

LANDCARE VICTORIA - RETURN ON INVESTMENT

Cost-benefit analysis of the Victorian Landcare Facilitator Program



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EXECUTIVE SUMMARY

Landcare in Victoria

The Landcare movement in Australia brings together a diverse community of staff, landowners and volunteers. Landcarers support rural and regional communities by restoring Australia's natural environment, improving the sustainability of agricultural activities and building resilience in communities. Landcare projects attract investment and in-kind support into these communities, provide opportunities for volunteering, and deliver substantial outcomes from relatively small investments.

The Victorian Landcare Facilitator Program (facilitators) support Landcarers around the state to deliver these outcomes by building partnerships, securing grants and supporting project delivery. The facilitators supported 689 groups around the state in 2019, who recognised the major role the facilitators played in initiating, securing funding for, delivering, and increasing the impact of projects.

The Victorian Government supports Landcare activities across the state, including by investing in facilitators. This Study aims to quantify the return on that investment.

Contribution to government priorities

Projects delivered by Landcare contribute to high priority public policy objectives. These include:

- the mitigation of climate change impacts
- building resilience in the agricultural industry to adapt to climate change impacts
- supporting Australia's contribution to the United Nations Sustainable Development Goals
- building resilience in regional communities, particularly at the current time when the community has been impacted by drought, bushfires and more recently, the COVID-19 public health crisis
- driving human capital development through training, awareness and education, and productivity improvements in the industry.

Importantly, Landcarers contribute to these goals with relatively modest funding, through collaborative and partnership approaches, and at a grassroots level without requiring significant Government involvement.

Purpose of this Study

The Study was commissioned by Landcare Victoria to estimate the Return on Investment (ROI) from funding the facilitators. The Study used a Cost Benefit Analysis (CBA) framework, also known as welfare economics, to estimate the economic, environmental and social benefits achieved by the facilitators.

The Study was conducted by obtaining data on Landcare project activities in 2019 from a group of facilitators, project collaborators and group managers, and using that sample to:

- estimate the net benefits of Landcare projects across the whole of Victoria
- estimating the contribution that the facilitators made to these outcomes
- comparing the benefits attributable to the facilitators to the costs of funding the facilitators
- estimating the Benefit Cost Ratio (BCR) and Net Present Value (NPV) for the facilitators, which are measures of the ROI to Victoria from investing in the facilitators.

The CBA should be interpreted as an estimate of the benefits attributable to the facilitators in 2019. This provides useful data on the benefits of ongoing investment in the facilitators. The CBA calculates the total benefits and costs of projects over the life of the projects, using a 4 per cent discount rate to compare future year benefits and costs, to current year values in Present Value (PV) terms, as recommended by the Victorian Department of Treasury and Finance (DTF).

Benefits of Landcare in Victoria

This ROI Study found that the projects supported by Victorian facilitators deliver net benefits to Victorians after considering their economic, environmental and social benefits. The estimated average BCR for projects

is **3.4** and estimated net benefit to Victoria is **\$123 million PV**. These projects are delivered through government funding, volunteer effort and in-kind landowner contributions.

The contribution of facilitators

Facilitators have played a crucial role in initiating, attracting support for, and delivering Victorian Landcare projects. Without the facilitators, many of these projects would not have been achieved, or would not have delivered the same magnitude of impact.

This Study focuses on this contribution made by the facilitators and the cost of funding the facilitators. The modest annual investment of **\$4 million**, compares to an attributable **\$31 million PV** of the net project benefit estimated above. That is, the facilitators are estimated to return more than **7 dollars for every dollar invested**. The results of sensitivity testing show that the finding of a BCR greater than 1 and a positive net benefit are robust to alternate values for key assumptions.

The results show that facilitators play a crucial 'leveraging' role in the state. While the projects deliver net benefits in and of themselves, the facilitators amplify the scope and scale of Landcare activities across the state. The data also show that some projects have the potential to be delivered at an even larger scale.

Moreover, the findings show that when the contribution by the facilitators is viewed from a different perspective, which is the role they play in bringing together the community to foster social cohesion, the net benefits are likely to be much greater. A top-down / social cohesion approach to estimation suggests an attributable net benefit of the facilitators to be **\$87 million PV** across the state.

The results are broadly in line with previous studies. Overall, the results show that the facilitators provide a relatively high benefit compared to the cost of funding.

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1 INTRODUCTION

1.1 Landcare in Victoria

Landcare is a community-based approach to managing and restoring Australia's natural environment, improving the sustainability of agricultural activities and building resilience in communities (Henry et al, 2017). It plays a significant role in regional and rural communities by:

- building and maintaining social cohesion
- promoting the adoption of sustainable agricultural practices
- restoring and conserving biodiversity
- building experience and skills
- providing a forum for engagement with indigenous Australians
- supporting individual wellbeing and mental health.

The Landcare movement brings together a diverse community of staff, landowners and volunteers. It attracts investment and in-kind support into regional communities, provides opportunities for volunteering, and delivers substantial outcomes from relatively small investments.

The Victorian Landcare Facilitator Program (facilitators) supports Landcarers around the state to deliver these outcomes by building partnerships, securing grants and supporting project delivery (RMCG, 2019). The facilitators supported 689 groups around the state in 2019, who recognised the major role the facilitators played in initiating, securing funding for, delivering, and increasing the impact of projects.

The Victorian Government supports Landcare by funding facilitators, providing grants, and fostering partnerships with other government and non-government organisations (refer to Figure 1).

How does the Victorian Government support Landcare?



Figure 1 Victorian Government support for Landcare

1.2 Purpose of this Study

RPS was engaged by Landcare Victoria to estimate the return on investment (ROI) in Victorian Landcare facilitators (the Study).

Facilitators provide crucial support to Landcare groups and networks by building partnerships, securing grants and supporting project delivery (RMCG, 2019). The evaluation of the Landcare Facilitator program in 2019 included a survey of Landcare groups to understand first-hand the difference made by the facilitators. Survey respondents consulted during the evaluation acknowledged that many of the outcomes delivered by Landcare in Victoria were achieved largely through facilitator support.

In many cases, facilitators are responsible for obtaining the required funding, identifying the right partnerships and providing the impetus critical to delivering a project in the first place, or increasing the scale of its impacts.

This Study aims to quantify this contribution in monetary (dollar) terms. While the outcomes achieved through facilitator support include economic, environmental and social benefits to the communities served by Landcarers, expressing this outcome in monetary terms allows comparing the benefits to the costs in a common unit.

The framework used to estimate the ROI was welfare economics, or cost-benefit analysis (CBA). CBA is a standard tool used in policy and investment decision making to assess whether a policy or project investment is in a group's interests. The reference group for this CBA is the state of Victoria. As such, the CBA assesses the return on investment in Landcare facilitators from a whole-of-Victoria perspective.

