



MIDCOAST
council



**MANNING
RIVER**
ESTUARY &
CATCHMENT



FARMERS CONSULTATION 2019

Annexure D

Farmers Consultation

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2019



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Acknowledgements

Grateful thanks to our interviewees. Interviews were carried out during the drought when most farmers were busy hand feeding cattle and in survival mode.

Many thanks to our Focus Group participants who gave their time to inform our study with their insights and experience.

Thanks also to Louise Duff from MidCoast Council for informed advice on the study design and implementation.

Thanks also to Hedda Askland, a social scientist from the University of Newcastle, for reviewing the interview questions.

The support from Hunter Local Land Services staff who referred interview candidates and participated in the focus group workshop was much appreciated.

This project is assisted by the NSW Government through its Coastal Management Program.

Executive Summary

Brief

MidCoast Council (MCC), on behalf of the Manning River Estuary Coastal Management Program (ECMP), engaged Nick Bullock Consulting to investigate the motivations and challenges for beef and dairy farmers implementing measures to improve the ecology of the Manning River Basin (MRB); and to report on its findings, with recommendations to support those farmers to change.

Method

The existing literature investigating the barriers to uptake of farming innovation was reviewed and summarised. From that review, 17 questions were formulated to test incentives and barriers to uptake. Face-to-face and phone interviews were conducted with 24 Manning River Basin beef and dairy cattle farmers, selected by the consultant and MCC to maximise feedback from farmers throughout the valley operating with a variety of farm husbandry methods. Responses were analysed for common themes.

Two workshops were held, one with the farmers' group "Women in Dairy" and the second with MCC, Hunter Local Land Services and Landcare personnel. The workshops shared the findings to date, and sought additional feedback.

The final report presents the themes, provides analysis of the responses against the literature review, and concludes with recommendations for targeted programming of MCC resources.

Findings and Recommendations

1. If it ain't broke there is no point in trying to fix it.

Farmers regard the MVB as being generally in good ecological health. Any measures to "fix" a problem which the stakeholders do not acknowledge as being a problem will not work. A robust assessment of current catchment condition could provide a common understanding and credibility for MCC programs which addressed identified issues or priorities.

2. What is the problem?

Are we treating problems or the risk of problems? If problems at particular locations can be identified then proposed solutions may be well received by farmers. If the program, or elements of the program, are about risk management in source catchments then an explanation of this approach to securing future water quality for the MRB may be needed to encourage farmer engagement.

3. Out of the fat and into the fire

While some management solutions (eg fencing off waterways) might have benefits acknowledged by the farmers, those solutions may themselves throw up new problems (eg ongoing high costs of maintenance and weed control) which reduce the uptake of long term implementation; and increase the divide between on the ground farmers and "academic" extension personnel.

To be effective, a proposed solution must be perceived to be effective in addressing the identified problem; and not create another set of problems. It should also take into account the ongoing costs to the landholders for maintenance of the funded infrastructure.

4. There is more than one way of skinning a cat

Any proposed solution, such as waterway fencing, must also be seen by farmers to be the most effective way to address the problem. There is an opportunity to explore the benefits to water quality of a range of stock and grazing management which were suggested by participating farmers as being equally effective, and which may provide the relative advantage required for broad adoption.

Evidence suggests that riparian fencing and vegetation enhancement is effective if the issue is streambank erosion, but that otherwise maintaining pasture around first order streams and drainage lines is most effective in capturing nutrients and sediments, and farmers seem to know this.

5. One approach will not suit all – horses for courses

The farming community, while generally cohesive, is not homogenous. Motivators for change will need to resonate with the goals of individual farmers in order for strategies to succeed, but those goals differ depending on the life stage, values and aspirations of the farmer, the position of the farm within the catchment, their individual and industry specific husbandry practices and their own resource management. Any strategic objective must address each of the variations within the system, and find a range of individual measures each appealing to the goals of individual farming ventures.

6. We learn from experience and observation

Seeing other farmers' practices and talking to neighbours about management issues were identified as being major sources of information for the interviewees. For those who did not consult widely, the views of other local farmers were important. Involving members of the farming community is an effective means of spreading knowledge about the adoption of new practices.

7. Do we speak the same language?

For some (a majority?) farmers, environmental values included production values – your perceptions are different from mine. When exploring options to address a problem, it is vital to understand the mental models which underpin perceptions and practices.

8. Do I have that tool in my toolbox?

Farmers may recognise solutions which they acknowledge will work, but may not have the specialised knowledge and skills to make implementation fully effective. For example, successful shade tree planting, stockwater reticulation or rotational grazing systems

9. Seeing beyond the fence

Many cattle farmers are unaware of the harvesting restrictions placed on the oyster farmers in the estuary of the catchment. Increased awareness of this could foster a willingness to undertake management strategies to benefit other farmers.

10. What's in it for me?

Are we asking farmers to fix our problems for our benefit? Farmers are not likely to adopt practices which do not advance their goals, and proposed solutions must provide a benefit to the farmers which is perceived as greater than the financial or management cost to them. Win-win solutions are more likely to be adopted.

Recommendations

What is needed is to change the paradigm, so that farmers willingly “buy-in” to a catchment management program to achieve the long term goal of improved water quality.

A program which builds upon existing catchment management efforts, promotes an integrated suite of practices, demonstrates a relative advantage for farm management and also benefits waterways will be most beneficial to farmers and could readily be linked to their values and aspirations.

Providing incentives, training and extension advice to develop new concepts and skills; supporting peer-to-peer learning; and negotiating win-win management actions will advance the goals of farmers while influencing culture and practices to improve management of the Manning River Basin.

1. Introduction

This report is the result of a qualitative social science research project commissioned by MidCoast Council for the Manning River Estuary Coastal Management Program (ECMP). The Manning River Estuary CMP is currently in the planning phase.

2. Project objectives

The objectives of this project were to gain insights into:

1. what motivates dairy and beef farmers to adopt best practice catchment management;
2. what prevents dairy and beef farmers from integrating best practice catchment management; and
3. how Council can support ongoing implementation of positive approaches, or encourage and incentivise beef and dairy farmers to change.

The insights reported here were gained via interviews with twenty-four landholders and two focus group sessions. One focus group was conducted with an active farmer group (Women In Dairy) and the second with staff engaged in agricultural and NRM extension from MidCoast Council, Hunter Local Land Services, Taree and Manning Landcare, Wingham.

The project was informed by a comprehensive literature review of agricultural extension research, which is available as a separate document from MidCoast Council.

3. Summary of findings and implications

The literature review identified that landholder perceptions were critical in their decision making with regard to waterway management. Interviews and focus group sessions focused on these perceptions and confirmed their importance.

The perceptions with most effect on decision making are landholder perceptions of current environmental condition (i.e. the problem), the effectiveness of the proposed activities (i.e. the proposed solution) and the benefits and disadvantages for the farmers if they adopted the proposed activities (i.e. relative advantage and trialability).

3.1 Environmental condition

The results suggest that farmers perceive the environmental condition of the catchment, the waterways and their own properties to be quite good. The implication of this is that a program which promotes its aims as being to repair environmental degradation will not resonate with a large number of farmers.

Nevertheless, many farmers noted that the catchment and waterways were not universally in good condition. Some particular locations were seen to be degraded and it was noted that some (perhaps a small number) of farmers were impacting water quality through stock management which allowed cattle unrestricted access to the waterways.

There are several implications of this for program design. First, a program which acknowledged the generally good condition of the Manning Valley and waterways as perceived by farmers, and targeted particular locations and particular practices as worthy of improvement might be well received by the community generally and be successful in engaging the people directly affected.

Second, a program which acknowledges that many farmers already implement 'good' or 'industry standard' practices to maintain environmental condition may be seen to give 'credit' to local farmers and might resonate with a large number of farmers. A cautionary note here may be that, as can be the case with any grants program focused on environmental repair, 'good' farmers whose land is in good condition through their management may perceive any grant program as a reward to undeserving farmers who are not good land managers.

Third, the group who most clearly identified poor water quality as a constraint to their enterprises were oyster farmers. An acknowledgement that some local farmers at the end of the system are currently being negatively impacted by activities upstream could be a useful way to engage a subset of farmers who value the catchment as a setting for productive farming activities, yet whose activities are endangering the production activities of other farmers.

Fourth, while most interviewed farmers thought the catchment and waterways were in good environmental condition and had observed flora and fauna as evidence of this, and the Women in Dairy focus group readily identified environmental values that they appreciated, there was also a strong suggestion from many farmers that environmental condition was valuable because it supported a productive landscape for humans. The implication of this for program design is that an appeal to environmental values may be more effective if it includes acknowledgement of the productive values as well.

Finally, if the aim of the program is to address the potential risk to water quality in particular locations rather than remediating actual degradation, then this distinction and the rationale which underpins it, may have to be explained.

3.2 Effectiveness of the proposed activities

Riparian fencing is promoted as a priority management practice for waterway and water quality protection. The farmer responses show a common acceptance that unrestricted or unmanaged cattle access to waterways has a negative impact on water quality.

However, there was a mixture of views as to the effectiveness of riparian fencing. The overwhelming response (19) to this question was "yes, but...", while some (5) farmers answered in the negative and 4 farmers suggested there were better ways to achieve a water quality outcome.

The common issues of concern were:

- the need for alternative water and shade if the waterway is fenced
- the location and extent of fencing
- the ongoing cost of pumping for stock water

- weed proliferation and control, and
- flood debris removal.

The literature review suggests that one of the critical factors for adoption of new practices is that landholders perceive the proposed solution to be effective in addressing the problem. Many farmers perceive there are other, more effective ways to improve the condition of waterways and water quality, such as managing groundcover, pasture and grazing pressure; rotational grazing which reduces pressure on waterways; and attracting stock away from waterways by providing alternative water, shade and lick blocks.

These alternative approaches involve varying degrees of difficulty. Off-stream watering systems are readily constructed with irrigation engineering that is locally available. Rotational grazing systems, by comparison, require new skills in pasture assessment and matching the timing of grazing with plant growth stages, and for many producers will require the adoption of both new practices and new paradigms. Success generally requires training and then on-farm adaptation and experimentation.

Planting trees for shade, while it sounds simple, was noted by several farmers to be quite problematic. Their own experience and that of neighbours was that planted trees did not thrive or just died. Best practice advice on tree planting for fast, successful establishment could be a relatively simple addition to program design with potentially big benefits for farmer engagement. Given the delay between tree planting and usable shade for stock, a staged program whereby shade trees were established several years prior to construction of fences and stock water systems might be attractive to farmers.

A study, whether formal or informal, which looked at the relationship between the farmers' management systems and actual environmental condition could potentially inform the development of locally relevant guides for 'best management practice'. At a minimum, it could inform program designers of the range of perceived disadvantages which might need to be addressed.

A program aiming to increase the extent of riparian fencing would need to demonstrate that it can be successfully implemented and/or accept that riparian fencing (an activity) is less important than riparian condition and water quality (outcomes) if they can be achieved by other means.

3.3 Benefits and disadvantages for the farmers

A large majority (17) of the farmers interviewed recognise that there are production advantages (benefits) from riparian fencing, yet only around half of these (9) have stock exclusion from all waterways and 5 of these 9 are dairy farmers with deep, saltwater frontage which stock would not use for drinking water.

An explanation as to why farmers who identify production benefits from riparian fencing do not fence their riparian zones is that the disadvantages are perceived to outweigh the advantages.

For example, beef farmers noted that they require back-up water supplies in the form of dams or access to creeks to provide water in the event of a failure in the troughed system. Consequently, for some beef farmers, reliance on troughs for watering their cattle is a significant barrier, reducing their ability to leave the farm when they want, as regular checks are required on reticulated systems to ensure cattle have access to water.

A program which does not address these disadvantages, either by compensating for them or identifying management practices which reduce or eliminate them, is unlikely to be attractive to local farmers.

