high intensity grazing.
- Develop standard pest monitoring impact systems.
- Develop indicators for sentinel sites (indicator areas).
- Establish protocols and adoption methods for the integration of Best Management Practices (BMPs) in NRM.

**Program – Biological control for exotic & environmental weeds and vertebrate pests.**

**Projects**
- Develop biological control for willow, gorse, blackberry, bridal creeper and vertebræ pests.
- Implement biological control as part of a regional weed plan for Patterson’s curse, ragwort, gorse and thistle.
- Develop awareness, best management practice, eradication and biological control for *Stipoid spp* (unpalatable grass syndrome).

**CHALLENGE AREA – IMPROVING SOIL AND LANDSCAPE HEALTH AND REDUCING SALINITY**

**Program – Soil health and condition.**

**Projects**
- Develop a means to reduce the organic matter decline in South West Victoria by incorporating waste organic matter into soils in a sustainable manner.
- Compare the effects of stubble retention v. stubble burning on air quality, soil organic matter, physical soil characteristics, structure, chemical composition and productivity for major soil types in South West Victoria.
- Assess and explain the long-term effects of effluent application on soil properties on a range of soil types in South West Victoria.
- Assess and recommend new practices for the degree of degradation producing negative environmental and production effects.
- Develop a self-assessment method/s for soil capability, health and adoption of appropriate BMPs.
Program – Groundwater and surface water flow systems.
Projects
- Investigate the variability and the effects of flow regime on wetland functions.  
- Investigate and characterise the Western Dundas Tablelands groundwater flow system.  
- Investigate the effects of salinity transport, rates of change and storage on the Volcanic Plains.  
- Evaluate the change in surface water systems of the Volcanic Plains.  
- Further investigate the characterisation of regional groundwater flow systems.

Program – Management of saline sites.
Projects
- Investigate native and introduced species for productive use on saline areas.  
  - Develop new species  
  - Use existing species for animal production  
  - Investigate potential growth limitations.  
- Improve the techniques for the management of productive and/or biodiversity aspects of saline areas.  
  - Salt accumulation under vegetation  
  - Environmental impacts of saline agronomy.

Program – Management of assets other than agricultural land.
Projects
- Assess the susceptibility of assets to salinity.  
- Understand the nature of the landscape prior to European settlement.

Program - Infiltration/leaky systems and their implications for land use practice.
Projects
- Identify and map spatial and temporal variations of infiltration for the management of recharge, nutrient loss and acidification.  
- Quantify the impact of change/s in soil moisture storage on recharge and water quality.  
- Quantify the leakiness of different land uses (agricultural intensity, type of management).

Program – Knowledge of the assets at risk.
Projects
- Improve and expand the quality of agricultural land, water, infrastructure, environment and heritage asset information.  
- Identify and develop an inventory of soil assets: pedology, hydrology and hydrogeology.  
- Identify and map naturally high value (biodiversity) saline areas for protection.  
- Develop an opportunistic regional soils assessment, utilising gas pipeline trenching.
CHALLENGE AREA – SUSTAINABLE LAND USE

Note: This working group reported programs of research and stated the objectives of these programs. Specific projects were not provided.

<table>
<thead>
<tr>
<th>Program - Environmental impacts of land-use (H)</th>
<th>Program – People, communities and land-use (M)</th>
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<tr>
<td><strong>Objectives:</strong></td>
<td><strong>Objectives:</strong></td>
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<tr>
<td>• To identify, understand and monitor the impacts of land uses on environmental assets</td>
<td>To identify, understand and monitor</td>
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<td></td>
<td>1. The impact of land uses on people and communities (demographic, employment, economic viability, health)</td>
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<td>2. Community perceptions &amp; values of land uses</td>
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<th>Program – Hybrid land-use systems (M)</th>
<th>Program – Tracking land-use and its impacts (H)</th>
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<tr>
<td><strong>Objective:</strong></td>
<td><strong>Objectives:</strong></td>
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<tr>
<td>• To explore the ways hybrid land use systems (especially systems including perennial plants) can achieve multiple environmental, social and economic benefits.</td>
<td>1. To understand and monitor the social, economic and environmental factors that drive land-use change.</td>
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<td>2. To track land-use change</td>
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<td>3. To track the social, environmental and economic impacts of land use change (including establishing appropriate benchmarks).</td>
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<th>Program – Pathways to sustainability (M)</th>
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<td><strong>Objective:</strong></td>
<td><strong>Objectives:</strong></td>
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<tr>
<td>To explore mechanisms for planning and achieving sustainability. For example:</td>
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<tr>
<td>• Ways of evaluating the sustainability of various land uses and practices (using various economic, social and/or environmental measures)</td>
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<td>• Ways to reconcile competing economic, social and environmental factors to achieve sustainability</td>
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<tr>
<td>• Ways of reaching stakeholder agreement on pathways to sustainability &amp; securing stakeholder commitment to the pathways.</td>
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### CHALLENGE AREA - BEST MANAGEMENT PRACTICES

**Program – Continuous improvement of BMP systems.**

**Projects**
- Assess the uptake of BMP guidelines applied in South West Victoria.  
- Evaluate the effect of BMP implementation on ‘triple bottom line’ objectives in South West Victoria and review interrelationships between the effects of the BMP (footprints).  
- Understand the assumptions, purpose, basis and outcomes of BMPs.  
- Define and understand the areas of uncertainty (assumptions) in the effectiveness of management actions to direct future research.  
- Develop retrospective assumption testing of prior actions. Understand and assess the effectiveness of past management actions to encourage learning from past mistakes or for successes to be passed on.