1.3 Study scope

Focus group

Landcare delivers outcomes for the communities it serves through the contributions of many groups and individuals, from volunteers, to government agencies, to other non-government organisations (NGOs), to coordinators employed by the Federal Government, in addition to the facilitators. However, this CBA focuses on the contribution made by the facilitators. As such, the CBA focuses on:

- the net benefits of Landcare projects that can be attributed to the activities of the facilitators
- the costs of funding the facilitators.

This Study recognises that the net benefits of Landcare projects could not be achieved without the contributions of all actors. However, the CBA requires an estimate of the specific contribution of the facilitators, or the 'attribution'.

Benefits and costs included

The CBA considers economic, environmental and social costs and benefits, from a whole-of-Victoria perspective. Examples of benefits and costs include:

- increased crop-yields through improved land management practices (economic benefits)
- carbon sequestration in soil (environmental benefits)
- increasing community members' wellbeing and mental health (social benefits)
- farm equipment, inputs and labour (costs)

On the cost side of the equation, the CBA includes what are referred to as 'resource costs', meaning the capital, land and labour required to deliver the projects.¹

¹ It should be noted that in a CBA, any labour is costed, irrespective of whether that labour is paid a wage, is a volunteer or is in-kind labour from landowners.

On the benefits side, the CBA aims to include all material benefits that accrue to Victorians, whether these are tangible benefits which may be valued using market prices (e.g. crop value), or intangible benefits that require so-called 'non-market' valuation techniques to translate their value into dollar terms.²

The CBA compares two scenarios – the current state of the world where the facilitators exist,³ and a hypothetical scenario where there are no facilitators.⁴ The incremental difference between these two scenarios is the net value of the facilitators to the state of Victoria.

The results of the CBA reflect the estimated incremental value of the facilitators in 2019. This is considered a 'backwards-looking' CBA. The result provides useful data to understand the benefits of maintaining or expanding the funding for facilitators going forward.

Landcare projects

The CBA aims to estimate the impacts of Landcare across the whole of Victoria. However, the Study used a sample of projects within the state due to data limitations and study constraints. The sample of activities aims to provide:

- a wide breadth of activities from different parts of Victoria
- a reasonable representation of the typical activities undertaken by Landcarers, to maximise its representativeness and facilitate the extrapolation of results across the state.

² Importantly, the CBA focuses on the outcomes achieved, rather than the funding or effort itself. This is the standard practice of CBA where purely financial effects such as the distribution of grant funding are excluded, but the outcomes from utilising that funding are included.

³ Sometimes referred to as the Policy Case or the 'Factual' scenario.

⁴ Usually referred to as the Base Case or 'Counterfactual' scenario.

2 METHODOLOGY

2.1 Framework to estimate ROI

The analysis used CBA to estimate the ROI (refer to Figure 1), which requires:

- defining the 'factual' (i.e. with facilitators scenario) and the 'counterfactual' (i.e. without facilitators scenario)
- understanding the incremental difference in outcomes between the two scenarios (i.e. how much additional benefit is gained due to the facilitators)
- estimating the incremental difference in costs between the scenarios
- estimating the net benefit (or cost)
- expressing the results as a Benefit Cost Ratio (BCR) and Net Present Value (NPV), which express the ROI as a ratio or as an incremental benefit, respectively.

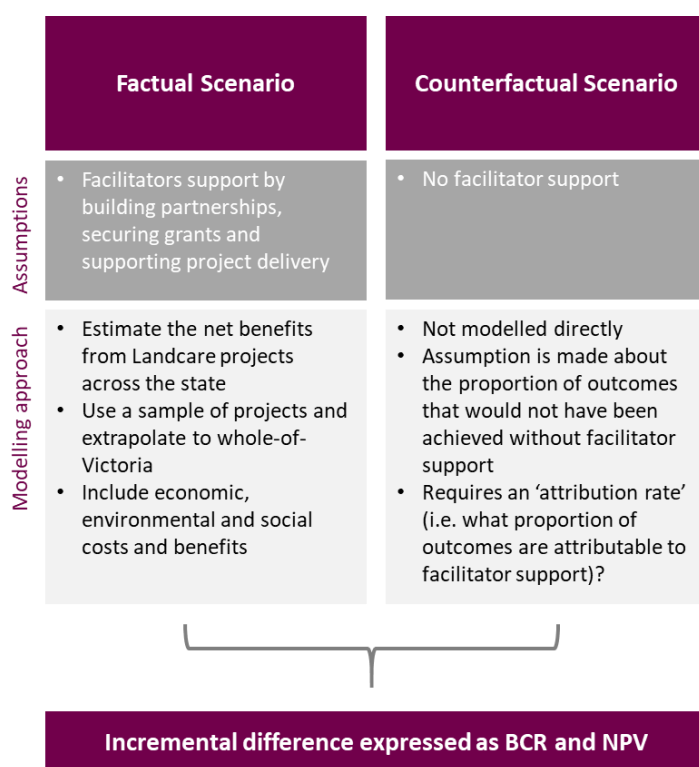


Figure 2 CBA framework

This approach is often used by government decision makers to evaluate policy or project decisions. The CBA is backward-looking and evaluates the impacts of facilitator support in 2019.

To estimate the value of benefits stemming from Landcare projects, the CBA used data from the literature on the market and so called 'non-market' value of project outcomes.

Some outcomes were conducive to valuation with reference to market prices (e.g. the value of increased crop-yields). Other outcomes required non-market valuation techniques. Non-market valuation is applied by either surveying beneficiaries about their WTP (i.e. 'stated preference') or deriving WTP based on the behaviour of beneficiaries (i.e. 'revealed preference').

This Study utilises market and non-market value data from other previous researchers' published work, rather than undertaking original surveys or market data analysis for valuation. This method known as the 'benefit transfer' approach.

The CBA calculates the total benefits and costs of projects over the life of each project, using a 4 per cent discount rate to compare future year benefits and costs to current year values, as recommended by the Victorian Department of Treasury and Finance (2013). Total benefits and costs are expressed as a Present Value (PV), which represents the aggregate value of all years of benefits or costs after applying the discount rate. Total net benefits are expressed as a Net Present Value (NPV), which is the difference between the PV of benefits and the PV costs. Sensitivity testing was undertaken to test the robustness of results to alternate values for key uncertain assumptions.

2.2 Research and analysis steps

Figure 3 summarises the specific steps used in this Study.

