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Social research evaluating River Tender Program outcomes

A report to the
North East Catchment Management Authority

July 2008

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& S. McDonald

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List of acronyms

CRP – Current Recommended Practices
DSE – Department of Sustainability and Environment
FGIS - Fixed Grant Incentive Scheme
LA - Landholder Agreements
MA - Management Agreements
MBI - Market Based Instruments
NE CMA - North East Catchment Management Authority
NRM – Natural Resource Management
RTP - River Tender Project

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INTRODUCTION

The River Tender Project (RTP) - previously the Riparian Pilot Project, was a substantial project (\$2 million budget over 4 years) administered by the North East Catchment Management Authority (NE CMA). The intention was to improve the quality and extent of riparian vegetation along the Ovens River, a Heritage River in Victoria. RTP funding was offered explicitly to implement actions that would enhance river health and biodiversity.

Governments have acknowledged the public benefits of work by landholders to maintain or improve the condition of riparian areas. Fixed grants have been the most common approach to providing support for work on privately owned/ managed riparian areas. Under a Fixed Grant Incentive Schemes (FGIS) the public is invited to apply for funds to complete work at a specified rate that is generally the same for all applicants and sites. FGIS usually include a range of extension support. The Landholder Agreements that the NE CMA enters into with landholders is an example of a FGIS.

Recognising the limits of FGIS to attract landholder interest in a cost effective manner, Victorian Natural Resource Management (NRM) agency staff have pioneered the use of economic instruments - Market Based Instruments (MBI) - such as the RTP. The distinctive features of MBI are that landholders are able to choose how much work they will do and the price they are willing to do that work for. Program staff then assesses the environmental benefit of work proposed before allocating resources to different bidders. Amongst other things, it is assumed that these attributes lead to greater program efficiency (lower per unit cost for work funded by government) and greater long-term commitment by landholders as measured by active, ongoing management of the works area.

Under the RTP participating landholders entered formal Management Agreements (MA). Typically, the MA specified works to be implemented (one-off and ongoing maintenance) and management issues to be addressed. Each MA was negotiated by the landholder with a NE CMA river restoration officer.

The NE CMA contracted the Institute for Land, Water and Society (ILWS) at Charles Sturt University (CSU) to provide social research expertise to support implementation and evaluation of the RTP over the four year period of its operation. The CSU team drew heavily on its previous work in the Ovens Valley in a project titled *Providing the knowledge base for landscape change in the Ovens catchment* (Curtis et al. 2001). A more recent report (Allan et al. 2006) included findings from a mix of quantitative (mail survey) and qualitative (interviews) research that addressed the following key tasks:

1. Benchmarking landholder commitment to riparian management before RTP
2. Comparing landholder responses to RTP and FGIS
3. Evaluating the communication and extension effort for RTP
4. Understanding learning and commitment developed through RTP.

A second contract in 2008 enabled the CSU team to undertake additional data collection and analysis to examine the effectiveness of the RTP in terms of the MBI;

1. attracting a different cohort of landholders compared to the FGIS;
2. effecting change in the knowledge and confidence in current recommended practices (CRP) of RTP participants; and
3. building stronger long-term commitment in terms of active and ongoing site management compared to a FGIS.

The findings presented in this report are based on the analysis of data collected through surveys in 2005 and 2008. RTP participants and other riparian landholders in the Ovens Valley were surveyed in 2005. Some of the original 2005 and subsequent RTP participants were also surveyed in 2008. Participants in NE CMA Landholder Agreements – a type of FGIS - who managed riparian land, were also surveyed in 2008 with funding from the ‘Designer Carrots’ program (Curtis et al. 2008).

METHODOLOGY

Social research objectives for RTP evaluation

1. Assess the extent that the RTP engaged a broad cross section of landholders and therefore represents a general policy tool.
2. Assess the extent that the RTP engaged a different cohort of landholders to the FGIS and therefore has the potential to enhance landholder engagement in NRM.
3. Assess the impact of landholder participation in RTP across a range of NRM intermediate outcomes (knowledge, confidence in CRP and long-term commitment to active management of their site).

Approach to data collection and analysis

Research objective 1:

Did the RTP engage a broad cross section of landholders?

This objective was accomplished by comparing landholders engaged in RTP with riparian landowners in the Ovens Valley. A small number of social and farming topics identified from previous studies as linked to adoption were used to make the comparison between the two groups. These data were collected in 2005 through a survey mailed to all RTP participants and a random sample of landholders with riparian land identified from a 2001 survey of landholders in the Ovens Valley (Curtis et al. 2001). Detailed finding related to this objective were first published in Allan et al. (2006)

Research objective 2:

Did the RTP engage a different cohort of landholders to the FGIS?

