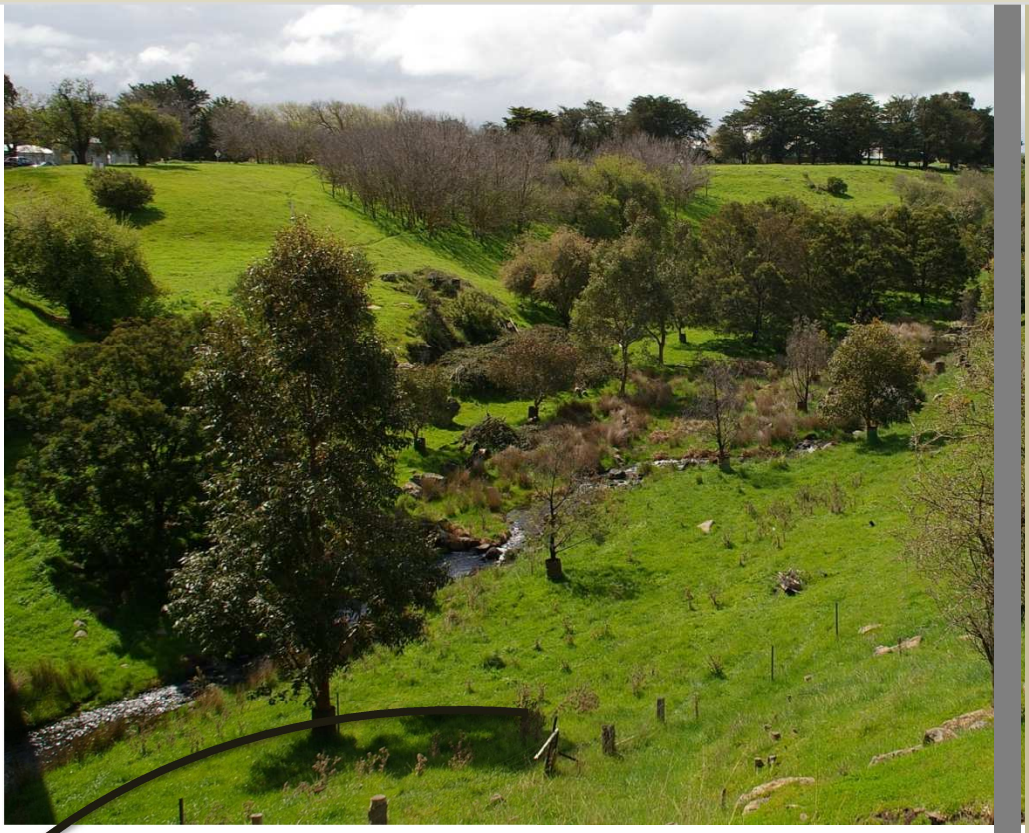
An investigation into cost sharing and funding allocation approaches used in Victorian riparian management programs



Final Report to the Department of Environment, Water, Land and Planning – November 2015

Natural Decisions

This report should be attributed as Dickson, M., Park, G., Roberts, A. and Pannell, D., 2015. *An investigation into cost sharing and funding allocation approaches used in Victorian riparian management programs. Final Report. November 2015*. Prepared by Natural Decisions Pty. Ltd. for the Department of Environment, Land, Water and Planning, Victoria.

Acknowledgements

This report was commissioned by the Department of Environment, Land, Water and Planning.

The report was prepared by Natural Decisions Pty Ltd. The authors would particularly like to thank Project Working Group members: Peter Vollebergh, Les Tate (DELWP), Luke Austin (Wimmera CMA) and David Nicholl (Glenelg Hopkins CMA) for active guidance and support and, Professor Ian Rutherfurd (University of Melbourne) for expert review. The authors would also like to thank CMA and Melbourne Water staff who participated in the investigation through online survey, workshops and review of draft documents. Their names are outlined in Appendix C.

Disclaimer

Overview

This report is the final milestone of a project '*An investigation of cost sharing and funding allocation approaches used in Victorian riparian management programs'* commissioned by the Department of Environment, Land, Water and Planning (DELWP).

The project was aimed at investigating the current approaches CMAs adopt for cost-sharing and funding allocation for riparian management activities and analysing their advantages and disadvantages as well as looking at other possible models and approaches for apportioning costs between landholders and CMAs and making recommendations about preferred approaches.

It was expected that the project would provide direction for CMAs enabling them to make adjustments to their current riparian management cost-sharing approaches.

It was also important to consider approaches that maximise the amount of on-ground work that can be achieved with a given amount of funding, as well as being able to demonstrate to Government and the public that the Victorian Waterway Health program is endeavouring to improve the efficiency and effectiveness of its delivery.

Finally, while assessing the efficient allocation of funds was a priority, it was also important to ensure that proposed cost-sharing approaches can lead to the best on-ground outcomes with consideration to factors such as who does the initial on-ground riparian work, landholder contributions, and whether a landholder is genuinely committed to the project and likely to undertake the long term management of the fenced-off area.

The report is structured in four sections, Parts 1-3 set out the milestones from the major phases of the investigation and Part 4 contains the report Appendices:

- Part 1: Final report and recommendations
- Part 2: Current approaches to cost sharing used by Catchment Management Authorities (CMAs) and Melbourne Water
- Part 3: Discussion paper - Investigation into Riparian Cost- Sharing Arrangements
- Part 4: Appendices

Abbreviations

BCR	Benefit:Cost Ratio
CMA	Catchment Management Authority
DELWP	Department of Environment, Land, Water and Planning
EOI	Expression of Interest
MBI	Market Based Instrument
NRM	Natural Resource Management
RBI	River Benefits Index
VWMS	Victorian Waterway Management Strategy

PART 1: FINAL REPORT AND RECOMMENDATIONS

1 Introduction

This final report forms part of a broader project to investigate report and provide guidance on:

1) To assess the current approaches CMAs adopt for cost-sharing and funding allocation for riparian management activities and analysing their advantages and disadvantages in different circumstances (e.g. industry and regional variation).
2) To investigate other possible models and approaches for apportioning costs between landholders and CMAs.
3) To provide recommendations and guidance on the most effective approaches for CMAs to use to deliver the best on-ground outcomes at minimum cost when developing and implementing their cost-sharing approaches for riparian management activities.

This final report sets out the key findings and recommendations from the investigation. The recommendations have been developed with consideration to feasibility, cost-effectiveness, flexibility and complexity. CMAs and the Department of Environment, Land, Water and Planning (DELWP)have been clear that proposed approaches should be neither prescriptive nor overly complicated (e.g. complicated formulas which are difficult to implement and justify to landholders).

Where possible the strengths of current approaches have been recognised and drawn upon, recognising that they have developed and evolved to meet regional circumstances and changing government demands and priorities over time.

N.B. For the purposes of this investigation, Melbourne Water is the relevant authority with responsibilities for waterway management activities in the Port Phillip and Westernport CMA region. References to CMAs in this report therefore include Melbourne Water.

1.1 Approach

This investigation into cost sharing and funding allocation for riparian management was undertaken in three major phases including:

Literature review and discussion paper; involved examining the economic theory for cost sharing, identified other approaches from Australia and the United States and described a set of conceptual approaches to cost sharing for consideration (see Part 3)

Investigation of current approaches; involved a review of documents and consultation with CMAs through survey and interviews in order to describe, summarise and analyse current approaches to cost sharing used by CMAs including identification of advantages and disadvantages of approaches and alignment with conceptual approaches and policy principles (see Part 2).

Analysis and final recommendations; involved summarising the findings from previous stages of the investigation, formulation of recommendations and development of the Riparian Benefit:Cost Scoring Tool.

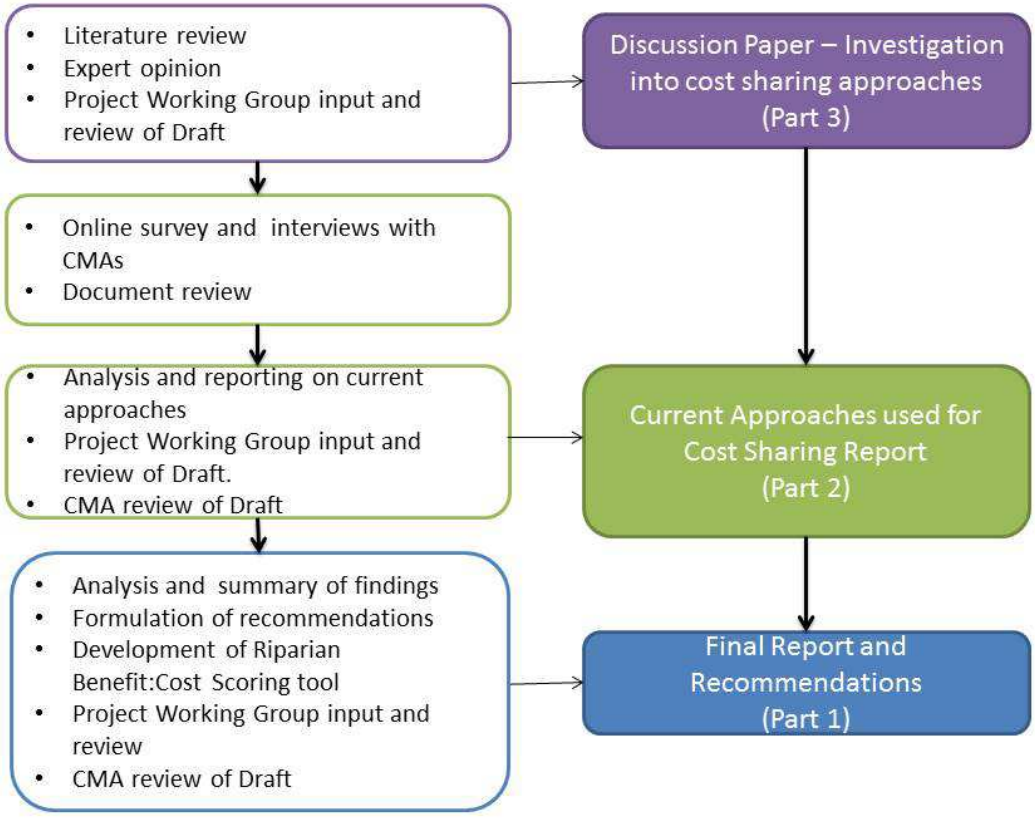


Figure 1. Project Approach

2. Key findings about current approaches

Survey and follow-up interviews with each of the CMAs and Melbourne Water enabled more detailed understanding of the current approaches CMAs adopt for cost-sharing and funding allocation for riparian management activities. Full details of findings from the investigation into current approaches used by CMAs can be found in Part 2 of this final report 'Current approaches to cost sharing used by Catchment Management Authorities and Melbourne Water'.

Programs have evolved over time as part of adaptive management and understanding of specific local context. Overall CMAs were satisfied with current approaches, with suggestions for improvement largely about refinements rather than fundamental changes. All expressed interest in learning from each other and trialling new approaches to improve outcomes from investment in riparian programs.

2.1 Variability in approaches

2.1.1 Delivery mechanisms

Eight CMAs[1] [2]currently use grants/incentives to deliver riparian management programs, for six of the eight this is their primary delivery mechanism, these CMAs also use direct works as a secondary delivery mechanism for specific riparian activities such as coordinated weed maintenance, revegetation or instream and large scale willow removal works (N.B instream and large scale willow removal works are not the focus of this investigation).

Two[3] CMAs have a mixed model using direct works or contracting arrangements together with a grants program. A further two CMAs[4] primarily use a direct works approach where they fund and coordinate the delivery of works through the use of contractors. All CMAs reported using a direct works approach for instream works and large scale willow control.

The two CMAs[5] which have moved away from direct works to a grants/incentives model were driven in part by a desire to use a model that they believe better encourages increased landholder ownership of the works through landholder participation. They believe that this approach, where landholders make a contribution to the direct up-front costs leads to increased long-term commitment to manage sites and maintain benefits, but it is acknowledged that this has not been proven.

The two which have moved from grants/incentive approaches to direct works cited reasons of higher quality of works achieved, increased ability to secure landholder participation in priority reaches, efficiency in program administration and the ability to deliver programs within funding timelines.

Tender approaches (MBIs) have been used by five[6] CMAs, with Melbourne Water currently trialling one. Overall there hasn't been widespread adoption of MBIs for riparian programs. It had been proposed that MBIs might encourage greater long term commitment to site maintenance, but results were inconclusive in the North East CMA (NECMA 2008). Landholders had problems with the bidding process, felt they had insufficient technical advice to prepare bids and as a result under-bid for projects (Curtis et al 2008). Some landholders dropped out of the program after the first year of a multiple year funding and management agreement. It appears that MBIs may require higher technical capacity and interaction with landholders than traditional approaches and may have higher administration requirements and transaction costs. All of these factors suggest that for some CMAs the increased complexity is not seen as sufficiently worthwhile over more traditional cost share approaches. Another factor may be that tenders have not been run over sufficiently large areas, have attracted a limited number of landholder bids and therefore may have not actually generated enough market friction to elicit cost-effective bids.

[1] Corangamite, East Gippsland, Glenelg Hopkins, Goulburn Broken, Mallee, Melbourne Water, North East, Wimmera
[2] Note that Melbourne Water is considered as a CMA in terms of its riparian management program.
[3] Mallee, Melbourne Water
[4] North Central, West Gippsland
[5] East Gippsland and North East
[6] Corangamite, Glenelg Hopkins, North Central, North East, Wimmera

2.2.2 Cost share

None of the approaches used by CMAs can be described as a simple percentage based cost share approach. Approaches have their basis in the concept of a percentage based cost-share between government and the landholder but there is a complex array of incentive rates, delivery mechanisms and funding rules for specific project activities. This means in practice that is it difficult to actually work out what the cost share is between CMAs and landholders. An attempt was made to summarise cost shares for fencing and revegetation using the supplied incentive rates and a range of assumptions regarding the full cost of works and likely landholder contribution. For fencing cost sharing was estimated to range from 25:75 up to 100:0 (CMA: Landholder), whilst for revegetation cost sharing ranged from 40:60 to 100:0. The approach to the estimation of cost shares is set out in Part 2 Section 3.2 and the diversity and complexity of approaches used is summarised in Appendix G.

2.2 Ranking and project selection

CMAs have widely varying approaches to prioritise (rank) and select projects. Ranking is sometimes used where multiple projects need to be compared or in other cases is used to assess suitability where there is a threshold or score to guide whether projects should be funded.

All CMAs have a preliminary set of criteria to establish whether a project is eligible for funding, which commonly relate to factors such as a project being located in a priority reach, minimum fence set back width and landholder contribution (financial or in-kind).

All CMAs also require landholders to sign a management agreement.

Under these agreements any Crown Frontage land that is managed under a grazing licence is converted to a riparian management licence. Where Crown Frontage land is occupied but not licenced, then the landholder must be willing to enter into a riparian management licence to be eligible for funding.

Other factors commonly assessed to rank projects include:

- Priority of waterway
- Length of stream or area of site to be included in the project
- Quality of vegetation/site condition
- Connectivity with past works or remnant vegetation
- Other site based threats e.g. erosion

The approaches used by CMAs:

1. Assess suitability of an individual project proposal for funding (yes/no – is the project suitable to be considered for funding?);
2. Rank a set of project proposals received where an annual call/expression of interest for projects process is used;
3. Determine the level of incentive (usually for fencing) offered to funded projects, as a proportion of the overall direct cost associated with a project (used where variable rate cost sharing is used).

2.3 Public benefits assessment

The assessment of net public benefits by CMAs for riparian programs is both variable and hard to ascertain. Landscape and project heterogeneity is large, as is starting site condition, all of which, along with the management actions that the land manager is prepared to undertake will affect potential for public benefits.

There appear to be three main approaches[7] currently being used:

- Five CMAs[8] do some form of assessment to assess project suitability and determine a variable rate of cost share;
- Three CMAs[9]do some form of assessment to rank projects;
- Two CMAs[10] do not do a formal assessment and assume that, provided the project is in the priority reach, it automatically has sufficiently high public benefits.

Overall there are two main issues with current approaches:

- Lack of consistency and transparency in how public benefits are assessed overall.
- Considerations of what would happen 'with' and 'without' project investment at each site are not considered. The issue of considering 'with' and 'without' is fundamental in any approach which seeks to demonstrate value for money (Pannell 2015). No CMA currently uses the 'with' and 'without' concept explicitly and the importance of doing so is shown in Section 4.3.2.

2.4 Landholder contributions

Calculating landholder contributions can be complex and increase the transaction costs for CMAs. As a result, landholder contributions (cash or in-kind) are not typically calculated for the individual activities that are funded through riparian programs by CMAs. They are commonly:

- Assumed to be the portion of costs formed by the total cost for an activity (i.e. fencing) less the funding offered through a grant or incentive rate;
- Calculated based on the actual costs of an activity (usually off-stream watering);
- Assumed to be equal to the funding provided through an incentive or grant.

It is not recommended that CMAs undertake significant additional effort to estimate landholders' cash and in-kind costs (*see Recommendation 2*). While this would allow more accurate calculation of the actual cost shares, there is no theoretical basis for preferring any particular cost share. Efforts to limit the contribution of public funds whilst still achieving environmental targets can be pursued without accurate information about the actual cost shares.

Current riparian programs (with the exception of MBIs[11]) generally only provide funding for upfront costs, although in some cases additional funds are provided for weed control in the first few years of

[7] See Appendix G
[8] Corangamite, East Gippsland, Glenelg Hopkins, Goulburn Broken and Melbourne Water
[9] Mallee, North East, Wimmera
[10] North Central, West Gippsland

the project, with the on-going maintenance costs always to be borne by the landholder. In situations where a natural disaster such as a flood or fire damages a fence, the CMA may fund activities such as fence replacement, the approaches used in these cases vary by CMA and according to the source of the funds (see Part 2 Section 4.5 for more detail).

While the general approach of restricting funding to upfront works is clear in negotiation of landholder agreements and sound in terms of minimising the cost to government, it will only be effective if landholders do actually maintain riparian works in perpetuity. For those who do not, then the benefits of the initial investment will potentially be lost. As more and more riparian areas are managed, the likelihood of lack of compliance with maintenance will increase. Also, landholder agreements where there is no Crown Frontage lapse with change of ownership, which has the potential to degrade the overall benefits over time, particularly in areas where there is significant land turnover.

2.5 Public costs associated with riparian management programs

There are two main elements of public costs, costs to the Victorian government for administering the program and costs to the CMAs themselves associated with implementing the program. The public costs include both program administration and the public contribution to the cost share with landholders for the riparian works. For the purposes of this report it is assumed that costs to the Victorian government for program administration are similar for each CMA and that programs are administered efficiently. Victorian government and CMA program administration costs will therefore not be considered and the report covers issues to be considered at the CMA level.

This project did not collect information on the differences in costs faced by CMAs to administer and implement riparian programs.

2.5.1 Delivery mechanisms

Of the three principal delivery mechanism used by CMAs - grants/incentives, direct works and MBIs - the first two are currently favoured by CMAs to suit their particular regional context.

In terms of value for money both grants/incentives and direct works approaches could each be successfully used to implement projects. Interestingly both approaches have been justified by CMAs on the basis that they provide the most efficient and cost effective means of program delivery.

There is likely to be a trade-off between (a) the transaction costs borne in the process of obtaining and evaluating the information needed to make decisions about projects and (b) the environmental benefits generated. A well-conducted MBI enables environmental outcomes to be quantified consistently though use of the Environmental Benefits Index (EBI) and as a result a MBI is better able to demonstrate the outcomes achieved than a grants/incentives or direct works program. However the delivery of MBIs often involves additional time and costs for program administrators and/or landholders. A number of CMAs have made the judgement these additional costs are not worth bearing, but it is not clear what judgements they have made about the resulting benefits, or how they have made those judgements, so it is not clear if that it this is sound. A further issue

[11] MBIs generally provide stewardship payments usually over an extended time period, such as five years.

experienced with implementation of MBIs is that in some cases landholder payments were extremely high, possibly as a result of low numbers of landholder bids and limited market friction.

A transparent assessment of the costs (all costs including Victorian government and CMA program administration costs as well as payments to individuals) and the benefits involved in grants, direct works and MBI approaches would improve understanding of the degree to which there are differences between delivery models between regions in terms of achieving public net benefits at least cost (*see Recommendation 7*).

2.5.2 Program administration – project selection, project recording

As outlined earlier there is great variety in the approaches used by CMAs to assess and select projects, making it very difficult to assess the actual cost shares being applied, or whether funded projects are delivering the best value for money.

Significant improvements could be achieved through the adoption of a standard approach across CMAs to the assessment and ranking of projects, together with the documentation of estimated public benefits and landholder payments associated with projects (*see Recommendation 3)*.

2.5.3 Technical support

The adoption of a standard approach to the assessment and ranking of projects will generate a need for technical support to CMAs (*see Recommendation 3*). This will include provision of training in approaches, technical support, quality assurance and systems management training. Readily accessible and downloadable standard templates would also be useful to enable CMAs to either replace or augment current approaches. Theoretically sound and standardised approaches based on value for money are most likely to be implemented by CMAs if there is adequate technical support to help facilitate change.

2.5.4 Monitoring for outcomes

As highlighted earlier in the discussion relating to estimating public benefits, a crucial factor relates to estimating site conditions and values with and without riparian management activities. Monitoring efforts should focus on collecting information on the extent to which funded projects have contributed to the generation of public benefits by looking at both funded and unfunded sites (*see Recommendation 6*), as is occurring in the Riparian Intervention Monitoring Program (Morris et al. 2014).

2.5.5 Compliance assessment

CMAs need to undertake compliance assessment of riparian landholder agreements as an important element of maintaining the benefits of riparian management (*see Recommendation 6*). With the number of agreements increasing the public costs of compliance are also likely to increase significantly into the future and such costs need to be factored into budget allocations.

2.5.6 Reducing costs

Two main trade-offs were identified from the idea of reducing costs to government (i.e. through changes to cost sharing arrangements or levels of funding). These were (a) that the quality of works might reduce as a result of offering lower payments, with an impact on the security of the outcome,

and (b) that participation by landholders particularly in priority areas would be affected. These two factors were raised throughout interviews with a number of CMAs, both as factors contributing to choices in of delivery mechanism and in the rates established for incentives/level of funding. The recommendations (*see Recommendations 1a and 4)* that CMAs should attempt to identify the lowest level of funding / cost share that still achieves sufficient participation does not conflict with this.

The drivers for an individual landholder's participation in an environmental program are complex and are related to factors such as personal values and socio-economic circumstances.

If participation is too low in priority areas, it could be that the funding level / cost share has been set too low, but this is just one factor that will contribute to participation rates.

In relation to quality of the works, this should be clearly defined when the works are contracted and can (and is currently) be managed through processes such as paying on completion and inspection of works and the use of standards to underpin agreements.

2.6 Victorian Waterway Management Strategy (VWMS)

2.6.1 Alignment with VWMS cost sharing principles

The Victorian Waterway Management Strategy (VWMS) explicitly considers the issue of cost sharing in Policy 9.7. The policy provides guidance on the government's position regarding apportioning costs for riparian management. It outlines that the level of payment to be made by the Victorian Government should be based on the following factors:

- Priority for management activities;
- Level of public benefit;
- Level of security of the agreement.

How current approaches align with VWMS principles are outlined along with suggestions for improving upon the VWMS principles. These are summarised in Recommendation 1d and some additional points under other recommendations are also shown below.

Priority for management activities: All CMAs are targeting the majority of their riparian works activities towards priority waterways/reaches but there are variants on how this occurs as outlined in Part 2 (Current approaches).

CMAs commonly interpret priority for management activities to be the whether the waterway is in a priority reach.[12] It is recommended that the priority reach should be considered as a simple eligibility criterion. (*see Recommendation 2*). This is because the specification of priority reaches is not a fine-grained measure of a reach's value or importance. Once eligibility is established, it is reasonable to base payments on the level of public net benefits and level of security of the agreement.

[12] Although further prioritisation through more detailed waterway action planning was reported by Glenelg Hopkins CMA.

The principle could be (but doesn't appear to be currently) interpreted to mean that CMAs should consider the priority of the individual management activity (i.e. fencing versus off-stream water versus revegetation) in determining the cost share / incentive. The priority for an individual management activity is highly context and landholder specific and therefore it is difficult to apply cost sharing rules in a consistent way.

CMAs do consider the degree to which an individual management activity has private versus public benefits. For example pumps for off stream watering are deemed to have a high potential private benefit and therefore the landholder bears the cost for this item, whilst trees in revegetation activities are considered to have a high public benefit therefore CMAs often fund a higher proportion of the costs.

Finer scale ranking and valuing of priority waterways as is done through Waterway Action Planning or through a BCR will assist with achieving better environmental outcomes and value for money from government

Level of public benefit: As discussed earlier (section 2.3), the assessment of public benefits by all CMAs is unclear. There is scope to improve the standardisation and rigour of the estimation of public benefits.

Given the principle that public funding should be limited to the lowest possible level while still achieving outcomes, projects that generate higher levels of public benefits should not necessarily involve higher incentive payments / cost shares for CMAs. However, if higher incentives / cost shares are required to secure sufficient landholder participation, then they are more likely to be justified in projects that generate greater public benefits and should be accompanied by higher levels of monitoring, compliance assessment and security of agreement (*see Recommendation 5*).

Level of security of agreement: All CMAs use a legally binding contract to define the conditions of cost sharing and the long-term roles and responsibilities for the management of riparian land. Two CMAs[13] increase the level of funding for sites that are covenanted, which represents the best alignment with the VWMS principles.

Given that covenanting is secured on title (and used mostly to secure high quality sites where landholders are willing to do so), there is reduced risk of losing the benefits of the project than on uncovenanted sites, provided the sites are maintained. Covenanting is often used to secure high quality sites; under standard agreements the risks of degradation are potentially high when land changes hands. This means that, other things being equal, covenanted land generates a high expected public benefit ("expected" in a statistical sense). Thus, when considering the level of incentive / cost share, covenanting should be treated similarly to public benefits. That is, projects that involve covenanting of land should not necessarily involve higher incentives / cost shares, but if higher payments are required to secure sufficient landholder participation, then they are more likely to be justified in projects where land is covenanted (*see Recommendation 5*).

[13] Glenelg Hopkins and Goulburn Broken CMAs.

Overall, because CMAs generally use a standard management agreement with only a limited amount of covenanting reported to be occurring across the state setting the level of incentive/cost share based on the security agreement will not have wide application in riparian programs.

2.6.2 Width of riparian fencing

The width of riparian areas being fenced through CMA programs was raised as a potential concern during this project. The VWMS states that 'Riparian land fenced for riparian management purposes will aim to be at least 20 m wide on average from the top of the bank and must not be narrower than 10 m in any one place.' However the majority of CMAs have a minimum requirement of 10m. This investigation did not collect information on the proportion of fences constructed at 10m versus 20 m. The degree to which at least 20 m is achieved is not clear but is likely to be not achieved in particular areas (e.g. smaller farms and higher value agricultural land such as dairy and horticultural enterprises). There are also likely to be practical issues in fencing at 20 m widths in some areas of the state due to topography and landholder capacity (particularly for maintenance).

2.7 Landholder participation

While there remain many priority reaches in regional waterway strategies, a key emerging issue for some CMAs is the level of landholder participation in some areas. Some CMAs reported difficulty in attracting participants for new projects. This issue may become more significant over time, especially if works are targeted to a limited number of priority reaches. Declining levels of participation may prompt several responses from CMAs such as:

1. Move their focus from the selected priority to a different priority area in which participation is expected to be higher;
2. Increase rates of funding in order to attract more participants to projects in high-priority reaches;
3. Try different engagement approaches to secure participation by landholders if the current approach isn't effective.

Any of these approaches are potentially reasonable. Once the limits of voluntary participation have been reached (i.e. projects that landholders are willing to do with low levels of financial support), there will be a trade-off between those projects that are potentially most beneficial, and those that are most socially feasible in practice.

3 Key findings from the discussion paper

3.1 Conceptual approaches

At the start of the project four conceptual approaches to cost sharing were proposed:

A. Costs shared according to an agreed percentage, such as 50: 50;
B. Costs shared according to the ratio of private benefits: public benefits;
C. Costs shared so as to minimise the public cost of achieving any particular outcome;
D. Costs shared so as to maximise the public benefits from the program.

As discussed in more detail below, the approaches used by CMAs currently do not fit neatly within any of these approaches, although they most strongly align with Approach A.

3.1 Findings from Victorian literature

The available literature on riparian management programs delivered by CMAs reflected past practices and a key part of commissioning this project was to update knowledge about the changes that have occurred and reflect on current approaches. The literature from Victoria, based on reports from 2009 -2014 indicated that three general approaches were employed by CMAs:

1. Grants/incentives provided to landholders with costs notionally shared at an agreed percentages. This can be described as a traditional cost share approach. There was insufficient detail to tease out the precise cost-sharing rules in each region but it was apparent that there was considerable variation between approaches used by CMAs;
2. Direct works approach. This involved involves cost sharing in the sense that land holders may be responsible for a proportion of the initial costs, plus ongoing maintenance;
3. Use of Market Based Instrument (MBI) River Tender approaches. These involve cost sharing in the sense that winning bidders may have elected to bear some of the costs. While MBI approaches have been trialled by several CMAs for riparian programs, there appeared to be factors limiting their widespread adoption over more traditional approaches.

3.3 Experience from interstate and overseas

There were limited available examples in the Australian literature to help inform this investigation. It appears as though Victoria is well ahead of other states in the sophistication of riparian management programs., Where issues related to cost sharing have not been addressed in any systematic way Victoria can learn from some aspects of cost-share programs internationally, particularly with respect to clear rules for participation, active contract management, provisions for compliance inspection/accountability and the need for extension and technical support for land managers (Craig and Roberts 2015, Shimshack and Ward 2005). These are captured in *Recommendations 2, 5 and 6.*

The literature review raised several other issues that would be useful to consider in recommending improvements to Victorian programs. These included issues of targeting given limited budgets, the scale of participation and costs to achieve outcomes, and the links between site and river reach/riparian program scales.

Land tenure and licensing of Crown water frontages has been of major interest to the Victorian government. Interesting recently completed work (Aither 2015) suggests that livestock exclusion is the most significant issue in achieving waterway health outcomes rather than land tenure (freehold or Crown frontage).

MBI approaches appear to offer an economically robust and accountable approach to funding riparian management programs (because of consistency in assessment of public benefits and transparency in costs that landholders will accept to participate). However, more traditional cost-sharing programs using grants/incentives and direct works continue to be well accepted by CMAs compared with MBI approaches. Reasons for the lack of hoped for uptake of MBIs are outlined

further in section 2.1.1 and section 2.1 in Part 2 'Current approaches'). Some CMAs have also made active decisions away from grants/incentive model to a direct capital works approach and others have gone in the opposite direction.

Given the considerable differences in approaches there will be large differences in overall public benefits and cost-effectiveness of riparian management programs between CMA regions and across projects within the same region.

If MBI-type approaches are deemed by CMAs and/or the Victorian government to be not as cost-effective as traditional approaches in improving riparian management outcomes or are not accepted for other reasons, then public benefits and value for money can still be enhanced through:

(a) Attempting to identify the lowest level of funding / cost share that will prompt sufficient participation to achieve the program's goals;
(b) Allowing the option for appropriately increased funding / cost shares for more beneficial actions; and
(c) Prioritising projects with landholders that will provide the largest environmental benefits per dollar of funding[14].

[14] However it will be important to consider the potential negative impacts on landholder engagement that may result from this. For example the perception of equity is often cited.

4. Recommendations

In light of the review above, this section sets out a set of seven recommendations to improve approaches to funding and cost sharing in riparian programs in Victoria.

4.1 Overarching principles for development of recommendations

To consider how existing approaches can be improved, a useful starting point is the principle that the preferred approaches should be those that provide the best value for money. With increasing pressures on government budgets, it is becoming increasingly important to demonstrate this.

To demonstrate value for money, the following equation (Benefit: Cost Ratio or BCR[15]) should ideally be used in place of approaches used currently:

Equation 1: BCR = (public benefits – public costs for administration and delivery[16])/cost for on-ground works

There is, however, complexity in understanding public costs for administration and delivery[17] and then working out how to apportion those costs to an individual project. Given this, in the interests of simplicity, it may be preferable to set aside the administration and delivery costs, and only include the cost for on ground works; that is either the grant to landholders, or the cost for materials and contractors, and simplify the equation to:

Equation 2: BCR = public benefits[18]/public cost for on-ground works.

A spreadsheet tool has been developed to enable CMAs to assess projects and has been used as the basis of the examples provided below.

Favourable projects then become those with higher BCRs. There are two elements required to maximise the public benefits and value for money of the overall investment:

(a) a large enough number of projects with suitable characteristics from which to select to fund and
(b) appropriate setting of the level of funding / cost share.

[15] As outlined in 1.4.2 those projects with lowest BCRs, for example the bottom 20%, could be excluded from funding. This level may need to be adjusted based on available budgets.

[16] On-ground costs for the project, namely the grant/incentive or contractor payment as relevant.

[17] Note that this project did not collect information about public costs. However, it can be assumed that one of the important reasons as to why MBIs have been not been continued is the high public costs to administer and deliver due to increased complexity relative to other approaches.

[18] Public benefits are based on the value of the asset, the degree to which the project will improve change condition (effectiveness of works), the fence set back, whether one or both sides are fenced, site connectivity, likelihood of adoption, risk of failure and project on-ground costs.

These insights suggest the following principles for evaluating the potential for improvements to existing cost-sharing and project selection approaches.

- CMAs should attempt to identify the lowest levels of funding that will prompt sufficient participation to achieve the program's goals. MBIs are one way to do this, but it could also be attempted by negotiation, perhaps with standard values used as a starting point to help guide the negotiators.
- If a project offers a larger public benefit, it may be worth offering higher levels of funding. However, the higher funding should not be automatic. Ideally, they should only be offered if they are necessary to secure participation.
- Public benefits should be estimated as the *additional* public benefits generated as a result of the project (i.e. benefits 'with' minus benefits 'without' the project). In other words, the key question is, what difference will the project make? Including variables like current condition site values or level of threat are not enough to achieve this. Variables such as the width of riparian land fenced off and the potential to improve connectivity would be expected to contribute to public benefits.
- Projects should be ranked on the basis of value for money. This should be done using the BCR (public benefits /public costs as per equation 2 above), not on the basis of benefits alone, and not on benefits minus cost.

Ideally you would only fund projects were the overall benefits exceed the cost, that is, projects with a BCR > 1. However this approach requires the benefits to be expressed in dollar values, or to use a system, such as INFFER where the relative value of different assets can be related back to a dollar value. In the INFFER asset ranking system each point is equivalent to $20 million. In the BCR equation described in this report we have proposed a ranking system, similar to that used in INFFER, but without allocating a unit dollar value. Further work would be required to align this valuation system with INFFER, or to ascribe dollar values to waterway assets at the level of specific assets.

As outlined above at the heart of suggesting improvements to current approaches should be to use the BCR to rank projects and base funding of projects based on the relative ranking. Below are suggestions for how to improve current approaches based on each of the elements outlined in the equation, plus initial project ranking and selection recommendations.

Section 4.7 provides a schematic overview of both current and proposed future approaches. It provides guidance on how the following recommendations could be applied in tandem with these approaches or support improved mechanisms that aim to achieve value for money with government investment in riparian programs.

R1: Recommended principles for improving cost sharing approaches used by CMAs for riparian programs:

Preferred cost-sharing approaches should be those that provide the best value for money. Public benefits and value for money achieved through current approaches can be enhanced through:

R 1.1: Attempting to identify the lowest level of funding that will prompt sufficient participation to achieve the program's goals (see Recommendation 4);

R 1.2: Prioritising projects that will provide the best value for money (see Recommendation 2).

- Criteria used for assessing public benefits should not be confused with eligibility criteria.
- Public benefits should be estimated as the *additional* public benefits generated as a result of the project (i.e. benefits 'with' minus benefits 'without' the project)
- Projects should be ranked on the basis of BCR = [public benefits /public cost for on ground works]. Considering both benefits and costs in this way will provide greater public benefits overall than approaches based on benefits alone, or on benefits minus cost. A BCR formula is outlined in Section 4.3.4.

R 1.3: Allowing increased levels of funding for more beneficial actions, but only providing that increased funding is necessary to generate sufficient participation; (see Recommendation 5).

R 1.4: Suggested improvements to VWMS principles are to:

- Use value for money rather than level of public benefit as a principle (this includes consideration of costs as well as benefits).
- Use the priority status of a Waterway as an eligibility criteria for funding rather than as a consideration in determining the level of cost share/funding (see Recommendation 2).
- Retain the principle regarding the level of security of agreement and recognise that more secure agreements (e.g. covenants) are likely to generate higher levels of public benefits, all other factors being equal.

4.2 Ranking and project selection

A variety of approaches are used by CMAs to assess projects for funding as outlined in Part 2 'Current approaches'. In some cases CMAs assess proposals as they come in, while others have a single annual call. Assessment methods typically use a spreadsheet tool that includes a range of criteria against which projects are scored.

In assessing and ranking projects for funding, it is important to distinguish between eligibility criteria and those criteria which relate to project benefits, costs and value for money. Assessing project eligibility should be as simple as possible (yes/no) – e.g. based on whether the project is within the CMA priority waterways and that it meets minimum standards, such as the required overall 20 metre fence set back. Suggested project eligibility criteria are summarised in Table 1.

If standard incentive rates remain fixed and budgets are limited then improvements in public benefits can still be made according to the principles outlined below. *It is important to recognise that use of standard incentive rates is unlikely to achieve best value for money as there may be a wide variation in the payments needed to achieve participation, and in the public benefits generated by projects.*

The core criterion for ranking projects is value for money: a measure of project benefits divided by project-related costs (as outlined in Section 5.1). Eligible projects should be ranked based on a BCR formula (suggested in Section 5.3). This requires not only a consideration of public benefits, but also a consideration of the level of landholder payment. *None of the systems examined assessed projects in terms of value for money.*

Recognising that projects vary greatly in their benefits and costs, it is unlikely that all submitted projects are worth funding. This could be recognised by excluding those projects assessed as providing the lowest value for money (as ranked using the Benefit: Cost Ratio formula). For example, a rule of thumb could be that the bottom, say, 20% of submitted projects are highly likely to not represent good value for money. An improved understanding of the range in cost-effectiveness of projects, based on the BCR (Recommendation 1.2) would assist in determining what the appropriate threshold might be.

For CMAs which have a single call for expressions of interest, the BCR threshold could be set once the projects have been ranked (for example potentially excluding the bottom 20%). For CMAs that accept proposals on an on-going basis the threshold will need to be set in advance, and based on the premise that approximately 20% of projects (or whatever level is chosen) will not be funded. While there may be good reasons for projects being accepted on an on-going basis, this appears overall to be a riskier strategy in terms of achieving best value for money outcomes. Ranking based on a single call is likely to make it easier to recognise the best and worst projects. Guidance on the considerations of public benefits, public costs and landholder payments are outlined below.

R2: Recommendations for ranking and project selection

R 2.1: Ranking and assessing projects should be conducted in two stages:

- **Stage 1: Assess eligibility (does the project qualify yes/no);**
- **Stage 2: Selection of projects based on value for money, preferably using a BCR calculation.**

R 2.2: A minimum threshold should be used below which projects should not be funded. This threshold score will depend upon the amount of available money and the degree to which benefits exceed costs[19].

[19] Potential rules of thumb include excluding the bottom 20% of projects, or setting a BCR score below which projects will not be funded.

4.3 Assessing value for money and public benefits

If government desires value for money from its investment in riparian programs then it will need to provide clearer guidance as to how it wants public benefits and public costs assessed.

Findings from current approaches (see Part 2 of this report), including discussions with CMAs, Melbourne Water and DELWP, highlight that there is a wide variation in the level of public benefits generated from riparian management projects. The level of benefits is influenced by factors including:

- The size of the project, both in terms of area and length of waterway being managed;
- The type of management actions undertaken;
- The starting condition of the site, the level of threats operating and the potential for future improvement from proposed management actions;
- The location of the project, especially where it contributes to improving riparian connectivity.

It is important to acknowledge the high degree of heterogeneity between projects within one region (e.g. upper catchment versus lower catchment) and between regions, which poses a challenge in assessing value for money from riparian management at a state-wide scale.

The benefits of a project should be estimated as a difference: with versus without the project, not before versus after the project. The review of current approaches indicates that the "without" scenario for projects is commonly not thought about, and can potentially leads to exaggerated estimates of the benefits. Additional details are provided in section 5.3.2

Appendix F lists the criteria used currently by CMAs to determine the level of funding/cost share for riparian works. A summary of these criteria is outlined in Table 1 and comment is provided as to the impact of the criterion on public benefit and/or whether it should be a project eligibility criterion.

Table 1. Summary of criteria currently used to determine the level of funding for CMAs

Criteria	Comment on the influence on public benefit	Should this be a project eligibility criteria?
Priority waterway	Protection of priority reaches is assumed to generate higher public benefit than non-priority reaches. There is however likely to be variability in the public benefits between priority reaches and much variability at the site level so priority reach alone is not a strong indicator of public benefits.	Yes
Condition	Condition *per se is* not a sufficient indicator of public benefits, because it is not necessarily clear whether a reach in better condition will generate higher or lower benefits. For example, a reach in pristine condition would have no scope for improvement and a project would generate no public benefits unless the reach is expected to deteriorate without additional protections. Conversely, a reach in poor condition may offer an opportunity for large benefits (if technical feasibility of improvement is high) or may be so damaged that improvements are very difficult to achieve. This highlights the importance of considering the *difference* that a project can make (i.e. comparing the predicted outcomes with versus without the project).	No
Fence set back	Influences public benefit by increasing the area available for flora and fauna habitat and sediment and nutrient filtering. The greater the	Yes for minimum setback

Criteria	Comment on the influence on public benefit	Should this be a project eligibility criteria?
	setback the greater the potential for public benefits although the relationship will not be linear.	requirement, but shouldn't be an eligibility criteria beyond this
Landholder input to upfront works	This does not necessarily influence potential for improved public benefit and is not relevant in situations where direct works approaches are used.	No
Connectivity	Connectivity has strong potential to improve public benefits by enabling additional habitat areas and fauna movement.	No
Fence both sides	If livestock are present then fencing the waterway will increase public benefits. Fencing is a crucial part of improving the condition and hence public benefits. Fencing both sides of a permanent waterway is preferred, however where there are different landholders involved either side of the waterway it might not be practical and fencing on one side may be better than no fencing. For temporary waterways the VWMS states that Government will generally not fund fencing of one side due to the risk posed by stock access during dry conditions (DEPI 2013).	No* With the exception of temporary streams.
Legally binding agreement	Legally binding agreements are standard conditions of participation. As such they don't influence the level of funding but they are an eligibility requirement. Agreements on title, for example conservation covenants, might be expected to influence level of public benefit – see BCR formula for further explanation.	Yes
Crown licence conversion	Riparian management licences for works on Crown frontages are standard conditions of participation. As such they don't influence the level of funding but they are an eligibility requirement	Yes

4.3.1 The River Benefits Index

River Tender, a riparian MBI provides the most consistent and transparent approach currently to assessing public benefits in a standardised fashion. It involves an objective process to assess bids that ranks the potential improvements in terrestrial vegetation condition and river health condition. This requires two different types of data collection and interpretation:

- Improvements in terrestrial vegetation condition are assessed using an index called the Biodiversity Benefit Index (BBI) which is used in the BushTender assessment process and is described elsewhere (Oliver & Parkes 2003); and

- Improvements in river health condition are assessed using an index called the "River Benefit Index" (RBI) (Doeg, T, 2009).