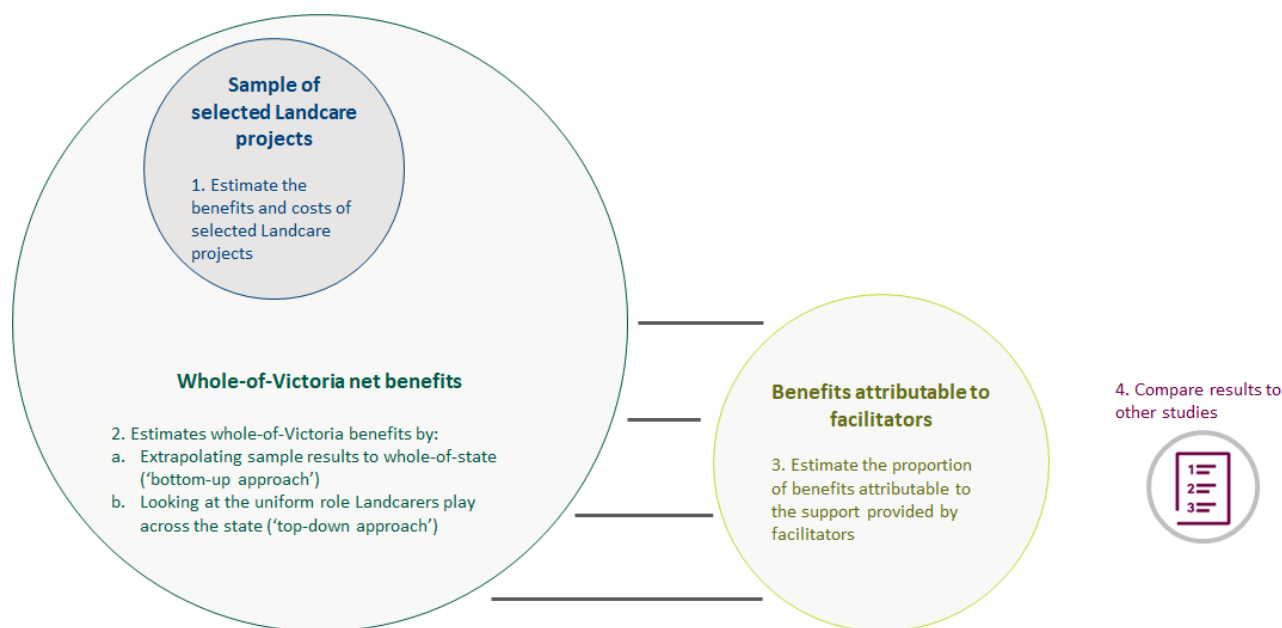


Figure 3 Research and analysis steps

The steps used were:

1. Use a sample of projects to estimate the benefits and costs of selected Landcare projects.
2. Estimate the whole-of-Victoria benefits using two methods, namely:
 - a. A bottom-up approach where the sample results are extrapolated to whole-of-state
 - b. A top-down approach which considers the fundamental role that Landcarers play across the state
3. Estimate the proportion of these benefits attributable to the contribution of the facilitators.
4. Compare the results of the Study to other work.

2.3 Data gathering

Information sources

The Study sourced project data from facilitators, project collaborators and group managers, whose contact details were provided to the RPS team by Landcare Victoria. Each of the respondents who kindly offered to share project data, provided information on:

- the number of projects they have supported
- the size of these projects (e.g. \$ of funding obtained, \$ invested etc.)

- a description for each project
- the scale of outcomes achieved for each project (e.g. the hectares of land treated, trees planted, community members engaged etc.)
- details about that the project (e.g. species of tree, types of skills developed etc.)
- any other data they felt relevant to understanding the benefits and costs of projects.

Table 1 summaries the contributors of project data, who the author would likely to sincerely thank for their participation.

Table 1: Contributors of project data

Respondent	Organisation represented	Data provided
Kerri Robson	Gecko CLaN (Goulburn Broken)	Landcare project data
Andrea Mitchell	Project Platypus (Upper Wimmera)	Landcare project data
Scott Elliott	Yarram Yarram Landcare (West Gippsland)	Landcare project data
Sonia Sharkey	Southwest Goulburn Landcare	Landcare project data
John Robinson	DELWP	Information on related research
Matthew Warnken	Agriprove	Modelled data on land management technology
Bob Currie	Wadonga Urban Landcare Network	Landcare project data
James Link	Landcare Australia	Information on related research

3 SAMPLE OF LANDCARE PROJECTS

3.1 Overview of sample

The sample of projects activities that the CBA was based on were selected to provide

- a wide breadth of activities from different parts of Victoria
- a reasonable representation of the typical activities undertaken by Landcarers, to maximise its representativeness and facilitate the extrapolation of results across the state.

The projects were selected following consultation with the individuals listed in Table 1.

Table 2 summarises the projects included in the CBA.

Table 2: Sample of Victorian Landcare projects

Respondent	Economic benefits	Environmental benefits	Social benefits
Seagrass restoration	✓	✓	
Cover cropping	✓	✓	
Perennial pasture	✓	✓	
Wild dog fences	✓		✓
Governance workshops for women	✓		✓
Tree planting		✓	
Community and health activities ¹			✓

Note 1: Includes community events, first aid training, drought-related activities, and mental health and suicide prevention interventions. Not utilised for the bottom-up modelling but used instead to inform the top-down assessment (refer to Section 3.5).

These projects are detailed in the next session.

3.2 Projects included in cost-benefit analysis

The following subsections summarise the projects included in the sample. Appendix A outlines the key assumptions used to estimate their benefits and costs, including a rationale and source for each assumption.

Seagrass restoration

Yarram Yarram Landcare teamed with commercial fishers, volunteers and academics from the University of Melbourne and the University of Western Australia, to restore the habitat for fish species in the Corner Inlet. The seagrass habitat is important for the top commercially fished species including King George Whiting, Rock Flathead, Calamari and Garfish, and an estimated 75 per cent of fish species are reliant on seagrass for their survival.

Prior to the project, the Corner Inlet contained 7,000 hectares of seagrass. The project resulted in the restoration of 200 hectares. The project aims to sustain the affected species, which are estimated to have a commercial value of \$2.18 million in 2015 prices (Department of Primary Industries, 2015). The restoration of seagrass also provides nutrient cycling and carbon sequestration benefits.

The project was funded through federal and state government funding of \$200,000 and \$50,000 respectively.

Cover cropping

Project Platypus supported landholders to utilise cover cropping, which is a farming technique that increases the soil's capacity to retain moisture and nutrients, suppresses weeds and mitigates soil compaction. The technique involves planting crops on land that would otherwise be fallowed.

The Sustainable Agricultural Research and Education organisation in the United States provides data on the financial benefits of cover cropping to American farms (SARA, 2019). Their research showed that cover cropping often does not have an immediate financial payoff, however:

- yields tend to increase when measured over longer durations (e.g. 3 or 5 years)

- the yield payoff is substantially higher when there is a drought year, or under other specific circumstances such as when there are compaction issues or potential grazing income.

Protecting yields during drought conditions has become an increasingly important consideration for Australian agriculture, and this is likely to increase further in the future due to the impacts of climate change. Therefore, while such techniques may have a modest or marginal financial payoff at present, they play a crucial role in maintaining the resilience of Australian agriculture going forward.

SARA (2019) noted that the main incremental costs of cover cropping are for seed and seed application, while the main benefits include long-term yield increase, alleviation of compaction, improved water infiltration and weed suppression.

Perennial pasture

Yarram Yarram Landcare collaborated with a local landowner to apply pasture renovation technology to a 45-hectare plot of land. The Australian technology called Soilkee, developed in Gippsland, applies specific crops and mulching techniques that increases:

- nutrients in the soil
- biological and vermicological activity
- moisture retention
- carbon sequestration in soil.

