

## **Interpreting private landholder stream restoration practices**

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### **Key Points**

- Waterway health outcomes and policies are informed by biophysical science although it is possible landholders involved in waterway health may not comprehend the science nor value it
- Patterns of social data emerged in this research distilled into seven key themes of landholder practical senses
- This research reflects this need to integrate this ‘social body’ of knowledge to the current ‘scientific problems and solutions’ approach to waterway restoration.

### **Keywords**

Maribyrnong, biophysical, social, landholders, practice, knowledge, aesthetics

### **Introduction**

The Maribyrnong catchment lies immediately to the north-west of Melbourne and its waterways collect the soaks, seeps and flows of 143 square kilometres of southern Victoria. The waterways of the Maribyrnong have long bonded people and place. These socio-cultural relationships contribute to differences in people’s perceptions, views and knowledge of waterways. Perceptions and perspectives must be understood as they guide the practices for effective management. Melbourne Water as the waterway authority relies profoundly on a partnership approach with landholders to manage healthy waterways in the Maribyrnong Catchment. Waterway health outcomes and policies are informed by biophysical data measuring stream conditions. This data is grounded in science, and forms the basis of communication to landholders. It is possible though that these landholders may not comprehend the messages bound in these biophysical values of waterway condition. Nor may they value them. Research using an ethnographic narrative analysis attempted to understand landholder practices, interpretations and relationships regarding river restoration and discuss the implications for such river management. The research focused around rural landholders and aimed to compare biophysical pictures to social pictures of waterway health.

### **The Research**

Using ethnographic narrative analysis, this research project attempts to understand landholder practices, interpretations and relationships regarding river restoration and discuss the implications for such river management.

### ***The ISC***

Developed in 1999, the Index of Stream Condition (ISC) is regarded as an important milestone in benchmarking the environmental condition of waterways. It provides a detailed full picture of river condition across the state and is evaluated for individual river reaches. Since its review in 2004, it integrates data on five sub-indices – hydrology, water quality, streamside zone, physical form, and aquatic life. According to

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Department of Sustainability and Environment (2005) these five sub-indices represent the key factors that contribute to, or affect, river health.

The ISC concept appears to disregard interacting with society, especially those with a keen knowledge of river health management, including farmers and landholders who manage the frontages of so much of Victoria's river length.

### *The Landholders*

The research focused around five landholders. Their properties all carried creeks and they were spread across the Maribyrnong catchment's rural parts. No two landholders were located within the same reach of waterway.

### *Using Ethnographic Narratives*

Ethnography is the deliberate 'witness-cum-recording' of human experiences (Willis and Trondman, 2000). This is important because experience is meaningful and human behaviour and thought is shaped by this meaningfulness (Denzin and Lincoln 2003). Thus this research project was a place-based narrative analysis. Five landholders and their 'stories' is a 'discourse of familiarity' with their rivers, recorded through face-to-face interviews undertaken on foot along these river frontages. They are informants with a 'point of view' on river health. This narrative analysis attempts to convey meaning to this 'sense' and how it reflects against the meaning of the ISC and what it implies for future restoration works. These landholders will illuminate the 'social picture' of river health, whereas the ISC illuminates the 'biophysical picture' of river health. This research will, although involving a small sample size, explore the differences in the patterns of illumination.

## **Discussion of Results**

This research aimed to compare biophysical pictures to social pictures of waterway health. These are clearly inexact comparisons. Nonetheless, it is worthwhile to examine the patterns and reflections of both the biophysical and social pictures.

### *The biophysical picture*

The ISC data drew a biophysical picture of only moderate waterway health for the reaches encompassing these frontages. All five frontages belonged to different reaches within the Maribyrnong Catchment. Four of these were moderately healthy and one was in poor health. Each picture was different even though three of the five reaches all scored 28/50 or 5.6 out of 10, as the sub-indices widely varied across sites.

### *The Social Picture*

The transcripts of each interview were analysed to determine patterns or themes given to the values of waterway health. What landholders said and what they did about their waterways were revealing. The results found that particular thoughts and practices emerged repeatedly through the interview process, both within the one interview and across interviews. These themes described the positive and negative values allocated to waterway condition by these landholders. The following section details these themes.

### *The Social Practice*

The social picture depicts several key themes on a landholder's knowledge of waterway health. It represents the place-based aspects of this narrative analysis. Seven major practices were identified below and considered as 'practical sense' shown by landholders.