The RBI focuses on environmental values, and does not explicitly consider social and economic values. If the outcomes being aimed for by riparian programs are primarily environmental values, or they are social and economic outcomes dependent on the environmental values, this seems reasonable. The RBI involves a structured assessment of current riparian condition and significance, and the potential for habitat improvement, and quantifies the likely benefits generated from the management interventions. Unlike other tender metrics it appears the RBI does not assess the difference in benefits with and without management interventions (Tim Doeg, pers. comm.). As such

whilst it has the makings of a good metric, it does not meet a key requirement to maximise value for money.

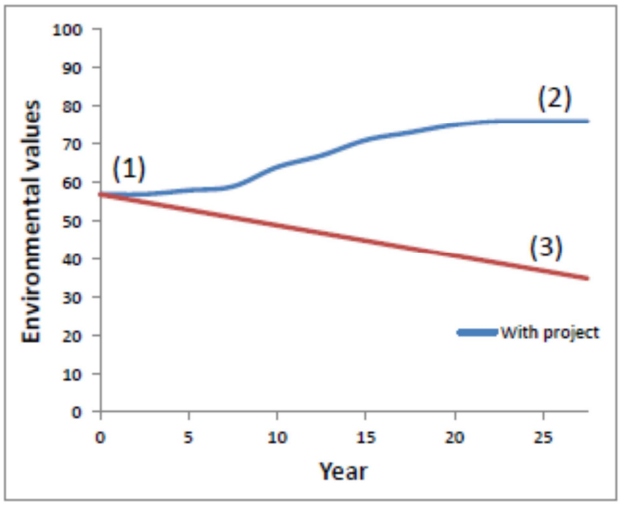
Adoption of a standard, transparent and robust approach for assessing public benefits across all CMAs and all riparian projects is a key recommendation of this project. Such an approach would have a number of benefits including:

- Clear justification for ranking projects on the basis of their public benefits at a regional scale;
- An ability to compare projects (within and between regions) on the basis of value for money, assuming the level of landholder payments are known;
- A justification to vary the level of landholder payments where the level of public benefits warrants this.

4.3.2 Thinking about with and without

The benefit of a project is the change in values generated as a result of the project. In other words, it is a difference: the difference between the values with the project and without the project. The following three case studies illustrate why this concept is important if CMAs are interested in understanding the public benefits generated by riparian management projects and ultimately allocating funds on the basis of value for money.

In each case the starting condition of the three sites is the same, approximately 60% of the benchmark condition. The benchmark condition should be described and assessed in a standard way, for example it could be equated to an Index of Stream Condition (ISC) score of good or excellent. All projects involve fencing to reduce grazing impacts and revegetation.

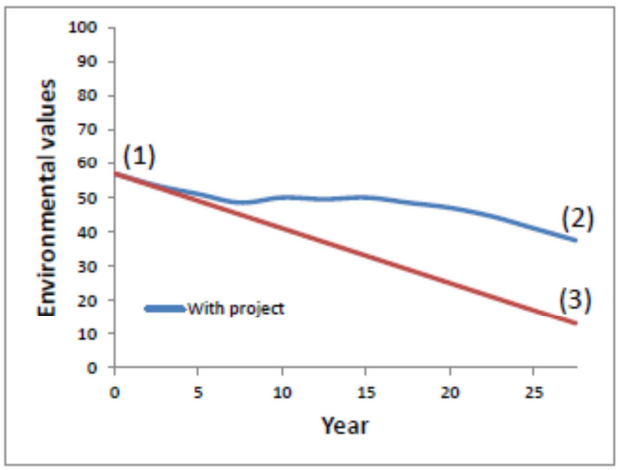


A: In this case the condition improves to ~ 75% of the benchmark over 20 years as a result of the project, whereas without the project it is predicted that the values will be 40% of the benchmark.

This may be the 'typical' riparian project.

The benefit is expressed as a proportional increase in values relative to the benchmark condition ~ 0.35.

Figure 2. 'Typical' riparian project where works have a significant effect on site condition and values

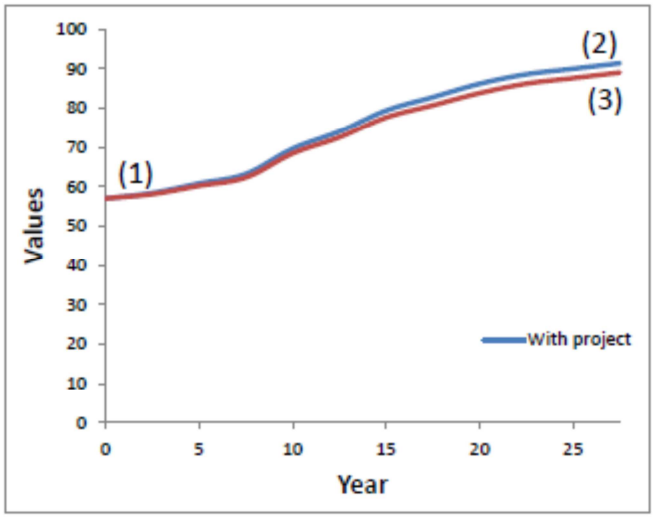


B: In this case the condition declines to ~ 45% of the benchmark over 20 years if the project is implemented, whereas without the project it is predicted the values will be 15% of the benchmark.

The decline in condition with the project may be because the project is in a grazing landscape, only one side is fenced, or the threats to the values are from an upstream source or are not being addressed by the activities funded.

The benefit is expressed as a proportional increase in values relative to the benchmark condition ~ 0.3.

Figure 3. Site fenced one side only with significant upstream threats



C: In this case the condition improves to ~ 90% of the benchmark over 20 years if the project is in place, whereas without the project it is predicted that the values will be 87% of the benchmark.

This could be because the project is in an amenity landscape where there is very limited grazing and there is active natural regeneration. The benefit is expressed as a proportional increase in values relative to the benchmark condition ~ 0.03.

Figure 4. Low threat site with naturally improving trajectory

If each of these projects receives the same level of funding, the overall value for money would be significantly different. The project shown in Figure 4 has a better final environmental condition than the project in Figure 2, but once the trajectory without the project is considered, the benefits of the Figure 2 project are very much greater. In order for the project in Figure 4 to be competitive with the project in Figure 2, it would need to cost significantly less.

4.3.3 Connectivity

Riparian projects confer benefits at the site scale (for example, improving site condition increases the values of a specific project site), and also at a larger scale (for example by increasing the level of connectivity of riparian habitat). A number of the ranking and assessment systems used by CMAs include an assessment of the contribution of a project to improving connectivity. Determining the connectivity benefits resulting from the project should be a consideration in the public benefits assessment. The BCR equation, outlined below in Section 4.3.4, includes connectivity as one element to be assessed when estimating the benefits associated with projects.

4.3.4 A proposed standard approach for assessing value for money

An important aim of this project has been to provide guidance on the most effective approaches for CMAs to use to deliver the best on-ground outcomes at minimum cost. The use of a standardised, assessment metric is one tool that could assist CMAs in this area. A metric for assessing the value for money of riparian projects has been developed and is provided below for consideration. The metric has been developed with the aim of being transparent, robust and not too complex; although in practice there are some elements of the metric that are more challenging than others.

Below is a suggested metric that could appropriately calculate a Benefit Cost Ratio, while Appendix A provides a User Guide for application of the BCR Calculator, together with two case studies to assist CMAs wishing to apply this approach in practice.

$$\mathbf{BCR} = V \times [\, W + X + Y + Z] \times L \times (1 - R) \,/\, (C + M)$$

The variables that feed into the BCR are:

V: value of the asset

A set of variables to represent the benefits of the project:
W: effectiveness of works*
X: fence set back from the waterway*
Y: whether there is fencing on one or both sides of the waterway*
Z: contribution to connectivity*

*Weights can be included with *W*, *X*, *Y* and *Z* into a factor representing the difference with versus without the project. These factors all contribute to the overall benefits and can therefore be considered in an additive way.

The other variables included are:

L: landholder compliance. This parameter represents the probability that a contract is not honoured.

R: the risk (a probability) of the project failing to deliver intended outcomes for reasons other than those related to adoption, such as technical failure.

C: the upfront and short term maintenance cost to the CMA for the on-ground works (public costs only).

M: the aggregate maintenance cost required following the project over a period of time (e.g. 20 years) (public costs only). This could include a contribution to ongoing maintenance, and monitoring and enforcement and the landholder's contracted activities. For most riparian agreements it is the responsibility of the landholder to bear all ongoing maintenance costs, however there is also the CMAs monitoring and compliance costs to consider in this variable. For simplicity CMAs may choose not to include the other ongoing public costs associated with monitoring and compliance because of the difficulty of apportioning this cost to individual projects. In this case M could be dropped from the BCR calculation.

Firstly the metric requires an indication of the value or importance of the improvements that will be generated from the riparian works. These are likely to be correlated with the overall value or importance of the river reach and associated vegetation (*V*).

This is currently considered only to the extent of assessing whether the reach is a priority reach. A more quantitative approach that allowed for different reaches to have different scores would improve the capacity to identify the most beneficial project options.

The benefit of a riparian project is the change in values generated as a result of the project works. In other words, it is a difference: the difference between the values with the project and without the project.

To estimate the benefits of a riparian project, what is needed is to (a) predict the physical conditions with and without the project, and (b) translate the difference in physical conditions into a measure of value, importance or significance.

A variable that captures the "effectiveness of works" or "technical feasibility" (*W*) should be included in assessing public benefits. The estimation of W, should consider the current trajectory of the condition of the river and riparian vegetation without the project, for example is it getting better or worse? Or not changing? How easy will it be to make a sizable difference to river/vegetation condition?

Some of the variables used by some of the CMAs to evaluate projects would be correlated with the difference between the values with the project and without the project: fence set back (*X*), whether there is fencing both sides (*Y*), and the contribution of the project to increased connectivity (*Z*). These are appropriate variables to include.

Whilst the current condition of a site is used by some as one of the variables for assessing project, this is not a sufficient indicator of public benefits, because it is not necessarily clear whether undertaking a project in a reach that is currently in better condition will generate higher or lower benefits.

R3: Consider adopting and providing technical support for a standardised approach to assessment and ranking of riparian projects based on an assessment of benefits and costs (value for money).

Elements of such an approach include:

R 3.1: Implementation of a two stage approach to assess project eligibility and selection as outlined in Recommendation 2.1

R 3.2: Provision of accessible and downloadable standard templates;

R 3.3: Provision of support for CMAs to include provision of training in approaches, technical support, quality assurance and systems management training and adaptive management as required.

4.4 Identifying the lowest level of funding / cost shares for riparian works

The first principle for improving current approaches is for CMAs to attempt to identify the lowest level of funding (that is the lowest incentive/grant or cost share arrangement) that will prompt sufficient participation to achieve the program's goals. This principle is likely to be the most difficult to achieve in practice. Two areas are considered in providing recommendations on landholder payments:

- What costs are shared?
- Lowest level of funding for sufficient landholder participation

4.4.1 What costs are shared?

Regardless of whether CMAs use grants/incentives or a direct works approach, there are a range of items that are publicly funded, either fully or in part. These items (summarised in Appendix F) are:

- Fencing materials
- Fencing labour or contractors
- Revegetation materials
- Revegetation labour or contractors
- Initial weed control materials
- Initial weed control maintenance
- Site preparation
- Long-term weed maintenance (>2 years)
- Long-term revegetation maintenance (< 2 years)
- Off-stream watering materials

While there are differing (and not particularly transparent) amounts paid for the different items, what really matters is not precisely what cost-share is paid for particular items, but the overall benefits generated in relation to the level of funding contributed by the CMA.

There is a trend by many CMAs towards higher (sometimes 100% funding of short-term direct cash costs) for fencing and revegetation, with more variation in cost-share for provision of off-stream watering.

Fencing rates tailored to terrain and particular standards based on differences in total costs has been required to maintain participation rates, and seems reasonable as long as the level of public benefits is justified.

Restricting the level of funding of items that potentially have a high private benefit such as pumps for off-stream watering aligns well with the principle of paying the least amount possible to landholders without affecting participation.

Current practice and the VWMS policy assume that long term maintenance is the responsibility of the landholder. A possible option for the future if maintaining benefits under the current policy arrangement proves to be difficult might be to consider negotiating a reduced up-front cost on condition that the CMA funds part of the maintenance costs for a limited time period.

4.4.2 Lowest funding for sufficient landholder participation

There are a number of possible approaches to limit costs (incentives / cost shares) to landholders to a level that is no higher than necessary.

(a) MBIs. If they are well understood by landholders and sufficiently beneficial overall for the Victorian government and the CMA regions in which they are implemented, MBIs are one method that could be used to elicit the lowest price that the landholder is willing to accept and participate. Improvements could be made in terms of considering how to improve the RBI metric to address the issue of what would have occurred without the project.

This project involved a limited examination of MBI data. This indicated a low overall number of landholder bids and a narrow geographic scope of the individual tender rounds. This suggests that the tender processes may have not revealed the lowest cost for landholder participation. MBIs require real competition and a sufficient number of bids to be robust.

(b) Individual negotiation. This would miss out on the benefits of competition that is potentially present in an MBI. On the other hand, the limited number of bids in the MBI data examined suggests that competition may not have been very effective in those MBIs in any case.

(c) Trial and error in setting standard rates for incentive payment. Some CMAs have been adjusting their incentive rates in response to a lack of participation in some cases.

There are some rules of thumb that could be used to formalise this approach.

- Well over 100% program subscription suggests that payment rates are too high;
- Programs being substantially under-subscribed (for example less than 50%) suggest that payment rates are too low;
- Programs that are somewhat undersubscribed (in the order of 25%) might be close to least costs for the majority of landholders.

It may be possible to combine approaches. For example, a one-off state-wide riparian MBI could be used to help estimate the lowest acceptable incentives / cost shares, followed by negotiations or trial and error in subsequent rounds of funding ,. This would need to occur in a manner to elicit variation across the state and under differing landuses etc.

R4: Eliciting lowest possible level of funding / cost share for riparian works

R 4.1: Embed an approach that aims to limit the contribution of public funds (incentive rates / cost shares) to levels that are no higher than necessary to achieve the required participation;

R 4.2: The additional effort to estimate a landholders' cash and in-kind costs[20] is not required;

R 4.3: If MBIs are not considered effective in particular settings, consider approaches based on individual negotiation or trial and error over time to modify standard payment rates;

R 4.4: Consider the possibility of a multi-regional or state-wide MBI to help underpin and inform an approach that mainly relies on negotiation or trial and error[21].

4.4.3 Increased funding for more beneficial actions

Given the principle that public funding should be limited to the lowest possible level while still achieving targets, projects that generate higher levels of public benefits should not necessarily involve higher payments to landholders. However, if higher levels of funding are required to secure sufficient landholder participation, then they are more likely to be justified in projects that generate greater public benefits.

R5: Increased level of funding for projects with higher public benefits (if required[22])

R5.1: Develop approaches that provide for a negotiated/option rather than automatic increased level of funding based on public benefits;

R 5.2: Consider accompanying higher levels of funding for higher benefits with measures to increase the security of the benefits (including exploration of covenanting) and outcome and compliance monitoring.

[20] While this would allow more accurate calculation of the actual cost shares, there is no theoretical basis for preferring any particular cost share. Efforts to limit the contribution of public funds whilst still achieving environmental targets can be pursued without accurate information about the actual cost shares.

[21] If a multi-regional approach is more acceptable it would group similar broad land use and/or production system types within the bidding process.

[22] Given that landholders have a wide range of economic, environmental and social motivations; it should not automatically be assumed that higher payments are required for high public benefit projects.

4.5 Influence of funding up front versus maintenance

Currently long term maintenance is not funded in a formal way and there are good reasons for this especially that excluding it reduces the ongoing costs to government. Landholder agreements are clear; the ongoing responsibility lies with the landholder. However, as more sites are protected the issue of long term maintenance overall becomes more significant and if government wishes to maintain the benefits of investment then monitoring by CMAs for compliance of landholder agreements is essential.

It is possible that over time better value for money will be achieved through some allocation of investment towards previously funded sites for maintenance activities that protect public benefits. There is however the potential for such an approach to be seen to reward non-compliant landholders and penalise those landholders who are maintaining sites as per the requirements of landholder agreements. A future judgment may therefore need to be made about whether more stringent monitoring and enforcement is required, or whether CMAs take on some future maintenance activities. Ways to resource long term management of riparian project sites are being considered by DELWP through its long term resourcing project and an issue to consider in this context is how compliance is resourced over time.

R6: Monitoring and compliance of riparian management agreements

R 6.1: Increase effort and focus on systematic monitoring and auditing of sites, engagement with landholders and enforcing agreement conditions by CMAs;

R 6.2: Increase focus on monitoring for outcomes such as the extent to which funded projects have achieved outcomes and include monitoring of both funded and unfunded sites;

R 6.3: Retain current riparian management agreement conditions whereby landholders are responsible for long term management of the fence and fenced riparian land but consider trialling stewardship payments/ follow up support in the form of small maintenance grants in the context of long term resourcing needs and adaptive management.

4.6 Role and influence of delivery approaches

CMAs gave a range of reasons for the selection of their primary delivery mechanism (direct works or grants/incentives model) and the level of cost share for the up-front costs (varying indicatively from 25:75 CMA:landholder to 100:0 CMA:landholder) as summarised in Appendix F (*see also Part 2 Section 3.2*).

For instance CMAs using a grants/incentives model cited that the involvement of landholders in the delivery of the works, through in-kind contributions or coordination of contractors leads to greater long-term ownership and maximises the chance that landholders will undertake long-term maintenance. CMAs using a direct-works model believe that by them having control of the delivery of the works leads to higher quality on-ground outcomes from initial works.

CMAs also reported that having the landholders make a financial contribution to the project (regardless of the delivery mechanism) also engendered a sense of ownership by the landholder with similar benefits for long term maintenance.

While the reasons provided are logical and based on regional experience, there is little empirical evidence to suggest which is superior (Allan Curtis pers. comm.).

There is complexity in the driver and influences on landholder behaviour in relation to long term maintenance of sites and There is a need to understand the influence of the delivery mechanism and the role of the landholder contribution (financial or in-kind) in achieving greater public benefits as this will affect value for money and the long term maintenance of benefits.

R7: Improve understanding of the influence of delivery mechanisms on landholder stewardship

R 7.1: Investigate the role of delivery mechanism (grants versus direct works) and how different levels of landholder contributions influence the achievement of environmental outcomes with consideration to:

- **Quality of works;**
- **Long term stewardship of sites by landholders /level of compliance with agreement conditions;**

R 7.2: Undertake an assessment to better understand the differences in public costs associated with different delivery mechanisms (including program delivery and administration costs and costs for works) in the context of aiming to achieve public net benefits at least cost.

4.7 Potential improvements to current approaches for assessment and ranking of projects

This section provides a schematic overview of both current and proposed future approaches. It provides guidance on how recommendations outlined in earlier in Section 4 could be applied in tandem with these approaches or support improved mechanisms that aim to achieve value for money with government investment in riparian programs.

Boxes 1 -3 (below) describe four approaches to the assessment and ranking of projects, with suggested improvements indicated (dotted line box).

Approach A: Projects not ranked and flat rate funding applied (see Box 2).

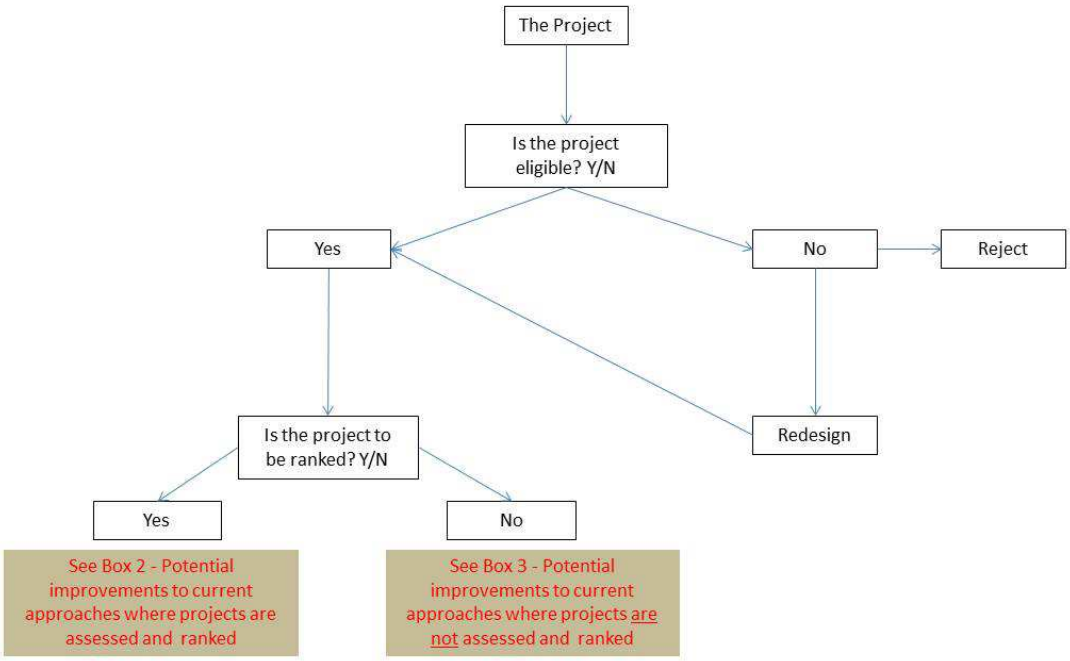
Approach B: Projects not ranked and variable funding rate applied (see Box 2).

Approach C: Projects ranked according to level of public benefits and funded using flat or variable rates (see Box 3).

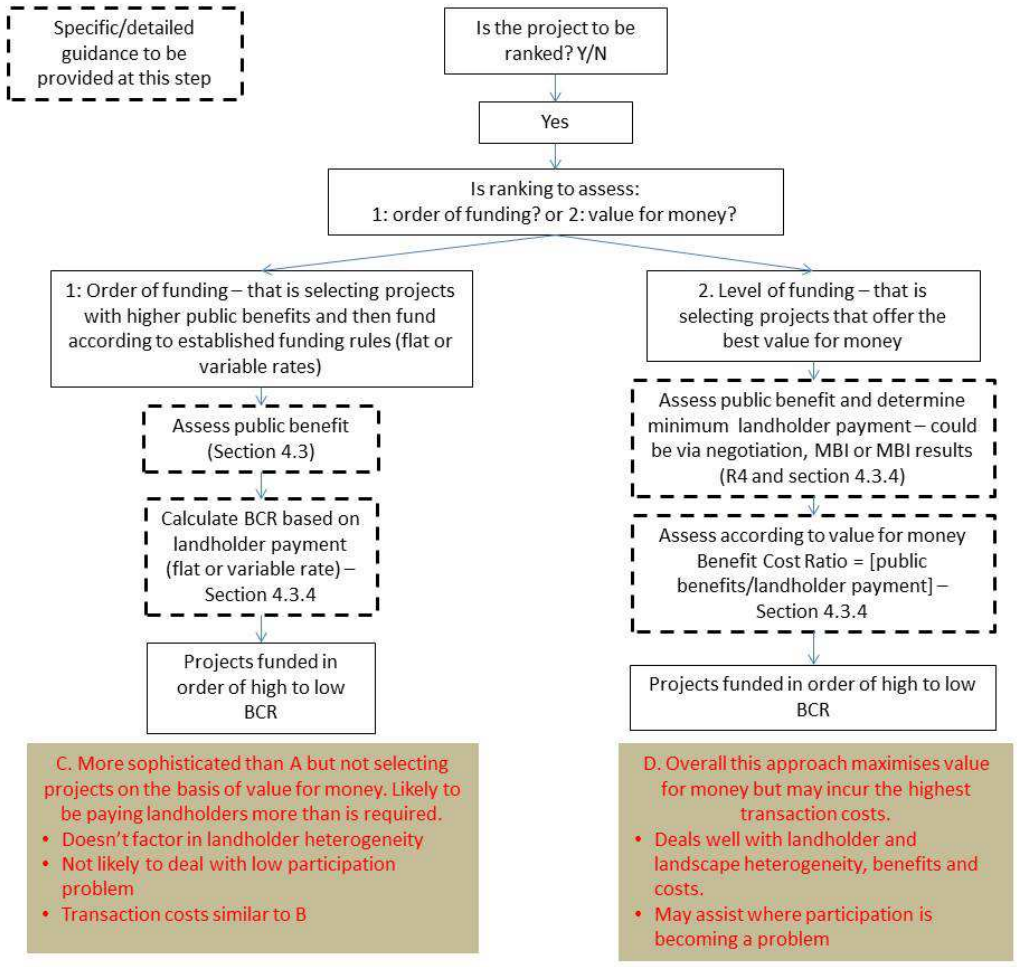
Approach D: Projects ranked and funded according to value for money (see Box 3).

Approaches A and B most closely resemble those currently used by CMAs. These approaches could be improved by considering the lowest level of landholder payment and improved assessment of public benefits. Approach C is similar to the approach used by the CMAs that rank projects, but again this approach could be enhanced with closer attention to estimating public benefits and funding projects in order from high to low BCRs. Approach D is not currently used by CMAs but overall offers the most robust assessment of value for money. It may however incur increased transaction costs. This approach is described in Section 4.3 and forms the basis for Recommendation 3.

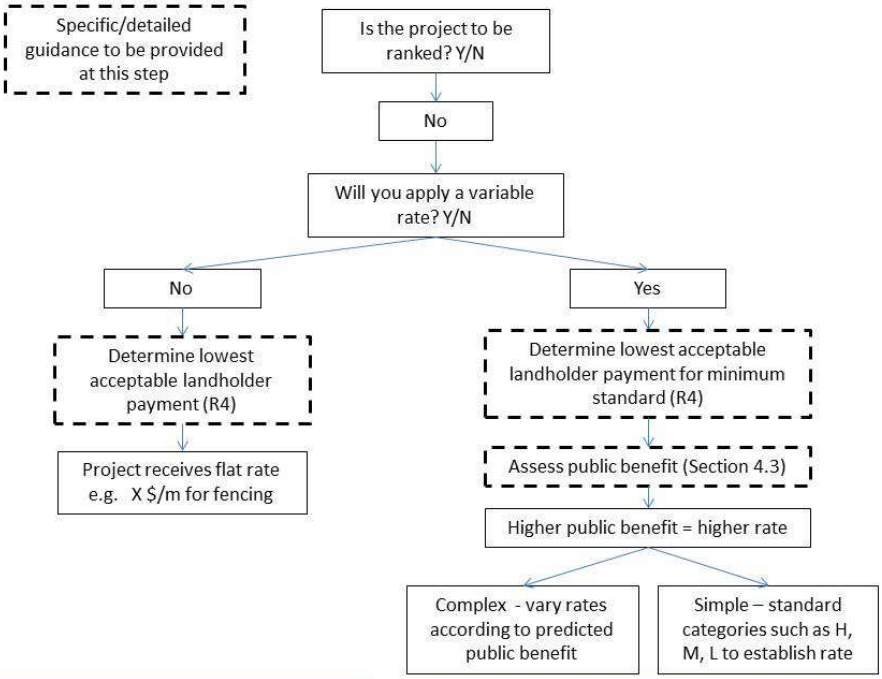
Box 1 - Potential improvements to current approaches: project eligibility and ranking



Box 2 - Potential improvements to current approaches where projects assessed are ranked



Box 3 - Potential improvements to current approaches where projects are not assessed and ranked



A. Simple approach but unlikely to provide good value for money

- Transaction costs are low
- Ignores heterogeneity of benefits and costs
- Level of landholder payment should be reviewed over time

B. Likely to generate high level of public benefits but may also incur high costs so not likely to be highest value for money

- Transaction costs > A
- Only partially deals with heterogeneity
- Level of landholder payment should be reviewed over time

5. Conclusions

This report recommends the most effective approaches for CMAs to use to deliver the best on-ground outcomes at minimum cost when implementing their cost-sharing and funding allocation approaches for riparian management activities.

An examination of current approaches to the assessment, ranking and funding of riparian management suggests that better value for money can be achieved. Conclusions from current approaches are that:

- Delivery models (direct works, grants/incentives, MBIs) have evolved over time and as a result of different drivers and perspectives in different regions;
- The level of cost share, regardless of the delivery model was difficult to determine and there are a large range of cost shares offered both within CMA regions and across the state;
- Approaches used for project ranking and selection vary greatly between CMAs and in most cases are inconsistent with economic principles on how to maximise the overall benefits generated from public investment;
- Approaches to assess public benefits are often unclear;
- No CMA uses the concept of assessing public benefits based on the difference in outcomes based on the difference in outcomes 'with' versus 'without' the project, often resulting in flawed estimates of project benefits;
- The methods by which landholder costs have been considered when ranking projects are often not clear;
- No CMA explicitly assesses whether public costs could have been reduced without compromising the achievement of sufficient participation (although some have attempted to do this in an ad hoc informal way);
- Approaches are generally well aligned with the current VWMS, however only two regions provide additional payments for a more secure agreement (covenanted sites);
- Riparian fencing to the required 20m set back from the top of bank and not less than 10 m is not always adhered , this is likely to be due to a range of factors (land use/value, landholder capacity, topography);
- Engagement with landholders both to maintain on-going relationships and to provide technical support is important;
- Monitoring and compliance through site visits and engagement with landholders will become increasingly important to ensure the long-term benefits of Victorian government investment in riparian management are maintained.

Recommendations to improve funding allocation approaches used in Victorian riparian management programs are:

1. Recommended principles for improving cost sharing approaches used by CMAs for riparian programs:

1.1 Attempt to identify the lowest level of funding that will prompt sufficient participation to achieve the program's goals (see Recommendation 4);

1.2 Prioritise projects that will provide the best value for money (see Recommendation 2).

1.3 Allow increased levels of funding for more beneficial actions, but only providing that increased funding is necessary to generate sufficient participation; (see Recommendation 5).

1.4 Suggested improvements to VWMS principles are to:

- Use value for money rather than level of public benefit as a principle (this includes consideration of costs as well as benefits).
- Use the priority status of a Waterway as an eligibility criteria for funding rather than as a consideration in determining the level of cost share/funding (see Recommendation 2).
- Retain the principle regarding the level of security of agreement and recognise that more secure agreements (e.g. covenants) are likely to generate higher levels of public benefits, all other factors being equal.

2. Recommendations for ranking and project selection

2.1 Ranking and assessing projects should be conducted in two stages:
- Stage 1: Assess eligibility (does the project qualify yes/no);
- Stage 2: Selection of projects based on value for money, preferably using a BCR calculation.

2.2 A minimum threshold should be used below which projects should not be funded. This threshold score will depend upon the amount of available money and the degree to which benefits exceed costs.

3. Consider adopting and providing technical support for a standardised approach to assessment and ranking of riparian projects based on an assessment of benefits and costs (value for money).

3.1 Implementation of a two stage approach to assess project eligibility and selection as outlined in Recommendation 2.1

3.2 Provision of accessible and downloadable standard templates;

3.3 Provision of support for CMAs to include provision of training in approaches, technical support, quality assurance and systems management training and adaptive management as required.

4. Eliciting lowest possible level of funding / cost share for riparian works

4.1 Embed an approach that aims to limit the contribution of public funds (incentive rates / cost shares) to levels that are no higher than necessary to achieve the required participation;

4.2 The additional effort to estimate landholders' cash and in-kind costs is not required;

4.3 If MBIs are not considered effective in particular settings, consider approaches based on individual negotiation or trial and error over time to modify standard payment rates;

4.4 Consider the possibility of a multi-regional or state-wide MBI to help underpin and inform an approach that mainly relies on negotiation or trial and error.

5. Increased level of funding for projects with higher public benefits (if required[23])

5.1 Develop approaches that provide for a negotiated/option rather than automatic increased level of funding based on public benefits;

5.2 Consider accompanying higher levels of funding for higher benefits with measures to increase the security of the benefits (including exploration of covenanting) and outcome and compliance monitoring.

6. Monitoring and compliance of riparian management agreements

6.1 Increase effort and focus on systematic monitoring and auditing of sites, engagement with landholders and enforcing agreement conditions by CMAs; 6.2 Increase focus on monitoring for outcomes such as the extent to which funded projects have achieved outcomes and include monitoring of both funded and unfunded sites;

6.3 Retain current riparian management agreement conditions whereby landholders are responsible for long term management of the fence and fenced riparian land but consider trialling stewardship payments/ follow up support in the form of small maintenance grants in the context of long term resourcing needs and adaptive management.

7. Improve understanding of the influence of delivery mechanisms on landholder stewardship

7.1 Investigate the role of delivery mechanism (grants versus direct works) and how different levels of landholder contributions influence the achievement of environmental outcomes with consideration to:

- Quality of works;
- Long term stewardship of sites by landholders /level of compliance with agreement conditions;

7.2: Undertake an assessment to better understand the differences in public costs associated with different delivery mechanisms (including program delivery and administration costs and costs for works) in the context of aiming to achieve public net benefits at least cost.

[23] Given that landholders have a wide range of economic, environmental and social motivations; it should not automatically be assumed that higher payments are required for high public benefit projects.

The success of past riparian management works have resulted in significant improvement of the state's waterway assets and further improvements are possible.

5. References

Aither, 2015. *Managing crown frontages under licence. Investigation of costs and benefits to landholders, the Victorian Government and the community A report prepared for the Victorian Department of Environment, Land, Water and Planning (Waterway Health). April 2015*,

Anon, USEPA Cost Share Paper.pdf.

Anonymous, 2015. *WRC Cost sharing Final - Read Sturgess report*,

Arentino, B, Holland, P, Matysek, A and Peterson, D., 2001. *Cost sharing for biodiversity conservation: a conceptual framework*,

Aretino, B. et al., 2001. Cost sharing for biodiversity conservation: a conceptual framework. Productivity Commission.

Craig, RK; Roberts, A., 2015. When will governments regulate nonpoint source pollution? *Boston College Environmental Affairs Law Review*, 42, pp.1–64.

Curtis, A; Sample, R; McDonald, S., 2008. *A Comparative Evaluation of the Effectiveness of River Tender*,

DEPI, 2013. *Improving our Waterways. Victorian Waterway Management Strategy. Department of Environment and Primary Industries. Victoria.*,

Doeg, T., 2009. *The "River Benefit Index" for assessing River Tender bids.*,

Hajkowicz, S. & Young, M., 2000. *An Economic Analysis and Cost Sharing Assessment for Dryland Salinity Management*,

Harvey, S., 2005. *Using contracts to mitigate salinity : an analysis of voluntary cost-sharing agreements*,

Lankester, a., Valentine, P. & Cottrell, a., 2009. "The sweeter country": social dimensions to riparian management in the Burdekin rangelands, Queensland. *Australasian Journal of Environmental Management*, 16(2), pp.94–102.

Lichtenberg, E. & Smith-ramirez, R., 2003. *Cost Sharing , Transaction Costs , and Conservation. Department of Agricultural and Resource Economics. University of Maryland.*,

Loo, S., Hopkins, K. & Vollebergh, P., 2009. *Review of the Victorian Catchment Management Authorities' processes for riparian land management and landholder funding allocation. Department of Sustainability and Environment. 2009.*,

Marshall, G., 1998. Economics of Cost Sharing for Agri-Environmental Conservation. In *42nd Annual Conference of the Australian Agricultural and Resource Economics Society, University of New England, Armidale Australia, 19-21 January, 1998.*

Maryland Department of Agriculture, Conservation has its rewards. CREP. Marylands Conservation Reserve Enhancement Program.

Maryland Department of Agriculture, Stay with CREP. Marylands Conservation Reserve Enhancement Program. Answers to Frequently Asked Questions abou renrolling in CREP.

Maryland Department of Environment., 2013. *Maryland Agricultural Water Quality Cost-Share Program Manual. October 2013.*,

Morris, K. et al., 2014. *Riparian Intervention Monitoring Program Version 1. Arthur Rylah Institute for Environmental Research. Technical Report Series. December 2014*,

NECMA, 2008. A Comparative Evaluation of the Effectiveness of River Tender. Designer Carrots. North East Catchment Management Authority. , (August).

Oliver, I. & Parkes, D., 2003. *A Prototype Toolkit for Scoring the Biodiversity Benefits of Land Use Change. Department of Sustainable Natural Resources, NSW.*,

Pannell, D., 2009. Cost sharing for environmental works. Pannell Discussions. No. 149, 30 March 2009. *Pannell Discussions*. Available at: http://dpannell.fnas.uwa.edu.au/pd/pd0149.htm.

Pannell, D. et al., 2011. Integrated assessment of public investment in land-use change to protect environmental assets in Australia. *Land Use Policy*, 29, pp.377–387.

Pannell, D., 2008. Public benefits, private benefits, and policy intervention for land-use change for environmental benefits. *Land Economics*, 84(2), pp.225–240.

Pannell, D., 2015. *Ranking Environmental Projects. Working Paper 1506. School of Agricultural and Resource Economics. University of Western Australia*,

Park, G. et al., 2013. The quality of resource condition targets in regional natural resource management in Australia. *Australasian Journal of Environmental Management*, 20(May), pp.285–301.

Perez, M., 2014. Regulating farmers: lessons learned from the Delmarva peninsula. *Choices, the magazine for food, farm and resource issues*, 26(3), pp.1–13.

Race, D. & Curtis, A., 2013. Reflections on the Effectiveness of Market-Based Instruments to Secure Long-Term Environmental Gains in Southeast Australia: Understanding Landholders' Experiences. *Society & Natural Resources*, 26(March 2014), pp.1050–1065.

Roberts, A.M. et al., 2012. Agricultural land management strategies to reduce phosphorus loads in the Gippsland Lakes, Australia. *Agricultural Systems*, 106, pp.11–22.

Shimshack, J.P. & Ward, M.B., 2005. Regulator reputation, enforcement, and environmental compliance. *Journal of Environmental Economics and Management*, 50, pp.519–540.

SKM, 2003. *Guidelines for riparian land management: cost-sharing options for riparian management projects. A report prepared for the North East Catchment Management Authority.*,

Virginia Department of Conservation and Recreation, 2014. *Program Year 2015. Virginia Agricultural Cost Share Service (VACS) BMPS. April 24, 2014*,

Watson, A. & Cummins, T., 2012. *Management of crown frontages : Getting the policy settings right.*,

Whitten, S. & Coggan, A., 2010. *Conserving biodiversity through private land managers: integrating adaptive management, economic design and field experience. CSIRO Ecosystem Sciences*,

Whitten, S., Reeson, A. & Langridge, J., 2014. *Evaluation of Wimmera CMA programs : MBIs , Incentives and Group Support*,

PART 2 CURRENT COST SHARING APPROACHES USED BY CATCHMENT MANAGEMENT AUTHORITIES AND MELBOURNE WATER

Executive Summary

This report provides details of the current approaches used by Catchment Management Authorities (CMAs) in Victoria to allocate funds and share costs with landholders for riparian works.

Underpinning the current approaches used by CMAs is the history and maturity of the Victorian Waterway Management Program. The previous Victorian River Health Strategy and current Victorian Waterway Management Strategy have established an adaptive management approach for waterway management and this has led to the evolution over time of a range of cost sharing approaches used by CMAs for riparian programs.

Eight CMAs currently use grants/incentives to deliver riparian management programs, for six of the eight this is their primary delivery mechanism, whilst two have a mixed model using direct works or contracting arrangements together with a grants program. A further two CMAs primarily use a direct works approach where they fund and coordinate the delivery of works through the use of contractors. All CMAs reported using a direct works approach for instream works and large scale willow control.

Two CMAs have moved away from direct works to a grants/incentives model, driven in part by a desire to use a model that they believe supports and encourages increased landholder participation in waterway programs and 'buy in' that leads to increased long-term commitment to manage sites. Two others have moved from grants/incentive approaches to primarily a direct works model citing reasons of higher quality of works being achieved, increased ability to secure landholder participation in priority reaches, efficiency in program administration and the ability to deliver programs within funding timelines. Tender approaches have been used in five regions but overall there has been a move away from tenders in recent times.

The conceptual approach of a 'simple' percent based cost-share for a project is not being implemented in practice. All approaches have their basis in the concept of a percent based cost-share between government and the landholder but use a combination of incentive rates and funding rules for specific project activities. CMAs use widely varying approaches to prioritise and select projects. Given both the diversity of cost-sharing approaches and the differing ranking and selection methods there are opportunities to improve the metrics and associated processes around prioritisation and project selection. Robust and theoretically sound principles for ranking projects are available and guidelines could be developed to help regions improve ranking and selection processes. Improvements to approaches to select appropriate payments could also be improved such as using the following formula: [public benefits – public costs apart from landholder payment)/landholder payment]. The metrics around public benefits assessment are worthy of further attention.

Four regions reported concerns about securing landholder participation in the future. This poses a major challenge – as achieving outcomes on priority reaches is unlikely to be met through voluntary participation at low public costs. Costs both to maintain the benefits and to secure new participants will markedly increase costs, and not only for new projects but for existing projects as well.

CMAs use a legally binding contract to define the conditions of cost sharing and the long term roles and responsibilities for the management of riparian land. Having such agreements is extremely important in terms of accountability for public spending.

All CMAs reported a mix of informal and formal monitoring programs and nine reported they had formal standards that underpinned their riparian work programs. Work standards, follow up site inspections and longer term monitoring are all important elements of quality assurance for riparian management programs. Monitoring and compliance through site visits and engagement with landholders will become increasingly important to ensure the long term benefits of government investment in riparian programs are to be maintained.

Current riparian approaches are adhering to VWMS principles in general, particularly in the areas of priorities for riparian management and security of agreement. Improvements could be made through better assessment of public benefits including the importance of assessing value for money.

Four conceptual approaches to cost sharing have been used as a reference point from which to assess the nature and performance of current approaches used by regions.

All CMAs reported being interested in learning from each other and trialling new approaches as a way of improving outcomes from investment in riparian programs. This report identifies a number of considerations for future refinement of cost sharing principles used by CMAs. These factors will inform the recommendations and guidance provided as part of the final report for this project.

N.B. For the purposes of this investigation, Melbourne Water is the relevant authority with responsibilities for waterway management activities in the Port Phillip and Westernport CMA region. References to CMAs in this report therefore include Melbourne Water.

1. Introduction

1.1 Purpose

This report forms part of a broader project to investigate report and provide guidance on:

- Current approaches Catchment Management Authorities (CMAs) use for cost-sharing and funding allocation for riparian management activities, including analysis of advantages and disadvantages in different circumstances (e.g. industry and regional variation);
- Other possible models and approaches for apportioning costs between landholders and CMAs;
- Increasing the effectiveness of approaches to deliver the best on-ground outcomes at minimum cost when developing and implementing cost-sharing approaches for riparian management activities.