Only 16% of farmers identified grants as sufficient incentive for practice change, while 25% of farmers identified advice and farm planning as sufficient incentive for practice change.

The aspirations expressed in farmer visions are:

- Handing on the farm
- Balancing production and environment
- Building the business, and
- Transitioning.

Each will benefit from advice and planning. A program with a win-win philosophy which helped farmers to realise their heterogeneous social, economic and environmental goals could be attractive to local farmers.

4. The landholder interviews

4.1 The questions asked

Interview questions were identified through a combination of:

- the key factors found in the literature review to influence decision making and behaviour change
- discussion with Council staff to ensure relevance to project objectives
- a review by a social scientist to ensure the clarity, reliability, validity and appropriate use of closed- and open-ended questions.

Interview responses were collected through semi-structured face-to-face interviews of around one hour duration. The interviews took a conversational approach which allowed follow-up questions to elicit the perceptions and reasoning of the landholders. Following an initial response, the landholder would be asked: Why do you say that?

While the project objectives refer to the general term “best practices”, the relevant questions referred specifically to waterway fencing. Interviewees were asked 17 questions covering four broad topics:

Context

Four questions were asked on contextual topics related to themselves, their property current enterprise, and the impact of the drought on their farms.

Responses were simply collated.

Values and perceptions

Nine values/perception questions were asked. Eight questions were asked which related to farmers’ perceptions of environmental issues and farm practices which emerged from the

literature review as key factors in adoption decisions; and one question was asked about their vision for the farm.

Content analysis with Open Coding was used i.e. the responses to these questions were analysed for themes to identify patterns or clusters of similar perceptions. Emergent themes were those concepts, ideas or comments that were raised by a number of farmers.

Experience of funded programs

Three questions related to farmers' experience and opinions of funded programs.

Other issues

A final "any other issues" question was also asked.

An explanatory introduction statement and confidentiality statement were used at the commencement of each interview (see Appendix 1).

4.2 Who was interviewed?

A sample of twenty-four landholders were selected for interview based on a desire to receive responses from a representative range of geographic locations and primary industries within the Manning Valley. MCC sought expressions of interest from landholders and 5 farmers responded. The other 19 farmers were selected.

It is not a representative sample in a statistical sense as the interviewees were known to MidCoast Council, LLS or Nick Bullock and selected because they were believed to be well connected with their communities and/or active in broader agricultural issues. A majority (19/24) of the farmers interviewed had implemented management improvements such as riparian fencing. Presumably, the interviewees could provide views which reflect a range of issues likely to be raised by other local landholders.

This is a qualitative project which aimed to elicit the range of issues and perceptions likely to be found within the farming community, rather than a proportional quantification of the number of landholders within the Manning Valley likely to raise particular issues or have particular perceptions.

While this report refers to twenty-four landholders being interviewed, only seven of those interviewees reported that they were the sole decision makers for the enterprise. Decision making for the majority seventeen enterprises was reported to be joint decision making involving other family members.

Sixteen farmers were interviewed on their own, 6 with their partners (spouses), and 2 with their fathers.

The geographic locations of interviewees were:

- 6 in the lower estuary
- 13 in the middle reaches of the catchment
- 5 in the upper catchment

The primary industries in which the interviewees were engaged were:

- 10 dairy

- 13 beef
- 3 lifestyle beef grazing.

The locations of interviewees within the Manning Valley are shown in Figure 1.

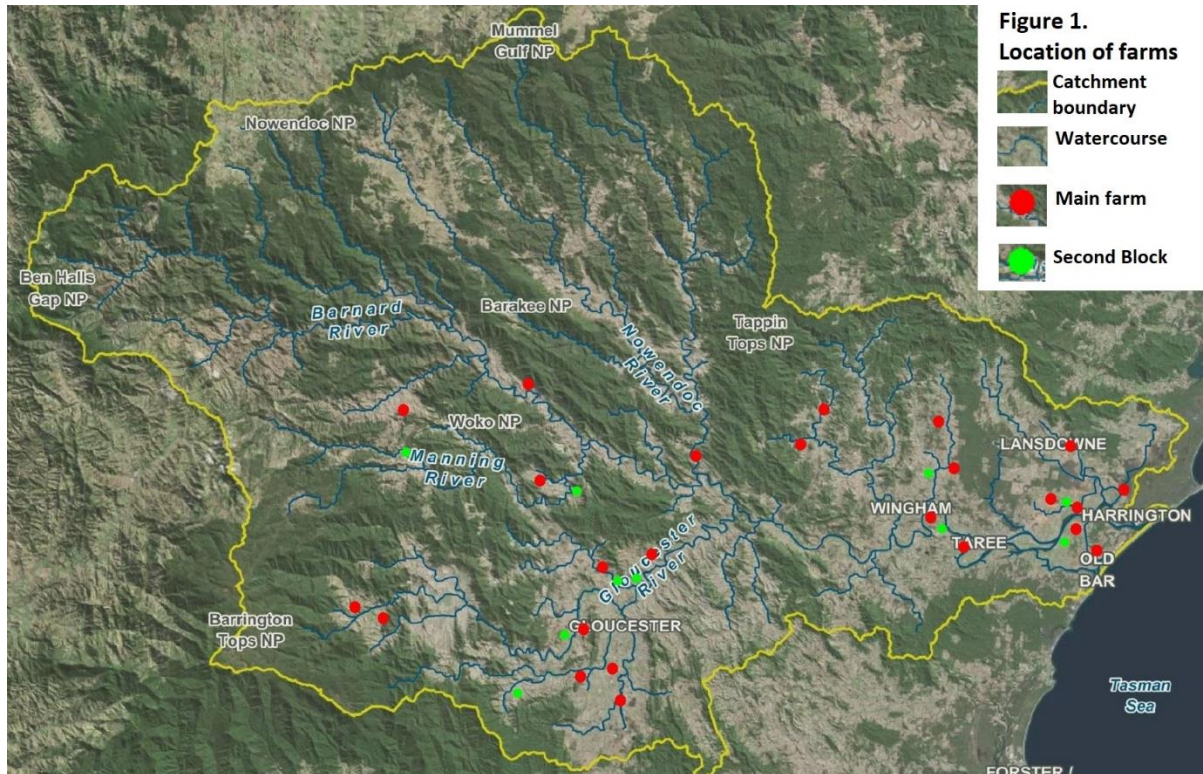


Figure 1 Location of farmers interviewed

Waterways represented in the group included the Avon, Barrington, Gloucester, Little Manning, Lower Manning, Manning and Nowendoc Rivers; and Berrico, Bowman, Caparra, Cedar Party, Dickenson, Ghinni, Killabakh, Mortons, Pigna Barney, Scotts, West Dingo and Woko Creeks; and many named creeks in upper catchment.

4.3 Interview responses

Responses to questions relating to values and perceptions have been analysed for emergent themes, while those relating to contextual topics have simply been tabulated.

Where it seemed useful, responses have been allocated to a Likert scale based on my own assessment of landholder responses, to enable a simple graphical representation of the range of responses.

Quotes from respondents in the report are in italics and referenced when relevant with a letter to indicate where the farm is located within the catchment:

- “E” for farmers in the lower catchment, or estuary
- “M” for farmers in the middle reaches of the catchment
- “U” for farmers in the upper catchment

5. Results: Context

5.1 Contextual factors

The farm was the primary source of income for 21 farmers, and for 3 farmers it was not.

Age and experience

Age	27 to 88, average 58
Time on the property	First generation 8, grew up on the farm 16
Length of time as farmers	Range: 3 to 60 years
Previous career	Always farmed 9, previous career 15

5.2 Waterways

Farmers made a distinction between “wet” waterways such as a creek or river and “dry” waterways such as an ephemeral stream or gully. All farmers have single or double frontage to “wet” waterways.

While 19 of the 24 farms visited have fenced some or all of their waterways, 5 farms have no waterways fenced and stock have unrestricted access. Stock have no access to waterways on only 9 farms and no access to creeks on only 3 farms.

Speculatively, some farmers may also be making a distinction between fencing a waterway on their boundary (which would be to define and manage stock access to and from their property) and fencing a waterway within their property (which could be for stock management or environmental protection).

Waterway fencing	#
Fenced some or all waterways	19
No waterways fenced	5
Stock access	
Stock do not have access	9
Stock only have limited access (crossing, access for neighbour's stock)	2
Stock have some access	8
Stock have unrestricted access to waterways	5

5.3 Watering points

In addition to the 5 farms with no waterways fenced and direct stock access (see above), a further 8 farms provide direct access to waterways for stock water.

Four farms which allow no access for stock to waterways adjoin saltwater rivers.

Stock water sources	#
Troughs on all or part of the property	22
Direct access to river/ creek for stock water	8
River/ creeks only	5
Dams only	7
Town water only	2

5.4 Shade areas

Thirteen farmers reported having lots of shade, while eleven farmers reported having “some” shade.

Many farmers said that they needed more shade, which in some cases referred simply to a need for a greater quantity of shade, while in other cases it was shade in particular locations such as in paddocks adjoining waterways which was needed.

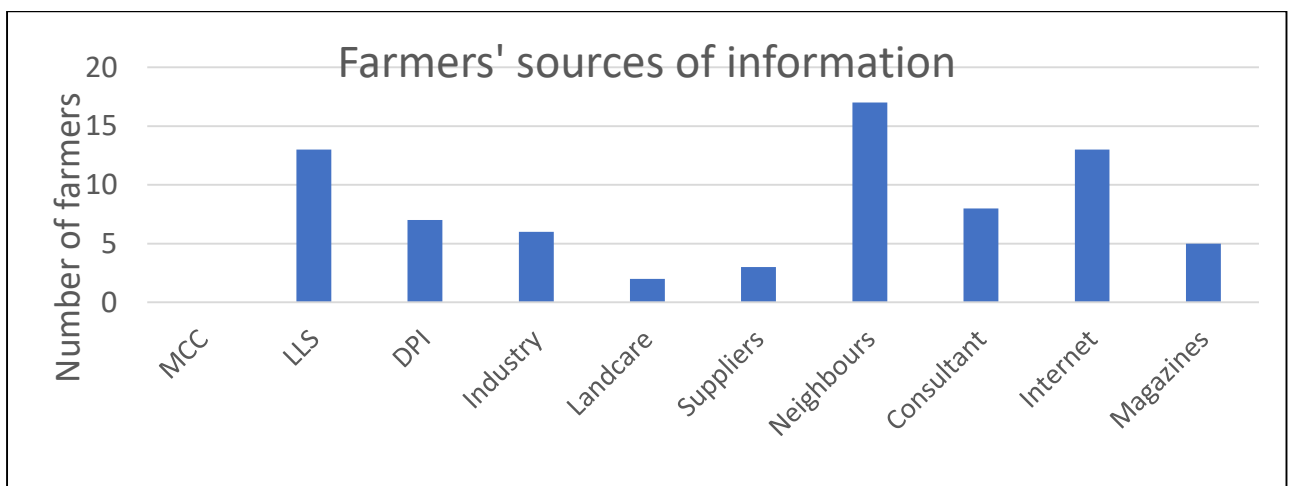
5.5 Sources of information

Eight farmers use only 1 or 2 information sources, with neighbours being one of those sources for 4 farmers.

Most use several sources, with 15 farmers using 3 or more sources of information.

Neighbours (17), Local Land Services (13) and the internet (13) were the most common sources of information, with DPI (7) and industry bodies (6) also significant sources.

While there is a range of information sources used by farmers, peer to peer interactions with neighbours are very common.



6. Results: Farmer vision and perceptions

6.1 Vision

Farmers were asked to describe their vision for their farms, and several themes emerged.