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### Landholders' Practical Common Sense

1. Weed removal – ‘cleaning the creek’
2. Revegetation – ‘trees first’
3. Maintaining personal access - ‘opening up the creek’
4. Taming creek lines – ‘serenity, peace and calm’
5. Managing for aesthetics – ‘beautification, look a picture’
6. Restore flow and flushing – ‘getting the water moving’
7. Encouraging wildlife – ‘bringing back the birds and frogs’

### What are the reflections of each picture like?

Two pictures have been drawn representing the condition of specific creeks and frontages in the Maribyrnong Catchment. One interprets the biophysical data and the other interprets the social data. These pictures share some similarities and fundamental differences. The following table details the reflections of each picture. Diagram One also elucidates these similarities and differences with reflections of those positive values afforded to each picture.

Both pictures carry knowledge. One is an everyday knowledge and the other a specialized knowledge. Both sources of knowledge have informed and both have revealed a picture of waterway health for this research. These pictures are very relevant to waterway management, particularly in a framework of partnership between ‘authorial power’ and ‘landholder familiarity’.

**Table 1. Descriptions of the reflections of the biophysical and social pictures of waterway health in random sections of different creeks of Maribyrnong Catchment**

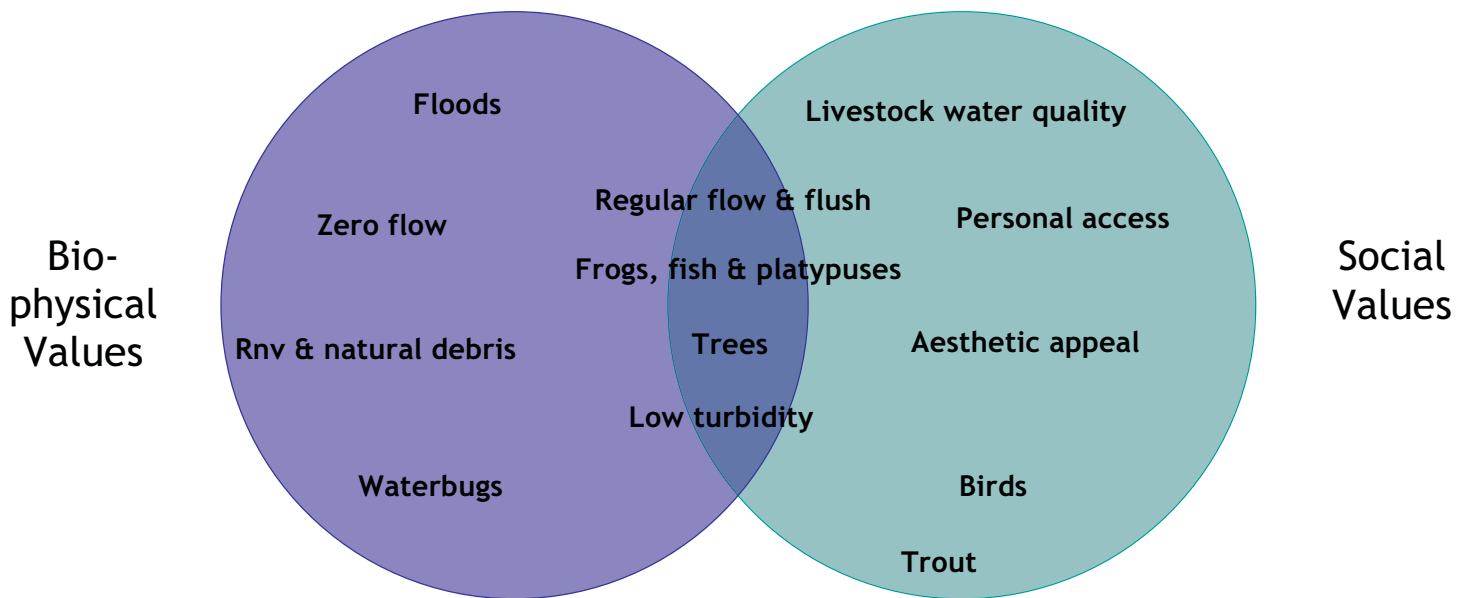
Feature of Waterway Health	Depiction in:		Clear areas of overlap	Clear areas of difference
	Biophysical Picture	Social Picture		
1. Hydrology	Prominent	Vague	Flow regime range that revolves around moderate flow levels and occasional low flooding or flushing  Damming and diverting flow devalued in the biophysical picture is partially reflected in the social picture	Biophysical picture valued low and zero flow events whereas social pictures devalued these  Biophysical picture valued high flows (floods) events whereas social picture devalued these  Biophysical picture valued flow variability and timing whereas these features were irrelevant and therefore absent from social picture
2. Water Quality	Prominent	Background	Turbidity presented itself as ‘murky’ or ‘gunge’ in the social picture	Biophysical picture valued pH, phosphorus and salinity levels whereas these features were