This report forms the second major milestone report for the project and aims to provide details on the current approaches being used by CMAs and the major themes emerging from the consultation with these agencies on the advantages, limitations, issues and opportunities arising from current cost sharing approaches.

N.B. For the purposes of this investigation, Melbourne Water is the relevant authority with responsibilities for waterway management activities in the Port Phillip and Westernport CMA region. References to CMAs in this report therefore include Melbourne Water.

1.2 Context

The Victorian Waterway Management Strategy (VWMS) explicitly considers the issue of cost sharing in Policy 9.7. The policy provides guidance on the government's position regarding apportioning costs for riparian management, with the level of payment to be made by the Victorian Government based on the priority for management activities, the level of public benefit and the level of security of the agreement (DEPI 2013).

Given the level of investment by the Victorian Government into riparian programs, the Department of Environment Land Water and Planning (DELWP) has determined that there is a need for greater transparency in cost sharing for riparian management across the state, and clear alignment between the VWMS policy and the frameworks and processes used by CMAs to allocate funds.

1.3 Conceptual approaches to cost sharing

Fencing and revegetation of riparian areas is one of the major types of environmental investment by governments and communities. Under cost-sharing arrangements landholders are paid a portion of the cost of the works by a funding authority (usually government) where a public benefit is derived from the works being undertaken.

Sharing the costs between public entities and private landholders is one approach to funding projects that have environmental benefits. It has been widely used as a conceptual and practical approach in Australia. Although the concept of cost sharing seems intuitively appealing, it is challenging to apply in a rigorous way to achieve the most valuable environmental outcomes. The key issues are: (a) how to determine what the costs are that will be shared, and (b) how to determine what share of those costs should be met by the public.

Often, only direct cash costs involved in purchasing inputs and materials are used as a basis for cost share percentage. However, in reality there are other costs that are just as relevant and should, in principle, be considered, for example unpriced labour provided by landholders and opportunity cost incurred through 'loss' of productive land.

Approaches that can be used to underpin cost-sharing programs include:

A. Costs shared according to an agreed percentage, such as 50: 50;
B. Costs shared according to the ratio of private benefits: public benefits;
C. Costs shared so as to minimise the public cost of achieving any particular outcome;
D. Costs shared so as to maximise the public benefits from the program

There is a trade-off between effectiveness and costs amongst these approaches. Overall approach C and D are likely to result in better environmental outcomes than A or B. Approach A is simple to understand, politically acceptable to both landholders and governments and can have relatively low program administration costs. However, its achievement of public benefits may often fall well short of potential. Approach D has the highest effectiveness in achieving environmental outcomes, but also the highest transaction costs and requirement of economic expertise.

Another way of thinking about cost sharing is to consider some principles that would maximise the environmental benefits from government funding. These include:

(a) Attempting to identify the lowest uniform cost share that will prompt sufficient participation to achieve the program's goals;
(b) Allowing for appropriately increased cost shares for more beneficial actions; and
(c) Prioritising agreements with landholders that will provide the largest environmental benefits.

A further key issue to be considered is that of transaction costs, both in terms of the costs incurred by government in running the program, and to landholders for participating.

1.4 Victorian Waterway Management Strategy Principles

The Victorian Waterway Management Strategy sets out the following principles for funding of riparian works, with the level of payment to be made by the Victorian Government based on the priority for management activities, the level of public benefit and the level of security of the agreement (DEPI 2013).

The extent to which these principles are being met through current cost-sharing approaches has been assessed as part of this report.

1.5 Method and report structure

The investigation of current approaches was based on a set of themes including:

- Existing frameworks, principles and rules for cost sharing (upfront and maintenance)
- Tools, scoring, matrices and criteria used at a site scale to inform cost sharing
- Factors influencing cost sharing arrangements
- Role of cost sharing arrangements in relation to securing long term stewardship of sites, including maintenance requirements and costs
- Advantages of current approaches and how they could be improved

The themes were developed in order to provide a structured way to address the key requirements of the project brief, in particular to provide a comprehensive stocktake of regional approaches.

Multiple methods were used to collect information from Catchment Management Authorities on current and past approaches to cost sharing and allocation of funding, including:

- Document review (policies and procedures, riparian program guidelines etc.)
- An online survey/questionnaire
- Face-to-face or telephone interview.

This approach allowed for input from a range of staff involved in the design and delivery of riparian programs.

An online survey was developed in consultation with the DELWP project manager and relevant documentation was sought from CMAs. The online survey was open for response for approximately four weeks. All nine CMAs and Melbourne Water participated in the survey and 31 responses were received, ranging from 1 -5 responses from each region. Differences in responses were discussed as part of subsequent interviews and consensus was sought where it was required in order to report on specific questions.

Subsequent semi-structured interviews were also held to clarify responses and capture more detailed information. A summary of each interview was prepared and reviewed by the participating CMA and Melbourne Water staff.

A list of participants in the online survey and follow up interviews is provided in Appendix C.

The report has been structured to draw on the investigation themes and align the results where possible. The report also aims to provide both a stocktake of current approaches and provide analysis of approaches against policy and economic principles to inform the development of guidance for CMAs to consider in their cost sharing approaches into the future. The structure of the report is outlined below in Table 1.

Table 1 Report structure and content

Section	Content
1. Introduction	Sets out the purpose and approach to the investigation.
2. Existing approaches to cost sharing	Describes the frameworks used for cost sharing by CMAs including: • Delivery mechanisms • Types of incentive rates • Activities funded • Annual process for identifying sites • Reported advantages and potential improvements to current approaches
3. Tools and criteria used for cost sharing	Details the levels of funding and incentive rates used for various project activities and the tools used to inform cost sharing.
4. Factors influencing cost sharing	Discussion of the key factors influencing cost sharing arrangements including: • Equity and consistency of approaches • Landholder stewardship and quality of works • Ability to secure landholder participation • Land tenure • Flood and fire recovery programs
5. Role of cost sharing in securing long term outcomes	Discussion of the role of monitoring, site inspections and compliance in securing long term outcomes.
6. Alignment with frameworks for cost sharing	Reports on alignment of current approaches with VWMS principles for cost sharing and economic principles for improving cost sharing arrangements.
7. Considerations for future cost sharing approaches	Discussion of potential refinements to cost-sharing approaches for consideration in the final report.
8. Next steps	Describes the next steps for the project investigating cost sharing arrangements for riparian programs.

1.6 Limitations

The following limitations should be noted in interpreting the findings outlined in this report.

- While there are many similarities between the approaches used by regions, there are significant differences that have resulted from the evolution and tailoring of approaches to

the specific regional context. These differences have not always been simple to categorise, or to capture the nuances associated with how programs are implemented in each region.

- Not all staff associated with waterway programs have contributed to the findings in this report.
- The information gathered through surveys, interview and document review is qualitative in its nature and whilst the analysis and reporting of this information has been undertaken with the aim of faithfully and accurately representing the views and opinions of participants the consultants do not claim that the report may be without error.

2. Current approaches to cost sharing

This section describes the approaches used by Catchment Management Authorities (CMAs) to deliver riparian works that are undertaken through cost sharing arrangements between CMAs and landholders in Victoria.

Underpinning the current approaches is the history and maturity of the Victorian Waterway Management Program. The previous Victorian River Health Strategy and current Victorian Waterway Management Strategy established an adaptive management approach for waterway management and this has led to the evolution over time of cost sharing approaches used by CMAs for riparian programs.

It has been difficult to clearly segment the results from the investigation because of the high levels of variability between the approaches used by CMAs and the nuances of each approach. It has also been challenging to document the incremental change and evolution of programs that has occurred as part of adaptive management cycles.

Despite these difficulties it is apparent that CMAs in Victoria have adapted and will continue to adapt their programs in response to factors such as participation levels, standard of works, funding requirements and a desire for continual improvement.

It is also clear that CMAs are keen to ensure programs deliver enduring outcomes for waterway health and are committed to learning more about the approaches used across the state. All CMAs reported that as part of this investigation they were keen to learn about other approaches and to look for opportunities to fine tune their programs based on the findings of this project.

2.1 Delivery mechanisms

CMAs were asked to nominate the delivery mechanisms being used for their riparian programs (see Table 2).

The main delivery mechanisms used are:

- Grants / incentives: whereby the CMA provides funding to a landholder to encourage them to participate in an activity. Under this delivery mechanism the landholder is generally responsible

for the completion of the works, the landholders share of the costs may be in the form of labour (in-kind) and/or may also be a direct financial contribution.

- Direct works using contractors: this approach is known by a number terms including capital works, targeted works and direct works. This approach involves the CMA contributing funding and taking the lead responsibility for the completion of works through a contractor or in some cases an internal workforce. These works may be fully funded by the organisation or the landholder may make a financial contribution.
- Market based instruments / tenders: involves a competitive process where landholders are able to submit bids for projects to undertake specified waterway management works on their land. These bids are then assessed in terms of value for money by the funder (with a limited pool of funds) and funded projects are then the responsibility of the landholder to implement.

CMAs also provide funding through other contractual arrangements particularly with public land managers such as Parks Victoria and Local Government to complete riparian works. These arrangements have not formed the focus of this report.

Table 2. Delivery mechanisms used by CMAs and Melbourne Water for riparian programs

Region	Devolved grants / Incentives	Direct works using contractors	MBI/ Tender	Change in delivery mechanism since 2009
North East CMA	✓	✓	✓	Shift away from direct works using contractors in priority reaches to the use of grants/incentives across the region as the major delivery mechanism. River Tender has been used in the past and direct works are used in one priority waterway.
Goulburn Broken CMA	✓	✓		No change in delivery mechanism, although the grants/incentives approach has adapted over time, including an increased focus on engagement with landholders and CMA coordination of some components of projects.
North Central CMA	✓	✓	✓	Shift away from the use of grants / incentives (for fencing) and delivery through third party. River Tender has been used in the past
West Gippsland CMA		✓		Shift away from the use of grants / incentives (for fencing).
East Gippsland CMA	✓	✓		Shift away from the use of direct works using contractors for riparian programs. CMA coordinates some elements (revegetation) depending on funding source and outcomes being aimed for.
Melbourne Water	✓	✓	✓	No change in delivery mechanisms, although the planning and delivery of works across grants/incentives and direct works (capital and maintenance) has become more integrated. A tender is being trialled in one priority catchment.
Corangamite CMA	✓	✓	✓	Grants and incentives offered in two priority areas in partnership with Landcare. Multiple MBIs have been run targeting a broad variety of asset types for the past twelve years. Projects secured as part of these have included riparian projects. Almost all on ground works for wetlands for the past ten years have been secured through the Wetland Tender mechanism, initially developed in Corangamite in 2006.

Region	Devolved grants / Incentives	Direct works using contractors	MBI/ Tender	Change in delivery mechanism since 2009
Glenelg Hopkins CMA	✓	✓	✓	Grants /incentives are still the main delivery mechanism, although a small works crew has been retained. River Tender and wetland tender has been used in the past and a stewardship program is being used for wetland programs.
Wimmera CMA	✓	✓	✓	Grants/incentives are still the main delivery mechanism although River Tender has been used in the past.
Mallee CMA	✓	✓*		Some fluctuation in the use of grants/incentives as well as contracting directly with public land managers to complete works. CMA coordinates some elements of the works (i.e. revegetation) depending on funding source and outcomes being aimed for. *Mallee CMA also has a large program of riparian works delivered through contractual arrangements with Parks Victoria.
Key: ✓ Primary delivery mechanism ✓ Secondary delivery mechanism				

The results show that:

Two CMAs (West Gippsland and North Central) deliver riparian programs through direct works as their primary delivery mechanism.

Eight CMAs use a grants and incentives delivery mechanism. For six of the eight this is the primary delivery mechanism (North East, East Gippsland, Goulburn Broken, Corangamite, Glenelg Hopkins and Wimmera). These CMAs also use direct works as a secondary delivery mechanism for specific riparian activities such as coordinated weed maintenance, revegetation or instream and large scale willow removal works (N.B instream and large scale willow removal works are not the focus of this investigation).

Mallee CMA delivers a significant component of their riparian program through contractual arrangements with Parks Victoria. They use grants and incentives with private landholders and complete some direct works; however this varies depending on the priorities and targets of particular funding programs. This investigation has focussed on investigating and reporting on the grants and incentives approach used by the Mallee.

Melbourne Water has a much larger scale riparian program than the other CMAs. Melbourne Water delivers through direct works and grants/incentives. Direct works are split into capital works and maintenance programs for specific priority areas and specific projects (according to risk, public profile, land management arrangements etc.), and has four programs for grants and incentives (stream frontage, rural land, community grants and 'corridors of green' with public land managers). In 2014-15 they are also trialling a MBI/tender in a priority catchment. This investigation has largely focussed on investigating and reporting on the grants and incentives approach used by Melbourne Water.

Six CMAs have used tenders for riparian works in the past or are currently implementing tenders for riparian works (North East, North Central, Corangamite, Glenelg Hopkins and Wimmera and Melbourne Water).

Change in delivery mechanism

Four CMAs have changed their primary delivery mechanism for riparian works since the previous report on cost sharing arrangements in Victoria in 2007 (Loo et. al, 2009)[24].

East Gippsland and North East have both moved away from direct works as the primary delivery mechanism to a grants/incentives model. For both regions the change has been driven in part by a desire to use a model that they believe supports and encourages increased community participation and 'buy in' to increase long-term commitment in waterway programs. Improving organisational efficiency was reported as a contributing factor for North East CMA. Securing long term stewardship by the landholder of riparian works was a key factor for East Gippsland CMA in the choice of this delivery mechanism.

North Central and West Gippsland CMAs have both moved from programs that had a grants/incentive element to primarily a direct works model. Both of these CMAs reported an overall high level of satisfaction with the delivery mechanism with contributing factors including: higher quality of the works can be achieved under this model compared with grants/incentives, an increased ability to secure landholder participation in priority reaches, efficiency in program administration and the ability to deliver programs within funding timelines. Both regions also reported that under the grants/incentives model there were significant problems with landholders not completing works on time or to the standard required which resulted in the CMA either having to find alternate sites or fix up the problems. North Central CMA also reported that they believe the involvement of the landholder in the initial stages of the project including negotiating and establishing the site objectives and fence alignment, and discussing the ongoing maintenance responsibilities helps to ensure the landholder's sense of stewardship.

Glenelg Hopkins has retained a grants / incentives approach as its primary delivery mechanism but now also uses direct works and stewardship payments in certain situations for reasons similar to those reported by West Gippsland and North Central but also to assist landholders that have difficulty finishing projects and to complete works in urban areas.

Factors influencing choice of delivery mechanism

The adoption of different models, for example use of contractors to undertake direct works versus grants/incentives, was driven by a similar desire to increase landholder participation and to achieve enduring high quality outcomes, suggesting that past experiences with specific models, regional context and a common desire to improve outcomes may play an important role in the selection of delivery approaches.

For the eight CMAs that use grants/incentives this approach was in general favoured because it is believed that the model engenders long term stewardship by the landholder because the landholder is involved in the initial works through in-kind and financial contributions.

[24] Loo et al. 2009 reported six out of 10 regions, namely Glenelg-Hopkins, Wimmera, West Gippsland, Goulburn Broken, Corangamite and North Central) used a cost-sharing approach for delivery of riparian works, most commonly based on a 50:50 cost-share.

Use of MBIs/tenders

CMAs were asked to reflect and make general comment on the use of MBIs and tenders in the context of cost-sharing arrangements for riparian works. The comments presented in this section are therefore not a comprehensive view of tenders and should not be taken as a formal review of tender approaches with grants and incentives.

Six CMAs (North East, North Central, Glenelg Hopkins, Corangamite, Wimmera and Melbourne Water) have used or are currently using tenders or MBIs to deliver riparian works for specific funding programs. The drivers for the application of these approaches has varied from, trialling as part of State Government programs (North East, Wimmera and Glenelg Hopkins), through to selective and strategic use for certain priority areas (Melbourne Water, Corangamite and North Central).

There are different views on the suitability and success of tenders for use in riparian programs in regions where they have been used.

For example in the Wimmera region there is extensive experience in the use of tenders for terrestrial and wetland projects. A review completed for all tenders for the Wimmera CMA (Whitten et. al, 2014) suggests that tenders are likely to generate better value for money than traditional approaches. The Wimmera CMA noted that tenders are an effective and preferred mechanism in specific situations, but in their experience are not as effective for traditional waterway programs. Wimmera CMA reported that for the priority areas they are currently focussed on, there appears to be little advantage for riparian programs in a tender approach over a fixed price incentive program.

Glenelg Hopkins commented that tenders were more suited for programs aimed at protecting remnant vegetation whilst grants/incentives were more suited for programs that required larger amounts of revegetation.

Wimmera and Glenelg Hopkins reported that the use of MBIs had helped inform the appropriate payment levels for incentive programs.

North East reported some concerns arising from the use of tenders including value for money. For example there was a view that the high level of annual stewardship payments and some landholders dropping out before the end of the tender has resulted in less than optimal environmental outcomes. There was also a view that MBIs increase paperwork, complexity and transaction costs for the CMA.

Glenelg Hopkins has a strategic approach to tender/stewardship application, using them in situations where there are extremely high value assets (e.g. freshwater wetlands on high value agricultural land), where landholder opportunity costs are very high and participation using conventional approaches is deemed to be unlikely.

Corangamite is different to the other regions in that in some cases tenders and traditional grants programs are used in a complementary fashion over the same geographic area. Further information is required to confirm the mechanics of program delivery in order assess the strengths and weaknesses of this approach.

2.2 Annual process for identifying projects and securing participation

CMAs were asked to describe the annual process for identifying projects and securing participation in riparian programs (see Table 3).

Table 3. Annual process for identifying projects used by CMAs

Region	Annual process for identifying projects and securing participation
North East CMA	Annual advertised expression of interest process (as well as word of mouth), followed by check of eligibility, site visit and assessment to rank projects for funding and determine level of funding/ cost share.
Goulburn Broken CMA	Funding proposal development process sets targets in priority reaches from RWS. Landholders are targeted in these priority reaches through proactive engagement as well as referral through Landcare and expression of interest process. A declining demand has led to this more targeted approach. Expression of interest/targeted engagement process is followed by eligibility check, site visit and assessment to rank projects for funding and determine level of funding/ cost share.
Corangamite CMA	Annual advertised expression of interest process via Landcare as well as direct application to CMA, followed by check of eligibility, site visit and formal assessment to rank projects for funding and determine level of funding/cost share. A tender process is also used over specific geographic areas (e.g. Victorian Volcanic Plain)
East Gippsland CMA	Funding proposal development process sets targets in priority reaches from RWS. Engagement is primarily completed as part of this process to gauge interest and commitment of landholders. Includes a mix of targeting landholders, expression of interest where interested landholders contact the CMA and referral from Landcare followed by site visit and eligibility check and formal assessment to rank projects for funding and determine level of funding/cost share.
West Gippsland CMA	Funding proposal development process sets targets in priority reaches from RWS. Engagement is primarily completed as part of this process to gauge interest and commitment of landholders. Includes a mix of targeting landholders, interested landholders informally expressing interest with the CMA and referral from Landcare. This is followed up with a site visit and completion of record of conversation form to record negotiated outcomes.
Melbourne Water	For Stream Frontage program an expression of interest process for new projects occurs through local networks (or recommendation for follow up works from audit of existing projects) whilst Community Grants program is more broadly advertised. Once expression of interest is received a site visit is conducted by independent assessor and funding proposal is developed collaboratively with landholder. An eligibility check and formal assessment is undertaken to rank projects for funding and determine level of funding/ cost share. The process remains open until funds are fully committed. A tender process is used for MBIs.
Glenelg Hopkins CMA	Funding proposal development process sets targets in priority reaches from RWS. For the majority of riparian projects a Waterway Action Plan is undertaken to engage with landholders to identify high priority actions within priority reaches at the sub-catchment and property level. An expression of interest process is then undertaken within the Waterway Action Planning area. This is followed by a site visit and formal assessment to rank projects for funding and determine level of funding/ cost share. For riparian projects delivered through the Landcare program, this involves an expression of interest period and approval process based on statewide and regional criteria. A direct mail out and tender process is used for MBIs.

Region	Annual process for identifying projects and securing participation
North Central CMA	Funding proposal development process sets targets in priority reaches from RWS. Expressions of interest are sought via direct mail out or through broader media campaign to promote project opportunities to landholders in funded priority asset areas. Interest is followed up with a site visit to scope works and negotiate mutual outcomes. Priority sites are selected based on the objectives of the project and a set of guiding principles.
Wimmera CMA	An EOI for projects is undertaken. Potential sites are then prioritized using a decision metric considering individual site values and catchment priorities.
Mallee CMA	Funding proposal development process sets targets in priority reaches from RWS. Engagement occurs via a mix of targeting landholders, interested landholders contacting CMA and referral from Landcare followed by site visit, record of project details to capture negotiated outcomes. Waterway strategy and Regional Catchment strategy provide the prioritised areas and the funds are allocated by site by site visits compared to previous works projects and site visits.

The results show that two main approaches are used by CMAs to secure landholder participation in riparian programs:

- Expression of interest process, either where the landholder indicates interest to participate in riparian programs, or where the landholder submits a written expression of interest, outlining the proposed project details to the CMA. More formal processes were reported to either occur on an annual basis with a cut-off date for receipt of applications or less well constrained with applications received across the year.

- Proactive engagement with landholders, undertaken by the CMA in targeted areas (priority reaches or linked to specific funding programs).

All CMAs reported that they use both approaches to some degree as well as processes such as referral from Landcare and other landholders. Regardless of the approach used for initial engagement, all regions use a site visit process for the purpose of assessing and finalising project negotiations.

Two CMAs, North East CMA and Melbourne Water (for grants/incentives) use a formal expression of interest process, with an advertised open call for projects from the whole region. The priority of the waterway is considered in subsequent ranking processes (see Section 3.1).

Five CMAs; Wimmera, Glenelg Hopkins, Corangamite, Goulburn Broken and East Gippsland CMAs have a formal expression of interest process that is more targeted in a geographic sense with eligibility limited to priority areas or reaches linked to specific funding programs. The priority of the waterway is also considered in subsequent ranking processes.

North Central, West Gippsland and Mallee CMAs use a combination of informal expression of interest process and proactive engagement with landholders to secure participation in reaches linked to specific funding programs and targets.

Glenelg Hopkins CMA uses the development of Waterway Action Plans (informed by the Regional Waterway Strategy) for priority areas as a precursor to identifying projects. This process aims to build landholder awareness of the funding program as a 'stepping stone' towards participation and was seen as a key strength in that region.

Corangamite CMA uses Landcare coordinators and networks to assist in the identification, development and assessment of projects.

Goulburn Broken CMA reported that it is becoming increasingly difficult to secure participation by landholders in priority areas and as a result more effort and time is going towards directly contacting landholders. West Gippsland, East Gippsland and Mallee CMAs also reported concerns about being able to secure participation in specific priority areas in the future.

2.3 Activities funded

CMAs were asked to identify the range of activities funded through their riparian programs (see Table 4).

All CMAs provide funding for fencing materials, revegetation materials and off-stream watering materials.

The circumstances around funding of labour and contractors for fencing and revegetation are more complex.

In general where an incentive rate is offered for fencing it appears that this incentive can be used for materials or labour/contractors or both at the landholder's discretion. In this case it is the level of the incentive for a given site in comparison to the overall cost of the fence construction that dictates the degree to which both components are funded.

Initial weed control is funded by nine CMAs, however two CMAs indicated that they only fund weed control under certain circumstances (Wimmera, Corangamite and Mallee CMAs) for example when weed control is required for revegetation activities to take place, as part of site preparation. Mallee CMA reported that weed control wast typically the responsibility of the landholder.

All CMAs formally divest responsibility for long term maintenance[25] of the works to landholders through the management agreement, with the expectation that ongoing management and maintenance of the initial works are the responsibility of the landholder.

Funding of longer term maintenance of revegetation or weed control (>2 years) was only formally funded by Melbourne Water through its follow up auditing and expression of interest process. Seven CMAs (Goulburn Broken, North Central, East Gippsland, North East, Mallee, Glenelg Hopkins and West Gippsland) reported funding long term maintenance on an as needs basis or in a scheduled way as a part of initiatives to address emerging risks from weed regrowth or failure of plantings due to poor seasonal conditions. Site inspections and monitoring were reported to be an important process to inform maintenance requirements for these CMAs (see Section 3.2). CMAs who had used tender programs reported that maintenance is an activity eligible for funding under this model.

[25] Weed control or revegetation activities completed in follow up to initial works has been reported as 'maintenance' for the purposes of this report

Other project components

CMAs were asked to nominate any other works delivered through cost-sharing arrangements with landholders. The majority (seven) of CMAs stated that riparian cost sharing is limited to the activities reported above. Corangamite and Glenelg Hopkins report that they also undertake cost sharing for stock-crossings, whilst North East CMA have incorporated willow control and minor stabilisation into their grants and incentives program, however it was noted that the uptake for this component in the first round has been low, perhaps in part due to the level of incentive.

All regions reported that they deliver large scale instream works (stabilisation, fishways etc.) and willow control works through a direct works program. East Gippsland reported that they had originally considered cost sharing for instream works but had not implemented this approach due to the potential risks associated with these works and landholder capacity.

A number of regions reported on associated programs specifically for wetlands (Glenelg Hopkins, North East) and Melbourne Water has a rural land grants program in priority sub-catchments of which a broader range of activities (off waterway) are eligible for funding.

Table 4. Activities eligible for funding through CMA riparian programs

Region	Fencing materials	Fencing labour or contractors	Revegetation materials	Revegetation labour or contractors	Initial weed control materials	Initial weed control labour or contractors	Site preparation	Long term (>2 years) maintenance of weeds	Long term (> 2 years) maintenance of revegetation	Off-stream watering materials	Other / comment
North East CMA (Grants/incentives)	✓	✗	✓	✗	✓	✓	✓	✓*	✗	✓	Nest boxes, willow control and minor stabilisation works also eligible under grants and incentives. Subject to review following first year of implementation (2014-15). * CMA funds long term maintenance as part of as a part of initiatives to address emerging risks from weed regrowth
Goulburn Broken CMA (Grants/incentives)	✓	✓	✓	✓*	✓	✓	✓	✓*	✗	✓	* CMA funds long term maintenance as part of as a part of initiatives to address emerging risks from weed regrowth
East Gippsland CMA (Grants/incentives)	✓	✓	✓	✓*	✓	✓	✓	✓*	✗	✓	* CMA funds long term maintenance as part of as a part of initiatives to address emerging risks from weed regrowth
West Gippsland CMA (Direct works)	✓	✓	✓*	✓	✓	✓	✓	✓*	✗	✓	Maintenance for 2 years is responsibility of CMA. *Landholders pay for trees up to maximum 2000 plants per km waterway. * CMA funds long term program to eradicate willow and high threat

Region	Fencing materials	Fencing labour or contractors	Revegetation materials	Revegetation labour or contractors	Initial weed control materials	Initial weed control labour or contractors	Site preparation	Long term (>2 years) maintenance of weeds	Long term (> 2 years) maintenance of revegetation	Off-stream watering materials	Other / comment
											weeds from all sites.
Melbourne Water (Grants/incentives)	✓	✓	✓	✓	✓	✓	✓	✓*	✓*	✓	*Maintenance funded through annual site audit and EOI process.
Corangamite CMA (Grants/incentives)	✓	✓	✓	✓	✓*	✓*	✓	✗	✗	✓	Stock crossings funded 50% of the total cost of stock crossing, with the Maximum CMA funding available being $3,000. Weed control funded only as part of site preparation
Glenelg Hopkins CMA (Grants/incentives & tenders/MBI)	✓	✗*	✓	✓*	✓	✓*	✓*	✓*	✓*	✓	Grants programs largely fund materials although labour can be provided for revegetation of larger sites. Tenders/stewardships would fund all elements. Increased incentives for EOI period only following WAPs can go towards some part payment for fencing labour CMA will provide 50% of labour cost for weed control if landholder using a contractor Funding for site preparation is for chemical only. * CMA funds long term maintenance as part of as a part of initiatives to address emerging risks from weed regrowth

Part 2: Current cost sharing approaches used by Catchment Management Authorities and Melbourne Water

Region	Fencing materials	Fencing labour or contractors	Revegetation materials	Revegetation labour or contractors	Initial weed control materials	Initial weed control labour or contractors	Site preparation	Long term (>2 years) maintenance of weeds	Long term (> 2 years) maintenance of revegetation	Off-stream watering materials	Other / comment
North Central CMA (Direct works)	✓	✓	✓	✓	✓	✓	✓	✓*	✗	✓	Maintenance for 1 year following completion of works is funded by CMA * CMA funds long term maintenance as part of as a part of initiatives to address emerging risks from weed regrowth
Wimmera CMA (Grants/incentives)	✓	✗	✓	✓	✓*	✓*	✓	✗	✗	✓	Weed control funded only as part of site preparation
Mallee CMA (Grants/incentives)	✓	✓	✓	✓*	✓*	✓*	✓	✓*	✗	✓	The degree to which each component is funded is negotiated with landholders and is based on the site values, condition and risks and the landholder capacity. * CMA funds long term maintenance as part of as a part of initiatives to address emerging risks from weed regrowth

Key - ✓ Activity funded through riparian program. ✓* Activity eligible for funding only under certain circumstances (see section 3.2), ✗ Activity not eligible for funding

2.4 Types of incentive rates and funding allocation approaches

Cost sharing arrangements for riparian projects are complex, with different arrangements defined for each activity within a given project.

Cost sharing arrangements are set out through the use of incentive rates and funding allocation rules for grants/incentives and direct works delivery models. For tender approaches landholders prepare a bid for a project, including a proposed cost for specified works and actions over a particular timeframe. This bid may also include a consideration of opportunity costs and ongoing maintenance costs. This section focusses on the incentive rates and funding allocation rules reported by CMAs for grants/incentives and direct works. These rates and rules can be categorised into (see Table 5):

- Flat rates - where the same rate (or cost-share percentage) is offered to all participants.
- Variable rates – where a range of incentive rates (or cost-share percentages) are offered based on a set of rules or criteria.
- 100% funding – where 100% of the upfront cost of the activity (materials and labour) is funded by the CMA.
- Funding and cost sharing negotiated on a site by site basis – where the level of funding and costs to be borne by the landholder and the CMA are defined through negotiation.

Further detail on the rates for major activities is provided in Tables 8 – 11.

Table 5. Types of incentive rates and cost sharing arrangements used for riparian programs

Region	Types of incentive rate / cost sharing arrangement by major activity type			
	Fencing	**Revegetation**	**Weed control**	**Off stream watering**
North East CMA	Flat rates	Flat rates	Variable rates	Flat rates (%)
Goulburn Broken CMA	Variable rates	Cost sharing negotiated on site by site basis or 100% funding	Cost sharing negotiated on site by site basis or 100% funding	Flat rates
North Central CMA	100% funding	100% funding	100% funding	Flat rates
West Gippsland CMA	100% funding	Flat rates	100% funding	Flat rates
East Gippsland CMA	Variable rates	Flat rates or 100% funding	Flat rates	Flat rates
Melbourne Water	Variable rates	Flat rates	Flat rates	Cost sharing negotiated on site by site basis. Funding for materials only with a set of rules regarding eligibility for particular components.
Corangamite CMA	Variable rates	Flat rates	Not typically funded	Flat rates (%)
Glenelg Hopkins CMA	Variable rates	Flat rates	Flat rates (%)	Variable rate (%)
Wimmera CMA	Flat rates	100% funding	Not typically funded	Flat rates (%)

Region	Types of incentive rate / cost sharing arrangement by major activity type			
	Fencing	**Revegetation**	**Weed control**	**Off stream watering**
Mallee CMA	Cost sharing negotiated on site by site basis	Cost sharing negotiated on site by site basis	Cost sharing negotiated on site by site basis	Cost sharing negotiated on site by site basis

All CMAs currently use a mix of rate types to fund riparian works.

- Five CMAs offer variable rates for fencing (East Gippsland, Corangamite, Glenelg Hopkins and Goulburn Broken CMAs and Melbourne Water), they also use 100% funding or flat rates for other activities.
- North East and Wimmera CMA offer flat rates across the majority of their project activities, with the exception of weed control for North East (which is variable) and revegetation for Wimmera CMA (which is 100% funded).
- North Central offers 100% funding of the upfront costs of all revegetation and weed control. Fencing is 100% funded to a maximum amount per km for fencing (flat and steep rates). A flat rate is offered for off-stream watering costs (material only).
- West Gippsland offers 100% funding of the upfront costs for all activities except for, revegetation where landholders are required to make a cash contribution and off-stream watering where they are required to make a contribution to the installation of the system.
- Mallee CMA negotiates cost sharing on a site by site basis with some project activities funded 100% and others requiring a landholder contribution depending on the site.
- All regions reported some degree of flexibility within cost sharing arrangements used for grants/incentives and direct works delivery models to enable them to negotiate an outcome with landholders, the factors contributing to these situations included:
  - if the site was deemed to be of particularly high value or priority,
  - in response to low landholder capacity to take responsibility for works or,
  - in response to landholder willingness to take on more responsibility for completion of works.

Variable rates were reported to be offered as a way to encourage participation and recognise the variations in public benefits associated with a project activity.

Flat rates were reported to be important to ensure equity between landholders in a region or to ensure a consistent approach across incentive programs delivered in a region.

Flexibility of cost sharing approaches based on local context was reported to be highly valued by CMAs and all CMAs expressed a desire to retain this feature of their current cost sharing arrangements.

Previous reporting on cost sharing approaches undertaken in 2009 by Loo et. al. indicated that six out of ten CMAs were delivering their riparian programs through a grants and incentives program using typically a 50:50 cost share. The findings in this report (see also section 3.2) indicate that there has been significant change in the funding allocation approaches used by CMAs since 2009.

2.5 Monitoring and ensuring outcomes

CMAs were asked to describe the ways in which they monitor and measure success of their riparian programs. The responses to the survey were diverse and ranged from ecological monitoring, monitoring work sites and site inspections and long term resource condition monitoring (see Table 6). The results presented in this section are focused on monitoring and measuring the success of works as opposed to long term ecological outcomes or resource condition.

Table 6. Approaches used by CMAs to Melbourne Water for site inspections and monitoring

Region	Site inspection at completion of works	Longer term monitoring of sites
North East CMA	✓	Site visits undertaken on an informal basis beyond completion of initial works. Additional contact will be made by project officer as required. For River Tender sites an annual inspection is undertaken to ensure works have been completed.
Goulburn Broken CMA	✓	A re-engagement program commenced in 2013-14 involves site visit and landholder survey. 45 Landholders participated in first year. The program has built relationships with landholders, clarified responsibilities and allowed for maintenance work (for the CMA and landholder) to be identified. A number of other monitoring projects have run in the past including riparian condition assessments.
North Central CMA	✓	Works monitoring[26]/annual audits have been undertaken, for randomly selected sites from three years prior. Site visits also undertaken on an informal basis throughout and beyond the project life.
West Gippsland CMA	✓	Works monitoring is completed at a small number of sites. A number of other monitoring projects have run in the past including assessment of vegetation establishment, fauna surveys etc.
East Gippsland CMA	✓	Works monitoring has been a specific program the responsibility of a dedicated staff member. There is a set site monitoring cycle, on completion of site works and then every three years. All breaches of an Agreement are recorded and landholders are informed to address the breach. Engagement with landholders is recorded through a central database. Additional contact is made by project officers through phone call and follow up site visit if required.
Melbourne Water	✓	All projects have a 12 month completion audit undertaken by an independent assessor. This site visit often results in a follow up grant for weed control or supplementary planting.
Corangamite CMA	✓	Site visits undertaken on an informal basis beyond completion of initial works. Works monitoring has been used as a tool for follow up inspections. It helps to stay engaged with landholders and to evaluate the success of the project through visual inspections, recording data and taking progress photos.
Glenelg Hopkins CMA	✓	An annual re-engagement/compliance program is implemented involving site visit and social surveys. The program looks at long-term success (range of projects between 2-10 years of age) of fencing, maintenance, revegetation, weeds.
Wimmera CMA	✓	Works monitoring is used; a follow up site visit to review and audit of compliance is undertaken after twelve months.

[26] The works monitoring method is currently under review by the Arthur Rylah Institute.

Region	Site inspection at completion of works	Longer term monitoring of sites
Mallee CMA	✓	Site visits undertaken on an informal basis beyond completion of initial works. Additional contact will be made by project officer as required and as resources allow for. When longer term funding is available (i.e ECL) consultants may be engaged to undertake condition assessments.

All CMAs indicated they undertake a site visit upon the completion of funded works. For the eight CMAs that are using a grants/incentives delivery model this site inspection often coincides with authorisation of a final payment to the landholder.

Seven of these eight CMAs pay part or all of the grant or incentive on completion of works and sighting of receipts. Melbourne Water is slightly different as upfront payments are made followed by a twelve month inspection/audit by an independent assessor. This process combines both monitoring the compliance with agreements together with the opportunity to provide further support in the form of advice and/or funding to support further stages of works or management of the site. This annual re-engagement and funding support for landholders was reported as in general occurring for up to 3-4 years.

For North Central and West Gippsland who use a direct works model a final site inspection is completed by the relevant project officer as part of quality assurance processes to ensure contractors have completed works to an appropriate standard.

Nine CMAs reported they used formal standards and program guidelines to underpin their work programs of which seven were based on state wide standards developed by DELWP (details provided in Appendix F).

A mix of formal and informal longer term monitoring is undertaken by all CMAs.

Five CMAs (North Central, West Gippsland, East Gippsland, Corangamite and Wimmera) reported they were using or had used a works monitoring method developed by the Department. Application of the method was reported to occur at varying levels, either at a small number of sites or as part of a larger program of site inspections and auditing. The original works monitoring method was reviewed in 2014 and has been replaced by the 'riparian intervention monitoring (RIM) approach, which is now being used by nine CMAs (not by Melbourne Water). CMAs who used the former works monitoring method commented on its usefulness as a tool to assess the success of works and the site visits were a mechanism to re-engage with landholders.

In addition to Melbourne Water, five CMAs (North Central, Glenelg Hopkins, Goulburn Broken, Wimmera and East Gippsland) have formal longer term site monitoring and landholder re-engagement programs. These programs differ to the monitoring carried out in other regions in that they occur at a larger scale and incorporate both site assessments and a more formal engagement (including through the use of surveys or questionnaires) with landholders. The regions with these more formalised programs remarked that undertaking regular visits and discussing issues around maintenance and compliance with landholders was an important factor in ensuring outcomes were maintained in the longer term. The ability to implement these programs was noted to be dependent on long term funding, such as through Environment Contribution Levy.

Follow up site visits and re-engaging with landholders over the longer term were reported by all CMAs as being the most effective way to 'enforce' landholder responsibilities under management agreements.

Four CMAs (East Gippsland, North Central, Glenelg Hopkins and Wimmera) reported that they had pursued issues of non-compliance with agreements in a formal way through actions such as requiring funds to be returned or refusing further investment in projects. This may also be the case in other regions but it wasn't reported during the consultation.

2.6 Advantages and potential improvements to current approaches

CMAs were asked to identify the advantages and potential improvements to their cost sharing approaches (see Appendix E). These questions were asked unprompted in the survey and the further discussed in the subsequent interviews.

All CMAs reported that their programs had evolved over time and expressed that they wanted to continue to adapt their programs in response to factors such as participation levels, standard of works, funding requirements and a desire for continual improvement.

The common themes highlighted by regions in relation to advantages of current approaches were:

- Landholder contribution (through cash or in-kind contribution) to the upfront works mean they are more likely to have ownership of the works and therefore are more likely to maintain the sites into the future (Corangamite, East Gippsland, North East, Mallee, Glenelg Hopkins, Melbourne Water).
- Quality of works is high or has improved as a result of direct works or CMA coordination of some components of projects (West Gippsland, North Central, and Goulburn Broken).
- Approach to riparian cost sharing is consistent, fair and easy for landholders to understand (Goulburn Broken, Melbourne Water, West Gippsland, and North Central).
- Approach to cost sharing is cost effective (more outcomes achieved from available funds) or costs to deliver are lower, in comparison to direct works models (Wimmera, Melbourne Water, North East, and Glenelg Hopkins).

Common themes for areas of potential improvement were:

- Review delivery mechanisms (Wimmera and North East), and trial alternatives (stewardship payments, grants/incentives or MBIs) in order to achieve outcomes (West Gippsland, Glenelg Hopkins and Goulburn Broken).
- Increased emphasis on follow up site visits and monitoring by CMAs to improve landholder relationships ensure long term maintenance of outcomes (West Gippsland and Glenelg Hopkins)
- Increased compliance effort by DELWP for crown frontage licences (East Gippsland, Goulburn Broken, and West Gippsland).
- Review of incentive rates to ensure they reflect market rates or secure participation to achieve outcomes (Corangamite, North Central and Melbourne Water).

A number of novel approaches to improve cost-sharing arrangements were also suggested, including:

- requiring landholders to complete initial control of weeds (blackberries etc.) prior to commencing CMA coordinated works (West Gippsland)
- requiring landholders to attend a riparian management workshop as a condition of their participation (requirement of the landholder agreement) (North Central)
- landholder submission of photographs/reports on completion of works to minimise costs for follow up audits (Melbourne Water)
- having flexibility in incentive approaches required according to different socio-economic (demographics agricultural industry, land value) and landscape factors (topography) (Glenelg Hopkins)
- incorporation of indigenous values (e.g. food/medicinal plants) into riparian projects (such as plants with traditional uses) (Glenelg Hopkins).

Overall there was a high degree of satisfaction with current approaches, with most suggestions seen to be refinements rather than fundamental changes. All CMAs reported being interested in learning from each other and trialling new approaches as a way of improving outcomes from investment in riparian programs.

3. Tools and criteria used to inform cost sharing

This section sets out the tools used to inform cost sharing and the incentive rates and their rules and criteria.

3.1 Ranking and selection of projects

An assessment was made of the tools and approaches used by regions to assess projects prior to deciding on the allocation of funds (see Table 7).

All CMAs have a preliminary set of criteria to establish whether a project is eligible for funding. While there are differences between regions in the number and type of eligibility criteria they commonly relate to factors such as a project being located in a priority reach, and that a minimum fence set back is used and that the landholder agrees to make a financial or in-kind contribution.

All CMAs also require landholders to sign a management agreement and require that land subject to Crown licence is converted to riparian management licence and for unlicensed Crown Land a landholder must be willing to enter into a riparian management licence to be eligible for funding. Other factors commonly assessed to rank projects include:

- Priority of waterway
- Length of stream or area of site
- Quality of vegetation/site condition
- Connectivity with past works or remnant vegetation
- Other site based threats i.e. erosion

Seven CMAs reported the use of a tool to evaluate projects either for the purpose of determining suitability, ranking or to determine the level of incentive.

Of the three that don't use a ranking tool, two (North Central and West Gippsland CMAs) have a works program that is highly targeted to a specific priority reach/es, and therefore all eligible project sites that contribute to this goal are funded according to the defined cost rules for that region. North Central CMA use a set of guiding principles to assess the extent to which potential sites meet overall program objectives in order to determine a priority order for funding.