Handing on the farm

15 farmers vision included handing the farm on to the family:

“My son is taking over, and I’d like to see the farm continue to be viable as a unit, not subdivided”

“We want to continue the farm as a family business”

“I’d like the farm to remain in the hands of the family”

Balancing production and environment

13 farmers saw balancing production and environmental condition as a priority:

“We want to improve the land, water and environment, and minimise the impacts of farming”

“Continue to be viable, but that means making sure we utilise all nutrients on the farm, they do not leave the farm, and the effluent system works properly”

“Self-sufficient, viable farm”

“Sustainable grazing property. Hand it on in better shape”

Building the business

11 farmers were focussed on building the business:

“We want to utilise the land as best we can”. “Continue as we are but more profitable”

“We want to improve soils and infrastructure to boost our overall efficiencies”

“An ongoing business that can support 2 families”

Transitioning

Three farmers were in transition from dairy to beef, and one beef producer was looking to downsize their operation.

“Moving to beef cattle is our highest priority: fencing and farm layout”

Discussion and Recommendations

In general, the responses are consistent with findings in the literature review. Landholders have a heterogeneous mix of economic, social and environmental goals and are unlikely to change their management unless they can be convinced that the proposed changes are consistent with their goals. The themes provide clues as to the likely program approaches and communications that local landholders may find consistent with their goals. However, landholders with different goals may not respond in the same way to any particular approach or communications.

‘Handing on the farm’ is compatible with protecting the natural resources of the farm, as most farmers want to hand on something of value. A program might appeal to this group by highlighting how protected natural resources can enhance the value and long-term sustainability of the property.

‘Balancing production and environment’ requires farmers to assess production levels and profits against the state of the environment. A program might appeal to this group by assisting whole-farm planning that optimises the benefits to farm businesses while protecting waterways and natural features on the property.

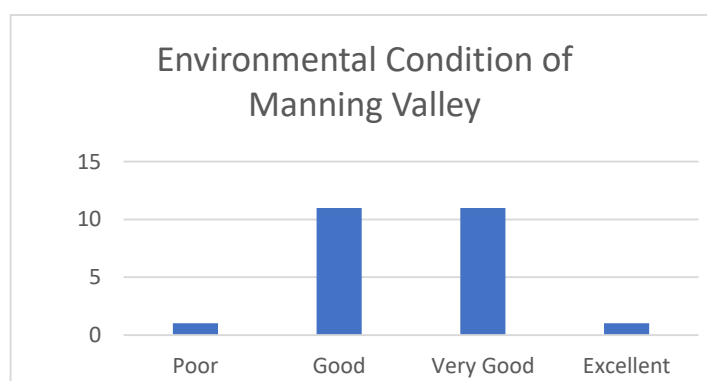
‘Building the business’: There may be a risk that farmers who are focussed solely on building the business can overlook the impacts they have on waterways and natural vegetation. A program might appeal to these farmers by demonstrating that there can be benefits (profitability and efficiency) to the business that also protect or enhance the environment. While building the business was a theme, no respondents identified maximising profit as an objective or part of their vision.

‘Transitioning’: There is an opportunity to work with farmers that are transitioning from dairy to beef to set up fencing, water and shade systems that are compatible with minimising cattle pressures on waterways. However, farmers who are transitioning to retirement may not be attracted to programs offering new or additional activities.

6.2 Condition of the environment

6.2.1 Q 6(a) Environmental condition of Manning Valley

Farmers generally perceive the Manning Valley to be in good to very good environmental condition.



Themes which emerged were:

The catchment is in very good environmental condition

Many farmers were unaware of any major issues and consider the normally high rainfall in the catchment an advantage as the river systems are flushed and natural vegetation grows when left unchecked. One farmer regards the Manning Valley in pristine condition: unique, unspoiled.

“It’s a pretty unique place, it’s unspoiled.” E

“It’s pristine in some places, pretty good in others” M

“In a normal season, things grow and groundcover is not an issue” U

The catchment is in very good environmental condition, but not perfect

The majority of farmers consider the environmental condition of the valley to be very good, but could be improved as some parts are excellent, others not so good, with individual farmers being careless in showing no regard for the state of the waterways.

Almost half of the farmers interviewed gave a *good* score as conditions are not perfect with a number of ongoing issues such as overstocking by some farmers, weeds, erosion in places, cattle access to waterways, feral animals, rubbish, fire risks.

"You still see cows in the river and mangroves, that's not good" E

"It depends on the land-use and attitude of the farmer, there are individual farmers that are careless" M

"Most of the valley is great, but there are parts that could be improved" U

Catchment environmental condition is trending to improvement

More than half the farmers interviewed considered the conditions are getting better with more natural vegetation in the landscape: "more trees than 30 years ago", "regrowth is naturally occurring".

The changing land use is seen as a positive for the environmental condition with fewer dairies (which are thought to have high fertiliser use) and more hobby blocks (which are thought to use relatively little fertiliser).

"It's not wall-to-wall dairy farms like NZ – they've got problems" E

"We've got more trees growing than we had before; trees want to grow in this valley" M

"Stocking rates are generally lower than other catchments, although there are a few with large numbers" U

"Overall it's pretty pristine, no major erosion, limited mining, a good balance" U

The catchment is a productive landscape

Some (4) farmers consider the Manning Valley a "working catchment", with pockets of good farming country, producing valuable products such as beef, milk and oysters.

"There are pockets of good farming country" E

"To be honest, it is very poor at the moment. This could be one of the most pristine talked about valleys, but there is serious underutilisation of good country in some places" M

"It's a working catchment, so there needs to be a balance between production and environment"

Notably, one farmer gave a "poor" score to the environmental condition of the valley, on the basis that there is a large area of underutilised farm land that could be improved.

Discussion and Recommendations

The literature review suggests that one of the critical factors for adoption of new practices is that landholders perceive a problem i.e. that riparian and catchment condition is 'poor' in the district and that downstream water quality is a serious problem.

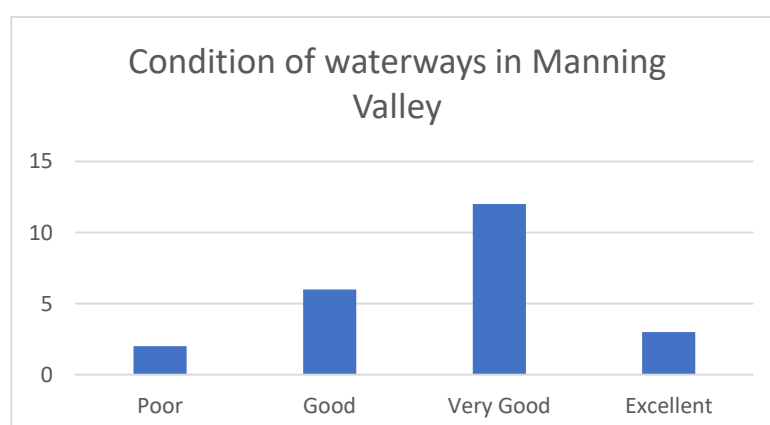
This is clearly not the case for the interviewed landholders. Landholders are unlikely to act in response to a program which appeals to them to act to fix this 'problem'.

Programs that include production outcomes and benefits would appeal to this group of farmers:

- Programs could highlight that the environment is in pretty good shape and robust, but that there are vulnerable parts of it – and good farm management is about focussing on these areas to minimise impacts
- Examples include: stock crossing, effluent systems, shade areas

6.2.2 Q 6(b) Environmental condition of waterways within the Manning Valley

Farmers generally perceive the waterways in the Manning Valley to be in good to excellent condition. For some interviewees this was a water quality issue, while for others it was related to stream stability issues.



Themes which emerged were:

Water quality is very good

Most farmers consider water quality is "pretty good" indicated by "clear water", the fact they can "drink the water at home", and evidence of "fish, platypus, mud crabs and dolphins" in the river.

Most farmers were unaware oyster farmers could not directly harvest in the Manning, whilst in other river systems they could.

"I see dolphins and mud crabs in the river" E

"We think it's pretty good, we drink water directly from the river" M

"The fact they can farm oysters in the estuary and we see platypus in our river are good indicators" M

"Normally, it's the best water in the state, based on testing they did a few years ago" U

Streams are stable

Farmers generally considered there was "no large-scale erosion" in the waterways. However, trees growing in waterways was a concern for several farmers who were concerned at the potential for erosion of river banks if not removed.

"The revetment program has been really good; but it needs to be finished off properly. We have a few hundred metres more needed" E

"There is more wash from boats in the Lansdowne, and this is causing trees on the banks to fall in. It's a real problem" E

"Not being able to remove she-oaks in the creek is a real worry – it is going to create more erosion." M

"There needs to be clear practical guidelines about trees in the creeks, because farmers are taking it into their own hands" M

"Our streams are all rock or gravel based and so very stable" U

Stream flows are important

Many farmers also link low flows with poor water quality, which has been exacerbated by an increase in the number of pumps and higher water use in growing towns.

"Natural flows no longer occur as there is too much pumping for towns and irrigation" E

"Water quality depends so much on the flow in the river. Normally with high flow there is lots of flushing" M

"The river runs clear most of the time, just after storms you get turbidity, but also with low flows quality goes down as the creeks dry up into pools" U

One farmer who had properties on two creeks observed that water quality is excellent in Caparra Creek when there is flow, but is of poor quality in Pipeclay Creek even in normal flows.

One farmer on the Avon River noted the flow in the river is generally low even in normal times, which impacts negatively on quality.

There are issues in the estuary

Farmers in the estuary identified particular issues. Several farmers in the estuary were very concerned about the erosion caused by boat wash, particularly in the Lansdowne river.

Most farmers in the estuary believed that the entrance closure is a big issue for water quality, and that there are now longer periods of inundation when the entrance at Old Bar is closed. Comment was made about the successful scheme at Tweed Heads.

"There is more wash from boat activity in the river in recent years" E

"Quality is poor when the entrance is closed; we need to learn from the Tweed Heads scheme" E

"The closure of the entrance has meant our paddocks are inundated for longer – what used to be 4 days is now 10" E

"There are acid sulphate hot spots, but mostly we are learning how to best manage these"

"Poorly maintained drains and leaking floodgates is the biggest issue in the lower river" E

"Old Bar closure is a big issue for water quality" M

Other comments related to:

- Litter: Three of farmers noted that there is "more rubbish in the river", including "plastic bottles" and "building materials such as plywood".
- Data: Four farmers welcomed "feedback from MCC on water quality testing", and commented that sampling used to be good but that they have no knowledge of recent water testing results.

Discussion and Recommendations

The literature review suggests that one of the critical factors for adoption of new practices is that landholders perceive a problem i.e. that riparian and catchment condition is 'poor' in the district and that downstream water quality is a serious problem.

This is clearly not the case for the interviewed landholders. Landholders are unlikely to act in response to program which appeals to them to act to fix this 'problem'.

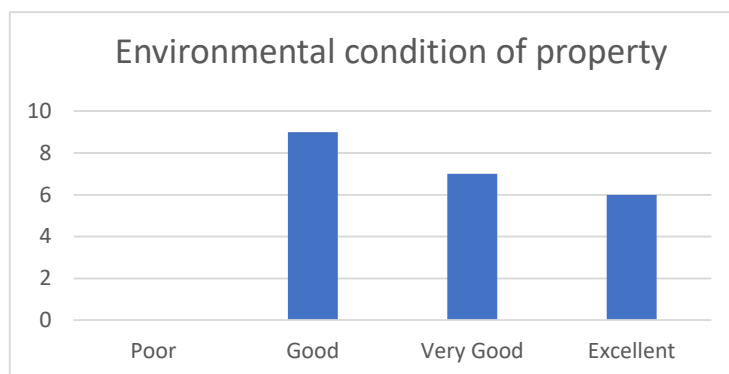
Although oysters can be grown in the estuary, they cannot be directly harvested as the water quality is not consistent enough for the Food Authority, while other estuaries in NSW allow direct harvesting as water quality meets minimum standards consistently

Farmers in the estuary are very aware of the impacts of management upstream (e.g. rubbish brought down in floods, weeds), however mid- and upper-catchment farmers do not appear to be aware of the situation of the local oyster industry.