### CHALLENGE AREA - INDIGENOUS INVOLVEMENT

The programs and projects identified here should be considered as draft recommendations to be discussed further and confirmed in consultation with Indigenous communities in South West Victoria.

**Program - Traditional knowledge skills and understandings in South West Victoria.**

**Projects**
- Evaluate and record indigenous jurisdiction in South West Victoria concerning traditional knowledge, skills and understandings, including the community processes to sanction the publication and use of such knowledge.  
- Explore and document how traditional knowledge, skills and understanding can be integrated into contemporary management arrangements of public lands, reserves and parks.

**Program – Indigenous people and Natural & Cultural Resource Management (NCRM)**

**Projects**
- Explore and document land-use agreements involving indigenous stakeholders and their relevance to South West Victorian contexts.  
- Explore and develop ways to foster and sustain indigenous involvement in NCRM at the level of policy, management and practice by reviewing experiences across Australia.  
- Develop and implement an audit of training for indigenous people in NCRM and analyse an investigation of the most appropriate training models for indigenous stakeholders.

**Program - Site investigation, protection and management strategies**

**Projects**
- Develop and maintain an audit of existing documentation of sites and protective regimes.  
- Develop archaeological surveys to find where gaps exist that, would include oral histories from relevant traditional owners.  
- Develop and explore different management options.
# CHALLENGE AREA – COMMUNICATION AND EDUCATION

## Program - Knowledge sharing networks and databases.

**Projects**

- Investigate and identify the gaps in different databases.  
- Identify and understand client segment values.  
- Develop and implement a cross curriculum natural resource management package.  
- Investigate and develop meaningful engagement program/s.  
- Develop and manage access methods to institutional and industry data  
- Investigate ways indigenous stakeholders can be involved in natural resource management.  
- Develop and implement the best support for community-based groups. e.g. Landcare, Land for Wildlife, Trust for Nature etc.  
- Develop specific understanding of urban and rural community values (attitudes and beliefs) towards NRM and their impacts on the environment.  
- Identify and evaluate ways communities can become involved in NRM.  
- Develop and manage effective community networks between key NRM stakeholders  
- Review the effectiveness of current existing NRM education programs.  
- Explain how short-term funding can achieve long-term outcomes.  
- Develop effective communication methods for the community and industry segments.  

*This project should be considered as a draft recommendation to be discussed further and confirmed in consultation with indigenous communities in South West Victoria.*

## Program – Community capacity to implement BMPs.

**Projects**

- Develop and survey communities for their ‘willingness to adopt’ techniques identified in subcatchments.  
- Explore and understand the barriers for adoption of BMPs.  
- Develop strategies to promote the uptake of BMPs.
C. RECOMMENDATIONS FOR ACHIEVING INTEGRATED CATCHMENT RESEARCH & INVESTIGATION

The report up to this point has focused on the Research and Data Directory and the proceedings of the Research and Investigation Workshop.

Workshop participants, researchers and research stakeholders reported that research and investigation needs and priorities were in a dynamic state – shifting as programs and projects were completed, as threats to assets took shape and as Federal, State and regional strategic directions were revised.

In addition, the Glenelg Hopkins CMA and Corangamite CMA are undergoing considerable growth and development across a wide range of activities, with research and investigation supporting these developments.

In this section the authors propose a number of mechanisms to achieve co-ordinated and strategic research that addressed the pressing and dynamic issues of the region.

Research and investigation management in the CMAs

The Glenelg Hopkins CMA and Corangamite CMA have engaged in an ongoing process of identifying and prioritising research and investigation. This process has included:

- The iterative, consultative processes to develop their Regional Catchment Strategies and Salinity, Nutrient, Native Vegetation, Weed Action and River Health Management Plans. These management plans were or are under review by expert technical committees, which consider the adequacy of current knowledge, research needs and priorities.
- The development of a directory of previous research and investigation conducted in South West Victoria over the past 15 years.
- A major workshop of 50 key representatives of the research community and stakeholders to confirm, extend, validate and prioritise research and investigation needs and directions.
- Research priorities are documented in the Regional Catchment Strategy and actioned through the Regional Investment Plan to provide a research and investigation response integrated across key challenge areas.

These activities place the Glenelg Hopkins CMA and Corangamite CMA in a sound position to plan investment in research and investigation in the short to medium term. However, the authors recommend **two key strategic actions** and **six enabling actions** to ensure the CMAs progress the research and investigation agenda in a co-ordinated and systematic way, add value to the works already completed and remain abreast of the research and investigation required for integrated catchment management.

Although presented with the Glenelg Hopkins CMA in mind, the actions proposed may be undertaken by the Glenelg Hopkins CMA and/or Corangamite CMA independently or in partnership. The authors believe, however, that the level of technical knowledge required, the research network complexity and the workload and level of partner agency integration needed to conduct the recommended tasks require a high level of resourcing and an organisational setting best achieved within individual CMAs.