The third, Mallee CMA, direct their grants/incentives to priority reaches and in the past, assessments have been informal based on judgement of the project value, and consideration of the relative level of funding required for the works and the level of landholder contribution. At the time of reporting Mallee CMA were developing a site assessment process to formalise the assessment of benefits and value for money to inform selection of projects.

Whilst there is a great deal of variation in the design and use of these tools, they are broadly used in three different, but interrelated ways:

4. To assess suitability of an individual project proposal for funding,
5. To rank a set of project proposals received from the annual call (see Section 2.2)
6. To determine the level of incentive (usually for fencing) offered to funded projects, as a proportion of the overall direct cost associated with a project.

For all these purposes a variety of assessment criteria (see Table 6 below) have been established and projects are scored against the criteria to calculate an overall project score. Some of the tools include criteria that would be more appropriately used to determine eligibility, rather than as part of a scoring system. For example one region scored projects according to whether it met an action in the previous Regional River Health Strategy.

As a result of the enormous variation in the make-up of the various spreadsheet tools it is impossible to assess their relative utility in ranking and assessing projects. Nonetheless there are a number of potential improvements that could be made to enhance the ability to evaluate projects. Recommendations to improve the design and application of assessment tools are outlined in Section 7.1 and in Part 1.

It should be noted that, of the various tools and assessment metrics examined through this investigation, none of them addressed the issue of what is the least the CMA could pay to achieve project outcomes.

Table 7. Ranking and selection tools used by CMAs to inform riparian cost sharing

Region	Site/Project Assessment Tool	Assessment criteria	Score used to assess suitability of an individual project	Score used to rank a set of projects	Score used to determine incentive rate	Comment
North East CMA	Yes – spreadsheet tool	• Site quality and threats • Priority reach in waterway strategy • Project size • Incentive $ offered per Ha • Length of stream protected • Linkages to other works	No	Yes	No	Based on current state rather than potential for improvement Possible 'double counting e.g. site quality and priority reach
Goulburn Broken CMA	Yes – spreadsheet tool	• Fence set back • Habitat hectares score • Waterway Strategy Priority	No	No	Yes	Assessment tool used to calculate incentive rate for fencing only. Cost share varies from min. of 30% to max. of 75% CMA contribution.
North Central CMA	No	See comment	N/A	N/A	N/A	Informal principles used to guide project selection: • Contribution to funding program outcomes • Priority reach in waterway strategy • Presence of remnant vegetation /requirement for revegetation. • Connectivity with past works or existing habitat • Site quality and threats • Presence of rare or threatened species
West Gippsland CMA	No for State Government funding		N/A	N/A	N/A	Spreadsheet tool used to assess suitability of projects for AG funding in Corner Inlet.
East Gippsland CMA	Yes – spreadsheet tool	• Set back of fence • Priority reach in waterway strategy (Heritage River, link to catchment goal, priority program)	Yes	No	Yes	Categorical score sets maximum amount to be paid (e.g. 14+ = $10/m, 10-13 = $8/m)

Region	Site/Project Assessment Tool	Assessment criteria	Score used to assess suitability of an individual project	Score used to rank a set of projects	Score used to determine incentive rate	Comment
		• Located in proclaimed water supply catchment • Presence of remnant vegetation /requirement for revegetation • Presence of wetland				Not clear if scores are used to rank projects, rather to calculate rate to be paid.
Melbourne Water	Yes – spreadsheet tool	• Length of project • Values • Priority area • Link to strategies and plans • Complementing other works • Connectivity • Threats • Link to water quality • Local leaders/champions • Education value • Works likely to be completed safely and on budget • Likely to lead to future works	Yes	No	No	
Corangamite CMA	Yes – spreadsheet tool for priority program areas	• Contribution to funding program outcomes • Priority reach in waterway strategy • Presence of remnant vegetation /requirement for revegetation. • Connectivity with remnant vegetation • Associated river health benefits • Presence of rare or threatened species • Significant EVC • Landholder rating • Management of weeds and pests • Risks to success of project • Funding sought • Landholder contribution	Yes	Yes	No	Scores used to rank projects not to determine incentive rates. There are lots of criteria, some of which may lead to double counting (e.g. priority reach, remnant vegetation) or perverse results (e.g. extreme project risk may be offset by other high values).

Region	Site/Project Assessment Tool	Assessment criteria	Score used to assess suitability of an individual project	Score used to rank a set of projects	Score used to determine incentive rate	Comment
Glenelg Hopkins CMA	Yes – spreadsheet tool	• Set back of fence • Quality of habitat • Connectivity with other sites • Level of threat	Yes	Yes	Yes	Higher scores attract higher rates for fencing. Assessment tool is used to rank project.
Wimmera CMA	Yes - spreadsheet tool	• Connectivity with past works or existing habitat • Priority reach from waterway strategy • Vegetation condition • Requirement for revegetation works / presence of remnant vegetation • Presence of active erosion	No	Yes	No	Some apparent anomalies with assessment criteria, For example a project with high vegetation condition and active erosion will score the same as a project with low vegetation condition and no erosion. Appears to be double counting with catchment priority and other criteria e.g. vegetation condition, erosion which have presumably been used to inform priority?
Mallee CMA	No – currently under development		N/A	N/A	N/A	

3.2 Incentive rates and rules /criteria to determine levels of funding

This section sets out the range of incentive rates, levels of funding and the criteria to determine the level of funding for riparian programs.

Corangamite CMAs report that their incentive rates have remained stable for many years (Corangamite, Glenelg Hopkins CMAs whilst others have been reviewed in light of increased overall costs (Melbourne Water, Glenelg Hopkins), in response to reduced landholder participation (Goulbourn Broken CMA) .

Two regions have more recently adopted grants /incentives model (North East and East Gippsland CMA). North East CMA reported that alignment between the rates offered in the riparian program with other grants/incentives programs in the region has been an important factor in how their rates have been established.

Fencing

Table 8 sets out the arrangements used by CMAs for funding of fencing. Fencing is funded by five CMAs (East Gippsland, Corangamite, Glenelg Hopkins and Goulburn Broken CMAs and Melbourne Water) through a variable rate.

Wimmera and North East offer a flat rate for fencing regardless of site conditions or the set-back or site condition.

West Gippsland and Mallee reported that they generally fully fund fences with exceptions where mesh fencing is required (West Gippsland. North Central provides fencing up to $7.00/m or $10.00/m based on site conditions, which typically fully funds the fence construction.

The rates themselves vary significantly across the state. Minimum rates for standard non-electric fences vary from $2.50/m to $6.00/m and maximum rates from $4.00/m to $10.00/m. Goulburn Broken, Glenelg Hopkins and North Central reported offering two different rates for different parts of their region to reflect differences in cost to construct fences in flatter terrain versus steeper country.

The Victorian Waterway Management Strategy policy principles state that ‘riparian land fenced for riparian management purposes will aim to be at least 20 m wide on average from the top of the bank and must not be narrower than 10 m in any one place’ (DEPI 2013).

Seven CMAs reported they required an average 10m width or a minimum 10m width as the basis for the minimum or standard rate for fencing. Glenelg Hopkins reported a 20m minimum for priority waterways and 10m minimum for other waterways. Goulburn Broken also reported a 20m minimum and Mallee did not specify their minimum setback requirement.

Table 8. Incentive rates, funding levels and criteria for funding fencing

CMA Region	Incentive Rate / level of funding	Criteria / funding rules
North East CMA	$8.00/m standard $5.00/m electric	Minimum fence set back 10m and fence constructed to standard.
Goulburn Broken CMA	$3.00/m up to $7.50/m plains $3.60/m up to $9.00/m hill country	Incentive rate offered based on funding 30% to max 75% of $10.00/m plains and $12.00/m for hill country based on criteria. Scored based on: • Waterway Strategy priority • Water quality / catchment impact (site located in proclaimed water supply catchment) • EVC conservation • Fence set back 20m - 40m • Vegetation quality (habitat hectares)
North Central CMA	NCCMA fund and coordinate materials and contractor for construction of standard fence. $7.00/m for flatter areas $10.00/m for steeper land These are the maximum costs with actual costs varying based on actual material costs and contractor quotes.	Minimum fence set back 10m and fence constructed to standard. Fence alignment and materials negotiated with landholder according to: • Topography • Dripline of overhanging vegetation • Flood history of site • Stock watering needs • Landholder's experience with fence design and ease of ongoing maintenance
West Gippsland CMA	WGCMA fund and coordinate materials and contractor for standard fence Typical costs $8.00 -$12.00/m inclusive.	Minimum average 10m fence set back and fences constructed to standard. Landholder contributes to cost of mesh fencing where required.
East Gippsland CMA	$6.00/m, $8.00/m or $10.00/m for standard fence.	Minimum average 10m fence set back and fences constructed to standard. Incentive rate based on criteria: • Set back of fence • Priority reach in waterway strategy (Heritage River, link to catchment goal, priority program) • Located in proclaimed water supply catchment • Presence of remnant vegetation /requirement for revegetation • Presence of wetland
Melbourne Water	$6.00/m up to $9.60/m for standard fence	Funding is preferred to be directed a Melbourne Water designated waterway for stream frontage grants however projects may be funded on other waterways. For rural land grants all waterways in priority catchments eligible. Minimum average 10m fence set back. Fences constructed to standard. Incentive rate based on fence set back. Rates based on: Funding up to 80% of $12/m for standard fence. 50% at 10m ($6.00), 65% at 15m ($7.80) and 80% at 20m ($9.60). Up to 80% of $10/m for electric fence. 50% at 10m ($5.00), 65% at 15m ($6.50) and 80% at 20m ($8.00).
Corangamite CMA	$4.00/m up to $6.00/m for standard fencing $2.50/m up to $4.50/m for electric fencing applies where revegetation is required: OR $5.00/m up to $7.00/m for standard fencing $3.50/m up to $5.50/m for electric fencing applies where fencing remnant vegetation or within Special Water Supply Catchment (SWSC) with the exception of the Barham SWSC and the Barham River downstream of the SWSC	Minimum average 10m fence set back. Fences constructed to standard. Incentive rate based on fence set back. Rates established based on a principle of a minimum rate based on funding 50% of assumed total cost of fence, with rates based on fence set back: For revegetation project: (standard) $4.00 at 10m, $5.00 at 15m or $6.00 at 20m (electric) fence set back, $2.50 at 10m, $3.00 at 15m or $3.50 at 20m Remnant vegetation projects and specific Special Water Supply Catchments: (standard) fence set back, $5.00 at 10m, $6.00 at 15m or $7.00 at 20m (electric) fence set back, $3.50 at 10m, $4.50 at 15m or $5.50 at 20m.

CMA Region	Incentive Rate / level of funding	Criteria / funding rules
Glenelg Hopkins CMA	$2.50/m for 10m set back up to $3.30m for >20m set back. Additional amounts for habitat quality (up to additional $0.50) and connected sites (0.20). Total maximum $4.00	Minimum average 10m fence set back except for priority streams where minimum is 20m fence set back. Fences constructed to standard. Incentive rate based on fence set back. Rates based on: Fence set back $2.50 @10m, $3.30 @ 20m or greater an Additional amount for habitat quality Medium value + $0.10/m, high value + $0.30/m Additional amount for connected sites +$0.20/m
Wimmera CMA	$6.00/m for standard fence	Minimum average 10m fence set back. Fences constructed to standard.
Mallee CMA	Determined on a site by site basis. Mostly will fully fund fence (materials and contractor)	Determined on a site by site basis. Mostly will fully fund fence (materials and contractor)

Revegetation

Table 9 sets out the arrangements used by CMAs for funding of revegetation. As with fencing there is significant variation in the level of funding / incentives provided for revegetation activities. This report has focussed on revegetation with tube stock, as opposed to direct seeding which is used for riparian works, however the cost sharing arrangements are more difficult to define.

Wimmera and North Central CMAs fully fund the cost of materials (tube stock and guards) and fund contractors for site preparation and planting. . North Central report a higher standard of site preparation, planting and plant survival using contractor labour and the avoidance of landholder/volunteer burnout and disappointment of failed revegetation leading to poorer future uptake of incentives. Mallee CMA also reported they mostly funded revegetation (when required) in this way.

East Gippsland and Goulburn Broken CMAs fully fund the cost of materials (tube stock and guards) and together with Glenelg Hopkins will also fund contractors for planting of larger sites under certain circumstances. These three CMAs reported that landholder capacity and ensuring a high standard of works particularly associated with large sites was a factor in setting a higher incentive rate and sometimes fully funding revegetation activities.

Melbourne Water fully funds the costs of materials (tube stock and guards). Melbourne Water reported that revegetation was an activity with predominately public benefits and that the incentive rate was set to reflect this.

West Gippsland requires a financial contribution from landholders for the cost of tube stock up to 1,000 plants per km waterway fenced. The CMA funds the cost of site preparation planting and tube stock requirements over 1,000 plants per km. West Gippsland reported that having the landholders make a financial contribution to the works was important in ensuring they had ownership of the works but that delivery through the direct works model ensured a high quality of work was completed within annual funding timeframes.

Glenelg Hopkins, Corangamite and North East require a contribution from landholders which is generally assumed to be in-kind through provision of labour for planting. A potential lower quality result from works was remarked upon by these CMAs when compared with a direct works approach,

with success rates of plantings sometimes less than desired. Glenelg Hopkins also reported that they had retained a small internal workforce to assist with planting of larger sites and weed control in the case where landholders do not have the capacity to do works or to deliver projects in urban areas.

Table 9. Incentive rates, funding levels and criteria for funding revegetation

Region	Incentive Rate / level of funding	Criteria / funding rules
North East CMA	$3.50 / stem capped $2500/ha	Locally indigenous species Planted according to NECMA standards
Goulburn Broken CMA	$1.50 / stem up to $6.00 / stem	Applicable where remnant vegetation is limited. Range of delivery models available depending on circumstances $1.50/stem where CMA reimburses Landholder for seedlings purchased and planted (Landholder does not use guards etc). $3/stem where CMA supplies seedlings & materials, Landholder prepares site & plants $3/stem CMA reimburses Landholder for seedlings, materials purchased and planted $5.50/stem where CMA supplies seedlings, materials & plants, Landholder prepares site $6.50/ stem where CMA does all
North Central CMA	NCCMA fully fund and coordinate site preparation, supply and planting of tubestock (1000 stems/hectare). Typical costs are $4.50/stem.	Where weeds are a low threat and a native seed source exists, natural regeneration of fenced sites is preferred. Enhancement of existing overstorey revegetation is most common to put back the native shrubs and grasses.
West Gippsland CMA	WGCMA fund and coordinate site preparation and planting and contribute to tubestock requirements over 2000 stems/km waterway. Costs vary $1.00 - $2.00 for plants and up to $2.00 for planting	Landholder pays for cost of plants at a rate of 1,000 stems per km waterway fenced.
East Gippsland CMA	100% cost of tube stock up to 500 stems/site.	Where revegetation is required at over 500 stems/site must form part of the objectives of a specific project. EGCMA most often coordinates site preparation and planting in these circumstances. Where a landholder is keen and has capacity they are provided tubestock and do the planting – this accounts for around 15% of sites.
Melbourne Water	100% cost of tube stock, guards and stakes.	
Corangamite CMA	50% of the combined cost of site preparation, plant and guard purchase, and planting including in-kind labour calculation.	
Glenelg Hopkins CMA	$1.00/ tube stock plus $ 0.50 milk carton and stakes or $1.00 for sureflute guards and stakes. Options for cells as well.	Priority given to planting sites with existing remnant vegetation in favour of cleared sites. GHCMA revegetation standards apply. Landholder must demonstrate evidence of plant order placement.
Wimmera CMA	WCMA fully fund and coordinate site preparation, supply and planting of tubestock.	
Mallee CMA	Determined on a site by site basis. Mostly will fully fund revegetation.	

Off stream watering

Table 10 sets out the arrangements used by CMAs for funding of off stream watering. CMAs commonly reported that they fund off stream watering through a grant based on a flat rate or % cost share. Nine CMAs fund the activity this way and one (West Gippsland) directly purchases materials for landholders, with requirements determined on a site by site basis. No CMAs reported fully funding off stream watering.

Table 10. Incentive rates, funding levels and criteria for funding off stream watering

Region	Level of funding for off stream watering	Rules and criteria
North East CMA	Funding provided as a grant based on 50% of actual material and labour costs up to $3,000 per site	Quotation of works required. Only infrastructure and labour directly related to offsetting the loss of watering points by implementing the project will be covered. Dams and cost associated with concentrating or consolidating access points to streams will not be eligible for funding.
Goulburn Broken CMA	Funding provided as a grant based on 75% of costs capped at $5,000/km	Funding only provided for materials not labour. Materials specified: pipe, troughs, fittings and tanks.
North Central CMA	Funding provided as a grant of up to $3,000 per unit.	Funding only provided for materials not labour (pipes, troughs and fittings only). Funding provided based on three quotes obtained by the landholder.
West Gippsland CMA	WGCMA purchase materials. Negotiated on a site by site basis.	Funding only provided for materials not labour (pipes, troughs and fittings only)
East Gippsland CMA	Funding provided as a grant based on maximum $4,000/site.	Funding provided for materials or contractor does but does not cover landholder labour
Melbourne Water	Funding provided as a grant based on 50% cost share.	Funding only eligible for paddocks affected by the fencing of the waterway. Pumps excluded as assumed to have private benefit and 50% funding provided for header tanks because of the potential for private benefit. For stream frontage grants activity only eligible if the project has precluded access to water (no retrofitting allowed). For rural land grants is similar but reticulation is also considered in context of whole property water infrastructure.
Corangamite CMA	Funding provided as a grant based on 75% of costs, capped at $4,500/km waterway.	Funding for materials not labour. Components specified - new pumps, pipe, troughs, tanks and fittings only
Glenelg Hopkins CMA	Funding provided as a grant based $2,000 / km for ISC waterways (assumed to be a 2/3 cost share) and $1,000/km for non ISC waterways (assumed to be half cost share). Additional funds on a pro rata basis for the first km if pump is to be purchased (must be solar or air well for extra funds to apply) - $2000.	Funding level and items funded based on agreed site plan materials not labour. Only eligible if the project has precluded access to water. Eligible components include includes; pump, tanks and troughs - size and number must be justified by stock numbers and paddock size; dams where deemed appropriate; tank footings, stands and site excavations; poly pipe, fittings. Renewable energy sources may also be considered for funding.
Wimmera CMA	Funding provided as a grant based on 50% of actual costs of materials	Funding for materials not labour. Materials specified: pumps, pipe, troughs, tanks and fittings only.
Mallee CMA	Funding provided as a grant negotiated on a site by site basis	Cost sharing usually involves a cash or in-kind contribution from the landholder

Of the nine offering a grant, three CMAs (Glenelg Hopkins, Corangamite and Goulburn Broken) offer this in the form of a rate per km with a capped amount (between $1,000 - $5,000/km), three CMAs (North Central, East Gippsland, North East) provide funding at a capped amount per site (between $3,000 and $4,000 per site), two (Mallee and Melbourne Water) provide funding as a grant negotiated on a site by site basis and Wimmera provides 50% of the cost of materials. West Gippsland purchase and provide materials (limited to troughs, pipes and fittings) to the landholder, with requirements negotiated on a site by site basis.

Seven CMAs (West Gippsland, North Central, Corangamite, Glenelg Hopkins, Goulburn Broken, Melbourne Water and Wimmera) restrict funding to materials only, with landholders required to make their contribution to the installation of the off stream watering system. East Gippsland will contribute to contractors but not for landholder labour for installation.

North Central reported concerns about appropriately costing this project component, especially where it was seen as a key impediment to participation. Materials are more expensive where the waterway has steeper, deeper banks and isolated from power infrastructure.

Melbourne Water noted that pumps were not eligible for funding because the pump is portable and is seen as having a private benefit and cost sharing restrictions apply for header tanks for similar reasons.

Weed control

There is more diversity in the approaches used by CMAs to fund initial weed control than other riparian works activities (see Table 11).

Six CMAs fund initial weed control through a grant (North East, East Gippsland, Corangamite, Wimmera, Glenelg Hopkins and Melbourne Water), two (North Central and West Gippsland) fully fund and coordinate weed control activities, and one CMA (Goulburn Broken) negotiates both the level of funding and delivery mechanism on a site by site basis, taking into account the priority of the works and the capacity of the landholder. One CMA (Mallee), report that weed control is typically not funded and forms part of the landholder responsibility.

Of those CMAs that typically fund weed control; two CMAs (Wimmera and Corangamite) report that they only fund weed control that forms part of site preparation for revegetation activities and North Central report that they full fund weed control because it is seen to be a specialised activity that can lead to greater cost in the long-term if not done effectively the first time.

Table 11. Incentive rates, funding levels and criteria for funding initial weed control

Region	Level of funding for weed control (excluding willow control)	Rules and criteria
North East CMA	Up to $1,000/site ($400 or $700) depending on infestation.	Level of funding based on site assessment and criteria. Paid according to the type of control method required to treat the infestation and how heavy the infestation is.
Goulburn Broken CMA	Negotiated on a site by site basis. Sometimes undertaken through direct works coordinated across multiple sites.	Restricted to high priority waterways, where funds permit and there is deemed a need to assist landholder i.e. initial control of infestation is too great for Landholder management, to attain access or appropriate site condition to undertake other works. It is generally a Landholder/licensee requirement to actively manage these types of weeds under the CaLP Act and/or as part of the RMA/CWF licence.
North Central CMA	NCCMA fully fund and coordinate contractor for weed control	Includes weed control in the year after initial works then becomes landholder responsibility
West Gippsland CMA	WGCMA fully funds and coordinate contractor for weed control	Funding and coordinating weed control/general maintenance for 2 years then becomes landholder responsibility.
East Gippsland CMA	Maximum $1,000 (based on size of site)	Funding can be provided for this activity as a one off payment to buy chemical can be used over a timeframe of the landholder's discretion.
Melbourne Water	Up to $550/day	Funding provided at this rate for a maximum of 3 days. Additional days based on 50:50 cost share.
Corangamite CMA	Funded where required as part of site preparation for revegetation	Funded where required as part of site preparation for revegetation otherwise is generally responsibility of landholder.
Glenelg Hopkins CMA	Funding for up to 50% of costs (materials or contractor).	In-kind not counted in cost share. Indicative costs guided by quotes from contractors.
Wimmera CMA	Funded where required as part of site preparation for revegetation.	Funded where required as part of site preparation for revegetation otherwise is generally responsibility of landholder.
Mallee CMA	Typically responsibility of landholder.	Landholder generally undertakes control of weeds as part of their contribution to the project.

Maintenance

Three CMAs (West Gippsland, North Central and Glenelg Hopkins) reported that they fund short term maintenance of weeds (1-2 years) through their riparian work programs. North Central and West Gippsland fund and coordinate maintenance of weeds in the initial and second year of the project, whilst for Glenelg Hopkins they would do this only if there are significant weed issues on the site. East Gippsland provide funding as a one off payment for chemical for weed control capped at $1,000 per project based on the size of the site, which can be used over a timeframe of the landholders discretion.

Corangamite and North East don't formally fund maintenance; however it is not clear if follow up weed control can be funded on a site that had previously received funds for riparian works. Corangamite will consider new projects on the same site in the case of revegetation failure.

Melbourne Water has provision for funding longer term management of sites funded through their grants/incentives programs through an annual audit and expression of interest (EOI) process. Through this process an independent auditor assesses the site and recommends further funding (for weed control or supplementary plating) to support the landholder to manage the site if required.

Six CMAs (Goulburn Broken, North Central, East Gippsland, North East, Glenelg Hopkins and Mallee) reported that at times they coordinated reach based weed control programs to maintain older work sites (more than 2 years old) where regrowth of weeds such as willow or blackberries were having a substantial impact on the success of works. An additional CMA (West Gippsland) reported that they will always aim to eradicate willows and any high threat weeds on all sites on an ongoing basis. For all these CMA the programs are scheduled based on follow up inspections of past works, which provided for a more systematic approach to funding maintenance.

Melbourne Water's capital works and maintenance programs have a similar approach for longer term maintenance of works.

Two CMAs (Corangamite and Wimmera) reported that they do not fund long term maintenance at all (for sites older than 2 years) through their primary delivery mechanism, although maintenance is funded through tender programs via annual payments.

Calculating landholder contributions

There is significant variation in how landholder contributions to cost sharing are considered by CMAs for funding of riparian works. Calculating landholder contributions can become complex and increase the transaction costs for CMAs due to the additional information requirements associated with including landholder costs in project administration processes. Landholder contributions are therefore not typically calculated for the individual activities that are funded through riparian programs by CMAs (see Table 12).

Three CMAs (Corangamite, Glenelg Hopkins and Goulburn Broken CMAs) reported that they did capture estimates of landholder contributions for fencing or revegetation activities. The four CMAs who fund off-stream watering based on actual costs (North East, Goulburn Broken, Corangamite and Wimmera) are also able to calculate the landholder contribution.

It appears therefore that CMAs use other approaches to understand the level of contribution likely to be made by landholders. These are summarised below:

- Landholder contribution is assumed to be the portion of costs formed by the total cost for an activity (i.e. fencing) less the funding offered through a grant or incentive rate.
- Landholder contribution is calculated based on the actual costs of an activity (commonly off-stream watering)
- Landholder contribution is assumed to be equal to the funding provided through an incentive or grant.

Table 12. Calculation of landholder contributions

Region	Calculation of landholder contribution
North East CMA	Landholder cash contribution to off stream watering is calculated. For other activities landholder contribution not calculated.
Goulburn Broken CMA	GBCMA have a range of estimates for in-kind i.e $2.50 per stem for planting. Landholder cash contribution to off stream watering is calculated.
North Central CMA	Landholder cash or in-kind contribution to off stream watering is calculated.
West Gippsland CMA	Landholder cash contribution for tubestock up to 2000/stems per km waterway.
East Gippsland CMA	Landholder contribution not calculated.
Melbourne Water	Landholder contribution not calculated.
Corangamite CMA	CCMA estimate $500/ha in-kind for years 1-5 and $250/ha years 6-10. CCMA use $30/hour for calculating in-kind labour.
Glenelg Hopkins CMA	GHCMA record estimates for in-kind contribution i.e. $3/m labour for fencing and $30/hour for other components of the project.
Wimmera CMA	Landholder cash contribution to off stream watering is calculated.
Mallee CMA	Landholder contribution is calculated on a site by site basis.

The limited calculation of landholder contributions combined with regional differences in actual costs of activities means that determining the % cost-share for the purposes of analysis and comparison has been challenging.

Estimating cost shares for riparian fencing and revegetation

The incentive rates described above have been used in an attempt to estimate cost shares for fencing and revegetation (see tables 13 and 14).

It should be noted that there are a number of areas for potential error in calculating the cost share, in particular the assumed costs[27] (which varies across the region), estimates of the landholder contribution and for revegetation the number of plants per hectare.
For fencing the assumed total costs range from $7.00m up to $12.00m reflecting topography and standard fence requirements associated with different land use.

For fencing the analysis indicates that estimated cost shares range from 25:75 up to 100:0 (CMA:landholder).

- The lowest cost-share for CMAs for fencing is 25:75 and 30:70 of the upfront costs for fence construction. Two CMAs have a cost share at around this this level (Glenelg Hopkins, and Goulburn Broken) and for all three it is the minimum rate offered as part of a variable rate for fencing.
- Three CMAs have a minimum cost-share at around 50:50 (Melbourne Water, East Gippsland and Corangamite) as a part of a variable rate.
- Two CMAs offer a flat rate (North East and Wimmera) at 75:25 and 85:15 respectively and three fund the cost of fencing materials and construction (North Central, West Gippsland and Mallee) reflecting a cost share of 100:0.

[27] Assumed total costs have drawn on those reported by CMAs, and in program guidelines where available or else have been drawn from recent work by Aither 2015.

- The cost share for the maximum rates offered by those CMAs with a variable rate ranged from 40:60 (Glenelg Hopkins) to around 90:10 (Melbourne Water and East Gippsland).

Cost sharing for revegetation was similarly diverse and there is less confidence in the estimates for revegetation due to the assumptions for the assumed costs. The analysis indicates that:

- The lowest cost-share for CMAs is 40:60 of the upfront costs for revegetation materials and planting. Two CMAs have a cost share at around this this level (Glenelg Hopkins, and Goulburn Broken) and for both it is the minimum cost share offered. Both CMAs reported that in some circumstances they would also fund materials and contractors for planting reflecting a cost share of 100:0.
- Four CMAs have a cost-share at around 50:50 (Melbourne Water, East Gippsland, West Gippsland and Corangamite). East Gippsland reported that they for many projects they would also fund materials and contractors for planting reflecting a cost share of 100:0.
- Three CMAs fully fund revegetation materials and planting (North Central, Wimmera and Mallee) at 75:25 and 85:15 respectively.
- Three CMAs fund the full cost of fencing materials and construction (North Central, West Gippsland and Mallee) reflecting a cost share of 100:0.
- North East have a cost share of around 60:40 however their incentive is capped at $2500/ha and so the cost share would reduce in certain circumstances.

Table 13. Estimated cost shares between CMAs and landholders for riparian fencing

	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
Assumed total cost for fencing materials and construction.	$10.50/m[A]	$10.00/m plains[B] $12.00/m hills[B]	$7.00/m plains[C] $10.00/m hills[C]	$10.50/m[A]	$10.50/m[A]	$12.00/m[B]	$10.50/m[A]	$10.50/m[A]	$7.00/m[A]	$7.00/m[A]
Incentive rate/ level of funding	$8.00/m (flat rate)	$3.00/m (minimum rate offered) plains $3.60/m (minimum rate offered) hills	$7.00/m or $10.00/ m (assumed total cost borne by CMA)	$10.50 (assumed total cost borne by CMA)	$6.00/m (minimum rate offered)	$6.00/m (minimum rate offered)	$4.00/m (minimum rate offered) revegetation sites	$2.50/m (minimum rate offered)	$6.00/m (flat rate offered)	$7.00/m (assumed total cost borne by CMA)
Proportion of total fence cost funded by CMA	0.76	0.30	1.00	1.00	0.57	0.50	0.38	0.24	0.86	1.00
Proportion of total fence cost funded by landholder	0.24	0.70	0.00	0.00	0.43	0.50	0.62	0.76	0.14	0.00
Incentive rate / level of funding		$7.50/m (maximum rate offered) plains $9.00/m (maximum rate offered) hills			$10.00/m (maximum rate offered)	$9.60/m (maximum rate offered)	$7.00/m (maximum rate offered) remnant sites	$4.00 (maximum rate offered)		
Proportion of total fence cost funded by CMA		0.75			0.95	0.80	0.67	0.38		
Proportion of total fence cost funded by CMA		0.25			0.05	0.20	0.33	0.62		
Fencing overall average cost share or cost share range CMA:landholder	**75:25**	**30:70 to 75:25**	**100:0**	**100:0**	**55:45 to 95:5**	**50:50 to 90:10**	**40:60 to 65:35**	**25:75 to 40:60**	**85:15**	**100:0**

[A] Estimated fence cost from Aither 2015, [B] Estimated cost from CMA program guidelines, [C] Estimated cost from reported CMA typical costs

Table 14. Estimated cost shares between CMAs and landholders for riparian revegetation

	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
Total assumed cost for revegetation materials and planting (tubestock)	$5.50 /stem	$4.50 / stem up to 6.50 / stem	$4.50/ stem	$3.00 / stem	$3.00/stem	$7.00 / stem	$5.50/stem.	$5.50/stem	$3.00/stem (excluding site preparation)	$3.00/stem (excluding site preparation)
Incentive rate / level of funding	$3.50 /stem (capped at $2500 per hectare)	$1.50 per stem	$4.50 per stem assumed cost for CMA to fund plants and contractors for planting	$1.50 per stem assumed cost for CMA to fund contractors for planting	$1.50 / stem up to 500 stems assumed cost of tubestock (CMA pays on actual cost)	$4.00 / stem assumed cost for tubestock, guards, stakes and jute mat.	CMA 50% of total costs	$2.00 per stem	CMA funds site preparation, plants and contractors for planting	CMA funds site preparation, plants and contractors for planting
Proportion of total revegetation cost funded by CMA	0.63	0.38	1	0.50	0.50	0.57	0.50	0.36	1	1
Proportion of total revegetation cost funded by landholder	0.38	0.63	0	0.50	0.50	0.43	0.50	0.64	0	0
Incentive rate / level of funding		CMA funds site preparation, plants and guards contractors for planting (Assume CMA funds $6.50 per stem – 100% of cost)			CMA funds site preparation, plants and guards contractors for planting. (Assume CMA funds 100% of cost)			CMA funds site preparation, plants and guards contractors for planting. (Assume CMA funds 100% of cost)		
Revegetation overall average cost share or cost share range CMA:landholder	**60:40 excluding site preparation but as funding is capped at $2500/ha could be lower.**	**40:60 to 100:0 including site preparation**	**100:0 including site preparation**	**50:50 excluding site preparation**	**50:50 excluding site preparation up to 100:00 in certain circumstances**	**55:45 excluding site preparation**	**50:50 including site preparation**	**40:60 up to 100:0 in certain circumstances**	**100:0 including site preparation**	**100:0 in most situations**

	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
Assumptions used for costing revegetation materials and planting (tubestock)	$5500/ha using $2.50 per stem for tubestock and guard and $3.00 each for planting and guarding. 1000 stems per hectare.	Where CMA reimburses Landholder for seedlings purchased and planted (Landholder does not use guards etc). CMA uses following costs estimates: CMA cost $1.50 / stem and Landholder cost $2.50 /stem. Where CMA coordinates preparation and planting and purchases materials assume $6.50 / stem	$4500/ha based on CMA estimates of $4.50 / stem and 1000 stems per hectare	$6000/ha not including site preparation. $1.50 per stem for tubestock (landholder contribution) and $1.50 per stem for planting (CMA contribution).	$1500/site. Assumed cost $1.50 per stem for tubestock and $1.50 per stem for planting. Assume 500 plants per site.	$7000/ha using costs below. $1.50 per tubestock $2.50 for guards stakes and jute mat (sureflute guards $0.92 hard wood stakes $0.35 ea x 2, jute mat squares $0.40, jute mat pins $0.10 x4). $3 each for planting and guarding. = $7.00 total cost. 1000 stems per hectare.	$5500/ha based on costs below. Total cost of tubestock and sureflute guard $2.50 /stem. $3.00 each for planting and guarding.Total $5.50 each stem. 1000 stems per hectare. CMA fund 50% costs including estimate of in kind labour.	Total cost of tubestock and sureflute guard $2.50 /stem. $3 each for planting and guarding. Total cost $5.50 each stem. Assume 1000 stems per hectare. CMA fund $2/stem for tubestock and guard and landholder plants	$1.50 per stem for tubestock and $1.50 per stem for planting	$1.50 per stem for tubestock and $1.50 per stem for planting

4. Factors influencing cost sharing

CMAs were asked to identify the range of factors influencing their cost sharing approach in the online survey and this was followed up through discussion in subsequent interviews.

A large range of factors were identified as influencing the cost sharing approaches used by CMAs. These included; (see Appendix F for detail).

- To encourage landholders to have long term ownership of the works (9 CMAs)
- To maximise participation in particular priority areas (9 CMAs)
- To ensure a consistent approach (across the region, across years, between sites) (9 CMAs)
- To ensure equity between landholders (9 CMAs)
- To reduce complexity in the program administration and delivery (8 CMAs)
- To ensure works are completed to an appropriate standard (7 CMAs)
- To recognise the public benefits of the works (7 CMAs)
- To recognise the costs to landholders to participate in the works (7 CMAs)
- To meet a target (5 CMAs)
- To maximise the outputs achieved from a given budget (5 CMAs)
- Other (3 CMAs)

Four factors were reported by the majority of CMAs (nine out of ten) as influencing their cost sharing approaches, these were:

- Ensuring a consistent approach (across the region, across years, between sites)
- Ensuring equity between landholders.
- Encouraging landholders to have long term ownership of the works
- Maximising participation in particular priority areas

These factors along with other potential factors associated with land tenure, and fire and flooding are discussed below.

4.1 Equity and consistency within regions

A common theme reported by CMAs was the importance of a consistent and equitable approach across their programs, whilst also requiring the need for flexibility to respond to special situations.

There is a fundamental tension between 'equity' (if the definition of equity is that everyone is entitled to a similar amount or rate) and 'value for money'. Value for money means being clear about the public net benefits[28] and public net costs (total costs minus landholder costs) – to get value for money means that not everyone will get the same amount.

Because CMAs and Melbourne Water are at the 'front line' of riparian management they will be more exposed to landholder and organisational equity based arguments. If government desires

[28] '*Public net benefits*' *means benefits* minus costs accruing to everyone other than the private land manager. (Pannell 2008)

value for money from its investment in riparian programs then it will need to provide clearer guidance as to how it wants public benefits and public net costs assessed so that projects can be funded on a value for money basis.

Considerations of equity are confounded by meaning and interpretation. Sometimes equity is related to ideas about sharing, for example different projects are funded according to factors such as area or length of fencing, whereas sometimes equity relates to ideas about fairness, which may relate to matters such as transparency or ability to pay. Where equity was raised as an important factor in developing cost-sharing arrangements for riparian projects it was usually related to the use of standard rates for activities, such as fencing and revegetation, rather than fairness. For example it could be argued that an equitable approach might be to pay a larger percentage cost-share for a project that delivers a high level of public benefit per unit of cost, as long as the rules for determining variable cost shares were evident to all participants. The support for the use of consistent approaches was often justified on the basis of equity. Many regions felt that it was important for the standard rules to be applied across all projects for a sufficient length of time so that participants knew what to expect. This was seen as very important in maintaining organisational credibility and trust with landholders and the wider community. There is a strong argument for maintaining consistent and transparent approaches over time.

4.2 Landholder stewardship and quality of works

Concerns about the landholder commitment and ability to maintain outcomes through the long term management of sites were common themes reported by CMAs.

Two CMAs (East Gippsland and North East) have shifted away from direct works/contractors to grants/incentives in recent years. There are several drivers for this including a desire to increase long term landholder stewardship of the site. In this case by having the landholder make a substantial contribution to the upfront costs it is believed they will more likely have a stake in the long term management of the site.

Four CMAs (Goulburn Broken, North East, West Gippsland and East Gippsland) reported issues related to ensuring long term stewardship of works and enforcing the conditions outlined in riparian agreements. The issues were varied across the CMAs and included a reported perception that the CMA had limited ability to do anything substantial about breaches of conditions and that the need to enforce conditions was confounded by the need to secure participation and maintain good long term relationships with landholders. A lack of compliance action by DELWP for breaches of Crown frontage licence conditions was also a factor complicating the CMAs situation in regards to enforcing compliance. However, DELWP noted that compliance by landholders with their riparian agreements with CMAs was very different to landholder compliance with their Crown frontage licence conditions.

North Central CMA reports that their approach ensures the landholder's sense of stewardship through involvement of the landholder in the initial stages of establishing the site and, negotiating the delivery of works, and discussing the ongoing maintenance responsibilities as detailed in the Landholder agreement. They also felt that building of relationships and trust is key to the ongoing management commitment of the landholder, and hence the long-term survival of the works, despite most of the initial works being funded by the CMA.

Four CMAs (East Gippsland, Goulburn Broken, North East and Glenelg Hopkins) indicated that they were increasing effort or wanted to increase effort in the area of follow up site visits with landholders as a mechanism to assist with monitoring of outcomes and compliance with agreements. A further issue exists, relating to change in ownership of sites, especially in areas undergoing significant socio-demographic change. There was some concern expressed that project investment may be compromised by land ownership turnover or landholders not adhering to the conditions of their riparian management agreements.

There is little in the way of empirical research about the extent to which different levels of cost-sharing promote long-term maintenance of projects or any comparative studies examining the long-term outcomes from programs that cover the full cost of direct works versus those where landholders are making significant financial contributions (Allan Curtis, pers.comm.). This is a complex area and warrants further investigation as current assumptions on the merits of these two very different approaches is largely based on local experience, over short timeframes.

4.3 Ability to secure landholder participation in priority areas.

Nine CMAs reported that the ability to secure landholder participation in riparian programs was one of a number of important factors influencing their cost sharing approach. Wimmera CMA was the only region not to identify this as an important factor instead nominating value for money and efficient and effective delivery.

Four CMAs reported concerns about their ability to secure landholder participation into the future (Goulburn Broken, West Gippsland, North Central and Mallee). This was linked to there being a limited number of willing participants with sufficient capacity and for two regions (Goulburn Broken and West Gippsland) this was also a result of working for a long time in the some priority reaches. Responses to this problem has included offering an increase in the rates offered for incentives, or alternatively taking direct control of some aspects of the project (e.g. contracting revegetation and weed control works).

North Central and West Gippsland both use a direct works /contractor model and both work in a sub-set of priority reaches in a given year (linked to targets in funding agreements), with landholders making a financial contribution to one or more components of the project (i.e. paying for tube stock or contributing to fence cost) but the work being carried out by contractors.

Under this model the level of funding paid by the CMA towards upfront works is almost certainly higher than in a grants/incentives approach. The regions using this approach reported that the quality of the upfront work is higher than when they used an incentive approach, that the approach helps to secure participation in priority reaches and ensures the region delivers work within timeframes.

The issue of declining landholder participation over time is likely to become more acute in coming years, especially if funded projects are focused on a limited number of priority waterways. At some point it may well be necessary to enable more flexible approaches, such as variable rates tied to increasing public benefits, or tender based approaches in an effort to meet program goals.

The adoption of different approaches (e.g. direct works versus incentives) in different regions appears to be an adaptive response to the factors that relate largely to the success of past experience, changing contextual factors (e.g. decreasing participation) and a desire for continuous improvement – a good example of active adaptive management. While it is easy to understand the rationale for different approaches in each region it is not possible to determine the cost-effectiveness of each strategy without a clearer understanding of the public environmental benefits associated with various projects.

4.4 Land Tenure

All regions noted that there was no difference in the level of funding or cost sharing for riparian projects on land with a Crown water frontage licence compared with riparian areas on freehold land.

A number of regions commented that there had been improvements in the communications between DELWP and CMAs in regards to identifying the status of Crown frontage licenses and identification of licence holders. Another improvement was the process to ensure licensing arrangements were in place prior to the region agreeing to fund riparian works and for DELWP to amend licences based on the riparian management agreement. Some CMAs noted that there was an increased administrative burden for them as a result.

One outcome from this process for landholders is a reduced licence cost resulting from the transfer of licence type from grazing to riparian management. A number of regions reflected that they weren't observing this outcome as being an incentive for landholders to participate in riparian programs.

4.5 Flood and fire recovery programs

Eight CMAs reported they had different levels of funding/cost sharing arrangements in place for emergency recovery situations compared with their normal programs. With the exception of Melbourne Water and North Central CMA, all regions reported that they fully funded fence replacement resulting from flood and fire damage, some regions also reported funding revegetation activities (although some sources of funding may have specific requirements around cost sharing). Melbourne Water reported that they fund replacement works according to the standard conditions of their grants programs and North Central reported varying rates depending on whether the fence required repair ($3/m), replacement with the same materials ($5/m) or a new fence ($ 7/m), noting that when the floods went through in 2011/12 many landholders had already fixed fences by the time the CMA got around to visiting.

