

# Riparian fencing: can't we just make them do it? No, and here's why.

Greg Peters<sup>1</sup>

1 Riverness Pty. Ltd., 1b 51 Little Fyans Street, Geelong VIC, 3220. Email: [greg.peters@riverness.com.au](mailto:greg.peters@riverness.com.au)

## Key Points

- there is no single panacea for the long-term management of riparian land
- voluntary and mandatory approaches to riparian fencing will involve trade-offs and difficulties
- a combined approach of voluntary (incentives and subsidies) and mandatory (penalties and regulations) may be the best way to achieve riparian outcomes

## Abstract

Riparian management generally involves encouraging landowners to undertake fencing, weed control and/or revegetation works voluntarily. Waterway managers have traditionally favoured the 'carrot' over the 'stick' approach, assuming that this leads to better long-term outcomes through the creation of a culture of willing, rather than reluctant, landholders. Others, particularly environment groups, have challenged these tactics, noting that the slow pace of change requires a mandatory approach to be implemented in some cases.

This paper describes a range of voluntary, mandatory and mixed approaches to the fencing and long-term management of riparian land; illustrated by local and global case studies. We present a process model that outlines a generic description of each of the voluntary and mandatory pathways and how they can be used together to create on-ground change over time. The advantages, pitfalls and resourcing implications of each approach are highlighted.

We acknowledge that there is no single panacea for riparian restoration, with each pathway involving trade-offs and difficulties. We propose that a combined approach of voluntary (incentives and subsidies) and mandatory (penalties and regulations) can be used to achieve the best possible outcome.

## Keywords

Riparian, management, voluntary, mandatory, waterway, fencing, maintenance

## Introduction

The Victorian Waterway Management Strategy (VWMS; DEPI, 2013) and the Regional Riparian Action Plan (RRAP; DELWP, 2015) state that the objective for the management of riparian land, particularly Crown land, is to maintain or improve its condition to support environmental, social, cultural and economic values. As part of the Victorian Government's Waterway Health Program, millions of dollars per year are allocated to riparian protection, improvement and maintenance projects through Catchment Management Authorities (CMAs).

Typically, riparian projects involve working collaboratively with landowners who own freehold riparian land and/or hold Crown land water frontage licences, to voluntarily undertake works such as fencing to keep stock out of the riparian zone, weed management, revegetation and the provision of infrastructure to support off-stream stock watering.

Environmental advocacy groups have expressed concern that the rate of uptake of riparian fencing programs by landholders is too slow under the current voluntary approach, particularly in high priority areas. They contend that fencing should be mandatory on Crown land water frontages given that ownership of this land rests with the state. Conversely, landholder advocate groups maintain that the program should remain voluntary as forcing landholders to fence is an unfair impost on them.

CMAs have traditionally preferred fencing and associated riparian works to remain voluntary in the belief that this leads to better long-term outcomes through the creation of a culture of willing, rather than reluctant, landholders.

This paper investigates voluntary and mandatory approaches to the fencing and long-term management of riparian land using relevant local and global case studies. It includes a discussion of the advantages, disadvantages and resourcing implications of the two approaches based on a review of the current literature and the development of a number of relevant local and global case studies.

## **Literature review**

A literature review of the published experiences and investigations into voluntary and mandatory approaches to riparian management was undertaken to summarise the existing knowledge base. Approaches that support and incentivise landholders to improve water quality by excluding livestock, have increasingly been reported in the literature and are far more numerous than those that support a mandatory approach.

However, a change in community expectations towards riparian management and water quality can be identified in some recent literature (e.g. Aarons 2011; White et al. 2014), with indications that there is growing community support for mandatory approaches, at least to ensure minimum environmental standards are met.

Nonetheless, there were few comprehensive in-depth studies found in the literature that directly compared the outcomes – environmental, economic and social – from mandatory or voluntary approaches to changing the management of riparian land.