The technology requires upfront expenditure in terms of capital equipment, the 'Soilkee renovator', and additional operational costs in terms of seed. The technology aerates the soil, buries residual organic matter, top-dresses the pasture, and drills seed into rows.

Field testing comparing the technology applied to plots of land have shown positive results relative to control plots.⁵ The technology was involved in the first issue of soil carbon credits under the Australian Climate Solutions Fund (CSF).

The financial payoff from the use of this technology includes revenue from Australian Carbon Credit Unit (ACCUs) and more efficient use of inputs. It should be noted that the technology is suited to high-intensity high-rainfall agricultural areas, and not suited to dryer farmland areas.

Wild dog fencing

Gecko CLaN, in collaboration with the state government, local government and other local stakeholders, attracted Federal Government funding to install 2.8 km of exclusion fencing to avoid wild dog attacks on local farmers' livestock.

The Department of Environment, Land, Water and Planning (DELWP) considers exclusion fencing to be one of the most effective and non-lethal control methods for wild dog management.

The application of fencing avoids the lost value from stock deaths, reduces the requirement for a Wild Dog Controller, avoids local farmers' own costs of wild dog surveillance and control, and the stress that accompanies the threat of stock loss.

Governance workshops for women

Project Platypus conducted two full-day governance training sessions for female attendees. The governance workshops both upskilled the participants and increased their confidence. The attendees developed skills to fulfill roles on organisational boards, as well as general management skills that may be applied to general business administration. Participants ranged from women in agriculture, to marketing, science, environment and natural resource management (NRM) fields.

The importance of increasing female participation in the labour force to support economic growth is well recognised. Economic studies show that female labour force participation is associated with economic

⁵ <http://www.wgcm.vic.gov.au/for-farmers/gippsland-soil-trials/soilkee-renovator-soil-pasture-demonstration>

growth in developed countries (e.g. see Tam, 2011). Moreover, studies have quantified the effect of training on labour productivity and growth (e.g. Dearden et al, 2006; Konings and Vanormelingen, 2014).

Tree planting

Tree planting is an important and prevalent activity for many Landcare groups around Victoria, as it is with Landcare groups around Australia. Tree planting activities were consistently reported as part of this Study's research, as examples of activities supported by facilitators in 2019. The Study used data from two groups' tree planting activities to estimate the costs and benefits of this activity.

Project Platypus organised four community plant out events in 2019 covering 17 hectares. The tree and understorey plant species were a mix of the local area species including Eucalypts, Acacias, Sheoaks, and Dianellas, among others.

Separately, Southwest Goulburn Landcare worked with landholders to plant 8 hectares of Environment Protection and Biodiversity Conservation (EPBC) Act listed Grey Box and derived grasslands on their property, including helping to organise volunteers and prepare 10-year management plans.

3.3 Other projects

The contributors of project data (refer to Table 1, Section 2.2) provided information on a wide range of activities undertaken by their respective organisations in 2019. While the CBA quantified the impacts of those projects that were more amenable to inclusion in the analysis, this longer list of projects demonstrates the breadth and variety of the activities undertaken by Landcarers across the state.

These activities include weed management, climate change adaptation technologies, training, information and awareness, erosion control and animal protection. The ROI or net benefits from some of these activities have been quantified in earlier studies (e.g. refer to Aurecon 2019, West Gippsland CMA, 2017).

3.4 Assessment of attribution

As discussed in Section 1.3, understanding the contribution of facilitators in achieving these outcomes is a key component of this Study. To that end, the evaluation undertaken by RMCG in 2019 provides useful information about the difference facilitators make in securing and increasing the impact of Landcarer activities across the state.

The survey of Landcare group members showed that 80 per cent of survey respondents believed the facilitators helped build community capacity and partnerships, supported NRM Projects and secured grants. Similarly, 72 per cent of respondents believed that the facilitators have done very well in securing project grants and other funding, while 21 per cent believed this was done 'reasonably well'. Facilitators also scored strong ratings for building capacity, building partnerships and on-ground support.

Overall, the evaluation noted that *"Feedback from the Landcare community suggests that the facilitators played a critical role in these achievements, and that in the absence of this role, the level of on-ground outcomes that groups and networks deliver would be significantly reduced."* (RMCG, 2019).

The information provided in the evaluation suggests that facilitators played a crucial role in delivering and increasing the scale of on-ground outcomes. This Study adopts a relatively conservative attribution assumption of 25 per cent, that is, assumes that 25 per cent of the net benefits delivered by Landcarer projects are attributable to the contribution made by the facilitators.

3.5 Top-down assessment

How Landcare supports community cohesion

The projects delivered by Landcarers result in tangible benefits to the community. These benefits can either be measured with reference to market values, such as the increase in crop yield or reduction in stock losses, or by using non-market valuation techniques to value the environmental and social outcomes, such as biodiversity and carbon sequestration.

However, almost all of these projects involve bringing together community members, increasing their sense of social cohesion, and community belonging. Examples of activities that help build a sense of community include:

- organising and running community events
- providing first aid, including mental health training, to community members
- mental health and suicide prevention interventions, including drought events and seminars
- events for schoolchildren and other demographics to learn about the land and the environment.

Valuing this cohesion

Having a connection with the land is known to significantly increase the resilience of the community and community members (Hegney et al, 2007). While the contribution that Landcare makes to social cohesion is oft cited and well accepted, the benefits of social cohesion do not appear to have been estimated in many economic studies.

This Study has attempted to quantify the contribution that the facilitators make to social cohesion using evidence from the literature. This 'top-down' assessment assumes the same attribution rate as the bottom-up assessment, which is that the benefits of social cohesion delivered by Landcarers across the state can be partly attributed to the work of the facilitators (i.e. 25 per cent).

The value of cohesion was estimated using techniques from the health economics field (refer to Appendix A), and a study by Austin et al (2018), which established a quantitative relationship between 'a sense of community' and mental health in rural Australia. The study estimated that the incidence rate of general distress, measured using the K10 mental health score⁶, for community members that feel a sense of community is 33 per cent the rate of those that do not.

3.6 Benchmarking results against other studies

The results of this Study were compared with similar work undertaken by others. This included a study by Aurecon (2008) estimating the ROI in Landcare NSW and a study by West Gippsland Catchment Management Authority on the Social Return on Investment (SROI) from a project delivered by the Merriman Creek Landcare Group (West Gippsland CMA, 2017).

Impact of a supported Landcare in NSW (Aurecon, 2018)

Aurecon estimated the value of Landcare in NSW, which is supported through the Local Landcare Coordinator Initiative (LLCI) and the support body Landcare NSW, including the attributable difference made by the LLCI and Landcare NSW.

The study estimated the value of a supported Landcare in NSW as \$500 million per year. The study found that estimating the portion of this benefit that is attributable to the coordinators funded through the LLCI and the support body Landcare NSW is challenging, but that this is likely to be at least 10 per cent of the \$500 million at \$50 million per year.