This objective was accomplished by comparing landholders engaged in RTP with riparian landowners in the Ovens Valley who expressed interest in a FGIS included in the 2005 survey. With the 'Designer Carrots' project there was also the opportunity to compare a selection of RTP participants with those involved in riparian management through the Landholder Agreements (LA) using surveys conducted in 2008.

Research objective 3:

What was the impact of participation in RTP across a range of NRM outcomes?

This objective was to be accomplished using two approaches:

- Assessing the extent there had been a significant change in the same RTP participants between 2005 and 2008 on a number of intermediate NRM outcomes. Given the level of direct investment by the NE CMA in onground work through the RTP it was not valid to make a comparison of adoption before and during the RTP.
- The initial intention was to re-survey the sample of Ovens Valley landholders included in the 2005 survey who had riparian land and had previously been involved in an FGIS. The aim was to compare the extent of change over time in this group and the RTP participants. This approach was abandoned in favour of combining the 2008 RTP and LA participants identified through the 'Designer Carrots' evaluation of RTP. By combining the two populations it was possible to undertake analyses that explored relationships between RTP participation and respondent scores on a number of intermediate outcomes. In other words, did RTP participation make a difference to respondent's scores? Given the level of direct investment through the two programs, it was not valid to assess the impact of RTP participation on adoption. However, the 2008 surveys included six items exploring landholder commitment to active and ongoing management of their site.

Background to adoption of riparian management practices

RTP funding was offered explicitly to implement actions (current recommended practices, CRP) that would enhance river health and biodiversity through changes in riparian area management by private landholders. The theoretical underpinnings to the mail surveys undertaken by CSU were therefore largely grounded in the literature on landholder adoption of conservation practices, and in this case, riparian management (Cary et al. 2002; Curtis and Robertson. 2003; Millar and Curtis 1997; Pannell et al. 2006; Race and Curtis 1998; Thomson and Pepperdine 2003).

As Pannell et al. (2006) explain, landholders will adopt conservation practices that are consistent with them achieving their individual and family goals/objectives, including their need for financial security and social acceptance. In turn, willingness and ability to take up a practice will depend on a number of additional factors:

1. Personal characteristics of landholder and their immediate family
 - Education levels; knowledge; skills; length of experience in area/ as a farmer; risk taker; introvert/ extrovert; income; stage of life; family succession; and personal network.
2. Social context of landholder
 - Prevailing norms; information flows through networks; education/ training opportunities; local organisations; and level of trust in extension agents.
3. Nature of the practice
 - Including its trialability; observability; complexity and extent of re-skilling required; whether the practice fits with existing farming systems and lifestyle; the cost and time for returns to accrue; and the extent the practice is a substantial improvement on what is already being done.

The 2005 mail surveys

River Tender Project (RTP) participants were sent surveys after they had received a site visit from NE CMA staff who assessed the suitability of the landholder's site for the RTP. NE CMA staff informed the landholders that a survey would be sent from CSU in 2005 and 2007 (occurred in 2008). Of the 49 RTP participants, 34 returned completed surveys to CSU for a response rate of 69%.

To provide a "control" group for comparison with RTP participants, a sample of Ovens Valley landholders was drawn from respondents to the 2001 survey by Curtis et al. (2001). This survey was mailed to 1,000 of 8,658 rural landholders with properties larger than 10 hectares as identified on local government ratepayer rolls. Only landholders within 500m of a river/ creek were selected and successful RTP participants were excluded from the control sample. One hundred and one properties were identified and surveys were mailed to these landholders. Nine recipients were removed from the list because respondents indicated that the property had changed hands or the surveys were "returned to sender". Of the 92 eligible properties, 58 returned surveys to CSU for a response rate of 63%.

The only difference in the surveys to the control group and the RTP participants was that the control group survey included a section exploring respondent interest in a Fixed Grant Incentive Scheme (FGIS) (N=25). The FGIS proposed offered financial assistance to landholders for a substantial component of establishment costs and a payment for ongoing management and the opportunity costs associated with revegetation work.

Survey topics sought information about:

- The importance of issues thought to be contributing to problems in rural areas.
- Management practices on the property, both general property practices and management specific to river/creek frontage or wetlands.
- The values landowners attach to waterways, wetlands and adjoining land on their property or in their district.
- The level of landholder knowledge of land and water management.
- Views about the management of waterways or wetlands and confidence in recommended practices.
- Background social and farming information.

