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Australian Case Studies of Integration in Natural Resource Management (NRM)

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Supplementary Issue

Australian Case Studies of Integration in Natural Resource Management (NRM)

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CONTENTS

Continued over page

SHORT ARTICLES:

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An Introduction to Australian Case Studies of Integration in Natural Resource Management (NRM)

*Gabriele Bammer, Catherine Mobbs, Ruth Lane, Steve Dovers and Allan Curtis**

The central concern for this supplementary issue of AJEM is integrative policy and practice in the natural resource management (NRM) domain in Australia. It is now conventional wisdom that good solutions to many of the problems facing us require that people work together in a whole system sense. There are many designed and natural 'experiments' in integration underway around Australia and internationally, with growing numbers of examples demonstrating that integration achieves better ways forward than a focus on isolated elements. But it is hard work, and integration rarely leads to neat optimal solutions. The papers in this supplementary issue are reflections on a variety of aspects of integration, demonstrating that integration is inherently messy and requires a highly involved process to deal with difficulties which emerge at all stages.

Dovers (2005) distinguishes five dimensions of integration in the resource and environment domain:

- why integrate (the purpose), including integration of ecological, social and economic factors, implementation of integrated policy and management, and integration of differing interests
- how to integrate (the methods)
- participation as integrative strategy
- issues of integrating across scales
- the different skills of different groups that can assist with integration.

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One way of categorising the papers in this supplementary issue is to apply Dovers' (2005) dimensions to examine the aspects of integration highlighted in the papers. Michael Lockwood *(Integration of Natural Area Values: Conceptual Foundations and Methodological Approaches)* goes to the heart of one of the thorniest issues, namely the integration of values formed by different ecological, social and economic imperatives. His framework provides a systematic structured way of thinking about values and the available methods for reconciliation that are possible. He shows that while there are multiple research, decision-support and participatory methods, none are uncontested or universally applicable.

Nicole Hodgson and colleagues *(The WA Collaboration: Facilitating Integration of Sustainability Issues in a Community and Civil Society Context)* examine the integration of different interests using participation as an integrative strategy. These aspects are also highlighted in the short paper by Lewis Kahn and co-workers *(Successful Research with Local Farmers to Improve Native Grasslands)*. These two papers differ in their geographical scale and in the extent of the participatory engagement. While Hodgson and colleagues work at the state level and aim to reconcile widely disparate interests around the notion of sustainability, Kahn's group focuses on a region and the resolution of farming practice with technical expertise.

Several papers focus on implementation of integrated policy and management. Brian Coffey and Andrew Major *(Towards More Integrated Natural Resource Management in Victoria: Elements of a Statewide Integrated Policy Framework)* outline new state-wide policy and restructuring, which aims to set in place improved arrangements for an on-going integrated approach to managing environmental problems. Geoff Park and Jennifer Alexander *(Integrate or Perish - Lessons in Integrated NRM from North Central Victoria)* examine progress being made with Victoria's existing catchment management framework. Additionally, Harry Abrahams *(Devolution Enhances Integration)* argues that devolution of responsibilities to regions from national, state and even local bodies, inherently leads to better integration, as it forces policy makers to work outside their traditional silos and to engage with new partners.

These papers illustrate the continuing struggle of policy to establish the foundations for the achievement of desired societal outcomes.

Alistair Phillips and Kim Lowe *(Prioritising Integrated Landscape Change through Rural Land Stewardship for Ecosystem Services)* demonstrate the value of a powerful concept (ecosystem services) as an integrative tool. As in the case study provided by Kahn and colleagues, the aim is to reconcile economic profitability with environmental sustainability and, at their scale of operation, the informal processes used by Kahn's group are unlikely to be successful. A concept such as ecosystem services, with associated funding and infrastructure, may be an essential ingredient for scaling up from farm to region to state. Both of these papers also provide illustrations for Lockwood's system of reconciling environmental and economic values. For space reasons, we have had to hold over a paper by Saan Ecker and Linda Coote *(BestFarms - An Integrated Approach to Environmentally Sustainable Farming in the South West of Western Australia)* which sketches out an Environmental Management System as another integrative tool. This will appear in a later issue of AJEM.

The papers demonstrate the increasing focus on regions as a tractable spatial scale to address the growing number of functions that people desire from their landscapes, and as a manageable scale for demonstrating the full range of diverse interests and allowing them to be dealt with. Most of the papers here focus on catchments but we should not lose sight of the fact that there are other terrestrial bioregions, as well as marine regions, that are targets for NRM. A range of policies, including the *National Action Plan for Salinity and Water Quality,* the *Natural Heritage Trust,* the *National Water Initiative* and *Australia's Oceans Policy,* provide the structural foundation for an integrated approach.

The Land & Water Australia Integration Symposium

The papers in this supplementary issue are a subgroup of those presented at an Integration Symposium in May 2004, organised by Land & Water Australia, one of the Australian Governments' rural research and development corporations. The symposium aimed to support the exchange of knowledge and experiences, to enhance mutual learning, and improve capacity in integrating the important elements and dimensions of NRM.

The symposium was attended by a targeted audience of around 50 critical thinkers from across the policy, management and research communities. Twenty-four of these participants and their co-authors contributed pre-circulated papers, which are available on CD (Land & Water Australia 2004). Two sets of papers were modified in light of the symposium and reviewers' comments in standard peer-review processes. One set, focusing on policy and practice case studies, is published here. The second set, which concentrates on research integration, is being published in October 2005, in the electronic *Journal of Research Practice* (http://jrp.icaap.org).

The Symposium culminated in the production of a set of *Guiding Principles for Integration in Natural Resource Management (NRM) as a Contribution to Sustainability,* which are also reproduced in this supplementary issue. The Principles serve as an overall summary of the key issues that were raised during the event, but also have value in their own right for those contemplating integrated approaches. They cover: the value of integration; ways of thinking about integration; approaches to integration; realistic expectations of integration; new institutions and networks for enhancing integration; and funding to enhance integration; all in the context of natural resource management.

An excellent complement to these guidelines is Julie Thompson Klein's set of guiding questions for integration in research (Klein 2003; reproduced on the Land & Water Australia 2004 CD), which provides a checklist for discussion and assessment at all points of an integrated project's lifecycle.

The collection of papers in this supplementary issue of AJEM is a valuable resource for furthering understanding and broadening discussion about integration policy and practice to allow Australia's NRM challenges to be tackled more effectively.

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Guiding Principles for Integration in Natural Resource Management (NRM) as a Contribution to Sustainability

Gabriele Bammer and Land & Water Australia Integration Symposium Participants*

1. The value of integration in NRM

Integration in natural resource management (NRM) aims to improve both the understanding of complex systems and the ability to enact effective policy and practice. Numerous cases show that integration is effective in achieving those aims and there is considerable optimism about the future of integration in enhancing NRM.

A particular strength is that integration is adaptable to specific NRM contexts. It can have diverse objectives and be undertaken in numerous ways. Common themes, methods and learnings are emerging from this multiplicity, illustrating that continuing support for the development of integrative theory, methods and practice is warranted and required.

2. Ways of thinking about integration in NRM

Integration is a means to an end, not an end in itself and it is defined by the NRM problem or outcome of interest.

Three key ways of thinking about integration are:

- re-aggregation of fragments that have been intensively studied by reductionist methods
- beginning with and studying whole systems contexts, using a plurality of approaches. In the case of NRM, landscape context including people, place and resource base, is central
- as an approach or practice inherent or developed in individuals and organisations.

These three forms of integration are not interchangeable. All are necessary and require considerable intellectual and practical development, as well as supportive institutional structures.

3. Approaches to integration in NRM

Disciplines, policy and practice are homes of valuable knowledge. One key challenge of integration is harnessing and adapting, rather than re-inventing, that knowledge. Approaches drawn from multi-, inter-, and trans-disciplinary and multi-, inter-, and trans-sectoral activities are essential for integration.

Integrative practice and research would benefit from systematic reporting on and evaluation of six dimensions of integration. This will provide a basis for comparison across different approaches and contexts, as well as for 'quality-control' and accountability. The six core dimensions of integration are:

- integration **for what and for whom**; in other words, what is the integration aiming to achieve
- integration **of what**; in other words, what is being integrated and which actors are involved
- the **context** in which the integration is occurring, ranging from political and other drivers for action, to the scale at which integration is planned
- integration **by whom**; in other words, what is the integrative decision-making process
- **how** is the integration being undertaken, including the theoretical underpinning, the starting point, the methods used, transparency and accountability
- the **impact** of the integration; in other words, did it achieve its aims and were there other positive and negative outcomes.

4. Realistic expectations of integration in NRM

Expectations of integration must be realistic. Not all NRM problems require, or are amenable to, an integrative approach. In addition, integration does not produce 'perfect' solutions to complex problems.

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The Land & Water Australia (LWA) symposium participants were: Harry Abrahams, Kate Andrews, Gabriele Bammer, Michele Barson, Bobbie Brazil, Thomas Brinsmead, David Brunckhorst, Andrew Campbell, Brian Coffey, Steve Cork, Allan Curtis, Allan Dale, Sharon Davis, Rhondda Dickson, Jim Donaldson, Steve Dovers, Gordon Duff, Saan Ecker, Rod Griffith, Ronnie Harding, Nicole Hodgson, Tony Jakeman, Gary Jones, Lewis Khan, Ruth Lane, Michael Lockwood, Kim Lowe, Andrew Major, Gerry Maynes, Warwick McDonald, Catherine Mobbs, Joe Morrison, Simon Murnane, Deborah O'Connell, Bill O'Kane, Geoff Park, Alistair Phillips, Cathy Pitkin, Richard Price, Wendy Proctor, Helen Ross, Alice Roughley, Paul Ryan, Sarah Ryan, Tony Slatyer, Geoffrey Syme, Rob Thorman, Lorrae van Kerkhoff, Helen Vooren, Marie Waschka, Bob Wasson and Lisa Watts.

Integration is a process that allows more factors to be considered, trade-offs to be more transparent, and compromises to be more explicit.

Innovation benefits from pluralism, competition and conflict. Smothering these is not an aim of integration. Instead, integration aims to maximise the benefits and minimise the costs of these forces. Integration practice and research requires negotiation of numerous paradoxes and complexities. These include the requirement to act under time pressure and with incomplete information, the ability to deal effectively with political exigencies, the skill to sensitively handle power and cultural differences, the ability to develop on-going relationships in environments of rapid staff turnover, the capacity to compensate for loss of corporate memory, as well as to effectively distil masses of complex information, the ability to integrate at small and large scales, and the balancing of logical analysis and discursive interpretation.

5. New institutions and networks for enhancing integration in NRM

Integration relies on individual relationships and can be greatly enhanced when these are supported by structural relationships. Effective links between strategic policy, strategic planning and regional implementation can substantially boost integration between different levels of government and on-the-ground action. These need to inform, and be informed by, the best quality evidence. High levels of competence are necessary to achieve the best possible outcomes. Issues of leadership and culture are critical to successful integration.

Distributed networks with institutional research, policy and practice nodes would be an asset to the practice of integration and can provide opportunities for those with an interest in integration to learn from each other. Such networks would benefit from:

- being open to the full range of academic disciplines, as well as practice-based experience and local knowledge
- an awareness of historical developments in NRM and in integration
- developing the ability to research in more depth skills involved in integration and in working with adaptive learning frameworks
- supporting and encouraging partnerships that bring together Indigenous and non-Indigenous knowledge systems in relevant Australian NRM contexts
- encouraging the development and application of appropriate techniques for evaluating integration processes and outcomes, as well as openness to discussing, and learning from, mistakes
- the building of intellectual capital in NRM integration in network nodes.

The continued flourishing of the practice and study of integration requires passion and the development of a critical mass of policy makers, practitioners and researchers committed to improving the quality of integration. Such a critical mass is also essential for appropriate recognition and rewards for integration.

Integration in NRM is firmly grounded in practice, which is intense and demanding. Policy makers, practitioners and researchers recognise the value of deep reflection that can stimulate further innovation in theory, method and practice, and the importance of institutionalised opportunities for such reflection. In addition, short-term secondments to other sectors provide opportunities to acquire skills helpful in integrating across sectors. Further, building the capacity to practise and study integration by both existing and up-coming young practitioners, policy makers and researchers requires the enhancement of existing teaching programs and the development of new ones.

There is also a role for skilled people to act as facilitators or ‘knitters’ in integration. Their skills include empathy; being adaptive, with the ability to fill a number of roles and to know which is appropriate and when; the ability to listen, to disintegrate and then re-integrate different perspectives; and to analyse and synthesise.

6. Funding to enhance integration in NRM

Integration has a number of transaction costs (particularly upfront) but if well managed can lead to better results overall. For example, trust and other aspects of relationships are enhanced by face-to-face meetings and often require longer timeframes. In addition, a common language is required to facilitate communication, and integrators need opportunities to escape isolation and meet with each other. Funding for transaction costs is essential for integrative research, policy and practice. Transaction costs can be minimised through experience, attention to targeting the right questions through effective scoping, and developing efficient processes. The relationship between investment in integration and return on investment requires monitoring to ensure that the field is progressing.

There are three particular challenges for funding bodies:

- the adaptive learning foundation of much integration means that requirements can change as the project progresses. An ability to be flexible in providing top-up funding and in adjusting outcomes is extremely helpful.
- the interstices between policy, practice and research are often hard to find funding for and there is a vicious cycle between underdevelopment in these areas and lack of funding. Adoption of research findings in policy and practice is an area that requires particular development.
- critique is essential for the improvement of quality and the development of theory, method and practice. The close interrelationships fundamental to integration can make critique risky both to undertake and to fund.

Integration of Natural Area Values: Conceptual Foundations and Methodological Approaches

*Michael Lockwood**

Values are fundamental to choice and decision. This paper addresses how the notion of value is implicated, addressed and integrated in relation to decisions that affect natural areas. Three topics - rationality, citizen participation and values - are brought together in a review of methods for value integration. Each method is discussed in relation to its processes and products, value inclusiveness, assumptions, limitations, strengths and application. None of the methods have the ability to integrate all relevant values for all actors across the variety of contexts in which environmental choices must be made. Application of an integrative rationality is needed to yield a combined approach that utilises a number of methods such that their respective limitations and weaknesses are, as far as possible, overcome. A crucial task is to enhance our capacity for designing citizen-inclusive, value comprehensive and transparent multi-method processes.

Introduction

Natural areas have been at the centre of some of the most difficult and contested land use and public policy decisions in Australia. From the flooding of Lake Pedder, rainforest logging in northern NSW, and wood-chipping in the south-east and south-west of the continent, through to more recent issues of biodiversity conservation on private property and establishment of marine protected areas, numerous methods have been used to inform and assist decision-making. Values and value integration are fundamental to such decisions and the choices that underlie them. By value integration, I mean that it is necessary to consider two or more values, either by type or between holders, in the construction of a decision. All decisions involve at least implicit integration of values, with the exception of those that are fully determined according to a single lexicographic criterion. In lexicographic choice, one alternative is preferred to another based on a single value criterion, ruling out trade-offs between value components (Lockwood 1996).

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Decisions concerning the future of natural areas involve the selection of one or more choices from a pool of options, each of which may comprise ends (visions, goals, objectives) and means (actions, strategies, policies). Typical elements in such a choice process include an *environment* that has biophysical, social, cultural and economic aspects; a *need* that may be reactive (issue-based) or creative (vision based); a *body of knowledge* that may be scientific, local or individual; identification of one or more *options* to address the need; and *selection* of one or more of these options in a decision.

Three types of actors are engaged with this choice process: *governing actors* who characterise the environment, identify the need(s), apply knowledge, identify options, make choices and advance their implementation (with different actors potentially involved for each element); *participating actors* who directly contribute to one or more of the elements, but do not govern outcomes in relation to them; and *alienated actors* who are impinged upon in respect of one or more of the elements, but who are not participating or governing actors.

I focus on how the notion of value is implicated, addressed and integrated in relation to these elements and actors. In particular, I consider the problem of how to integrate values into environmental choices. The discussion is relevant for all natural area management issues, whether sectoral (water allocation, forestry, fisheries, agriculture, protected areas), systemic (biodiversity conservation, prevention of land degradation) or procedural (stakeholder participation, rationality, practicality). It is also pertinent across all jurisdictional and institutional scales - Commonwealth, state and territory, regional and local.

I first consider the modes of rationality and participation that are applied in environmental choice processes, followed by a characterisation of natural area values. These three threads (rationality, citizen participation and values) are brought together in a review of methods for value integration in environmental decision-making. Each method is discussed in relation to its processes and products, value inclusiveness, assumptions, limitations, strengths and application to Australian natural area decisions.

Modes of rationality

Individual actors compose decisions from values that are a product of individual experience, predisposition and understanding, as shaped by a complex of social, cultural, environmental and economic influences. Such composition constitutes an act of integration, which can be undertaken intuitively, instinctively or according to a rational process. As is widely appreciated, choices and decisions concerning natural areas involve multiple actors, imparting an interpersonal dimension to the required value integration. It is almost certain that there will not be unanimity, ruling out intuition and instinct as bases for decisions. Value integration must therefore be performed according to a decision-making process that engages rationality. Several kinds of rationality may be involved.

Instrumental rationality demands logical relations between means and ends, and prescribes how to decide on right action. Such efficiency in choice has been formalised, in economics for example, through axiomatic descriptions of human preferences based on logical conditions of transitivity, completeness, reflexivity and so on (Gravelle and Rees 1981). Rationality in economics can be characterised by internal consistency of choices that are directed toward maximisation of self-interest. Such approaches implicitly assume that there is one politically uncontentious optimal state (Rydin 2003). The ends justify the means, and no consideration is given to how the ends are established or to their relative significance or validity. *Substantive rationality*, articulated for example by the social theorist Weber, is more general in that it requires consideration of ends (purposes, goals, objectives). Substantively rational decisions involve analysing the relative importance of different ends, as well as identification of the most appropriate means to achieve them (Friedmann 1987; Alexander 2000). *Strategically rational* decision-makers recognise that they will be better able to achieve their objectives by taking into account the prevailing social norms and power relations between actors (Alexander 2000).

Several rationalities recognise the limited ability of humans to adopt instrumental or substantive rationality, and that sub-optimal information gathering and processing is often evident. These approaches recognise that the complex of environmental elements and actors can never be completely analysed or understood. *Bounded rationality* allows for truncated information searches, limited information processing, and use of simplifying heuristic choice strategies. The demands of formal instrumental rationality are relaxed. Given limited intellectual capacity and limited time, boundedly rational 'doing well enough' rather than optimising choices is inevitable in many contexts (Simon 1985; Briassoulis 1989). Here, a governing actor's strategy is selected on the basis of a trade-off between the desire to make the 'correct' decision and the investment of time and effort required to achieve this ideal. *Pragmatic rationality* focuses on consequences and draws on experience to select actions according to what has worked in the past. *Incrementalism* advocates using small and preferably reversible actions, without reference to medium or long-term ends (Friedmann 1987; Lindblom 1979). No explicit attempt is made to consider the combined impact of individual decisions. Pragmatism, incrementalism and strategic rationality all consider political, administrative and economic feasibility as important elements in the choice process.

Rationality has also been characterised according to quality of argument. The German philosopher and sociologist Jürgen Habermas argued that knowledge and rationality are social constructs (Alexander 2000). Rationality in this case is not about ends, means or actions but social interactions (Alexander 2000). This is a *communicative rationality* that is concerned about the quality of communication, using criteria such as honesty, clarity, sincerity; as well as lack of distortion, manipulation and deception (Allmendinger 2002).

Through the work of authors such as Forester (1989) and Healey (1996), communicative rationality has become an influential model for urban, regional, social and environmental planning. The goal is to reach a consensus amongst participating actors. With communicative rationality, decisions and actions are rational if they arise from circumstances in which all actors have been able to express themselves without inhibition or constraint, and where outcomes are freely accepted by all participating actors (Healey 1997).

Such communication rarely if ever exists in practice. Bounded modifications of this ideal must generally be adopted by, for example, accepting that the relative power of governing and participating actors will influence the quality of communication, and that reaching a consensus may not be possible. A typical participatory engagement is directed by governing actors as a process of consultation with participating actors who are one or more of: passive receptors of information, sources of information, and sources of values and opinions (Wondolleck and Yaffee 2000).

Deliberative democratic processes are a particular style of participatory engagement that provides for collective

decision-making through discussion, examination of relevant information, and critical discursive analysis of options. Attempts are made to eliminate the power and advantage afforded by political or economic position, so that participants regard one another as equals, defend and criticise positions in a reasonable manner, and accept the outcomes of such discussions (Dryzek 1997). Deliberative democracy is considered by its proponents to better recognise citizens' interests than more limited participative involvement (Dryzek and Braithwaite 2000). Deliberation is also argued to lessen the impact of bounded rationality in decision-making (Elster 1998). It is claimed that such methods 'help governments to identify the real values and judgements of all their citizens' (Simonsen and Robbins 2000, p. 39).

Despite participatory and deliberative processes offering opportunities for citizens to express views, and perhaps have an influence at the margin, the core policy agenda and framework often largely remains under the control of governing actors and sectoral interests. Collaborative planning (Healey 1997) constitutes a more radical model of participation, based on communicative rationality, in which citizens have a central, not marginal, influence.

Individually, each of these rationality modes is deficient in their ability to address the complexity of environmental choice processes. In combination, they do offer a potential basis for the integrated consideration of natural area values. Such an *integrated rationality* 'has to be a complex construct, a recursive process deploying different forms of rationality at successive stages by various actors in changing roles' (Alexander 2000, p. 247). For example, a set of objectives could be established by substantively rational governing actors. Choice options might be designed by participating actors in a process that meets the requirements for (bounded) communicative rationality, while recognising the instrumental relationship between each objective and the possible means by which it might be achieved. Bounded instrumental rationality might be applied to understanding the biophysical and socio-economic implications of alternative choice options. Participating and governing actors could again contribute to a communicative process, evaluating the choices and arriving at a decision.