We are confident the recommendations proposed in the report will greatly assist the CMAs. We believe that credible, relevant and achievable research will be advanced by the CMAs adopting the strategic and enabling recommendations of this report.
Key Strategic Actions

Research and investigation contributes to better management decisions and actions for integrated and adaptive catchment management. We believe creating a dedicated Research Co-ordinator position within a CMA, supported by a specialist Advisory Group is the best way to ensure research and investigation is strategically targeted, integrated, relevant and cost-effective.

Strategic Action 1 - Appoint a Research & Investigation Co-ordinator

The Research & Investigation Co-ordinator position should be at a senior level within the CMA corporate structure and is a pivotal recommendation in this report. The occupant should have appropriate academic and research qualifications and experience as a researcher and project manager. The role of the R & I co-ordinator would be that of knowledge manager, research broker and facilitator, who promotes and supports partnerships and collaboration, networks, cross institutional teams and co-funding of priority research. The role also would support and facilitate consultative processes and the exchange of knowledge between stakeholders.

The duties of the co-ordinator would include:

- Undertake the development of an R&I Advisory Group (see Key Strategic Action 2)
- Report to and liaise regularly on R&I matters with the CMA CEO and Program Managers
- Oversee and co-ordinate R&I projects and research project management staff
- Directly manage several key research projects.
- Manage a Knowledge Audit review process across key challenge areas/themes (see Enabling Action 3).
- Develop an R&I Agenda in consultation with stakeholders (see Enabling Action 4)
- Facilitate the input of landowners, agency managers and community to research projects.
- Liaise with research organisations, researchers and funding agencies, ‘brokering’ links, memorandums of understanding and research partnerships between institutions, researchers, key stakeholders and funding sources.
- Act as the point of contact regarding R&I and disseminate R&I information throughout the CMA, including the Board and Implementation Committees
- Facilitate and co-ordinate the development of major research initiatives and funding applications with research partners and key stakeholders.
- Ensure the 7 year rolling plans and actions under NAP are supported by strategic and cost-effective research and investigation
- Oversee the maintenance of the research directory of past and current research and investigation (see Enabling Action 2)
- Develop an interim set of R & I principles and protocols (Develop Enabling Action 5)
- Provide advice on research protocols and the planning, implementation and evaluation of R&I projects.
- Ensure R & I undertakings are not duplicated and their findings are widely accessible.

Strategic Action 2 - Establish a Research & Investigation Advisory Group

The Research & Investigation Advisory Group would draw together key individuals with knowledge and expertise in the research area representing the diversity of NRM fields. Membership of the advisory group and its specific functions are not prescribed in this report. We suggest the establishment and development of this group is best undertaken by the R & I Co-ordinator in conjunction with senior CMA staff and the CMA Board. This would occur as the R & I Co-ordinator role evolves. Our view, supported strongly by respondents to the draft report, is that the group should be small with the CMA represented by the R & I
Co-ordinator. As participation in this advisory group would be ‘core business’ for representatives of leading research agencies, costs to the CMA would be minimal.

The following are possible functions of the R & I Advisory Group:

- Advise the R&I Co-ordinator of emerging research initiatives, partnerships and funding opportunities.
- Provide policy advice through the R & I Co-ordinator, to the CMA CEO, Board and the Implementation Committees.
- Advise on aligning research and investigation with the Regional Catchment Strategy
- Advise on the presentation, communication and dissemination of research progress and outcomes to key stakeholders – working through existing communication and publicity staff and mechanisms.
- Advise on the ongoing priority setting process and review and recommend criteria for assessing research. The group would not determine priorities, rather it would support existing prioritisation mechanisms.
- Advise on developing, implementing and evaluating R&I proposals and applications
Recommended Enabling Actions

The following recommendations would be co-ordinated and managed by the R&I Co-ordinator to develop the ways which complement existing processes in the CMA, and support the communication objectives identified in the draft Communication Strategy (GHCMA, CS, 2002). The authors propose six enabling actions:

3. Establish routine Knowledge Reviews/Audits for each Key Regional Challenge Area.
4. Develop a Research & Investigation Agenda for each CMA.
6. A statement on actioning workshop outcomes.

Enabling Action 1 – Complete Research & Investigation Directory

The Research & Investigations Directory is 30% complete as at July 31, 2002. The authors recommend that this task be completed with a focus on research initiatives currently underway or undertaken recently. The authors estimate an additional 3 months full-time equivalent will be required to complete the directory.

Enabling Action 2 – Maintain a Live, Online Research & Investigation Directory

The Research & Investigation Directory will provide a précis of past and current research initiatives and their results. This task is well progressed and will become a sound resource for researchers and research stakeholders.

This task was originally to include a systematic analysis of the current state of NRM knowledge, identify its relevance to current NRM practices and identify where crucial knowledge gaps exist. The authors propose that this task not be completed as originally planned. The authors believe this is a sophisticated and ongoing task requiring a high level of technical and analytical skill. Significant investment in expert analysis would be required to conduct such a broad and in-depth review as originally proposed. The authors are of the firm view that these tasks are absolutely essential and propose an alternative to achieving these outcomes in Enabling Action 3.