The key conclusions from the literature review were that:

- there is an evolving community expectation for environmental standards
- voluntary approaches appear to be supported for addressing diffuse and incremental environmental degradation
- mandatory approaches appear to be supported for addressing point source (identifiable) environmental degradation
- a combination of voluntary and mandatory instruments may be the best approach to enhancing the environmental condition of riparian areas and adjacent waterways

## **Case studies**

Six relevant case studies (see Table 1) were identified for development to highlight the advantages and disadvantages of voluntary and mandatory program components. They were developed based on available academic and grey literature and phone interviews with government agency staff and landholders involved with the projects. At least three interviews were conducted for each case study, including with at least one project manager and one landholder involved in the project.

Table 1 - Voluntary and mandatory case studies

Project reviewed	Region	Project approach	Type of works
Glenelg River Restoration Project	Victoria, Australia	Voluntary	Riparian fencing and management
Mary River Riverbank Restoration Scheme	Queensland, Australia	Voluntary	Riparian fencing and management
Victorian Gorse Taskforce	Victoria, Australia	Voluntary (with the potential for mandatory)	Weed management
Coliban Water Drinking Water Storages	Victoria, Australia	A mix of voluntary and mandatory approaches	Riparian fencing
Waikato River Dairy Farm Management	Waikato, New Zealand	Voluntary (though mandatory as a condition of milk sales for farmers)	Riparian fencing and management, farm management
River Red Gum Parks	Victoria, Australia	Mandatory	Riparian fencing and grazing licence non-renewal

An example of one case study is presented below.

### *Waikato River Dairy Farm Management*

#### *Background*

The Waikato catchment has a long history of human occupation, dairy farming and economic development – with intense pressure on the natural waterways and subsequent efforts to restore water quality most acute. In the 1990s, the dairy industry was readily identified as a point source for the discharge of pollutants into New Zealand waterways, with farms in the Waikato catchment receiving particular criticism.

Over the past two decades, improving the water quality of rivers, lakes and wetlands has consistently been identified as the top issue for the people of the Waikato region. However, regular monitoring has found that nitrogen, phosphorus, sediment and bacteria levels are increasing in the major waterways of the catchment – a situation found elsewhere in New Zealand.

New Zealand’s Resource Management Act 1991 (RMA) requires all Councils to prepare a Regional Plan as to how natural resources would be developed and managed, including farming.

The Waikato Regional Council’s Regional Plan has become increasingly specific in terms of spatially referencing all rural land in the catchment (>2 ha) and capping nitrogen outputs, managing discharges from point and diffuse sources, and setting limits and targets. For example, it is now mandatory that all livestock are permanently excluded from waterways. Furthermore, proposed changes to the Regional Plan include:

- all rural properties greater than 2 ha be registered with the Council (including land-use and livestock numbers);
- all rural properties greater than 20 ha to have an approved Farm Environment Plan prepared by a Certified Farm Environment Planner (with clear actions of how mitigate the discharge of nitrogen, phosphorus, sediment or microbial pathogens to waterways); and
- all rural properties greater than 20 ha establish a Nitrogen Reference Point (with subsequent 5-yearly reporting of reductions against the property’s Nitrogen Reference Point).

#### *Implementation methods*

Key elements in implementing the Waikato River Dairy Farm Management Project are summarised below:

- The approach combines mandatory requirements, market incentives and voluntary access to funding and technical support.
- Some rural industries (such as dairy) have worked with their members to develop and implement a Farm Environment Plan under a Certified Industry Scheme.
- The Dairying and Clear Streams Accord was signed by government, Fonterra and representatives of local and regional councils in 2003 (Murray, 2011). The Accord aims included:
  - dairy cattle to be excluded from 90% of Accord-type streams (defined as deeper than ankle deep, wider than 1 m and permanently flowing), rivers and lakes by 2012;
  - 90% of dairy cattle stream crossings to have bridges or culverts by 2012;
  - dairy shed effluent to comply with resource consents (supposed to come into effect immediately in 2003);
  - dairy farms to have nutrient management plans in place; and
  - regionally significant or important wetlands to be fenced.
- The original Accord concluded in 2013 and has now been replaced by the Sustainable Dairying: Water Accord. The peak industry body – Dairy NZ, reports that “... *the Water Accord includes commitments to targeted riparian planting plans, effluent management, comprehensive standards for new dairy farms and measures to improve the efficiency of water and nutrient use on farms*”.
- Fonterra undertakes an annual Farm Dairy and Environment Assessment with its supplying farmers to ensure farms are compliant with Council regulations.
- There are a range of programs that provide funding support to landholders to undertake riparian restoration work. For example, Fonterra has a partnership with the Department of Conservation for supporting restoration work associated with the Waikato Peat Lakes.
- For landholders outside the dairy industry, the Waikato River Authority has established a Clean-up Trust with \$200 million to be allocated to restore and protect the cultural, social, environmental and economic qualities of the Waikato River and tributaries over the next 30 years. The Clean-up Trust allocates about \$5 million per year.