Natural area values

Rationality is used to identify and integrate values into choice processes. Before considering the methods that might be used to accomplish this task, the scope and content of natural area values needs to be understood. The term 'value' in the biological sciences is generally used to indicate particular functional relationships between elements of an ecosystem - for example, the value of tree hollows to arboreal mammals. Such functional relationships are often an important basis for constructing values, but do not constitute in themselves values as direct inputs into environmental choices.

Values that are relevant for such choices are *held* principles such as notions of fairness or belief in an intrinsic value in nature (see below); or *assigned* to things, whether they are goods such as timber, activities such as recreation, or services such as education (Brown 1984). Held values are generally regarded as being more absolute and stable than assigned values, which are more contingent and labile. Assigned values may not exist prior to engagement with the choice process. People may have no view on an issue, or have an unformed view that is difficult to express. If the latter is the case, then they may not desire to clarify or more exactly define their values (Fischhoff *et al*. 1980). Clearly defined values may only be assigned to items and in contexts with which the person has had previous opportunity to form them through trial and error (Fischhoff 1991). The choice process may provide participating actors with such opportunities, thereby facilitating construction of a new or modified value set (Gregory *et al*. 1993).

Governing actors hold values prior to engagement with the choice process. These prior values become embodied in the process elements. Environmental characterisation, needs and options identification, type(s) of rationality adopted, selection and use of knowledge, choice of methodology, and treatment of any participating and alienated actors, are all influenced by governing actors' values. This imparts an inherent subjectivity to the choice process. In addition, the process itself may shift actors' prior values or facilitate construction of a modified value set.

Participating and alienated actors recognise, possess or benefit from a wide range of values. Categorisation of these choice-relevant natural area values assists systematic elucidation of their key features and avoids the confusion associated with comparing value types across classificatory boundaries. Various categorisations have been offered from philosophical (e.g. Rolston 1985), economic (e.g. Randall and Stoll 1983; Freeman 1993), and protected area (e.g. Harmon and Putney 2003; Worboys *et al*. 2005) perspectives. To provide a value language for use in the rest of the paper, I use a mixed-mode categorisation of natural area values based on such sources, which derives substantially from Lockwood (1999a).

Anthropocentric values are instrumental to human needs and wants. Instrumental values are values that refer to some 'higher' purpose. There can be a chain of instrumental values that lead to a fundamental intrinsic value. For something to be intrinsically valuable, it must be an end in itself - valuable only for its own sake regardless of anything else (O'Neill 1992). Intrinsic values therefore impart meaning to instrumental values. For example, food is of instrumental value to human beings because it sustains the intrinsic value of human life. Many philosophers have argued that all values are anthropocentric. This view is based on the position that only people have intrinsic value, and that all other value is instrumentally related to human needs and wants (Passmore 1974).

In contrast, *ecocentric value* arises from the possibility of an intrinsic value in nature - that is, nature having value in its own right, regardless of humans. Over the past 35 years, a number of environmental philosophers have gone against the anthropocentric tradition and developed arguments in support of an intrinsic value in nature (Routley and Routley 1979; Rolston 1989; Attfield 2003; Jamieson 2003). While there is no consensus among academics, belief in the possibility of an intrinsic value in nature is 'a widely shared intuition' (Callicott 1986, p. 140). It is likely that some, if not many, stakeholders in environmental issues believe in such value (Kempton *et al*. 1995). The notion of ecocentric value means that it is too restrictive to regard the natural world simply as a resource. Preservation of the environment can be underpinned by more than just human-centred survival or economic or aesthetic considerations - it can also be justified as respect for the value of nature for its own sake.

Current and future use values are anthropocentric values that people assign to environmental goods and services - for example, timber for housing and furniture, or attractive places for undertaking recreation activities such as bushwalking or sightseeing. These values may be related to present use, or may be related to opportunities for use in the future. Ecosystem services indirectly support the production of such uses. Ecosystem services flow from natural assets (soil, biota, water systems and atmosphere) to support human activities and lifestyles that are generated outside natural areas, but are indirectly dependent on them. The agricultural industry, for example, depends heavily on many ecological processes, including soil formation and nutrient cycling.

Non-use value is an anthropocentric category that has two aspects. First, existence value is the benefit received by those who derive satisfaction from knowing that a site is preserved in a certain condition irrespective of use or potential use by the individual or others (Randall and Stoll 1983). Second, people may also value natural areas as a 'bequest' to future generations (McConnell 1983). It should be noted that non-use values are different from ecocentric values. Non-use values are related to the satisfaction a human being derives from knowing an area exists in a natural state. Ecocentric values are independent of such human satisfaction.

None of the value categories are mutually exclusive. An actor may, for example, simultaneously believe in an intrinsic value in nature, enjoy recreation use benefits, hold non-use values and receive ecosystem service benefits from particular natural areas.

Value integration methods

Consideration of multiple values demands an integrated approach to rationality in the selection of assessment methodologies. Methods need to provide opportunities for participating actors to express their values. These methods may address one or more specific value types, so that a number of methods may be required for comprehensive value identification. In most circumstances, an understanding of the relative strength of these values will also contribute to choice rationality. This assessment may be done qualitatively or through the use of formal quantitative methods. The methods used for value expression and identification may be different from those used to undertake value measurement.

An important consideration in selecting and integrating methods is the assumed degree of association between each value category. Value integration can be based on commensurability or comparability. Non-comparable values cannot be integrated using rational processes. In this paper, I set aside some of the complexities articulated in the values literature surrounding notions of incomparability, non-comparability and rough equality (see Chang 1997; Aldred 2002).

Values can be treated as commensurable, measured according to a common scale, and aggregated to a single value. For example, economic valuation is an instrumentally rational process that requires value commensurability. The goal of the economic rationalist is maximisation of utility, given constraints such as prices and income. What constitutes utility is generally regarded as irrelevant to the economist - under the principle of consumer sovereignty, utility is determined by each individual. Utility maximisation is expressed through assigned values based on the relations of exchange. There

is no exchange without the possibility of equality and no equality without commensurability (Georgescu-Roegen 1954). All things that are exchanged must be comparable against some common standard. This principle allows quantitative comparisons to be made concerning the relative value of choice options.

Values can also be comparable but not commensurable. Comparable values can be ordered in relation to each other, from most preferred to least preferred. Value equality is also recognised. Such orderings can be strictly qualitative, in that comparisons are made without any numerical attributions. Numerical attributions can also be made to establish a preference ordering, without implying any cardinal relationships.

The major methods used to assist environmental choices are given in Table 1. A comprehensive picture of participants' values will often require the employment of several of these methods. In Table 1, the characteristics

Table 1. Summary of value integration methods.

Method	Dominant rationality	Extent of value integration	Usual product	Example
Benefit cost analysis	Instrumental	Exchange values only	Economic worth	Remnant native vegetation on private property (Lockwood and Walpole 2000)
Multicriteria analysis	Substantive, maybe with (bounded) communicative	Analyst determined, potentially all	Qualitative comparison or ordinal ranking	Comparison of riparian revegetation options in North Queensland (Qureshi and Harrison 2001)
Psychometric scaling	Substantive	Analyst determined, potentially intrinsic, non-use, use	Ordinal comparison	Comparative measurement of intrinsic, use and non-use values (Winter and Lockwood 2004)
Paired comparisons, voting	Substantive	Analyst determined, potentially all	Ordinal or cardinal ranking	Paired comparisons of forest management options in Victoria (Lockwood 1999b); Voting on forest management options in Finland (Laukkanen *et al.* 2002)
Political judgement	Strategic, pragmatic	Politically determined, likely to be limited	Decision	Overrule, in 2003, by the Tasmanian Government of its planning authority's recommendation not to proceed with the Meander Dam
Public inquiries, meetings, submissions and the like	Bounded, strategic, pragmatic	Process determined, potentially all	Policy advice	All states and territories have processes for public involvement in management plans for protected areas, forests and catchments
Citizens' jury, deliberative poll, consensus conference	(Bounded) communicative	Participant determined, potentially all	Recommended decision	Citizens' jury of allocation of funding to park management activities in NSW (James 2004)
Professional judgement, private judgement	May encompass strategic, pragmatic, bounded, substantive, instrumental	Individually determined, limited	Decision	Management agency choices of how to interpret and implement strategic plans; Individual landholders and recreationists routinely make private decisions
Market	Instrumental	Market values only	Exchange of goods and services	Murray-Darling Basin water markets

of each method are given with respect to their rational bases, extent of value integration and end products. A more detailed consideration of each method follows. In the interest of brevity, the assumptions, problems and limitations, strengths and examples of each method are presented as 'dot point' lists.

Benefit Cost Analysis

Benefit Cost Analysis involves quantification of benefits and costs in dollar terms, using a suitable economic valuation methodology, and aggregation of these values using a decision rule such as the Net Present Value criterion. Where a market exists, it is relatively easy to determine values, but where there is no market, economic values must be deduced from whatever evidence can be found of how people would behave if there was one. Techniques for evaluating non-market economic goods (such as non-use values and some future use values) include contingent valuation, choice modelling and the travel cost method (Garrod and Willis 1999; Bennett and Blamey 2001).

Assumptions

- The goal of policy should be to maximise net social benefits.
- Individual preferences are all that should count (consumer sovereignty).
- Individuals act as rational, self-interested utility maximisers.
- Preferences should be weighted by the existing distribution of income.

Problems and limitations

- The relative influence of participating actors is determined by economic capacity.
- Not all values are tradeable, and intrinsic values in particular are typically not accommodated by Benefit Cost Analysis.
- Some people have preferences inconsistent with rational, self-interested utility maximisation.
- Preferences are not necessarily accurate reflections of well-being.
- There is academic disagreement concerning the validity and reliability of non-market valuation methods.
- Benefit Cost Analysis does not necessarily direct policy towards sustainable outcomes.

Strengths

- Everyone's exchange values can be incorporated.
- Participating actors with the strongest preferences have the most influence over outcomes.
- The method is instrumentally rational.
- The method is transparent and produces clear policy advice.

Examples

- Forest management options in south-east Australia (Streeting and Hamilton 1991).
- Salinity control in the Goulburn Broken catchment, Victoria (Read Sturgess and Associates 2000).
- Remnant native vegetation on private property (Lockwood and Walpole 2000).

Multicriteria Analysis

Multicriteria Analysis is a general term used to describe a number of procedures that organise information relevant to the decision-making process. The basic element common to all Multicriteria Analyses is an effects table that indicates the performance of each management option in relation to a set of criteria. Multicriteria Analysis can be used to choose one or more superior alternatives, generate a complete or partial ranking of alternatives or analyse the acceptability of each alternative (Lahdelma *et al*. 2000). At its most basic, Multicriteria Analysis serves simply as a means of organising and presenting the value implications of alternatives. Governing actors can use the Multicriteria Analysis effects table as a means of assisting choice and clarifying the nature of the options, but some professional judgement must be explicitly applied to select a preferred alternative. In more formal applications, the performance of each option can be assessed against each criterion using qualitative scales and the results aggregated to produce an overall score for each option. Participative or deliberative components can also be built into the method (Proctor and Drechsler 2003).

Assumptions

- Values must be at least numerically comparable if a score for each option is to be calculated.
- The dimensions of a choice problem can be disaggregated into a set of independent (value-based) criteria.

Problems and limitations

- There is no standard, agreed method for establishing criteria, criteria weights or aggregating across criteria.

- It is usually impractical to incorporate the preferences of all affected actors - the number of participating actors is typically small and the number of alienated actors large.
- Values (criteria) may not be commensurable.

Strengths

- All value types can be represented.
- Any type and number of criteria can be included.
- Policy can be directed towards sustainable outcomes.
- The method is transparent.

Examples

- Comparison of riparian revegetation options in North Queensland (Qureshi and Harrison 2001).
- Establishing politically feasible water markets (Ballestero *et al*. 2002).
- Regional priority setting for natural resource management in Queensland (Hajkowicz 2002).

Psychometric scaling

Value scales can be developed using psychometric methods. Data are gathered using a survey instrument, often containing value statements for which respondents are asked to give importance ratings against a Likert scale. Responses are processed to identify the relative strengths of underlying value types using exploratory factor analysis (if no prior value classification is assumed) or confirmatory factor analysis (to confirm a theoretically derived value structure). Results on the relative importance of various values (use, non-use and intrinsic) can be used to inform decisions.

Assumptions

- Values must be at least numerically comparable.
- The scope and content of respondents' values can be represented by a list of simple statements and the responses respondents make to these statements.
- Respondents have well defined values, or are able to construct them during the survey process.

Problems and limitations

- Survey responses to short value statements may not reveal deeper or more complex value positions.
- Translation of the value information into a choice context can be difficult.

Strengths

- Intrinsic, non-use and use values can be represented and compared.
- Understanding of participating actors' values is enhanced.
- A representative sample of citizens' values can be incorporated.
- It is transparent, although technical.

Examples

- Ecocentric and anthropocentric value orientations (Stern and Dietz 1994).
- Linkages between values and pro-environmental behaviour (Nordlund and Garvill 2002).
- Comparative measurement of intrinsic, use and non-use values (Winter and Lockwood 2004).

Paired comparisons, voting

The psychometric method of paired comparisons enables an ordering of preferences to be established between the elements of a choice set (David 1988; Peterson and Brown 1998). Participants are presented with two of the options from the choice set, and asked to 'vote' for one of them. The process is repeated for each pair of options. The choice data are processed to produce an ordinal ranking of options. A number of other voting systems may also be used, varying in complexity from the simple selection of one preferred option and aggregation of this choice across participating actors to produce a preference ordering, through to Borda counts and the Hare system (D'Angelo *et al*. 1998).

Assumptions

- The responses of all participating actors are equally important.
- It is appropriate for governing actors to determine the nature of the choice options.

Problems and limitations

- Participants may not find any of the options on offer particularly attractive.
- The value bases for the preferences expressed through a vote are generally not evident. It can be assumed that value positions underlie the preference expressions, but generally no information is elicited on the exact nature, content or strength of these value positions.

Strengths

- All value types can be represented.

- The method is transparent, although some voting systems can be technically demanding.
- Clear policy advice can be provided.

Examples

- Election of representative governments.
- Voting on water resource management (D'Angelo *et al*. 1998).
- Paired comparisons of forest management options in Victoria (Lockwood 1999b).
- Voting on forest management options in Finland (in combination with Multicriteria Analysis) (Laukkanen *et al*. 2002).

Political judgement

While political judgement is an almost ubiquitous component of environmental choice processes, it is often done in conjunction with one or more of the other methods described in this paper. The legitimacy of unaided political choice relies on the power afforded by a representative democracy to its elected officials as governing actors.

Assumption

- Elected representatives have a mandate to make choices on behalf of enfranchised citizens.

Problems and limitations

- It is unlikely that all relevant values will be fairly represented in the choice process.
- Choices are generally not transparent.
- Political processes are subject to capture by special interest groups.

Strengths

- Enlightened political leadership can advance environmental sustainability.

Examples

- The 1983 'surprise' decision by the South Australian Government to strictly control land clearing.
- The overruling, in 2003, by the Tasmanian Government of its planning authority's recommendation not to proceed with the Meander Dam.

Public inquiries, meetings, submissions and the like

There are numerous methods used by governing actors to enable wider participation in environmental choice processes. These range from formal inquiries and opportunities to make written submissions, through to informal consultation via face-to-face discussions with participating actors. Participative approaches involve a shift from representative to participative democracy in which citizens are actively engaged with the processes of policy development and implementation.

Assumptions

- Government processes need to be augmented or replaced by various forms of direct citizen participation in environmental choices.

Problems and limitations

- Contributions may only be tokenistic, in that choices have already been made.
- Resolving conflict between participating actors is often difficult.
- Participating and governing actors often have different views on the purpose of participation.
- Participating actors are often those who have the capacity (time, knowledge, social connections, economic freedom) to engage, leaving a large body of alienated actors.
- The grounds on which the governing actors make their final choices may not be transparent.

Strengths

- Public engagement can improve the legitimacy of representative democracy by supporting the rights of citizens to be involved in decisions that affect them.
- Choices are likely to be more reflective of community values than those made solely through political judgement.
- Local knowledge is more likely to be acknowledged and incorporated.
- Public ownership and commitment to solutions is likely to be enhanced.

Examples

- All states and territories have processes for public involvement in management plans for protected areas, forests and catchments.
- Most jurisdictions have legislatively mandated public representations on local government planning schemes.

Citizens' jury, deliberative poll, consensus conference

Citizens' juries, deliberative polls and consensus conferences have been used to enable informed choices over contested options for addressing environmental

issues. These methods are designed to provide participants with an opportunity to investigate an issue, deliberate on options, and arrive at a mutually agreed decision (Wiseman 2003). Citizens' juries are a group of about 12 people chosen to make a decision on behalf of the community. The jury is given a 'charge' that typically requires them to choose a preferred option from several alternatives. A deliberative poll involves a large group of people hearing and discussing evidence, before voting on a proposition related to the issue at hand. In a consensus conference, a panel of about 12 participants engages in a process that typically involves two preparatory sessions and an extended conference session. As with the other deliberative methods, panel members have the opportunity to hear from witnesses and engage in extended discussion. The aim is to come to a consensus view on the issue (James 2004).

Assumption

- Deliberation gives rise to superior choices.

Problems and limitations

- Members of citizens' juries and consensus conferences are not representative of stakeholders. Even with the larger numbers of a deliberative poll, representativeness can be a problem.
- Consensus may not be reached (but is not necessarily required in citizens' juries and is not sought in deliberative polls).
- The value domain covered in the process is dependent on the interests and diligence of the participants and may be circumscribed by the organisers, so that some values may not be considered or may be inadequately considered.
- Outcomes can be influenced by the personalities and relative power of participating actors.
- Final choices are still generally made by governing actors, outside the deliberative process.

Strengths

- The ethical dimensions of natural area values are best considered in a deliberative environment (Wilson and Howarth 2002).
- Time and information availability allows for value construction, so that during the deliberation, well developed and stable value positions may be attained.

Examples

- Consensus conference on gene technology (Australian Museum 1999).
- Deliberative poll on whether Australia should become a republic.
- Citizens' jury on allocation of funding to park management activities in NSW (James 2004).

Professional or private judgement

Professional judgement can be exercised by governing actors (often planners or policy makers) in a conventional 'top-down' choice process. Private judgements are made by individuals regarding their own behaviour in relation to environmental choices.

Assumption

- The problem under consideration does not require wider input in relation to the values involved.

Problems and limitations

- Value selection and emphasis is likely to be biased.
- The value bases underlying choices made by the various actors are generally not evident.
- The reasons for choices are generally not transparent.
- Where externalities, public goods or ethical questions are involved, the outcomes may not be democratically legitimate and may not have community support.

Strengths

- Response to addressing the issue can be rapid.
- Some professionals have a sound understanding of the implications of their choices, and can efficiently and effectively make decisions.
- Private choices are made freely.

Examples

- Management agency choices of how to interpret and implement strategic plans.
- Individual landholders and recreationists routinely make private decisions.

Markets

As long as certain conditions can be met, markets are thought to efficiently allocate resources, so that benefits to the community can be maximised. Many environmental resources are produced, consumed and exchanged through markets. In some cases, these markets are 'distorted' by government subsidies. Over the last decade there has been increasing interest in developing or improving the efficiency of markets for environmental resources. A market value for a scarce environmental asset can be established by creating tradeable property rights over its use. For example, in the case of water, an

upper limit on total allocations is first identified, taking into account factors such as resource availability and environmental flow requirements. Initial quotas are then allocated to water owners and a market is established by allowing them the opportunity to sell some or all of their water to others.

Assumptions

- The goal of policy should be the efficient allocation of resources.
- Individual preferences are all that should count (consumer sovereignty).
- Individuals act as rational, self-interested utility maximisers.

Problems and limitations

- Property rights allocations based on prior rights, historical precedent and special interest group preferences can:

  - result in resource commitments that exceed sustainable environmental capacity

  - perpetuate inequitable power relations (for example, it has been shown that water markets may disadvantage women (Davidson and Stratford 2003))

  - produce a large number of alienated actors.
- Not all values are tradeable.
- Alienated actors must rely on market governance mechanisms to secure their interests and represent their values.
- Some people have environmental values inconsistent with rational, self-interested utility maximisers.
- Markets do not necessarily give rise to sustainable outcomes.

Strengths

- Participating actors' exchange values can be incorporated.
- Choice and decision-making are decentralised.
- Participating actors with the strongest preferences have the most influence over outcomes.
- The method is instrumentally rational.
- There are potential environmental and efficiency benefits.

Examples

- Murray-Darling Basin water markets.
- Hunter River salinity trading scheme.

Conclusion

Actors hold and ascribe a range of values for natural areas. Consideration of these values in environmental decision processes can entail three stages of integration. First, modes of rationality (instrumental, substantive, bounded, pragmatic, strategic, communicative) can be used to develop an integrated process that establishes the identity of governing and participating actors, their roles and powers within the process, as well as the methods that enable expression, identification and measurement of actors' values. Second, integration typically occurs for different value types both within each participant's value set and across all participating actors' values. An important consideration in selecting a method to perform this integration is the degree of association (comparability or commensurability) between the value components. Third, rational governing actors integrate all the value information generated in the process and use it to inform their decisions.

None of the methods described in this paper have the capacity, on their own, to comprehensively represent and integrate all relevant values for all actors. Application of an integrative rationality is required to yield a combined approach that utilises a number of methods so that their respective limitations and weaknesses are, as far as possible, overcome. To implement this approach, governing and participating actors would need to take on a number of roles at various stages through the choice process.

The following combined methodology illustrates how the concept of integrated rationality could be employed. Governing actors could initiate an initial statement of need and intent (objectives) using professional experience and judgement. An enlarged group of participating actors (stakeholder representatives) could then engage in a deliberative process to build on this statement and identify a range of options for meeting the objectives. Biophysical and social scientists should be part of the process, particularly contributing to participants' understanding of the implications for functional relationships implied by the choice options. Selection from amongst choice options could involve first the use of a substantively rational method such as Multicriteria Analysis, with criteria and weightings again established through a multi-actor communicative process. Choice powers could then be widened so that scoring each option was done by aggregating responses from an extended pool of participating actors. Deliberation on the implications of the Multicriteria Analysis could be tasked back to the stakeholder/government group. Of course,

many other process models could be devised. There is almost certainly no single, optimal process.