In its current form the data directory is an excellent basis for developing an ongoing and ‘live’ directory of research and investigation across South West Victoria. It is crucial that steps be taken to ensure the directory is maintained and developed to its full potential. The authors propose:

- Developing a simple, user-friendly web-based interface that stores summary information on all current research/investigations in the Glenelg Hopkins CMA region (and logs completed projects). Researchers will input and edit the details of their research. The site will be part of the CMA web page, accessible and searchable by the public. Well developed models and web interfaces that perform this function already exist.
- Requiring all research or investigation projects funded, supported or co-ordinated through the CMAs to register and maintain their research project details on the directory, especially those sponsored by the National Action Plan for Salinity and Water Quality (NAP) and Natural Heritage Trust (NHT).
- The online directory will be the key stakeholder and general public reporting interface for NAP research and investigation projects. This would be easily achieved by a design, which enabled easy searching, listing, sorting and reporting of current and past NAP research projects.
• Appointing a project officer on a part-time basis to support the live directory (including editing online contributions and updates).

Enabling Action 3 - Undertake structured knowledge reviews or audits for each of the key challenge areas on a recurrent 12-18 month basis.

Throughout the authors engagement in this project, regional stakeholders have made it clear that the analysis of current knowledge, identification of gaps and development of priorities must be regularly revisited. The following recommendation suggests how to build a reliable program for assembling and analysing the best available knowledge to service integrated and adaptive catchment management. The recommendation also is a means for achieving a cost-effective, transparent and achievable regional framework for evaluation, monitoring and target setting that is sensitive to the needs of each major challenge area or theme.

The audit/review for each ‘challenge area’ or ‘theme’ would aim to:

• Be a rich, reliable and fully cross referenced resource accessible to all stakeholders in the region. It would be the key reference document for agencies generating extension, communication or public relations materials and thus bring a level of consistency to information dissemination and service delivery. It would be a key reference document for NRM officers and professionals working in the region.
• Be a partner document to the corresponding strategic or management plan and thus could be referred to as, for example, the ‘River Health Audit’ or the ‘Salinity Audit’.
• Assemble the key knowledge in a form ready for the efficient and regular revision of strategic and management plans by specialist/stakeholder committees. The authors estimate that greater than 50% of the investment in each strategy/management plan effectively goes toward the “knowledge audit task”.
• Be revised on a recurrent 12 or 18 month basis and timed to support the updating of key strategic/management plans prepared for the region.
• Provide the Evaluation, Monitoring and Target Setting Framework for each challenge area or theme. It would track progress toward resource condition targets, assess the contribution of management actions and on-ground works toward reaching targets, and provide expert commentary and recommendations regarding progress toward targets.
• Be a sound basis for reporting on regional outcomes to the state and federal agencies.

The audit/review for each ‘challenge area’ or ‘theme’ would involve:

• A systematic collation and analysis of the current state of knowledge. The format and methods used would follow an established national or state approach to auditing the state of the environment (or community), of which there are many examples.
• Assessment and verification by an independent review committee comprised of specialists in the key challenge area.
• The identification of all new contributions to the knowledge base since the last audit. This would ensure R&I providers and regional management agencies did not waste time and resources scoping or initiating research already conducted.
• A determination of the applicability of new knowledge generated since the last audit to current catchment and natural resource management practices.
• The identification of crucial knowledge gaps and presentation of a range of research and investigation pathways or options for addressing these gaps. The audit would not develop priorities for investment. However, it would provide a firm scientific basis for priority setting by existing committee and consultative processes used in the development of plans and
strategies. These prioritised options would streamline the routine task of revising the Research and Investigation Agenda (Enabling Action 4).

This recommendation requires a significant and recurrent commitment of regional resources and specialist expertise to produce the audits. The authors believe that this approach will ultimately prove efficient and cost-effective by aligning and eventually limiting the myriad of overlapping research, investigation and monitoring/reporting/evaluation initiatives across the region.

**Enabling Action 4 – Develop a Research & Investigation Agenda**

The authors recommend that the R&I Co-ordinator, in consultation with key stakeholders, develop a Research & Investigation Agenda that provides a robust and coherent blueprint for future investment in research and investigation.

The agenda would:

- Chart and prioritise future directions for research and investigation in each of the key challenge areas (as well as on a catchment scale).
- Outline a mix of research that contributes to the body of knowledge in the region through diligent and systematic academic enquiry, and investigations more targeted to answer specific questions in a specific timeframe.
- Be updated regularly and listed on the CMAs websites to provide stakeholders with ready access and clear guidance on the agreed regional research needs and priorities.

Materials generated by the initiative documented in this report provide a firm starting point for this task. The authors propose the R&I Co-ordinator build on the R&I Directory, the proceedings of the Workshop, and meaningful engagement with key regional stakeholders which began through the Regional Catchment Strategy consultations and continued through this current research and investigation initiative.

**Enabling Action 5 – Establish Interim Statement on Research & Investigation Principles and Protocols**

The authors recommend that the R & I Co-ordinator facilitate the development of a set of interim principles and protocols that address the role of research in integrated catchment management. These principles would provide guidance while the Research & Investigation Agenda is being developed. The authors recommend the following principles:

- Research & Investigation is a key component of integrated catchment management and operational planning
- Research & Investigation is an important component of community capacity building
- Research & Investigation involves partnerships with catchment stakeholders at the levels of planning, funding, implementation and evaluation
- Research & Investigation should contribute to multiple outcomes in cost-effective ways
- Research & Investigation should contribute knowledge, skills and understanding in ways that are accessible to all stakeholders
- Research & Investigation is a tool through which adaptive management will be actively pursued.