Four CMAs (West Gippsland, East Gippsland, Goulburn Broken and Melbourne Water) noted that they were now taking a more targeted and considered approach to funding of recovery works including undertaking site assessments, prioritisation and establishing or amending management agreements before proceeding with works. It was noted that in the past there had a been a tendency to get in and get the works done which may have led to poorer long term outcomes as a

result of fences not being well placed, agreements not being established or landholders not accepting responsibility for the long term maintenance of the fence. The need for sensitivity, flexibility and prudent judgement was noted as being important particularly when dealing with bushfire recovery because of the stress being faced by landholders as a result of losing stock, homes and other assets.

Goulburn Broken CMA reported that the provision of fully funded fences through other initiatives such as drought employment programs whilst achieving significant outcomes in terms of the length of waterways fenced has created an increased expectation by some landholders for the CMA to fully fund fencing for all new riparian projects regardless of the source of funds.

5. Role of cost sharing in securing long term outcomes

Maintaining the benefits of riparian investment is critical. Monitoring and compliance issues will become increasingly important to address to ensure that landholders adhere to the conditions of cost-sharing arrangements and that the benefits from government funding in the upfront works on riparian land are maintained.

5.1 Strength of landholder agreements

CMAs in Victoria use a legally binding contract to define the conditions of cost sharing and the long term roles and responsibilities for the management of riparian land. Having such agreements is extremely important in terms of accountability for public spending. It also provides an important basis on which to base assessment of compliance with funding conditions.

Regardless of the delivery approach all regions underpin their riparian works with a legally binding landholder agreement. For the nine CMAs these agreements have their basis in a standard agreement developed several years ago in collaboration with DELWP, whilst Melbourne Water has developed its own agreement. A detailed review of the landholder agreements was not part of this investigation but it is understood that the agreements have common elements including:

- Landholder details and address.
- Site details including a map showing land tenure
- A description of the works being funded and the cost-sharing arrangements (if applicable).
- The roles and responsibility of the CMA in relation to the upfront works, ownership of any assets i.e. fences and watering infrastructure, and ongoing maintenance, and
- The requirement for a signature of both the landholder and a representative of the CMA.

The agreements also provide for DELWP to amend licensing arrangements from grazing to riparian management (or in the case of occupied unlicensed Crown water frontages, a riparian management licence is established) with the landholder agreement to form part of the ongoing conditions of the riparian management licence.

5.2 Site inspections, monitoring and compliance

The strength of landholder agreements for riparian works and licensing arrangements for Crown land provide a sound basis for maintaining the benefits of riparian investment. For the benefits of riparian investment to be maintained, ensuring long term compliance with landholder agreements will also become increasingly important.

Compliance is an unpopular area even though governments and CMAs agree it is important. There can be either insufficient resources or insufficient political will for assessing and enforcing compliance. However in situations where there is very limited monitoring and compliance following completion of works then there is no guarantee that the benefits of all the previous will be maintained.

The most robust model for monitoring and compliance would include, monitoring and compliance assessment (associated with payment), when works have been completed and regular inspection and engagement with landholders to ensure ongoing compliance with conditions of agreements. This approach is high cost in terms of time but good relationships with landholders are maintained.

Six CMAs (Melbourne Water, North Central, Glenelg Hopkins, Goulburn Broken, Wimmera and East Gippsland) have reported formal longer term site monitoring and landholder engagement programs. Three CMAs reported on their efforts to enforce non-compliance although overall the degree to which non-compliance is enforced is not clear.

Another approach would be to undertake a formal approach to compliance assessments. Internationally this has been proven to work (Shimshack & Ward 2005, Perez 2014), but this is often associated with heavy penalties for non-compliance. This kind of approach would require political and organisational will and adequate resourcing, and it would represent a significant departure from current cooperative arrangements between CMAs and landholders.

6. Alignment with frameworks for cost sharing

6.1 Alignment with conceptual approaches

Section 1.3 outlined four different conceptual approaches that could be used to underpin cost-sharing programs. To recap these are:

A. Costs shared according to an agreed percentage, such as 50: 50;
B. Costs shared according to the ratio of private benefits: public benefits;
C. Costs shared so as to minimise the public cost of achieving any particular outcome;
D. Costs shared so as to maximise the public benefits from the program.

There is a trade-off between effectiveness and costs amongst these approaches. Overall approach C and D are likely to result in better environmental outcomes than A or B. Approach A is simple to understand, politically acceptable to both landholders and governments and can have relatively low program administration costs. However, its achievement of public benefits may often fall well short of potential. Approach D has the highest effectiveness in achieving environmental outcomes, but also the highest transaction costs and requirement of economic expertise.

The current approaches used by most waterway managers is most closely aligned with approach A, where an agreed percentage of the total direct upfront costs are paid, although this is commonly expressed as an incentive rate or funding rule rather than a percentage. The actual public contribution to costs is highly variable between different waterway managers and between different types of activity (e.g. see Table 5), and seems somewhat ad hoc in many cases. If adjustments to public cost shares where determined in a sophisticated way, the performance of investments in terms of value for money could approximate approach C, although existing approaches are likely to fall somewhat short of that.

The way that costs and benefits have been considered in current approaches are discussed in more detail below:

Costs considered in current approaches

All CMAs determine cost shares on the basis of direct upfront costs and don't explicitly consider ongoing maintenance costs in determining cost shares.

Opportunity costs are not formally considered in determining cost shares. However, one CMA (West Gippsland) acknowledges the 'freeing up of land to be fenced' as a potential landholder contribution for the upfront costs and the five CMAs using a variable rate for fence set back (Goulburn Broken, East Gippsland, Melbourne Water, Corangamite and Glenelg Hopkins) could be interpreted to be considering opportunity cost as well as public benefit.

Consideration of private benefits

No CMAs conduct an assessment of net private benefits in determining cost shares.

Five CMAs (Goulburn Broken, East Gippsland, Melbourne Water, Corangamite and Glenelg Hopkins) have adopted approaches that aim to recognise a higher degree of beneficial actions by landholders and two CMAs (North East and Wimmera) use an assessment to identify projects with higher public

benefits. These enhancements correspond to the three improvement principles (1, 2 and 3) outlined below.

In reality there are likely to be significant differences in both opportunity and ongoing costs between landholders – this means that under current arrangements some landholders will be being paid more than is necessary to secure participation.

Consideration of public benefits

The methods for assessing net public benefits are generally based on current values (e.g. site condition, presence of significant flora and fauna etc.) rather than the potential difference in public benefit with and without the project.

As previously described in Sections 2 and 3, in practice the cost sharing approaches used by CMAs are complex and variable and difficult to map easily against the four conceptual approaches outlined above. The cost sharing approaches used by CMAs have evolved over time in response to factors such as local context and participation rates.

Although a uniform cost share has significant limitations, its overall performance at providing environmental benefits can be enhanced by incorporating a consideration of three economic principles outlined below. These include:

1. Attempting to identify the lowest uniform cost share that will prompt sufficient participation to achieve the program's goals;
2. Allowing for appropriately increased cost shares for more beneficial actions; and
3. Prioritising agreements with landholders that will provide the largest environmental benefits.

Table 15 maps the current approaches used by regions in terms of the three economic principles identified as potential areas for improvement.

Table 15. Alignment of current CMA approaches with economic principles for improving cost sharing arrangements.

Region	1 – lowest cost share identified	2 – increase cost share for more beneficial actions	3 – formally ranking or assessing suitability of projects to select those with greater environmental benefits*(see also section 3.1)	Comment
North East CMA	✗	✗	✓	Standard rates for fencing across all landholders. Project ranking considers environmental benefits.
Goulburn Broken CMA	✗	✓	✓	Fencing incentive can vary from 30 – 75% of assumed total direct cost based on fence set back and site values. Project suitability assessment considers environmental benefits
North Central	✗	✗	✗	Standard rates for fencing across all landholders based on site conditions.

CMA				Sites with greater benefit are funded first.
East Gippsland CMA	✗	✓	✓	Payments vary based on fence set-back and size of site. Project suitability assessment considers environmental benefits
West Gippsland CMA	✗	✗	✗	Standard rates for fencing across all landholders.
Melbourne Water	✗	✓	✓	Payments vary based on fence set-back. Project suitability assessment considers environmental benefits
Corangamite CMA	✗	✓	✓	Payments vary based on fence set-back from 50 – 75% of assumed total direct cost. Project ranking considers environmental benefits.
Glenelg Hopkins CMA	✗*	✓	✓	Payments vary based on fence set-back and site values. Results of MBIs has informed minimum cost share %. *Glenelg Hopkins has the lowest fencing rate across all CMAs. Project ranking considers environmental benefits.
Wimmera CMA	✗	✗	✓	Standard rates across landholders. Project ranking considers environmental benefits.
Mallee CMA	✗	✓	✗	Payments are negotiated on a site by site basis.

* Principle 3 - Prioritising projects with greater environmental benefits has been interpreted as the use of a transparent quantitative method to rank potential projects.

Transparency and complexity of current approaches

The investigation has revealed that for fencing seven CMAs (North East, Goulburn Broken, East Gippsland, Melbourne Water, Corangamite, Glenelg Hopkins and Wimmera) express the level of cost share through an incentive rate for fencing. This is typically defined based on an estimated direct up-front cost for materials and labour.

However it is difficult to deduce the actual cost share particularly for fencing because of the way the incentive rates are developed and expressed, with some assumptions not clearly defined.

An example of the issues of complexity and transparency associated with analysing cost sharing rates is provided for illustration.

Glenelg Hopkins has the lowest minimum incentive level for fencing (~$2.50/m). This fencing rate is reported in the program guidelines to cover on average 80% of the cost of the materials, with the

landholder responsible for the construction. If the labour costs were assumed to be equal to the material cost this would make the assumed total cost of the fence to be approximately $6/m and the CMA's cost share to be about 40%.

In contrast North Central and West Gippsland CMAs through their direct works model fully fund fence material and construction at an estimate cost of $7/m and $10/m up to $8/m and $12/m respectively. In West Gippsland some other costs are shared, with landholders contributing to the cost of plants and to off-stream watering and in North Central landholders contribute to the cost of off-stream watering.

Clearly there are differences in material and construction costs both within and between regions but the wide variation in these direct costs suggests that in most cases the lowest cost share (Principle 1), is below what is currently being offered to landholders.

Five CMAs offer variable rates for the provision of more beneficial actions (Principle 2), typically for increasing the width of fence setbacks. These rates tend to be based on categorical assessments, for example in Corangamite, $4/m for a 10 metre setback and $6/m for a 20 metre setback.[29]

An assessment of environmental (public) benefits (Principle 3) is a feature of cost sharing approaches in most regions. In some cases this is used to rank projects for funding, while in other cases it is used as a factor influencing the cost share percentage, with some factors (e.g. fence set back) linked to a predicted environmental improvement and others (e.g. site condition) related to current values rather than a predicted level of improvement that the project will generate. In Table 13 we have interpreted this principle in a narrow sense of project ranking, as opposed to more quantitative assessment of environmental benefits.

6.2 Applicability of Victorian Waterway Management Strategy principles

The Victorian Waterway Management Strategy sets out a series of principles to be considered in relation to government contribution for waterway management activities. These are:

- Priority for riparian management activities
- The level of public benefit of the work
- The level of security of the agreement

The first of these presumably also reflects the public benefits associated with particular reaches, and would be correlated with the public benefits of investment. The third dot point also is one of the determinants of the benefits of investment.

An analysis of how the approaches used by each CMA align with the VWMS principles has been provided in Table 16.

[29] The Victorian Waterway Management Strategy policy principles state that 'riparian land fenced for riparian management purposes will aim to be at least 20 m wide on average from the top of the bank and must not be narrower than 10 m in any one place' (DEPI 2013).

Table 16 Alignment of current CMA approaches with VWMS cost sharing principles

Region	Victorian Waterway Management Strategy principles		
	Level of public benefit of the work[30]	**Its priority for management action**	**The level of security of the agreement**
North East CMA	Assessed through spreadsheet tool and used to rank projects.	Priority of waterway considered in ranking of project.	All funding subject to standard management agreement.
Goulburn Broken CMA	Assessed through spreadsheet tool and used to inform incentive rate.	Priority of waterway considered in ranking of project.	All funding subject to standard management agreement. Fencing fully funded if site is covenanted.
North Central CMA	Sites within priority reach informally assessed based on guiding principles. Projects are not formally scored.	Site must be in a priority waterway to be funded.	All funding subject to standard management agreement.
West Gippsland CMA	Not formally assessed on a site by site basis. If site is in priority reach assumed to have public benefit.	Site must be in a priority waterway to be funded.	All funding subject to standard management agreement.
East Gippsland CMA	Assessed through spreadsheet tool and used to rank projects.	Priority of waterway considered in ranking of project.	All funding subject to standard management agreement.
Melbourne Water	Assessed through spreadsheet tool and used to rank projects.	50% of funding directed to priority waterways.	All funding subject to standard management agreement.
Corangamite CMA	Assessed through spreadsheet tool and used to rank projects.	Priority of waterway considered in ranking of project.	All funding subject to standard management agreement.
Glenelg Hopkins CMA	Assessed through spreadsheet tool and used to rank projects.	Priority of waterway considered in ranking of project.	All funding subject to standard management agreement. Higher rates for stewardship payments on covenanted sites.
Wimmera CMA	Assessed through spreadsheet tool and used to rank projects.	Priority of waterway considered in ranking of project.	All funding subject to standard management agreement.
Mallee CMA	Not formally assessed on a site by site basis. If site is in priority reach assumed to have public benefit.	Not formally assessed but site must be in a priority waterway to be funded.	All funding subject to standard management agreement.

Priority for riparian management activities:

All CMAs are targeting at the majority of their riparian works activities towards priority waterways/reaches. Seven CMAs restrict eligible projects to those areas identified as priorities in their Regional Waterway Strategy. Two regions (North East and Glenelg Hopkins CMA and Melbourne Water) do not restrict eligibility for their grants programs to priority areas. Of these three regions North East and Glenelg Hopkins give a higher weighting in its ranking of projects for sites in priority reaches and Melbourne Water split their grants funding 50:50 between priority reaches and non-priority reaches[31]. However it is the opinion of the project team that the principle

[30] Note that we have not assessed the assessment tools in terms of how they assess potential public benefits, but it would be a useful thing for DELWP to do.

[31] Funding for Melbourne Water's riparian programs comes from a waterways and drainage charge collected from all Melbourne Water rate payers. Therefore there are different drivers for allocating funds across priority and non-priority waterways.

from the VWMS regarding the priority for management action is not very clear. This principle could be interpreted as either:

- the site location (in a priority waterway or not) should be considered in determining the cost share (the way CMAs are currently interpreting the principle), or
- the priority of the individual management activity (i.e. fencing versus off-stream water versus revegetation) should be considered in determining the cost share.

If the priority of the management action is to be considered in the cost sharing this would point to a requirement for different levels of cost sharing for different project components.

Level of public benefit of the work:

All riparian projects funded by CMAs are delivering public benefits, however there is likely to be a high degree of variation in the level of benefits across projects.

Seven CMAs (see Table 14) reported that assessment of public benefits is a factor in determining their cost sharing arrangements. The investigation has revealed that there is room for improvement in ranking and selection of projects for funding with different approaches being utilised by different CMAs and three CMAs not undertaking formalised assessment of environmental or public benefits to select projects for riparian programs. This area will be the subject of recommendations in the final report for the project.

The strongest evidence of funding being determined by level of public benefit is where regions are funding fencing through a variable rate. An important issue which is not clear from the VMWS is whether the public benefit requirement is 'gross' or 'net public benefits'.

The soundest test for funding 'value for money' riparian projects should be on net public benefits and costs. The formula to assess this is 'Public benefits – public costs apart from landholder payment)/landholder payment'. Most regions are not formally assessing the 'value for money' in the allocation of funds to specific projects. There are a number of factors, some related to benefits (e.g. environmental threats, adoption, values, risk) and others related to cost that are crucial to include if assessments are aimed at determining value for money in a theoretically sound way. If the aim is to maximise the value of environmental outcomes achieved then value for money is the ultimate criterion into which all the other factors feed. It's not just one of the criteria; it's the overarching criterion that pulls everything else together to maximise environmental outcomes. The analysis indicates there is room for improvement in both initial prioritisation processes and project selection based on value for money.

Level of security of agreement

The level of security of agreement is not generally a factor in the level of funding paid and all funding and cost sharing with landholders is subject to a legally binding signed riparian management agreement. The level of funding and cost sharing arrangements for projects on Crown land versus private frontage is the same, according to the rates determined by each region.

Two CMAs (Glenelg Hopkins and Goulburn Broken) did report that they offered different rates for sites that were covenanted. For Glenelg Hopkins this formed part of their stewardship payments for wetlands and a higher rate was offered for sites ($650 p/ha versus $150/ha), whilst Goulburn Broken will fully fund fences on sites that are covenanted. Covenanting is the most secure form of private land tenure and it is difficult to achieve – increasing the financial incentives to secure covenants and make them a more attractive option would seem sound.

While the security of agreement overall is not an issue (all agreements are legally binding and signed by landholders), ensuring that conditions of agreements are met is very important and there is room for improvement in this area. A change in ownership results in the voiding of standard landholder agreements and while this was reported as an issue by CMAs experiencing some turnover of land involving funded projects it is not a major concern at this stage.

7. Considerations for future cost sharing approaches

This section identifies a range of considerations for the refinement of cost sharing approaches used by CMAs in Victoria.

7.1 Ranking and assessing projects

The majority of CMAs use assessment tools or matrices to evaluate projects. The tools are used in a number of ways including, assessing eligibility, ranking of project proposals in order to determine priorities for funding, or to determine the level of incentive for fencing where variable rates are used. Most CMAs have criteria for setting incentives rates and funding levels that are set out in program guidelines or manuals.

For the regions using a tool to assess projects, there are some similarities and many differences in the considerations and construct of the prioritisation/scoring tools. The tools examined as part of this investigation commonly focus on assessing benefits through inclusion of parameters related to site values or condition. A number also included assessment of parameters related to landholder capacity or risk. None explicitly combined an assessment of benefits and costs in a way that would support this in a theoretically robust way.

An examination of the assessment tools and metrics used to the rank and inform decision making about projects was undertaken and reported in Section 3.1.

This section provides some preliminary suggestions for improving the consistency and use of tools by CMAs for riparian cost sharing (See Pannell, 2015 for a detailed explanation).

Ideally ranking and selection should be done as a two stage process, with the first step confirming project eligibility and the second step assessing value for money of eligible projects. It is preferable not to mix questions related to eligibility with those related to assessment of benefits and value for money.

Attention to the way metrics are designed and used is critical. Common problems with many environmental ranking tools include:

Weighting and adding of key variables inappropriately.

In some cases it may be appropriate to add values for different types of benefits, but other factors such as those related to risk should be captured as proportions and combined in a suitably designed metric (see Pannell, 2015 p 34).

Omitting key variables

Some assessment metrics consider a large number of factors related to environmental benefits, such as contribution to connectivity, vegetation condition, but do not consider important factors such as technical feasibility. If for example the risk of technical failure is ignored, and projects vary widely in their likelihood of failure, it won't be possible to discriminate between 'good' and 'bad' projects.

Including "value for money" as a criterion separate from the variables that determine value for money.

Some systems ask questions about relevant variables (like environmental values and threats, risk and costs) but then have a separate question about value for money, rather than calculating value for money based on the other information that has already been collected.

Scoring variables that would be better assessed as pre-assessment criteria.

In some cases projects are scored on the extent to which they meet RWS priorities with a low value given even when they do not contribute at all. Such projects should be screened out prior to the assessment process (as outlined above in relation to eligibility).

Not thinking clearly about the 'with' and 'without' situation

The benefits of a project should be measured as the difference in outcomes between the case where the project is implemented and the case where it isn't. The assessment tools all rely on users understanding this and responding appropriately. It could be made clearer to improve the quality of responses.

Insufficient consideration of costs

There are several different types of costs related to environmental projects that may need to be considered when ranking projects. They are: the cost of the project itself (cash costs to the funder, in-kind costs to the lead organisation and private costs to participants), ongoing costs to maintain the benefits generated by the project, and the opportunity cost of the funds invested in the projects. Almost all systems largely ignore maintenance costs and all ignore opportunity costs.

There would appear to be value in examining the design and application of a standard assessment approach across all CMAs to initially rank projects and then to assess what is the least that can be paid (value for money) to get participation. This process would include a theoretically robust metric for assessing benefits and costs, together with a set of pre and post assessment criteria.

The suggestions provided above draw on Pannell (2015) which provides a detailed examination of key principles for ranking environmental projects.

7.2 Ways to reduce costs to government

CMAs were asked if the level of funding their organisation contributed in cost-sharing arrangements might be too high and if there were ways to reduce the costs to government for riparian programs.

The responses were unsurprisingly varied with CMAs commonly reporting a fair degree of satisfaction in their approaches to cost-sharing, whilst acknowledging that some situations may lead to them paying a higher amount than was considered reasonable.

There are two main scenarios which give context to discussions around reducing costs to government:

- Areas where demand for participation is high
- Areas where the limits of participation have been reached

In the situations where more landholders are willing to participate than current funds allow there may be ways to reduce the costs to government. Focus on clear assessment of public benefits (and the metrics to assess this), public costs and landholder payment components and the following the formula [public benefits – public costs apart from landholder payment)/landholder payment] may well provide opportunities for reducing costs to government. Sound metrics to assess public benefits[32] , attention to paying the minimum amount possible to still get participation and clear selection of projects based on the above formula may well provide opportunities to reduce costs.

In contrast, where the limits of voluntary adoption have been reached (for example where waterway managers have been working on a subset of priority reaches for many years and managers are finding it difficult to maintain their participation in new actions) then costs to government may have to increase if new sites are to be added and benefits of existing sites are to be maintained.

Such situations might include where a target from a strategy or project is being aimed for but there has already been a high level of participation meaning there are low levels of additional landholder willingness to participate or where there are other socio-economic factors which are barriers to participation such demographics, landholder capacity or financial stress. There was also a reflection that in some areas whilst costs weren't perceived to be too high, the quality of the site / environmental outcomes being achieved through riparian programs had reduced. In such cases even though costs weren't perceived as being high, the overall value for money could in fact be low. This highlights that both benefits and costs need to be considered when selecting investments.

Glenelg Hopkins and North East also raised concerns around stewardship payments associated with tenders in terms of the level of annual payment being quite high in some cases similar to the land value, with the long term implications for achieving outcomes unclear. This highlights the potential importance of going beyond ranking of projects and also considering the point at which projects are not worth funding (as in Approach D).

Two main trade-offs were identified from the idea of reducing costs to government (i.e. through changes to cost sharing arrangements or levels of funding). These were (a) that the quality of works might reduce as a result of offering lower payments, with an impact on the security of the outcome, and (b) that participation by landholders particularly in priority areas would be affected. These two factors were a consistently raised throughout interviews with regions, both as factors contributing to choices in of delivery mechanism and in the rates established for incentives/level of funding. However, our suggestion that CMAs should attempt to identify the lowest level of funding / cost

[32] The large variation in spreadsheet tools used to rank projects suggests that there are likely to be improvements made in the assessment of public benefits for riparian projects.

share that will prompt sufficient participation does not conflict with this. If participation is too low, then the managers have misjudged what the lowest funding level / cost share is. In relation to quality of the works, this should be clearly defined when the works are contracted. There will be a trade-off between quality of works and cost, requiring managers to make a judgement.

Suggestions to reduce costs to government included;

- Broadening eligibility for participation to all waterways in a region, not just priority reaches, therefore using willingness and interest to drive participation (this approach would almost certainly reduce costs but it is likely to also reduce the potential for achieving outcomes as insufficient riparian management in many reaches to result in measurable environmental outcomes would be the result).
- Having flexibility to choose between approaches, using direct works where a target needs to be met and there have already been high levels of participation, or using grants/incentives in areas where there hasn't been a history of past works.
- Combined approaches of direct works and incentives within the one delivery model whereby some elements of the project are managed by the region and some are undertaken by the landholder.
- Involving landholders in monitoring through provision of photos and project reports as a mechanism to reduce auditing / site inspection costs.
- Bulk buying materials

A perception of grants/incentives programs being lower cost (at least in the upfront works) was identified by some CMAs as a possible benefit of this approach over a direct works model. However the actual differences in the cost to deliver programs and effectiveness of each model is not clear. In reality there are likely to be different levels of costs for administration processes, quality control, and engagement with landholders under each model.

7.3 Other Considerations for future cost sharing approaches

During the development of this report a number of questions have been posed to elaborate on the findings from consultation. Responses to these questions are provided below:

Are some approaches more applicable with different types of farmers, different landscapes, etc.?

The approaches used by each region have evolved over time to suit the regional context and experiences with past approaches.

There is significant heterogeneity across regions and within regions, related to characteristics including landscape and biophysical attributes, climate, farm and enterprise type, and the socio-cultural profiles of landholders.

Landscape and landholder heterogeneity is an inescapable reality, while these factors will affect the relative level of public and private benefits associated with projects, it is the opinion of the project team that it is more important to focus on the three principles outlined earlier[33]. Predicting the types of approaches that may be more applicable to particular groups of landholders in particular landscapes would require more targeted social research in order to answer the question with confidence.

CMAs typically only focus on priority reaches to fund works. Should there be mechanisms to determine priorities for funding *within* these reaches? Should a condition assessment score be used to determine the priority of one site compared to another? Are such mechanisms already in place and used by any CMAs?

The majority of CMAs are using a targeted approach to the delivery of riparian projects, focusing on particular waterways or catchments as determined in their Regional Waterway Strategies

In a number of cases assessment tools are used to assess sites or projects within these priority areas, using criteria such as site condition to rank projects or to determine where variable rates are used.

Where CMAs are not undertaking a formal assessment of site condition to prioritise projects, there is no evidence that sites in poor condition are treated any differently to those in good condition. From a value for money perspective what really matters is not the starting condition of a site, rather the change in condition and values associated with a proposed project.

Currently where site condition is used as a criterion to rank or determine a cost share, projects with higher condition are favoured. Understanding the impact of this approach is important because in fact the change in condition as a result of the investment (with and without) may in some cases be quite small. For example a project involving a lifestyle landholder with a high value site and no grazing animals may see little change in value over time.

Should we use a 'River Tender like' metric to score riparian project sites and proposed actions to assess the net benefit of the proposed works at the site and use this to guide cost-sharing? What could such a metric look like?

There are two potential advantages of using a 'River Tender like' metric to assess the net benefits of proposed site and to guide cost-sharing. These are:

1. A consistent and transparent approach that could be applied to all riparian projects across the state.
2. Explicit consideration of the net benefits with and without project actions.

(a) [33] Attempting to identify the lowest uniform cost share that will prompt sufficient participation to achieve the program's goals;
(b) Allowing for appropriately increased cost shares for more beneficial actions; and
(c) Prioritising agreements with landholders that will provide the largest environmental benefits.

At this level such a metric could be used to enhance Approach A as previously discussed enabling a greater level of cost share to be applied to projects where the public net benefits are larger. Pannell (2015 pp17-22) provides a detailed discussion on alternative approaches to assessing net benefits, including a comparison of the use of Environmental Benefits Indices (e.g. River Tender), with other approaches such as deliberative processes and dollar values. This is discussed in Part 1 of this report.

Are there simple and easy to understand factors which are best to use to help shape a cost-share approach which could take account of the Strategy's three criteria (i.e. priority of the riparian management activities, level of public benefit of the work and the level of security of the agreement)? For example, some CMAs use the width of riparian land fenced to alter the cost-share between landholder and CMA (Loo et al 2009).

There are simple and easy to understand factors currently being used by CMAs to help shape cost-share approaches that take into account the three overarching criteria of the Victorian Waterway Strategy (i.e. priority of the riparian management activities, level of public benefit of the work and the level of security of the agreement). For example a number of regions use variable rates for fencing, offering higher rates for wider fence setbacks where the public benefits are assumed to be higher.

The approach of offering higher incentives through variable rates has been queried because of concerns around a higher cost share for government than when flat rates are used. This assumption is likely be flawed without better understanding of how net public and private benefits are assessed. As has been outlined earlier there are issues with the methods being used to assess public benefits and no regions are using estimates of private benefits to inform cost-shares.

Any additional considerations by CMAs in cost sharing, for example, consideration of private benefits, has the potential to lead to more complexity in approach and ultimately increase transaction costs, but this is not necessarily the case.

Another Strategy action is to investigate long term resourcing for managing fenced riparian areas, i.e. largely weed and pest animal management in the fenced area. If resources were to be provided to landholders for long term management of fenced riparian areas, would this affect the up-front cost-share? In what way?

Often, projects need ongoing funding in the long term to preserve or maintain the benefits generated by an initial project. For example, funds may be needed to maintain, repair, or replace fences; or for continuing payments to people to ensure ongoing adoption of improved practices, such as pest plant and animal control. These costs might arise for a few years beyond the end of the initial project, or they might last more-or-less forever. The 'ideal' level of maintenance funding can be substantial, potentially exceeding the cost of the initial project, and maintenance costs vary greatly between different projects, so it's an important factor that needs to be accounted for when ranking projects.

Currently the typical model is that landholders are paid an up-front cost share, either for direct works or in the form of a grant/incentive with an expectation that they will maintain the benefits in perpetuity, with the expectation that any future maintenance costs, for example pest plant and animal control, will be borne by the landholder. These costs are likely to vary widely between

projects and therefore the ability of landholders to meet these obligations over time may be constrained by many factors.

Current landholder agreements have maintenance responsibilities borne by the landholder and it is therefore likely that increased monitoring and compliance will become increasingly necessary as the number of funded sites within the landscape increases over time. Without either enforcing agreements in terms of maintained or providing additional funding for maintenance, it is likely that the benefits of riparian management will not be maintained in all cases, and this will be increasingly so as more riparian areas are protected.

In theory it may be possible to build a consideration of long term maintenance costs into the up-front cost share provided to landholders as part of an initial grant. This would require a clear assessment of the costs and benefits associated with these activities, including an assessment of what is required as a minimum duty of care by the landholder, together with an assessment of the predicted future impact of weeds on the site.

What possible methods could be "built in" to the implementation of these programs which would assist with monitoring and evaluation of the different approaches to support future adaptive management?

All CMAs reported their current primary delivery approaches, either direct works or grants/incentive models, are in general working well. In support of their current approaches strong and logical reasons were put forward, for example a perceived strength of a direct works model leads to higher quality work, while for grants/incentives it promotes long term ownership of the project.

While there may be good anecdotal evidence to support these assertions there appears to no empirical studies to support these claims.

A high priority should be directed to research and evaluation to compare the two approaches in terms of:

- the extent to which different delivery approaches promote or constrain actions by landholders to maintain project benefits
- the impact of different delivery mechanisms and levels of funding on landholder attitudes to riparian management activities
- the difference in the quality of project works over time (is the standard of the initial works sufficient to last through time)
- the success of the cost sharing approach in terms of levels of participation

The report should also take into account the findings of the current project examining the costs and benefits of managing Crown frontages under licence and an earlier cost-benefit project by Cummins and Associates (2012).

The recent reports by Aither (2015) and Cummins and Watson (2012) were reviewed as part of the previous discussion paper prepared for this report. Aither make the following observation:

"*Government contributes substantially to the cost for riparian works on riparian management licences to encourage landholders to fence the frontage and prevent uncontrolled livestock access to the waterway. Based on the evidence and analysis undertaken in this study, it appears that this government contribution is appropriate given the existence of environmental externalities associated with river health and stream bank erosion. Assuming that this investment is justified (which was not the specific purpose of this study), then the policy mechanisms used by government to encourage land use change, and the level of government contributions should be reviewed to determine whether they remain appropriate."*

This consultation report highlights that there is likely to be a wide range in actual public benefits achieved and cost share percentages applied currently across regions.

As previously reported (Section 3.1) there are different approaches used by CMAs to assess public benefits of riparian projects and overall public benefits assessment is not particularly clear, sophisticated or consistent. In addition, landholder contributions are typically not calculated, rather they are an assumed contribution.

This approach to sharing costs is simple resulting in reduced transaction costs for CMAs and provides for regional flexibility. However without increased consistency in assessing public benefits and basing landholder contributions on transparent assumptions or actual costs it is not possible to say how close current approaches are in terms of achieving the optimal environmental outcomes from limited budgets.

Cummins and Watson (2012) also highlight that consideration of economic efficiency, equity and the costs of public administration are important.

The findings from this investigation indicate that some current approaches are unlikely to be close to achieving optimal economic efficiencies, because of the limitations and difficulties in assessing both public and private benefits and costs.

The application of standard incentive levels in order to provide consistency and equity for landholders does result in compromises in terms of paying the least amount for an environmental outcome. There is likely to be a wide range of differences in private net benefits resulting from these approaches because landholders are treated similarly under current arrangements regardless of differences in private benefits and costs. This is an area that could be improved but will require a balance between the need to achieve optimal environmental outcomes with limited budgets, value from government funds and regional desire for simplicity and equity.

8. Next steps

This investigation has provided detailed information on the current approaches used by CMAs for cost-sharing and funding allocation for riparian management activities.

During this investigation Victorian CMAs reported that whilst they are fairly happy with current approaches they are keen to continue to adapt, evolve and learn from others.

The investigation has highlighted a number of considerations and issues which could form the basis of recommendations and guidance. These include:

- Minor refinements to current approaches
- Greater consistency of ranking and assessment tools
- Greater consistency of approaches for assessing benefits and calculation/estimates of costs
- Ways to align approaches with economic principles (achieving optimal environmental outcomes with limited budgets),
- Ways to align approaches with VWMS principles

The next step of the project is to develop the guidance/recommendations for future programs drawing both on this report and the findings from the previous literature review.

9. References

Aither, 2015. *Managing crown frontages under licence. Investigation of costs and benefits to landholders, the Victorian Government and the community A report prepared for the Victorian Department of Environment, Land, Water and Planning (Waterway Health). April 2015*,

Anon, USEPA Cost Share Paper.pdf.

Anonymous, 2015. *WRC Cost sharing Final - Read Sturgess report*,

Arentino, B, Holland, P, Matysek, A and Peterson, D., 2001. *Cost sharing for biodiversity conservation: a conceptual framework*,

Aretino, B. et al., 2001. Cost sharing for biodiversity conservation: a conceptual framework. Productivity Commission.

Branson, J, Arnott C, Cummins, T. and K.J., 2015. *Managing Crown Frontages Under Licence Final STC 5Feb15*,

Craig, RK; Roberts, A., 2015. When will governments regulate nonpoint source pollution? *Boston College Environmental Affairs Law Review*, 42, pp.1–64.

Curtis, A; Sample, R; McDonald, S., 2008. *A Comparative Evaluation of the Effectiveness of River Tender*,

DEPI, 2013. *Improving our Waterways. Victorian Waterway Management Strategy. Department of Environment and Primary Industries. Victoria.*,

Doeg, T., 2009. *The "River Benefit Index" for assessing River Tender bids.*,

Hajkowicz, S. & Young, M., 2000. *An Economic Analysis and Cost Sharing Assessment for Dryland Salinity Management*,

Harvey, S., 2005. *Using contracts to mitigate salinity : an analysis of voluntary cost-sharing agreements*,

Lankester, a., Valentine, P. & Cottrell, a., 2009. "The sweeter country": social dimensions to riparian management in the Burdekin rangelands, Queensland. *Australasian Journal of Environmental Management*, 16(2), pp.94–102.

Lichtenberg, E. & Smith-ramirez, R., 2003. *Cost Sharing , Transaction Costs , and Conservation. Department of Agricultural and Resource Economics. University of Maryland.*,

Loo, S., Hopkins, K. & Vollebergh, P., 2009. *Review of the Victorian Catchment Management Authorities' processes for riparian land management and landholder funding allocation. Department of Sustainability and Environment. 2009.*,

Loo, S, Hopkins, K and Vollebergh, P., 2009. *Final Report_Review of CMA riparian mgt and funding_20090826*,

Marshall, G., 1998. Economics of Cost Sharing for Agri-Environmental Conservation. In *42nd Annual Conference of the Australian Agricultural and Resource Economics Society, University of New England, Armidale Australia, 19-21 January, 1998.*

Maryland Department of Agriculture, Conservation has its rewards. CREP. Marylands Conservation Reserve Enhancement Program.

Maryland Department of Agriculture, Stay with CREP. Marylands Conservation Reserve Enhancement Program. Answers to Frequently Asked Questions abou renrolling in CREP.

Maryland Department of Environment., 2013. *Maryland Agricultural Water Quality Cost-Share Program Manual. October 2013.*,

Morris, K. et al., 2014. *Riparian Intervention Monitoring Program Version 1. Arthur Rylah Institute for Environmental Research. Technical Report Series. December 2014*,

NECMA, 2008. A Comparative Evaluation of the Effectiveness of River Tender. Designer Carrots. North East Catchment Management Authority. , (August).

Oliver, I. & Parkes, D., 2003. *A Prototype Toolkit for Scoring the Biodiversity Benefits of Land Use Change. Department of Sustainable Natural Resources, NSW.*,

Pannell, D., 2009. Cost sharing for environmental works. Pannell Discussions. No. 149, 30 March 2009. *Pannell Discussions*. Available at: http://dpannell.fnas.uwa.edu.au/pd/pd0149.htm.

Pannell, D. et al., 2011. Integrated assessment of public investment in land-use change to protect environmental assets in Australia. *Land Use Policy*, 29, pp.377–387.

Pannell, D., 2008. Public benefits, private benefits, and policy intervention for land-use change for environmental benefits. *Land Economics*, 84(2), pp.225–240.

Pannell, D., 2015. *Ranking Environmental Projects. Working Paper 1506. School of Agricultural and Resource Economics. University of Western Australia*,

Park, G. et al., 2013. The quality of resource condition targets in regional natural resource management in Australia. *Australasian Journal of Environmental Management*, 20(May), pp.285–301.

Perez, M., 2014. Regulating farmers: lessons learned from the Delmarva peninsula. *Choices, the magazine for food, farm and resource issues*, 26(3), pp.1–13.

Race, D. & Curtis, A., 2013. Reflections on the Effectiveness of Market-Based Instruments to Secure Long-Term Environmental Gains in Southeast Australia: Understanding Landholders' Experiences. *Society & Natural Resources*, 26(March 2014), pp.1050–1065.

Roberts, A.M. et al., 2012. Agricultural land management strategies to reduce phosphorus loads in the Gippsland Lakes, Australia. *Agricultural Systems*, 106, pp.11–22.

Shimshack, J.P. & Ward, M.B., 2005. Regulator reputation, enforcement, and environmental compliance. *Journal of Environmental Economics and Management*, 50, pp.519–540.

SKM, 2003. *Guidelines for riparian land management: cost-sharing options for riparian management projects. A report prepared for the North East Catchment Management Authority.*,

Virginia Department of Conservation and Recreation, 2014. *Program Year 2015. Virginia Agricultural Cost Share Service (VACS) BMPS. April 24, 2014*,

Watson, A. & Cummins, T., 2012. *Management of crown frontages : Getting the policy settings right.*,

Whitten, S. & Coggan, A., 2010. *Conserving biodiversity through private land managers: integrating adaptive management, economic design and field experience. CSIRO Ecosystem Sciences*,

Whitten, S., Reeson, A. & Langridge, J., 2014. *Evaluation of Wimmera CMA programs : MBIs , Incentives and Group Support*,

PART 3: DISCUSSION PAPER - Investigation into Riparian Cost- Sharing Arrangements

Executive Summary

Fencing and revegetation of riparian areas is one of the major types of environmental investment by governments and communities. Under cost-sharing agreements landholders are paid a portion of the cost of the works by a funding authority (usually government) where a public benefit is derived from the works being undertaken.

Approaches that can be used to underpin cost-sharing programs include:

A. Costs shared according to an agreed percentage, such as 50: 50;
B. Costs shared according to the ratio of private benefits: public benefits;
C. Costs shared so as to minimise the public cost of achieving any particular outcome;
D. Costs shared so as to maximise the public benefits from the program

There is a trade-off between effectiveness and costs amongst these approaches. Overall approach C and D are likely to result in better environmental outcomes than A or B. Approach A is simple to understand, politically acceptable to both landholders and governments and can have relatively low program administration costs. However, its achievement of public benefits may often fall well short of potential. Approach D has the highest effectiveness in achieving environmental outcomes, but also the highest transaction costs and a requirement of some economic expertise.

Victorian riparian management programs most commonly fall into three main types - type A approaches, a direct capital works approach (which involves cost-sharing in the sense that land managers are responsible for a proportion of the initial costs, plus ongoing maintenance costs) and some use of Market Based Instrument (MBI) River Tender approaches (Approach C).

There are considerable differences in approaches undertaken by Catchment Management Authorities (CMAs) leading to likely large differences in overall public benefits and cost-effectiveness of riparian management programs. Despite MBI approaches having been used by several CMAs for riparian management, traditional cost-share programs continue to be well accepted. MBI approaches are a more defensible and potentially accountable approach to riparian management than more traditional cost-sharing approaches, but there appear to be factors limiting their widespread adoption which need to be assessed as part of this project.

There are limited readily available examples of evaluating the types and performance of riparian management programs in Australia overall. Victoria can learn from some aspects of cost-share program examples from the United States, particularly the well-established and clear rules for participation, contract management, provisions for compliance inspection/accountability and strong public sector extension/technical support. The powerful farm lobby interests in the United States are likely to reduce the potential for outcomes significantly in terms of lack of targeting, simplistic equity considerations and in some cases the potential to make overly generous payments to landholders.

There are important issues which need to be thought through in terms of the degree of targeting required with limited budgets, the scale of participation and costs to achieve outcomes, and the links between site and river reach/riparian program scales. Management (particularly livestock exclusion) appears to be a more significant issue in terms of public benefit from riparian management than land tenure (freehold or Crown frontage).

If approaches C and D are viewed as too complex or unacceptable for other reasons, the environmental benefits from a uniform cost-share approach can be enhanced by:

(a) Attempting to identify the lowest uniform cost share that will prompt sufficient participation to achieve the program's goals;
(b) Allowing for appropriately increased cost shares for more beneficial actions; and
(c) Prioritising agreements with landholders that will provide the largest environmental benefits.

1. Introduction

1.1 Background

In Victoria (as well as nationally and internationally) there is substantial government investment in riparian maintenance and improvement projects implemented through the Victorian Waterway Management Program. This investment is implemented by Catchment Management Authorities (CMAs) through regional work programs to maintain or improve the condition of waterways through their role as waterway managers under the Water Act 1989 (DEPI 2013).

The projects involve CMAs working collaboratively with landholders on both crown frontages and private land to undertake works such as stock management fencing, revegetation, weed management and the provision of infrastructure to support off-stream stock watering.

Typically these works are paid for through cost-sharing arrangements between landholders and government. The government and private landholders contribute funds (and/or in-kind contributions) to pay for the initial works and occasionally some short-term maintenance. The current and historic expectation of the Victorian government is that landholders should pay for long-term maintenance.