The choice process should be transparent at every stage, with full information and decision rationales available to any interested person. The process should seek to minimise the number of alienated actors. Particular attention may need to be given to including actors with minority interests who hold particular values, as well as members of the general public who are generally disengaged from decisions. The goal is to achieve comprehensive value inclusiveness (intrinsic, non-use, use, ecosystem service) in the choice process.

Actor-inclusive and type-comprehensive value integration requires the use of multiple approaches, drawn from the menu of technical, participatory, deliberative and decentralised methods. In a way, that is what is already done. However, there are considerable opportunities for using integrative rationality to improve choice processes and the consequent decisions that affect natural areas. While there is still work to be done enhancing the validity and reliability of individual techniques, the more important task is to enhance our capacity for designing rational, citizen-inclusive, value comprehensive and transparent multi-method processes.

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The WA Collaboration: Facilitating Integration of Sustainability Issues in a Community and Civil Society Context

*Nicole Hodgson, Kathryn Buselich and Darren Halpin**

As a more long-term and integrative approach to policy-making, sustainability is a concept that exercises the minds of policy-makers, business representatives and citizens alike. Policy that pursues a sustainability agenda therefore attracts a vast array of stakeholders, each keen to pursue often disparate interests or causes. Through a case study of the WA Collaboration's experience with sustainability policy-making in Western Australia, this paper considers the way in which innovative engagement between government and civil society organisations can contribute to enhancing more integrative and strategic policy-making capacity. In particular, this paper examines the role of the WA Collaboration in facilitating policy integration through the deliberative opportunities it provides for developing more encompassing positions amongst its diverse membership. The paper suggests that this style of engagement, while not without its difficulties and tensions, is valuable for making progress in highly contested policy contexts.

Introduction

Sustainability is clearly an issue that tests the policy-making capacities of governments. It attracts broad public interest, and a large number of organised stakeholders are likely to seek input into sustainability policy-making. Their demands are often disparate and pertain only to their given narrow constituency. Sustainability is a highly contested and malleable concept and, as such, participants in the public debate often attempt to redefine the term in ways that fit best with their existing agendas. However, competing and bargaining of interests does not further sustainability because it can lead to compromised outcomes and displacement of problems. It follows then that effective governing for sustainability fundamentally requires integration - of the imperatives of public, civil society and private sectors, and across social, cultural, environmental and economic concerns.

In this paper we examine the role of the WA Collaboration in facilitating integration. Its contribution in this area is examined in respect to its capacity to find 'encompassing positions' amongst its diverse membership (as opposed to working only on a single point of convergence), and its ability to facilitate strategic policy-making capacity by mobilising public debate.

At the heart of the WA Collaboration is the recognition of the potential strength of an integrated civil society approach to the sustainability agenda. While coalitions of interest groups are not new, they tend to form with single issue agendas, and this situation is not conducive to the collective approach that sustainability requires. The WA Collaboration is something quite different. It aims to provide an alliance suitable for the breadth of issues the concept of sustainability encompasses (across the triple bottom line of environmental, social and economic perspectives) and ultimately to facilitate the greater involvement of the community in policy-making for sustainability. Moreover, it seeks to build the long-term, ongoing relationships and collective ownership that will be essential to furthering the sustainability agenda.

This paper is an empirical description and an early analysis of a unique example of a civil society response to the need to integrate environmental, social and economic perspectives in the pursuit of sustainability. This article focuses on how an interest organisation operates in a collaborative rather than coalition context, and the internal processes it has developed to achieve the challenging process of institutional design.

Integration of issues in policy-making

It has been persuasively argued that the modern Australian policy process lacks the capacity for political 'integration', that is, the 'ability of the formal political

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system to create and/or distil support for proposed actions in public and interest-group opinion' (Marsh 2000, p. 178). Marsh argues that the existing public policy process in Australia tends to mobilise the general public only at the end of the issue cycle and largely once government has settled on the overall thrust of change. While a limited number of key stakeholder groups may be involved, there is little capacity to integrate them, or more importantly their constituencies, into a strategic policy conversation.

Ironically, these integrative capacities are on the wane at precisely the time when they are needed more than ever. The proliferation of groups over the past three decades making narrow claims on government, the technical complexity of many issues, and the fragmentation of social structures and bases that created certainty and stability in policy-making all suggest the contemporary importance of strategic policy-making capacity (Marsh 2000; Richardson 2000).

There are many who would be sceptical of the capacity for groups to act in a way that enhances integration. While interest groups, whether labelled as pressure groups, social movements or non-government organisations, are central to resolving policy issues, accounts of the orthodox public policy process tend to emphasise issues being resolved through depoliticised consensus seeking amongst directly affected interests and relevant government agencies (see discussion in Halpin 2002, pp. 489-490). The emphasis is on 'closed' depoliticised policy-making rather than mobilising broad public debate. Similarly, it has been argued that groups are unlikely to seek goals that are not in the particular interest of members or to consider 'knock-on' effects of their claims (Beer 1982; Brittain 1983; Olson 1965, 1982; Jordan and Richardson 1987 provide a useful summary). The WA Collaboration, on the other hand, was established to facilitate groups to work together to mobilise public debate and popular participation in order to form an encompassing policy agenda around sustainability.

Of course, in a contemporary context we find that groups do form coalitions. However, these tend to operate on a single issue basis; they bind together groups in the most minimal of fashions, relying on the opportunistic overlap of group goals. A high profile example is the National Farmers' Federation deal with the Australian Conservation Foundation to deliver the Landcare Package in the early 1990s. While undoubtedly a very worthy political project, it was a one-issue deal that required neither group to develop a broader understanding of the other's agenda, to change values, or to look at knock-on effects in other areas of policy (McEachern 1993). The political landscape is littered with better and lesser known deals between the most unlikely groups on single issues.

Browne (1990, p. 497) notes that '[e]ffective coalitions are probably formed on the principle of integrating the least number of players needed to win rather than searching for encompassing policies that satisfy the widest range of policy claimants.' If Browne's synopsis of the US evidence is an accurate reflection of contemporary Australian practices, enhancing the strategic and integrative capacities of the policy process clearly requires a more substantive form of interaction and debate amongst partners of group coalitions.

At its core, it requires groups occupying a collaborative and intermediary role, both articulating the wishes and interests of their constituencies while at the same time being cognisant of the resources of the state and the wider impacts of immediate demands on other sections of the community. Moreover, it requires a deeper process and commitment to generating, through dialogue, encompassing positions from amongst collaboration members to a set of common values. It is not about a marriage of political convenience, although windows of political opportunity may catalyse collaboration formation, but a stated intention to work through a range of policy issues to find encompassing policy resolutions. It also does so amidst the full public gaze; the mobilisation of public opinion is a core part of the way collaborating groups create legitimacy for their new agendas. Change is not simply contained to group élites who may easily find encompassing positions amidst some type of deliberative process. Rather it extends to the constituencies of each group and then to the broader public.

The existence of the WA Collaboration can also be viewed as a civil society example of a deliberative structure. According to Dryzek (2000), the notion of deliberative democracy refers to a process where citizens can participate in decisions which affect them in a way that their preferences can be transformed through deliberation. Dryzek (2000, p. 7) raises some key points of contestation about deliberative democracy pertinent to the WA Collaboration:

> Is the proper location of deliberation the existing representative institutions and legal system of liberal democracy, or should deliberation extend more broadly throughout society? Might existing representative institutions prove inhospitable to effective deliberation, such that alternative locations should be sought?

Civil society in its politicised sense, the 'public sphere', consists of 'self-limiting political association oriented by a relationship to the state' (Dryzek 2000, p. 100), and provides a counterweight to the state and an oppositional space where alternative perspectives can be forged (see also Eckersley 2004).

It was on this basis that the WA Collaboration was formed, providing opportunities to broaden policy deliberation beyond the more restricted processes conventionally offered by the state, such as stakeholder forums, focus groups and advisory committees. It provides longevity of space for deliberation, building ongoing networks and collaborative relationships.

This case study of the experiences of the WA Collaboration provides an insight into a different mode of intra-group relations that emphasises encompassing positions that integrate interests and mobilise both specific constituencies and ultimately the broader community. In so doing, it highlights some of the limitations and opportunities in such approaches, providing insights into ways of encouraging interest group collaboration in future.

The Western Australian State Sustainability Strategy

Western Australia is the first State Government in Australia to develop a comprehensive strategy for sustainability. A Sustainability Policy Unit was created in the Department of Premier and Cabinet in July 2001. In September 2002, *Focus on the Future: the Western Australian State Sustainability Strategy* consultation draft was released, with public comment on the consultation draft closing in February 2003.

The consultation strategy undertaken by the Sustainability Policy Unit included six major public seminars in Perth and further seminars in regional Western Australia, as well as informal discussions with a range of groups and individuals - a relatively conventional consultation process, and not surprisingly limited to key stakeholders and interest groups. Furthermore, there has been limited coverage of the State Sustainability Strategy in the Western Australian media, suggesting there may be limited opportunities for the growth of public awareness of such issues. However, the broad interest in sustainability from interest groups and private sector organisations is evident in the large number of public submissions received by the Sustainability Policy Unit and the large attendance at the range of public seminars held throughout Western Australia. There were 371 written submissions over two rounds of consultation on the Sustainability Strategy, and over 500 people attended various workshops and seminars on the sustainability strategy.

The final strategy *Hope for the Future: Western Australian State Sustainability Strategy* (Government of Western Australia 2003) was released in September 2003, and implementation of the strategy is currently being progressed through initiatives such as the multi-sectoral *Sustainability Roundtable*, the development of a *Sustainability Code of Practice* for government agencies and the drafting of a *Sustainability Act.*

The WA Collaboration

During the lead up to the State election in February 2001, key Western Australian environmental groups (such as the Conservation Council of WA, The Wilderness Society, Environs Kimberley, etc) had been working co-operatively under the banner of the Environmental Alliance to bring environmental and sustainability issues to the forefront of the election campaign (Environmental Alliance 2001). At the same time, the WA Council of Social Service was undertaking a research project to develop a model of *Social Sustainability* as a precursor to developing housing indicators for socially sustainable communities in Western Australia (Barron and Gauntlett 2002).

These organisations, already involved in deliberations about sustainability, recognised the potential for developing a strong and coordinated voice from civil society to contribute to the sustainability debate. The WA Collaboration was also inspired by the formation of the Australian Collaboration in 2001, a similar grouping of peak organisations at the national level, and their publication of *A Just and Sustainable Australia* (Yencken and Porter 2001).

Many commentators have suggested that partnerships and collaboration between and within different sectors are essential for achieving sustainability. Nocon (2004) describes sustainability foremost as a process that is most productive through communicative and collaborative processes. In addition, Hemmati (2002) focuses on how people and organisations from very different backgrounds can work together in an increasingly complex political, social and economic environment and argues that more developed multi-stakeholder processes will be critical to engendering ownership of strategies to advance sustainability.

For the organisations involved, the WA Collaboration represents an attempt to progress sustainability in Western Australia through partnership, and represents the

first time that organisations from such a diversity of perspectives have cooperated to such an extent in WA, particularly around a concept as broad as sustainability.

The founding organisations of the WA Collaboration are primarily 'peak bodies' in the civil society sector. A peak body is 'a non-government organisation whose membership consists of smaller organisations of allied interests' (Melville and Perkins 2003, p. 5, cited in Maddison *et al*. 2004, p. 9). The composition of the WA Collaboration is an attempt to draw together peak bodies representing the quadruple bottom line of environmental, social, cultural and economic concerns:

- *Council of Churches of WA* - an association of Christian Churches or related Christian bodies, which exists to promote a closer unity among Christians in WA
- *Ethnic Communities Council of WA* - advocates on behalf of all ethnic communities in WA
- *Conservation Council of WA* - the peak body for conservation organisations in WA
- *Unions WA* -the peak trade union body in WA
- *WA Council of Social Service* - peak council of community service organisations and individuals in Western Australia.

In addition to these organisations, two other organisations were part of the founding partnership:

- *Aboriginal and Torres Strait Islander Commission* - since its abolition by the Federal Government, the WA Collaboration has yet to identify an organisation to represent indigenous interests to take its place on the Steering Committee
- *WA Sustainable Industry Group* - a multi-stakeholder network of business, public sector, environment, engineering and education professionals. Because the Sustainable Industry Group is not enabled to make policy statements on behalf of its signatories, and because the WA Collaboration was increasingly interested in doing so, it is no longer involved in the Steering Committee.

Apart from the peak-body organisations represented on the Steering Committee, the WA Collaboration also invites interested community organisations to affiliate, and at the time of writing, there were approximately 30 organisations formally affiliated. These affiliates include groups operating in the areas of social service provision, environmental advocacy, community development and individual churches. In addition, the WA Collaboration has established a much broader community of interested individuals which continues to grow, including people working in academia, state and local government, and the private sector.

The WA Collaboration has a regular schedule of events including community policy forums; 'Conversation Cafes' for more informal discussion of sustainability issues and exchange of perspectives; an annual 'Sustainable September' promotion which is based around a calendar of sustainability-related events; a weekly email bulletin; and continued assistance to regional and metropolitan communities as a network, information base and contact point for sustainability issues and activities. These activities allow a broader group besides the peak bodies represented on the Steering Committee to engage in policy deliberation for sustainability.

The WA Collaboration secured funding from Lotterywest (the official state lottery for Western Australia) for roughly two and a half years from August 2002. This allowed the Collaboration to develop an independent space for community exchange on sustainability and a counterpoint in the policy development process. The key source of administrative funding is now the State Government of Western Australia.

Developing the Community Sustainability agenda

The commitment of the State Government to develop a *State Sustainability Strategy* focused the initial efforts of the WA Collaboration on coordinating a 'community' response to the draft State Sustainability Strategy. In developing this response, the WA Collaboration sought to model a more inclusive and participatory approach to sustainability than that being undertaken in the development of the *State Sustainability Strategy*. From the outset, the WA Collaboration was committed to the idea of creating an encompassing and multi-sectoral agenda around sustainability - integrating the environmental, social and economic dimensions of sustainability. The WA Collaboration recognised that genuine partnerships and dialogue are characteristics of a short-term project, and that it was unlikely that the diverse interests represented in the WA Collaboration would quickly or easily come to complete agreement in a field as complex as sustainability. However, its structure and operation signalled an attempt to operate differently.

The origins of the WA Collaboration lie partly in response to what Keating (2000) and Coleman and Gøtze (2001) suggest to be a loss of legitimacy and

accountability of traditional structures of government; Coleman and Gøtze (2001, p. 4) argue that 'it is undoubtedly the case that most developed democracies are experiencing a collapse of confidence in traditional modes of democratic governance'. As mentioned above, many commentators have argued that achieving sustainability will require processes that provide opportunities for deeper collaboration and policy deliberation amongst a wide range of interests and stakeholders (e.g. Nocon 2004; Hemmati 2002). Yet at a time when more participatory approaches to policy-making and decision-making are being demanded by communities and stakeholders, there exist a number of serious critiques of the democratic practice of all levels of government. Criticisms range from processes being top-down, failing to genuinely take account of a range of community views, and complaints of both over- and under-consultation. The WA Collaboration's response to these critiques was to essentially undertake an engagement process on the *State Sustainability Strategy* parallel to the one being conducted by the Sustainability Policy Unit of the Department of Premier and Cabinet.

Between September 2002 and February 2003, the WA Collaboration conducted ten workshops throughout WA, between Albany and Kununurra, involving almost 200 people, and with the aim of increasing discussion in the community about sustainability and considering the implications of the State Government's draft *State Sustainability Strategy*. In organising the workshops, specific attempts were made to attract as wide a range of perspectives as possible, and the most successful workshops were those with a diversity of perspectives (for example, social service providers and advocates, environmental groups, church leaders, local business owners and progress associations).

Workshops were exploratory, aiming to build a picture of sustainability challenges and possible solutions in that region from the 'ground-up'. Besides reporting back to participants, the outcomes of these regional workshops helped to shape the agenda of the two day Sustainability Summit, held in February 2003. Organised by the WA Collaboration, the Summit brought together another 200 people (some of whom were at some of the regional workshops) to explore the issues and themes identified in the regional workshops in more depth, as well as to attempt to identify actions and recommendations for furthering sustainability in Western Australia.

The *Community Sustainability Agenda: Creating a Just and Sustainable Western Australia* was launched in March 2003. It was originally conceptualised as a response to the *State Sustainability Strategy;* however, as the process unfolded, it developed into a document that could stand alone as a position statement of the civil society sector in relation to State Government action on sustainability, and not just a reactive submission to the State Sustainability Strategy process. The final document is probably somewhere in between the two, with a focus primarily on what the State Government should be doing to respond to the challenge of sustainability, but also managing to capture a rich array of civil society perspectives by bringing them together around some key policy issues and recommendations. It outlines 47 recommendations in ten sections, and not surprisingly, foregrounds the importance of a strongly participatory approach to the further implementation of the sustainability agenda in Western Australia (Duggie and Hodgson 2003). The process undertaken to develop the themes from the regional workshops into the Community Sustainability Agenda is analysed further in the following section.

Reflections

In reflecting on the WA Collaboration's experience with integration, it is useful to consider the experience in terms of Marsh's (2000, pp. 196-200) two imperatives for increasing integrative capacity: generating encompassing positions (more than agreeing to disagree on everything but the one issue being pursued); and mobilising public debate. As the WA Collaboration found, these are both particularly challenging tasks, requiring conscious efforts on the part of the organisations involved.

Developing encompassing positions

A substantial and ongoing challenge for the WA Collaboration is that its focus - sustainability - does not lend itself to easy development of a single, coordinated position. Sustainability is complex and multi-faceted - 'an essentially contested and culturally rich discursive domain' (Davison 2001, p. 41). The challenge for the groups involved in the WA Collaboration is to be strategic and focused on where the common ground on sustainability lies, rather than seeing sustainability as a 'parking ground' for every issue of interest to each organisation.

This became particularly important in the finalisation of the *Community Sustainability Agenda*. This process was driven by the Coordinator of the WA Collaboration together with a consultant on a short-term contract. The outcomes of the discussions at the regional workshops were analysed, and the key themes from these discussions helped to shape the agenda of the Sustainability Summit.

The discussions on the first day of the Sustainability Summit were analysed on day two by a self-selected working group of participants with the aim of developing the general outcomes into workable recommendations for the *Community Sustainability Agenda*.

The very short timeframe for the entire process meant that the final negotiations to finalise the *Community Sustainability Agenda* happened very quickly. Drafts of the document were taken to three meetings of the WA Collaboration with representatives from each of the major partners taking part in the final discussions. As in every public policy process, at some point there needs to be a decision. The WA Collaboration could only open up the debate to the broader community for so long, until having to refer back to a more familiar form of decision-making: getting the key decision-makers together to finalise the recommendations, which did involve making some compromises from particular angles.

This is, however, an important part of the value of collaboration between interest groups, as opposed to straight out direct community consultation. The WA Collaboration performed a form of interest aggregation and prioritisation that direct consultation may not have achieved. While wider participation did come to a close at the refining stage of the *Community Sustainability Agenda,* key interests remained involved through the Steering Committee of the WA Collaboration to the end of the process and were prioritised and integrated collectively. The regional workshops and the Summit, for instance, allowed a wide range of views to be collected, and for these to be synthesised and offered back to participants and into the public arena. In this sense, it focused civil society on the issue of sustainability, then fed the results in an aggregated form back to civil society.

The differences in opinion which arose during these negotiations continue to shape much of the interesting deliberation in the WA Collaboration. Some of these issues include the most appropriate scale to consider sustainability (for example state versus global), and the apparent conflicts between social and environmental priorities (for example, potentially significant equity impacts of environmental policies, such as a rise in the price of water or a tax on polluting older vehicles). However, given the long-term nature of the WA Collaboration partnership, these more contentious issues are not swept aside completely but are likely to be deliberated and considered in the future.

There is early evidence that the WA Collaboration has promoted a form of coalition building that is more than matching pre-existing positions and ignoring differences. The development and release of the *Community Sustainability Agenda* is the most significant example of where the differing organisations of the WA Collaboration have found common ground. There are obviously some sections and recommendations within the document which are of more interest to some organisations than others, but many areas touched on by the *Community Sustainability Agenda* were strongly supported by all organisations. These areas included recommendations about the need for a genuinely participatory process and some institutional reforms to support sustainability, a framework for human rights in Western Australia, and policies for greater access to public transport and for reducing consumption.

As a basis for advocacy, it is difficult to accurately determine the impact of the *Community Sustainability Agenda* on the final policy outcomes of the *State Sustainability Strategy.* However, there were a number of significant 'policy gaps' in the consultation draft of the Strategy on which the WA Collaboration focused its advocacy efforts in the six months between the release of the *Community Sustainability Agenda* and the release of the final *State Sustainability Strategy*. The final Strategy reflected the WA Collaboration's priorities (to some extent) in a number of key areas, such as institutional reform for sustainability, Sustainability or Genuine Progress indicators, and legislative reform (including a *Sustainability Act).*

At the minimum, the *Community Sustainability Agenda* demonstrates the potential for this type of engagement between groups under the umbrella of structures like the WA Collaboration. In reality, the WA Collaboration faces a difficulty in finding the time or opportunity to facilitate internal processes of deliberation amongst the founding organisations, each of which has diverse background histories and cultures which are significant to the ongoing sustainability dialogue. In order to address this need for internal integration and examine the diversity of the group more closely, the WA Collaboration has undertaken a process to reflect on their differing policy positions, approaches to sustainability and values[1]. Such reflection has helped build understanding of the underlying values and policy positions of each organisation and helped develop a more robust sustainability discourse within the WA Collaboration.

1. The WA Collaboration Steering Committee participated in an intensive research process with Kathryn Buselich, one of the authors of this paper, as part of her PhD research. The intensive process helped to surface the underlying perspectives of the Steering Committee members and explore the commonalities and differences.