The 2008 mail surveys

The NE CMA and the Department of Sustainability and Environment (DSE) provided the research team with a list of participants from Round 1 and Round 2 of RTP. Another list was supplied of landholders in the Ovens catchment who have river frontage sites, had been involved in various projects during the past five or so years and were subject to a LA. In most cases the CMA arranged and implemented most of the on-ground work rather than works being undertaken by landholders. In all cases, the LA specified that the landholders were responsible for ongoing maintenance.

Where possible, program evaluations should compare “apples with apples”, that is, programs employing MBI should be compared to similar programs using FGIS (scale of investment; extent of effort by NRM staff; time-frame; issues being addressed; social context of landholders). Information provided by NE CMA and DSE and that obtained by the research team through surveys and telephone conversations with survey respondents suggests that RTP and LA are in fact both “apples”.

The RTP participant list included the names of 43 landholders. One exceptionally large property was removed from the list, leaving 42 landholders to be surveyed. The LA participant list included the names of 44 landholders, however one name was repeated and therefore was removed from the list prior to mail out, leaving 43 LA landholders to be surveyed.

Two survey instruments were designed; one for the RTP participants and another for the LA participants. Both surveys contained similar questions with some modifications to suit the different programs. The topics included in the surveys were similar to those in the 2005 surveys, with the exceptions that an additional topic asked for views about River Tender or the Landholder Agreement programs; and the topic exploring adoption of CRP focused on riparian area management over the “first two years”, 2007 and 2008, and the “next two years”. The latter topic included six items exploring landholder long-term commitment to the management of their site.

As with the 2005 surveys, the survey design and the mail out process employed a modified Dillman (1979) approach. The surveys were presented as a distinctive booklet and were mailed with an appealing cover letter. The mail out process was closed four weeks after the initial mailout with a response rate of 84% (N=32) for the RTP participants and 77% (N=24) for the LA participants.

FINDINGS

Research objective 1:

Did the RTP engage a broad cross section of landholders?

The intention was to assess the extent that landholders engaged through the RTP were typical of most landholders and as a result, determine whether the RTP was a policy instrument with widespread application. As explained earlier, this objective was accomplished by comparing landholders engaged in RTP with a sample of riparian landowners in the Ovens Valley. Surveys were mailed to all RTP participants and a random sample of landholders with riparian land identified from a 2001 survey of landholders in the Ovens Valley (Curtis et al. 2002). A small number of social and farming topics identified from previous studies as linked to adoption were used to make the comparison between the two groups.

Data summarized in Table 1 suggest that the RTP participants were very different from the random sample of all riparian owners in the Ovens Valley. Perhaps the most important difference is that RTP participants were less likely to be farmers by occupation. Indeed, less than 20% of the RTP participants were farmers by occupation whereas over 40% of the landholders in random sample were farmers. Accordingly, RTP participants were significantly more likely to operate smaller properties, work off-property, spend less time working on-property, and were less likely to report an on-property profit but reported much higher off-property incomes. RTP participants also had far less experience of local conditions (length of residence). RTP participants were also significantly younger than the control group, but both cohorts had median ages above 50 years. There were also some differences in enterprise mix for the two groups, with RTP participants more likely to be involved in trees for timber/ firewood and to report that they were not involved in agriculture. Interestingly, there were no differences in terms of landcare group membership, involvement in property/ farm planning short courses or property planning.

RTP participants were also different from the control group in terms of the values they attached to waterways and wetlands. The key differences were that RTP participants gave a higher rating to environmental and social values and a lower rating to economic values. To a large extent it appears that these differences in values are linked to the relative importance of farming as an occupation and as a source of income for RTP participants and the control group. These relationships

also appear to affect the uptake of recommended practices in that those in the control group were far more likely to say stock grazed part of their river/ creek frontage or wetland or that stock drank from the same area [Table 2]. There were also some important differences in attitudes to stakeholder roles and the level of confidence in CRP for improved management of remnant vegetation and river/ creek frontages. For example, RTP participants expressed a higher level of willingness to work with government; were more confident in the ability of scientific knowledge; and were more confident that fencing to manage stock access and off-stream watering were effective management strategies.

These attributes affect the capacity of landholders to engage in natural resource management and the differences identified would require some adjustments on the part of government programs and extension staff. For example, those working off-property may be difficult to meet on-site during the week; they may be time-poor in terms of undertaking onground work; but they may be knowledgeable and committed to biodiversity conservation (see later notes). Past research, including in the Goulburn Broken (Curtis et al. 2001) and Corangamite (Curtis et al. 2007) also suggests that regional programs are less effective in engaging this non-farmer cohort of landholders.