The study estimated a BCR of 6, or \$6 of return for every \$1 of investment.

Social return on investment from the Merriman Creek Landcare Group project (West Gippsland CMA, 2017)

West Gippsland CMA estimated the SROI from the Merriman Creek Landcare Group project, which received funding from the Victorian State Government to undertake on-ground works such as tree-planting, fencing and weed control along Merriman Creek.

The objective of SROI is similar to CBA, as both aim to estimate the ROI but employ different techniques. SROI uses the concept of 'financial proxies' to value non-market outcomes, which are measurable financial

⁶ For a description of this measure refer to <https://www.beyondblue.org.au/the-facts/anxiety-and-depression-checklist-k10>

outcomes deemed to be approximately equivalent to the non-market outcomes (e.g. the financial cost of therapy as a proxy for the health and wellbeing benefits gained by being part of a social group etc.).

The outcomes that West Gippsland CMA valued were:

- greater sense of group purpose
- emotional wellbeing
- improved connection with local community
- Natural Resource Management (NRM) knowledge and skills.

The study estimated an SROI of 3.41, or \$3.41 of return for every \$1 of investment.

4 RESULTS

4.1 Bottom-up assessment

This Study estimated that investment into Landcare facilitators in Victoria returns 7.3 dollars for each dollar invested, that is, it provides a **BCR of 7.1**. This estimate takes into account that:

- the project activities of Victorian Landcarers delivered a total of **\$123 million PV** in net benefits in 2019 to Victorians based on economic, environmental and social outcomes, with:
 - a return of **\$173 million PV** in project benefits compared to **\$50 million PV** in project costs
 - an average project **BCR 3.2**
- facilitators both enable projects and increase their scale and scope, and **\$31 million PV** of these net benefits are attributable to the activities of the facilitators such as grant funding, knowledge sharing, partnership building and capacity building
- this compares to a funding cost for the facilitators of approximately **\$4 million** per year.

Figure 4 summarises this estimation process.

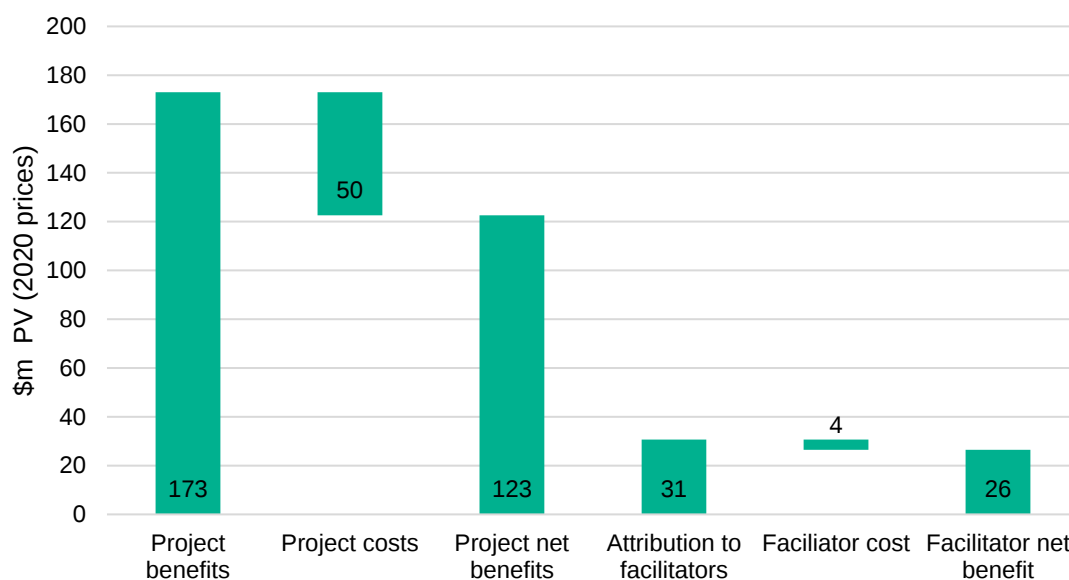


Figure 4 Estimation of facilitator costs and benefits

Table 3 summarises the benefits and costs of the individual projects that contributed to the estimated result of \$123 PV in net benefits from Victorian Landcare projects.

Table 3: Benefits and costs of Victorian Landcare projects

Landcare project activity	Project benefits	Project costs	Project BCR
Project (network or group)	\$000s PV	\$000s PV	Ratio
Seagrass restoration (Yarram Yarram)	664	350	1.9
Cover cropping (Project Platypus)	14	6	2.4
Wild dog fences (Gecko CLaN)	555	60	9.3
Governance workshops (Project Platypus)	85	9	9.4
Perennial pasture (Yarram Yarram)	485	105	4.6
Tree planting (Project Platypus & Gecko CLaN)	339	95	3.6
Total across sample (1.2% of Victoria)	2,143	625	3.4
Whole-of-Victoria	173,000	50,000	3.4

4.2 Top-down assessment

This Study estimated the mental health benefits stemming from the social cohesion resulting from Landcarer activities to be **\$367 million PV**, and the facilitators contribution to that value as being **\$91 million PV**.

Deducting \$4 million in facilitator costs, provides a net present value of **\$87 million PV**.

4.3 Sensitivity analysis

The CBA required making many assumptions. These assumptions were based on data provided to RPS and further desktop research (refer to Appendix A). Key uncertain assumptions have the potential to impact the findings of the CBA. Key uncertain assumptions are:

- the social discount rate
- the extent of project benefits attributable to the facilitators
- the scaling factor used to extrapolate from the sample of projects to the whole-of-Victoria.

Figure 5 illustrates the impact of key uncertain assumptions on the BCR. The sensitivity testing assesses the impacts of alternative values for the key uncertain assumptions.