In practice the delivery mechanisms and cost-sharing approaches adopted by CMAs have developed at the regional level and as a result different approaches are used in different regions.

There have been various studies into cost sharing arrangements and frameworks for funding allocation in Victoria (Doeg, 2009; Loo et. al, 2009; SKM, 2003; Watson & Cummins, 2012; Whitten, Reeson, & Langridge, 2014) however, there has never been a single framework or approach adopted at a state-wide level.

There is also strong recognition across Australia that riparian management is important (Lankester et al. 2009), and that landholder decisions involve a complex array of factors including perceived financial benefits and losses, financial capacity and a range of social factors (Lankester et al. 2009). However, available Australian literature evaluating the approaches and effectiveness of cost-sharing programs for riparian management appears scant.

In recent years there have been substantial changes to the funding level and mix, and requirements around work programs delivered by CMAs. The result has been changes to delivery mechanisms including the use of tenders, and a shift away in some regions from in-house delivery of works towards partnership arrangements and grants programs.

The Victorian Waterway Management Strategy (VWMS) explicitly considers the issue of cost sharing in Policy 9.7. The policy provides guidance on the government's position regarding apportioning costs for riparian management, with the level of payment to be made by the Victorian Government based on the priority for management activities, the level of public benefit and the level of security of the agreement (DEPI 2013). It employs the "beneficiary-pays principle", which is discussed in section 1.4.

These changes along with the policy defined in the VWMS mean that it is timely to review and analyse cost sharing and funding allocation arrangements for riparian management works in the Victorian Waterway Management Program. Given the level of investment by the Victorian Government into riparian programs, the Department of Environment Land Water and Planning has determined that there is a need for greater transparency in cost sharing for riparian management across the state, and clear alignment between the VWMS policy and the frameworks and processes used by CMAs to allocate funds.

1.2 Purpose

This discussion paper forms part of a broader project to investigate, report and provide guidance on:

- Current approaches CMAs adopt for cost-sharing and funding allocation for riparian management activities and analysing their advantages and disadvantages in different circumstances (e.g. industry and regional variation);
- Other possible models and approaches for apportioning costs between landholders and CMAs;
- The most effective approaches for CMAs to use to deliver the best on-ground outcomes at minimum cost when developing and implementing their cost-sharing approaches for riparian management activities.

The discussion paper provides background thinking to the subsequent stages of the project. It includes defining cost-sharing, introduces cost-sharing approaches and outlines what costs should be included in programs. It analyses readily available reports on Victorian riparian management programs, provides a brief examination of approaches being implemented elsewhere in Australia, and provides three international examples from the eastern United States. It outlines several additional important factors which need to be considered in designing effective riparian management cost-sharing programs.

Given the time allocated, the review of literature is not exhaustive. Furthermore a number of the journal papers we examined were not particularly useful for the aims of the work and therefore it should be considered as a discussion paper.

1.3 What is meant by cost-sharing?

Cost-sharing is defined as a publicly financed program through which society, as a beneficiary of environmental protection, shares part of the cost of pollution control with those who must actually install the controls (Anon n.d.). Put more simply, under cost-sharing landholders are paid a portion of the cost of the works that are believed to generate a public benefit (Harvey 2005). These benefits include pollution control, but they can also relate to other social benefits such as recreation, species protection, and general environmental quality.

Sharing the costs between the public and private sectors is intuitively appealing and politically favoured (Weersink et al. 2001) and has been widely used in Australia (Pannell 2009). A number of well-founded reports exist on cost-sharing including those by Aretino, Holland, Matysek, & Peterson (2001) and Marshall (1998). Cost-sharing has been used to address a number of environmental problems including water quality (Harvey 2005)(Lichtenberg & Smith-ramirez 2003) (Anonymous 2015), biodiversity conservation (Aretino et al. 2001) and riparian management (Loo et al, 2009).

1.4 Rights and responsibilities

The concept of cost sharing is essentially about who pays for actions that generate public benefits (and, potentially, private benefits). It is about rights (Arentino et al 2001) – which parties in the community, if any, have the rights to expect that other parties will pay?

One rights-related concept that is sometimes discussed in relation to natural resource management (NRM) is the "duty of care". In the context of NRM, a duty of care is an expectation that a landholder will meet basic social and environmental requirements. It is an assertion that the community has the right to expect that certain social or environmental outcomes will be provided by landholders. It is possible for a duty of care to be specified in regulations (this has happened in Queensland), but most commonly they are not so specified. For this reason, landholder performance requirements in assessing duty of care in land management, including riparian management, is often unclear (Hajkowicz & Young 2000).

There is a spectrum of possible positions along a duty of care continuum (Hajkowicz & Young 2000). The determination of a duty of care has the potential to markedly change cost-sharing arrangements. A lower duty of care places more of the costs on society whereas a higher duty of care places more onus on landholders.

Duty of care is closely related to the "polluter pays principle". Under a polluter-pays regime, landholders are required bear the costs of reducing environmental impacts. Conversely, under a "beneficiary pays" regime, governments agree to bear some or all of the costs of providing public benefits.

It may be tempting to think that questions about cost-sharing can be resolved by application of existing agreed duties of care or beneficiary-pays or polluter-pays principles. If such duties or principles were fully agreed or legislated, then this may be possible. In reality, this is rarely the case. The process of selecting an approach to cost-sharing is in effect a process of selecting which duty of care or which "pays" principle should apply.

The fact that there is such a thing as a "polluter pays principle" does not necessarily mean that it should be applied. That depends on choices made through political, administrative and community processes. As noted above, these are choices about which parties in the community, if any, have the rights to expect that other parties will pay. Seen in this light, duty of care, beneficiary pays and polluter pays are not "principles" in the sense of something that *should* be applied and provides guidance. They are options that the community can choose, usually through political or administrative processes.

2. Cost-sharing approaches

In thinking about the rules for cost-share programs there are a number of approaches that could be used. Below are four that programs might consider using:

A. Costs shared according to an agreed percentage, such as 50: 50;
B. Costs shared according to the ratio of private benefits: public benefits;
C. Costs shared so as to minimise the public cost of achieving any particular outcome;
D. Costs shared so as to maximise the public benefits from the program.

In Table 1 these four cost-share approaches are outlined, along with comments about their application and effectiveness.

Table 1. Potential approaches to use to determine cost-sharing rules.

Approach	Comments
A. Costs shared according to an agreed percentage, such as 50: 50.	• Simple to understand. • Low transaction[A] costs (i.e. relatively low cost to the program of collecting and analysing the information needed to apply this approach). • Requires only information about private costs. • A key question is which private costs to share. • All landholders get the same percentage cost share. • Usually does not maximise environmental benefits. To do so the public cost share would have to be set at the lowest level needed to secure landholder participation, and the most cost-effective agreements would need to be selected. Offering the lowest effective cost shares allows more agreements with landholders to be funded, which increases the public benefits that can be purchased. • Usually, a standard cost share for a particular practice is specified for a region. Where standard cost shares are offered to all potential participants for similar actions, this reduces the overall environmental benefits from the program because some landholders are paid more than necessary (reducing the funds available to buy additional agreement), while others who could provide large benefits are not offered sufficient funding to secure their participation.
B. Costs shared according to the ratio of private benefits: public benefits.	• Also simple conceptually and perhaps seems intuitively appealing. • Requires information about private costs, private benefits, public costs and public benefits (including opportunity costs, unpriced labour costs and maintenance costs). • The private benefits used to determine cost shares should be net private benefits (i.e. private benefits minus private costs). • Higher transaction costs than approach A because information is needed about benefits as well as costs, and estimating benefits is probably harder than estimating costs. • Similarly to approach A, this approach usually does not maximise overall environmental benefits because the cost shares generated are not related to the minimum cost shares that would secure landholder participation and because the most cost-effective agreements are not prioritised. • Cost shares can be different for different landholders for the same practice, or a standard cost share for a particular practice can be determined on the basis of average costs and benefits for a region. Where standard cost shares are offered to all potential participants for similar actions, this reduces the overall environmental benefits from the program because some landholders are paid more than necessary (reducing the funds available to buy additional agreement), while others who could provide large benefits are not offered sufficient funding to secure their participation.
C. Costs shared so as to minimise the public cost of achieving any particular outcome.	• Cost shares differ between landholders for the same practice. • Like A and B, it assumes that the target outcome is desirable, so doesn't consider whether the overall benefits exceed the overall costs. • Cost share is derived from the question, "What is the least payment that landholders will accept to participate?" The focus is not really on the share, but on the level of payment required to motivate participation. • That lowest acceptable payment can be determined by auction or negotiation, or

Approach	Comments
	estimated by modelling and expert judgement. • If determined by auction or negotiation, information is not required about private costs or private benefits, just the lowest acceptable payment, which can be determined directly without knowing those costs and benefits. The transaction costs in this case are mainly those for the auction or negotiations, including the cost of obtaining information about the environmental benefits of management actions. • If the lowest acceptable payment is determined by economic modelling/expert judgement, rather than by auction or negotiation, information about the private costs and benefits is needed (in order to estimate the lowest acceptable payment). The transaction costs in this case are those associated with the modelling/expert judgement process and then engagement with landholders to reach agreements. • If the budget is limited, the investment options can be ranked using the formula: (public benefits – public costs apart from landholder payment)/landholder payment. (i.e. value for money is considered as in an auction). In that case, information is needed about public benefits and costs. Using this formula is part of maximising environmental benefits overall, because it directs funds to those agreements that would provide the greatest benefits per dollar. It can be applied whether the public funding is determined by auction, by negotiations or by economic modelling. • Ignoring transaction costs, this approach is better than A and B in terms of environmental benefits generated because it maximises overall participation by ensuring that no more money is spent on each agreement than necessary (leaving money for additional agreements), and it prioritises those projects that provide the greatest environmental value for money. The key question is whether its transaction costs are so high as to outweigh this benefit.
D. Costs shared so as to maximise the public benefits from the program (i.e. maximising value for money).	• Similar to approach C except that it is not assumed that the target outcome is desirable. Each investment is evaluated in terms of value for money, with judgements made about the dollar value of public benefits generated, to consider the question of whether the public benefits exceed the public costs (including payments to landholders). • Public benefits can be monetised using "non-market valuation" studies, or by extrapolating the results of previous non-market valuation studies, or by expert judgement (as is usually done in INFFER, www.inffer.com.au). • Ignoring transaction costs, this is the ideal approach, in terms of environmental benefits generated by the program, but it has the highest information requirements and so the highest transaction costs.

[A] Transaction costs the costs of running the program, and the costs to landholders of participating, such as the costs of their time or legal advice.

[B] Opportunity cost is the foregone rate of return from alternative uses of the land and resources for conservation(Aretino et. al, 2001)

The four approaches in Table 1 can be grouped into two pairs. Approaches A and B have in common that they usually do not maximise environmental benefits because they are not based on determining the minimum effective cost share and do not prioritise the most cost-effective agreements in terms of environmental benefits per dollar. In other words they are usually not consistent with economic principles designed to maximise the environmental benefits of a program. Approaches C and D have in common that they do attempt to use the minimum effective cost share and do prioritise agreements on the basis of environmental cost effectiveness. Further comments on each of the approaches are provided below.

2.1 Approach A - Costs shared according to an agreed percentage, such as 50: 50.

This approach is widely used in Australia and in other countries, particularly the United States in both state and federal programs. It presumes that a mix of beneficiary pays and polluter pays is appropriate. The major advantages are that the approach is simple to understand and is often politically acceptable. Landholders perceive it as 'equitable' as all participants get the same percentage of costs for the same actions. Providing public funding in this way clearly does lever private conservation activity. On the other hand, using a uniform percentage reduces the overall environmental benefits from the program because some landholders are paid more than necessary (reducing the funds available to buy additional agreements), while others who could provide large benefits may not be offered sufficient funding to secure their participation.

Many programs that use this approach base the calculation of the public contribution to costs only on the short-term direct private input costs. For example, they may pay a share of the cost of establishing a fence. For these programs, approach A has the advantage of very low transaction costs (meaning the cost to the program of administering, collecting and analysing the required information) because the information requirements are low.

In principle, there is no reason why other private costs could not also be included. Candidates include:

- On-going maintenance costs, such as repairs to fences;
- Opportunity costs: If the project involves land being taken out of production, the landholder has an opportunity cost equal to the income that would otherwise have been earned (Aretino et al., 2001; Pannell, 2009a). Opportunity costs can be permanent and on-going, and in cases where the current land use returns are high, the opportunity costs might be more substantial in the long-term than paying for the initial up-front costs;
- Unpriced labour costs, such as the cost of the landholder's time devoted to installing fences or managing new pests;
- Transaction costs: The costs to the landholder of participating in the program including the value of the landholder's time spent on paperwork, the application process, obtaining technical assistance, learning how to meet program design specifications, contract negotiations, etc.

These are real costs that are actually borne by landholders, so including them in the calculation of costs might be seen as fair. In Europe, payments are often pitched at a level that is intended to cover all of these costs.

However, given the arbitrary nature of this approach, it is not possible to say whether including these additional private costs would generally improve or worsen the achievement of environmental outcomes. That would depend on whether the cost shares based on input costs are too high or too low relative to the lowest effective cost shares.

If the additional private costs are included in cost share calculations, this would add to the transaction costs to government, as it would need information about these other costs, some of which may be hard to measure

Although a uniform cost share has significant limitations (discussed above), its overall performance at providing environmental benefits can be enhanced by making it operate as close as possible to the economic principles outlined earlier. This would include:

(d) Attempting to identify the lowest uniform cost share that will prompt sufficient participation to achieve the program's goals;
(e) Allowing for appropriately increased cost shares for more beneficial actions; and
(f) Prioritising agreements with landholders that will provide the largest environmental benefits.

When viewed in this way, it doesn't really matter which types of private costs are included within the cost-share calculations (e.g. input costs, opportunity costs, maintenance costs, unpriced labour costs, transaction costs), as long as the public contribution to specific management actions is as low as it can be and still result in sufficient participation. This could be achieved by the public providing a relatively high percentage of up-front costs, or a lower percentage of all relevant costs, with the absolute dollar amount being the same in either case.

A strategy that is used in some cases is for public funds to cover a high percentage of up-front input costs (e.g. 100%), leaving landholders to cover all other costs. Whether this is the most effective approach depends on how close this comes to providing the lowest uniform cost share that will prompt sufficient participation to achieve the program's goals.

2.2 Approach B - Costs shared according to the ratio of private benefits: public benefits.

Sharing costs according to the ratio of private and public benefits may seem intuitively appealing. Despite its appeal, this approach generally does not identify the lowest effective cost share, and usually does not prioritise the most cost-effective options, so it does not provide the most valuable environmental benefits. It may result in payments to landholders that are higher or lower than they would ideally be to maximise environmental benefits overall.

One question for managers using this approach is whether to base cost shares on net benefits or gross benefits (i.e. are costs subtracted from the benefits before cost shares are determined?). Working with net benefits (i.e. benefits minus costs) is more comprehensive and may be considered fairer as it accounts for the fact that achieving higher benefits is likely to cost the landholder more.

On the other hand, calculating net benefits for both landholders and the environmental agency requires a great deal of information: private benefits, private costs, public benefits and public costs for each activity. Transaction costs would be increased relative to approach A because of this greater information requirement, and also because benefits are more difficult to estimate than are costs.

The same question about which private costs to include (see approach A) arises again. In addition, the agency also faces the question of which public costs to include. Candidates include:

- The costs paid directly to landholders for the life of the program;
- The transaction costs of the program itself (extension and technical support required, search and information costs, bargaining costs, policing and enforcement (compliance) costs. Search and information costs are costs such as those incurred in determining that the required good is available on the market, which has the lowest price. Bargaining costs are the costs required to come to an acceptable agreement with the other party to the transaction, drawing up an appropriate contract and so on. Policing and enforcement costs are the costs of making sure the

other party sticks to the terms of the contract, and taking appropriate action (including through the legal system) if required;

- Ongoing costs to maintain the benefits once the formal program finishes. If these are not included, the agency needs to consider whether it is likely that the benefits will be maintained.

It is not possible to say in general whether including these various costs would make the program better or worse in its achievement of environmental benefits.

Cost shares could be different for different landholders for the same practice, or alternatively a standard cost share for a particular practice can be determined on the basis of average costs and benefits.

This approach offers less flexibility to managers (compared with approach A) in choosing the level of public funding provided to landholders. The flexibility consists of choosing which costs to consider, but not the percentage cost share. For this reason, it may be more difficult to make the approach consistent with providing the lowest uniform cost share that will prompt sufficient participation to achieve the program's goals. This observation, combined with the higher information costs of this approach, is likely to be important when identifying the preferred approach.

2.3 Approach C - Costs shared so as to minimise the public cost of achieving any particular outcome.

Under approach C the cost shares are different for different landholders for the same practice. Similar to approaches A and B, the target outcome is assumed to be desirable and there is not a consideration of whether the overall benefits exceed the overall costs.

Approach C attempts to directly identify the lowest effective public funding contribution that will ensure sufficient participation. In other words the focus is not really on the share, but on the level of payment required to motivate participation. The lowest acceptable payment can be determined by auction or negotiation or estimated by modelling and expert judgement. The cost share for any given landholder is not actually considered when the level of payment is being determined, but can be calculated later.

Approach C should also include prioritisation of those landholders whose actions will provide the most valuable environmental benefits per dollar of public funding.

If the lowest effective cost share is determined by auction or negotiation, the information required for approach C is less than for A or B. Knowing private costs, private benefits, public costs or public benefits is not required. Knowing the lowest acceptable payment can be determined directly by asking landholders to reveal what they would accept as a payment. The transaction costs in this case are mainly those for the auction or negotiations, including the cost of obtaining information about the environmental benefits of management actions. How they compare with the transaction costs for A and B depends on how the information is obtained in those cases.

If the lowest acceptable public payment is determined by economic modelling or expert judgement, understanding the private costs and benefits is required in order to estimate the lowest acceptable payment. Again the public costs and benefits are not required. The transaction costs in this case are

those associated with the modelling/expert judgement process and then engagement with landholders to reach agreements.

Where the budget is limited, investment options can be ranked using the following formula: (public benefits – public costs apart from landholder payment)/landholder payment). This means that information is needed about public benefits and costs. Using this formula is part of maximising environmental benefits overall, because it directs funds to those agreements that would provide the greatest benefits per dollar. It can be applied whether the public funding is determined by auction, by negotiations or by economic modelling.

This approach is closer to the theoretical requirements for maximising overall environmental benefits than are approaches A and B. However, it is likely to have higher transaction costs, at least compared with approach A, because of the need to assess public benefits.

In Victoria, there is some familiarity with the use of auctions for approach C, including familiarity with developing assessments of public benefits (for example the Environmental Benefits Index used in Eco-Markets programs). However, no CMA that has used River Tender has chosen to continue provision of funding by this approach (Peter Vollebergh, personal communication). Reasons for this need to be better understood in this project. We note that tenders are not the only option for pursuing approach C. As noted above, it may also be possible to estimate the lowest effective cost share using economic modelling, expert opinion or negotiation with landholders.

2.4 Approach D - Costs shared so as to maximise the public benefits from the program

This approach is the one that is most closely aligned with economic principles designed to maximise overall environmental benefits for a given budget. It is similar to C except that the target outcome is not automatically assumed as desirable; each investment is evaluated in terms of value for money. Judgements are made about the dollar value of public benefits generated so that it is possible to judge whether the overall benefits of an investment outweigh its costs.

Public benefits can be monetised using “non-market valuation” studies, or by extrapolating the results of previous non-market valuation studies, or by expert judgement (Pannell et al., 2012)

The advantage of approach D is that, if transaction costs are ignored, it has highest environmental benefits. The disadvantages are that it is the most complex of all four approaches, having the highest information requirements and thus potential for the highest transaction costs. Depending on how the public benefits are monetised, it may require a level of capability in economics that CMAs generally do not have.

2.5 Overall conclusions

A summary assessment of the four approaches that underpin cost-share programs is provided in Table 2.

Table 2. Simple assessment of four types of cost-share programs

Cost-sharing approach	Effectiveness	Program cost	Comment
A. Agreed percentage	Low-Medium	Low	Low-medium effectiveness but also the lowest in cost and well accepted politically.
B. Private/public benefits	Low-Medium	Med-high	Less flexible and more costly relative to approach A.
C. Minimised public costs	High	Med-high	Higher effectiveness than A, but also higher costs.
D. Maximised public benefits	Highest	High	Highest effectiveness, but requires economics expertise. Transaction costs may be excessive, plus the approach may be outside the comfort zone of some stakeholders.

Of the four approaches, it appears that the trade-off between effectiveness and cost does not favour Approach B. It has higher information requirements (and therefore higher program costs) than A, but seems unlikely to provide effectiveness that is much superior, if at all. Approach D has the highest effectiveness but also the highest program costs. It would require a greater cultural change than the other approaches. If D seems too difficult or too expensive, it comes down to a choice between A and C, where A saves program costs but sacrifices some environmental outcomes. Factors that would influence the relative performances of approaches A and C include the following:

(a) How tight the budget is. If there is sufficient money to fund everyone who is interested then there may in reality be little difference between choosing A or C. If, however, the budget is tight and only a small proportion of eligible landholders could receive funding then C is more likely to be a better approach than A..

(b) Whether approach A is applied in a relatively simplistic way or in a way that recognised the requirements for high cost-effectiveness. If managers prioritise well amongst landholders, attempt to determine the lowest effective cost share and allow greater cost shares for more beneficial actions, the shortfall in effectiveness of A relative to C will be reduced.

(c) The quality of information used to determine public benefits. Currently, tenders are conducted in Victoria using information from EnSym or an Environmental Benefits Index. It would be possible to apply approach C (using a tender, economic modelling or expert judgement) using simpler assumptions about public benefits, such as that there are equal benefits for all riparian work in priority areas, as happens with traditional cost-share grants. This would reduce the environmental effectiveness of approach C, therefore reducing its advantage over approach A. It would, however, continue to have an advantage over simple versions of approach A because it would allow accurate determination of the lowest feasible cost share on a farmer-by-farmer basis. Whether the saving in costs through reducing the quality of information about public benefits is greater or less than the loss of benefit would need careful consideration.

3. Other considerations

This paper has focussed on approaches for designing environmental programs to achieve the highest public net benefits within practical political constraints. In this section we outline additional factors that are worth considering in designing more effective programs.

3.1 Agreements/contracts and obligations

A clearly defined agreement or contract is important for both the landholder to understand his/her obligations and for the funder to show clear accountability for spending of public funds. An agreement/contract should have a defined duration over which the landholder agrees to undertake some defined actions for a desired outcome at a specified price (Harvey 2005). A clear agreement/contract clarifies the understanding between the landholder and the CMA and ensures landholders are aware of the duties and expectations that government has regarding the use of the funds, including maintenance of the agreed works. Without clarity, there is high risk that intended outcomes will not be achieved.

We understand that clearly specified and written agreements (a legal contract) are an increasing feature of riparian projects implemented through the Victorian Waterway Management Program and that there has been effort to ensure there is consistency in the clauses and terms and conditions used by CMAs. While we have not assessed the variation in current Victorian riparian management landholder agreements, there could still remain significant variation in their clarity and strength given the known variation in CMA approaches. The experiences in North East Victoria, where participants did not fully consider the real long-term maintenance costs when agreeing to the terms (NECMA 2008), and which could be important reasons for lack of long-term commitment (Race & Curtis 2013) would be one area to look at.

An important issue is the degree to which landholder agreements are legally binding. More binding legal contracts increase accountability of public spending but to be credible require monitoring and enforcement, which increases overall program costs. More strongly enforced contracts are less likely to attract voluntary landholder participation; landholders can be suspicious of government actions in relation to their individual property rights (Harvey 2005). It is very likely that programs in the United States are stronger than Victorian programs in this regard.

Funders should make active decisions about the degree to which landholder agreements/contracts should be enforced, based on factors such as the average size of contracts, the scale of participation required, the degree to which there needs to be accountability for public spending and the implications for program costs (monitoring for compliance where required).

3.2 Monitoring compliance and enforcement

Related to the issue of contracts and obligations is the degree to which governments monitor compliance and take enforcement action if necessary. Internationally there is a policy movement away from enforcement 'with teeth' to informational and advisory enforcement (Shimshack & Ward 2005). Furthermore, enforcement of environmental obligations is nowhere near as popular in Australia as it is in countries such as the United States (Craig and Roberts, 2015).

In Australia there is commonly limited emphasis on monitoring and compliance assessment (Whitten & Coggan, 2010). Short durations of programs and limited funding were found to be reasons for this. There is usually limited formal evaluation to assess the overall effectiveness of the incentive measures against stated performance criteria or compared to alternative approaches (Whitten & Coggan, 2010).

The degree to which program compliance and enforcement actions are undertaken can affect the success of environmental programs. A water pollution enforcement study of United States' pulp and paper plants (Shimshack & Ward 2005) showed that a single fine for one water plant violation strongly enhanced the regulator's credibility overall, amplifying that fine's impact. Plants observed and learned from the experiences of their neighbours. The authors concluded that a surprisingly large increase in outcomes could be achieved from a relatively small additional investment in enforcement. A marginal fine induced an average two-thirds reduction in the state-wide violation rate in the year following a fine whereas non-monetary sanctions had no impact on compliance.

Agricultural compliance assessment is an increasing focus in the United States in the area of water quality, particularly in the Chesapeake Bay watershed and there are some valuable insights that can be gained from differing approaches in the states of Maryland, Virginia and Delaware. Learnings include that 1) more frequent and effective farm inspections and significant fines are useful; 2) states have to balance the goal of gaining buy-in from farmers with increasingly regulatory pressures to achieve mandated water quality outcome goals; 3) collaborative processes can be voluntary or regulatory in nature; 4) If a regulatory approach is chosen, there is a need for easily monitored and verifiable practice assessments to reduce the uncertainty of detecting compliance during on-farm inspections (Perez 2014).

There is also anecdotal evidence that participation in voluntary programs will increase where there is impending fear of increased regulatory pressure (Beth McGee, personal communication, Chesapeake Bay Foundation). This is also the case in Victoria, where some landholders are participating in voluntary programs because they believe that they will be forced to fence crown frontages at some time in the future.

Overall, while monitoring compliance and enforcement are known to be difficult in programs with private landholders and are also unpopular in Australia (Craig & Roberts, 2015), it is sound to make active decisions about the degree to which monitoring and enforcement should be undertaken as part of overall program design.

3.3 Participation, scale and overall program goals

An important observation in the 2007 review of CMA approaches (Loo, S, Hopkins, K and Vollebergh 2009) was there is only limited uptake of works in any priority reach. This has important implications for the extent to which outcomes will be achieved from riparian management (terrestrial habitat, aquatic habitat and water quality). The finding raises two main issues: 1) the link between site activities and the scale of outcome sought; 2) the degree of participation needed to achieve outcomes and associated consideration of costs involved.

In work conducted in environmental programs across Australia we frequently observe that overall program goals could be improved. Being clear about the natural assets being protected in particular riparian programs and identifying 'SMART' (specific, measurable, achievable, realistic and time-bound) goals is a critical component of any program (Park et al. 2013; Pannell et al. 2011)

The Victorian Waterway Management Program has used a priority reach approach. This is both a simple way to be spatially explicit about the assets being protected and is also useful to prioritise between reaches based on their value and the feasibility of their protection or enhancement. River reaches are typically in the range of 10 to 30 km and the scale at which works are conducted is often much smaller (typically less than 1 km). Setting SMART goals at the river-reach scale is critical and linking site to overall program assessments has potential to improve both the thinking and the outcomes from riparian management. Reviewing the criteria to assess the values of priority reaches would be useful. The need to better link between large program goals and more local goals has also been raised by others internationally (Perez 2014).

Limited participation by landholders in individual reaches raises issues about whether program outcomes will be achieved, the realistic time-frame to expect outcomes and overall costs of achieving them. The factors that are important to consider are outlined elsewhere (Pannell et al. 2011) and should be considered in deciding whether to invest everywhere or focus efforts on particular reaches which are both sufficiently valuable and feasible to protect.

Achieving functional riparian outcomes particularly to achieve improved water quality outcomes is often likely to require participation of a majority of landholders along a reach. Costs are likely to be very different between landholders and different landholder types may need different kinds of support to participate (Race & Curtis, 2013). Costs are likely to increase substantially as the scale of participation increases (Whitten et al., 2014; Roberts, Pannell, Doole, & Vigiak, 2012) Added to this is the issue that inclusion of long-term maintenance costs and opportunity are likely to be critical components in securing continued participation.

3.4 Land tenure

With the exception of the second round of River Tender, the Victorian Government currently runs a 'tenure-blind' approach to encouraging its preferred riparian management practices and provides the same incentives for fencing and other riparian management works on freehold land as it does for Crown frontages (Aither 2015). Given the importance of clarifying rights and responsibilities associated with existing property rights (Aretino et al. 2001), the issue of freehold versus Crown frontages has been of interest to the Victorian government in thinking through the benefits and costs associated with riparian land management.

The recently completed Crown Frontage project found very little difference in the costs and benefits associated with freehold and Crown frontage land tenure. The only actual difference that was assessed was the financial costs associated with licensing. The major finding of the work was associated with management rather than tenure where livestock grazing was quantified as having significant detrimental public benefits compared to livestock exclusion (Aither 2015).

3.5 Crowding out

Whichever cost-sharing approach is used, there is a potential for the 'crowding out' of environmental motivations. Crowding out means that landholders who would have participated in the absence of the program do either not participate or will only participate if paid. If this occurs, the reduction in voluntary actions at least partly offsets the benefits generated from the public funds. Landholders can develop an expectation that public funding will be available for many good management practices (Lichtenberg & Smith-ramirez 2003) and become less willing to undertake actions without payment. The overall significance of this type of crowding out are still not clear, but the issue deserves further consideration and perhaps further research.

3.6 Consideration of equity

A common temptation in government environmental programs, and one that landholders often mention, is the notion that that a program needs to be 'equitable'. Cost-sharing programs that are perceived as equitable are more likely to receive support (Weersink et al. 2001). This is part of the attractiveness to both participants and governments for developing arbitrary percentage-based cost-share programs (approach A).

Equity is about fairness and means different things to different people. Landholders commonly perceive equity to mean that everyone gets equal access to incentive funding. Given that landholder circumstances are extremely heterogeneous (neighbouring properties can vary markedly in terms of socio-economic circumstances, management capability and degree of environmental threats), cost-share programs providing the same level of incentive payments to different landholders will sacrifice some level of environmental benefits, because a more sophisticated approach allows cost savings, and therefore allows investment in more projects. Therefore taxpayers may perceive that a fair approach pursues the maximum value for money from public funding, and so avoids more uniform funding approaches.

In reality, decisions about cost-sharing arrangements are likely to involve trade-offs between equity (using whichever equity principles are favoured) with other considerations such as administrative feasibility, effectiveness, cost-effectiveness and transaction costs.

3.7 Potential for perverse outcomes

Program design requirements, program transaction costs and landholder selection processes have the potential to lead to perverse outcomes. These can include the possibility of adverse selection of landholder participants (i.e. funding directed to landholders who do not deliver the greatest public benefits), over-representation by politically influential landholders, providing cost share for practices that would have been adopted anyway and sometimes even lower levels of conservation overall than in the absence of programs (Lichtenberg & Smith-ramirez 2003).

4. Funding riparian management

4.1 Victorian riparian programs

There have been several studies which partly addressed cost-sharing for riparian management programs in Victoria (Loo et al. 2009; Aither 2015; NECMA 2008; Whitten et al. 2014). Here we look at the findings from these studies in light of the approaches outlined in section 2.

An assessment of riparian funding allocation processes was completed in 2007 (Loo et al. 2009). This review found that the majority (six out of 10 CMAs, namely Glenelg-Hopkins, Wimmera, West Gippsland, Goulburn Broken, Corangamite and North Central) used a cost-sharing approach for delivery of riparian works, most commonly based on a 50:50 cost-share split (approach A). There were differing levels of prioritisation amongst the CMAs, with complete details being hard to discern from the report. One CMA (North East) made use of an MBI approach (approach C) using River Tender where initiative funding was made available, but typically used grants and direct capital works. Two CMAs (Mallee and East Gippsland) and to some extent Melbourne Water, in addition to grants also used a more direct approach (not cost-share) through funding capital works including maintenance costs being borne by the CMA (see Loo et al. 2009 - Table 5, p19). Three CMAs (North East, East Gippsland and Mallee) targeted the majority of efforts within priority reaches, Wimmera targeted high priority sites based on conservation significance and the Goulburn-Broken assessment included consideration of the reach priority as a score within the assessment.

Work conducted in 2007 found that there were provisions by some CMAs to increase the cost-share rate based on factors such as increased riparian width or improving connectivity between properties. Government cost share was limited to direct upfront costs and the landholder cost-share component could be provided through in-kind contributions in including labour. In general funding was provided for fencing, revegetation, off-stream watering and weed management. The on-going cost of the maintenance of fences and pest/weed control was borne by the landholder and there was no consideration of opportunity costs (Loo et al. 2009). In general these costs together with landholder transaction costs appear not to have been recognised in cost-sharing.

MBI approaches used in the North East, and more recently in the Wimmera (Whitten et al. 2014) and Glenelg Hopkins, provide a better surrogate for public benefits assessment (using an Environmental Benefits Index metric) than more traditional arrangements. The Corangamite

approach reported by (Loo et al. 2009) of targeting high value sites within priority reaches would also be expected to lead to more cost-effective public net benefits than less targeted approaches. In 2007 just over half of the CMAs (Goulburn Broken, Corangamite, Glenelg Hopkins, West Gippsland, Wimmera and North Central CMAs) used a sliding scale subsidy rate and the degree to which this improved public net benefits are unclear.

An important point made in the 2007 study (Loo al. 2009) is that that the cost-share amount was decided in proportion to the public benefits, although how this is decided was not clear.

A recent study by Aither (2015) indicates that cost shares have sometimes increased. CMAs were asked about four categories of costs – fencing, revegetation, off-stream watering and site preparation including weed management. From the information supplied (a spreadsheet supplementary to the report fencing and revegetation cost shares commonly ranged from 50 to 100% and both off-stream watering and site preparation varied from 0-100%. Overall for riparian works the report concluded that governments contribute 72% of the cost, with the remaining cost share met by landholders (28%). The largest capital expense was associated with fencing, followed by off-stream watering and revegetation. Average annual landholder expenses to operate and maintain the riparian works were estimated at $2,100 per licence on an 'average' frontage. The majority of this annual expenditure was associated with fencing and off-stream watering. Additional weed maintenance was also borne by the landholder where they had licenced frontage (Aither 2015)

The Aither study also quantified the public benefits associated with riparian management. It concluded that the public benefits associated with improved river health outcomes were likely to be considerable where a frontage had been fenced and revegetated, and uncontrolled grazing prevented. This situation occurred where either unlicensed frontage or grazing licences were converted to riparian management licences (public benefit is estimated at $3,400 per frontage per year for an 'average' frontage size) or where a grazing licence was converted to a riparian management licence (public benefit is estimated at $13,500 per frontage per year for an 'average' frontage size) (Aither 2015).

Since 2007 there has been an increased uptake in the use of MBIs for riparian management programs (approach C). Evaluations completed for the North East and Wimmera CMAs (NECMA 2008; Whitten et al. 2014) compared the effectiveness of MBIs in comparison to traditional grants/incentive programs. It was concluded that MBIs in the Wimmera substantially outperformed grants based programs (Whitten et al. 2014), as would be expected where environmental benefits are assessed and the landholders reveal the price they would accept. The North East study was less conclusive. Follow up with people directly involved in these approaches as part of this study is important. Differences in outcomes from the two approaches could not be identified and both programs had a similar proportion of money allocated to program management and implementation. Participants, particularly in River Tender, would have liked more technical support in the bid development process and also more follow up support from CMA staff. Under-bidding for long-term weed control and replacement of fencing in the event of flooding in both approaches was an important issue (NECMA 2008, Race & Curtis 2013), which supports the need for technical assistance in helping landholders identify real costs for long-term maintenance.

Overall there has been limited evaluation of Victorian riparian management programs, but that which has occurred supports that:

- There are considerable differences in approaches undertaken by CMAs leading to likely large differences in overall public benefits and cost-effectiveness of riparian management programs;

- There can be large public benefits from riparian management if stock are excluded from riparian zones;
- Despite considerable use of MBI approaches including River Tender, more traditional cost-share programs continue to be favoured, suggesting that there are significant limitations in complexity or other factors with MBI approaches ;
- Inclusion of realistic assessments of maintenance costs and provision of additional technical support for landholders would appear to be needed to maintain public benefits of riparian management programs.

4.2 Riparian programs elsewhere in Australia

Efforts were made to find and examine documentation on cost-sharing approaches to riparian management programs in other states, with limited success. While riparian programs exist in all Australian states, reports outlining sufficient detail of the approach taken and their evaluation are scant. Appendix G outlines the characteristics of three examples, the Booroowa catchment in NSW, the Reef Rescue Program delivered by the six Queensland NRM regions draining to the Great Barrier Reef, and a community-based approach from South Australia.

The status of the Booroowa example is unclear, and it most closely resembled approach C, albeit most likely without the state-wide approach to Environmental Benefits assessment that exists in Victoria. In the case of the Reef Rescue program in Queensland a standard approach to cost-sharing (most similar to approach A) was applied for a range of land and water management projects, including riparian works, although individual variation has developed in regional implementation. In South Australia, regional NRM Boards (counterparts to Victorian CMAs) are largely focused on provision of strategic planning and technical advice, with almost all current implementation of riparian programs occurring through Australian Government funding (e.g. Biodiversity Fund) through community-based initiatives such as that described for the Goolwa-Wellington Local Action Planning Association.

In New South Wales, the Independent Pricing and Regulatory Tribunal undertook a review (IPART, 2013) to determine a preferred framework for cost-recovery by the newly established Local Land Services (LLS) Boards, for the delivery of a range of functions including natural resource management programs. Like this Discussion Paper, the review provided an overview of cost-sharing literature and developed a number of recommendations for the LLS. It is not clear to what extent this has translated into guiding the design and implementation of riparian management programs in New South Wales.

4.3 Examples from the United States

The United States has a long and well documented history of cost-share programs compared to Australia, three examples of which were examined to inform this review. These are the Maryland Agricultural Cost-Share (MACS) Program, the Maryland Conservation Reserve Enhancement Program (CREP) and the Virginia Agricultural Cost-Share (VACS) Program (Maryland Department of Agriculture n.d.; Maryland Department of Agriculture n.d.; Virginia Department of Conservation and Recreation 2014; Maryland Department of Environment. 2013) . The characteristics of these programs are shown in Appendix H).

The MACS and VACS programs most closely represent an arbitrary percentage-based program (approach A). Desirable features of these two programs include:

- Both are mature and well established;
- There is strong provision of technical assistance and history of funding and monitoring;
- The rules, responsibilities and obligations regarding program participation are clear for participants.

The MACS program is also moderately targeted with the majority of funds to priority watersheds where there is the greatest potential for non-point source pollution from agricultural sources. Grants are also screened for cost-effectiveness (but this will be based on their deemed rates rather than actual costs). The VACS program appears relatively untargeted.

The Maryland CREP program provides the third US example. CREP is a national program which has state variants. CREP provides assistance to landowners for planting streamside buffers, establishing wetlands, protecting highly erodible land, and creating wildlife habitat while providing dependable land rental income. CREP is a voluntary program designed to help farmers to do their part to protect local waterways without hurting their bottom line. CREP offers a one-time signing bonus of up to $250 an acre, extremely attractive annual rental and incentive payments (district rate +200%), one-time incentive payment worth 40% of the total cost of installing certain practices (streamside buffers, wetlands, livestock fencing, watering facilities and other stream protection practices), maintenance payments, easy re-enrolment of expiring contracts, and the option of a permanent easement (Maryland Department of Agriculture n.d.). The Maryland CREP is available over and above the MACS.

Maryland's CREP program doesn't really fit well with any of the four cost-share approaches outlined earlier, although it has some characteristics of approach C in that the incentives offered (very generous land rental rates well above district averages) would be expected to cover opportunity costs, maintenance and transaction costs. It will not minimise public costs however; very high land rental rates and initial payment for participation mean that environmental outcomes will certainly be lower than they could be with a better-designed program which asked for farmers to reveal the minimum payment they would accept.

Given the emphasis on agricultural land in close proximity to water, CREP is likely to achieve larger environmental outcomes than the MACS program. That said the Maryland CREP is still not a highly targeted program in that goals are based on overall acreage enrolled of eligible lands rather than being well defined around particular natural assets.

The overall learnings from the United States programs are that cost-share programs are very well established and there are clear rules for participation, contract management and provisions for compliance inspection and accountability (if farmers don't adhere to agreements there is potential for payments to have to be re-paid). Strong public sector extension support is available to help farmers participate. There are powerful and vested powerful farm lobby interests in the United States and the design of cost-share programs is likely to be influenced by these (voluntary cost-share programs are politically acceptable). There appear to be significant opportunities for much more targeting and better designed programs to achieve environmental outcomes at less cost.

5. Conclusions

Under cost-sharing agreements landholders are paid a portion of the cost of the works by a public authority where a public benefit is derived from the works being undertaken. Approaches that can be used to decide on the public funding contribution include:

A. Costs shared according to an arbitrary percentage, such as 50: 50;
B. Costs shared according to the ratio of private benefits: public benefits;
C. Costs shared so as to minimise the public cost of achieving any particular outcome;
D. Costs shared so as to maximise the public benefits from the program

Approaches C and D are likely to result in better environmental outcomes than A or B. Approach A is viewed as simple to understand, politically acceptable to both landholders and governments and can have relatively low program administration costs, but its achievement of public benefits will usually fall well short of potential.

Differences in approaches by CMAs are likely to result in differences in overall public benefits and cost-effectiveness of programs. Despite MBIs (approach C) having been used by several CMAs for riparian management, traditional cost-share programs continue to be well accepted. MBI approaches are a more defensible and potentially accountable approach to riparian management than more traditional approaches, but there appear to be factors limiting their widespread adoption.

If approaches C and D are viewed as too complex or unacceptable for other reasons, the environmental benefits from a uniform cost-share approach can be enhanced by:

(a) Attempting to identify the lowest uniform cost share that will prompt sufficient participation to achieve the program's goals;
(b) Allowing for appropriately increased cost shares for more beneficial actions; and
(c) Prioritising agreements with landholders that will provide the largest environmental benefits.

6. References

Aither, 2015. *Managing crown frontages under licence. Investigation of costs and benefits to landholders, the Victorian Government and the community A report prepared for the Victorian Department of Environment, Land, Water and Planning (Waterway Health). April 2015*,

Anon, USEPA Cost Share Paper.pdf.

Anonymous, 2015. *WRC Cost sharing Final - Read Sturgess report*,

Arentino, B, Holland, P, Matysek, A and Peterson, D., 2001. *Cost sharing for biodiversity conservation: a conceptual framework*,

Aretino, B. et al., 2001. Cost sharing for biodiversity conservation: a conceptual framework. Productivity Commission.