The relationships that have developed through the WA Collaboration have facilitated a whole range of other partnerships between organisations, such as between the WA Council of Social Services, Unions WA and the Conservation Council of WA on the issue of electricity reform; or between the WA Council of Social Services and the Conservation Council of WA on city policy and the impacts of oil depletion. In this way, the WA Collaboration has an ongoing and significant impact on the constituencies of the peak organisations involved in the WA Collaboration.

Mobilising public conversations on sustainability

As mentioned previously, the WA State Sustainability Strategy process tended to follow a more conventional form of public engagement, where governments tend to decide on an agenda and invite response rather than embarking on a process of engaging public opinion early on in the issue cycle. This approach to engaging the community has led to considerable disillusionment with the policy process. In responding to the State Government's sustainability agenda, the WA Collaboration aimed to model a more inclusive and participatory approach to developing sustainability policy.

The major points of differentiation between the WA Collaboration process and more traditional consultation processes stem from the WA Collaboration's unique situation and intermediary role. The regional workshops and the Sustainability Summit were approached with a genuine sense of inquiry and willingness to listen, being open to the views and issues that emerged and not being constrained by current government policy or politics. Consistent with Marsh's (2000) prescription, the WA Collaboration was able to step outside existing policy ideas and criticise government policy where necessary. There was an emphasis in the workshops and the Summit on facilitating discussion rather than imparting information. Rather than acting as a forum for group leaders and other élites to find common points of interest on which to base a lobbying strategy, the Collaboration membership were content to open up the agenda to 'community' input.

In opening up the debate, there were of course limiting factors and areas where input was below expectations. For instance, the WA Collaboration process did follow some familiar and more traditional patterns, such as a lack of provision for the greater involvement of indigenous people and minority groups and a lack of time for extra background research to minimise the exploratory and information phase of the regional workshops. While the discussions were useful for scene-setting and information-gathering, they were not long or extensive enough to move on from identifying the major sustainability issues in that region. Time constraints were also evident in the work of the WA Collaboration in the small lead-up time available to create awareness of sustainability issues in the broader community, as well as to mobilise opinion on which issues are important to people.

Levels of previous engagement with the concept of sustainability were relatively low in the broader community. This means that in an open process there will often be new people at meetings and workshops with little experience of the WA Collaboration or the concept of sustainability itself. Maintaining an open process can prevent ongoing deliberations from moving forward but also tends to move discussion back to the beginning, to the gathering of information and general discussion about sustainability. In addition, the absence of media attention for either the work of the State Government or the WA Collaboration inhibited the development of an informed public able to engage with the concept of sustainability in a timely manner.

The ability of the WA Collaboration to adopt an open-ended mode of conversation with the community, well beyond its founding partner organisations, was to some extent attributable to its funding. The contribution of Lotterywest to funding the group meant that it was independent of the direct operational realities of its member groups and of obligations to the state. Being independent of government and the member organisations enabled the Collaboration to function as a true intermediary between state and civil society. It was freely able to engage and criticise government without risking a loss of funding.

Since early 2005, the WA Collaboration's primary source of funding has been from the State Government of Western Australia, which raises questions about the continued independence of the WA Collaboration. This issue confronts almost all groups operating in the non-government sector, but the evidence to date is that the State Government is committed to an arms-length relationship.

Continuing the intermediary role

With the release of the final *State Sustainability Strategy,* the WA Collaboration continues to play a key intermediary role between the civil society sector and the State Government in the implementation of the Strategy. The primary institutional driver for the implementation of

the *State Sustainability Strategy* is the Sustainability Roundtable, a multi-sectoral body providing advice to the Premier of Western Australia. The Coordinator of the WA Collaboration is a member of the Roundtable, and the WA Collaboration continues to hold open community forums in order to better communicate those views within State Government processes. In this way, the WA Collaboration continues to facilitate greater involvement of the community in policy-making.

The links that continue to be established between the policy system and the WA Collaboration represent some significant challenges. For example, there has been the tendency for the WA Collaboration to be viewed as a 'peak of the peaks' or a peak body for 'community', and in some ways a substitute for a broader participatory process. With its reasonable success in mobilising participation, deliberation and public opinion - in effect becoming an intermediary structure between state and society - it seems that government has had unfounded expectations of the WA Collaboration and lacks familiarity with both its processes of participation and modes of behaviour. One can appreciate the way in which more traditional and institutional modes of operation would be attractive for government. However, at the end of the day, the WA Collaboration cannot discipline, coerce or bargain with society. It is able to develop a position amongst group leaders and generate authority for its statements by its own methods of participation and mobilisation, but it is not a substitute for elected government to exercise authority and represent its public.

One of the most significant impacts of the WA Collaboration to date has been its role in increasing awareness of the sustainability agenda amongst the community and non-government sector and in maintaining a deliberative space in which to seek encompassing positions. Most of the indicators of broader interest in the WA Collaboration are increasing, such as the number of groups affiliating with the WA Collaboration, hits on the website, and growing interest in events, forums and the email list. Another significant measure of achievement is that sustainability remains on the political agenda and is being addressed in a strategic manner by the State Government.

Conclusions

Initiatives such as the WA Collaboration facilitate the types of mobilising and participatory processes essential for integration to occur, but at the same time there is a need for a policy environment that supports its strategic policy-making capacity. The WA Collaboration has made significant progress towards creating opportunities for deliberation that leads to integration of policy issues in its mobilisation of public participants in a relatively short period of time. Partnerships between and within civil society, government and the private sector, such as those the WA Collaboration fosters, will enable a transition towards strategic and more integrative decision-making.

This general approach of forming collaborations of groups and interests around the issue of sustainability could conceivably be replicated elsewhere. This case study offers evidence that groups are able to move beyond coalition to a more enduring form of collaboration. Specifying the precise conditions (from a group perspective) for collaboration is beyond the scope of this paper, but it would make a useful future strand of research. However, the WA Collaboration experience does suggest that the policy and institutional environment has a significant bearing on the likelihood of replicating this structure elsewhere.

Other jurisdictions in Australia are tackling sustainability in a variety of ways, for example, South Australia has a Sustainability Roundtable and an Office of Sustainability, and the Australian Capital Territory has an Office of Sustainability and a set of sustainability indicators. However, Western Australia is the only state to have attempted a comprehensive sustainability strategy.

The process to develop the *State Sustainability Strategy* provided a significant catalyst for the formation of the WA Collaboration and gave some sense of urgency to the WA Collaboration deliberations. As is evidenced in the attempts to develop similar collaborations in South Australia and Queensland, it is difficult to make this kind of collaboration a high priority without impetus of the surrounding policy environment. The availability of generous funding from Lotterywest was another critical factor in allowing the WA Collaboration to quickly establish and undertake a significant process of mobilising public opinion.

However, there are significant challenges inherent in operating in this integrative mode for interest groups, social movements and NGOs. As time goes on, maintaining a collaboration rather than simply a coalition will remain a challenge. The emphasis on collaboration rather than coalition requires intensive internal 'team building' efforts, and tensions exist between differing opinions on the role, and the most appropriate focus, of the WA Collaboration. In terms of public mobilisation, there is a struggle in moving beyond the 'usual suspects' who are already convinced of the value of a sustainability perspective. The WA Collaboration has been committed to moving beyond this, but such a task takes time and

resources, both of which are under pressure within the short-term phases of the conventional policy process.

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Towards More Integrated Natural Resource Management in Victoria: Possible Elements of an Integrated State-wide Policy Framework

Brian Coffey and Andrew Major#*

There is a growing recognition of the complexity of environmental issues and acceptance of the value of more integrated approaches to address them. Evidence of progress with the development of more integrated approaches is however less clear cut. Within this context, this paper explores how a more integrated approach to natural resource management at a state government level could be progressed. Using recent experience in Victoria as a focus, this paper provides an overview of environment and natural resources issues confronting the state, highlights why integration is an important element of any response, and outlines the current policy and organisational context. Possible elements of a state-wide policy framework for more integrated natural resource management across a state government organisation are also outlined and discussed.

Introduction

Environmental issues are widely recognised as important public policy issues, and while the nature and adequacy of responses adopted varies, there is little dispute that the issues are important.

One clear theme in the diverse policy literature on environmental issues is the need for environmental objectives to be integrated into all facets of decision making - the environment cannot be treated as an add-on. However, recognising that integration can be pursued at different levels and in different ways, this paper seeks to contribute to the development and implementation of a more integrated approach to natural resource management (NRM). Recent work on developing a framework for integrated NRM undertaken within the Victorian Department of Sustainability and Environment is outlined and discussed.

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The remainder of the paper is structured as follows: Section 2 provides a brief overview of some of the environmental challenges facing Victoria; Section 3 introduces policy integration as an essential element of sustainable development; Section 4 outlines the current policy and organisational context for NRM in Victoria; and Section 5 proposes a framework that could be applied to progress a more integrated approach to NRM.

In broad terms, while this paper touches on conceptual elements of integration, the primary focus is on how integration can be progressed in practice. The paper is pitched at the state government level, although the framework proposed could be scaled to other levels (e.g. regional) and so may be of particular interest to policy and program practitioners within state governments and catchment management agencies.

Environment and natural resource management context

Victoria, like many other areas, has many environmental characteristics or 'natural assets', covering land, water, biodiversity (both plants and animals) and air. In relation to biodiversity, an overview of the principal types of ecosystems in Victoria, and some of the ecosystems and species at risk, is provided in the volume of Victoria's *Biodiversity Strategy* titled *Our Living Wealth* (DNRE 1997).

Maintaining, and where possible enhancing, these 'assets' will undoubtedly contribute to Victoria's long term environmental sustainability. Important values associated with these assets include:

- their intrinsic value (biodiversity is valuable for its own sake)
- the ecosystem services they provide (e.g. clean air and water)
- the amenity and recreational benefits they provide

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- the opportunity to use them to provide economic and social goods
- the maintenance of inter-generational equity (Chapter 2 of Eckersley 1992 provides a detailed discussion of different motivations for environmental concern).

However, a credible body of evidence indicates that Victoria's environment is facing serious threats. Much of this evidence is presented in the Victorian Catchment Management Council's report *The Health of Our Catchments - A Victorian Report Card,* which provides an authoritative and comprehensive assessment of efforts to date (VCMC 2002). For example, it is estimated that 70 per cent of Victoria's native vegetation has been cleared since European settlement, and this clearing has impacted in particular upon vegetation types in the more fertile or accessible landscapes suited to pastoral, agricultural or urban land use (VCMC 2002). Further, this widespread land clearing has not only reduced biodiversity (including habitat for animals), it has also contributed to other NRM issues, such as soil erosion, rising water tables and dryland salinity, through changes to water balances.

In relation to dryland salinity, 670 000 ha of land in Victoria is currently predicted to be at risk from shallow, saline water tables, with a worst case scenario (assuming a relatively wet climatic scenario) that within 50 years, the area at risk of severe salinity could be over 3 million ha (NLWRA 2001). Under this scenario, between 8 and 18 per cent of Victoria's agricultural land is predicted to fall into the high salinity risk category, with a further 47 per cent at moderate risk. Further examples of the environmental threats facing the State are provided in Table 1, which summarises a selection of catchment condition indicators from the Victorian Catchment Management Council's Report.

Importantly, the nature and magnitude of different threats varies, as does their spatial expression across Victoria and across land tenures (i.e. threats originating from private land may be expressed on public land, and vice versa). In addition, some areas are subject to multiple threats, leading to stressed landscapes (Morgan 2001).

There is also an emerging recognition that, in addition to environmental challenges, the consequences of economic and demographic change need to be considered (ABC 2005; VCMC 2002; Barr 2004).

Given these are some of the major threats and challenges facing Victoria, how effective are the responses that have been implemented? The Victorian Catchment Management Council's analysis is insightful, as the following extracts demonstrate:

Table 1. The condition and trend of selected environment and natural resource indicators for Victoria (VCMC 2002).

Indicator	Statewide Assessment of Condition and Trend
Conservation of native vegetation types at the state and bioregional level	Poor and negative
Conservation status of species at the state and bioregional level	Poor and negative
Index of stream conditions	Moderate
Environmental flows	Unknown
Estuary conditions	Unknown
Urban water consumption	Unknown
Groundwater allocation and use	Good and stable
Compliance with bulk water entitlements	Unknown
Dryland salinity	Poor and negative
Soil acidification	Moderate and negative
Soil structure decline	Poor and unknown
Greenhouse gas emissions	Negative

> Are we making a difference? - the simple answer is yes, but not enough! (VCMC 2002, p. 95).
>
> Our natural resources are under pressure and, in many cases, will not be passed on to the next generation in good condition ... under current resourcing and management paradigms our efforts to protect and sustainably manage natural capital are not keeping pace with the breadth of degradation symptoms depreciating the natural capital base. (VCMC 2002, p. vi).

This assessment indicates that much more needs to be done if Victoria's environmental and natural resource challenges are to be met. While there are a number of ways in which this can be progressed, a clear development in the policy literature and current practice is that integration is a key mechanism for progressing environmental sustainability.

Environmental policy integration as an essential element of sustainable development

This section provides a brief overview of the concept of integration and why it is important for promoting sustainable development. It provides the context for later discussion on what a more integrated approach to NRM might look like.

Environmental policy integration is recognised as an essential element of sustainable development. Lafferty and Hovden (2002, p. 1), for example, state that:

> One of the key defining features of 'sustainable development' is the emphasis on the integration of environmental objectives into non-environmental policy sectors. This entails a fundamental recognition that the environmental sector alone [i.e. environmental agencies] will not be able to secure environmental objectives, and that other sectors must therefore take on board environmental policy objectives if these are to be achieved.

More integrated ways for addressing sustainability issues are also needed because sustainability issues present different challenges to other policy issues (see Dovers 1997 and Carter 2001 for more detailed discussions).

The idea of integration is not new. Both Persson (2002) and Hertin and Berkhout (2003), for example, recognise that the necessity of jointly considering economic and environmental policy has been emphasised in several classical environmental texts, such as *A Blueprint for Survival* (Goldsmith *et al*. 1972), the *World Conservation Strategy* (IUCN 1980) and *Our Common Future* (WCED 1987). Further, Lafferty and Hovden (2002, p. 1) state that 'although EPI (environmental policy integration) does not in itself constitute sustainable development, it is impossible to conceive of sustainable development without successful EPI'.

However, what is meant by the idea of integration? Two different forms of integration are typically identified:

- *Horizontal* (or inter-sectoral) integration pursues a coordinated and coherent strategy across different sectors (e.g. whole of government approaches).
- *Vertical* (or intra-sectoral) integration focuses on the integrated management of a single natural resource (legislation, policy, governance, investment and delivery aligned) (adapted from Carter 2001).

While this may suggest that environmental policy integration is a relatively straightforward endeavour, this is not the case for a range of reasons. Firstly, examples of successful integration are less apparent than one would think. For example, Hertin and Berkhout (2003) consider that, although the question of how an integrated approach to the environment can be positively implemented has been continuously debated since the 1970s, the practice of environmental policy making remains largely unchanged. The recent report of the Productivity Commission (1999) into the implementation of ecologically sustainable development by Commonwealth Government departments and agencies is instructive in this regard, making it clear that there is considerable room for improvement in current Australian policy practice. This challenge is clearly demonstrated in the title of a recent paper *Environmental policy integration: the easy idea that is difficult to implement* (Janicke 2003).

Secondly, the concept of integration is more complex than it first appears. For example, despite Janicke's (2003) view of integration being an easy idea, Scrase and Sheate (2002) identify 14 different meanings of integration in the environmental assessment and governance literature. Wisely, Scrase and Sheate (2002) conclude that integration is not a panacea for promoting sustainability, and that while some approaches to integration are positive, this is not always the case. Some approaches to integration may work against sustainable development, while the value of others will be influenced by the circumstances in which they are pursued.

This leads to the issue of how to pursue integration in a way that positively contributes to sustainability. The questions investigated by Hertin and Berkhout (2003, p. 40) provide a starting point for clarifying these issues:

> What exactly should be integrated: policy objectives, decision making structures, knowledge and capabilities, or policy instruments? Does it involve a change of balance of power between sectoral and environmental administrations, or is integration a question of expertise and organisational routines?

If integration is to be successful and positive, it needs to be targeted and tailored to a particular situation. In relation to the focus of this paper, it is considered that there is a clear need in Victoria for greater coherence and clarity of policy goals and directions for NRM at the state-wide level, and that integration provides a clear mechanism for pursuing this.

Policy and organisational context

This section briefly outlines two major policy developments that inform the Victorian Government's approach to sustainable development and which currently influence how integrated approaches to NRM may be progressed. These two developments are the release of *Growing Victoria Together* (DPC 2001), and machinery of government changes to establish the Department of Sustainability and Environment.

Growing Victoria Together: Innovative State, Caring Communities (DPC 2001) was released in November 2001, and articulates the Government's broad agenda for public policy and government. This includes what the Victorian Government sees as the social, environmental and economic goals for the State over the next 10 years and how they will be achieved. Adams and Wiseman

(2003) provide a more detailed 'insiders' account of the development and rationale underpinning *Growing Victoria Together.*

In broad terms, environmental sustainability is stated as a core element of the Government's policy directions, as is evident from the Government's *Vision for Victoria* in 2010 (DPC 2001, p. 6), in which:

- 'innovation leads to thriving industries generating high quality jobs
- protecting the environment for future generations is built into everything we do
- we have caring, safe communities in which opportunities are fairly shared, and
- all Victorians have access to the highest quality health and education services all through their lives.'

Further, 'promoting sustainable development' and 'protecting the environment for future generations' are two of the strategic issues the Government has identified as needing to be achieved if their vision for Victoria is to become a reality (DPC 2001, p. 6).

Following its re-election in November 2002, the Government announced the establishment of the Department of Sustainability and Environment, to bring together the State's responsibilities for managing its natural and built environments, and provide a strong policy focus on sustainability as a key objective of government. It was also expected that the Department would help to achieve the Government's vision of Victoria as a world leader in sustainability (DSE 2003).

The implications of these policy developments in terms of achieving greater integration are not clear-cut. Firstly, while *Growing Victoria Together* includes a commitment to sustainable development, the approach adopted would appear to be more informed by the notion of a 'balanced' approach to sustainable development rather than an 'integrated' approach.

Secondly, the Department of Sustainability and Environment was established by splitting off the primary industry responsibilities from the Department of Natural Resources and Environment and adding planning responsibilities from the Department of Infrastructure. On face value, this is problematic in terms of integration as the Department of Natural Resources and Environment had clear organisational responsibility for both the environment and primary industries. In theory at least, this creates clear opportunities for driving the integration of environmental concerns into other spheres of decision-making (in this case primary industries).

However, at least two questions can be raised against this role of the Department of Natural Resources and Environment. Firstly, were environmental views appropriately considered within the Department, or did economic views dominate? Secondly, was the Department of Natural Resources and Environment too narrow in focus (only being concerned with the environmental implications of primary industries) and does the Department of Sustainability and Environment, with its policy focus on sustainability as a key focus of government, provide greater scope for integration across all areas of government?

These questions, while important from a broader policy perspective, are beyond the scope of this paper. Instead, this paper is focused on how greater integration can be achieved across the range of state-wide policies and programs that are being undertaken across the Department of Sustainability and Environment, particularly in relation to NRM. However, the framework advocated is scalable, and could also be applied at regional level.

Towards a more integrated approach to natural resource management policy

An important element of the Department's objective to establish Victoria as a leader in environmental sustainability is the development of 'a statewide framework for integrated natural resource management in a catchment context to complement the suite of regional catchment strategies and guide state wide investment in land, water and biodiversity' (DSE 2003, p. 11). The framework outlined below was developed as part of a project established to deliver on this commitment.

In a broad sense, the integrated NRM project was a high-level policy review project that aimed to improve Victoria's approach to NRM. Put simply, the project focused on articulating a coherent framework for linking the different NRM activities undertaken (such as pest plant and animal management, native vegetation management, salinity management or water resource management).

Project Staging

Stage one of the project was completed in June 2003 and culminated in the preparation of a review paper (Coughlin 2003), which considered international experiences in establishing NRM frameworks and identified some possible elements of an integrated NRM framework. In a sense, this paper involved the undertaking of an environmental scan to identify best practice examples from other jurisdictions, and a consideration of their suitability for Victoria. Stage two, which commenced in July 2003, involved the development of a draft integrated NRM

framework, with some of its key elements outlined in this paper. Stage three, which commenced in late 2004, involved gaining agreement for different elements of the framework.

Building on, and enhancing, current efforts

Over the past 30 years or so, a wide range of policies and programs have been established and implemented in response to particular environmental and natural resource issues. However, as more policies and programs have been established, Victoria's approach to environmental governance has become more complex. While this reflects (at least in part) the complexity of sustainability issues, it also indicates that limited attention has been directed to how the different elements intersect.

For example, in undertaking the project it was identified that:

- While there are approximately 28 pieces of 'environmental' legislation and numerous state-wide strategies and investment programs, there is no state-wide framework that provides a coherent focus for these activities (i.e. strategies and programs are pitched at different levels and the coverage of issues is not comprehensive).
- There are no state-wide goals and targets to provide a clear focus for efforts to achieve integrated land, water and biodiversity outcomes, and there is no consistent approach to developing these goals and targets.
- It is difficult for regional and local authorities to align priorities with state-wide goals and targets.
- The relationship between on-ground expenditure and state-wide priorities is unclear.
- The value of knowledge and integrated understanding is not fully appreciated or utilised.
- Monitoring and review is not systematically undertaken.
- The links between NRM and regional land use planning are poorly established.

A more integrated approach to setting integrated state-wide policy and program directions would therefore seem to be particularly useful in a mature system of environmental governance, such as Victoria's (by mature system, we mean where sectoral and single issue policies and programs have been in operation over the past 30 years or so). It is also recognised that total integration may not be feasible or desirable - diversity enables policy learning - therefore integration should be approached in a strategic manner - it should be purposeful (i.e. clearly focused on promoting sustainability).