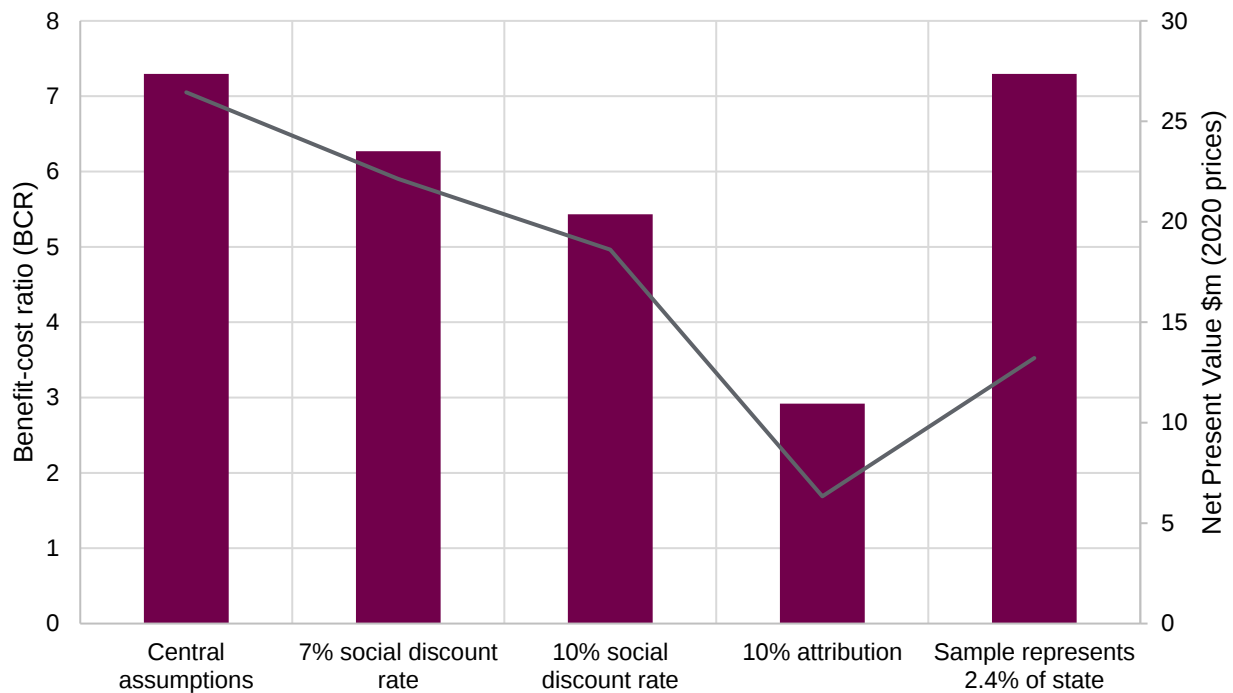


Figure 5 Sensitivity of BCR and NPV to alternate values for key assumptions

The results of the sensitivity testing show that the finding of a BCR greater than 1 and a positive net benefit are robust to alternate values for key assumptions.

4.4 Comparison to other studies

Figure 6 and Figure 7 compares the results of the present Study to similar work.

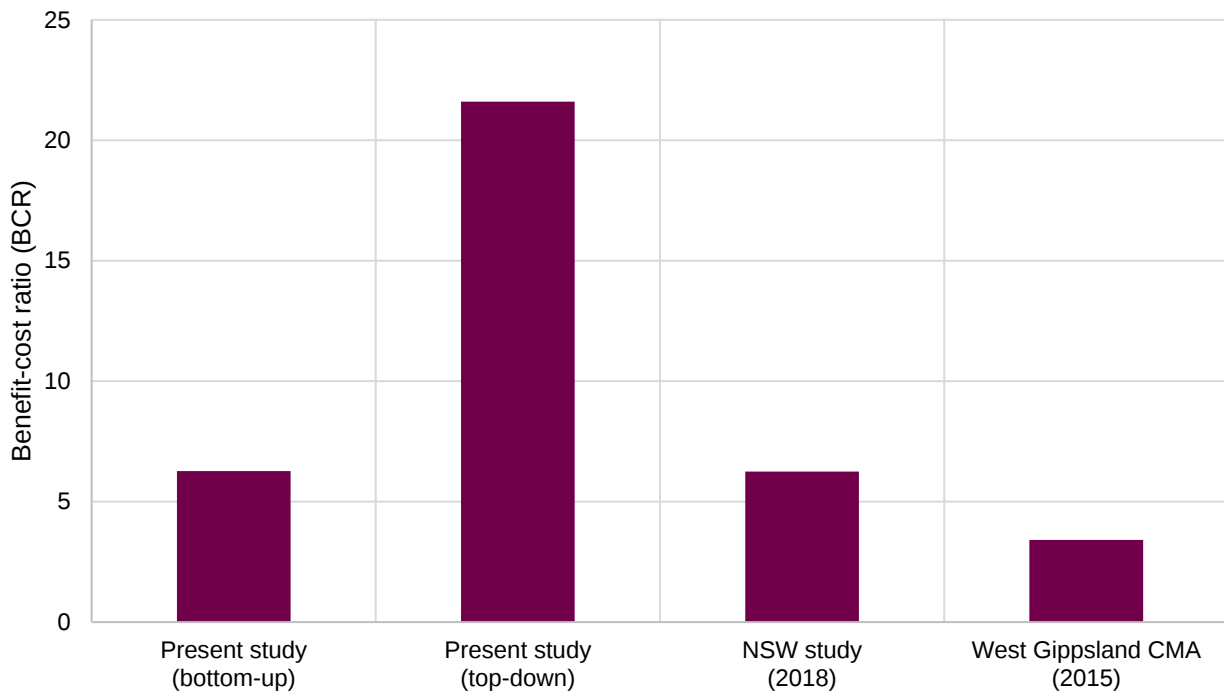


Figure 6 BCR estimate compared to other studies

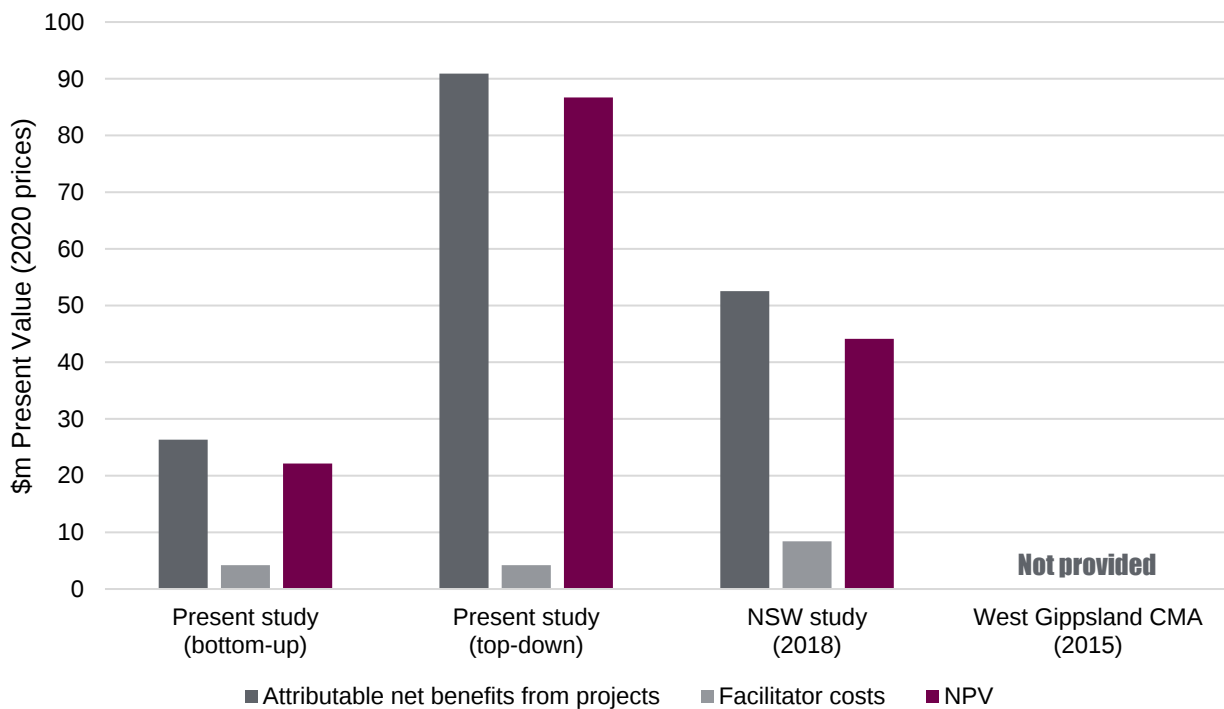


Figure 7 NPV estimate compared to other studies

The results show that investment in Victorian facilitators delivers a relatively high BCR (as per Figure 6). While the NPV is estimated to be lower than NSW Landcare (as per Figure 7), it should be noted that the level of investment is also lower.