A program with a whole of catchment approach which increased mid- and upper-catchment farmers' awareness of the downstream issues for other producers, might engage fellow primary producers.

6.2.3 Q 6(c) Environmental condition of the farmer's property

Farmers generally perceive the environmental condition of their properties to be good to excellent.



Themes which emerged were:

We are managing in line with industry standards

Most farmers (17) consider they are managing in line with industry standards e.g. putting in the required infrastructure, careful management, and doing all the right things (fencing waterways, targeting fertiliser and cell grazing).

"We've put in fencing, laneways and effluent system to protect the environment" E

"We have the infrastructure to minimise the impacts of farming, for example the effluent system" M

"We adopt industry standards in everything we do on the place" U

We apply good practices

All farmers believed they do the best they can as good farm managers, and they can readily provide evidence of adopted practices to support this belief. Farmers characterised actions under "good farm management" as "good ideas" and "practical common sense", rather than actions sanctioned and officially endorsed by industry.

Many farmers have adopted good environmental practices such as fencing off waterways, using no chemical fertilisers, no use of chemicals.

"Fertilisers are targeted to where they are needed, it is too expensive to waste" E

"We have weeds under control" M

"We have some erosion on cattle tracks but we manage ground cover carefully" U

Most farmers look at the evidence on their properties where there is little or no erosion, healthy trees growing, although almost all farmers consider planting replacement trees a priority.

We are maintaining good biodiversity values

Many farmers (7) consider themselves good environmental stewards who are providing habitat and biodiversity, and planting trees.

"We have areas that are a wonderful habitat for birds and wildlife" M

"We have isolated a number of pristine pockets on the farm that are not to be touched" M

"We have great biodiversity. We have a plan of what we want to achieve" M

Farmers in the estuary have particular issues

Farmers on the estuary contend with bank erosion, Acid Sulfate Soils and maintenance of flood gates. They have learned to apply solutions to Acid Sulphate problems.

Notably, many interviewees commented on and appreciate the effectiveness of Bob McDonald, an extension officer at MidCoast Council who provides a valuable point of contact for this issue.

"Fillets and revetment work have been a great success"

"We have learned how to manage acid sulphate soils over time"

"My floodgates are working well – but I have been lucky with funding to get them installed. There are lots of other floodgates that need attention"

Discussion and Recommendations

As discussed above, the literature review suggests that one of the critical factors for adoption of new practices is that landholders perceive a problem i.e. that riparian and catchment condition is 'poor' on their own property. Farmers did not refer to riparian condition as a problem when responding to this question, so this is clearly not the case for the interviewed landholders.

Farmers responded to this question by referring to a broader range of issues (i.e. biodiversity and good farm management practices) and consider the environmental condition of their properties to be good to excellent.

Landholders are unlikely to act in response to a program which appeals to them to act to fix environmental 'problems' on their properties. However, many may be attracted to programs that focus on industry standards and "good farm management" while simultaneously highlighting the production benefits.

While all farmers were able to identify examples of good practices that they applied, and some were able to refer to consistency with industry standards, no-one identified a comprehensive list of best management practices. While this was not the question that was asked (and may have been an unreasonable question to ask) it possibly suggests that there is no such comprehensive guide to best management practices, or if a framework exists it is not widely known and applied.

The dairy industry has used a self-assessment tool, DairySAT, for many years to provide a checklist for dairy farmers to assess their environmental performance and develop an action plan of prioritised actions.

A program that developed local examples and descriptions of “best management practices” for local beef producers might be useful in raising awareness of good practices. Similarly, examples and a description of riparian fencing options (i.e. what type of fence), location (i.e. where should it be in relation to waterways and banks) and maintenance options (how to manage weeds and promote regeneration) could be useful in raising interest and engagement.

6.3 Q 7. What changes have you seen in the valley since you have been here?

Farmers have been on their current properties for an average of 32 years, ranging from 3 to 60 years.

The themes which emerged were:

Trees have grown back

Most farmers reported an increase in the number of trees grown in the valley, primarily as a result of regrowth but also planting of trees.

Farmers thought this was the result of:

- changing land use (e.g. fewer dairies)
- regrowth on steep areas that should not have been cleared in the first place
- the effort and cost of maintaining steep land for little grazing benefit.

Fauna is better now

Most farmers reported increasing fauna numbers, with mentions of fish and wildlife in the rivers, mullet, bass, flathead, eels, crayfish, crabs, platypus, frogs, wallabies, echidnas, snakes, birds and koalas. Two farmers reported jewfish back in the river after a 50-year absence.

There are more weeds

Weeds were an important issue for most farmers, and they reported increasing issues with weeds.

In particular, those weeds which are spread along the road verge by council trucks and machinery e.g. giant paramatta grass (GPG) were of concern.

Invasive weeds such as Cat’s Claw Creeper were also noted as a potential disaster for the valley.

Discussion and Recommendations

The literature review and interviews show that farmers have a mix of goals including financial security, environmental protection, social approval, legacy and succession and balancing work and lifestyle.

Understanding individual farm goals, helping farmers link their goals to perceived improvements in the catchment and improve management to continue this positive trend could be a useful principle to underpin extension programs.

Weeds are commonly rated by landholders as their most important environmental issue. Weed control or eradication is a notoriously difficult issue, and farmers are probably correct in identifying roads as vectors for the locally notorious GPG.

This has two implications for program design:

1. A program which promised to address weed problems would be attractive to farmers (though it may also be expensive, difficult to deliver, and have a low chance of success)
2. Programs for riparian management which ignore or insufficiently acknowledge the weed management implications of practices such as riparian fencing will not be attractive to farmers.

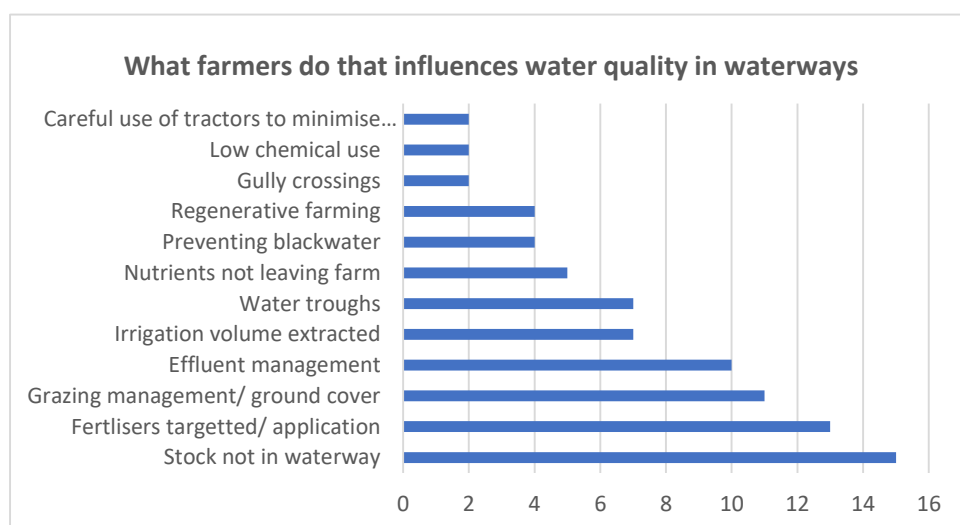
6.4 Influence, challenges and threats

6.4.1 Q 8. How does what you do on your land influence water quality in the waterway?

Farmers readily identified a range of their own current practices which have a positive influence on water quality. These include:

- keeping cows out of waterways
- targeting fertiliser use
- careful dairy effluent management
- ensuring nutrients are not leaving the farm
- grazing management to maintain ground cover
- installing water troughs and gully crossings

Notably, 6 farmers expressed an interest in regenerative farming – a term used for different purposes and with different meanings by different farmers – but most mentioned Peter Andrews’ model of storing more water in the landscape as a good model.

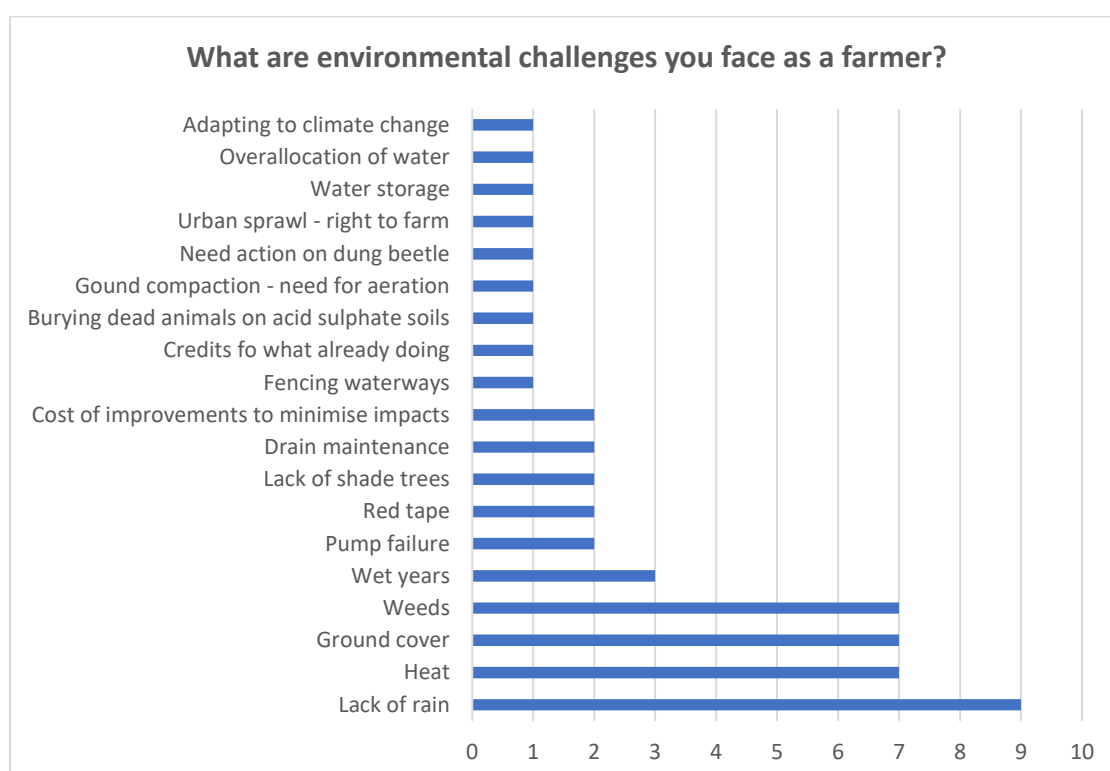


Estuary farmers have specific issues

Farmers in the estuary are aware of the issue of blackwater and maintenance of floodgates to minimise impacts on downstream users.

6.4.2 Q 9. When it comes to the environment, what are the challenges you face as a farmer?

Farmers' responses to this question were highly varied, most likely reflecting the drought conditions at the time of the survey, with lack of rain and heat featuring high on the list.



Credit for environmental actions

A number of farmers (4) raised the issue of “credit” for management practices or infrastructure they already have in place to protect the environment. Farmers see this is about both fairness in government funding and recognition of those who have ‘done the right thing’.

These farmers are concerned that LLS provide incentive funding to farmers who are not “doing the right thing”, whilst they themselves have already invested in infrastructure to minimise their impacts.