A strategic approach to integration

Building on Scrase and Sheate's (2002) recognition of the many forms of integration, it is also apparent that integration can be approached at various levels and in various ways. Working towards integrated policy is therefore complex; there are no magic bullets.

However, we also consider that integration is best approached in a systematic manner - there should be a concerted effort to understand how different policies and program settings interact and there should be a clear agenda for change. By contrast, while benefits may be obtained from improving integration within particular program areas (e.g. water resource management), these may or may not contribute to overall integration. We consider that more significant benefits arise from investigating and progressing opportunities for integration in a systematic manner rather than relying on *ad hoc* piecemeal changes. Within an adaptive management framework, this would be considered as purposeful change (Dovers 1997).

In line with this, the following elements are proposed as an effective means for bringing about more integrated NRM through purposeful change:

- establishing a vision for integrated NRM
- identifying integrated NRM outcome areas, and approaches to target setting
- creating a more integrated legislative framework
- aligning policy with outcomes
- identifying and investing in priorities
- improving knowledge and capacity
- monitoring, evaluation and reporting.

These elements are closely interlinked, as indicated in Table 2, but will be discussed sequentially to give insights into the different elements. It should be noted that there is limited discussion of issues related to investment in this paper for the sake of brevity.

Creating a State-wide vision, outcomes and targets for natural resource management

Establishing an integrated vision, set of outcomes and associated targets gives meaning to the idea of sustainability: it provides a clear indication of what is to be achieved, across what areas, and within what time-frames.

In proposing a vision and associated outcome areas, we have been heavily informed by the approach adopted in Sweden (see EOC 2004).

Table 2. A possible framework for more integrated natural resource management policy in Victoria.

Proposed Vision for NRM: Sustainability in a Generation
(What do we want to achieve?)

↓

Natural Resource Management Framework
(How will we know if we've achieved our vision – what might regional environmental sustainability look like?)

Natural Resource Management Outcomes	**Healthy Land Systems**	**Maintain and Enhance Biodiversity and Ecological Integrity**	**Healthy Rivers and Waterways**	**Sustainable Marine and Coastal Zones**	**Respect and Preserve Cultural Heritage**	**Vibrant Communities and Livable Human Settlements**	**Clean Air and Atmosphere**
Target Setting	*What are some of the milestones that need to be achieved along the way?*						
	Honour existing targets, but review over time using a rigorous approach to target setting						
Policy, Business and Delivery. • *Aligning policy with outcomes* • *Enhancing legislative frameworks* • *Identifying and investing in priorities* • *Improving knowledge and capacity*	**By what means can we achieve environmental sustainability?**						
	Current: What programs and knowledge do we have?						
	Future: What programs and knowledge do we need? – increased focus on program design and mix of policy tools						
Monitoring, Evaluation and Review	**How will we know if we are making a difference?** The SOE Report to be prepared by the Commissioner for Environmental Sustainability provides a useful mechanism for obtaining independent feedback and advice to Government on environmental performance.						

Vision

The articulation of a vision for NRM can provide a clear sense of purpose to guide future effort. A possible vision identified as part of the project is that Victoria could seek is:

> to achieve regional environmental sustainability within one generation.

This example vision is adapted from Sweden's goal of achieving sustainability within a single generation.

Identifying agreed outcome areas

While an outcomes focus can be criticised for simplifying complex issues and neglecting the importance of 'process' in public policy deliberations (Di Francesco 2001), we consider that it nevertheless can be useful for environmental policy and planning for a number of reasons. The identification of agreed NRM outcomes focuses attention on what it is that is trying to be achieved and provides a mechanism for focusing effort and measuring progress. The seven outcome areas proposed are consistent with the themes used for national State of the Environment reporting (ASEC 2001) and the themes identified as part of the Australian and New Zealand Environment and Conservation Council work to identify core environmental indicators for State of the Environment reporting (ANZECC 2000). We consider that linking sustainable development with an outcomes orientation creates a clear impetus for change.

The development of agreed outcome areas is also useful for a range of other reasons, principally that they:

- provide a coherent focus for policies and programs
- establish links between different programs and frameworks
- align with nationally recognised themes and indicators
- provide a mechanism for aligning NRM policies and programs with State of the Environment reporting to be undertaken by the Commissioner for Environmental Sustainability.

This alignment is outlined in Table 2. However, while the identification of clear outcomes is beneficial, it is necessary to remember that biophysical systems are interrelated, and so will not align with human defined boundaries that are imposed.

Great care also needs to be taken to ensure that attention is not inadvertently focused upon particular areas to the detriment of others. This would appear to be particularly the case with target setting, as there is a risk that the identification of targets narrows the focus of activity onto selected high profile areas, while other important areas are neglected.

Target setting

Setting targets provides a clear sense of what is to be achieved, by when (while recognising that targets can never fully capture the diversity of areas that require attention). Nonetheless, target setting can be useful for focusing attention, tracking progress, and developing a shared sense of milestones that have been achieved. Over time, targets would be established for each of the outcome areas identified above, and progress towards these targets regularly reported.

A range of targets are established in the existing suite of strategies. However, no consistent approach to target setting has been adopted, which makes it difficult to obtain an overall sense of what is trying to be achieved and what progress is being made. There are also gaps in the areas of established targets. To improve the coherence between strategies and programs, a clear approach to target setting should be established. Our current thinking is that the broad methodology agreed by state and commonwealth ministers in May 2002, through the Natural Resource Management Ministerial Council, provides a useful starting point for thinking about targets (i.e. aspirational targets, resource condition targets and management action targets).

A more integrated legislative framework

The Department of Sustainability and Environment portfolio ministers (i.e. Ministers for Environment, Water, Planning) are responsible for Victoria's principal environmental legislation. Over time, this suite of legislation has been added to, amended, and in some cases repealed, but effectively provides the legislative framework for environment and NRM in Victoria. Each Act is also a product of the specific circumstances operating at the time in which it was enacted, which means that older Acts may be outdated.

A high level scan of Victoria's principal environmental Acts was used to identify opportunities for improving Victoria's legislative framework for integrated NRM. Two particular areas where further attention would be useful include:

- *articulating natural resource management objectives (framework legislation).* The establishment of overarching NRM objectives legislation could articulate NRM aspirations, identify agreed outcome areas, require the development and five yearly review of a state-wide NRM strategy, and establish coordination and advisory bodies, among other things. Such an approach would be consistent with Sweden's approach
- *reviewing and enhancing under-utilised legislative tools.* There has been no systematic assessment of the environmental implications of Victoria's legislation. It would therefore be useful to review legislation to identify opportunities for enhancing legislative coverage; identify regulations that hinder sustainable development; consider under-utilised legislative policy tools; and clarify various roles and responsibilities. While potentially a major undertaking, such an approach has potential to improve environmental performance. The experience with the National Competition Policy demonstrates that mandated regulatory review processes are possible (Curran and Hollander 2002).

Aligning policy with outcomes

Clarifying program logic

Victoria has a wide range of state-wide strategies, policies and frameworks related to NRM (e.g. native vegetation management, pest plant and animals, biodiversity, salinity management, coastal management, etc). The links between these strategies are often not clear (different strategies are informed by different 'program' logics). Clearly articulating the alignment of policies with the outcome areas would provide a clearer sense of policy coverage and policy gaps. Other benefits are a strengthened focus on outcomes, less potential for contradictory policy objectives, and a clearer nesting and cascading of strategies.

Improving policy design

The design of policies and programs is the principal means for achieving policy outcomes on the ground. Therefore designing policies and programs with the 'right' mix of policy tools (or instruments of governance) is critical. Victoria has established, and currently deploys, a range of governance instruments as part of NRM efforts, with many of these being innovative. However, despite these efforts, the evidence from the

Victorian Catchment Management Council indicates that better approaches are required. One way that this can be achieved is through a stronger focus on policy design - more actively considering the range of policy interventions necessary to achieve the desired outcomes. This approach is consistent with a portfolio policy approach to the design of policy interventions as discussed by Doremus (2003).

Investment planning and priority setting

Investment planning can make a significant contribution to policy integration through matching investment decisions with policy directions; improving investment processes; and better identification of priorities. In some ways, the priority of an issue is reflected by the amount of resources directed towards it. A more integrated approach to investment would assist in targeting funding towards agreed priority outcomes.

More integrated approaches to investment planning also provide a mechanism for different funding providers to jointly identify areas where shared investments can deliver multiple outcomes. Such an approach is being progressed as part of Regional Catchment Investment Processes in Victoria. By contrast, past (and present) approaches to investment generally rely upon the use of single issue based funding programs of limited duration and with a project focus. This reduces flexibility and capacity to fund activities with multiple benefits. It also often makes it difficult to identify the links between projects, programs and outcomes.

It is also important to identify where effort should be directed, and further work in this area would be beneficial. For example, work on priority setting for salinity and NRM has been, and continues to be, undertaken through a range of mechanisms. While acknowledging the value (and limits) of previous work, the Victorian Auditor General (2001, p. 76) has recommended that:

> the Department invest in evaluative tools to measure the socio-economic, environmental and economic impacts of proposed salinity management options. This will provide a basis for sound decision making in terms of identifying appropriate management options and establishing funding priorities.

In progressing work in this area, a useful starting point is the recognition that priority setting is a complex and evolving activity.

Knowledge and capacity

Issues of knowledge and capacity are being considered as key elements for successful integration. Having the right data, information and knowledge is a critical component in progressing sustainable development (Dovers 1995). However, the value of these elements is not always fully appreciated, let alone utilised. Further, in order to deal with NRM in a more integrated way, the data collected, and the ways in which it is transformed into information and knowledge, must also be become more integrated. Flowing from this is the need to manage data, information and knowledge in ways which move beyond compartmentalised, or siloed approaches, while acknowledging that detailed technical data is still required in many circumstances. In a broad sense though, integrated decision making requires integrated understandings.

Questions of capacity, while complex, are clearly central to achieving integrated NRM. Our current impressions are that approaches to capacity building for NRM tend to:

- vary considerably using a range of different approaches
- are undertaken in the absence of a strategic framework
- are more likely to be issue based than integrated in their approach
- appear to place more emphasis on individual capacity rather than organisational or social capacity.

We therefore consider that, despite current efforts, further work on capacities is required to successfully progress more integrated approaches to NRM. In general terms, this would involve more attention being given to the areas of policy capacity, business capacity and capacity for delivery.

Monitoring, evaluation and reporting

The need for effective monitoring, evaluation and reporting is clear cut - it provides the means for tracking and reviewing progress, and is a key element of an adaptive management approach (see Dovers and Mobbs 1997). A key element of the integrated NRM project is to improve the alignment of policies and programs with agreed outcomes. As part of this, the intention is that the framework for NRM be consistent with the framework for State of the Environment reporting that is to be prepared by Victoria's newly established Commissioner for Environmental Sustainability. Under the *Commissioner for Environmental Sustainability Act 2003* (POV 2003), the Commissioner is responsible for preparing a State of the Environment report for Victoria. Having these frameworks aligned offers real potential for the establishment of a high-level continuous improvement cycle for NRM in Victoria.

Conclusion

Victoria has many important environmental assets. Ensuring these assets are maintained and, where possible, enhanced for current and future generations is an important challenge. More integrated approaches to NRM are considered a key element in meeting these challenges.

Integration is important because it provides a mechanism for environmental concerns to be built into decision-making, and thus is a critical mechanism for promoting sustainable development; albeit one that is more complex and difficult to achieve than first appears. Further, as integration can be pursued at many levels and through many means, there are no simple answers and no certainty that integration necessarily leads to sustainability.

As a way to encourage discussion on strategies and mechanisms for pursing more integrated approaches to NRM, this paper reports recent work undertaken in Victoria. This paper also proposes a policy framework that provides a practical basis for progressing more integrated approaches to NRM at a state government level, and particularly across an organisation. The framework outlined articulates a coherent sense of what it is that is trying to be achieved, and some of the key elements available for translating this vision into practice. In simple terms, it connects policy directions with business processes and monitoring and review mechanisms, to establish a mechanism for promoting sustainable development.

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Prioritising Integrated Landscape Change Through Rural Land Stewardship for Ecosystem Services

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Despite at least two decades of Government - community partnerships on issue-based natural resource management (NRM), evidence across the Victorian rural landscape continues to reveal a downward trend across a range of indicators. Integration of both program planning and implementation is proposed in this paper, as a key principle needed if the decline in catchment or landscape condition is to shift into being a measurably sustainable stewardship of rural land. Central to this integration principle are farm enterprise activities that integrate production and management of ecosystem services with production of food and fibre. The concept of integration in this instance should be understood as orchestrated actions at the individual farm enterprise scale and strategically located actions at a multiple farm regional scale. This paper contemplates NRM planning, with particular consideration of how state government, regional planning bodies (such as Catchment Management Authorities), and private land managers might better achieve integrated multiple outcomes that provide both public and private benefits from 'every day' land management activities. The paper draws on experiences from Victoria's Rural Land Stewardship *project.*

Introduction

Assessment of the rural landscape in Victoria, Australia, reveals a mediocre future prognosis for landscape assets under current land management practices. This downward trend is noted across a range of indicators, including dryland salinity, increased presence of pest organisms, and the receding distribution of naturally occurring native vegetation (VCMC 2002). This circumstance exists despite two decades or more of Government - land holder partnerships on issue-based NRM actions in Victoria (DNRE 2002).

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There has been a tendency in previous decades to approach rural natural resource issues as non-integrated or single-issue challenges. The reasons behind this history of actions are understandable. Resource or knowledge constraints have led to a predisposition for a reductive analysis of landscape problems. For example, perceived causal relationships between action and problem are assessed to produce linear, remedial actions. Within the scope of specific concerns, this issue-based approach has often been successful.

However, we argue here that, while this approach has logical origins and has produced some beneficial landscape outcomes, it is no longer sufficient for the scale and trajectory of change needed in the rural landscape. In addition, a critique of contemporary NRM efforts might reveal many missed opportunities for broad landscape, asset-based approaches while programs remain unintegrated or issue-based in focus. We argue that the landscape, asset-based approach provides a logical and sequential step into the broader planning framework implicit under the concept of ecosystem services, where these are defined as *public benefit services,* such as clean air and water, biodiversity increase or management, saline water table mitigation, soil condition management, carbon sequestration, pollination, soil and water nutrient management, waste assimilation, etc. In the context of this paper, ecosystem services (as public goods) are produced on private, rural land. Critically, we suggest that program integration in both planning and action is likely to be the only way change is achieved at a scale sufficient to deliver ecosystem services.

In a recent paper, David Adams (2003, p.4) observed that:

> Powerful public ideas have consistent features. Specifically they are simple to understand, resonate with people's experience of the world, make normative claims on resources, can be organised through the administrative forms of the day, have few or weak ideas to compete with, appear capable of solving major public problems and have a strong policy network to sustain them over time.

 # Disclaimer: the views expressed in this paper are not necessarily the views of the Victorian State Government.

The challenges to achieve alignment with the prerequisite conditions for successful new policy (set out above) are significant, particularly in preparing to deploy a complex program planning concept like 'ecosystem services'.

The *Rural Land Stewardship* project

The *Rural Land Stewardship* project is a policy development exercise within a stable of land stewardship strategy endeavours - including *Forest Stewardship* and *Public Land Stewardship* - currently in the final phase at the Department of Sustainability and Environment, Victoria. Attributes of the *Rural Land Stewardship* project include background elements, such as seven specialist discussion papers published by the Department, numerous seminars and workshops across the state, steerage by three separate stakeholder and technical committees; and resource backing by both state and national governments. The pivotal policy and program concept to emerge from the work to date is the provision and purchase of ecosystem services - produced on private land (for public good) in the rural landscape.

Information from the *Rural Land Stewardship* project and partnerships between state and regional 'sustainability' agencies point to a number of particular operational concepts needed to support rural land landscape change. In particular, we argue that through the use of an ecosystem services model, government might assist regions in integrating rural landscape management actions. Critical to the success of this task is to connect a number of related concepts into a coherent line of reasoning via an ecosystem services framework. The project uses a range of concepts: land stewardship (behaviour and ethic), ecosystem services (landscape product), landscape (a scale measure), landscape change (an outcome), public good (benefits that go beyond the boundaries of production location), integrated actions (complementary and orchestrated efforts), duty of care (a standard), etc. It is essential to the rationale of the project that ultimately the combined meaning of these terms sum to represent 'Rural Land Stewardship'.

NRM and integration

For this paper, we have adopted the definition of NRM proposed by Douglas *et al*. (2002): NRM is the management of the potential and realised impacts of people on the environment with the purpose of attaining ecologically sustainable development. The Commonwealth of Australia (1992) defined ecologically sustainable development as using, conserving, and enhancing the community's resources so that ecological processes are maintained or restored, and the total quality of life, now and in the future, can be increased.

Inherent in our definition of NRM is the need to recognise that improvement in NRM requires attention not only to the biophysical phenomena but also to the values, activities, and capabilities of resource stewards, and to the institutional, social and economic frameworks within which resource stewards operate. Having defined NRM in terms of the impact of people on natural resources, it follows that problem representations, analyses, policies, programs and institutional settings directed towards changing behaviour can be powerful mechanisms for improving NRM outcomes.

Understandably, the need for behavioural change is often associated with the people having direct responsibility for NRM decisions, the land stewards. However, improvement in NRM will also require the inclusion of activities, people, organisations and institutions that shape the parameters within which the stewards operate. This must include consideration of the globalised trading market and all levels of domestic government and its bureaucracies, as these provide drivers and barriers for stewards.

We have taken integration to be the direct, indirect and interactive effects of orchestrated and complementary activities. The purpose of integration in natural resource management is to achieve higher levels of effectiveness and efficiency by maximising synergistic effects and minimising antagonistic or perverse interactions between resource managers and users. Integration for effective NRM is proposed here as not being simply co-investment by multiple interests into a single issue. It is projected to be the alignment of complementary actions across multiple land issues to produce broader change in the landscape. It is also argued that integration of collective farm-scale actions may be most effective when directed through landscape-scale priorities for change such as those set out in the State of Victoria's ten *Regional Catchment Strategies.*

It is important to note that integration is concerned with activities, processes and outputs at all points from the conception of an idea to the realisation of beneficial change arising from action. It may be that different points (or stakeholders) in the 'conception to realisation' pathway have various integration requirements which need to be supported in a range of ways to be effective.

Landscape-scale (change) and participation

Farming has produced our current rural landscapes and, accordingly, we argue that these landscapes can be

transformed again by farming or farmer activity. Reviewing the history of primary industry in Australia shows that Australian farming has a record of being flexible and responsive to change (Barr and Cary 1992), and is a land-use type that is spatially contracting (Annett 2003).

To meet global sustainability imperatives and the challenge of arresting declining natural resource conditions in Victoria's rural landscape, we propose that landscape change at a sub-regional, regional or inter-regional scale is needed. At a sub-regional scale, for example, this may represent land-use change within a collection of hills, a tributary valley, or multiples of such rural landscape types. At a program level, this would necessitate working simultaneously with many landholders (farmers) covering many properties with project outcomes measurable in square kilometres of vegetation change, in-stream water quality change, etc. In other words, the focus is not just on change at the individual property scale.

Given this desired scale of change, there are likely to be threshold points below which projects under new approaches should not proceed. For example, a particular sub-region-scale project may need landholder participation rates that represent 85 per cent landscape coverage to be effective. High involvement levels or involvement thresholds are considered important to ensure scales of change are adequate to lead to ecosystem service production. Landholder participation rates and capacity will reasonably need to be considered across site-specific issues. In the firming *Rural Land Stewardship* approaches, it is anticipated that lower rates of landholder participation are unlikely to deliver landscape-scale outcomes inside appropriate time-spans - within five to ten years, for example.

Ecosystem services

As the evidence on declining natural resource condition continues to accumulate, it is becoming clearer that ecosystem services are not the infinitely available, anthropocentric resource once assumed. At the same time, we may be entering a period of hiatus where ecosystem services (particularly from the rural landscape) are beginning to be valued both environmentally and economically. This is manifested in the emerging discussion of multi-function agriculture, which emphasises the production of appropriate market goods as well as public goods and services (e.g. Hall *et al.* 2004).

The use of the term 'ecosystem services' and related language is increasing globally as a framework to rethink policy and programs to support provision of services in the rural landscape. In its Millennium Ecosystems Assessment project, the United Nations (2003, p. 3) declared that:

> Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as regulation of floods, drought, land degradation, and disease; supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, religious and other non-material benefits.

The Organisation for Economic Co-operation and Development discussed ecosystem services in the context of landholder roles and responsibilities. They also implied the importance of metrics in the private production of public benefits:

> Many environmental values associated with privately-owned natural resources are actually public goods. For example, private farmland may provide habitat for wildlife, and sinks for atmospheric carbon. The values of these services typically cannot be appropriated by individual landowners, though compensating producers for them should be considered ... where there is a problem of under-supply. If under-supply is a problem, and payments or other financial incentives are warranted, they should be clearly related to the public benefits being provided ... (OECD 2001, p. 92).

In Australia, the Australian Museum (2003, p. 1) argued that:

> Ecosystem services maintain the atmosphere, provide clean water, control soil erosion, pollution and pests, pollinate plants, and much more. Their total annual value in Australia has been estimated by the CSIRO to be $1327 billion...

As the signs mount, there seems little doubt that ecosystem services (and related terms) are becoming, or have become, the acknowledged framework for planning and implementation of change in the rural landscape. One theme that might be characterised from the various definitions quoted above is that society is rapidly reaching a point where it wants to procure currently non-marketable 'public goods' from the rural landscape. However, an aspect that is not clear in these definitions is that assessment of landscapes in terms of the provision of ecosystem services requires us to consider the landscape at a significant scale. We may contemplate a particular sub-region (or sub-bioregion) and produce an assessment of the ecosystem services that are in deficit (including those services that ought to be provided under a duty of care), and then design the appropriate scale project to close the sub-region gap in ecosystem services.