#### *Successes and key findings*

Fonterra has made the minimum standard for environmental management, including fencing of waterways, part of the contract requirements by supplying farmers. By mid-2015, Fonterra reported that about 96% (24,352 km) of defined waterways had now excluded livestock on farms with approved Farm Environment Plans.

There is a move toward greater reporting, and potential independent auditing, of environmental standards on farms. This has led to greater awareness about water quality and the effectiveness of alternate options for improving waterways.

Key findings from the method are summarised below:

- The approach has become more stringent over time and has community and industry support to become so.
- External pressure from community, environment and angling groups has encouraged increased scrutiny of target achievement.
- The combination of stringent regulations on rural land-use, increasing funding available for implementing on-farm works and market-driven incentives for primary producers (e.g. condition of milk sales for farmers) is rapidly scaling up riparian restoration activity.
- Working with industry to develop standards and policy has increased acceptability for landholders.

- Whilst the Accord has resulted in a large proportion of waterway fenced (Fonterra says farmers which supply it with milk have excluded cows from 98% of the country's "defined" rivers, wetlands and lakes), significant environmental improvements have not been realised. One of the issues identified is that there is an insufficient riparian buffer between the paddock and the waterway to intercept the run-off, with many fences installed at the top of the bank i.e. zero buffer.

## Choosing the best approach

When considering whether a voluntary or mandatory approach is most appropriate for a particular program, managers should consider the key elements outlined below, based on the findings of the literature review and case studies.

**Agency and landholder partnerships.** Mandatory approaches are likely to test agency-landholder relationships and are considered more likely than voluntary approaches to negatively impact these relationships. However, there is often broader community support for compliance action as well, especially where neighbouring properties are involved in the program or impacted by non-compliance.

**Uptake rates and social licence.** While a voluntary program may have landholders that are more motivated, they inherently have lower uptake rates than mandatory programs and can entrench the view that riparian management is 'optional/nice to have' rather than part of a landholder's obligations and critical to water quality and biodiversity goals.

**Ability to meet program goals.** Voluntary approaches have historically been unable to achieve high or fast rates of program implementation, whereas mandatory approaches have been able to achieve more in a shorter timeframe. For example, the River Red Gum Parks project fenced nearly 1500 km of the Murray River and its main tributaries (Goulburn and Ovens rivers) over a four year period.

**Long-term maintenance of works.** It is unclear the extent to which a voluntary or mandatory approach enhances the long-term maintenance of works as both can act to change social norms about acceptable practice. The medium-term nature of voluntary agreements (e.g. 10 years) and the potential loss of investment associated with a change in property ownership needs to be balanced against the potential for increased 'ownership' and maintenance with a voluntary approach.

**Cost.** Mandatory and voluntary approaches have different costs associated with them. For example, a voluntary approach will generally have increased implementation costs (particularly when seeking high levels of landholder participation). Whereas, in the longer term, maintenance costs will rest with government under a mandatory approach (as the land has become government responsibility) compared to a voluntary approach where ongoing maintenance will typically rest with the landholder.

**Mechanisms for driving change.** The program goal, its criticality, the timeframe for achievement and the land tenure will also influence the choice of approach. For example, dairy farming has been identified as contributing disproportionately to degraded water quality in New Zealand due to livestock access to waterways and bank erosion (White et al. 2014), so a mandatory approach can be effective and efficient, rather than relying and waiting for voluntary approaches to be adopted.