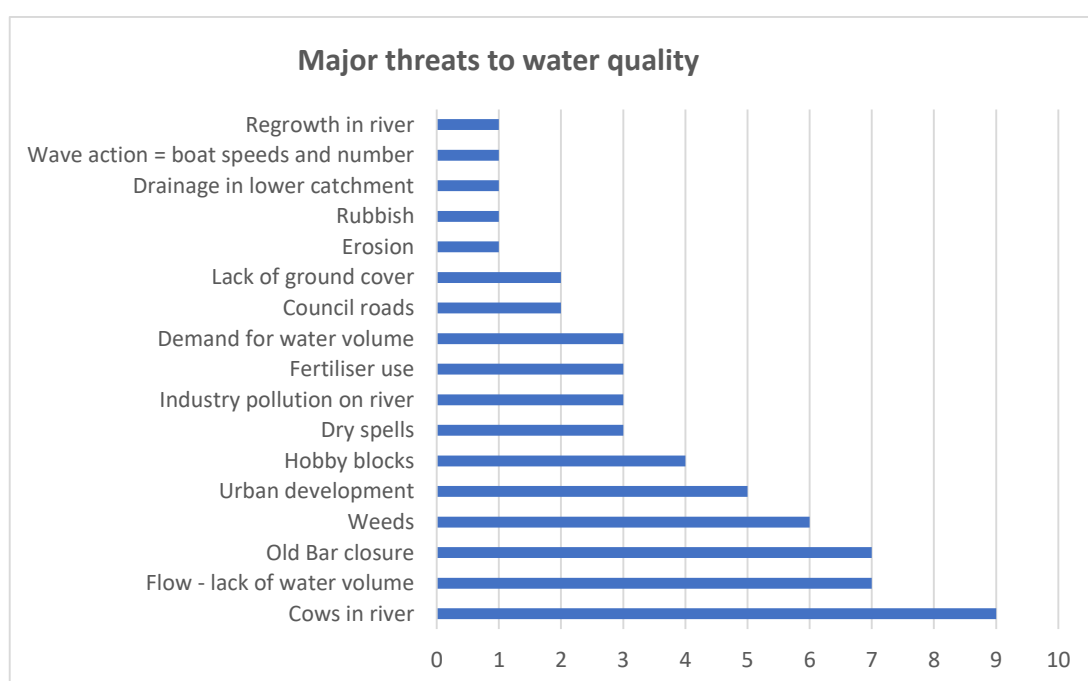
An example given related to feed-pads on dairies. Some farmers have invested around \$100k from their own resources in concrete feed-pads, but believe that some farmers without feed-pads could potentially apply for funding to reduce their environmental impacts by constructing a feed-pad. Farmers considered this would be unfair.

[This view reflects a common criticism of NRM funding programs: providing funding to ‘poor managers’ rather than rewarding or acknowledging farmers already producing ecosystem services outcomes within a productive system.]

Moreover, farmers do not want to be seen as the environmental vandals they are sometimes made out to be. They want credit or “kudos” for doing the right thing.

6.4.3 Q 10. What do you think are the major threats to water quality in the Manning Valley?

Farmers’ responses to this question were, unsurprisingly, quite varied.



The most common response was “cows in the river”, suggesting that while environmental condition is perceived to be good and farmers consider themselves to be good managers, they also recognise that stock have a negative impact on water quality. This recognition may be related to the comments that while catchment environmental condition is good, there are some farmers who are not doing the right thing.

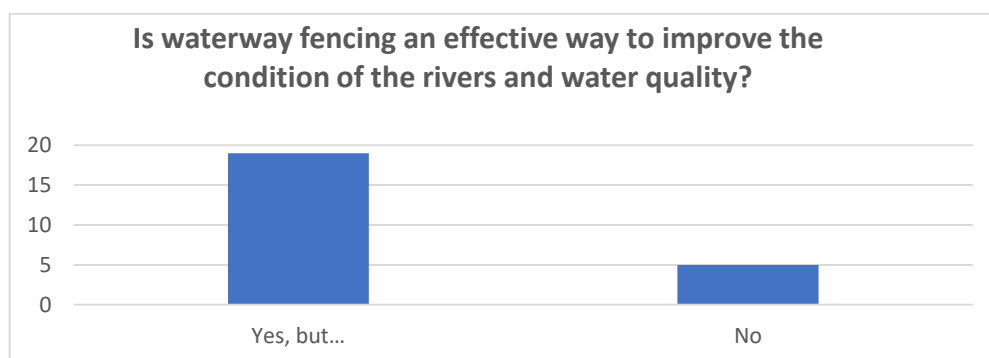
Most farmers recognised that cows in waterways was not only a threat to the waterway health but also provided an unfavourable picture of farmers to the community at large.

6.5 Waterway fencing

6.5.1 Effectiveness of waterway fencing

Q 11. Do you think fencing waterways is an effective way to improve the condition of rivers and water quality?

The overwhelming response (19) to this question was “yes, but...”, while some (5) farmers answered in the negative.



Several themes emerged.

Fencing waterways is counter-productive

A fifth of the group considered that fencing waterways was not effective, mainly due to the negative side-effects of fencing. These included:

- fencing the waterway removes natural shade and water for cattle
- fencing in flood-prone areas needs regular maintenance and creates a hazard downstream
- fencing waterways creates a significant weed problem on-farm but also downstream.

“My cattle have all they need in the paddock now with the creek. Why would I fence it off?” M

“Fencing the waterways is environmental vandalism. In a flood all the wire and metal posts get washed downstream to your neighbour. Someone has to clean it up”. M

“We fenced off the creek and dam on the dry block. But on the dairy we have gone the other way and pulled out the fencing along the creek – it was just too hard to control the weeds”. M

“You are better off having a gully that’s fully grassed up” U

There needs to be water and shade provided if the waterway is fenced

Most farmers in the group have already fenced some or all of their waterways (19/24), although in most cases stock still have access to the waterway (9/24 do not have access at all).

All farmers noted that providing watering points and shade areas was essential if the river was fenced.

"Fencing is part of the solution, but troughs and shade away from the waterway are as important" E

"Fencing the river cannot be carried out on its own – water and shade are essential" M

"Water, shade and lick blocks draw cattle away from the creek." U

The location and extent of fencing is important

Farmers commented that fencing waterways should not be a rigid rule and suitability at a specific location should be assessed on a case-by-case basis.

Farmers considered fencing waterways:

- is not appropriate on flood prone areas
- is not realistic for creeks and gullies
- is difficult where the waterway goes through the property
- works well for large waterways that form a boundary of the farm
- works best if all neighbours fence the waterway at the same time
- is ideal for heavy traffic areas
- is ideal for areas of highly erodible soils
- is not needed at high, steep banks that cattle do not climb down
- is not needed where the river is gravel based.

"No point in putting fence where it is going to get washed away by a flood" E

"The fence needs to be located back from the bank top a bit so you can get in there to manage the grass and weeds" E

"I've tried it on the creek that runs through my place but I have just pulled it all out as the weeds were a menace" M

"Strategic fencing at high traffic areas works well and reduces cattle pressure on the banks, but the whole waterway does not need to be fenced" M

Looking at a reach of waterway works best

Many farmers (8) noted that fencing waterways works best when all neighbours on the reach of river implement it – otherwise cattle will still access the waterway and the impacts will not be reduced. In effect the boundary fence has been moved.

Several farmers (4) noted how successful the Rivercare planning process had been in the past. This success was seen in terms of identifying priority actions for the reach or sub-catchment, and in bringing groups of farmers together to care for their waterway.

"I have fenced my river but my neighbour hasn't -his cattle still access the river so there is still pressure on the banks and vegetation" M

"The Rivercare plans were really good at addressing the main issues on the river" U

There are alternative ways of reducing impacts

Several farmers (4) recognised that the impacts of cattle on the waterway can be reduced in other ways (rather than fencing along the bank) such as cell grazing to reduce the pressure of cattle on the waterway, and encouraging cattle away from the river with shade and troughs.

"Cell grazing means cattle do have access to the waterway, but the pressure is hugely reduced"
M

"Encouraging cattle away from the river with shade and troughs will eliminate damage to the banks and vegetation on the waterway" M

"I have built dams and shade areas halfway up the hills and by providing lick blocks cattle work that country much better. The pressure on the creeks is minimal" U

Farmers also noted that fencing needs for dairy and beef differ. For example, where cows are strip grazed in dairy pasture systems, they may have access to the river bank for 1 day every 3 weeks or so, rather than on a daily basis as is the case under set-stocking systems.

There are downsides to fencing

The main problems farmers experienced with waterway fencing was:

- the ongoing cost of pumping for stock water
- weed control and
- flood debris removal.

Beef farmers noted the difference between beef and dairy operators. Dairy farmers inspect the cattle every day, and check there is water in the troughs, whilst beef farmers may not check cattle for over a week (as a minimum). This means that beef producers require back-up water supplies in the form of dams or access to creeks to provide water in the event of a failure in the troughed system.

Consequently, for some beef farmers, reliance on troughs for watering their cattle is a significant barrier, reducing their ability to leave the farm when they want, as regular checks are required on reticulated systems to ensure cattle have access to water.

Weed control was the most common issue mentioned by farmers.

"Weeds, dropped tree limbs and flood debris are all ongoing maintenance work" E

"Fencing the waterways is the lesser of two evils, as weeds are a real issue" M

"Fencing waterways is not a practical solution because of the ongoing costs, weeds and feral animals" U

Issues

For a group of farmers in the upper catchment, fencing waterways is considered a challenge and a concern for their businesses. Whilst only one farmer indicated it was a concern for him, 6 farms in the group would be similarly impacted. Many of these farms are large enterprises, with each farm

incorporating 30- 50km of river and creek frontage (many of it double sided). Fencing waterways for these farmers requires a total re-think of how they manage their grazing areas and significant cost.

Several farmers noted that they were negatively impacted by waterway management. One farmer saw it as important to demonstrate to the community that farmers are already trying to tackle the issue.

"It should be promoted more with Youtube videos, so that farmers, but also the community, can see how farmers are dealing with the issues" E

Other farmers identified the negative impacts from upstream activities:

"We are like the South Australia of the Manning – everyone's rubbish from upstream ends up on our place" E

"We now have real problems with lantana and prickly pear that have come from upstream" E

Discussion and Recommendations

The literature review suggests that one of the critical factors for adoption of new practices is that landholders perceive the difficulty in implementing the proposed solution.

Not all innovations or practices are the same. Some involve simply changing the type of product which is already considered worthwhile. But some involve changes to farm management, new skills, or even new enterprises.

Kaine et al (2008) identify four types of innovations:

1. Incremental innovations which may involve new components or skills, but which build on and improve existing practices
2. Modular innovations which involve new components and concepts so that existing practices become obsolete and new skills will be required
3. Architectural innovations require a reconfiguration of existing elements within a system
4. Radical innovations require a new set of concepts as well as new infrastructure and skills.

While fencing is a relatively simple task, fencing of riparian zones will be a "modular" innovation requiring new ways of doing things (e.g. accessing stockwater, moving stock and managing weeds), a change from set stocking to rotational grazing will be an "architectural" innovation requiring new concepts of grazing management, significant learning and new skills, extensive infrastructure and changes to many aspects of farm management.

In both cases the barriers relate to developing new concepts and skills, and practice change requires confidence that there is a relative advantage from adoption. While every new practice has a financial and management cost, the perception of relative advantage is about the ratio of benefit to that cost.

The literature review also suggests that one of the critical factors for adoption of new practices is that landholders perceive the proposed solution to be effective in addressing the problem.

This is not the case for many of the interviewed farmers: 5 farmers thought riparian fencing was counter-productive, and 4 farmers suggested there were better ways to achieve a water quality outcome.

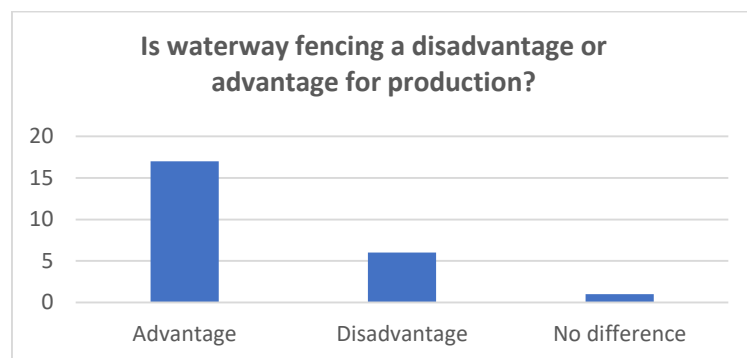
A program aiming to increase the extent of riparian fencing would need to demonstrate that it can be successfully implemented and/or accept that riparian fencing (an activity) is less important than riparian condition and water quality (outcomes) if they can be achieved by other means.