The increasing policy interest in developing ecosystem services and related concepts indicates a policy trend toward institutional investment support for the provision of ecosystem services by landholders (e.g. DEFRA 2002). This movement represents a significant opportunity for agencies of many jurisdictions to devise strategies and programs that provide support for ecosystem services production.

Purchasing ecosystem services

One of the key background principles identified in early workshops in the *Rural Land Stewardship* project was a need to keep people in the landscape. This is based on the argument that our rural landscape is a much-altered ecosystem and no longer has the stasis of naturally occurring landscapes, consequently requiring people to manage it.

The contemporary literature reveals the 'farm gate' level complexities in the proposition of retaining people in the landscape for its management. Geno (1999) and Rhodes *et al*. (2002) suggested it is only profitable farming operations that can afford to meet sustainability objectives. In addition to this, farm management can be in a state of flux driven by complicated changes in farmer demographics (Barr 2002), and adoption or disregard of sustainable practices often correlates with financial advantage or disadvantage (Cary *et al.* 2002; Lundqvist 2001). Through the creation of an additional income stream - farmers generating income from production of ecosystem services (in addition to income from production of food and fibre) - the *Rural Land Stewardship* project aims to increase the likelihood of people remaining in the rural landscape.

The Victorian Catchment Management Council (VCMC 2002) raised the concept of purchasing ecosystem services as a fundamental shift in the way land management change could be supported by government policy. Instead of concentrating effort and expenditure on repairing land, the focus shifts to production and payment for ecosystem services. A principle behind this approach is the need to protect and enhance broader ecosystem health, thereby securing production of ecosystem services.

The policy-level shift may be seen as being to a more positive approach to land-use change and away from a focus on the tension between decline and repair. At the policy level, an ecosystem services framework may also represent a shift from support for activities to support for measurable outcomes. There has been general agreement through the numerous *Rural Land Stewardship* workshops and seminars that ecosystem services have the potential to become a deliverable service (or product) from farms, and that rewarding landholders for producing ecosystem services needs further consideration. Key policy issues to consider include:

- What ecosystem services are above and beyond community, or legislated, expectation?
- How can ecosystem services be measured and paid for, what are the range of metrics needed?

How can this knowledge be transferred to landholders?*

The work of the project over the past two years indicates that some of these questions may be addressed through standards of care approaches, improved knowledge and information systems, and improved payment arrangements. A number of related program support methods are discussed in the following section.

Matters from *Rural Land Stewardship* and related policy papers

The *Rural Land Stewardship* project supported the preparation and publication of several policy discussion papers (available at www.dse.vic.gov.au). A number of pivotal policy and program themes emerged from these contributing papers. Primarily, the need was identified for a more formal alignment of current policy tools to be used in addressing the complexities of NRM (see VCMC/DSE 2003; Chaudhri 2003; Young *et al*. 2003).

This 'portfolio of tools' approach translates in its simplest form to mean the use of a palette of policy mechanisms that are responsive enough to be applied in varying degrees depending on a rigorous understanding of both the biophysical and social circumstances of particular rural landscapes. An example is applying leverage through an appropriate mix of mechanisms to support *volunteered, regulated* or *contract-driven* change in management practice. Some tools will also operate in a mutually inclusive manner - the use of market mechanisms require regulation to clearly define boundaries, and appropriately designed auctions can actually help to change the boundary between the marketed and non-marketed parts of the economy (Chaudhri 2003). There are a number of existing and new tools which could form part of such a portfolio, drawing from the spheres of 'information', 'regulation', voluntary and market-based instruments (Stoneham and Chaudhri 2000).

Another key theme to emerge was the pressing need for 'big picture' or landscape-scale goals to work toward. The goals and targets were described as being needed at

state, but particularly at regional or catchment levels (e.g. Mech *et al*. 2003; Young *et al*. 2003). There was strong agreement among discussion paper authors relating to the need for better information and understanding of the activities and practices which will move society toward achieving such landscape goals.

Several of the *Rural Land Stewardship* background papers raised the issue of 'heterogeneity' in both landscape and social capacity. The reality is that the same actions cost different landholders different amounts, and combined with this, the same actions will almost always have different results in different parts of the landscape (Chaudhri 2003; Young *et al*. 2003). The complexity that this situation presents has led the project to be focused on how to generate the most outcomes for the least public cost.

It was made clear in most of the papers that regulations are essential to underpin NRM. For instance, it is key to ensuring that landowners are not paid to undertake management actions that are part of their legal obligations. Specifically, regulations are critical to ensuring that some of the new, market-based, policy tools can function effectively (Chaudhri 2003; Young *et al*. 2003; Mech *et al*. 2003; Sammon and Thomson 2003). A key point was that regulation should be framed as enabling rather than restrictive, and that provisions, within existing Victorian legislation, have either been under-utilised or not yet fully applied.

Many of the contributing papers acknowledged the complexity of issues impacting on management of the rural environment. In particular, the inter-relationships between social, economic, and environmental aspects - reward for early adopters, duty of care and point of sale thresholds for selling ecosystem services, streamlining regulations and government investment processes - are issues discussed and evaluated by Cocklin *et al*. (2003) and Young *et al*. (2003).

Approaches to integrated sustainable rural landscapes

Gathering support and clarity about landscape-scale goals is as much a political process as it is technical, and can be time-consuming and difficult. Currently, the *Regional Catchment Strategies* come closest to describing regional aspirations of the people in each catchment area. With time, more information, and increased community understanding, even clearer goals will be developed at this level. Additionally, agreed goals for important cross-catchment assets (e.g. the Murray River) are also needed. The process of 'transacting' ecosystem services is likely to rely heavily on information capacities, which in some cases are not currently in place. As transition to higher order information occurs, however, there is a general information base available concerning 'more sustainable practices' for farm enterprises. We generally understand which practices are 'better' or less damaging to environmental assets or values than others.

Land managers need clarity and understanding about how that information can be applied. Some of the key information identified in the *Rural Land Stewardship* project as being required by landholders and potential investors is:

- clearly articulated regional or landscape-scale goals and targets
- practical knowledge of the actions which will achieve those goals.

Further, it is likely that potential implementation tools such as Environmental Management Systems - a business management tool for property level environmental management by agricultural enterprises - are unlikely to work well at a landscape-scale in the absence of having strategic landscape-scale goals, targets and knowledge systems in place (Mech *et al*. 2003). To address the variability of landscapes and their management across Victoria, it would be appropriate to articulate regional goals through the *Regional Catchment Strategies*. Codes of practice might then be used to describe the actions required to achieve those goals. When such prerequisites are in place, the role of Environmental Management Systems as a business management tool will be strengthened, by allowing focus on preferred multiple outcomes at the catchment scale. With an ecosystem services approach, those innovators who achieve the desired outcomes can be rewarded, but a *Rural Land Stewardship* program must include ways of continuing to build capacity, so that all interested landholders can engage as interest and other imperatives increase.

Mechanisms for moving forward

The need for clarity in broader community expectations of landholders through a standard for duty of care and regulation has been commonly noted through the work to date of the Rural Land Stewardship project (e.g. Cocklin *et al*. 2003). Young *et al*. (2003) identify that high level clarity and understanding of what is currently defined as being reasonable can be provided to landholders and other land managers by defining an environmental duty of care. They go further to discuss the potential need for transition payments where landholders are unable to meet

base-line duty of care expectations, or where the duty of care changes over time.

Clarity of understanding will contribute greatly to the identification of those ecosystem services which are being produced over and above what is 'expected', and which then could rightly be available for purchase, either by government or third party investors.

If framed appropriately, it is likely that duty or standards of care may operate and perhaps maximise benefits in the framework of landscape and social heterogeneity. This potential is particularly evident in creating more flexible forms of regulation that have various outcome foci. It has also been suggested that, to deal with regional differences and varying regional goals, agreed notions of 'reasonableness' could be set out in *Regional Catchment Strategies* (Young *et al*. 2003).

An effective payment or reward system for the production of ecosystem services would require a cluster of tools in support. This would require a move beyond the traditional fixed grants or cost-share type of approaches, which are confining, issue-based and activity focused (e.g. kilometres of fencing, number of rabbit-warrens destroyed, number of trees and shrubs planted) to approaches which are more outcome focused (e.g. area of habitat restored and managed, regional ground water flow mitigation, kilograms of carbon sequestered). Market-based approaches may be used to determine how much a specific, outcome-producing action would cost a specific landholder.

Approaches such as those using auction mechanisms firstly require a clear understanding of the rights and expectations of a landholder (it needs to be underpinned by regulation or a duty of care approach). It then requires dependable information concerning both the biophysical circumstances and the actions proposed to deliver the desired services. Once these criteria have been developed and reliably described, it is possible for a purchaser and a seller to 'do business' (Stoneham and Chaudhri 2000). An auction approach can reveal the best value for money for the buyer, and ensure that the seller is paid the true cost of the action, rather than an average cost, which may not meet his or her needs (Chaudhri 2003).

A clear understanding of rights and expectations can also pave the way for other market-based approaches, such as cap and trade and eco-labelling. All of these arrangements will require contracts and agreements to underpin them, and these can provide the confidence needed by potential third party investors.

Throughout the *Rural Land Stewardship* work, it has also been made clear that there may be circumstances where fixed grant-type approaches will still be needed (Young *et al*. 2003). These circumstances include situations where the 'public good' required is restricted to one specific property or area (e.g. threatened species protection), or where the desired outcome is clearly one which should be paid for by the government on behalf of the public.

Governance

To ensure all interested parties to the concept of buying and selling ecosystem services are able to engage, new governance arrangements may also have to be considered. Traditional approaches remain useful, particularly those approaches that have included the use of regulatory settings and taxes to ensure that the impacts of certain activities do not affect others in a negative way. However, in order to make effective use of the portfolio of approaches discussed in previous sections, existing governance arrangements within and between the public, private and third sectors may need closer examination.

The way governments do business is changing. Greater flexibility and an increased focus on *governance* rather than *government* is an emerging global trend (Hodge 2001). New approaches often include empowering communities to make decisions about their regions, ensuring that policies are flexible and responsive, and re-aligning traditionally separate objectives, such as agricultural, environmental and social goals.

Engaging with the private and 'third' sector

With the scale of NRM required across Victoria, and the limits to government funds, there is a need to consider leverage of private investment. Sammon and Thomson (2003) highlight government policy arrangements and regulatory interventions that assist in overcoming perceived impediments to private investment. Examples given include policies aimed at increasing consumer awareness and the implementation of a regulatory structure that provides for accreditation of public companies. These examples of government intervention have the potential to drive consumer demand, and thus stimulate further investment.

In addition, taxation reform can assist and promote private investment in research and development, and alternative investments. Specifically, Sammon and Thomson (2003) mention the options of increasing tax concessions for investment in research and development,

an Infrastructure Borrowing's Tax Offset Scheme to offset the high cost of infrastructure, and a range of other tax policy options designed to encourage investment in environmental land-use change. Sammon and Thomson (2003) also indicate that there are opportunities for government to assist the investment community in setting targets for superannuation fund investment in sustainable landscape practices.

What might new integrated approaches look like?

Two hundred years of European development and landscape change have produced a complex system of natural, amenity and productive land across Victoria. While the resulting matrix of landscapes offers many success stories, significant impairment has occurred and continues to occur in parts of the rural landscape. The challenge of integrating rural land management is broad and perhaps mirrors the multifarious nature of the landscape.

Integration through ecosystem service production is likely to require close collaboration between the producers, the measurers or monitors, and the purchasers. The producers might include private landholders, larger industry bodies, or even public land managers such as rural local government. The measurers and monitors will possibly include bodies such as Catchment Management Authorities, universities and other science providers. The purchasers may include national government programs, state-wide government programs, private sector investors or philanthropic organisations.

If state investment in a Victorian *Rural Land Stewardship* initiative (Department of Sustainability and Environment), for example, was conducted through the *Regional Catchment Investment* program - the potential exists to also attract (national) Australian Government investment (Department of Agriculture Fisheries and Forestry/ Department of Environment and Heritage). This is an important point under the concept that powerful public ideas have resonance when they can be organised through the administrative forms of the day (Adams 2003).

Under a *Rural Land Stewardship* project, Catchment Management Authorities or local government may propose a project under large-scale, (high threshold) criteria covering biophysical, social and financial questions. Biophysical includes estimated extensive scale delivery of ecosystem services - ground water flows, biodiversity, pest organisms, etc - from an entire subcatchment or valley, not just a single hill-top or valley head. The central challenge is being able to confidently model biophysical outputs (the ecosystem services) required to fulfil the scale of landscape change needed to not only halt, but reverse natural resource base decline. Reliable modelling of specified actions for required outputs across a range of indicators and metrics may reveal the extent of land-use change sought, and therefore the minimum landholder participation rate considered necessary for a viable *Rural Land Stewardship* project.

Conclusion

The *Rural Land Stewardship* project in Victoria is aimed at production of strategy and program to integrate currently fragmented or single issue-based approaches to sustainable management of the rural landscape. The project has constructed a significant foundation of guiding principles through the publication of numerous background papers and information documented through numerous consultation exercises.

The central conclusion of the project is that integrating single issue-based approaches to land management actions is imperative and has the greatest chance of being achieved through the use of an ecosystem services framework. This framework opens the potential to consider the rural landscape at a significant scale; that is, to produce ecosystem services from private rural land for broader public benefit will require planning and implementation at a landscape or sub-region scale, rather than at the individual property level.

It is planned that the 'operationalisation' of *Rural Land Stewardship* will symbolise a practical aspect of the elusive next paradigm shift in rural NRM - expanding the scale of land-use change through increasing possible income sources for landholders (ecosystem services transactions). Integration of effort at both the farm, regional and inter-regional scales is clearly pivotal to the *Rural Land Stewardship* concept of buying and selling ecosystem services.

The challenges are many. They include: rural landscape governance arrangements, measuring, modelling and valuing ecosystem services across multiple metrics and indicators, understanding the complex interaction between social and landscape capacities, and describing a practical mix of policy tools. In order that we meet the sustainability imperatives of the rural landscape, tackling these challenges is a vital endeavour.

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Integrate or Perish - Lessons in Integrated NRM from North Central Victoria

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The establishment and maturation of the catchment management framework in Victoria has influenced the development of a landscape approach to the protection and restoration of land, water and biodiversity resources. At the regional catchment scale, integrated approaches such as Biodiversity Action Planning have led to a clearer understanding of the complexity of landscape processes and the application of policy, extension, information management and community engagement tools that address the underlying causes of declining catchment health.

Introduction

Integrated Catchment Management approaches vary around Australia but are fundamentally based on the concepts of integration of community involvement, technical knowledge, organisational structure and policy objectives (Bellamy *et al*. 2002). Victoria has the most advanced level of devolvement of power of any state with respect to catchment management. In Victoria, the ten Catchment Management Authorities (CMAs) were established in 1997 as statutory authorities.

Each CMA has the primary goal of ensuring the protection and restoration of land and water resources, the sustainable development of natural resource-based industries and the conservation of natural and cultural heritage for particular regions (VCMC 2002). Regional Catchment Strategies are the core tool through which CMAs define how this goal is to be achieved.

CMAs also have a responsibility for involving the community in decisions relating to natural resource management (NRM) within their region and promoting community awareness and understanding of the importance of land and water resources, their suitable use, conservation and rehabilitation. The establishment of the *Catchment Management Framework* in Victoria in the mid 1990s has been a major step in connecting community aspirations to landscape dynamics. Central to this effort has been the unfolding of a sophisticated dialogue about Integrated Catchment Management.

The *Regional Catchment Strategy* is the primary integrated framework for land, water and biodiversity management in the CMA regions and the overarching strategic document, under which are nested the various regional action plans and strategies (DNRE 2002a). The *Regional Catchment Strategy* provides a vision for the future landscape of the region and the foundation for investment decisions to ensure improved resource outcomes. The *Regional Catchment Strategy* integrates a range of national, state and regional policies and plans that deal with NRM and incorporates regional and local agendas within that framework.

This paper provides a case study of how integrated NRM is occurring in North Central Victoria. It provides:

- an overview of the policy and practice context of the Victorian CMA framework
- an articulation of the asset-based framework being applied in the development of Regional Catchment Strategies
- an examination of how a NRM planning tool - Biodiversity Action Planning is being used for community engagement, strategic planning and implementation at a landscape scale
- lessons from this experience.

In the context of integration, this paper examines the need to plan and implement at a range of spatial and temporal scales, based on a better understanding of the complexity of landscape processes and with a focus on the underlying causes of declining catchment health.

The Victorian CMA framework - policy and practice context

The first generation of NRM plans and strategies in Victoria, including *Regional Catchment Strategies,* were largely problem- or threat-based. *Salinity Management Plans* and *Land and Water Management Plans* were developed in response to emerging issues such as dryland

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and irrigation salinity in areas of Victoria where these threats were being manifested. Their focus was mainly on how to deal with problems, such as dryland salinity, declining water quality and biodiversity loss.

This approach, whilst a good first step, was not sustainable because actions were determined based on urgency rather than the strategic importance of the resource and its value, in both financial and non-financial terms. As a result of these limitations and greater knowledge of problems, it is assets and the goods and services that they provide, rather than problems, that are now the major focus of the current generation of plans and strategies. This second generation of planning and implementation is based on a more sophisticated understanding of the asset-base and the nature and connectivity of processes that operate at a landscape scale. The North Central CMA region has also embraced the concept of integrated catchment management, where the linkage between managing different aspects of the catchment is recognised and understood. This has had a major influence on the way in which projects are implemented to deliver multiple benefits.

Integrated Catchment Management can only occur when all parties are involved in the planning and implementation process. The North Central CMA recognises that community ownership and engagement is fundamental for the successful implementation of the *Regional Catchment Strategy* and integrated catchment management. It has initiated a process to determine how best to engage the community and to establish the necessary roles, responsibilities, structures and processes.

Integration can be defined as 'the act, process...the condition of being formed into a whole...' (Gove 1971, p. 1174). Within the context of the North Central CMA region, the term integration has been loosely defined in the values and principles statement of the Authority (NCCMA 2003). In this statement, integration suggests that 'we will manage catchments holistically; that is, decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchments' (MDBMC 2001, p. i). These values and principles are in turn derived from the *Murray Darling Basin Ministerial Council Integrated Catchment Management Statement* (MDBMC 2001).

Landscapes are complex systems. They support a myriad of ecological processes, a diversity of social and community interactions, as well as the resource base for economic activity. This is exemplified at the regional scale by the interplay between dryland salinity and biodiversity planning. Where remnants are located in mid-catchment areas and lower slope landscape positions, there is a risk of a potential impact on native biodiversity (native vegetation and dependent fauna) from salinity, as suggested from our current understanding of salinity processes including knowledge about groundwater flow systems (Coram *et al*. 2000).

North Central context - landscape, community, economy

The North Central region is located within the Murray-Darling Basin. The study area encompasses the North Central Catchment Management Authority region, an area of approximately three million hectares (13 per cent of the State of Victoria), with a regional population of 200 000. Land-use in the region is diverse, with agriculture the principal activity, utilising 65 per cent of the land. Other important land-uses include forestry, mining, urban infrastructure, and 'lifestyle' or small acreage holdings. The region has an extensive network of state and national parks, including the unique Terrick Terrick National Park in the north of the region. Extensive dryland farming includes sheep and cattle grazing, grains, legumes, oil seeds and hay crops. Irrigated agriculture is significant, particularly in northern areas where dairying, vegetable production and horticulture are practised. Approximately 13 per cent of the region is public land, with much of this reserved and managed for specific purposes, including state and regional parks, state forests, flora reserves and reference areas. The majority of soil types in the region are of low fertility, and are shallow and prone to degradation.

Major threats facing the region include irrigation and dryland salinity, water quality decline and groundwater contamination, soil acidification, erosion and soil structural problems, flooding and drainage, fragmentation and destruction of wildlife habitat, and pest plant and animal infestations and proliferation. In addition, the viability of some agricultural industries is threatened. The region has some of the most severely salt-affected areas in Victoria, directly impacting on the Murray River. There is an extensive network of community groups (approximately 160 Landcare and community groups) actively involved in addressing NRM issues.

The gross value of primary production in the North Central region has increased from $685 000 in 1997 to $785 000 in 2001 (NCCMA 2003). This is in line with the trend across much of rural and regional Victoria. Declining terms-of-trade, however, have led to a downturn in some sectors, such as wool, while there has been a shift to higher value land-uses, such as irrigated horticulture.

Economic success has come at a cost. A continued reliance on high input agricultural systems is placing stress on the natural asset-base, resulting in declining health of soil, water and biodiversity. Across the North Central CMA region:

- It is estimated that up to 390,000 ha of land is at risk of developing shallow water-tables over the next 50 years.
- Soil health is declining, with soil acidity estimated to cost $45 million annually in lost production.
- Only 2 per cent of the waterways are considered to be in good condition, with 53 per cent in poor to very poor condition.
- Only 12 per cent of the original native vegetation cover remains, with a number of bioregions having less than 5 per cent retained vegetation cover.
- Greater than 90 per cent of all bioregional Ecological Vegetation Classes are considered to be endangered or vulnerable.
- More than 75 fauna species and 112 flora species are threatened (NCCMA 2003).

The processes threatening the natural asset-base result from both past and present actions. Reducing the impact of these threats will require major changes in land-use over the next 20 years if agricultural production is to remain viable. The impact of climate change and the likelihood of increased temperatures, increased drought frequency and more intense, episodic rain events, will place further stress on an already compromised landscape (Jones *et al*. in press). In summary, economic sustainability is threatened through continued soil acidification, soil loss and salinity. Environmental sustainability is threatened through loss of biodiversity and salinity, and social sustainability will be threatened with population decline resulting in part from land degradation.

Farming communities, Landcare and Catchment groups are increasingly developing a more holistic approach to NRM that incorporates biodiversity maintenance as a foundation for tackling issues, such as dryland salinity, soil acidification, water quality decline and soil erosion. The North Central region has a strong record of community involvement in integrated NRM planning and implementation, which has enabled the region to tailor technical solutions to meet the needs of land managers. The region pioneered community engagement through the irrigation and dryland salinity plans that established a successful model used widely ever since. The region has also been particularly progressive in the Landcare movement, with the first official group formed in the region in 1986, and very strong growth in groups.