## An integrated approach

An alternative to adopting either a voluntary or mandatory approach to the fencing and long-term management of riparian land is to combine various elements of the two approaches – an integrated approach.

Three programs profiled in the case studies applied both voluntary and mandatory elements to deliver their riparian programs:

- Victorian Gorse Taskforce
- Coliban Water Drinking Water Storages
- Waikato River Dairy Farm Management.

For the purpose of this paper, we have defined an integrated approach as a riparian program based on voluntary action (often with the provision of incentives), but with a mandatory (or compliance enforcement) approach available (e.g. in cases of severe degradation, pollution or infestation) either concurrent with the voluntary program or publicly known to be the next step if the initial voluntary program fails to achieve program goals.

A process model has been developed to provide a generic description of voluntary and mandatory pathways and how they could combine into an integrated approach (see Figure 1 below). The subsequent section provides an explanation of the main elements of this process model.

### *Applying an integrated approach – process model*

#### *Program drivers*

Within the process model, the initial step is to articulate and analyse the ‘drivers’ for a change in policy or use of an alternate policy instrument. This step is identified as the foundation and starting point for development of an effective riparian restoration program.

Riparian programs, like other NRM programs, may be initiated in response to social, economic, environmental and/or political drivers. These include, but are not limited to:

- community concern and demand
- technological advancement
- natural disasters/disaster prevention
- legislation or policy changes
- market demand
- environmental degradation
- climate change mitigation.

Each of these drivers may present the government and community with opportunities and/or problems that need to be addressed. In general, riparian programs are developed from evidence-based policy and strategies and implemented through risk-based regional programs. However, reactive programs may also be developed following natural disasters or where community concern and needs are high.

#### *Program goals and strategies*

Once a program need has been established, it is critical to identify goals and strategies that both take advantage of the opportunities available and address the problems. In Victoria, these goals and strategies are typically developed by CMAs and documented in regional waterway strategies, developed under the umbrella of the VWMS (DEPI, 2013) or the RRAP (DELWP, 2015).

The effectiveness and success of the program is determined by how well program implementation delivers the intended outcomes toward achieving the goal.

Peters, G. - Riparian fencing: can't we just make them do it? No, and here's why.