The result shows that Landcare Victoria facilitators achieve a relatively high public benefit with a modest public investment.

The analysis of projects also showed that many of the Victorian projects addressed very significant issues such as climate change resilience, habitat and biodiversity restoration, productivity, and community wellbeing and resilience. However, the scale of funding limited the scale and reach of each of the activities. Many activities have the potential to be delivered at a much larger scale including land management techniques, environmental restoration and training. In particular, the evidence base reviewed suggested that the land management techniques would provide greater economies scale if delivered at a much larger scale.

5 CONCLUSION

Benefits of Landcare in Victoria

This Study found that Landcare in Victoria undertakes a wide range of projects across the state that deliver economic, environmental and social benefits. These projects are delivered through government funding, volunteer effort and in-kind landowner contributions.

This ROI Study has found that these projects deliver net benefits to Victorians. The estimated average BCR for a project is **3.4** and estimated total net benefit to Victoria is **\$123 million**.

More broadly, projects delivered by Landcare contribute to high priority public policy objectives. These include:

- the mitigation of climate change impacts
- building resilience in the agricultural industry to adapt to climate change impacts
- supporting Australia's contribution to the United Nations Sustainable Development Goals
- building resilience in regional communities, particularly at the current time when the community has been impacted by drought, bushfires and more recently, the COVID-19 public health crisis
- driving human capital development through training, awareness and education, and productivity improvements in the industry.

Importantly, Landcarers contribute to these goals with relatively modest funding, through collaborative and partnership approaches, and at a grassroots level without requiring significant Government involvement.

The contribution of facilitators

Facilitators have played a crucial role in initiating, attracting support for, and delivering these projects. Without the facilitators, many of these projects would not have been achieved, or would not have delivered the same magnitude of impact.

This Study focuses on this contribution made by facilitators and the cost of funding the facilitators. The modest annual investment of **\$4 million**, compares to an attributable **\$31 million PV** of the net project benefit estimated above. That is, the facilitators are estimated to return more than **7 dollars for every dollar investment**. The results of sensitivity testing show that the finding of a BCR greater than 1 and a positive net benefit are robust to alternate values for key assumptions.

The results show that facilitators play a crucial 'leveraging' role in the state. While the projects deliver net benefits in and of themselves, the facilitators amplify the scope and scale of Landcare activities across the state. The data also show that some projects have the potential to be delivered at an even larger scale.

Moreover, the findings show that when the contribution by facilitators is viewed from a different perspective, which is the role they play in bringing together the community to foster social cohesion, the net benefits are likely to be much greater. The top-down / social cohesion approach to estimation suggests an attributable net benefit of **\$87 million PV** across the state.

The results are broadly in line with previous studies. A similar study conducted for Landcare NSW estimated a slightly higher net benefit but a lower BCR (Aurecon, 2018). It should be noted that the NSW study was based on NSW facilitator costs of approximately **\$8 million**, which double the Victorian facilitator cost used in this present Study. Comparing this Study with earlier work suggests that:

- the estimated ROI from investment in Victorian facilitators is slightly higher than, but broadly in line with estimates from earlier work, when expressed as a benefit-cost ratio
- greater investment in facilitators is likely to deliver greater net benefits.

REFERENCES

- Aurecon (2018). *Landcare NSW regional data snapshots Impact of a supported Landcare in NSW*. Sydney: Landcare NSW.
- Austin, E. K., Handley, T., Kiem, A. S., Rich, J. L., Lewin, T. J., Askland, H. H., ... & Kelly, B. J. (2018). Drought-related stress among farmers: findings from the Australian Rural Mental Health Study. *Medical Journal of Australia*, 209(4), 159-165.
- CSIRO, Australian Bureau of Metrology and FarmLink (2019). *Regional Weather and Climate Guide – Wimmera, Victoria*. Retrieved from: <http://www.bom.gov.au/climate/climate-guides/guides/040-Wimmera-VIC-Climate-Guide.pdf>
- Dearden, L., Reed, H., & Van Reenen, J. (2006). The impact of training on productivity and wages: Evidence from British panel data. *Oxford bulletin of economics and statistics*, 68(4), 397-421.
- Deloitte Access Economics (2008). *The Health of Nations: The Value of a Statistic Life*. Office of the Australian Safety and Compensation Council. July 2008.
- Department of Primary Industries (2015). *Fisheries Victoria's commercial fish production information bulletin 2015*. Queenscliff, VIC: Department of Economic Development, Jobs, Transport and Resources.
- Department of Treasury and Finance (2013). *Economic Evaluation for Business Cases Technical Guidelines*. Retrieved from: [http://www.dtf.vic.gov.au/sites/default/files/2018-03/Economic Evaluation - Technical Guide.doc](http://www.dtf.vic.gov.au/sites/default/files/2018-03/Economic%20Evaluation%20Technical%20Guide.doc)
- Campbell, R. (2011). *Assessment of the habitat value of Leard State Forest*. Report for the Maules Creek Community Council (MCCC), prepared by Economists at Large. Melbourne, Australia.
- Hegney, D. G., Buikstra, E., Baker, P., Rogers-Clark, C., Pearce, S., Ross, H., ... & Watson-Luke, A. (2007). Individual resilience in rural people: a Queensland study, Australia. *Rural and remote health*, 7(4), 1-13.
- Henry, A., Koech, R. and Prior, J. (2016). *The value of Landcare to the Australian community*. Landcare NSW. December 2016.
- Konings, J., & Vanormelingen, S. (2015). The impact of training on productivity and wages: firm-level evidence. *Review of Economics and Statistics*, 97(2), 485-497.
- Nordhaus, W. (2017). Revisiting the social cost of carbon. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, 114 (7) 1518-1523.