While there were important differences between the random sample and RTP participants, survey data suggests that the RTP landholders were typical of many landholders. For example, RTP participants were mostly non-farmers and non-farmers comprised 57% of all respondents in the random sample of riparian landholders in the Ovens Valley. These data suggest that there was a substantial pool of landholders likely to be engaged through successive rounds of the RTP or a similar incentive program.

Information in Table 1 also suggested that the RTP participants were a worthwhile target because they managed significantly larger median areas of native bush and were significantly more likely than the control group to manage crown river frontages. That is, the landholders engaged through the RTP were more likely to manage critical assets identified by the NE CMA for biodiversity conservation.

Table 1
Control group compared to RTP participants
Summary information
River Tender and Ovens riparian landholders surveys, 2005
Control N = 59, River Tender N= 34

Topics	Control ¶		River Tender		Sig P value
	n =	value	n =	value	
Median area of property	54	62 ha	33	22 ha	0.0013*
Yes, property includes crown river frontage	51	51%	33	79%	0.0196*
Median area of native bush cover on property	51	4 ha	33	6 ha	0.0329*
Proportion of your property covered by native bush	51	1%	33	14%	0.0000*
Yes, irrigated part of farm last year	52	25%	34	35%	0.3068
Median age of respondent	54	59 yrs	34	51 yrs	0.0116*
Completed a short course relevant to property planning since 2000 – % yes	53	34%	34	29%	0.83513
Main occupation - % farmers	53	43%	33	12%	0.0036*
Median hours per week worked on farming/property related activities last year	53	40 hrs	33	12 hrs	0.0005*
Days per week in paid off-property work last year	52	0 days	33	50 days	0.2254
Median length of residence in district	53	40 yrs	34	15 yrs	0.0000*
Member of a local landcare group	55	46%	34	50%	0.8423
Yes, work at least partially funded by federal or state programs since 2000, eg. Landcare, NHT, Weed busters	56	34%	34	44%	0.4578
Yes, property returned a profit last financial year (03/04)	57	51%	33	30%	0.0935
Median total off-property income before tax for you and partner	29	\$10,000	10	\$35,000	0.0261*
Not started a written property plan	55	62%	33	55%	0.6542
Not started a succession plan	54	56%	31	71%	0.2410

* Significant at p <0.05

Table 2
Control group compared to RTP participants
Adoption of land and water management practices
River Tender and Ovens riparian landholders surveys, 2005
Control N = 58, River Tender N = 34

Management Topic	Control n =42 to 44	River Tender n = 29 to 30	Sig P value
	value	value	
Yes, some paddocks include river/creek frontage	89%	72%	0.1442
<i>Median number of paddocks with river frontage</i>	3	1	0.0053*
Yes, work to control pest animals & weeds in waterway or wetland in 2004	75%	79%	0.8860
<i>Median cost (\$)</i>	\$200	\$600	0.0258*
Yes, in 2004 stock grazed part of river/stream frontage or wetland for over a week at a time	72%	41%	0.0182*
Yes, in 2004 stock drank from river/stream frontage or wetland for over a week at a time	70%	34%	0.0053*
Yes, some distance along the river/creek or wetland is fenced to allow stock access	64%	57%	0.7186
<i>Median length of fencing in metres</i>	300 m	265 m	0.5471
Number of paddocks with river/creek frontage with off-stream watering for stock through a trough or tank	50%	48%	0.9243
Yes, fencing erected along waterway or wetland since 2000 to manage stock access	36%	37%	0.8682
Yes, trees/shrubs planted since 2000 up to 40m either side of a river/creek or wetland	36%	52%	0.2904

* Significant at p <0.05

Research objective 2:

Did the RTP engage a different cohort of landholders to the FGIS/LA?

Landholders are a heterogeneous group and no single policy approach is likely to appeal to all/ most landholders. CMA therefore need to employ a variety of policy instruments and check that the mix employed engages a sufficient proportion of landholders in their catchment, or, those landholders with high priority assets that are the focus of CMA effort. It is also important to ensure that there is not complete overlap in the landholder cohort engaged by different policy instruments.

This assessment was initially undertaken through a comparison of landholders engaged in RTP and riparian landowners in the Ovens Valley who expressed

interest in a FGIS included in the 2005 survey. Fifty-four of the respondents to the 2005 Owens Valley riparian landholder survey said “Yes” or “More than likely” that they would apply for funding under a FGIS to replant native species or better manage existing remnant bush on their property. With the ‘Designer Carrots’ project there was the opportunity to also compare the combined 2005 and subsequent RTP participants with those involved in riparian management through the Landholder Agreements (LA) using surveys conducted in 2008. Comparisons between the RTP participants and both the FGIS and LA were made for a small number of social and farming variables, including: property size, occupation, enterprise mix, age, crown land frontage exists, and remnant vegetation patches occur and the size of those patches.