The protocols should identify CMA expectations in relation to developed projects including attention to stakeholder involvement, communications, reporting frequency and detail and identification of key research and learning outcomes.
Enabling Action 6 - Statement on actioning workshop outcomes

The outcomes of the workshop are not an exclusive and comprehensive list of research and investigation required for the region. Rather, they are an interim and partial guide. Additional works are required to develop a coherent and robust research agenda to which all stakeholders have contributed. The programs and the projects identified in the report do offer a useful guide for developing research proposals.

The outcomes of the workshop may be developed into investment proposals for the CMAs to evaluate for investment (using established prioritisation processes) in three ways:

1. As a major overarching program of research incorporating a number of sequenced linked projects
2. As part of a larger proposal or project that meets identified research needs and contributes directly to catchment management and on-ground works
3. As a discrete but significant research project in its own right.

Research initiatives may take the form of collaborative endeavours addressing most of a research program’s objectives (as per 1. & 2. above). Alternatively, projects may take the traditional form of smaller discrete activities by a specialist research group (as per 3. above). CMAs are moving toward the former, but recognise that a mix of research project sizes will still be required to meet the objectives of each research program.

Ultimately investment decisions require an assessment of the professional quality of particular projects. This demands a set of specific criteria that assesses project specific issues, such as the rigor of the research design, the competence of the researchers and the level of integration with other research initiatives.
CONCLUSION

This project has placed the Glenelg Hopkins CMA and Corangamite CMA in a sound position to plan, facilitate and broker investment in research and investigation in the short to medium term. Our knowledge and understanding is constantly being improved as programs and projects are completed, priorities for land use and resources change over time and Federal, State and regional NRM objectives undergo revision. CMAs are undergoing considerable growth and development across a wide area of activity. The authors commend the two key strategic actions and six enabling actions, to ensure that research and investigation goes forward in a co-ordinated and systematic way, adds value to the works already completed and remains abreast of the research and investigation required for integrated catchment management.
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### APPENDIX TWO

**PEOPLE CONSULTED ABOUT THE FORMAT, STYLE AND CONDUCT OF THE RESEARCH AND INVESTIGATION WORKSHOP.**

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APPENDIX THREE
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APPENDIX THREE  -  
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<td>Rutherford Research Institute Communication Co-ordinator, RUTHERGLEN</td>
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## APPENDIX FOUR - WORKSHOP PROFORMAS – TASK 1
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## APPENDIX FOUR - WORKSHOP PROFORMAS – TASK 2

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<tr>
<th>Program Name/Description</th>
<th>Objectives</th>
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## TASK 3 PROJECT OUTLINE

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| Links to other projects |  |

| Timeframe |  |

| Possible Researchers (Groups with expertise & interest) |  |

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<tr>
<th>PRIORITY TASKS</th>
<th>Contributes to Program</th>
<th>Dependence &amp; Sequence</th>
<th>Aspirational Goals vs. Achievability</th>
<th>Inform on Ground Work</th>
<th>OVERALL PRIORITY High, Medium or Low</th>
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<td>Additional Notes</td>
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APPENDIX FIVE – ADVICE TO PARTICIPANTS
A. Invitation to Research and Investigation Workshop

RESEARCH AND INVESTIGATION REVIEW
RESEARCH DIRECTIONS, NEEDS AND PRIORITIES IN SOUTH WEST VICTORIA

This letter is an invitation to the workshop on research priorities to be held at Deakin University Warrnambool campus on Thursday 6th June 2002 at 9am. This workshop forms the second phase of the research and investigation review, which aims to identify research directions, needs and priorities, relating to natural resource management in South West Victoria. The workshop will bring together representatives of key stakeholders, specifically: researchers involved in managing and conducting research; resource managers involved in implementing research findings and evaluating action plans; and land user and landowner representatives.

We also take this opportunity to thank you for your contribution you have made thus far to this project.

The development of the database of natural resource management research conducted or in progress in South West Victoria is well underway. We are mindful however of the breadth of the task and the time and effort involved in gathering and forwarding this data, so if our project officers can assist you in any way, please contacts us to make arrangements. Project Officer contacts are Sally Muston k.muston@ghcma.vic.gov.au (03) 5551 3326 or Samantha Greiner k.greiner@ghcma.vic.gov.au (03) 5551 3325.

We look forward to your participation in the workshop and would appreciate your advice regarding attendance by Friday May 24th.

The workshop details accompany this letter.

Colin Dunkley
Chief Executive Officer
Glenelg Hopkins CMA

Greg Wearne
Project Manager
Glenelg Hopkins CMA
APPENDIX FIVE –
B. WORKSHOP PROGRAM

RESEARCH DIRECTIONS,
NEEDS & PRIORITIES IN SOUTH WEST VICTORIA

WHEN: Thursday June 6 2002 9.00am to 5.00pm

WHERE: Deakin University Warrnambool Campus

PARTICIPANTS: Representatives of research managers, researchers, natural resource managers, land users and landowners.

OBJECTIVES:
• Review past and current research.
• Recommend future research directions and priorities.
• Identify high priority projects and provide information to assist concept proposal development

PROGRAM:
8.30 - 9.00 Registration
9.00 - 9.30 Welcome and Keynote address
9.30 - 10.30 Working group session 1
10.30 - 11.00 Morning tea (provided)
11.00 - 12.30 Working group session 2
12.30 - 1.30 Lunch (provided)
1.30 - 3.30 Working group session 3
3.30 - 4.00 Afternoon Tea (provided)
4.00 - 5.00 Review
APPENDIX FIVE –
C. WORKSHOP CONDUCT

At the workshop we plan to establish six working groups, with a facilitator and assistant from within each group, loosely aligned with the key challenge areas identified in the Glenelg Hopkins Catchment Management Authority’s Regional Catchment Strategy.