- RMCG (2019). *The Victorian Landcare Facilitator Program – Review*. Department of Environment, Land, Water and Planning.
- SARA (2019). *Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops*. Sustainable Agriculture Research & Education Technical Bulletin. Retrieved from: <https://www.sare.org/Newsroom/Press-Releases/When-Do-Cover-Crops-Pay-New-USDA-SARE-Report-Addresses-the-Question#:~:text=Based%20primarily%20on%20yield%20and,scenarios%20and%20as%20c over%20crops>
- Tam, A., 2011. U-shaped female labor participation with economic development: some panel data evidence. *Economics Letters* 110, 140–142.
- West Gippsland CMA (2017). *Growing trees and growing change*. Retrieved from: <https://www.wgcma.vic.gov.au/wp-content/uploads/2015/01/2017-09-14-SROI-Report-Merriman-Creek-Landcare-Group.pdf>
- World Health Organisation (2015). *Global Burden of Disease Study 2015 (GBD 2015) Disability Weights*. Retrieved from: <http://ghdx.healthdata.org/record/ihme-data/gbd-2015-disability-weights>

Appendix A Detailed assumptions

The following tables provide details for the key assumptions used in the CBA.

Table 4: General CBA parameters and assumptions

Parameter or assumption	Value	Source	Comments
Year of project establishment	2019	Providers of data	The individuals consulted in the research provided data on projects undertaken in 2019.
Time horizon for costs and benefits	Varies by project	Consultant assumptions	The time horizon to account for ongoing cost and benefits of a project. Varies by project (refer to tables below).
Discount rate	4%	DTF (2013) guidelines	Applicable discount rate for Category 1 projects, which according to the guidelines apply to the project with “ <i>benefits [that] can be articulated but are not easily translated to monetary terms</i> ”. The rate is used to compare future costs and benefits with costs and benefits incurred in the base year.
Sensitivity discount rates	7 and 10%	DTF (2013) guidelines	Higher discount rates to test the robustness of results
Price year	2020	Chosen price year	All monetary figures are expressed at real 2020 price levels (i.e. they are adjusted for inflation)

Table 5: Key CBA assumptions for Seagrass restoration

Assumption	Value	Source	Comments
Restoration scale	200 ha	Yarram Yarram Landcare	
Time for habitat improvement to take effect	2 years	Yarram Yarram Landcare	
Time horizon for benefits	20 years	Consultant assumption	
Total value of fish species in the Corner Inlet	\$2.18 million	Department of Primary Industries (2015)	2015 prices
Proportion dependent on seagrass	75%	Yarram Yarram Landcare	All monetary figures are expressed at real 2020 price levels (i.e. they are adjusted for inflation)
Funding provided for costs	\$300,000	Yarram Yarram Landcare	\$250,000 and \$50,000 of federal and state government funding respectively

Table 6: Key CBA assumptions for Cover cropping

Assumption	Value	Source	Comments
Seed and seed application cost	US\$37 per acre	SARA (2019)	Converted to Australian units of measure and prices in the CBA
Return through higher yields (most years)	US\$37 per acre	Analysis of SARA (2019)	Assumes the financial return from cover cropping is marginal in most years
Frequency of a dry year	12 years every 30 years	CSIRO et al (2019)	Based on annual rainfall data for Wimmera
Return during a dry year	US\$70 per acre	Analysis of SARA (2019)	Returns vary according to the harvest crop, cover crop and specific challenges being addressed by cover cropping

Table 7: Key CBA assumptions for Perennial pasture

Assumption	Value	Source	Comments
Renovated pasture	45 ha	Yarram Yarram Landcare	
Soilkee capital and operating costs	Confidential ¹	Agriprove	
More efficient use of farm inputs	Confidential ¹	Agriprove	
Value of carbon sequestered	\$45 per tCO ₂ -e	Nordhaus (2017)	Approximate global social damage cost of carbon recommended by Nordhaus (2017) using the Dynamic Integrated model of Climate and the Economy (DICE). Adjusted to Australian dollars using market estimates of the exchange rate.

Note ¹: Provided by Agriprove on a commercial-in-confidence basis

Table 8: Key CBA assumptions for Wild dog fencing

Assumption	Value	Source	Comments
Livestock value	\$280 per sheep	Gecko CLaN	
Pre-project incidence of wild dog attacks	16 per year	Analysis of DELWP data	
Post-project incidence of wild dog attacks	4 per year	Analysis of DELWP data	
Losses per incident	15 sheep	Gecko CLaN	
Controller hours avoided	80 hours	Analysis of Gecko CLaN data	
Federal funding to meet costs	\$45,000	Gecko CLaN	
Hours of labour to install fencing	618 hours	Gecko CLaN	489 Landholder and 129 Gecko CLaN hours respectively
Labour cost	\$30 per hour	Gecko CLaN	

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Table 9: Key CBA assumptions for Governance workshops for women

Assumption	Value	Source	Comments
Attendee-hours of training provided	224 person-hours	Project Platypus	2 days of all-day training, with 16 attendees per day (assumes 7 hours of training)
Training effect on productivity	0.76% per hour	Konings and Vanormelingen (2014)	Estimated productivity premium per hour of training
Assumed base product of labour	\$50,000 per year	Consultant assumption	Approximate for a part-time unit of labour in Australia
Opportunity cost of trainer	\$250 per hour	Consultant assumption	Represents their value in the market (does not have to be a paid wage)
Facilities cost	\$400 per hour	Consultant assumption	Includes room hire, equipment, catering etc. (does not have to be a paid rate)

Table 10: Key CBA assumptions for Tree planting

Assumption	Value	Source	Comments
Area planted (Project Platypus)	17 ha	Project Platypus	Eucalypts, Acacias, Sheoaks, and Dianellas, among others
Area planted (Southwest Goulburn Landcare)	8 ha	Southwest Goulburn Landcare	Environment Protection and Biodiversity Conservation (EPBC) Act listed Grey Box and derived grasslands
Value of protected native vegetation	\$20,000 per ha	Campbell (2011)	In 2011 prices. The authors used data from Victoria's BushBroker programme, which provided a market for native vegetation offsets
Initial cost of protecting vegetation	\$3,804 per ha	Southwest Goulburn Landcare	Based on funding allocated to project
Ongoing cost of protecting vegetation	Initial cost incurred every 10 years	Consultant assumption	To account for maintenance and ongoing protection

Note ¹: Based on analysis of successful EcoTender auction bids published on the DELWP website (<https://www.environment.vic.gov.au/innovative-market-approaches/ecomarkets>)

Table 11: Key CBA assumptions for Top-down assessment

Assumption	Value	Source	Comments
Mental health (general distress) incident rate ratio for sense of community	0.33	Austin et al (2018)	Meaning a community member that feels a sense of community is 0.33 times as likely to have mental health concerns of feeling generally distressed as a community member that does not feel a sense of community
Burden of disease for moderate anxiety disorders, expressed as 'disability weight'	0.133	World Health Organisation (2015)	Factor used to estimate the quality of life impact of moderate anxiety disorder
Value of a Statistical Life Year (VSLY)	\$433,437	Deloitte Access Economics (2008)	Represents the estimated value of an illness free year of life, and therefore a baseline against which quality of life loss can be estimated
Community members participating in a Landcare group	100 per group	Approximation based on data provided by Yarram Yarram Landcare	