Many of the issues raised by this question relate to relative advantage, and will be considered in the discussion of Question 11(b).

6.5.2 Advantages and disadvantages of waterway fencing

Q 11 (b) Is waterway fencing an advantage or disadvantage for production?

Most farmers (17) considered waterway fencing an advantage for production.



Several themes emerged from the responses.

Helps with cattle management

Almost all farmers who had installed waterway fencing recognised the benefit in cattle management, in terms of strip grazing, rotating cattle between paddocks and knowing where cattle are at all times.

Improves production

Most farmers recognised that trough water was normally higher quality than dam water and this did have a production benefit – and in fact cattle preferred drinking from troughs rather than from the river or dams if given the choice.

Other advantages farmers listed included

- improving herd health by reducing mastitis
- reducing calving mortality rate
- reducing erosion of bank and loss of the best land
- increasing the fertility of the farm by keeping nutrients in the paddock

- keeping neighbours' cattle out
- trees that grow along river act as a windbreak
- allows paddocks to be rented out.

"My cows always prefer to drink from the troughs – they will even walk further to get the trough rather than drink from a dam or creek"

"Keeping cows out of waterways definitely reduces mastitis in our milkers and actually reduces milking times as cows' udders don't need to be washed" E

"Fencing the river means I can strip graze my best country easier, and keeps my neighbours' cattle off my pastures" M

"The trees that have grown along the river act as a natural windbreak for the paddocks on the flats"

"For me, improving my farm is about increasing fertility; that means retaining all nutrients on the farm. Fencing the waterways keeps those nutrients in the paddock growing grass" M

It's not cost effective

Those farmers (6/24) who regarded waterway fencing as a disadvantage for production commented on:

- the lost production from the best land,
- the fact that fencing waterways would not fit in with existing farm layout and would require major farm re-fencing, making the exercise not worth it.

A fifth of the group responded that fencing waterways was not effective, mainly due to the negative side-effects of fencing. These farmers considered the ongoing costs (weeds, fence maintenance, pumping, lost production) are in effect greater than any benefits.

"For our farm fencing the waterway would be a huge disruption to our paddock layout." U

"Fencing the waterways will mean a lot more work and costs – controlling weeds, maintaining and checking fences, pumps, pipelines, troughs and floatvalves." U

"Fencing the creeks and waterways would reduce production – losing green pick in lower country in dry times" U

Discussion and Recommendations

The literature review suggests that one of the critical factors for adoption of new practices is that landholders perceive that riparian fencing and stock exclusion (or any other recommended practice) provides a relative advantage i.e. that perceived benefits outweigh perceived costs or dis-benefits.

A large majority (17) of the farmers interviewed recognise that there are production advantages (benefits) from riparian fencing, yet only around half of these (9) have stock exclusion from all waterways and 5 of these 9 are dairy farmers with deep, saltwater frontage which stock would not use for drinking water.

An explanation for why farmers who identify production benefits from riparian fencing do not fence their riparian zones is that the disadvantages are perceived to outweigh the advantages.

These disadvantages were identified in response to Questions 11 and 11(b) and include:

- fence maintenance and flood repair
- alternative stock water provision and oversight of reticulated systems
- pumping costs
- loss of shade and the difficulty of establishing shade away from the waterway
- proliferation of weeds and their on-going management
- loss of management flexibility or increased management requirement.

A program which does not address these disadvantages, either by compensating for them or identifying management practices which reduce or eliminate them, is unlikely to be attractive to local farmers.

6.5.3 Cost of waterway fencing

Q 11 (c) How quickly do you think the cost of fencing waterways would be recouped?

Most farmers found this question too hard to answer. However, five (5) farmers made an estimate, based on “gut feel”:

- 4 farmers estimated between 5- 10 years
- 1 farmer estimated < 5 years.

Discussion and Recommendations

The responses, or lack of them, suggest that the benefits (or otherwise) of riparian fencing have not been studied sufficiently to be quantified in terms of a return on investment.

6.6 Effective ways to improve waterways and water quality

Q 12. What do you think are the most effective ways to improve the condition of waterways and water quality?

Several themes emerged from farmer responses to this question.

- Provide shade and water away from the waterway, so that stock are not using the waterway (10 farmers)
- Many farmers have had limited success in developing alternative shade areas away from the riparian zone (14 farmers)
- Manage groundcover, pasture and grazing pressure (8 farmers)
- Fertiliser and nutrient budgeting (4 farmers)

Discussion and Recommendations

The literature review suggests that one of the critical factors for adoption of new practices is that landholders perceive the proposed solution to be effective in addressing the problem.

Many of the interviewees perceive there are other, more effective ways than riparian fencing to improve the condition of waterways and water quality. Some of these are also identified in responses to Question 11.

Stock water supply was seen as the most important issue. Whilst most farmers interviewed reported that cattle prefer to drink from troughs, some farmers preferred dams over troughs (beef farmers in particular) and others preferred dams in specific situations (eg on run-off blocks, not on main dairy farm).

Shade was also a very important factor for farmers – as most existing shade is in the riparian strip. In addition, most farmers reported that developing shade trees and shade areas has been an ongoing issue for them, noting problems with species selection, location of shade areas, on-going care and maintenance. Many farmers have tried to grow shade trees, a few had success, but all had stories of failure. Overall sentiment was one of disappointing results.

Interestingly, responses to this question which suggest managing groundcover, pasture and grazing pressure reflect responses to some of the previous questions. Although it was not a topic specifically investigated in this study, rotational (cell) grazing systems and practices were mentioned by many farmers as part of their management for both production and environmental condition.

This study has found that interviewed farmers who do not have all their waterways fenced generally consider themselves to be managing well, and (presumably) able to manage without undue impact on environmental and waterway condition.

And maybe they are. A study, whether formal or informal, which looked at the relationship between the farmers' management systems and actual environmental condition could potentially inform the development of locally relevant guides for 'best management practice'. At a minimum, it could inform program designers of the range of perceived disadvantages which might need to be addressed.

6.7 Incentives, cost sharing and experience

6.7.1 Q 13. What incentives would make you consider changing your on-farm practices in relation to protecting or restoring environmental features on your property?

Several themes emerged from farmer responses to this question.

- Information and advice, including long term farm planning (6 farmers)
- Demonstration of benefits (6 farmers)
- Grants or incentives for project work (4 farmers)
- Off-setting other costs e.g. rates rebate, interest free loans or maintenance costs (4 farmers)
- Collaboration as part of a group (3 farmers)

"We need plans to make sure everything fits in with the overall farm plan" M

"Stockwatering systems need careful design to keep ongoing pumping costs down" M

"It would be great to get feedback from previous projects to see how everything works and the real benefits that were achieved" M

"More funding would help to get projects happening, otherwise we will chip away at it when we have the chance"

"Dumping silage at the tip should be free" E

"Other ways of funding should be looked at: rebates off our rates or interest free loans" E

"Time is the issue: volunteer labour or Landcare workers would be a great idea" M

"Sometimes it is easier to get things done when you work as a group. The task can seem so daunting if you've got to do it on your own" U

Discussion and Recommendations

Notably, 25% of farmers identified advice and farm planning as sufficient incentive for practice change (See also Q16 and Q17 below). All the aspirations expressed in farmer visions (Handing on the farm, Balancing production and environment, Building the business, and Transitioning) can be seen as benefitting from advice and planning.

A long term/ master plan would provide incentive for some farmers to implement projects, knowing there was an overall strategy. In addition, documentation of properly engineered solutions allows farmers to act when funds/ opportunity occur.

Information, knowledge and education - in particular demonstration of the benefits (to water quality) from previous projects - can build farmers confidence to take the next step and implement.

"If I am going to spend money and time on a project, I want to be sure there really is an environmental benefit"

For some farmers working together with other farmers and in collaboration with other groups (MCC, LLS, Landcare) can provide an incentive to get things done – working in a group can be a powerful motivator to undertake work that is not routine farming tasks.

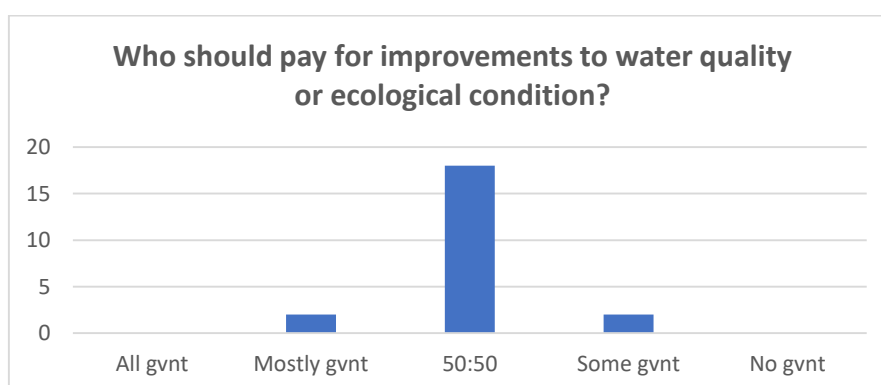
Since only 16% of farmers identified grants as sufficient incentive for practice change, the market for a grants program is likely to be a relatively small sub-set of the farmer population.

Many farmers saw time (their time) was the critical factor – most of their time is taken up with normal farming duties, and to find extra time for projects was seen as a problem. Some suggested volunteer labour be introduced for weed control.

A program with a win-win philosophy which helped farmers to realise their heterogeneous social, economic and environmental goals could be attractive to local farmers.

6.7.2 Q 14. Who do you think should pay for improvements to water quality or ecological condition of the Manning Valley?

Farmers' overwhelming response to this question was "50:50" for most projects, as this has worked well in the past. Farmers thought it should definitely not be free but incentives are needed to encourage farmers who are not motivated.



Even so, some farmers thought the ratio could be higher (e.g. for floodgates) and should be assessed on a case by case basis: a larger public benefit would justify a larger grant.

Most of the farmers interviewed strongly thought that their contribution should be "in-kind" in the form of labour, use of tractor etc. so that there was minimal impact on their business.

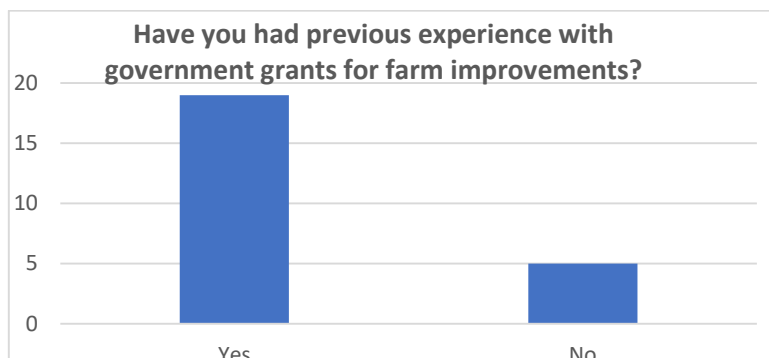
Most farmers also thought that an allowance for ongoing maintenance and operation must be factored into the budget.

In addition, most farmers' experience was that projects over-run the planned budget, so there needs to be some flexibility in funding arrangements – otherwise shortcuts may be taken at implementation and/or on-going operation.

[Note: Recipients of grants from past funding programs may have been 'trained' to expect a 50:50 split]

6.7.3 Q 15. Do you have previous experience with government grants for farm improvements?

Most farmers interviewed (19) had participated in incentive schemes for farm and environmental improvement.



Farmers who had received grants in the past

Farmers who had received grants in the past had generally positive feedback about the experience:

"Projects would not have been implemented without the funding."

"The funding meant I could fence the whole river at once, rather than over several years."