The NRM capability of the region is considerable and is made up of individuals, community groups, water authorities, local government and state agencies. A challenge is to establish and maintain effective relationships between the various stakeholders so that the management of the region's natural resources is improved. The North Central region must maintain a culture that encourages partnerships, information exchange and support in NRM.

NRM issues - assets/threat/risk framework

The development of the *Regional Catchment Strategy* using the asset-based framework, as required for state and Commonwealth accreditation, has imposed a new discipline on the region to identify the priority assets and values it seeks to protect and enhance. The framework for development of the *Regional Catchment Strategy* required an identification and valuation of natural, social and economic assets in the region, and a preliminary risk analysis (DNRE 2002a).

There are numerous NRM issues identified within the asset/threat/risk framework. This paper focuses on biodiversity as an example of an integrated approach to the implementation of the *Regional Catchment Strategy.* There is a strong emphasis on working towards agreed targets and outcomes for biodiversity, water, land and community assets. Whilst the management actions of the *Regional Catchment Strategy* are generally specific to assets or services, delivery of the actions is through integrated programs.

Biodiversity targets in the Regional Catchment Strategy - an asset based approach

The recently accredited *North Central Regional Catchment Strategy* sets a series of comprehensive and challenging targets for improving catchment health. Those pertaining to biodiversity assets are described in Table 1. Protection of assets is based on the understanding that lasting change in the way in which whole landscapes are restored and managed will be required in the region's high priority salinity areas or 'hot spots' (detailed in the next section).

Basis for determining priority biodiversity assets: The underlying basis for identifying biodiversity assets and determining their values is based on government priorities, scientific information, and community knowledge and preferences.

Table 1. North Central Biodiversity goals and resource condition targets (as reproduced from the North Central Regional Catchment Strategy 2003).

Asset class	Goal	Resource condition targets
Biodiversity	The ecological function of indigenous vegetation communities will be maintained and, where possible, improved. Populations of threatened native plant and animal species will be restored to viable levels. Threatened vegetation communities will increase in extent and improve in quality to achieve a net gain. This will be achieved by: • increasing the native vegetation cover of the region to 30 per cent • increasing the coverage of all Ecological Vegetation Classes to at least 15 per cent of their pre-1750 distribution.	• Improve the quality and coverage of all vulnerable or endangered Ecological Vegetation Classes and any others with less than 15 per cent of pre-1750 distribution by 10 per cent (as measured by habitat ha) by 2013. • Increase native vegetation coverage to 20 per cent of the region by 2030. • Maintain or improve existing viable populations of significant threatened species from 2003. • No further bioregional extinctions from 2003.

Four biodiversity asset classes (native vegetation, species, wetlands, rivers) have been identified as government priorities in Victoria. The *State Biodiversity Strategy* (DNRE 1997), the *Victorian Native Vegetation Management Framework* (DNRE 2002b), the *River Health Strategy* (DNRE 2002c), and the wetlands policy (DNRE 1997) guide bioregional conservation priorities. These policies assign conservation significance to each biodiversity asset on the basis of the extent of depletion (e.g. what proportion of the pre-European distribution of the asset still exists), the condition of the asset relative to its 'natural' condition, and its use by significant species.

For example, the *Victorian Native Vegetation Management Framework* sets priorities for protection of native vegetation from threats, such as salinity, and for management for each bioregion of vegetation types (classified into Ecological Vegetation Classes) and the habitat value of a site, as estimated by the Habitat Hectares Method (Parkes *et al.* 2003). This allows every native vegetation remnant to be allocated a conservation significance, which determines its priority for protection, enhancement and restoration. Further detail on the priority setting processes is given in Wierzbowski *et al.* (2002). Achieving the biodiversity target in the *Regional Catchment Strategy* (NCCMA 2003, p. 32) of 'improving the quality and coverage of all vulnerable or endangered Ecological Vegetation Classes by 10% by 2013' will require protection of priority remnants from the impacts of salinity (see next section).

Further scientific basis for the biodiversity targets are based on research reviewed in James and Saunders (2001) and the scientific tools available in Victoria. James and Saunders (2001) suggested that there is some, albeit limited, evidence on the relationship between landscape level of ecosystem 'intactness' and its function, such as major decline in natural ecological function below a threshold of 30 per cent landscape cover of native vegetation. The biodiversity targets outlined in the *Regional Catchment Strategy* are a hybrid between aspirational goals, needed to maintain some degree of ecosystem functioning and based on available scientific knowledge, and goals which have some hope of being accepted by the community living in the North Central CMA region.

Basis for determining salinity priority areas: A process was initiated to refocus delivery of the dryland salinity program in North Central Victoria at about the time the review of the first generation of salinity management plans commenced. That process had two main elements: development of a priority setting approach; and restructuring of the on-ground works and implementation program (NCCMA 2002). A suite of sub-catchment based salinity priority areas was identified, ten of which are currently the subject of 'targeted salinity implementation' projects.

The priority setting process was based on identifying and targeting areas of greatest salinity hazard. This approach was developed with the intention of identifying regional (as opposed to catchment) priority areas for development, and initiation of a suite of targeted salinity implementation projects or research and investigations into salinity processes and community capacity for NRM. It had three elements:

- a decision support tool based on Geographical Information Systems to identify and rank priority sub-catchments
- an expert-based 'feasibility assessment' to determine whether a priority sub-catchment was suitable for a farming systems-based implementation project, or

whether further research or capacity building would be required before a move to implementation was appropriate

- a multi-criteria analysis process to assign priorities within each group of projects (implementation and research).

High priority sub-catchments were first identified with a Geographical Information System-based decision support tool based on saline discharge, salt load export, groundwater risk, recharge risk and run-off risk. The feasibility assessment considered how likely the (broad) resource condition outcomes sought from intervention in priority sub-catchments were to be achieved, based on the conceptual understanding of hydrogeological processes, perceived community capacity and the level of public investment required. Multi-criteria analysis was then used to determine the relative importance of priority areas, based on a series of values developed by the Salinity Management Plan Steering Committee.

Biodiversity action planning as an example of an integrated approach

Biodiversity action planning

The approach taken to incorporate biodiversity into achieving multiple NRM outcomes across Victoria is called Biodiversity Action Planning. Biodiversity Action Planning is a structured approach to identifying priorities and mapping significant areas for native biodiversity conservation at the scale of the landscape or bioregion (DNRE 2002d). Biodiversity Action Planning uses a planning hierarchy from bioregion to landscape to local areas. Biodiversity Action Planning has received substantial support at a state level through incorporation into the *Regional Catchment Strategy* planning framework, the Native Vegetation Management Framework, and significant investment of Natural Heritage Trust and National Action Plan funds at a regional scale.

Basis for determining priority biodiversity assets

The underlying basis for identifying biodiversity assets and determining their values is based on government priorities, scientific information, and community knowledge and preferences. Various documents are produced as resources to inform this hierarchy (online at www.dse.vic.gov.au/conservation). There are three main components to Biodiversity Action Planning: the Strategic Overview; the assembling of Landscape Plans; and development of Local Area Plans.

The Strategic Overview provides details of the framework and methodology used in developing bioregional biodiversity action planning and an overview of the features and the natural assets of the bioregion. Specific information on assets and priorities for actions within landscape zones (subregions of bioregions) is assembled in the Landscape Plans. The Landscape Plans include the native vegetation priorities identified in the regional *Native Vegetation Plans,* and identify the best options for restoring native vegetation to recover biodiversity at a more detailed scale than is possible in the *Native Vegetation Plans.*

The biodiversity information provided in Landscape Plans is used as a resource input to Local Area Plans or other planning processes, such as Landcare Plans and Guidelines for Priority Salinity Areas, which may be developed through community engagement processes and cover the range of natural resource issues. It is at the level of development of Local Area Plans where local knowledge and community engagement is linked with scientific knowledge.

Biodiversity Action Planning also uses simple ecological principles, such as those employed by Wilson and Lowe (2003), to develop land-use change scenarios that plan for the restoration of native biodiversity. In their study, a set of indicative rules for restoring remnant, native vegetation was modelled within a geographical information system. The modelling of the rules resulted in a change in rural landscapes from highly fragmented (with few large remnants) to highly connected. Revegetation that provides for salinity, carbon sequestration, nutrient management and biodiversity can thus be integrated to deliver these multiple benefits.

Biodiversity Action Planning and salinity plans

Within the region's priority salinity areas, Biodiversity Action Planning is used to identify the remaining biodiversity assets and assess their risk from salinity. For the purposes of this paper, we give an example from the Upper Bet Bet Priority Salinity Area (total area of 8703 ha).

In this Priority Salinity Area, the remaining native vegetation cover is 2166 ha, with only three remnants greater than 100 ha in area, and four remnants between 40 and 100 ha. Seventy-five per cent of all remnants are less than 5 ha. The area of endangered and vulnerable Ecological Vegetation Classes in the zone is 700 ha (20 per cent of the original 3575 ha). There are records of two species of threatened fauna (Powerful Owl and Bush Stone Curlew) and one species (Lanky Buttons) of

Table 2. Bet Bet Priority Salinity Area: targets for asset protection from dryland salinity.

Indicator	Target
Community participation	At least 80 per cent of landholders in project area participating, as measured by preparation of paddock plans
Perennial vegetation protection and enhancement: • woody perennial vegetation coverage (including remnants, indigenous revegetation, farm forestry) • perennial pasture	By 2009/2010: • increase coverage from 10 to 25 per cent of project area (~1300 ha) • increase perennial pasture coverage to 6000 ha (at least 90 per cent of land without woody perennial vegetation)
Gully rehabilitation	At least 24 major gullies rehabilitated by 2009/10
Salt load reduction	3000 t/yr average reduction, as measured in Bet Bet Creek at Lillicur, by 2010
Water table levels	Stabilised water table levels in project area by 2012
Asset protection: • protection of remnant vegetation • threatened flora and fauna • urban land • agricultural land • roads • stream frontage • lake/wetland perimeter	Protection of assets threatened by salinity up to 2020: • 390 ha priority Ecological Vegetation Classes • Recorded sites for 2 species of fauna and 1 species of native flora • 280 ha within township of Lexton • 2000 ha • 35 km road, including 13.5 km sealed road • 80 km of perennial stream frontage • 3 km lake perimeter

threatened flora for the area. By around 2020, it is estimated that around 358 ha of native vegetation will be threatened by saline water tables less than 5 m from the surface (Peterson *et al*. 2002).

This analysis is used to guide the setting of targets in the priority salinity area guidelines, which is the means for communicating how government investment will be directed at farm level implementation of on-ground works. The guidelines use a conceptual landscape model which describes the main landscape elements of the Priority Salinity Area: ridges and upper slopes, the break of slope between mid and upper slopes, mid and lower slope areas not affected by salinity, mid and lower slope areas affected by saline discharge or gullying, alluvial plains, and riparian land. The model represents the best current understanding of salinity processes and management options for integrated outcomes for salinity, biodiversity and waterway management objectives.

Native vegetation restoration targets for the current five-year program are for establishment of 1322 ha of indigenous vegetation (according to Ecological Vegetation Classes benchmarks), with a habitat quality target to improve 20 per cent of current estate (regional endangered and vulnerable vegetation covers about 700 ha) in the first year of implementation. As an adjunct to the formulation of targets and priorities, the Biodiversity Action Planning also provides a spatial representation of biodiversity priorities in the form of Priority Salinity Area maps showing high conservation value remnants, corridor linkage zones and priority creeklines. Table 2 shows a summary of targets across a range of asset classes, including biodiversity for the Bet Bet Priority Salinity Area.

Community engagement within Biodiversity Action Planning

Biodiversity Action Planning relies on the voluntary co-operation and support of local land managers and communities for implementation. In this process, the strategic planning is interpreted for regional decision-making through programs such as Local Area Planning, Landcare planning, property planning and salinity planning.

Biodiversity Action Planning aims to achieve support for landscape planning for native biodiversity by ensuring that landholders are able to visualise (through the provision of locally relevant data and maps) and value biodiversity assets. A key process underpinning the implementation of Biodiversity Action Planning has been the collation and aggregation of Geographical Information System datasets for use by local communities. Analysis and interpretation of these data, informed by knowledge of ecological principles, has enabled the development of a strong partnership between agency extension staff, community groups and landholders in the development of local landscape plans.

While existing agency-held datasets are extensive, they have often revealed information gaps or errors related to asset characteristics. The on-going iterative nature of the community engagement and planning through Biodiversity

Action Planning has contributed to rectification of some of these gaps and an overall improvement in these supporting databases and information systems. Across the North Central CMA region, a number of techniques and approaches have been used to build community involvement in Biodiversity Action Planning and associated NRM planning. These include:

- bird surveys and remnant vegetation assessment. Up to 50 patches of remnant vegetation were surveyed for each target area. These surveys included a vegetation assessment using the Habitat Hectares methodology (Parkes *et al*. 2003) and a bird survey using a rapid assessment technique (Barrett and Davidson 1999). Results from these surveys were used to determine focal species (Lambeck 1997) that could be used to guide the establishment of guidelines for habitat protection, enhancement and restoration
- community field days and workshops:The presentation and discussion of results from the surveys was shared with landholder participants through a series of locally planned and conducted events, such as field days and workshops, which enabled landholders and extension staff to engage in a dialogue about the significance of the collected data and how they might inform NRM activities at a local scale
- development of publications. Locally specific publications, including project area maps, guidelines and field guides, were developed. These materials provided a collation and interpretation of Geographical Information System datasets relating to biodiversity assets and salinity hazard, which provided further local context for landholders engaging in the planning and implementation of NRM actions

Biodiversity Action Planning has trialled a range of community engagement methods (in partnership with the Farm$mart Living Systems Project; Straker and Platt 2002) and styles, and has developed a range of tools to foster this (e.g. focal species analyses of thresholds for remnant size, condition and isolation - see DNRE 2002d). Ten groups, involving an estimated 150 landholders, have participated and produced detailed implementation plans that will have biodiversity and salinity outcomes (e.g. DSE 2003).

Discussion

The link between scientific knowledge and community engagement

As outlined, government priorities, scientific knowledge and community engagement have been used in the Biodiversity Action Planning process. Brown (2004) suggests five knowledge sources being important in making decisions about complex sustainability problems. These are individual knowledge, local knowledge, specialist or professional knowledge, strategic or organisational knowledge, and holistic knowledge. Whilst holistic knowledge can be difficult to characterise, the other four knowledge constructions have been actively used in the Biodiversity Action Planning process, through the use of government priorities (strategic knowledge), scientific knowledge in the area of biodiversity and salinity processes (specialist knowledge), and community engagement (both individual and local knowledge).

This use of multiple knowledge sources, with science as a key input, suggests that the Biodiversity Action Planning process has potential to address the complex issues surrounding biodiversity conservation within agricultural landscapes facing the threat of salinisation. The complexity of decision-making for individuals implementing biodiversity conservation measures on farms is discussed further by Ridley (in press).

Biodiversity Action Planning is a resource-intensive process that requires strong institutional input from agencies. Within the North Central region, the North Central CMA, the Department of Sustainability and Environment and Department of Primary Industries have worked in partnership to support the development of Biodiversity Action Planning. Despite the relative maturity of Victorian CMAs compared with those in other states and the capacity of CMAs to determine their own planning processes, this work could not be achieved without strong commitment to, and input from, staff in government agencies, farmers and the CMA itself.

The partnership approach between government departments, CMAs and landholders can be delicate and difficult to manage successfully. It requires the development of long-term relationships and trust between government agencies, CMAs and landholders, whilst recognising that organisations and individuals can (and sometimes do) have different agendas. Engaging the community in a meaningful way can mean that scientific knowledge is ignored, and this can cause considerable pain to scientists and government departments. To date, this is not apparent in the Biodiversity Action Planning process, but there is an acknowledged risk in pursuing such a partnership approach.

Lessons from the Biodiversity Action Planning process

Biodiversity Action Planning is now a key tool for the delivery of projects and programs under the North Central

Regional Catchment Strategy. From a funding perspective, major investment through the National Action Plan and Natural Heritage Trust 2 is supporting the development and implementation of Biodiversity Action Plans.

No systematic evaluation of the outcomes from the Biodiversity Action Planning process has been completed to date. Whilst it could be argued that such evaluation may be premature, strong evaluation is a crucial part of any successful planning framework. Despite this lack of formal evaluation, there is anecdotal evidence that this process is developing a foundation of community involvement in planning and implementation of on-ground works. The following points summarise the key lessons learnt to date.

Lesson 1: A major strength of the Biodiversity Action Planning approach has been the bringing together of biophysical datasets across a range of asset classes and making these available to extension staff and land managers in a user-friendly format.

The growing acceptance of Geographical Information Systems and increasing computing power has supported this approach. The facility of Geographical Information Systems to combine and visualise multiple layers of information (e.g. biodiversity assets and salinity hazard zones) has been a major factor in the development of Biodiversity Action Planning and its application to NRM programs across the North Central CMA region and other parts of Victoria.

Lesson 2: A strength of Biodiversity Action Planning is its ability to underpin different planning frameworks at a range of scales.

This facility is important in enabling planning to occur at a range of scales from the paddock to the catchment. Boundaries for planning and implementation are set according to a range of criteria including social (e.g. community of interest), biophysical (e.g. catchment, waterway) or institutional (e.g. funding program).

Lesson 3: Biodiversity Action Planning has influenced the nature of a range of activities associated with biodiversity planning, including salinity and waterway management.

The development of guidelines for implementation of dryland salinity management programs in priority salinity areas has drawn heavily on Biodiversity Action Planning for priority setting, landscape conceptual modelling and community engagement. The development of Catchment Action Plans, incorporating the setting of priorities and targets across land, water and biodiversity asset classes using a Biodiversity Action Planning approach is now being used in target sub-catchments across the North Central CMA region.

Lesson 4: The incomplete nature of some datasets and an incomplete understanding of landscape processes can limit the quality and credibility of planning tools that aim to establish priorities for biodiversity conservation.

Despite the fact that geospatial datasets provide a rich picture of the landscape, they are compromised by their inherent reliance on the modelling of landscape attributes, such as vegetation type, habitat condition or watertable depth. These weaknesses have been addressed to some extent through the incorporation of local information, including rectification of data through ground-truthing, additional survey work and supplementation of datasets with community knowledge (e.g. fauna and flora records).

A major challenge for the future development of Biodiversity Action Planning occurs within the context of managing the impacts of dryland salinity. Despite recent advances in understanding of salinity processes and knowledge of groundwater flow systems within the North Central region, the certainty of predicting salinity outcomes at the local scale (e.g. paddock or remnant) is still rudimentary at best. The salinity planning process outlined earlier is still relatively crude, relying on a Geographical Information System-based decision support tool. It has no explicit linking of land-use to groundwater response.

The successful priority setting of achieving biodiversity outcomes will be limited by the extent to which salinity processes can be accurately predicted at the paddock or farm scale. In future, an approach such as that outlined by Beverly *et al.* (2004) with the incorporation of information layers on biodiversity assets could result in substantially improved confidence in the likely biodiversity outcomes.

Lesson 5: Experience in the region suggests that Biodiversity Action Planning involving community participation and consultation is a medium- to long-term, intensive process and requires significant commitment of material, time and staff resources to achieve a successful outcome.

The level of staff skills and training has emerged as a significant resource issue with a high level of maturity, technical skill and knowledge required for the complex task of community group biodiversity planning. These skills include competence with sophisticated

Geographical Information System programs, sound regional and local ecological knowledge, a thorough understanding of relevant biodiversity strategies and frameworks, well-developed community networking and liaison skills, group facilitation skills, and familiarity with sociological factors likely to influence nature conservation attitudes and behaviour (Morison and Nevill 2003).

Conclusion

In Victoria, there has been a recent maturation of thinking to develop more holistic, systems based strategies which have led CMAs to focus on an integrated catchment/landscape approach to NRM. Protecting these shared resources requires a whole-of-catchment approach, one that takes account of the relationships between natural systems, including land, water and biodiversity. The implementation of Biodiversity Action Planning in the North Central region has seen the application of a 'whole of landscape' approach to asset protection. Biodiversity Action Planning has also reinforced the importance of community involvement in planning and priority setting using existing science integrated with local knowledge and aspirations.

Experience from Biodiversity Action Planning has reinforced the importance of face-to-face contact as a primary way of initiating change and has also highlighted the crucial role that underpinning science plays. A strong scientific base, coupled with a range of other methods including small group planning, community information gathering and the production of locally relevant extension materials, has produced significant results in terms of community learning and on-ground actions.

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Devolution Enhances Integration

*Harry Abrahams**

This paper provides an overview from the perspective of someone working within the Natural Resources Management Team of the Australian government on regional delivery of the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust. This is a significant change to NRM delivery in Australia. The paper argues that the aim of integrated NRM delivery is enhanced through devolution of responsibilities from the Australian and State governments to regionally based organisations. The paper examines six components including: devolution of government administrative arrangements to Joint Steering Committees; devolution of priority setting to regional bodies; integration of Federal, State and local government activities through the work of the regional bodies; enhanced Indigenous engagement through devolution; improved integration of policy development and program delivery through devolution; and that devolution of monitoring and evaluation enhances the integration of program delivery.

Introduction

This paper focuses on two government programs, the *National Action Plan for Salinity and Water Quality* (COAG 2000), and the *Natural Heritage Trust* (EA&DAFF 2002). It assumes that most readers will have some understanding of these programs, but have differing perspectives regarding the strengths, weaknesses and the relative success of the programs in achieving integrated natural resource management (NRM) delivery.

The paper provides the perspective of an officer from the Australian government Department of Environment and Heritage, working within the NRM Team on regional delivery of the *National Action Plan for Salinity and Water Quality* and the *Natural Heritage Trust.* Thus, it is neither an academic treatise on integration nor the result of research on any particular element of integration.