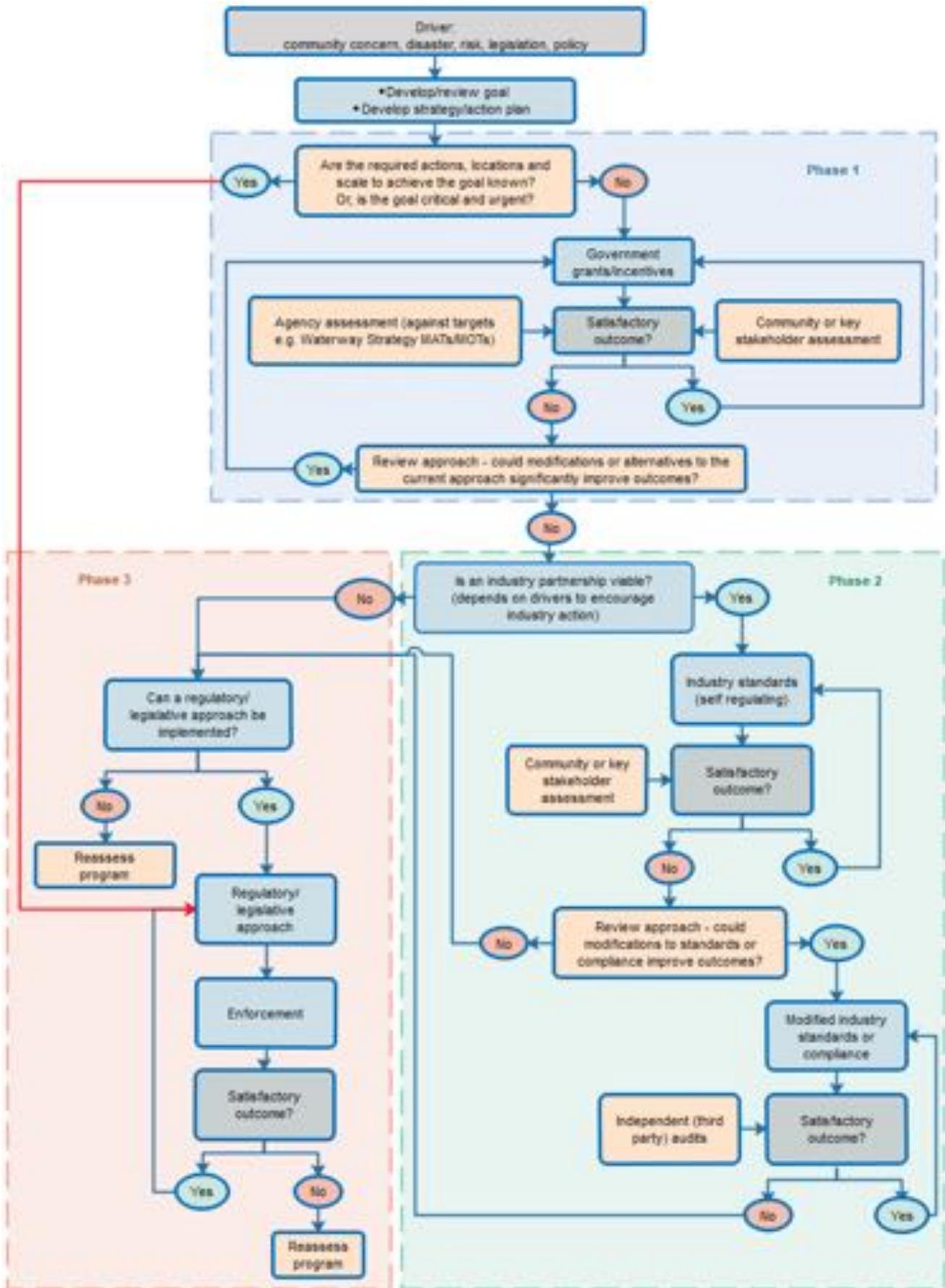


Figure 1 – Integrated approach - process model

## 9 ASM Full Paper

Peters, G. - *Riparian fencing: can't we just make them do it? No, and here's why.*

### *Phase 1 – Landholder incentives (voluntary)*

Historically, implementation of riparian programs has been achieved through government grants and incentives. This approach is viewed as the most conciliatory and as avoiding potential social and political 'backlash'.

Moreover, most riparian programs include a number of factors that constrain government certainty in program success and hence the ability to pursue a mandatory approach in the short term. For example, whilst the cause and effect of riparian restoration actions are generally well understood and accepted, the specific actions required at a site scale can vary from project to project. Hence, a mandatory fencing program could be successful at most sites but may be inappropriate, unnecessary or counter-productive at particular sites.

Where these factors are known and the goal is understood and achievable, it may be preferable to bypass this phase and go directly to a mandatory approach.

The criticality of the goal needs also to be considered at this point. For example, a mandatory approach may be adopted earlier in the process for high priority sites. The goal could be critical for environmental, water quality or recreational reasons. After some agreed time-frame post-implementation (e.g. 8 - 10 years), the outcomes from delivering the incentives should be reviewed. Project 'success' can vary significantly with consequences for program renewal or adaptation.

Where the voluntary (incentives) approach is considered a success, there is no need to trial alternative approaches. However, where success is not being achieved, the approach should be reviewed and alternative options considered. For example, if a riparian incentives program has been running for a number of years with limited buy-in from landholders an alternative approach such as a Market-Based Instrument may be trialled.

If alternative approaches are not viable, it is recommended that the riparian program move to Phase 2 – industry partnership.

### *Phase 2 – Industry partnerships*

Where incentives have been applied, but are not achieving effective outcomes, NRM agencies should consider forming partnerships with relevant industry organisations. Industry organisations can help agencies develop practical solutions to meet NRM targets that are also acceptable and viable for landholders to implement.