The RTP engaged landholders who were different to the typical landholder with river/ creek frontage in the Owens Valley interested in a FGIS [Table 3]. The RTP participants were more likely to be non-farmers, work fewer hours per week on property, own smaller properties and have lived for much shorter periods of time in their local district. As might be expected, the RTP participants attached significantly higher social values while the FGIS participants attached significantly higher economic values to their respective riparian areas [Table 4].

RTP and LA participants were similar for most of the social and farming variables included in the 2008 surveys [Table 5]. For example, these groups were comparable in age; had properties of similar sizes; included similar proportions of farmers, non-farmers and retirees (although there were different percentages of professional and trade occupations); and were just as likely to be a landcare member or have completed at least one short course related to property management. It was therefore not surprising that RTP and LA participants gave similar rating to the values they attached to their waterways, wetlands and adjoining lands

These similarities between RTP and LA participants suggest that the comparison with the LA program is a valid approach to evaluation of the RTP. However, these findings also suggest that the RTP did not engage a different landholder cohort than had been engaged through the more traditional LA program (a FGIS). This conclusion contradicts the finding from the analysis of 2005 survey data that RTP participants were significantly different from the sample of Owens valley landholders with riparian land who expressed interest in a FGIS. At least part of the explanation for this apparent contradiction is that LA participants were not identified at random: they applied to enter the program in response to an advertisement or were approached by NE CMA staff. For this reason, LA participants are likely to be more similar to RTP participants than to the random sample of Owens landholders who expressed an interest in a FGIS when surveyed. These findings suggest that the ability of an MBI to enhance the breadth of landholder engagement will depend to a large extent on the communications channels employed by those seeking to engage landholders in programs.

Table 3
Comparison of control (FGIS) and RTP participants
Background social and farming topics
River Tender and Ovens riparian landholders surveys, 2005
FGIS N = 25, River Tender N = 34

Topics	FGIS		River Tender		Sig P value
	n =	value	n =	value	
Median area of property	23	57 ha	34	22 ha	0.0061*
Yes, property includes crown river frontage	21	43%	33	78%	0.0076*
Median area remnant bush	22	2 ha	33	5 ha	0.2235
Median proportion of property under remnant bush	22	2.5%	33	14%	0.0020
Percentage farmers by occupation	25	40%	34	12%	0.0279*
Mostly grazing of beef cattle	25	64%	31	48%	0.3692
Median age	25	54 yrs	34	51 yrs	0.2624
Median length of residence in district	24	32.5 yrs	34	14.5 yrs	0.0234*
Median hours on-property work	25	40 hrs	33	12 hrs	0.0010*
Median days off-property work	24	84 days	33	117 days	0.3059
Property returned a profit	24	54%	33	30%	0.1016
Yes, involved in short course related to property management	25	40%	34	29%	0.4190
Landcare membership	25	36%	34	50%	1.0000
Work funded by govt past 5 years	25	36%	34	44%	0.5984
Not started a farm plan	24	63%	33	55%	0.5963
Not started a succession plan	25	40%	31	71%	0.0300*

*Significant at p <0.05

Table 4
Control (FGIS) compared to RTP participants
Values for waterways and wetlands
River Tender and Ovens riparian landholders surveys, 2005
FGIS N = 25, River Tender N = 33

Comparison of mean scores for each index			
	Control FGIS N = 24	River Tender N = 33	Sig P value
Index	Mean score	Mean score	
Environmental	4.2	4.1	0.9382
Economic	3.1	2.6	0.0108*
Social	3.2	3.9	0.0005*

*Significant at p <0.05

Table 5
Landholder Agreement compared to River Tender Round 1&2 participants
Background social and farming topics
River Tender and Landholder Agreement participant surveys, 2008
Landholder Agreement N = 24, River Tender N = 32

Topics	RT		LA		Sig P value
	RT n =	value	LA n =	value	
Median area of property	30	34 ha	23	25 ha	0.48
What is the area of land under the Agreement?	29	5 ha	22	.75ha	0.0007*
Yes, property includes crown river frontage	31	74%	22	77%	0.80
Median years owned or managed property	30	13	21	17	0.82
Yes, property principal place of residence	32	66%	23	74%	0.72
Median age	30	55	23	60	0.39
Yes, completed a short course related to property management in past 3 years	32	34%	23	35%	0.97
Median hours per week worked on farming/ property related activities past 12 months	29	15	23	10	0.85
Median days off-property work	29	30	22	20	0.86
Yes, a member of a local Landcare group	32	59%	22	50%	0.69

* Significant difference between RT and LA participants (proportions test) at $p < 0.05$

Research objective 3:

What was the impact of participation in RTP across a range of NRM outcomes?