Our groupings are:

- WATERWAYS
- SOILS & SALINITY
- BIODIVERSITY
- PEST PLANTS & ANIMALS
- SUSTAINABLE LAND USE
- COMMUNICATION & EDUCATION

The groups will be working within a contextual framework that takes account of strategic, legislative, regulative and administrative priorities, set in a technical framework that maps the elements necessary for a systematic and integrated approach. The task of each group will be to:

- Identify gaps and needs in past and current research.
- Signal and prioritise research projects that attend these needs.
- For the potential projects given the highest priority, develop information to inform concept proposals. Information which suggests project objectives, linkages to current or past projects, lead agencies and principle researcher, essential and possible partners and collaborators, steering committees or reference groups details, risks and limitations, potential for post graduate student involvement, timelines and, possible funding sources.

We are aware that our groupings serve as an organising device and are somewhat arbitrary and that many research projects will contribute across the key challenge areas. So although we invite your participation in the area of your choice or as a floating participant use feel free to suggest a change in accord with your expertise and area of interest.
Guidelines for group leaders

The smooth functioning of the small expert working groups is the key to achieving some worthwhile outcomes from the workshop. Your role is to facilitate the deliberations of your working group and steer them toward several decisions.

The outcomes we seek from each expert working group are:

- A series of statements identifying where research is needed.
- Outlines of research programs that address one or more needs, with an indication of their relative priority (high/medium/low). By program we mean a research theme or a cluster of related projects that address a specific research need or needs.
- A list and brief outline of projects, which might make up each research program, with an indication of their relative priority (high/medium/low).

The four main tasks, which you will need to co-ordinate, are:

Task 1 - Identifying the areas in which research is needed

We are confident group members bring considerable knowledge and understanding about the gaps in research and what the current research needs are. We expect that participant’s particular view on needs and priorities will take account of the research needs and priorities as they are expressed in relevant national, state and regional strategic plans and documents as well as the broader research literature. We have asked participants to bring information from these sources in their area of interest and expertise. I suggest you document the breadth of research needs at this stage, even those that the group may ultimately consider a relatively low priority!

The challenge will be to keep the discussion focused on statements of need about the broad picture, as we know participants will have particular projects in mind. To use an example from the Soils and Salinity working group, a need may be: *identify a variety of productive species suited to regional climatic conditions that are tolerant of saline conditions.*

Task 2 – Outline the programs of research that address research needs

By program we mean a research theme or a concentration or cluster of related projects that address a particular research need or needs. An example of a program in the soils and salinity area may be the *Research Program on species for productive use on saline discharge sites.* If possible try and come up with a short and catchy title for each program. Try and develop a program to bring together those researchers and managers with a common interest under a sensible umbrella. Identify which need/s (identified in Task 1) it aims to address. If possible, limit the number of programs developed by your working group to between 5 and 10.
Task 3 – Elaborate the Research Programs by identifying types of projects

This is a technical mapping exercise that identifies the kinds of projects that might make up each program identified at stage 2. By project we mean a discrete, research action or initiative with defined outputs, taking place in a defined period. A project that may form part of the research program used as an example in stage 2 may be: *Evaluation of the productivity of native grasses under saline conditions at discharge sites in the Dundas East and West Tablelands.*

After discussion we feel our expectation of generating detailed information about specific projects to guide future concept proposals is too ambitious in the time available, so at this stage we aim to:

1. Identify the types of projects required for each of the research programs identified at stage 2;
2. Briefly outline the objectives of each project;
3. Show how the project is linked or sequenced with other projects;
4. Indicate the time the project may take and,
5. Signal the groups with the expertise and interest to undertake the project.

Task 4 – Determining Priority of Programs and Projects

The relative importance of each program in addressing the research needs for the region should be expressed as high, medium or low.

The relative importance of a research project is a more difficult issue. Does a project rank highly because there is urgency about its completion, because it neatly fills a need, because it is easily achievable and cost effective or because it contributes to the ‘triple bottom line’ – or it aligns with the characteristics funding agencies currently use to rank projects. There are many possible issues to consider in ranking the relative merit of projects.

In this workshop we are especially interested in the extent to which a project contributes to the program it serves (and thus helps address identified research needs). However in prioritising a particular project, we would also like you to consider the extent to which:

1. Other research projects are dependent on it.
2. The project informs practical action or on ground works.
3. The project balances aspirational goals with achievability.

Many of the factors usually considered in prioritising a project can only be assessed with a more substantial project or concept proposal. However, it is worth being mindful of the well-worn criteria used by funding agencies for determining the merit of research projects. Here is a distilled summary of criteria that are represented in the guidelines of some funding agencies (e.g. NAP, NHT, ARC, LWRDC, RIRRDC, CCMA & GHCMA)

- Informs practice and on ground works.
- Integrated into the broader picture (Catchment wide strategies and operational plans).
- Is achievable in terms of technical feasibility, resources available and the minimisation of risks.
- Is cost effective.
• Is collaborative and involves partnership with key stakeholders across disciplines and agencies.
• Creates and enhances regional structures.
• Closes knowledge gaps in ways that are accessible to all.
• Contributes to the ‘triple bottom line’.
• Value adds existing work.