Branson, J, Arnott C, Cummins, T. and K.J., 2015. *Managing Crown Frontages Under Licence Final STC 5Feb15*,

Craig, R & Roberts, A., 2015. When will governments regulate nonpoint source pollution? *Boston College Environmental Affairs Law Review*, 42, pp.1–64.

Curtis, A; Sample, R; McDonald, S., 2008. *A Comparative Evaluation of the Effectiveness of River Tender*,

DEPI, 2013. *Improving our Waterways. Victorian Waterway Management Strategy. Department of Environment and Primary Industries. Victoria.*,

Doeg, T., 2009. *The "River Benefit Index" for assessing River Tender bids.*,

Hajkowicz, S. & Young, M., 2000. *An Economic Analysis and Cost Sharing Assessment for Dryland Salinity Management*,

Harvey, S., 2005. *Using contracts to mitigate salinity : an analysis of voluntary cost-sharing agreements*,

Lankester, A., Valentine, P. & Cottrell, A., 2009. "The sweeter country": social dimensions to riparian management in the Burdekin rangelands, Queensland. *Australasian Journal of Environmental Management*, 16(2), pp.94–102.

Lichtenberg, E. & Smith-ramirez, R., 2003. *Cost Sharing , Transaction Costs , and Conservation. Department of Agricultural and Resource Economics. University of Maryland.*,

Loo, S., Hopkins, K. & Vollebergh, P., 2009. *Review of the Victorian Catchment Management Authorities' processes for riparian land management and landholder funding allocation. Department of Sustainability and Environment. 2009.*,

Loo, S, Hopkins, K and Vollebergh, P., 2009. *Final Report_Review of CMA riparian mgt and funding_20090826*,

Marshall, G., 1998. Economics of Cost Sharing for Agri-Environmental Conservation. In *42nd Annual Conference of the Australian Agricultural and Resource Economics Society, University of New England, Armidale Australia, 19-21 January, 1998.*

Maryland Department of Agriculture, Conservation has its rewards. CREP. Marylands Conservation Reserve Enhancement Program.

Maryland Department of Agriculture, Stay with CREP. Marylands Conservation Reserve Enhancement Program. Answers to Frequently Asked Questions abou renrolling in CREP.

Maryland Department of Environment., 2013. *Maryland Agricultural Water Quality Cost-Share Program Manual. October 2013.*,

Morris, K. et al., 2014. *Riparian Intervention Monitoring Program Version 1. Arthur Rylah Institute for Environmental Research. Technical Report Series. December 2014*,

NECMA, 2008. A Comparative Evaluation of the Effectiveness of River Tender. Designer Carrots. North East Catchment Management Authority. , (August).

Oliver, I. & Parkes, D., 2003. *A Prototype Toolkit for Scoring the Biodiversity Benefits of Land Use Change. Department of Sustainable Natural Resources, NSW.*,

Pannell, D., 2009. Cost sharing for environmental works. Pannell Discussions. No. 149, 30 March 2009. *Pannell Discussions*. Available at: http://dpannell.fnas.uwa.edu.au/pd/pd0149.htm.

Pannell, D. et al., 2011. Integrated assessment of public investment in land-use change to protect environmental assets in Australia. *Land Use Policy*, 29, pp.377–387.

Pannell, D., 2008. Public benefits, private benefits, and policy intervention for land-use change for environmental benefits. *Land Economics*, 84(2), pp.225–240.

Pannell, D., 2015. *Ranking Environmental Projects. Working Paper 1506. School of Agricultural and Resource Economics. University of Western Australia*,

Park, G. et al., 2013. The quality of resource condition targets in regional natural resource management in Australia. *Australasian Journal of Environmental Management*, 20(May), pp.285–301.

Perez, M., 2014. Regulating farmers: lessons learned from the Delmarva peninsula. *Choices, the magazine for food, farm and resource issues*, 26(3), pp.1–13.

Race, D. & Curtis, A., 2013. Reflections on the Effectiveness of Market-Based Instruments to Secure Long-Term Environmental Gains in Southeast Australia: Understanding Landholders' Experiences. *Society & Natural Resources*, 26(March 2014), pp.1050–1065.

Roberts, A.M. et al., 2012. Agricultural land management strategies to reduce phosphorus loads in the Gippsland Lakes, Australia. *Agricultural Systems*, 106, pp.11–22.

Shimshack, J.P. & Ward, M.B., 2005. Regulator reputation, enforcement, and environmental compliance. *Journal of Environmental Economics and Management*, 50, pp.519–540.

SKM, 2003. *Guidelines for riparian land management: cost-sharing options for riparian management projects. A report prepared for the North East Catchment Management Authority.*,

Virginia Department of Conservation and Recreation, 2014. *Program Year 2015. Virginia Agricultural Cost Share Service (VACS) BMPS. April 24, 2014*,

Watson, A. & Cummins, T., 2012. *Management of crown frontages : Getting the policy settings right.*,

Weersink, A., Mckitrick, R. & Nailor, M., 2001. ß Current. , pp.23–36.

Whitten, S. & Coggan, A., 2010. *Conserving biodiversity through private land managers: integrating adaptive management, economic design and field experience. CSIRO Ecosystem Sciences*,

Whitten, S., Reeson, A. & Langridge, J., 2014. *Evaluation of Wimmera CMA programs : MBIs , Incentives and Group Support*,

PART 4: APPENDICES

Appendix A. User Guide for the Riparian Benefit:Cost Scoring Calculator

Introduction

The Riparian Benefit: Cost Scoring Calculator (the Calculator) has been developed in the course of the project, 'An investigation into cost sharing and funding allocation approaches used in Victorian riparian management programs'.

A key recommendation, outlined in the Final Report for the project is to:

Support the development and adoption of a standardised approach to the estimation of public benefits that result from riparian management projects. Such an approach needs to be theoretically robust and readily applied by CMAs.

To assist with this Natural Decisions have developed the Riparian BCR calculator to demonstrate a robust metric that could be readily used by CMAs to evaluate and rank riparian management projects. Improvements will be possible. In addition to assisting users to estimate the level of public benefits associated with projects, it also integrates a number of other key variables required to assess the relative value for money of projects.

The tool is based on sound economic principles and uses a streamlined form of Benefit: Cost analysis to rank the large numbers of potential projects, and can be applied across Victoria to the diversity of riparian management contexts within which CMAs operate.

This User Guide outlines a series of steps, together with simple instructions and guidance for users. It is augmented by a brief discussion (shown as a text box) of some of the key concepts and theoretical underpinnings of the tool, and suggested further reading. The Calculator is a .xls spreadsheet provided as an attachment to the final project report.

Overview of the Calculator

The Calculator supports an evaluation of riparian management projects in a way that integrates information on asset value, the level of public benefits estimated to arise from proposed project works, landholder adoption, risk of failure and project costs (both upfront and maintenance).

It is designed to enable a rapid assessment of a large number of projects, for example by an expert group, with sufficient knowledge of the principles of riparian management and the assets/projects under consideration.

The Calculator generates a project score which can be used to compare different projects within and between CMA regions if desired. It provides a relative ranking of potential projects, via a Benefit: Cost ratio (BCR).

Project scores are calculated according to the following equation

$$BCR = V \times [W + X + Y + Z] \times L \times (1 - R) / (C + M^{34})$$

The variables that feed into the BCR are:

- V = value of the asset
- W = effectiveness of works
- X = fence set back from the waterway
- Y = whether there is fencing on one or both sides of the waterway
- Z = contribution to connectivity
- L = a measure of landholder compliance.
- R = the risk (a probability) of the project failing to deliver intended outcomes for reasons other than those related to adoption.
- C: the total project cost (public costs only).
- M: the aggregate maintenance cost required following the project over a period of time (e.g. 20 years) (public costs only).

Note: Weightings could be applied to each of the benefits parameters if required, for example, if particular benefit factors were more or less important than others. Variables L and M are optional and can be excluded if:

- (L) Landholder compliance with agreements is regarded as likely not to vary between projects. Alternatively it could be set at 1.0
- (M) CMAs do not contribute on-going maintenance costs in order to maintain benefits. While maintenance costs are the responsibility of the landholder (e.g. weed control, fence repair), there will be other public costs associated with activities such as monitoring, although these may be deemed to be low and essentially equivalent.

Explanatory information on each of these variables is outlined below.

Asset value (V)

This parameter is a score between 0 and 5 that represents an all-things-considered judgement of the significance or importance of the site.

The score is calculated by firstly assigning a value, from 1 to 5 for the river reach in which the site is located; in terms of the values of interest (they may be ecological, social, cultural or economic). Secondly this score is multiplied by a proportion which represents the scale of the site in relation to the overall reach.

For example the reach in which the site is located is of extremely high value and assigned a score of 5. The reach is 10km in length and the project site is 1km.

V = 5 (reach value) x 1 (site length)/10 (reach length) which equates to V = 0.5

[34] For simplicity CMAs may choose not to include the other ongoing public costs associated with monitoring and compliance because of the difficulty of apportioning this cost to individual projects.

Reach value	Descriptor
5	Waterway with extremely important ecological, social and economic values. It may be in near pristine condition, in a relatively undisturbed state or of international importance (for example part of a Ramsar area).
4	Waterway with very important ecological, social and economic values. For example a Heritage River.
3	Waterway with regionally important ecological, social and economic values.
2	Waterway with moderately important values.
1	Waterway with low overall values.

The following parameters, W, X, Y and Z all contribute to the overall public benefits of the project and are therefore additive within the equation. Each parameter can be assigned a weighting (b1, b2, b3, b4) that reflects its relative contribution to the benefits. In the examples provided below W has been given a weighting of 3, with the other parameters given a weighting of 1.

Effectiveness of works (W)

This parameter is a proportion between 0 and 1 that represents the proportional change in condition of the site with and without the project works over a 20 year time period. In estimating *W*, people should consider (amongst other things) the current trajectory of the condition of the river and riparian vegetation without the project. Is it getting better, worse or not changing? How easy will it be to make a sizable difference to river/vegetation condition? In the future the results from the Riparian Intervention Monitoring could be used to inform the assessment of W through the establishment of models of W at a regional scale that could be applied in the assessment of projects.

In the interim an approach using expert judgement could be used based on the following steps to estimate W:

1. What is the current condition relative to the benchmark (best on offer) condition for the reach? E.g. 50% of the condition of the best sites* for that reach, or
2. What will be the condition in 2035, relative to this benchmark, if the project is implemented and maintained? E.g. 75%
3. What would be the condition in 2035 without intervention and assuming the same pattern of land use? E.g. 25%
4. What is the proportional improvement as a result of the project, which is the difference in condition with and without works? E.g.75% - 25% = 0.5

* This could be understood as the benchmark state for the particular reach and may be compared against the best sites within the reach or the condition that any site within the reach could be reasonably expected to reach by 2035.

Improvements will be possible and an expert panel to provide guidance on W assessment would help CMAs and provide the Victorian government with a more sound approach than currently.

Fence set back (X)

This parameter is a proportion between 0 and 1 that represents the width of the riparian zone that will be improved as a result of the project. Typically it will range from 0.2 for a 20 m buffer fence up to a maximum of 1 for a 100 m buffer. To account for regional differences the maximum value set may differ, for example a maximum 30 m buffer may be more realistic in one region, while 100 m may be realistic in another. In each case the value of X would be set as a proportion of the agreed maximum value.

Fencing both sides (Y)

This parameter is a proportion between 0 and 1 that represents whether the project will result in fencing on one or both sides of a waterway, with possible values of 0.5 for fencing on one side only or 1 for fencing on both sides. The level of public benefits is expected to be highly correlated to this factor.

Contribution to connectivity (Z)

Improving longitudinal riparian connectivity, in terms of native vegetation and aquatic features is a key objective of riparian management projects. This parameter is a proportion between 0 and 1 that represents the relative contribution of the project to connectivity. As a guide projects that make a low contribution (e.g. an isolated site within a disconnected landscape) are given a score of 0.33, a moderate contribution a score of 0.67 and a high contribution a score of 1.

These categorical values can be varied as required.

Landholder compliance (L)

This parameter is a proportion between 0 and 1 and represents the probability that a contract is not honoured. As a guide where there are legally binding contracts attached to land title (e.g. a covenant) a score of 1 is assigned. For all other riparian management contracts a default score of 0.8 is assigned, unless there is a compelling reason to vary this based on knowledge of factors such as likelihood of landholder's non-compliance with standard conditions (e.g. a landholder with a known poor 'track record' (suggested score of 0.5) or areas with predicted high ownership turnover (score of 0.6).

Risk of failure (R)

There are many reasons why projects may fail to deliver the expected benefits associated with riparian management works. This parameter is a proportion between 0 and 1 that represents the risk (a probability) of the project failing to deliver intended outcomes for reasons other than those related to adoption Typically these are technical risks associated with management actions that are implemented but don't work because something fails, or newly planted vegetation dies, or there was a miscalculation when designing the actions, or there is some sort of natural event that makes the actions ineffective.

To estimate the score for this parameter we recommend that first the various sources of risk to project success are identified, that is factors that may reduce the ability of the project to deliver the

expected benefits. Then, make an 'all things considered' judgment of the probability of these risks according to the following categorical options.

- ○ 0-5% Very low risk of project failure for any of the specified factors (P = 0.97)
- ○ 6-25% (P = 0.85)
- ○ 26-50% (P = 0.62)
- ○ 51-75% (P = 0.37)
- ◉ 76-100% Very high risk of long-term project failure for any of the specified factors. (P = 0.12)

These categorical default values can be varied at the discretion of the user.

Direct public costs (C)

This parameter is a $ value that represents the direct funding / public costs associated with the delivery of a project. Ideally it would include the landholder incentive, together with any transaction costs incurred by the CMA in implementing the project, for example, landholder negotiation, site assessment, extension advice etc.

In the interests of simplicity it is recommended that only the direct costs for the works incurred by the CMA be included. This would either be the incentive/grant payment to landholders under grants/incentives model or the cost of materials/contractors that are borne by the CMA under a direct works model.

Maintenance costs (M)

This parameter is also a $ value and is the public cost of maintenance. It could include a contribution from the CMA to ongoing maintenance, and monitoring and enforcement of the landholder's contracted activities. For most riparian agreements it is the responsibility of the landholder to bear all ongoing maintenance costs, however there is also the CMAs monitoring and compliance costs to consider in this variable. For simplicity CMAs may choose not to include the other ongoing public costs associated with monitoring and compliance because of the difficulty of apportioning this cost to individual projects.

Case Study examples

Two sets of case studies are provided.

1. Four adjoining projects along a waterway in one CMA region, where the project works are essentially identical, but the land use and landholder orientations are quite different.
2. Four different projects, with a variety of land uses, on-ground activities, riparian values and landholder orientations.

Case Study Examples – Set 1 (Adjoining projects along a waterway)

These four sites involve different, adjacent landholders and all involve 1km of fencing on one side, (the other side is assumed to be already fenced), with a 20m setback and revegetation with tubestock. A brief description of each landholder is provided below.

- Landholder A raises cattle and is commercially oriented.
- Landholder B is a cropping farmer with some sheep grazing and is commercially oriented.
- Landholder C is a lifestyle 'farmer' with some opportunistic cropping and mixed grazing.
- Landholder D is a lifestyle landholder with a strong nature conservation orientation (no livestock).

The projects are depicted in Table 1 below. This describes the condition change (from 2015 to 2050) at each site with and without the project works. Note that W has been calculated on the proportional difference after 20 years at 2035.

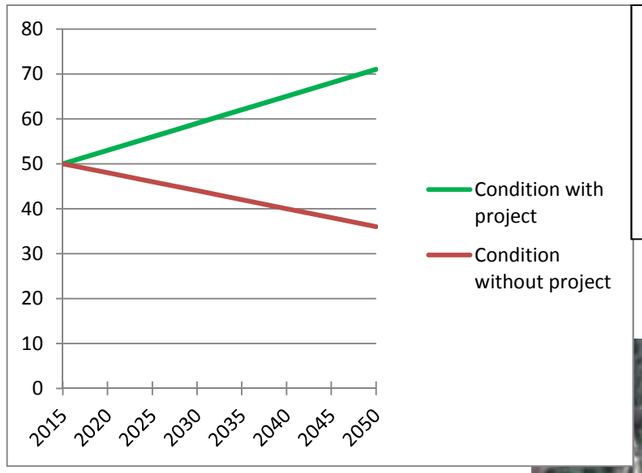
The BCR results are outlined in Table 1 below.

Table 1. BCR results for Case Study 1

Parameter	Possible values/units	Project A	Project B	Project C	Project D
Reach value	***0 - 5***	3	3	3	3
Reach length	***km***	10	10	10	10
Project length	***km***	1	1	1	1
Asset value (V)	***0 - 5***	0.3	0.3	0.3	0.3
Effectiveness of works (W)	***0 - 1***	0.2	0.16	0.12	0.04
Fence set back (X)	***0 - 1***	0.2	0.2	0.2	0.2
Fence both sides (Y)	***0 - 1***	1	1	1	1
Contribution to connectivity (Z)	***0 - 1***	0.67	0.67	0.67	0.67
Landholder compliance (L)	***0 - 1***	0.8	0.8	0.8	0.8
Risk of failure (R)	***0 - 1***	0.2	0.2	0.2	0.2
Up-front costs (C)	***$***	6000	6000	6000	6000
Maintenance costs (M)	***$***	0	0	0	0
Benefit: Cost Ratio		0.79	0.75	0.71	0.64

While each project looks superficially similar the BCRs vary as a result of predicted variation in the impact of works (W) that results from the effects of landholder value orientation, land use and land management.

The highest ranked projects involve the commercially oriented landholders The W value is higher in this example because without the project a higher and ongoing loss of condition is predicted to occur as a result of grazing activities than the situation where there are no livestock.

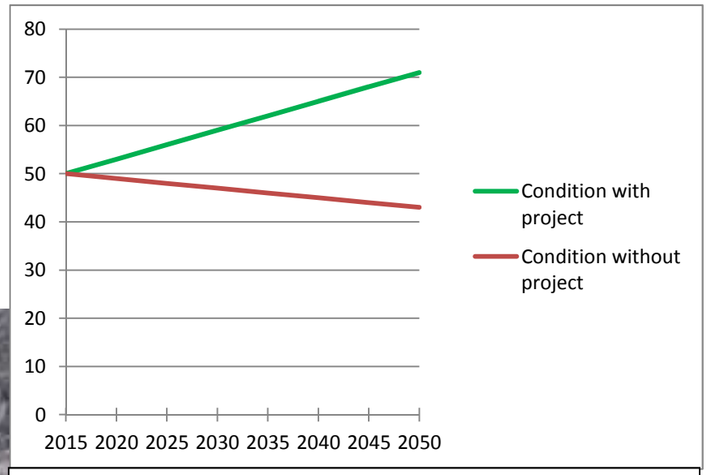


Landholder A – Cattle Grazing

This case has the greatest decline in condition without the project as a result of high and continuous grazing pressure.

W = 0.20

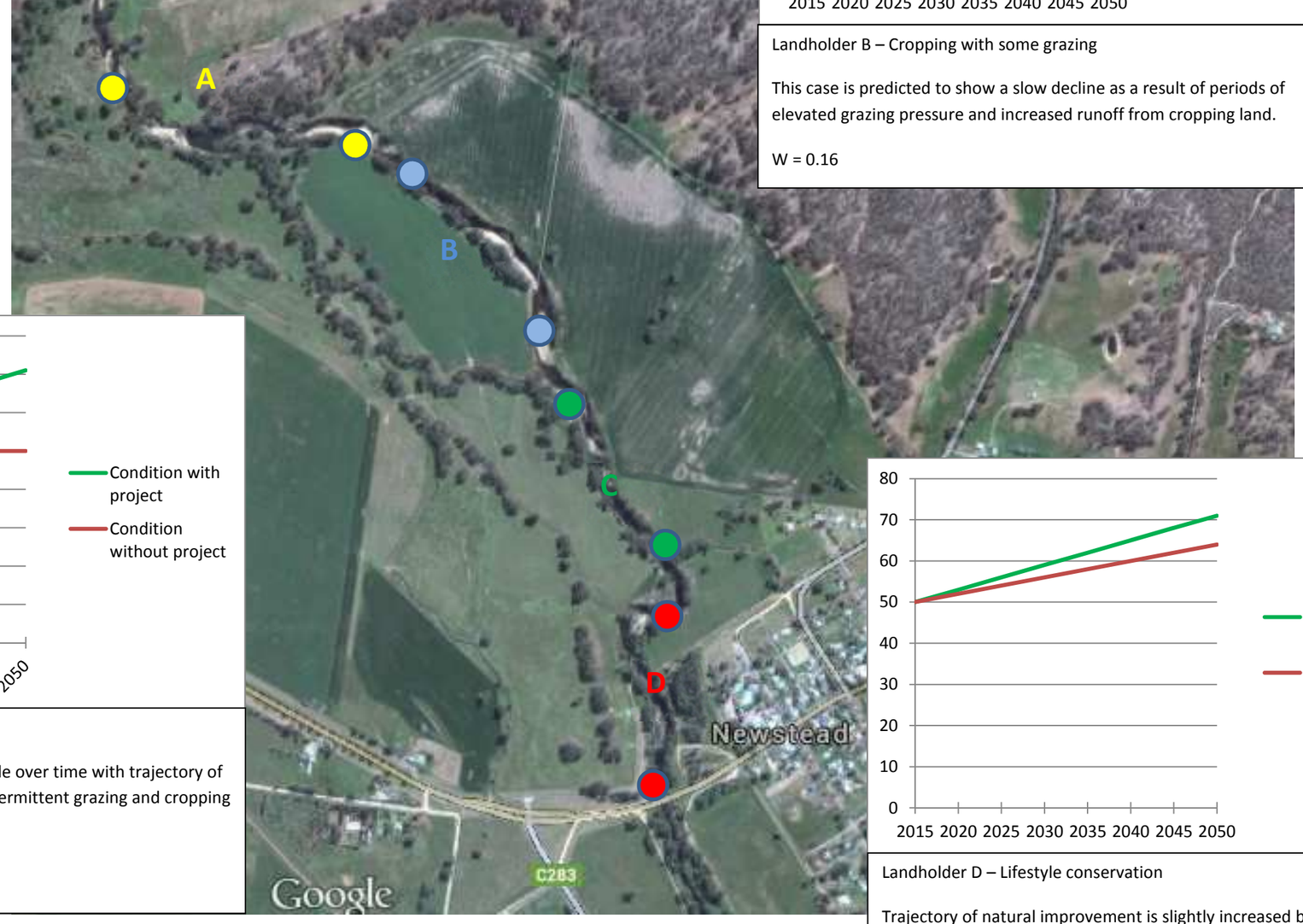
Figure 1. Case study examples (set 1)

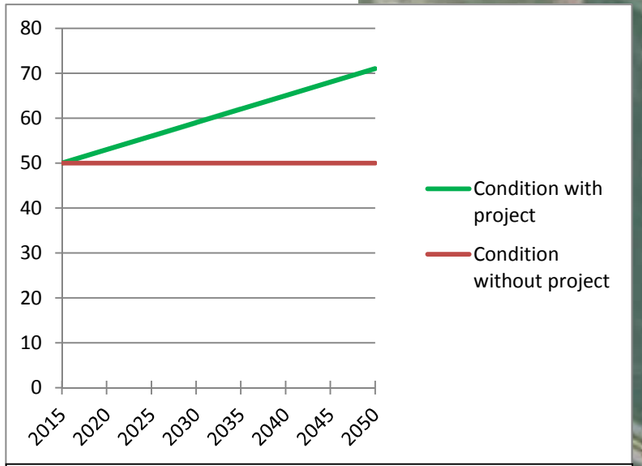


Landholder B – Cropping with some grazing

This case is predicted to show a slow decline as a result of periods of elevated grazing pressure and increased runoff from cropping land.

W = 0.16





Landholder C – Lifestyle farming

This case is predicted to remain stable over time with trajectory of natural improvement reduced by intermittent grazing and cropping impacts.

W = 0.12

Landholder D – Lifestyle conservation

Trajectory of natural improvement is slightly increased by additional revegetation activity.

W = 0.04

Case Study Examples - Set 2 (Variety of contexts)

Project A

Site located in priority reach, in a high rainfall area in an undulating catchment adjacent, the landuse is dairy. The reach is upstream of a highly valued estuary reach. The site itself is in poor condition with only a few scattered remnant trees and heavily infested with willows and blackberry. There is minor bank erosion associated with blockages caused by willows. The site length is 1 km and proposed fence set back is 10 m, upstream site has been fenced and revegetated and site opposite has been signed up for works. Landholder has been directly targeted by the CMA because the site is in strategic location to build on past works; the landholder has been reluctant to participate but has signed on because of the opposite neighbour.

The cost of work is high due to the fencing requirements, extensive revegetation and need for significant off-stream watering infrastructure.

Project B

Site is located in a priority reach in a floodplain zone. There is extensive remnant overstorey and some recruitment of understory species from flooding in recent years, the site could be considered to be in moderate condition, the reach itself is highly valued as it supports a rare fish species and is a target for environmental water delivery. The property has been in the family for a long time and has been grazed with beef cattle; the landholder has submitted an EOI through an annual process in response to an ad in the paper. The site length is 2 km and proposed set back is 30 m but the other side of the waterway is not fenced and nor is the downstream site (the upstream site is). Work will include fencing, minor weed control and a small amount of supplementary planting. Off-stream watering is also required.

Project C

Site is located in a priority reach adjacent to a national park. The site is owned by lifestyle property owners who do not permanently reside on the land. The site is in moderate condition with minor weed infestations, the site is less than 500 m in length but fence setback is 50 m. The landholders currently lease the land to a neighbouring farmer, who has temporary electric fencing in place to keep stock out of the waterway. Works include fencing and weed control and revegetation.

Project D

Site is located on a mixed cropping and grazing enterprise. In the last five years the site has not been grazed as the property has moved to predominately cropping. There is some remnant vegetation and recruitment of native vegetation following floods however there is also bank instability and sedimentation from upstream sources, it would generally be described in poor-moderate condition. The site is located in a strategic location as the neighbouring downstream properties for 5 km have all been fenced. Works include fencing and weed control and direct seeding. No off-stream watering is required; fence set back is proposed to be 20 m.

The BCR results are outlined in Table 2 below.

Table 2. BCR results for Case Study Set 2

Parameter	Possible values/units	Project A	Project B	Project C	Project D
Reach value	***0 - 5***	3	4	5	2
Reach length	***km***	10	10	10	10
Project length	***km***	1	2	0.5	1
Asset value (V)	***0 - 5***	0.3	0.8	0.25	0.2
Effectiveness of works (W)	***0 - 1***	0.2	0.2	0.1	0.2
Fence set back (X)	***0 - 1***	0.1	0.3	0.5	0.2
Fence both sides (Y)	***0 - 1***	1	0.5	1	1
Contribution to connectivity (Z)	***0 - 1***	1	0.67	1	1
Adoption or compliance (A)	***0 - 1***	0.8	0.8	0.8	0.8
Risk of failure (R)	***0 - 1***	0.4	0.2	0.3	0.3
Up-front costs (C)	***$***	12000	20000	3000	6000
Maintenance costs (M)	***$***	0	0	0	0
Benefit: Cost Ratio		0.32	0.53	1.31	0.52

In this case study project C (lifestyle landholder adjacent to national park) has the highest BCR, driven by a combination of factors including asset value and fence set back, and despite the relatively low effectiveness of works this has been offset by the low cost. Project A has the lowest BCR, driven largely by the lack of fence set back. In fact Project A could have arguably been assessed as ineligible under the current VWMS arrangements because of lack of average fence set-back of 20 m. Further discussion is likely to be needed (and potentially increased public costs due to the opportunity cost of taking dairy land out of production) if dairy participation at high levels is sought in riparian programs.

Appendix B. Online Survey Questions

Final Version: Investigation into riparian cost sharing with landholders (CMAs & MW Survey)

Natural Decisions has been engaged by DELWP to complete the project

"**An investigation of cost sharing and funding allocation approaches used in Victorian riparian management programs**".

The project is exploring what CMAs and Melbourne Water are currently doing in regards to cost sharing and identifying options to help CMAs/Melbourne Water consider improved cost-sharing approaches.

As part of the project we have developed a survey to collect information about your region's approach to cost sharing.

The survey has 19 questions and should take between 15 and 25 minutes.

We would encourage each region to circulate this survey to staff members involved in riparian programs, as it will help improve the quality of the findings and recommendations from the project.

Please complete the survey by Wednesday the 29th April.

Following the survey we will be meeting with each CMA / Melbourne Water to discuss in more detail the issues around cost sharing and funding allocation processes.

If you have any queries or issues when completing the survey please contact Michelle Dickson, michelle.dickson@naturaldecisions.com.au 0408378099.

1. **Please provide your contact details**

Name
CMA /Region
Email Address
Phone Number

2. **What is your role in relation to the management of riparian programs?**

(select as many choices as are applicable)

- Responsible for site visits and negotiations/discussion with landholders
- responsible for coordinating delivery of riparian works
- responsible for planning and/or reporting on riparian works
- responsible for overall management of waterway /riparian programs

Other (*please specify*)

3. **What delivery mechanism/s does your CMA currently use for its riparian works program?**

(select as many choices as are applicable)

- Devolved grants / incentives
- Market Based Instrument / tender
- Direct works using contractors

Other (please specify)

If you selected more than one please explain why more than one is used (e.g. different geographic areas, different funding etc)

4. **What types of costs are considered when determining the level of funding / cost share between landholders and the CMA for riparian works?**

(select as many choices as are applicable)

- Upfront costs of material
- Upfront costs of labour (or contractors)
- Long term (>2 years) maintenance costs for weeds, fences and revegetation
- Opportunity costs (e.g. landholder loss of access to frontage or use of productive freehold land)
- Transaction costs of the landholder (e.g. time to participate in negotiations, site visits etc.)
- Transaction costs of the CMA (e.g. program administration, assessment of grants, site visits, monitoring etc.)

Please provide details of other costs included in arrangements with landholders if relevant.

5. **Which of the following activities does your riparian program fund as part of cost sharing with landholders?**

(select as many choices as are applicable)

- Fencing materials
- Fencing labour or contractors
- Revegetation materials (tubestock, seed, guards)
- Revegetation labour or contractors
- Initial weed control materials
- Initial weed control labour or contractors
- Site preparation
- Long term (> 2 years) management of weeds
- Long term (>2 years) maintenance of revegetation
- Off-stream watering
- All of the above

Other (please specify)

6. **What approaches do you use for determining the funding allocation /cost share with landholders for riparian works?**

(Note: component means one part of the overall project such as fencing or revegetation or weed control)

- CMA offers a flat rate or % for each component of the upfront costs of the project (same rates offered for all sites).
- CMA offers variable rate or % for each component of upfront costs based on a set of criteria (higher rates based on site value, condition, width of fenced area etc.).
- CMA negotiates cost share with individuals on a site by site basis.
- CMA uses a tender process to determine funding allocation /cost share.
- CMA pays for 100% of the upfront costs for materials and labour for all components of the project.
- CMA pays for 100% of the upfront costs for some components of the project with landholder contribution to other components.

Other (please specify)

7. **What are the main factors that have influenced how the rates, or % cost shares have been decided on:**

(select as many choices as are applicable)

- To encourage landholders to have long term ownership of the works.
- To maximise participation in particular priority areas
- To meet a target.
- To ensure equity between landholders.
- To ensure works are completed to an appropriate standard.
- To recognise the public benefit of the works.
- To recognise the costs to landholders to participate in the works.
- To ensure a consistent approach (across the region, across years, between sites).
- To reduce complexity in the program administration and delivery.
- To maximise the outputs achieved from a given budget.

Other (please specify)

8. **What is the annual process for prioritising and allocating funds for riparian works on a site by site basis?**

9. **Are overall environmental benefits and value for money considered in this process? If so how?**

10. **Riparian projects incur costs for landholders and also have the potential to provide private benefits (shade and shelter for stock, livestock management) . Are these benefits taken into account when assessing potential projects?**

Yes
No
If yes, please describe what sort of private benefits you consider?

11. **Does the funding allocation process (including the level of funding or cost share) differ between private land and Crown frontage and licensed and unlicensed frontages?**

Yes
No

If yes, please provide a brief explanation of the differences.

12. **Does the funding allocation process (including the level of funding or cost share) differ for flood or bushfire recovery sites?**

Yes
No

If yes, how is it different? Why is it different?

13. **What are the minimum criteria in order for works to be eligible for funding?**

- Site is located in a priority reach identified in the Regional Waterway Strategy
- Site is in a particular condition (assessed through some scoring system)
- Proposed fence must be set back a minimum distance from top of bank
- Landholder is required to provide input as either money invested and/or labour/ time (i.e. for upfront works or long term management of weeds and fences)
- Site provides connectivity with remnant vegetation or other fenced riparian areas
- Both sides of the waterway must be fenced
- Other (please specify)

14. **Does the CMA have standards and guidelines for the completion of riparian work? If so, what are they?**

15. **What are the main outcomes the CMA is aiming for when undertaking riparian works?**

16. **Are these outcomes measured?**

- Yes
- No

If Yes, how is this done? (please provide some brief details)

17. **Does the CMA measure the success of the riparian program?**

- Yes
- No

If yes, how? (level of uptake, value for money invested, follow-up inspection, level of adherence to agreement conditions, formal evaluation) Please provide some brief details

18. **Overall what do you see as being the main advantages of the CMA's current approach to funding and cost sharing with landholders for riparian works? (including delivery mechanism, process for allocating funds and level of funding /cost share).**

19. **Are there areas of the CMA's current approach to funding and cost sharing with landholders for riparian works that you believe could be improved? If so please briefly describe these.**

Appendix C. CMA and Melbourne Water participants in riparian cost sharing investigation

Region	Survey respondents	Interview participants
NECMA	Rebecca Damm Glen McCallum Greta Quinlivan Michael Broughton Natalie Dando	Simon Feillafe Anthony Wilson Rebecca Damm Glen McCallum Greta Quinlivan Michael Broughton Natalie Dando
GBCMA	Mark Turner Geoff Brennan Kirsten Roszak Corey Wilson	Mark Turner Kirsten Roszak Christine Glassford
NCCMA	Angela Gladman	Angela Gladman Emma Wolters Lang Dowdell Anthony Sloan
WGCMA	Dan Cook Rod Johnston Richard Allen Dan Garlick Matt Bowler	Dan Cook Rod Johnston Richard Allen Dan Garlick Matt Bowler
EGCMA	Becky Hemming Clint Bain	Ken Judd Clint Bain
Melbourne Water	Joanne Thom Michelle Ezzy Gavin Brock	Joanne Thom Gavin Brock
CCMA	Denis Lovric Donna Smithyman Wayne Mclaren Nick McCristal	Denis Lovric Nick McCristal (phone follow up) Trent Wallis (phone follow up)
GHCMA	Adam Bester Helen Arundel	Adam Bester Helen Arundel David Nichol
WCMA	Luke Austin	Luke Austin Kristy Dicker
MCMA	Peter Kelly	Peter Kelly Louise Chapman

Appendix D. Areas of focus for investigation and report structure

The table below sets out the areas of focus for the investigation and the relevant section in the report.

(Excerpt from DEPI 2014. Project Brief. An investigation of cost sharing and funding allocation approaches used in Victorian riparian management programs. Unpublished document).

Question to be addressed by investigation	**Section in report**
Describe current approaches for allocating funds for riparian management activities used by CMAs:	
Describe and document them, including any funding rules or matrices used.	Part 2 - Section 3.2
Describe each CMA's rationale for their approach.	Part 2 - Section 2.1 and 4
What are the local drivers that have shaped the approach?	Part 2 - Section 2 and 3 and Section 4
What are their advantages and disadvantages?	Part 2 - Section 2.6
Do any involve scoring the condition of the site? If so, what approaches do they use? How is the score used in apportioning cost-sharing?	Part 2 - Section 3.1
Describe and document any criteria (and the process / formula involved) used by CMAs to provide different cost-shares (vs. a straight, say, 50:50 split under all circumstances)? Looked at another way, what can the landholder do to effect the level of cost-share? For example, it is understood that some CMAs use criteria such as whether the site is on a priority stream, the width proposed to be protected, etc.	Part 2 - Section 3.2
Are some approaches more applicable with different types of farmers, different landscapes, etc.?	Part 2 - Section 7.3
Do CMAs' current approaches meet the three criteria in the Strategy (i.e. priority, level of public benefit of the work and the level of security of the agreement)?	Part 2 - Section 6.2
If it is the case that more CMAs currently fund 100% of the up-front costs, examine the reasons for the change from their previous cost-sharing approaches (as documented in Loo et al 2009).	Part 2- Section 3.2
Is there a history of grants being over- or under-subscribed which has shaped CMAs' approaches?	Part 2 - Section 4.3
CMAs typically only focus on priority reaches to fund works. Should there be mechanisms to determine priorities for funding *within* these reaches? Should a condition assessment score be used to determine the priority of one site compared to another? Are such mechanisms already in place and used by any CMAs?	Part 2 - Section 7.3
Tenders place a higher priority on a project if it takes out some sort of conservation covenant or LMCA. Do any grants offered by CMAs pay higher rates for such agreements? Are any taken up?	Part 2 - Section 4.4
Should we use a 'River Tender like' metric to score riparian project sites and proposed actions to assess the net benefit of the proposed works at the site and use this to guide cost-sharing? What could such a metric look like?	Part 1 – Section 4.3 Part 2 - Section 7.3

Question to be addressed by investigation	**Section in report**
Are some cost sharing approaches more effective at achieving landholder commitment to the long term management of project sites? For example, it is often said that if a landholder does not pay any of the cost upfront, they will lack ownership of the project and may not manage the site in the long term.	Part 2 - Section 4.3
Are there simple and easy to understand factors which are best to use to help shape a cost-share approach which could take account of the Strategy's three criteria (i.e. priority of the riparian management activities, level of public benefit of the work and the level of security of the agreement)? For example, some CMAs use the width of riparian land fenced to alter the cost-share between landholder and CMA (Loo et al 2009).	Part 2 - Section 7.3
Consider the development of a decision matrix or similar (not guidelines) to assist CMAs in designing a particular cost-share program in a given landscape/community context.	Part 1 – Section 4.3.4 Part 2 - Section 8
What are the relative costs and effort to CMAs to implement different approaches? Should this be a factor in determining the approach (e.g. the 2003 guidelines were seen as too difficult to implement)?	Not clear from the investigation.
Another Strategy action is to investigate long term resourcing for managing fenced riparian areas, i.e. largely weed and pest animal management in the fenced area. If resources were to be provided to landholders for long term management of fenced riparian areas, would this affect the up-front cost-share? In what way?	Part 2 - Section 7.3
What possible methods could be "built in" to the implementation of these programs which would assist with monitoring and evaluation of the different approaches to support future adaptive management?	Part 2 - Section 7.3
The report should also take into account the findings of the current project examining the costs and benefits of managing Crown frontages under licence and an earlier cost-benefit project by Cummins and Associates (2012).	Part 2 - Section 7.3

Appendix E. Advantages and potential improvements to current approaches reported by CMAs

Region	Advantages of current approach to funding and cost sharing with landholders	Potential improvements to current approach to funding and cost sharing with landholders.
North East CMA	Grants/incentives approach has improved cost sharing with landholders (landholders making a greater contribution), resulting in landholders having more ownership of the site. The approach has opened up the process to interested landholders across the region. The cost for the NECMA to deliver works under a grants/incentives program is lower, however it was noted that when you include quality control, support to the landholder and follow up to ensure the works are consistent with what was approved the cost difference is not great.	A review of the first year of the program will assist to identify opportunities for improvement including: targeting to create connectivity, more support to landholders to build their capacity to manage the sites, improvements to scoring/assessment of site. It will be important to find a way so that CMA is not competing with other NRM agencies in the region when trying to deliver NRM projects. The length of programs (i.e.. short term funding) is problematic when trying to achieve outcomes at a reach based scale and frustrating for the community. The community dislikes change in approaches. There is a potential issue of the same landholders repeatedly applying for incentives. This is particularly evident where large landholders have large holdings and have plenty of scope to participate. Spatial output mapping now provides a strong record basis to stop landholders from applying for new works at previously funded sites. Grants / incentives approach could mean that there are less demonstrable outcomes at the reach scale and less community buy in and understanding of outcomes than compared with the direct works approach. CMA staff noted that it also isn't clear if the quality of works (fences, revegetation etc.) may be impacted under the incentives approach. An increased effort on increasing support to landholders to build capacity for long term maintenance may be required,
Goulburn Broken CMA	Quality control achieved through the current approach (grants/incentives) was noted as being an advantage over previous approaches. There are a few factors in this including, landholders are responsible for the fence and so have some ownership, payment occurs after completion and inspection. CMA manages weed control and revegetation as part of initial works and the ability to do this is an incentive for landholders to participate Flexibility of the current approach allows staff to leverage support where they can. This relies on having experienced staff with a good knowledge of waterways and negotiations /engagement with landholders	Long term maintenance of works and landholder stewardship is a concern. Still need to determine what is the best 'rate' to entice landholders to agree to riparian program Increased effort from DELWP in regards to compliance is required (issues such as licensing, illegal works, native vegetation clearing). Pressure to get funding spent in a twelve month period, being limited to priority waterways and having a reduced number of interested landholders in these areas (due to the long history of works in the priorities) sometimes drives works to be completed in a way which is less efficient

Region	Advantages of current approach to funding and cost sharing with landholders	Potential improvements to current approach to funding and cost sharing with landholders.
	The approach has increased emphasis on engagement and consultation than previously. Landholders are much clearer about the responsibilities. Long term maintenance by landholders was seen as an issue particularly where willow regrowth had occurred. Consistency in approach was noted by as being an important factor in the current approach for landholder understanding and buy in.	than could occur if there were longer time frames and if a greater number of waterways were eligible. There is interest in trialling other delivery approaches that may result in better uptake (or uptake by different landholders) in priority areas (tenders, stewardship payments etc)
Corangamite CMA	Cost sharing with landholders (for fencing) is an important aspect. Because landholder makes a contribution they are more likely to view it and manage it is as their own asset. Approach considers the landholder contribution and this is an important aspect for longer term management of the site (landholders who are willing to make a contribution up front are more likely to look after the site in the longer term). Flexibility of approach ability to cater for a wide range of scenarios and ability to build capacity with partners.	Increased site visits, monitoring, auditing and enforcing of compliance with agreements. Quality of works could be improved, current partnership arrangements may be a contribution to this issue. Increased consistency across the state but with the flexibility to have different approaches.
East Gippsland CMA	The grants/ incentives model encourages a transfer of ownership to the landholder and partnership emphasis with the landholder, whereas in the past in has all been CMA works. Level of grant funding is aimed to be proportional to the area of frontage being protected. Allocation of funding is very transparent, with the majority of funds directed to priority waterways. Landholder satisfaction has increased substantially since EGCMA has shifted from directly completing the weed control to providing a financial grant to landholders to complete the work. They have also stopped complaining about the quality of the work (because they are now responsible for it)	Concerned that weed control and ongoing maintenance (of fences and weeds) will not be undertaken by landholders due to financial constraints, capacity and lack of interest.
Glenelg Hopkins CMA	Flexibility of delivery mechanisms is important to target different landholders, landscapes and assets. Waterway Action Planning and variable rates assists with landholder participation in priority areas. Cost sharing arrangements (with higher landholder contribution) enables more works to be delivered as funding goes further and landholder is more willing to maintain works. It was noted that there is a trade off with quality of works that are completed by landholders compared with those managed by the CMA.	Greater use of stewardships and less reliance on tenders. Increased emphasis (and funding) for the CMA to monitoring and engagement with landholders. Alternative delivery mechanisms for revegetation components of projects. Maintenance of wetland stewardship projects – what to do when the $ run out with current agreements. Better incorporation of indigenous cultural values into revegetation projects/could engage with indigenous communities. In some cases riparian projects are being funded but elsewhere on the property there is loss of

Region	Advantages of current approach to funding and cost sharing with landholders	Potential improvements to current approach to funding and cost sharing with landholders.
		habitat structure from other activities (e.g. timber removal, stone removal). Looking at ways to incorporate this structure into riparian projects (perhaps through an incentive?)
North Central CMA	Direct works approach enables a high standard of works to be completed. The approach is fair and has been working well with no negative feedback from landholders.	A variable rate could be offered based on quality of remnant and width of proposed riparian area to be protected as a sliding cost share scale. A landholder contribution (in terms of $ or time) to the upfront works was noted as potentially being desirable. Concerns were raised however about the impact of this on participation rates. Concerns were raised around landholders taking on long term maintenance of sites. One solution would be to require landholders to attend a compulsory riparian management field day. It would also be good to understand what additional activities/works landholders have done as a result of participating in projects. Off-stream watering is an area that could be examined to improve the cost effectiveness and therefore attractiveness of this offer. Matrix/scoring systems need to consider the skills and resources of the landholder.
Wimmera CMA	The current approach (grants/incentives) delivers value for money outcomes and is comparable with other delivery mechanisms the CMA use to deliver other projects	Continue to review delivery mechanisms to ensure they achieve the outcomes. In the short term WCMA have not identified any significant changes required.
Mallee CMA	The current approach (grants/incentives) results in CMA working with the willing and interested landholders. This means there are less problems in the longer term with compliance and maintenance of outcomes. Engagement with landholders through the approach means they feel supported to undertake works and long term maintenance.	Long distances to sites means that the ability to undertake follow up site visits is difficult. Ephemeral nature of many of the waterways and large areas of frontage means that having more flexible approaches to fencing and management of the frontage (including standards around construction and control grazing) is required.
West Gippsland CMA	The approach enables works to be consistently completed to a high standard. Works can be delivered in line with seasonal conditions and other commitments. Contribution by landholders to cost of plants is fair; ensures their input and management of site Ongoing and new willow control is always completed by CMA to protect the investment	With additional funding, could consider an additional delivery mechanism i.e.. devolved grants or incentives for lower priority waterways which would involve a lower % CMA contribution. Increased monitoring of sites /engagement with landholders longer term to ensure outcomes are being maintained. Could consider broadening areas for works and/ or base site selection on landholder support as well as priorities as will result in better long term outcomes.