The intention was to assess the extent that RTP participation made a significant difference across a range of intermediate NRM objectives, including knowledge of NRM, confidence in current recommended practices (CRP) and long-term commitment to active and ongoing site management. This assessment was undertaken using two approaches:

1. examining the extent there were significant changes in RTP participants between 2005 and 2008 on items exploring landholder knowledge and confidence in CRP; and
2. combining the respondents to the 2008 RTP (both 2005 and subsequent) and LA surveys and examining the extent that there were significant relationships between RTP participation and respondent's scores on items exploring landholder commitment to active and ongoing management of their site.

Sixteen items that were repeated in both the 2005 and 2008 surveys explored respondent's knowledge of NRM. Respondents self-assessed their knowledge of each topic [Table 6]. As the data presented in Table 6 demonstrates, there were no significant differences in self-reported knowledge for participants in the 2005 and 2008 surveys. Five items were included in both surveys to explore respondent's confidence in CRP related to fencing, off-stream watering points and crash grazing [Table 7]. Again, there were no significant differences in

respondent's assessment of their confidence in CRP between 2005 and 2008. These findings are counterintuitive in that RTP participation involved substantial upfront interaction between landholders and program staff to prepare bids and assess riparian vegetation and landholders were responsible for undertaking or coordinating the onground work. Involvement in these activities could be expected to lead to improved knowledge and confidence in CRP. It is possible that our assessment tool didn't identify differences that exist. In terms of the knowledge topic, this may be because the survey items didn't focus on the RTP bid and assessment processes and some items explored knowledge topics beyond the focus of RTP. In summary, there is little evidence to suggest that participation in RTP has significantly enhanced RTP participant's knowledge or confidence in most CRP.

It was possible to combine the respondents to the 2008 RTP (both 2005 and subsequent) and LA surveys and examine the extent there were significant relationships between RTP participation and respondent's scores on six items exploring landholder commitment to active and ongoing site management [Table 8]. Analysis of survey data established a clear trend of RTP participants reporting they would spend substantially more funds/ time carrying out further work in their site over the next two years for each of the six items. However, only for one item was this trend a statistically significant difference [Table 8]. This difference remained significant ($P = 0.004127$) under multi-variate analysis employing a model with four variables significantly linked to higher commitment under pairwise analyses. The other variables were the value statements that *waterways, wetlands and adjoining land are important because they add to the market value of the property and is an attractive area of the property*; and the issues statement that *dryland salinity is a threat to the quality of river water in this district*. It is important to acknowledge that while RTP and LA participants were very similar, RTP participants reported significantly larger areas under agreement [Table 5] and some of the work planned by RTP participants may be prescribed under their agreements whereas all LA agreements would have been completed.

Table 6
Impact of River Tender participation on landholder knowledge
River Tender Round 1 participants
River Tender participant surveys, 2005 & 2008, N= 14

Your knowledge of different topics	2008		2005		Sig P value
	n =	mean	n =	mean	
<i>Mean scores based on 1= no knowledge to 5 = very sound knowledge</i>					
How to interpret results from water quality testing	12	3.00	12	2.92	0.7895
The proportion of native bush (as tree cover) remaining in the Ovens Valley as a percentage of what existed before European settlement	13	2.62	13	2.54	0.767
The ability of perennial vegetation to prevent water tables rising	12	3.08	12	3.17	0.6512
How to manage ground cover on paddocks used for grazing to minimise soil erosion	12	3.58	12	3.00	0.142
The ability of perennial grasses and standing stubble to improve the quality of runoff water	13	3.54	13	3.08	0.3175
The effects of unrestricted stock access to water ways	12	3.75	12	3.75	1
The impact of the 2003 bush fires on water quality in rivers in north east Victoria	13	3.46	13	3.54	0.7652
The production benefits of retaining native vegetation on farms	12	3.50	12	3.58	0.5239
The potential impact of climate change on the amount of water running off agricultural land in north east Victoria	13	2.85	13	3.00	0.7099
The ability of ground cover along waterways to maintain water quality	13	3.31	13	3.54	0.164
The benefits of farming systems that minimise water entering ground water systems	12	2.58	12	3.17	0.0909
How to prepare a farm or property plan that allocates land use according to different land classes	11	2.64	11	2.73	0.7809
<i>Mean scores based on 1= strongly disagree to 5 = strongly agree</i>					
Willows are no different to gum trees as a source of nutrients in rivers/creeks	14	1.21	14	1.36	0.481
Dead trees or sticks on the ground in river/creek frontages are important habitat for native birds and animals	14	4.64	14	4.57	0.6818
Clearing for grazing or cropping has substantially reduced the existence and diversity of native vegetation on river/creek frontages	14	4.64	14	4.36	0.3185
Grazing of domestic stock has had little impact on the existence and diversity of native vegetation on river/creek frontages or wetlands	14	1.64	14	1.71	0.3354