The Brief Overview
As the day progresses John Sherwood, Greg Wearne and Adrian Volders will gather information from the working groups and provide the whole group with an overview in the final session.

After the workshop
Reporting on the outcomes of the workshop and the complementary task of collating research and investigation undertaken over the previous 15 years in South West Victoria is the responsibility of the project manager and the project team. A draft report on workshop outcomes is expected by the end of June 2002.

Please call Greg Wearne on (03) 5565 1899 if you would like to discuss your role any further.
APPENDIX SIX – RESPONSE TO FEEDBACK

RESPONSE TO FEEDBACK

Future Directions for Integrated Catchment Research in South West Victoria: Report & Recommendations to Glenelg Hopkins and Corangamite Catchment Management Auth

Greg Wearne
12th March, 2003

On 7th August 2002, a draft report was prepared on a research and investigation initiative funded through the National Action Plan for Salinity and Water Quality. The report was titled Future Directions for Integrated Catchment Research in South West Victoria. Three components of the initiative were addressed:

1. The status of a Research Data Directory
3. Recommendations for managing research and investigation to support catchment management in Southwest Victoria.

The draft report was circulated to all workshop invitees and the broader research community by the Glenelg Hopkins CMA. In this document, I provide comment on the feedback.

Twelve written responses were received. Most responses, including informal email and verbal feedback, were supportive and positive of the workshop process and offered constructive comments and advice. Almost all supported the development of a systematic, integrated and collaborative approach to research and investigation in South West Victoria.

Most of the written responses suggested minor amendments and additions to research programs and projects, offered advice on the two strategic actions proposed, particularly regarding the establishment of a Research and Investigation Advisory Group, and suggested minor amendments to the six enabling actions.

A small number of responses offered major criticism of the project, questioning the consultative process and raising the fear that yet again ‘top down’ approaches to decision-making diminished the authority and influence of ‘grass roots’ land owners and managers. The critique also suggested CMAs were overreaching their charter by extending their involvement in research, it’s conduct and management.

Our view is that these major criticisms arise from a misunderstanding of the current project scope and purpose, the intentions of the strategic and enabling actions and the manner in which these
actions connect with the wider operations of the CMAs. We are confident further emphasis and clarification in the report and the integration of constructive suggestions will address these concerns.

The major issues and suggestions identified by respondents are discussed under the following headings, with cross referencing to the changes made in the report. Some sections of the report have been rewritten to improve the clarity and elaborate certain points. The remaining suggestions were worked directly into the report during this rewriting process.

1. Specifying research projects and programs and their integration into the wider NRM knowledge base and management

Critical feedback, albeit from only a small number of respondents, about the scope of this project and failure to adequately acknowledge the commitment of CMAs to community involvement and consultation is a serious criticism. Accordingly, I reaffirm our understanding of the project’s intentions.

The principal aim of this report is to assist the CMAs to fulfil their roles more systematically and effectively through relevant research and investigation. The conduct and outcomes of this report do not in any way diminish or run counter to the responsibility of CMAs to consult with all key stakeholders in catchment and natural resources management.

The research projects and programs identified are a partial representation of the research community’s views about research required to support integrated catchment management and contribute to contemporary NRM policy, processes and practices at a regional level. The views of the research community captured in the workshop proceedings are a contribution to the CMAs’ core business of grounding catchment management in the needs, aspirations and priorities of key regional stakeholders. The CMAs can contribute to the ongoing process of grounding and integrating research in the life of the catchment community by:

- Focusing research on knowledge exchange, brokering, networking, partnership and facilitation involving all stakeholders.
- Emphasizing and actively supporting co-funding, cross institutional and multi-disciplinary research planning, conduct and management.
- Making a commitment to communication and collaboration that avoids duplication and negative competitive impulses.

We are confident the recommendations proposed in the report will greatly assist the CMAs with these important tasks. We argue that credible, relevant and achievable research will be advanced by the strategic and enabling recommendations proposed.

The terms in which research needs are expressed, the degree of specificity and the prioritizing process were raised as concerns by a number of respondents. The workshop outcomes and priorities assigned by workshop participants should be viewed as an interim and partial statement by part of the research community with interests in South West Victoria. The outcomes of the workshop are not the exclusive and comprehensive list of research and investigation required for the region. The programs and the projects identified in the report, however, offer a preliminary guide for developing research proposals for consideration by the CMAs. Refer especially to Enabling Action 6 - Statement on Actioning Workshop Outcomes.

The size, scope and expression of research programs and projects and their integration with other NRM initiatives at property, local community, regional and state level are not specified in this
report. Such specification will need to occur as research projects and programs are developed and refined for investment consideration. Final priorities will emerge as the Research Agenda (Enabling Action 4) is developed with stakeholders and fine-tuned through Federal, State and regional consultative and investment procedures.

Changes to the report

1. Additional projects submitted by individual respondents included in Appendix 7
2. Further elaboration of the status and appropriate use of the findings of the workshop and the justification for the strategic and enabling objectives at:
   • Page 12 - (Workshop Outcomes – Research Programs and Projects)
   • Page 21- (Recommendations for achieving integrated catchment research and investigation)
   • Page 28 –(Conclusion).

2. The role of the Research and Investigation Co-ordinator

The appointment of the Research and Investigation Coordinator is a pivotal recommendation of the report.