Community acceptance of an industry or practice and its social licence to operate can change quickly (e.g. the wild catch industry and 'super trawler' ban in 2012, or the (since reversed) 2011 ban on live export of livestock). NRM agencies can work with industry to assist them to maintain their social licence by proactively reducing their environmental impacts.

In determining the viability of developing an industry partnership, CMAs should consider:

- the dominant industry within the program target area and the strength of its institutions
- the extent to which the industry has been regulated in the past
- potential drivers or incentives that could encourage landholder participation and adoption of actions (e.g. opportunity to secure markets, rate rebates, meeting sustainability criteria)
- the development of minimum standards that could be adopted by the industry
- the length of time required to develop standards and which groups need to be involved in development.

Where an industry partnership is considered viable, the next step should be to develop a set of agreed minimum standards that, if applied across the industry, would achieve the goals of the riparian program and enhance or maintain the viability of the industry.

## 9 ASM Full Paper

Peters, G. - *Riparian fencing: can't we just make them do it? No, and here's why.*

In the short term, the standards should be self-regulating with an agreed timeframe for review and assessment of outcomes. At the review, if stakeholders or partners (or the industry itself) consider that the standards or method of assessment is not achieving the desired outcomes then either the standards or compliance approach should be modified, or where this cannot be achieved, the program should consider adopting a regulatory/legislative (mandatory) approach (Phase 3).

### *Phase 3 – Regulation and legislation (mandatory)*

A number of legislative and regulatory tools (e.g. *Environment Protection and Biodiversity Conservation Act 1999*, *Victorian Flora and Fauna Guarantee Act 1988*, *Victorian Crown Land (Reserves) Act 1978*) exist that may be of assistance to CMAs in implementing riparian programs. The most relevant and accessible of these in Victoria is the management of licensed Crown frontages as land ownership rests with the state. Where it is considered feasible to implement a legislative or regulatory approach, government agencies should ensure that compliance is assured through a comprehensive enforcement program. If the program still fails to meet the goals or a mandatory approach is not viable, the CMA should reassess the program and determine if an alternative approach could be adopted to meet the goal.

## Conclusions

There is no single panacea for riparian restoration.

All approaches and programs will involve some trade-offs and difficulties, with a combined approach of voluntary (incentives and subsidies) and mandatory (penalties and regulations) – an integrated approach - likely to achieve the best possible outcome.

## Acknowledgments

Funding for the investigation was provided by the Victorian Riparian Management Program through DELWP.

The investigation involved the collective effort of a number of organisations and individuals. In particular, the author thanks:

- the project team - Simone Wilkie and Bron Gwyther (Riverness Pty. Ltd.) and Allan Curtis and Digby Race (Charles Sturt University)
- the project working group, consisting of representatives from CMAs (Luke Austin - Wimmera, Adam Bester – Glenelg Hopkins, Lang Dowdell – North Central) and DELWP (Peter Vollebergh and Rinske Poulier)
- the project advisory group, consisting of representatives from Environment Victoria (Juliet Le Feuvre) and the Victorian Farmers Federation (Lisa Gervasoni)
- the project managers and landholders interviewed for the case studies.

## References

- Aarons, S.R. (2011) Dairy farm impacts of fencing riparian land: An analysis of farmers' perceptions of the costs and benefits. *Journal of Soil and Water Conservation* September/October 2011 vol. 66 no. 5 140A-147A
- DELWP, 2015. *Regional Riparian Action Plan*. East Melbourne, Victoria: Department of Environment, Land, Water and Planning.
- DEPI, 2013. *Victorian Waterway Management Strategy*. East Melbourne, Victoria: Department of Environment and Primary Industries.
- Murray, C., 2011. Regional Councils in the Creation of Social Capital. NZARES Conference. Nelson, New Zealand.
- White, T., Dominati, E., Mackay, A. and Blackett, P., 2014. *More than just fencing: Options for riparian*

## **9 ASM Full Paper**

*Peters, G. - Riparian fencing: can't we just make them do it? No, and here's why.*

*zones on-farm and ecosystem services valuation.* In: Proceedings of the 5th Australasian Dairy Science Symposium 2014.