However, the most common negative comment was that the actual costs were higher than originally planned in the project budget, and that options to include flexibility with funding could be considered. In particular, after projects were completed, farmers found weed growth greater than anticipated resulting in higher costs and time for weed control.

Most appreciated assistance with the paperwork (presumably from Project Officers), although for some the application process was a burden. However, the new knowledge and designs were welcomed by farmers to improve their farms.

Farmers who had not received grants in the past

Comments from those farmers who had not received grants included:

- *"I don't want to go through the hoops",*
- *"I worked up a project with LLS but funding was not approved",*
- *"I don't agree with the philosophy; I don't want LLS telling me what to do"*
- *"I would if approached, but have not known about the funds in time".*

Suggestions for improved funding programs

Dairy farmers suggested the timing of funding would be best in spring when farm operations are least busy.

Some farmers thought the funding rounds favoured “farmers in the know”, rather than targeting the best projects. A more flexible, all-year funding source was suggested as a solution.

Some farmers were interested in planning for a “whole farm” project and then breaking it into “about \$10,000” steps that could be achieved.

One farmer pointed out the annual \$20,000 depreciation allowance, and suggested that this could make projects tax-effective.

6.8 Other issues and opportunities for MCC

Q16. Is there anything MidCoast Council could do to help you improve you land to protect water quality and catchment health?

and

Q 17. Are there other issues that concern you that we have not covered?

Farmers responses to these two questions have been combined as the responses to Q17 related to MCC. Farmers’ comments in response to these questions followed a number of themes:

Dialogue

Farmers felt intimidated by council and reluctant to raise issues. MCC was seen as the regulatory body and many farmers sought to minimise their interactions with council.

Many farmers commented that there was little feedback or communication from MCC:

- Weed officers
- Road repairs and maintenance
- Weeds on council land.

Farmers also thought MCC were reluctant to work with local agricultural businesses e.g. no involvement with the local Rural Youth in Agriculture (RYAG) event. The formation of a consultative committee of farmers was suggested as a way to improve dialogue.

Bob McDonald’s (MCC) role and work were appreciated and seen as a great way of creating dialogue with MCC. Farmers thought a member of staff in council with more general duties (i.e. not specifically ASS) would be helpful as a point of reference/ contact to air their views and complaints. It was suggested that this would be a good way to start engaging farmers and create a dialogue.

“The weeds officer has such a wealth of knowledge and sees weeds up and down the valley – it would be so good to get feedback from him” M

“I am so concerned about Giant Parramatta Grass – it’s all along the road reserve, something needs to be done” M

"We need a point of contact in council to talk to. Someone who can talk to farmers, has experience, won't give us the "run-around" and will be there for at least a few years" E

"MCC don't seem to want to engage with local businesses. I tried to get them involved with the RYAG program but heard nothing" M

Information

Farmers also thought MCC should work with other agencies, especially in provision of information on best management practices such as grazing management, fencing, weed control, removal of trees in the middle of streams, drought preparedness, bores/ access to groundwater, and advice for new landholders.

Many farmers were unaware of the work carried out with the Environmental levy and would value feedback on how it is spent.

"We need practical information, and it needs to consistent from all government bodies" M

"What is the environment levy spent on? It would be good to know" E

Water supply

Farmers in the lower catchment on town water supply wanted access to data on groundwater that MCC may have which is unavailable to farmers directly.

Farmers commented that new houses should be required to have tanks and also there should be more active water restrictions in towns.

A number of farmers raised the concern that Bootawa Dam offered too small reserve storage capacity for the town and extra storage capacity should be built.

Also, storage on farm for irrigation and drought-proofing was seen as a high priority for farmers.

"Townwater is one of my biggest costs – I'm sure MCC have bore data when the Pacific Highway was upgraded; this might help me work out if it is worth getting a bore dug" E

"There is not enough storage on the river, when you think of the size of the towns. We need more storage reserve and heavier water restriction" M

Roads

Farmers' most common complaint related to MCC roads. Many farmers thought that runoff from gravel roads has a larger impact on water quality than runoff from pastured areas or areas with kikuyu acting as a buffer or filter.

It was noted that on many gravel roads runoff drains directly into waterways. Farmers commented that if they were being asked to fence the waterway to exclude cattle, MCC should also fix this source of nutrient and pollution.

A number of farmers pointed out specific areas of erosion on the cut side of the road platform, where they had carried out their own fixes as MCC have not responded to requests.

Specific issues with particular roads and culverts were identified:

- Not enough care is taken by the grader driver when maintaining the gravel road, as the table drain is being gouged out creating an erosion source
- Where MCC have carried out work downstream of a culvert no rock reinforcement was placed creating scour/ erosion in the drainage line within the farmer's property
- On one culvert, the downstream edge of the structure forms the boundary with the property- but MCC have not provided fencing to control cattle
- One farmer had reported a broken headwall to a culvert, but no repairs had been carried out and there was no feedback on actions to be taken.

"I've had to fix the erosion on the cut side of the road because Council wouldn't do anything. I'm also worried about the way the grader forms the watertable drain – it is causing erosion in places"
U

"You can see the inconsistent approach MCC have to rock protection downstream of culverts; this one has no protection and eroded at least 30m into my property, whilst this culvert next to it has protection and there is no erosion"
M

Rates

The rapid increase in rates received negative comment from most farmers interviewed, especially when compared to the perception of poor value in terms of services they receive. A number of farmers noted that they did not have town water, were not sewered, and did not have a waste collection. The local road was seen as "the service" offered by MCC, and this was thought to be not graded often enough.

Farmers wondered if MCC could consider off-setting rates or reducing rates for a 1 or 2 year period in return for completion of projects. Reducing on-farm cash costs is a priority for some farmers.

Waste

Farmers were concerned silage wrap could not be dumped for free at the tip, and that removing a disincentive for farmers may ensure this plastic wrap is handled properly.

Weeds

A number of farmers noted that the Weed Officers have a wealth of knowledge about weed control, emerging weeds. Providing advice and feedback to farmers may help them to better understand and prioritise their weed control programs.

In addition, some farmers thought the role of the Weeds Officer could be to coordinate weed control for invasive weeds such as Giant Parramatta Grass, which was noted by most farmers as a real concern.

Boats and craft in lower rivers (Lansdowne)

The erosion created by the wash from boats in the lower estuary was of high concern for some farmers, particularly in the Lansdowne River. Trees continue to fall into the river at an alarming rate as a result of undermining of the bank by waves created by boat wash.

Although some measures had been taken (e.g. new signage on craft speeds), farmers thought this was inadequate and confusing.

Discussion and recommendations

Perception of MCC's environmental commitment and service levels are viewed holistically by farmers. There is a need for more coordinated approach to rural services including improved response rates to customer requests and improved communications.

Where Council programs are in place to address the concerns expressed (eg. MEMS road improvement project, stormwater improvement projects), the results should be promoted to farmers to raise awareness of Council and other agency activities in the catchment.

For farmers to protect catchment values for the public good, they need to see other stakeholders sharing responsibility and doing their part.

7. Focus groups

Two focus group sessions were conducted to gain a more nuanced understanding of the issues raised by the twenty-four interviewees. One focus group was held with 7 members of the estuary-based Women in Dairy group, and the second with 16 Natural Resource Management (NRM) professionals with experience working with farmers in the Manning Valley.

Each focus group session lasted for around one and a half hours, with planned (predetermined) questions used as prompts for an open discussion. The NRM professionals were presented with a summary of the findings of the literature review and interview responses as an introduction to the topics for discussion.

Specifically, the purpose of the focus groups was to:

1. Confirm (or otherwise) that the interview responses reflected typical perceptions that would be found among Manning Valley farmers
2. Gain insights into the thinking behind such perceptions
3. In the case of the NRM professionals group, to elicit suggestions for approaches that may be successful in engaging Manning Valley farmers.

7.1 NRM professional focus group responses

The NRM professionals were presented with summary findings from the literature review about the nature of decisions and behaviour change:

- Process and stages of decision making
- Factors needed for change
- Goals and motivators: drivers for decision-making
- The key factors influencing decisions: relative advantage & trialability

A series of prompting questions was asked to add value to the research and see if the theories rang true. The responses generally supported the findings of the literature review but also added some insights.

Peer to peer learning is powerful, and an element of trialability.

- *Peer-to-peer learning is good way to develop trust and share education – can be more powerful than imagined.*
- *You can tell someone several times and it doesn't sink in, but if a friend talked to them about it the message can be received differently.*
- *Sometimes level of awareness is low – haven't attended workshops, etc. Couldn't see consequences of their lack of awareness.*
- *Trialability can spread to neighbours – "it's worked here it can work there".*

Relative advantage (benefits) can be complex.

- *Advantages sought can be financial, but also recreational or other advantages*

- *Other additional benefits may not be foreseen until the action is done – e.g., gaining boat access, rock filleting has replenished fish supplies and mangrove restoration.*
- *Grants and incentives: provide advice that doing nothing is not a good option. Discuss the how it could cost them in the future. Show them what benefit they will get if they do something vs doing something.*

Adoption can depend upon a range of factors in a farmer's situation, so it is important to listen to the farmer – understand their point of view and experience. Adoption and perceptions can depend upon:

- *personalities*
- *what they've learnt*
- *who their mentor is*
- *succession of the farm*
- *income and how much money they have for such projects*
- *how a landowner thinks about their property – sometimes finishes at the fence line and not within a bigger context.*

The issues can be complex, and projects can change over time.

- *It's not just the river, it is the area and land around it – they're dependent on each other.*
- *Changes can be complex for landholders, so start small, have a win and move on to larger project.*
- *With large turn-over in ownership, good changes can be undone, e.g. removing solar pumping.*
- *Implemented changes can still evolve and change in the future e.g. one type of fencing eventually changed to another – trialability.*

Q: How would you describe the environmental condition of the Manning Valley?

The responses generally supported the findings of the interviews but also added some insights.

The Manning Valley is in good condition, but not everywhere.

- *MV in good condition but it depends on how 'condition' is defined.*
- *MV is a big area! Parts are good, parts are poor.*
- *One member reframed the concept: compared it to clean and green in Tasmania / NZ. What do you think of the MV?*
- *Observations suggest it is drought impacted, cattle are roaming everywhere in some areas, needs more riparian coverage, the scale of clearing is huge and soil is in trouble.*

Q. Do landowners perceive the water quality a problem? and

Q: Is fencing and stock exclusion considered good practice?

Insights from the NRM professionals group generally supported the findings from the interviews:

- *For farmers who think it is 'excellent' – it is not worth going to them and saying we have to fix up water quality if they aren't aware of the problems. They need education.*

- *Some farmers were able to see what their neighbours weren't doing well but not what they themselves could do better. Most farmers ranked their land as 'good' through to 'excellent'.*
- *Farmers' perceptions differ e.g., trees can be good or can be enemy – suck up water and redirect it...*
- *We need to interact with farmers looking through the farmers' lens not just ours.*

Q: What have you found are the critical factors to get farmers to change their infrastructure or management to protect waterways?

Insights from the NRM professionals group generally supported the findings from the interviews. NRM professionals were keenly aware of the need to tailor solutions to the circumstances of individual farmers, and to identify benefits for those farmers:

- *Respond to individuals – needs, problems, personal motivation*
- *Negotiating win-win solutions*
- *Identify the benefits farmers seek apart from increased productivity and ease of management.*
 - *Sustainable subdivision fencing*
 - *Managing groundcover*
 - *Effective stock watering*
 - *Time management (not having time to get stock out, loss of stock)*
 - *Improved stock management*
 - *Ease of stock management*
 - *Rotational grazing can help to maintain groundcover*

Looking beyond the specific riparian issue can be attractive to farmers:

- *Undertake whole farm planning*
- *Coordinate projects with neighbours – take a whole reach approach*

Shade and maintenance are issues that need to be addressed in program design:

- *Cattle go to river for shade. Farmers give up when their planted trees are trampled in one day, or frosted.*
- *It takes 15-20 years to grow sufficient shade trees. Artificial shade is worth exploring in interim.*
- *Investigate funding for maintenance e.g. outsource weed control.*
- *Ongoing support is needed beyond giving money for fencing i.e. for tree planting and weed control.*
- *Consider funding TIDE rather than the farmers themselves to do maintenance work. With the proviso that there also needs to be farmer 'ownership' of the problem as well.*

Implications for program design

The responses from the NRM professionals confirmed the findings of the literature review and the comments of the farmers were consistent with their extensive experience in designing and delivering NRM programs within the district.