Table 7
Impact of River Tender participation on confidence in CRP
River Tender Round 1 participants
River Tender participant surveys, 2005 & 2008, N= 14

Statements about managing waterways or wetlands and adjoining land in your district	RT 08		RT05		Sig P value
	n	mean	n	mean	
<i>Mean scores based on 1= strongly disagree to 5 = strongly agree</i>					
In most places, fencing river frontages is not practical because floods will damage fences.	14	2.93	14	2.86	0.5723
Fencing to manage stock access is an essential part of the work required to revegetate river/creek frontages or wetlands.	14	4.86	14	4.57	0.1102
Set stocking is usually better for retaining native vegetation in paddocks with river/creek frontages or wetlands than intensive grazing for short periods.	13	2.69	13	2.85	0.4368
The time and expense involved in watering stock off-stream is justified by improvement in river/creek bank stability and water quality or stock condition.	14	4.57	14	4.21	0.2456
Fencing river/creek frontages creates harbour for pest animals.	14	2.43	14	2.86	0.608

Table 8
Impact of River Tender on commitment to active, ongoing site management
Landholder Agreement and River Tender Round 1&2 participants
River Tender and Landholder Agreement participant surveys, 2008
N= 56 (RT n = 32, LA n = 24)

Do you plan to carry out further work in your site over the next 2 years? Topics:	RT mean	LA mean	P value
Erect fences to manage stock access (\$ value)	\$1750	\$500	0.127186212
Install off-stream water supply in paddocks where stock currently drink from the water way (\$ value)	\$1528	\$29	0.203593951
Plant trees and shrubs to revegetate areas (\$ value)	\$598	\$79	0.049326768*
Control weeds (\$ value of materials and labour)	\$1561	\$848	0.197127856
Pest animal control (\$ to be spent on materials and labour)	\$296	\$172	0.423806319
Estimated number of days of unpaid labour to be spent on controlling weeds and rabbits	18 days	8 days	0.205223812

* Significant difference using Kruskal Wallis test at p <0.05

CONCLUSIONS

Victorian Natural Resource Management (NRM) agency staffs have pioneered the use of economic instruments (MBI) such as the River Tender Program (RTP). The distinctive features of MBI are that landholders are able to choose how much work they will do and the price they are willing to do that work for. Program staff assess the environmental benefit of work proposed before allocating program funds to landholders. Amongst other things, it is assumed that compared to the typical Fixed Grant Incentive Scheme (FGIS) these attributes of MBI lead to increased program efficiency and long-term commitment by landholders as measured by active, ongoing management of works areas. Adding another policy instrument to the regional NRM toolbox should also enhance the capacity of Catchment Management Authorities (CMA) to engage landholders.

Social researchers at CSU were contracted by the North East CMA (NE CMA) to examine the effectiveness of the RTP in terms of:

1. attracting a different cohort of landholders compared to the FGIS;
2. effecting change in the knowledge and confidence in current recommended practices (CRP) of RTP participants; and
3. building stronger long-term commitment in terms of active and ongoing site management compared to a FGIS.

These evaluation questions were explored using data collected through surveys of RTP participants in 2005 and 2008, a random sample of all riparian landholders in the valley where the RTP was conducted, and a 2008 survey of landholders engaged in a FGIS (Landholder Agreement). Survey respondents were asked to provide information for topics exploring their social and farming background and factors linked to the adoption of CRP and their long-term commitment to active management of sites.

Landholders engaged through the RTP were not typical of most riparian landholders in the Ovens Valley. Perhaps the most important difference was that RTP participants were far less likely to be farmers by occupation. Consistent with this difference in occupation, RTP participants were significantly more likely to operate smaller properties, work off-property, spend less time working on-property, and were less likely to report an on-property profit but reported much higher off-property incomes agriculture. These differences in occupation seemed to affect landholder values, attitudes and confidence in CRP.