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Coming from that perspective, I consider 'integration' is the bringing together of different but separate activities to achieve an outcome that addresses the requirements of all the activities, builds on the synergies, and achieves the compromises needed to efficiently progress all the activities. In the context of NRM delivery, this means the ability to bring a range of policy, program and aspirational objectives to a process involving relevant people and organisations in an effective and efficient fashion. Inevitably, defining the topic raises questions - along the line of 'easily said but how do you do it?'

Through this paper, I intend to explore some issues surrounding the Australian federal and state governments' approaches to integration, and in doing so, provide some issues for discussion.

The *National Action Plan for Salinity and Water Quality* and *Natural Heritage Trust* programs (for details see http://www.nrm.gov.au) have the same basic approach to implementation: that the Australian and state governments deliver the programs at a regional scale, in partnership with community based, regional bodies. The basic design is for the regional bodies to develop integrated NRM plans, identify priorities for investment, and deliver government investment in the region to achieve on-ground change in NRM. While this paper focuses on the devolution of responsibility to these bodies, it is important to recognise that they must also be responsive to community organisations and individuals.

It is useful to identify the following similarities and differences between the programs:

- For the *National Action Plan for Salinity and Water Quality,* the Australian and state governments contribute matched cash investment that is jointly administered through a single holding account. The Natural Heritage Trust receives cash investment only from the Australian government whereas the states provide resources as cash or, almost exclusively, as 'in-kind' contributions.
- The primary objective of the *National Action Plan for Salinity and Water Quality* is to address salinity and water quality objectives, while the Natural Heritage Trust has a broader range of objectives, including sustainable agriculture, biodiversity and endangered species outcomes.

- The *National Action Plan for Salinity and Water Quality* is a relatively new program, championed by the Prime Minister, with resounding support from the state Premiers (to a total of $1.4 billion). In contrast, the *Natural Heritage Trust* has been a longer standing program that was extended in 2002 beyond its initial five-year phase with an Australian Government injection of a further $1 billion. The delivery of the *Natural Heritage Trust* through regional bodies is a significant change from its precursor program, administered federally.

Fundamental to both programs, is the objective to devolve responsibility, prioritisation and on-ground delivery to the regional level, in the expectation that this will result in more effective and integrated NRM delivery throughout Australia.

The central point to this paper is to suggest that devolution enhances integration. But is this political rhetoric or are the programs achieving integration? This paper explores this topic using examples where governments are working with the community. It is an overview of the work being undertaken and a discussion of some key issues, rather than a detailed analysis of each program.

Example 1 - Devolving program administration to the joint Steering Committees leads to better integration of program delivery

The joint state-Australian Government Steering Committees are at the heart of the delivery of both the *Natural Heritage Trust* and the *National Action Plan for Salinity and Water Quality*. Each state committee is typically formed around a small number of senior executives from the Australian Government Department of Agriculture, Fisheries and Forestry, the federal Department of Environment and Heritage, and their state government agency counterparts. Other stakeholders are engaged through formal membership, as observers, or through formal consultation processes. Responsibilities of Steering Committees are described in the various *Bilateral Agreements* (COA 2002-2004) and focus on administration and financial management, as well as jointly providing advice to Ministers.

The relationship between each state Steering Committee and the regional bodies is critical to achieving integration of program delivery. In some cases, the regional bodies (or representatives thereof) are members of the Steering Committee, in other cases formal relationships have been established between the two organisations. Frequent communication focusing on requirements, objectives, timeframes, and the expectations of the programs, regional bodies, and community is essential to achieving effective working relationships between the regional bodies and the Steering Committees.

The contention that devolving administration and delivery responsibility to the Steering Committees assists integration is supported by the comfort with which all of the Steering Committees deliver the two programs; interacting directly with the community and key stakeholders, and working through the differences in policy interpretation and direction from the governments. But perhaps the key is the direct involvement in these fora of a range of departments from different jurisdictions that are able to explore and resolve issues likely to hinder strategic delivery.

Example 2 - Devolving priority setting to regional bodies enhances effective NRM delivery

The critical element in the successful delivery of NRM is the development, by each regional body, of an integrated regional plan that clearly identifies priorities for investment and action. A requirement for the accreditation of the plans (NRMC 2002a) is that they address all government strategies and statutory responsibilities including, for example, endangered species, biodiversity strategies, and sustainable agriculture initiatives. The regional body, however, also develops an Investment Strategy to fund implementation of the priorities in their plan.

This is a massive task for the regional bodies. They must represent the local and regional communities' aspirations, recognise governments' investment limits, and prioritise their desired activities accordingly. To a certain extent, the regional bodies are the 'meat in the sandwich' between community and government.

Regional bodies can target a range of investment sources in their Investment Strategies. Nonetheless, to date the *National Action Plan for Salinity and Water Quality* and *Natural Heritage Trust* are the primary sources of investment.

By the end of December 2004, some 35 regions had plans accredited. This represented an extraordinary amount of work and commitment by the regional bodies, and their ability to accomplish the integration required to develop the plans. The differences between these plans and previous NRM planning processes were the requirements for the identification of clear resource condition and management action targets, and the direct link between the regional plan and the investment strategy. The plans identify the priorities, actions required, and desired outcomes, with clearly defined milestones relating to the

delivery of projects or activities to achieve resource condition change.

My assertion is that this process is working, in that the community has clearly demonstrated the ability to integrate and prioritise actions for NRM delivery. A clear lesson from the first phase of the *Natural Heritage Trust* was that the community had considerable capacity to deliver on-ground activity. The current processes provide a much improved, strategic framework within which to undertake these activities.

Example 3 - Devolving responsibility to the regional level improves integration of the activities of the Australian, state, and particularly, local governments

Integration with local government is an area where, particularly at the outset, there has been some tension. It has been asserted that the regional bodies will be a 'fourth tier of government', that they will obtain funds that should be going to local government programs, and that they will duplicate the planning and other works of local government.

Clearly the regional bodies and local governments need to effectively communicate and develop an on-going, working relationship. This takes time, and will work better in some circumstances than others. The issues of the day and individual personalities affect the shaping of relationships at this level. For example, a regional body of the Rangelands region of Western Australia is likely to interact very differently with the local government than will be the case in South-east Queensland. The issues in South-east Queensland are different; the impacts of suburban expansion, which is a local government matter, are a more important issue than in the Rangelands region of Western Australia and will directly impinge on the NRM aspirations of the regional body. Similarly, the capacity to deliver on-ground activities and integrate with local government will vary with the resources available to the local government, community and regional body.

A fundamental issue is the nature of the regional NRM bodies, especially their relationship to State government. There is a range of structures in place:

- pre-existing statutory authorities in the Catchment Management Authorities of Victoria
- Interim Regional Bodies of South Australia, that will be formalised upon passage of the *Natural Resources Management Act 2004* on July 1st, 2005, that will have broad powers to integrate delivery of state government activities
- statutory based regional bodies in NSW created through departmental restructuring
- community based bodies in Queensland, Western Australia and Tasmania with different arrangements for interacting with state government agencies
- a single regional body for the Northern Territory (N.T.), that works closely with, and receives substantial administrative and institutional support from, the N.T. government

Not surprisingly, the level of local government integration in these NRM processes is highly variable. In some instances, membership of the regional bodies includes Councillor or local government administration representation. In jurisdictions with less formal interaction arrangements, local government is more concerned, and it is taking longer to develop working arrangements. Despite this variability, there is a growing understanding and cooperation in all regions. The key to successful integration is the recognition by all parties that integration of local government and regional scale delivery is likely to lead to effective and efficient NRM.

Example 4 - Devolution to the regional scale enhances the involvement of Indigenous people in NRM delivery

Involvement of Indigenous people in NRM is highly variable across the country and represents an area in which there are significant challenges. Some regions are experiencing difficulty identifying the appropriate Indigenous speakers for country, as many Traditional Owners have moved from the region to the cities. In many regions, the capacity of the Indigenous community to be involved is low, and their priorities are often for more immediate issues than the planning phase of NRM.

Similarly, the capacity of many (if not most) regions to engage with Traditional Owners, Indigenous community representatives or instrumentalities like Land Councils is also very low. The Australian Government is directing resources to this area, with the intention of enhancing the capacity of both the regional bodies and Indigenous organisations to engage in the regional NRM processes, including through the preparation of *Guidelines for Indigenous Engagement* (COA 2004).

From my limited experience, in those instances where the Indigenous community is engaged in NRM planning and delivery at the regional scale, the journey is being progressed and is one of significant growth for all involved. That is not to suggest that the model itself assists Indigenous involvement; the 'jury remains out' on that issue.

Example 5 - Devolution of responsibility better integrates policy development and program delivery within government

Consistent with achieving a unified government position as required of the Steering Committee and regional body administrative arrangements, all jurisdictions are working within their processes and governance arrangements to achieve better integration of policy with delivery. One classic approach to restructuring departments under such circumstances is to combine areas of similarity and to carve off areas of dissimilarity into different areas or departments. This represents a very different approach to that adopted by the Australian Government Department of Agriculture, Fisheries and Forestry and the Department of Environment and Heritage when they established the Australian Government Joint NRM Team, in which staff from both agencies are working in unison to deliver the major NRM programs.

This level of departmental integration is a first for the Australian government. Program delivery is seamless, in that officers from the different departments work side-by-side, supervised by, or supervising, an officer of the other department. Officers still operate under differing Certified Agreements or human resource management processes, as well as some administrative arrangements. Officers representing both departments attend regional body meetings to provide guidance and advice on policies from both departments. This departmental integration has taken time. For example, the information technology environment is seamless between the members of this team - much more easily said than done. I consider that the devolution of responsibility to the Steering Committee and regional bodies has played a central role in achieving this integration.

Integration has also been enhanced by changes in the state departments. For example, in NSW, there were 21 regions with Catchment Management Boards (advisory bodies to the Department of Land and Water Conservation but including membership from other state departments). These boards spent a lot of time focusing on the policy differences and contrasting delivery arrangements of the different NRM departments. These NRM functions are now integrated within a single department, an amalgamation of the Planning and Natural Resource departments, and works with a reduced number of boards around the state. In Queensland, integration has been improved by the work of the state government's Regional Coordination Groups, which meet to consolidate policy positions to ensure that the regional bodies are receiving a coherent, consistent message.

Example 6 - Devolving monitoring and evaluation integrates delivery

Rigorous monitoring and evaluation is another new and significant element of the *Natural Heritage Trust* and *National Action Plan for Salinity and Water Quality* (NRMC 2002b). A program logic, including performance indicators, has been developed across jurisdictions. This monitoring framework has been designed so that regional activities and progress can be measured and reported against a set of targets using consistent indicators. This process obtains information locally or regionally, and allows for aggregation to the national scale so that achievements and trends can be reported.

Some regional bodies have perceived these monitoring requirements as an imposition. In part, this requirement flows from the devolution of accountability for government expenditure, something the NRM community previously did not have to demonstrate to the same extent. In the past, investments were generally smaller and reporting requirements related more to outputs than the achievement of outcomes.

The monitoring framework is a powerful tool, as it documents progress made and supports judgements about the effectiveness of programs. The devolution of the monitoring and evaluating to the regional bodies greatly increases on-ground use of the findings and also enhances continuous improvement of regional management.

For the *Natural Heritage Trust,* the state government investments will generally (if not exclusively) be in-kind contributions. To effectively report against the in-kind components, regional bodies have unprecedented access to an influence over state government NRM expenditure. They have a central role in ensuring that the delivery of state programs is more closely aligned with community expectations and NRM priorities.

In this context, the regional bodies (notably in Queensland and Western Australia) are really only finding their feet, but the opportunity for closer interrogation of state government NRM activities and expenditure though devolved reporting responsibility will potentially lead to a far greater level of integration of the delivery of these programs.

Conclusions

Governments collectively are making a significant, directional change to NRM delivery. In the NRM context, it is very early days, but in the program context, we are over half way through the life of these two

programs. Changing the delivery process too quickly is a key risk but one common to many government delivery processes. We do, and will continue to, work in electoral- and budget-cycle timeframes.

Similarly, there is the risk that, over time, the states may adapt delivery arrangements more closely to their own needs and thereby make it more difficult to integrate at the national scale. Again, this is almost inevitable and is an issue that is not restricted to these programs nor to NRM.

A key issue is the ability to build and maintain capacity in the regions to deliver these and other programs, to engage with the community, and to respond to changing circumstances. Governments acknowledge the risk of volunteer burnout and the risk of 'bureauocratisation' of the regional bodies. These are significant issues, however, this paper has been written from the perspective of an official involved in the policy process, and is intended as a useful basis for future discussions.

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Successful Research with Local Farmers to Improve Native Grasslands

*Lewis Kahn, Millie Nicholls, Judi Earl and Kylie Nicholls**

A three-year project, the Impact of Grazing Management on Native Grasses of Non-Arable Pastures in the Mid-North of South Australia, *was initiated by the farmer-led organisation Mid-North Grasslands Working Group. The project objectives were determined at a meeting of all stakeholders, and included demonstration that appropriate grazing management could allow native pastures to be grazed for production and result in improved conservation of native grasslands. Subsequent discussions with the farmers who managed the seven demonstration sites established to achieve this objective highlighted that their key objective was to increase production and, more importantly, profitability. The emergence of this previously undisclosed project objective resulted in the project consultants assigning grassland productivity as the focus and native perenniality as an incidental, but equal value, objective. Four elements were used in the conduct of the project: local and credible farmers committed to the project goals, capital support to facilitate change, technical expertise, and on-ground demonstration.*

Introduction

Most grasslands in the mid-north of South Australia have been managed conservatively over at least the past few decades, and in many instances, soil conservation has been a primary goal. Paradoxically, this management regimen has created less stable herbaceous communities dominated by introduced, annual grasses, often at the expense of native, perennial grasses. The changes in vegetation composition are profound and are represented across vast areas in the mid-north of South Australia and yet are incidental outcomes of land and stock management. Recognising that incidental outcomes of management regimens can have substantial on-ground impact is the key to increasing native perenniality in these grasslands, but this process must be farmer-driven.

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A traditional approach to increasing native perenniality and stability in grasslands is to gather the results of replicated, quantitative research to develop programs that extend this knowledge to industry leaders, innovators and early adopters, and to wait for the trickle down effect. Remaining focused at all times on the goal of increasing native perenniality is essential.

An alternative approach, and one the authors have used in the project described in this paper, is to promulgate strategies that address the primary concerns of farmers but also deliver the incidental benefit of increased perenniality. The challenge to consultants and extension personnel is to devise such win-win strategies in partnership with farmers.

The three-year project, from which this paper is drawn, was titled the *Impact of Grazing Management on Native Grasses of Non-Arable Pastures in the Mid-North of South Australia,* and was funded by the *Natural Heritage Trust*. The project was initiated by the farmer organisation Mid-North Grasslands Working Group, who engaged the consultancy services of Agricultural Information & Monitoring Services. The project objectives were established in a focus group meeting with potential stakeholders at the start of the project. The objectives relevant to this paper were: to demonstrate that appropriate grazing management can allow native pastures to be grazed for production and result in improved conservation of native grasslands; and to establish grazing demonstration sites on seven farms in the mid-north of South Australia.

Four elements were used in the operation of the project: local and credible farmers committed to the project goals, capital support to facilitate change, technical expertise, and on-ground demonstration. These elements are discussed in this paper.

Local and credible farmers

Farmers place a large emphasis on their peers as a source of new information and practices. There is merit in this approach because it provides the opportunity for farmers to evaluate a new technology in an environment that is commercially relevant and no risk. Because of this tendency to prioritise the knowledge of peers, programs driving a change in practice are ideally driven by farmers themselves.

During the 1990s, a group of farmers in the mid-north of South Australia developed the goal to demonstrate that grasslands could be better managed to improve both their conservation and profitability. These farmers formed the Mid-North Grasslands Working Group, co-opted state government representatives, and were successful in obtaining funding through the *Natural Heritage Trust* to tackle the issue of grassland management. The formation of the Mid-North Grasslands Working Group, under the guidance of local farmers, provided the project with credibility.

The value of the testimony and trust

The human component of any conservation or land management program is critical to its success, and yet is rarely discussed when projects are evaluated. The term 'human component' is used to describe the attributes and personalities of the individuals in the project. More often, the focus of evaluation is on numerical, physical outcomes - the number of trees planted, the kilometres of fencing, regeneration success, or number of people attending field days or seminars. The real success is in winning the hearts and minds of local land managers, and achieving long-term commitment to those important, on-ground outcomes. Achieving and measuring this type of success is not an easy task.

The most difficult part of any project is the selection of participating farmers. These farmers are future role models in the region and vital to establishing change in the wider community. Who is to be responsible for their selection? And how do these farmers contribute to the project outcomes and outputs? In terms of selection, a community-based person has both advantages and disadvantages. A major advantage is that community members understand families, family support, and existing social diversity (Vanclay 2004), and these are key elements in determining long-term commitment to projects. A potential disadvantage is exposure to unfair and unwarranted, local prejudices.

With the *Natural Heritage Trust* project, seven properties were selected to act as demonstration sites for rotational grazing management. The seven farmers associated with the properties ranged in age from 28 to 60 years, and were mostly considered to be open-minded and highly regarded in the district.

After three years, the oldest farmer, who initially appeared to be the least likely to succeed, was the most successful participant, whereas one of the youngest farmers had achieved little improvement in either his grassland or his management practices. The key attributes of the most successful participant were the individual's willingness to learn, the enthusiasm with which he embraced the concept, and his ability to recognise and develop on-ground success. The lowest achiever battled with older generation persons who, although not directly involved with the management of his land, managed to reduce his trust in the trialled system enough to prevent real change. The basis for the loss of trust was not determined but may have arisen from misplaced advice.

The successful farmers have all developed skills beyond those required for the *Natural Heritage Trust* project. They have also facilitated future project directions and research priorities by highlighting 'weak links' in local management systems (PetheramS and Clark 1998). Additionally, these farmers are ambassadors or mentors in the wider community as neighbours and other farmers seek their opinion on the project merit.

Trust underpins the success of the project. It is necessary between project personnel, by farmers in the technical expertise of the consultants, and by the consultants in the farmers' management. However, trust is developed through an iterative process based on technical and moral support, and through accumulated experience. Once established, trust between participants allows the envelope of future possibilities to be more fully explored.

Setting project goals and objectives

Once participating farmers have joined the project, a key issue is that of defining project goals and objectives. It is the goals and objectives against which the success of the project will ultimately be measured. The importance of establishing these goals prior to the start of a project cannot be overstated. This is the opportunity for resolving mutually exclusive goals and identifying the relative importance of project goals with participants.

In the Mid-North Grasslands Working Group, a key, agreed project objective was to improve the management of native grasslands and thereby increase the contribution of native perennial grasses. Yet, subsequent discussions highlighted that, for many farmers, their key objective was to increase production and, more importantly, profitability. As consultants to the project, we decided to make 'perenniality' an incidental goal when discussing the project with participating farmers. An incidental goal is one that is achieved in the process of achieving another goal. Assigning a goal to be of incidental nature should not reduce the importance of this outcome and it may limit some management options. For example, in this project, fertiliser was not evaluated because it was considered that it would advantage introduced, annual grasses at the expense of native, perennial grasses.

In the early years of the project, this approach enabled the development of trust between the parties, and it is fair to say that farmers focused largely on production outcomes. However, over time, these farmers recognised the value of the incidental outcomes as drivers of increased productivity. That farmers were allowed to make the link between perenniality and productivity themselves, and in the context of their farming situation (Petheram and Clark 1998), ensured a genuine understanding of the principles of pasture management.

Capital support

Prior to the development of trust and the emergence of project ambassadors, a major barrier for change is the funding of capital works. Financial incentives, even though they are often viewed as inadequate, provide the catalyst that is needed to overcome any inertia preventing the realisation of ideas. In grassland management, as in most other walks of life, access to finances controls what is possible.

The authors' experience is that financial support needs to be at arms length from 'the government'. For a variety of reasons, many farmers are very wary of accepting funding from a government source, as they have a suspicion that it means 'the government' will have some control over what they do on their farms. For a local person working with a community group and understanding the local social issues, that barrier is usually surmountable.

Technical expertise

Technical personnel are a key part in developing new management approaches but, to foster long-term ownership among participating farmers, these personnel should not assume the responsibility of success or failure of participating farmers. The process to achieve long-term ownership relies on the provision of principles and not recipes. Farmers must be allowed to take 'plastic principles' and adapt these to their own situations. The term 'plastic principle' is used to convey the understanding that principles form the core of many practices and, as such, they need to be plastic in nature to adapt to a variety of needs and situations. However, once on-farm management practices have been devised, there is no replacement for being able to present and discuss local data collected from specific farms over a specified period.

Farms are complex organisations, and their custodians (i.e. farmers) seldom reveal the full extent of this complexity until trust in the technical experts or consultants has been established. The process of building trust and understanding a complex system involves repeated, social interactions. Understanding the complexity of the physical and social environment is an important role of the consultant. Without this understanding, it is difficult for the farmer and consultant to interact in a meaningful way to develop new management approaches.

On-ground demonstration

The final element of change is the on-ground demonstration of new management regimens. For example, in this project, large paddocks (200-300 ha) were fenced into smaller (10-50 ha) paddocks and water was piped to troughs in each paddock. The initial cost of this development was $100 - $200/ha, depending on topography and access to water. The purpose of this subdivision was to better control the grazing process, by managing periods of grazing and then recovery in response to plant growth rate. These demonstrations highlighted that rotational grazing increased pasture growth rate by 26 per cent and stocking rates by 47 per cent, while also improving the health of native grasses. That these demonstrations were located on commercial farms rather than state research stations better allowed farmers to integrate knowledge into their own farming practices. A key part of the demonstrations is the need to be commercial in scale to gain credibility to the farmers, and to provide a meaningful context for information.

Conclusion

Farming communities are willing to play an active role in research if the research process allows these communities to address relevant issues. However, success will be restricted largely to dealing with immediate and local goals. Our approach encourages technical experts to devise ways which address the immediate objectives of individual farmers while delivering incidental project benefits. This approach, used in the *Natural Heritage Trust* project from which this paper is drawn, has strengthened the chance of long-term success and community ownership in the project region.

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