Insights of particular relevance were the importance of:

- Peer-to-peer learning
- On-going maintenance and landholder ownership of the project works
- Demonstrating benefits to the farmer and farm management
- Seeing issues from the farmer's perspective, and finding win-win solutions for individual situations.

7.2 7.2 Women in Dairy (WiD) focus group responses

The Women in Dairy focus group comprised 7 people who reside in the lower river and estuary, and who do not use the river for stock water. The workshop was divided into two sessions. Session one consisted of a range of activities that invited participants to share their values for the river. Session two was an informal, open discussion led by the participants, which focussed on the potential for collective, group action to address river management issues.

Several strong themes emerged from the discussion:

1. The Manning Valley is a productive landscape

This theme confirmed a theme which emerged from the interviews i.e. that the Manning Valley has value for humans.

- *Our livelihood depends on the river's health.* (oyster farmer)

This is also strongly reflected in answers to the question: What do you love most about the Manning River, its waterways and the estuary?

- *Its ability to provide*
- *It's a working river, providing fish, oysters and more*
- *I love the life it brings to the Manning Valley. The products it produces.*
- *The area it covers is diverse and rich.*

2. The Manning River and Manning Valley have amenity values which people appreciate.

This theme referred to both recreational and environmental values.

- *Still, quiet times to enjoy. It's not over used with jet skis etc.*
- *The beautiful energy it gives. The river sustains our existence*
- *Ability to row long distances.*

3. Proposed activities to address water quality issues need to provide an economic benefit to farmers.

This theme was consistent with both the literature review findings and the interview responses. Simply put, proposed activities or practices need to provide a production benefit and maintain or enhance the asset value of the property.

- *Tell farmers they can improve their asset by having mangroves and improve their land and farming. Farmer's want to know "What's in it for me?"*
- *Our river bank was going to fall in the river during next flood (motivator). We had to do something, we were losing our land. It was good to have support with 50:50 funding but the project was a lot of work. Council helped ... they did the paperwork and took that hard work out of it. We're really happy with the results, you can see it regenerating over time.*

4. There is concern among lower river and estuary producers about the impacts of upstream activities on downstream producers.

Perhaps reflecting a cooperative effort in the estuary among oyster and dairy farmers to address water quality issues over a long period (i.e. since the late 1990s):

- *In the past, dairy effluent was a problem – that was targeted.*

A suggestion from the Women in Dairy group, which reflected some comments from the interviews, was that better communication between people in different parts of the Manning Valley would be useful.

Specifically, telling the story of how cattle in creeks upstream, depositing of litter and pumping of water which reduces flows combine to degrade water quality in the estuary to such an extent that Manning River oyster farmers are unable to 'direct harvest' their oysters. They are thus at a financial disadvantage compared to oyster farmers in other estuaries with better water quality.

- *If cattle (goats, sheep) are standing in water because they have no shade during summer then they defecate in the river.*
- *Need communication down along the whole river.*
- *We monitor for E coli (not generally human, usually bird or cattle). There's no improvement at this stage – we want to see improvement.*
- *We lose knowledge when older people leave farming and it's not passed on through generations. Newcomers don't have the history of knowing about the value of the mangroves and so on.*
- *People along the river need to know what is happening up and down river and how each affects the other.*

There was also concern, consistent with interview responses, that urban development and associated pumping of water was a risk to water quality and production in the long term.

- *Dams are dry and on town water – don't over populate the Manning. There would be more water pressure.*
- *Planning about water is important.*
- *Water is a commodity that is sellable and high cost to them*

5. Group activities

The idea of groups with a river management role was floated and the focus group was asked: Would it be helpful for River Care groups that are collectives?

The discussion was informed by the group members experience of participation in a successful group (i.e. WiD) and was generally supportive of this idea, with some suggestions for what makes a group successful:

- *The motivation is 'connection' – can be self-centred on farm.*
- *Need a project to form the initial groups so they can move on from there. Short and sharp – don't let it drag on.*
- *What keeps you engaged? Observing the changes where there was nothing now treed and few weeds.*
- *The social side is important get on with each other. The key is to have an amicable group to start with – always stuff to start out.*
- *From the environmental aspect – having good understanding of aims and what is it I want to see happen.*

8. Conclusion

By drawing on established research, the local knowledge of extension officers and the observations of farmers, there are numerous opportunities for MidCoast Council to support existing catchment management efforts in the Manning and achieve environmental outcomes.

In general, the perceptions of the interviewed farmers were that current environmental condition is not a problem except in particular locations. They were unaware that water quality in the estuary is not suitable for direct harvesting of oysters.

The interviews revealed the farmer's view that waterway fencing is not completely effective. The fact that most of the interviewed farmers had not constructed fencing along their own waterways (other than on a property boundary for the purpose of stock control), suggests that they generally do not identify a relative advantage for themselves in waterway fencing. There are many management complications once waterways are fenced which present a barrier to this approach.

The motivators for adopting practice change are their values and aspirations for the farm. Farmers supported a more holistic approach to protecting waterways and improving water quality, such as promoting good pasture cover; rotational grazing; and providing shade, water and stock attractants away from waterways.

Practice change requires confidence that there is a relative advantage from adoption. While every new practice has a financial and management cost, the perception of relative advantage is about the ratio of benefit to that cost.

The literature review suggested that the challenge is often to develop innovations that are not only good for the environment but also financially beneficial. The results of the interviews and focus groups suggests that these innovations for waterway protection must also have advantages for farm management.

Providing incentives, training and extension advice to develop new concepts and skills; supporting peer-to-peer learning; and negotiating win-win management actions will advance the goals of farmers while influencing culture and practices to improve management of the Manning River Basin.

9. Appendices

9.1 Appendix 1 Introductory letter and confidentiality statement

“Understanding the motivators and challenges for farm land and water management in the Manning Valley”

Participant Information Sheet & Consent Form

Dates: 7th August – 25th September 2019

Project organisation: ~~MidCoast~~ Council and NBA Consulting

Project coordinators & primary contacts:

- ~~MidCoast~~ Council – Louise Duff, Catchment Coordinator, M 0436924577, E louise.duff@mcc.nsw.gov.au
- NBA Consulting – Nick Bullock, Consultant, M 0422307292, E nick.energyguys@gmail.com

Background: ~~MidCoast~~ Council (Council) has engaged Farming Consultant Nick Bullock to survey farmers in the Manning River Catchment to understand their successes, motivators and challenges managing land and water. The survey will be used to inform catchment management actions in the Manning River catchment management plan, as well as guiding future support for landholders to improve catchment management. The focus is on dairy and beef producers.

Aims: Nick will be interviewing 24 landholders to help us understand:

1. Successes, motivations and challenges for farmers managing land and water courses.
2. How Council can support positive approaches.

Invitation to participate in the project

MCC and NBA Consulting invite you to participate in the interviews to share your views. We are asking for your permission to be interviewed for approximately an hour at the time scheduled.

Nick Bullock will conduct the interview, taking notes and then writing up a report. You will also be invited to participate in a small-group conversation to discuss the results.

- Your involvement is entirely voluntary.
- Any discussions and information you provide will be handled in confidence.
- Outcomes of the interviews will be collated and individuals will remain personally anonymous in the research report.
- You can choose to withhold any information that you have provided at any time after the interview. To do so, please contact the Project Coordinator.
- You can withdraw your involvement in the project at any time by notifying one of the Project Coordinators.

If you agree to participate in the project please complete the form below and return to the Nick Bullock on the day of the interview.

If you have any further questions, or if you would like a plain language summary of results, please contact me using any of the contact information below.

Regards,



Louise Duff

Catchment Coordinator

MidCoast Council

4 Breese parade Forster NSW 2428

✉ louise.duff@midcoast.nsw.gov.au

☎ 0436 924577

Consent Form

The details of the above "Understanding the motivators and challenges for land and catchment management in the Manning Valley" research has been explained to me and the questions that I have asked have been answered to my satisfaction.

Confidentiality of the information, and the process involved in retrieving, sending and storing data and interview transcripts have been fully explained and I agree to the process.

I give my full and informed consent to be involved in this project in accordance with the terms outlined on the attached Participant Information Sheet.

Participant:

Name: _____

Signature: _____

Date: _____

Upon providing the full details of the nature of the research, the respondent above has expressed his/her full and informed consent to be involved in the project

9.2 Appendix 2 Interview questions

Interviewees were asked 17 questions. Some questions had several parts.

1. Can you tell me about your property and what you do here?
2. What connections do you have with your community?
3. Do you currently do/ have you done things on your property that would protect water quality?
4. Where do you get information about farming and land management? Who makes major decisions on farm?
5. I'm hearing a lot of farmers say this is the worst drought they've seen. What do you think? How is it impacting your farm?
6. (a) How would you describe the environmental condition of the Manning Valley?
(b) How would you describe the environmental condition of the waterways in the Manning Valley?
(c) How would you describe the environmental condition of your property?
7. What changes have you seen in the valley since you have been here?
8. How does what you do on your land influence water quality in the waterway?
9. When it comes to the environment, what are the challenges you face as a farmer?
10. What do you think are the major threats to water quality in the Manning Valley?
11. Do you think fencing waterways is an effective way to improve the condition of rivers and water quality?
12. What do you think are the most effective ways to improve the condition of waterways and water quality?
13. What incentives would make you consider changing your in-farm practices in relation to protecting or restoring environmental features on your property?
14. Who do you think should pay for improvements to water quality or ecological condition of the Manning Valley?
15. Do you have previous experience with government grants for farm improvements?
16. Is there anything MidCoast Council could do to help you improve your land to protect water quality and catchment health?
17. Are there other issues that concern you that we have not covered?

10. Appendix 3 Focus groups

10.1 A 3.1 Women in Dairy

Conducted on 1 November 2019

7 Participants

Facilitated by: Louise Duff, Nick Bullock, Janine Roberts

Prompting question for the group were:

- What do people value about the river?
- Would it be helpful for River Care groups that are collectives?
- What do you love most about the Manning River, its waterways and the estuary?
- It is important to protect...
- Where are your favourite places and why?

10.2 A 3.2 NRM professionals focus group

Literature Review and Discussion of Survey Responses

Conducted on 1 November 2019

16 Participants

Facilitated by: Nick Bullock

Social Science Survey Presentation

Discussion was prompted on the range of topics below, with presentation slides used as a prompt.

Slide 1: Nature of decisions and behaviour change

- Process / stages
- Six factors needed for change
- Decision-making in Agriculture
- Social factors
- Goals and motivators: drives decision-making e.g., handing farm down to children
- Types of innovation: incremental, modular, architectural, radical
- Key factors influencing decisions: relative advantage & trialability
- Relative advantage: is the change I'm going to do advantageous?
- Trialability: Complexity of the types of innovation

Slide 2/3: Critical factors

- Do landowners perceive the problems e.g., is water quality a problem? If not maybe that is a reason why they are not involving themselves.
- Is fencing and stock exclusion considered good practice?

Slide 4: How would you describe the environmental condition of the Manning Valley?

Slide 5: Results of above question

- Farmers' perceptions 'Good' and 'Very good' – environmental condition and condition of waterways
- Research was conducted on 24 farms (half dairy, half beef)

Slide 6: For 20 years riparian fencing has been promoted and from our survey a number of issues raised by farmers (weeds, floods, troughs, shade)

'What have you found are the critical factors to get farmers to change their infrastructure or management to protect waterways?'