Region	Advantages of current approach to funding and cost sharing with landholders	Potential improvements to current approach to funding and cost sharing with landholders.
Melbourne Water	Clear and consistent approach that landholders understand. Cost sharing with landholders is more cost effective (than direct works). Ongoing nature of funding enables longer term projects and relationship to be established. Use of assessors and annual audit process provide increased support for landholders.	Review of incentive rates to ensure they are encouraging desired outcomes. Option to investigate variable rates based on priority areas or stewardship payments over several years. Streamlining of audit process could reduce resourcing and costs i.e. through submission of photographs and report.

Appendix F. Summary of Victorian approaches to cost sharing and funding allocation for riparian management programs

Topic / Question	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
Primary delivery mechanism for riparian program **(Refer to Part 2 section 2.1)**	Devolved grants / incentives	Devolved grants / incentives	Direct works using contractors	Direct works using contractors	Devolved grants / incentives	Devolved grants / incentives Direct works using contractors	Devolved grants / incentives	Devolved grants / incentives	Devolved grants / incentives	Direct works using contractors (SLA with public land manager)
Secondary / other delivery mechanisms for riparian program **(Refer to Part 2 section 2.1)**	Direct works using contractors Tender / MBI (past program)	Direct works using contractors	Devolved grants / incentives Tender /MBI (past program)		Direct works using contractors	Tender /MBI	Tender / MBI	Direct works using contractors Tender / MBI	Tender / MBI (past program)	Devolved grants / incentives
Annual process to secure participation in riparian program **(Refer to Part 2 section 2.2)**	Annual expression of interest and ….?	Expression of interest and proactive engagement with landholders	Expression of interest and proactive engagement with landholders	Expression of interest and proactive engagement with landholders	Expression of interest and proactive engagement with landholders	Expression of interest – applications accepted all year.	Annual expression of interest	Annual expression of interest	Annual expression of interest	Expression of interest and proactive engagement with landholders
Types of incentives and rules used to funding allocation / cost share **(Refer to Part 2 section 2.4)**	Flat rates. Variable rates or % based on criteria or rules (for weed control).	Variable rates (for fencing) Fully fund some activities	Fully fund some activities and flat rates (landholder contribution to off stream watering)	Fully fund some activities (landholder contribution to revegetation and off stream watering)	Variable rates (for fencing control) Flat rates Fully fund some activities (revegetation)	Variable rates (for fencing) Flat rates Negotiate on a site by site basis	Variable rates Flat rates	Variable rates (for fencing and off stream watering) Flat rates	Flat rates Fully fund some components (revegetation)	Negotiate on a site by site basis
Consideration of environmental/public benefits **(Refer to Part 2 section 6.1)**	Assessed as part of project ranking	Assessed to determine project suitability and to determine variable rate.	Not formally assessed	Not formally assessed	Assessed to determine project suitability and to determine variable rate.	Assessed to determine project suitability and to determine variable rate.	Assessed as part of project ranking and to determine variable rate.	Assessed as part of project ranking and to determine variable rate.	Assessed as part of project ranking	Assessed as part of project ranking
Consideration of value for money **(Refer to Part 2 section 6.1)**	Assessed as part of project ranking	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed	Assessed as part of project ranking	Not formally assessed	Not formally assessed	Not formally assessed
Consideration of private benefits **(Refer to Part 2 section 6.1)**	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed	Not formally assessed
Minimum criteria for funding *Criterion scored and used for ranking projects or to inform variable rate rather than minimum requirement										
Site is located in a priority reach identified in the Regional Waterway Strategy	✓*	✓	✓	✓	✓		✓	✓*	✓	✓
Site is in a particular condition (assessed through some scoring system)	✓*	✓*			✓*		✓*	✓*	✓*	

Topic / Question	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
Proposed fence must be set back a minimum distance from top of bank	✓	✓	✓	✓	✓		✓	✓	✓	✓
Landholder is required to provide input required in terms of money invested or labour/ time	✓	✓	✓	✓	✓		✓	✓	✓	
Site provides connectivity with remnant vegetation or other fenced riparian areas	✓*				✓*		✓*	✓*	✓*	
Both sides of the waterway must be fenced	✓			✓			✓*		✓*	✓
Land subject to Crown licence must be converted to Riparian Licence or equivalent. Unlicensed Crown Land must be willing to enter into a management licence to be eligible for funding.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Applicant signs a legally binding management agreement	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Topic / Question	**North East CMA**	**Goulburn Broken CMA**	**North Central CMA**	**West Gippsland CMA**	**East Gippsland CMA**	**Melbourne Water**	**Corangamite CMA**	**Glenelg Hopkins CMA**	**Wimmera CMA**	**Mallee CMA**
Activities funded ***** Activity eligible for funding only under certain circumstances **Refer to Part 2 section 2.3)**										
Fencing materials	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fencing labour or contractors	×	✓	✓	✓	✓	✓	×	✓	×	✓
Revegetation materials	✓	✓	✓	✓*	✓	✓	✓	✓	✓	✓
Revegetation labour or contractors	×	✓*	✓*	✓	✓	✓	✓*	✓	✓	✓*
Initial weed control materials	✓	✓	✓	✓	✓	✓*	✓	✓	✓*	✓*
Initial weed control labour or contractors	✓	✓	✓	✓	✓	✓*	✓	✓	✓*	✓*
Site preparation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Long term weed maintenance (>2 years)	✓*	✓*	✓*	✓*	✓*	✓*	×	✓*	×	✓*
Long term revegetation maintenance (>2 years)	×	×	×	×	✓*	×	×	×	×	×

Topic / Question	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
Off-stream watering materials	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Incentive rates/ level of funding **(Refer to Part 2 section 3.2)**										
Fencing	$8.00/m standard $5.00/m electric	$3.00/m up to $7.50/m plains $3.60/m up to $9.00/m hill country	NCCMA fund and coordinate materials and contractor for construction of standard fence. $7.00/m for flatter areas $10.00/m for steeper land These are the maximum costs with actual costs varying based on actual material costs and contractor quotes.	WGCMA fully fund materials and coordinate contractor for standard fence Typical costs $8.00 - $12.00/m inclusive.	$6.00/m, $8.00/m or $10.00/m for standard fence.	$6.00/m up to $9.60/m for standard fence	$4.00/m up to $6.00/m for standard fencing $2.50/m up to $4.50/m for electric fencing applies where revegetation is required: OR $5.00/m up to $7.00/m for standard fencing $3.50/m up to $5.50/m for electric fencing applies where fencing remnant vegetation or within Special Water Supply Catchment (SWSC)with the exception of the Barham SWSC and the Barham River downstream of the SWSC	$2.50/m up to $3.80 for standard fence for 10m set back up to $3.30m for >20m set back. An additional 0.20/m incentive is provided where there are adjoining landholders.	$6.00/m for standard fence	Determined on a site by site basis. Mostly will fully fund fence (materials and contractor)
Revegetation using tube stock	$3.50 / stem capped $2500/ha	$1.50 / stem up to $6.00 / stem	NCCMA fully fund and coordinate site preparation, supply and planting of tube stock (1000 stems/hectare). Typical costs are $5/stem.	WGCMA fund and coordinate site preparation and planting and contribute to tube stock requirements over 2000 stems/km waterway. Costs vary $1.00 - $2.00 for plants and up to $2.00 for planting	100% cost of tube stock up to 500 stems/site. Other arrangements for sites where >500 stems required.	100% cost of tube stock, guards and stakes.	50% of the combined cost of site preparation, plant and guard purchase, and planting including in-kind labour calculation.	$1.00/ tube stock plus $ 0.50 milk carton and stakes or $1.00 for sure flute guards and stakes. Options for cells as well.	WCMA fully fund and coordinate site preparation, supply and planting of tube stock.	Determined on a site by site basis. Mostly will fully fund revegetation.
Off stream watering	Funding provided as a grant based on 50% of actual material and labour costs up to $3,000 per site	Funding provided as a grant based on 75% of costs capped at $5,000/km	Funding provided as a grant of up to $3,000 per unit.	WGCMA purchase materials. Negotiated on a site by site basis.	Funding provided as a grant based on maximum $4,000/site.	Funding provided as a grant based negotiated on a site by site basis.	Funding provided as a grant based on 75% of costs, capped at $4,500/km waterway.	Funding provided as a grant based $2,000 / km for ISC waterways (assumed to be a 2/3 cost share) and $1,000/km for non ISC waterways (assumed to be half cost share). Additional funds on a pro rata basis for the first km if pump is to be purchased (must be solar or air well for extra funds to apply) - $2000.	Funding provided as a grant based on 50% of actual costs of materials	Funding provided as a grant negotiated on a site by site basis

Topic / Question	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
Weed control	Up to $1,000/site ($400 or $700) depending on infestation and size of site.	Negotiated on a site by site basis. Sometimes undertaken through direct works coordinated across multiple sites.	NCCMA fully fund and coordinate contractor for weed control	WGCMA fully fund and coordinate contractor for weed control	Maximum $1,000 (based on size of site)	Up to $550/day	Funded where required as part of site preparation for revegetation	Funding for up to 50% of costs (materials or contractor). .	Funded where required as part of site preparation for revegetation	Responsibility of landholder. Landholder generally undertakes control of weeds as part of their contribution to the project.
Calculation of landholder contribution **(Refer to Part 2 section 3.2)**	Landholder cash contribution to off stream watering is calculated. For other activities landholder contribution not calculated.	GBCMA have a range of estimates for in-kind i.e $2.50 per stem for planting. Landholder cash contribution to off stream watering is calculated.	Landholder cash or in-kind contribution to off stream watering is calculated.	Landholder cash contribution for tubestock up to 2000/stems per km waterway.	Landholder contribution not calculated.	Landholder contribution not calculated.	CCMA estimate $500/ha in-kind for years 1-5 and $250/ha years 6-10.CCMA use $30/hour for calculating in-kind labour.	GHCMA record estimates for in-kind contribution i.e. $3/m labour for fencing and $30/hour for other components of the project.	Landholder cash contribution to off stream watering is calculated.	Landholder contribution is calculated on a site by site basis.
Estimated cost shares between CMAs and landholders for riparian fencing and revegetation **(Refer to Part 2 section 3.2)**										
Assumed total cost for fencing materials and construction. [A] Estimated fence cost from Aither 2015 [B] Estimated cost from CMA program guidelines [C] Estimated cost from reported CMA typical costs	$10.50/m[A]	$10.00/m[B] plains $12.00/m[B] hills	$7.00/m plains[C] $10.00/m hills[C]	$10.50/m[A]	$10.50/m[A]	$12.00/m[B]	$10.50/m[A]	$10.50/m[A]	$7.00/m[A]	$7.00/m[A]
Incentive rate/ level of funding	$8.00/m (flat rate)	$3.00/m (minimum rate offered) plains $3.60/m (minimum rate offered) hills	$7.00/m or $10.00/ m (assumed total cost borne by CMA)	$10.50 (assumed total cost borne by CMA)	$6.00/m (minimum rate offered)	$6.00/m (minimum rate offered)	$4.00/m (minimum rate offered) revegetation sites	$2.50/m (minimum rate offered)	$6.00/m (flat rate offered)	$7.00/m (assumed total cost borne by CMA)
Proportion of total fence cost funded by CMA	0.76	0.30	1.00	1.00	0.57	0.50	0.38	0.24	0.86	1.00
Proportion of total fence cost funded by landholder	0.24	0.70	0.00	0.00	0.43	0.50	0.62	0.76	0.14	0.00
Incentive rate / level of funding		$7.50/m (maximum rate offered) plains $9.00/m (maximum rate			$10.00/m (maximum rate offered)	$9.60/m (maximum rate offered)	$7.00/m (maximum rate offered) remnant sites	$4.00 (maximum rate offered)		

Topic / Question	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
		offered) hills								
Proportion of total fence cost funded by CMA		0.75			0.95	0.80	0.67	0.38		
Proportion of total fence cost funded by CMA		0.25			0.05	0.20	0.33	0.62		
Fencing overall average cost share or cost share range CMA:landholder	**75:25**	**30:70 to 75:25**	**100:0**	**100:0**	**55:45 to 95:5**	**50:50 to 90:10**	**40:60 to 65:35**	**25:75 to 40:60**	**85:15**	**100:0**
Total assumed cost for revegetation materials and planting (tubestock)	$5.50 /stem	$4.50 / stem up to 6.50 / stem	$4.50/ stem	$3.00 / stem	$3.00/stem	$7.00 / stem	$5.50/stem.	$5.50/stem	$3.00/stem (excluding site preparation)	$3.00/stem (excluding site preparation)
Incentive rate / level of funding	$3.50 /stem (capped at $2500 per hectare)	$1.50 per stem	$4.50 per stem assumed cost for CMA to fund plants and contractors for planting	$1.50 per stem assumed cost for CMA to fund contractors for planting	$1.50 / stem up to 500 stems assumed cost of tubestock (CMA pays on actual cost)	$4.00 / stem assumed cost for tubestock, guards, stakes and jute mat.	CMA 50% of total costs	$2.00 per stem	CMA funds site preparation, plants and contractors for planting	CMA funds site preparation, plants and contractors for planting
Proportion of total revegetation cost funded by CMA	0.63	0.38	1	0.50	0.50	0.57	0.50	0.36	1	1
Proportion of total revegetation cost funded by landholder	0.38	0.63	0	0.50	0.50	0.43	0.50	0.64	0	0
Incentive rate / level of funding		CMA funds site preparation, plants and guards contractors for planting (Assume CMA funds $6.50 per stem – 100% of cost)			CMA funds site preparation, plants and guards contractors for planting. (Assume CMA funds 100% of cost)			CMA funds site preparation, plants and guards contractors for planting. (Assume CMA funds 100% of cost)		
Revegetation overall average cost share or cost share range CMA:landholder	**60:40 excluding site preparation but as funding is capped at $2500/ha could be lower.**	**40:60 to 100:0 including site preparation**	**100:0 including site preparation**	**50:50 excluding site preparation**	**50:50 excluding site preparation up to 100:00 in certain circumstances**	**55:45 excluding site preparation**	**50:50 including site preparation**	**40:60 up to 100:0 in certain circumstances**	**100:0 including site preparation**	**100:0 in most situations**
Assumptions used for costing revegetation materials and planting (tubestock)	$5500/ha using $2.50 per stem for tubestock and guard and $3.00 each for planting and guarding. 1000 stems per hectare.	Where CMA reimburses Landholder for seedlings purchased and planted (Landholder does not use guards etc). CMA uses following costs estimates: CMA cost $1.50 / stem and Landholder cost $2.50 /stem. Where CMA coordinates	$4500/ha based on CMA estimates of $4.50 / stem and 1000 stems per hectare	$6000/ha not including site preparation. $1.50 per stem for tubestock (landholder contribution) and $1.50 per stem for planting (CMA contribution).	$1500/site. Assumed cost $1.50 per stem for tubestock and $1.50 per stem for planting. Assume 500 plants per site.	$7000/ha using costs below. $1.50 per tubestock $2.50 for guards stakes and jute mat (sureflute guards $0.92 hard wood stakes $0.35 ea x 2, jute mat squares $0.40, jute mat pins $0.10 x4). $3 each for planting and	$5500/ha based on costs below. Total cost of tubestock and sureflute guard $2.50 /stem. $3.00 each for planting and guarding.Total $5.50 each stem. 1000 stems per hectare. CMA fund 50% costs including estimate of in	Total cost of tubestock and sureflute guard $2.50 /stem. $3 each for planting and guarding. Total cost $5.50 each stem. Assume 1000 stems per hectare. CMA fund $2/stem for tubestock and guard and	$1.50 per stem for tubestock and $1.50 per stem for planting	$1.50 per stem for tubestock and $1.50 per stem for planting

Topic / Question	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
		preparation and planting and purchases materials assume $6.50 / stem				guarding. = $7.00 total cost. 1000 stems per hectare.	kind labour.	landholder plants		
Standards and guidelines for completion of work **(Refer to Part 2 section 2.5)**	Fencing standards and revegetation standards along with DELWP work standards defined in agreements and program guidelines	Standards defined for fencing, revegetation and weed control based on DELWP works standards defined in program information sheet	Works completed according to DELWP works standards	Fencing and revegetation standards based on DELWP works standards	Standards defined for fencing, revegetation and weed control based on DELWP works standards defined in landholder incentive procedure	Guidelines for fencing and revegetation for stream frontage grants program. This is negotiated between landholder and assessor. Best practice manual for Rural land program	Standards defined for fencing, revegetation and weed control in program guidelines	Standards defined for fencing, revegetation and weed control based on DELWP works standards defined in program guidelines	Minimum standard for fencing etc. outlined in the landholder agreement. Published DELWP works standards/guidelines also used including vegetation, flood prone fencing and control grazing. .	Not formalised however works subject to inspection to ensure works are completed to sufficient standard.
Main outcomes CMA is aiming for from riparian works **(Refer to Part 2 section 2.5)**	To deliver on priorities identified in the Regional Waterway strategies. The project objective may be to assist land managers to undertake on ground works and improve their capacity to manage riparian areas across the North East Region. It can also be to assist land managers to undertake on ground works for the improvement of riparian land, to work with clusters of landholders to promote riparian connectivity, and or to increase community engagement and capacity building with communities in the region.	Stock exclusion from waterway and vegetated buffer improvement. Bank protection, increased native vegetation (regrowth/recruitment), increased water quality, improved habitat values,	Improved structure and quality of native riparian vegetation, reducing the threat of livestock on the riparian vegetation and impact on bank erosion, sedimentation and water quality, improving instream habitat through increasing large wood debris, fringing veg and reducing the impact of willows.	Improving river health Improved water quality and biodiversity Improve native vegetation condition and extent, Provide increased bank stability, Improve habitat , Reduce the extent of exotic vegetation, Exclusion of stock from waterways	Improving relationships and partnerships with landholders and the community, connecting riparian areas and high value waterways, protecting existing assets and high value waterways. Ongoing stock exclusion - with zero 'crash grazing' Ongoing weed control Landholder ownership of site and provision of ongoing maintenance	Aim to improve the condition of the waterway to protect the values identified in the Healthy Waterway Strategy. Increased stewardship of waterways by landholders; Long term improvement in waterway condition, Improve habitat quality to extend the areas of higher level riparian condition and have set in the Healthy Waterways Strategy improvement trajectories for waterways.	Protection and restoration of riparian areas. An engaged landholder who will continue to maintain the site Total stock exclusion and improved riparian condition Depends on the asset, i.e. driver might be threatened fish habitat where locations have been prioritised due to threatened fish populations.	Outcomes defined for each project have recently started to look at having site outcomes which would be placed on each landholder agreement.	Work with private landholders to assist them to protect and enhance high priority waterway by improving the management of riparian areas on their properties.	Generally protecting the riparian areas from overgrazing but most of the time from recreation pressure. Excessive waterway traffic leads to denuded riparian areas and great risk of erosion.

Topic / Question	North East CMA	Goulburn Broken CMA	North Central CMA	West Gippsland CMA	East Gippsland CMA	Melbourne Water	Corangamite CMA	Glenelg Hopkins CMA	Wimmera CMA	Mallee CMA
Measuring outcomes from riparian works **(Refer to Part 2 section 2.5)**	Photo points, river health works monitoring, level of uptake, value for money invested, follow-up inspection, and level of adherence to agreement. Outcomes measured are based on outputs standards as determined by the DEPI output standards. Other outcomes are measured based on more qualitative methods, participation rates, feedback, etc.	Reporting on outputs delivered for projects. Measurable against outcomes identified in funding proposals	Photo point monitoring. Previously the Works Monitoring Method was used, annual VEFMAP monitoring along Loddon and Campaspe rivers.	Monitoring program Outputs are recorded and report but outcomes less so. Riparian works monitoring program that has been on-going for many years and participate in the State-wide riparian monitoring program. Numerous monitoring programs (fauna surveys, flora surveys etc.) linked to the Riparian program.	Works monitoring method completed on all sites where riparian works have been completed (and also use control sites). As part of this program we also monitor the condition of assets (fences, revegetation, etc.). Our relationships built with landholders are monitored and recorded through our ACE database. Monitoring - EGCMA has a full time works site monitoring staff member. His site monitoring cycle is: on completion of site works and then every 3 years.	Implementation targets (outputs) recorded and measured through mapping (km fencing, revegetation etc.); Long term improvement measured at a few selected sites; Landholder stewardship not currently measured Vegetation Quality assessments	Victorian Works Monitoring Method. Landholder ongoing participation is not measured works monitoring method and regular visits Not really. We only record outputs. This is ok, but it doesn't tell us, for example, how many litres of water we have saved by removing willows, how much carbon is being stored, etc.	Not effectively. GHCMA hoping that the DELWP output standards (mapping outputs to outcomes) would assist. Waiting for further direction in this area.	Follow up on ground monitoring of sites. Measuring on ground actions against the objectives and management actions outlined in Regional Catchment Strategy.	Photo points and area of revegetation achieved over a long period of time. Revegetation is perennial native shrubs rather than annual grasses. Therefore monitoring is undertaken due Autumn after a hot summer months to ensure key species still remain.
Measuring success of riparian programs **(Refer to Part 2 section 2.5)**	Value for money invested. Follow up inspections level of uptake , value for money invested , follow-up inspection, level of adherence to agreement Outputs achieved Refer to set outcomes as defined by the DEPI Output standards,	Only on some sites. Approaches have changed over time i.e. Works monitoring method, Habitat Hectare etc. GBCMA has begun a re-engagement program revisiting past sites, assessing condition and assisting where possible. Outputs also recorded i.e. Number of signed agreements are recorded, weed management (Hectares), fencing (Kms), revegetation(Hectares)	Mid-term and final Project Performance Reports Annual NRM audits of randomly selected sites from three years prior	Follow-up inspections and monitoring of some sites, would like to make this more be more structured State-wide monitoring project sites Reporting of outputs linked to outcomes defined in funding proposals. Photo points	In addition to above each EGCMA staff member in the field is constantly monitoring/observing sites, albeit informally. All breaches of an Agreement are recorded and LH informed to address the breach. In terms of LH engagement – EGCMA works on an 18 month contact cycle, initially by phone and then site visit if requested by the LH.	All projects have a 12 month completion audit which results in follow-up grants. The programs that we run have also had evaluations on their success. Periodic program review evaluates the program; this could be better done and a full and ongoing monitoring and evaluation program has not been designed. Surveys of participants have been undertaken in the past to gauge their satisfaction with program	Through the project and follow-up inspections to ensure adherence to conditions and to ensure works undertaken appropriately. Works monitoring method has been used as a tool for follow up inspections. Limitations to this approach were noted	Final site inspections before release of final payment. GHCMA have an annual reengagement/compliance project to look at long-term success (range of projects between 2-10 years of age) of fencing, maintenance, revegetation, weeds. This also involves a social survey.	Follow up inspections to ensure the agreed management actions are undertaken. Internal review of project delivery to ensure the projects achieved the desired outcomes and aims.	Depending on the resources from the project ranges from photo points to more formalised monitoring using consultants. .
Ranking and selection of projects **(Refer to Part 2 section 3.1)**										
Site/Project Assessment Tool	Yes – spreadsheet tool	Yes – spreadsheet tool	No	No for State Government funding	Yes – spreadsheet tool	Yes central database	Yes – spreadsheet tool	Yes – spreadsheet tool	Yes – spreadsheet tool	No – currently under development

Assessment criteria	• Site quality and threats • Priority reach in waterway strategy • Project size • Incentive $ offered per Ha • Length of stream protected • Linkages to other works	• Fence set back • Habitat hectares score • Waterway Strategy Priority		Eligibility and prioritisation of sites is determined during site visit based on the values of the site and negotiation with the landholder.	• Set back of fence • Priority reach in waterway strategy (Heritage River, link to catchment goal, priority program) • Located in proclaimed water supply catchment • Presence of remnant vegetation /requirement for revegetation • Presence of wetland	• Length of project • Values • Priority area • Link to strategies and plans • Complementing other works • Connectivity • Threats • Link to water quality • Local leaders/champions • Education value • Works likely to be completed safely and on budget • Likely to lead to future works	• Contribution to funding program outcomes • Priority reach in waterway strategy • Presence of remnant vegetation /requirement for revegetation. • Connectivity with remnant vegetation • Associated river health benefits • Presence of rare or threatened species • Significant EVC • Landholder rating • Management of weeds and pests • Risks to success of project • Funding sought • Landholder contribution	• Set back of fence • Quality of habitat • Connectivity with other sites • Level of threat	• Connectivity with past works or existing habitat • Priority reach from waterway strategy • Vegetation condition • Requirement for revegetation works / presence of remnant vegetation • Presence of active erosion	
Score used to assess suitability of an individual project	No	No	N/A	N/A	Yes	Yes	Yes	Yes	No	N/A
Score used to rank a set of projects	Yes	No	N/A	N/A	No	No	Yes	Yes	Yes	N/A
Score used to determine incentive rate	No	Yes	N/A	N/A	Yes	No	No	Yes	No	N/A
Comment	Based on current state rather than potential for improvement Possible 'double counting e.g. site quality and priority reach	Assessment tool used to calculate incentive rate for fencing only. Cost share varies from min. of 30% to max. of 75% CMA contribution.	Informal principles used to guide project selection: Contribution to funding program outcomes Priority reach in waterway strategy Presence of remnant vegetation /requirement for revegetation. Connectivity with past works or existing habitat Site quality and threats Presence of rare or threatened species	Spreadsheet tool used to assess project suitability for AG funding in Corner Inlet	Categorical score sets maximum amount to be paid (e.g. 14+ = $10/m, 10-13 = $8/m) Not clear if scores are used to rank projects, rather to calculate rate to be paid.		Scores used to rank projects not to determine incentive rates. There are lots of criteria, some of which may lead to double counting (e.g. priority reach, remnant vegetation) or perverse results (e.g. extreme project risk may be offset by other high values).	Higher scores attract higher rates for fencing. Assessment tool is used to rank projects (need to follow up)	Some apparent anomalies with assessment criteria, For example a project with high vegetation condition and active erosion will score the same as a project with low vegetation condition and no erosion. Appears to be double counting with catchment priority and other criteria e.g. vegetation condition, erosion which have presumably been used to inform priority?	
Main factors that have influenced how the rates, or % cost shares used by CMA's. **(Refer to Part 2 section 4.1, 4.2 and 4.3)**										

To encourage landholders to have long term ownership of the works.	✓	✓	✓	✓	✓	✓	✓	✓		✓
To maximise participation in particular priority areas.	✓	✓	✓	✓	✓	✓	✓	✓		✓
To meet a target.			✓	✓	✓		✓			
To ensure equity between landholders.	✓	✓	✓	✓	✓	✓	✓	✓		✓
To ensure works are completed to an appropriate standard.			✓	✓	✓	✓	✓	✓		✓
To recognise the public benefits of the works.		✓	✓		✓	✓	✓	✓		✓
To recognise the costs to landholders to participate in the works.		✓	✓		✓		✓	✓	✓	✓
To ensure a consistent approach (across the region, across years, between sites).	✓	✓	✓	✓	✓	✓	✓	✓		✓
To reduce complexity in the program administration and delivery.	✓	✓	✓	✓	✓	✓		✓		✓
To maximise the outputs achieved from a given budget.			✓	✓				✓	✓	✓
Other (please specify)								The primary factor will vary with incentive type but all are relevant	Ensuring the program achieves the best value for money and is delivered efficiently and effectively	
Alignment with VWMS principles for determining the proportion of costs paid by the Victorian government for riparian projects **(Refer to Part 2 section 6.1)**										
Level of public benefit of the work.	Assessed through spreadsheet tool and used to rank projects.	Assessed through spreadsheet tool and used to inform incentive rate.	Sites within priority reach informally assessed based on guiding principles. Projects are not formally scored.	Not formally assessed on a site by site basis. If site is in priority reach assumed to have public benefit.	Assessed through spreadsheet tool and used to rank projects.	Assessed through spreadsheet tool and used to rank projects.	Assessed through spreadsheet tool and used to rank projects.	Assessed through spreadsheet tool and used to rank projects.	Assessed through spreadsheet tool and used to rank projects.	Not formally assessed on a site by site basis. If site is in priority reach assumed to have public benefit.
Its priority for management action	Priority of waterway considered in ranking of project.	Priority of waterway considered in ranking of project.	Site must be in a priority waterway to be funded.	Site must be in a priority waterway to be funded.	Priority of waterway considered in ranking of project.	50% of funding directed to priority waterways.	Priority of waterway considered in ranking of project.	Priority of waterway considered in ranking of project.	Priority of waterway considered in ranking of project.	Not formally assessed but site must be in a priority waterway to be funded.

The level of security of the agreement	All funding subject to standard management agreement.	All funding subject to standard management agreement. Fencing fully funded if site is covenanted.	All funding subject to standard management agreement.	All funding subject to standard management agreement.	All funding subject to standard management agreement.	All funding subject to standard management agreement.	All funding subject to standard management agreement.	All funding subject to standard management agreement. Higher rates for stewardship payments on covenanted sites.	All funding subject to standard management agreement.	All funding subject to standard management agreement.
Alignment of CMA approaches with cost sharing principles **(Refer to Part 2 section 6.2)**										
1 – lowest cost share identified	×	×	×	×	×	×	×*	×	×	×
2 – increase cost share for more beneficial actions	×	✓	×	✓	×	✓	✓	✓	×	✓
3 – formally ranking or assessing suitability of projects to select those with greater environmental benefits*(see also section 3.1)	✓	✓	×	✓	×	✓	✓	✓	✓	×
Comment	Standard rates for fencing across all landholders. Project ranking considers environmental benefits.	Fencing incentive can vary from 30 – 75% of assumed total direct cost based on fence set back and site values. Project suitability assessment considers environmental benefits	Standard rates for fencing across all landholders based on site conditions. Sites with greater benefit are funded first.	Payments vary based on fence set-back and size of site. Project suitability assessment considers environmental benefits	Standard rates for fencing across all landholders.	Payments vary based on fence set-back. Project suitability assessment considers environmental benefits	Payments vary based on fence set-back and site values. Results of MBIs has informed minimum cost share %. Project ranking considers environmental benefits. *Glenelg Hopkins has the lowest fencing rate across all CMAs.	Payments vary based on fence set-back from 50 – 75% of assumed total direct cost. Project ranking considers environmental benefits.	Standard rates across landholders. Project ranking considers environmental benefits.	Payments are negotiated on a site by site basis.

Appendix G. Characteristics of selected cost-share programs in Australia

Characteristics of program	Booroowa River NSW	Reef Rescue QLD	Goolwa to Wellington Local Action Planning Association, SA
Overview	Landholder expression of interest followed by project officer site visit to assess Environmental Services Ratio (ESR) to establish baseline, assess whether minimum standards met and estimate environmental services. Project plan developed and agreed or rejected prior to payment.	Reef Rescue aims to improve the water quality of the Great Barrier Reef lagoon by increasing the adoption of land management practices (including riparian management activities) that reduce the run-off of nutrients, chemicals such as herbicides and pesticides and sediments from agricultural land.	Landholder expression of interest followed by site visit and assessment. Management Plan and landholder agreement developed for works to be funded.
Cost-share program	Yes, cost-share range 40-90%, higher cost share for high environmental services.	Generally 50:50 (landholder contribution as cash and/or in kind) with some regions using sliding scale systems to account for higher environmental benefits.	Yes, ratio typically 80% but varies according to site value.
Most similar program	Approach C	Approach A (sometimes C)	Approach A with some aspects of C
Private net benefits considered	No – cost-share based on ESR	No	Not explicitly
Public net benefits considered	Yes through ESR	Yes but assessment methods unclear and vary between regions.	Yes, but qualitative, methods unclear.
Cost shares same or different for participants	Different based on ESR.	Generally the same.	Generally the same.
Direct input costs	Yes.	Yes.	Yes
On-going maintenance costs	Not clear, assume some as the agreement is for 10 years and landholders agree to manage the site based on best-management principles.	Not clear but generally assumed that future costs are the landholders responsibility.	Landholder expected to meet future costs for pest plant and animal control
Opportunity costs	Not clear	No	No
Unpriced labour costs	Not clear	Yes – as part of 50% cost share	Not clear
Transaction costs	Not clear	Not clear	Not clear
Complexity of paperwork	Not clear	Low	Low
Technical assistance requirements	Site visit and assessment	Site visit and assessment	Site visit and assessment
Contractual obligations	10 year contract, but 50% paid up front and 50% on completion of the works, so probably little accountability once funding received.	Contract lengths vary, typically 5-10 years. Landholders are encouraged to make new owners aware of projects if properties change hands. This suggests much weaker obligations than for some US programs.	10 years, although works funded through Australian Government Biodiversity Fund with program to end in 2016.
Provision for payments beyond the life of the contract	Not beyond the 10 year program	No – all payment is on completion of works	No
Opportunity costs of funds invested	Not clear, assume no.	Not clear, assume no.	Not clear, assume no.

Characteristics of program	Booroowa River NSW	Reef Rescue QLD	Goolwa to Wellington Local Action Planning Association, SA
Other noteworthy features		Program delivered by 6 Reef catchment regions, with local 'idiosyncrasies' such as different approaches to determination of environmental benefits.	

Appendix H. Characteristics of selected cost-share programs in the United States.

Characteristics of program	Maryland Agricultural Cost-Share Program (MACS) – riparian forest buffer	Maryland Conservation Reserve Enhancement Program (CREP)	Virginia USA cost-share program - example livestock exclusion and stream fencing
Overview	Provides financial support to farmers for the installation of BMPs that control and reduce agriculturally related water pollution. Pollution sources can be from erosion, animal wastes, nutrients, or agricultural chemicals. Financial assistance is available to farmers because the BMPs provide public benefits and implementation costs imposed on individual farmers are not relative to any income-producing potential associated with the implementation of the BMP'.	Provides assistance to landowners for planting streamside buffers, establishing wetlands, protecting highly erodible land, and creating wildlife habitat while providing steady, dependable land rental income. CREP is a voluntary program designed to help farmers to do their part to protect local waterways without hurting their bottom line. CREP offers a one-time signing bonus, attractive annual rental and incentive payments, and cost-share assistance for streamside buffers, wetlands, livestock fencing, watering facilities and other stream protection practices.	Similar to the MACS, Virginia offers a comprehensive cost-share program for agricultural best-management practices.
Cost-share program	Yes	Works over and above MACS - offers very generous land rental rates.	Yes
Most similar approach	Approach A	Not really similar to any of the approaches. Likely to achieve some outcomes, although still not very targeted (goals are based on overall acreage enrolled of eligible lands) but certainly not at least cost.	Approach A
Private net benefits considered	Private net benefits not considered – only insofar as practices might have different levels of available cost-share.	Assumed that there are no or minimal private net benefits.	No
Public net benefits considered	Limited - While the stated program goals are about public benefits there is limited quantification beyond targeting funding based on listed watersheds prioritised on their potential for agriculturally related nitrogen and phosphorus delivery to waters of the State and which have a 'critical condition'. Priority areas may also exist outside of these watersheds provided a critical condition exists.	Limited - While the stated program goals are about public benefits there is limited quantification other than saying the program is targeting only the most environmentally sensitive lands. Eligible land is cropland next to a stream or highly erodible land within 1,000 feet of a stream that has been planted to an agricultural commodity, meets cropping history requirements and is still physically and legally capable of being planted may be eligible. Marginal pastureland next to a stream may also be eligible for certain practices.	Limited - there is a prioritisation ranking system but it is broad and most projects would qualify. Cost-share is available throughout Virginia.
Cost shares same or different for participants	Specific BMP cost-share percentages vary from 65% to a maximum of 87.5 percent of eligible project costs and are based on flat rates or actual costs, whichever is lower and can be substantiated with receipts or invoices. Cost-	Partly a cost-share program (can use MACS for cost-share to install practices). Additional payments are made in the form of local land rental rates as determined by the local Soil Conservation District. A landowner who plants a forested streamside buffer receives the local soil rental rate for the enrolled acreage plus an	100% reimbursement of the estimated or actual cost is available for permanent water body exclusion fence with minimum 35 feet away from the water body. Up to 50% cost-share of the estimated or actual cost of all other eligible components

Characteristics of program	Maryland Agricultural Cost-Share Program (MACS) – riparian forest buffer	Maryland Conservation Reserve Enhancement Program (CREP)	Virginia USA cost-share program - example livestock exclusion and stream fencing
	effectiveness is also considered as part deciding whether to grant cost-share. The cost-share rate for riparian forest buffers is 87.5%.	additional annual incentive payment that is 200% of the local soil rental rate.	(off-stream watering, rotational grazing etc.).
Direct input costs	Yes – based on a flat rate determined by the local Soil Conservation District. Direct input costs can include installation, labour and equipment. Farmers need to provide receipts or at least unpaid invoices. If actual costs are less than the estimated costs contained in the Agreement, the payment will be based on the actual costs.	Yes – either 40% of the total cost of installing practices or use MACS.	Yes
On-going maintenance costs	No except that financial assistance may be provided for repairs if the previously installed practice was damaged due to an unpredictable act of nature and not due to the applicant's negligence or poor maintenance. The landholder has to maintain the riparian forest buffer for 15 years.	Yes, based on much more than the local land rental rate for the life of the agreement (10-15 years), which would cover maintenance costs in addition to opportunity costs. Mid-way through the contract additional cost-share is available to help farmers implement approved management activities to support plant diversity and wildlife habitat. Farmers can receive up to 50% cost-share (not to exceed $100- $125 per acre for the life of the contract).	No
Opportunity costs	No	Yes through land rental agreements plus 200%. Landowners also have the option of selling a permanent easement on their land to the State of Maryland. This can be done directly or through cooperative contracts. Payments are based on the fair market value of foregone development and agricultural productivity.	No
Unpriced labour costs	Labour costs are allowed in the MACS program, based on receipts, but it is not clear regarding unpriced labour from the documentation. Likely that unpriced labour is part of the farmer's cost-share.	Not clear but rental rates would likely cover this.	No
Transaction costs	No	Not specifically but the rental agreement costs are sufficiently high that the transaction costs would be covered.	No
Complexity of paperwork	Program requirements are strict and well defined. Technical and administrative responsibility is clear.	Program requirements are strict and well defined. Technical and administrative responsibility is clear.	Program requirements are strict and well defined. Technical and administrative responsibility is clear and can involve three agencies, local, state and federal. All practices are subject to spot

Characteristics of program	Maryland Agricultural Cost-Share Program (MACS) – riparian forest buffer	Maryland Conservation Reserve Enhancement Program (CREP)	Virginia USA cost-share program - example livestock exclusion and stream fencing
			check procedures and any other quality control measures. Failure can result in cost-share having to be re-paid (although how often this occurs is unclear).
Technical assistance requirements	Strong – District staff help landholders with all aspects. Requirements are to specified standards and are inspected.	Strong – District staff help landholders with all aspects. Requirements are to specified standards and are inspected.	Strong – Natural Resources Conservation Service (NRCS) and District staff available to help landholders with all aspects. Requirements are to specified standards and are inspected and subject to spot checks and quality control.
Contractual obligations	Strong -Farmer is required to sign a contract agreeing to all terms including maintenance and allowing local Soil Conservation District to visit. Participants are liable for the full amount of State cost-sharing funds paid for practices not installed or maintained. The MACS manual states that 10% of all BMPs installed are inspected annually.	Clear -Farmer is required to sign a contract agreeing to all terms.	Strong -Farmer is required to sign a contract agreeing to all terms including maintenance and allowing compliance staff to visit.
Provision for payments beyond the life of the contract	No	Yes – landowners can re-enrol.	No
Opportunity costs of funds invested	Not clear.	Not clear.	Not clear.
Other noteworthy features	US cost-share is well established with powerful political interests (US Farm Bill) meaning that programs are unlikely to be removed. Cost-share is well-developed and many practices are eligible. Where farm ownership changes, farmers are required to transfer any MACS Agreement to the new owner.	US cost-share is well established with powerful political interests (US Farm Bill) meaning that programs are unlikely to be removed. Cost-share is well-developed and many practices are eligible. Where farm ownership changes, farmers are required to transfer any MACS Agreement to the new owner.	US cost-share is well established with powerful political interests (US Farm Bill) meaning that programs are unlikely to be removed. Cost-share is well-developed and many practices are eligible.