While there were important differences between the RTP participants and most riparian landholders, survey data suggests that the RTP landholders were typical of many landholders. For example, RTP participants were mostly non-farmers and non-farmers comprised 57% of all respondents in the random sample of riparian landholders in the Ovens Valley. These data suggest there was a substantial pool of landholders likely to be engaged through successive rounds of the RTP or a similar program. Survey data also suggested that the RTP

participants were a worthwhile target because they managed significantly larger areas of native bush and were significantly more likely than the control group to manage crown river frontages. That is, the landholders engaged through the RTP were more likely to manage critical assets identified by the NE CMA for biodiversity conservation.

Fifty-four of the respondents to the 2005 Ovens Valley riparian landholder survey said “Yes” or “More than likely” that they would apply for funding under a FGIS to replant native species or better manage existing remnant bush on their property. Landholders engaged through the RTP were also significantly different to these Ovens Valley landholders. Again, the RTP participants were more likely to be non-farmers, work fewer hours per week on property, own smaller properties and have lived for much shorter periods of time in their local district. This finding suggests that the MBI added to the cohort of landholders likely to be engaged by a FGIS and therefore represented a useful addition to the regional NRM toolbox.

Comparisons of RTP and Landholder Agreement (LA) participants surveyed in 2008 suggested that these landholder cohorts were very similar. For example, these groups were comparable in age; had properties of similar sizes; included similar proportions of farmers, non-farmers and retirees; and were just as likely to be a landcare member. It was therefore not surprising that RTP and LA participants gave similar rating to the values they attached to their riparian areas. This finding suggests that the RTP did not add to the landholder cohort engaged through the more traditional LA program (a FGIS). However, LA participants were not identified at random: they applied to enter the program in response to an advertisement or were approached by NE CMA staff. For this reason, LA participants are likely to be more similar to RTP participants than to the random sample of Ovens landholders who expressed an interest in a FGIS. These findings suggest that the ability of an MBI to enhance the breadth of landholder engagement will depend to a large extent on the communications channels employed by those seeking to engage landholders.

Assessments of RTP participant’s knowledge and confidence in CRP suggested there had been very little change between the 2005 and 2008 surveys. For example, there were no significant differences for any of the 16 self-assessed knowledge items or any of the five items assessing levels of confidence in CRP. Survey data therefore provided no evidence to suggest that participation in an MBI will enhance landholder knowledge or confidence in CRP, important precursors to adoption of CRP. These findings are counterintuitive in that RTP participation involved substantial upfront interaction between landholders and program staff to prepare bids and assess riparian vegetation and landholders were responsible for undertaking or coordinating the onground work. Involvement in these activities should lead to improved knowledge and confidence in CRP. It is possible that our assessment tool didn’t identify differences that exist. In terms of the knowledge topic, this may be because the survey items didn’t focus on the RTP bid and assessment processes and some items explored knowledge topics beyond the focus of RTP.

Analysis of 2008 survey data provided by LA and RTP participants suggested that RTP participation led to a higher level of commitment to active, ongoing site management. For example, RTP participants reported they would spend substantially more funds/ time carrying out further work in their site over the next two years for each of the six items exploring long-term commitment. The important caveat here is that these trends only represented a statistically significant difference for one item: planting trees and shrubs to revegetate the area.

In this study, those engaged through the RTP represented a substantial proportion of all landholders, suggesting that MBI had the capacity to engage most landholders and be a widely applied or standard policy tool for regional NRM. This evaluation also demonstrated that the RTP appealed to a very different cohort of landholders than the FGIS included in the mail survey to a random selection of riparian landholders, suggesting that an MBI has the capacity to expand the cohort of rural landholders engaged by regional organizations. However, the cohorts engaged by the RTP and a targeted FGIS were similar. A key evaluation finding was that RTP participants were more likely than the random sample of riparian owners to manage critical biodiversity assets identified by the NE CMA. This finding suggests that an MBI is more likely to engage those managing critical assets than a non-targeted FGIS. The MBI was more likely than the non-targeted FGIS to engage non-farmers. Given the trend to significantly increased proportions of non-farmer landholders in most Victorian regions, it seems that MBI will be an increasingly important part of the regional NRM toolbox. Survey data provided little evidence that participation in the RTP had enhanced landholder capacity to implement improved NRM practices in terms of improved knowledge or increased confidence in practices. Nevertheless, there was substantial evidence that RTP participation had enhanced landholder commitment to active, ongoing site management. However it is important to acknowledge that while RTP and LA participants were very similar, RTP participants reported significantly larger areas under agreement and could therefore be expected to expend larger dollar resources on future work in their sites.

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