Some respondents were concerned that such a position meant the CMAs were moving to concentrate NRM research in the CMAs by taking on the conduct of research that is currently the province of research agencies and research consultants. They argued this would cast the CMAs in a competitive environment for research funds. This is not our intention and we believe this scenario need not eventuate. We stress the proposed role of the Research and Investigation Co-ordinator is that of knowledge manager, research broker and facilitator, who would promote and support partnerships and collaboration, networks, cross institutional teams and co-funding of high priority research. The role will support and facilitate consultative processes and the exchange of knowledge between all stakeholders in catchment and natural resources management, such as:

- Assisting landowners, managers and communities to contribute to the research process
- Facilitating the integration of R & I with catchment and natural resource management
- Ensuring research findings are widely accessible and not duplicated.

The proposed co-ordinator would have a ‘hands on’ approach to research and investigation and keep the CMAs in step with a national trend toward evidence-based natural resources management. The co-ordinator would have a research profile and may provide intellectual input on some projects. They would not be charged however with expanding the research capacity of the CMAs.

We envisage the Research and Investigation Co-ordinator would assume management and coordination of some CMA research projects currently managed by senior CMA staff and contracted project managers. We are suggesting that by aggregating some and linking other existing CMA research management functions through a dedicated co-ordinator, there will be an improvement in knowledge exchange and communication within the CMAs and between regional research providers. This will ensure that in a rapidly expanding catchment and natural resources management sector the ‘left hand knows what the right’ is doing. The benefits will accrue by freeing up CMA and research provider staff time and reducing the costs accrued through inter-project liaison by those commissioned to manage and conduct research.
Changes to the report

1. Amendment of the Research and Investigation Co-ordinator role to more strongly reflect the knowledge manager, broker and facilitation role (page 22).

3. The role and constitution of the Research and Investigation Advisory Group

We agree with the constructive comments of respondents that this action requires more consideration and consultation. We note the following points made by respondents:

1. A reference or advisory group needs to be smaller in number
2. CMA staff are over represented
3. Deciding which research agencies or researchers should be represented is difficult

Therefore we have modified this strategic action considerably. We propose to defer consideration of the structure and membership of this group to the Research and Investigation Co-ordinator, who, in consultation with senior CMA managers, would consider the most appropriate way of accessing regular advice from the research community as the R & I co-ordination role develops.

One respondent raised concerns about the cost of servicing an advisory group. In our view, this will be at minimal cost to the CMAs because participation in such a reference or advisory group by organisations involved in research would be part of their core business. We believe the challenges of integrating knowledge production with catchment and natural resource management in the years ahead are so substantial that this initiative will more than pay for itself through gains in the efficiency of regional agencies. The benefits accruing to regional agencies and research providers of providing in-kind support to this initiative will far outweigh the costs to those who participate.

Changes to the report

1. Revising Strategic Action 2, The Establishment of a Research and Investigation Group (page 22) by suggesting this become a development activity overseen by the R & I Co-ordinator

Thank you again to those who have contributed at the various stages of this project. I sincerely hope the *Future Directions for Integrated Catchment Research in South West Victoria* report and recommendations assist those individuals, community groups and agencies who wish to see research and investigation harnessed to our most pressing regional issues.
APPENDIX SEVEN – ADDITIONAL PROJECTS SUGGESTED IN FEEDBACK

Program - Soil and landscape health and condition and reducing salinity
- Investigate erosional processes and develop appropriate risk management strategies for minimising their impacts on the environment.
- Investigate opportunities for the restoration and rehabilitation of primary discharge sites as a means of managing saline sites.
- Improve on the delineation of salinity hazard within the landscapes of South West Victoria to better determine regions where investment should be targeted.

Program – Impacts of land-use change
- Investigate the relationship between agricultural practices and the increase in nitrate of the newer volcanics aquifer system

Program – Groundwater and surface flow systems
- Investigate the reason for the relatively high salinity in the Hopkins River
- Investigate the impact of increased groundwater usage on the status of lakes in Western Victoria.

Program – Hybrid land systems
- Investigate mixed perennial farming systems for agriculture on saline sites
- Investigate and demonstrate the benefits of mixed perennial plant and animal farming systems for sustainable land-use, salinity and groundwater control and biodiversity enhancement in the region.

Program – South West Victorian flora, fauna and ecosystems inventory
- Develop a user-friendly biodiversity condition assessment tool for private land managers to use across the region.

Program – Develop biological control for exotic and environmental weeds.
- Develop biocontrol strategies for African Boxthorn as a partnership project with CMAs, local government and DSE
## APPENDIX EIGHT - ABBREVIATIONS

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<td>BINPN</td>
<td>Ballarat Indigenous Native Plant Nursery</td>
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<td>BMPs</td>
<td>Best Management Practices</td>
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<td>Catchment Agricultural Services</td>
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<td>Catchment &amp; Water Division</td>
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<td>Centre for Environmental Stress &amp; Adaptation Research</td>
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<td>Centre for Land Protection Research</td>
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<td>Natural Cultural Resource Management</td>
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<td>Commonwealth Scientific and Industrial Research Organisation</td>
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<td>LINCS</td>
<td>Linear Network of Communal Space</td>
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<td>Nation Action Plan for Salinity and Water Quality</td>
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<td>South West</td>
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<tr>
<td>TAFE</td>
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