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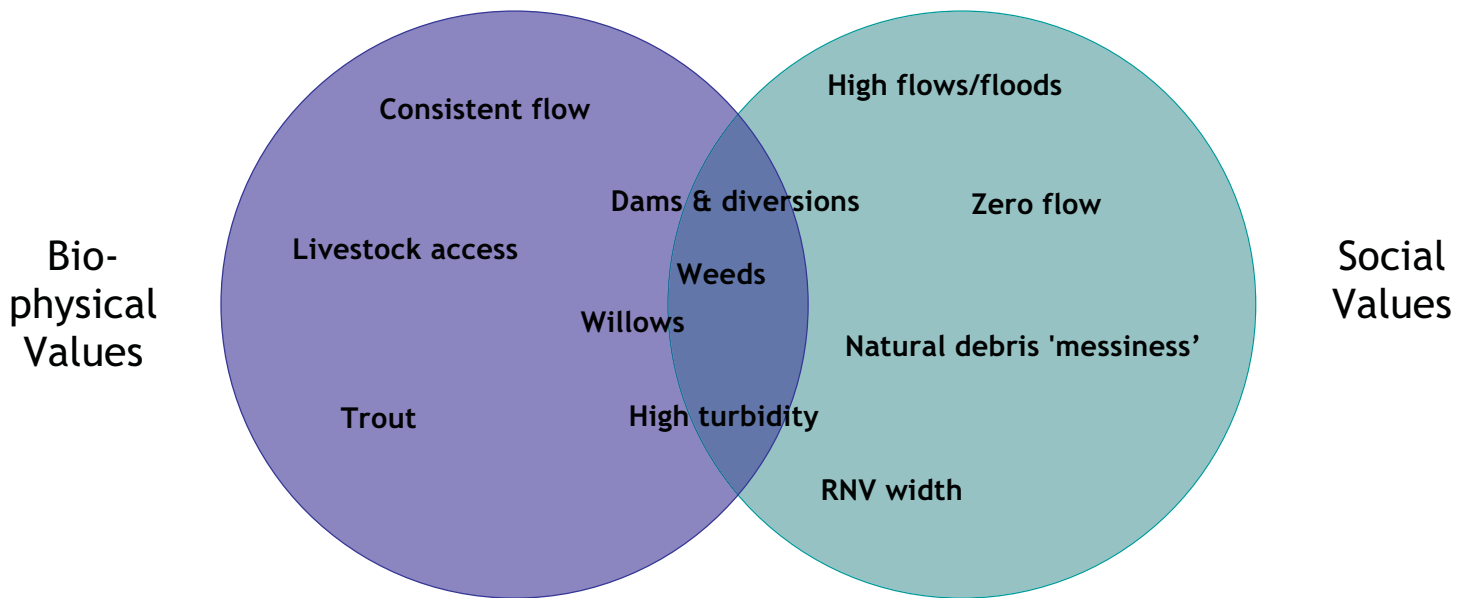
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Feature of Waterway Health	Depiction in:		Clear areas of overlap	Clear areas of difference
	Biophysical Picture	Social Picture		
			The drinking quality of the water, particularly for livestock in the social picture	absent from social picture
3. Streamside Zone	Prominent	Prominent	Low weediness  Overstorey  Full vegetative groundstorey in the biophysical picture only partially reflected as occasionally shrubby with maintained grassy areas in social picture	Remnant native vegetation not as highly valued in the social picture  Width of streamside vegetation not as highly valued in the social picture  Structure of vegetation and natural debris devalued in the social picture
4. Physical Form	Prominent	Vague	Streambank erosion	Biophysical picture values in-stream logs and fish passages whereas these features were irrelevant and therefore absent from social picture
5. Aquatic life	Prominent	Prominent	Frogs, Fish and Platypus	Biophysical picture values macro-invertebrates whereas the social picture largely ignores these  Social picture values terrestrial vertebrate wildlife particularly birds, whereas the biophysical picture largely ignores these
6. Weeds	Prominent	Prominent	Woody weeds especially the well-known 'noxious' species Gorse and Blackberry  Willows	There were differences in the rationale for weed removal between biophysical and social pictures. Biophysical data reflected eco-hydrological and biodiversity function whereas social data reflected views of and access to the creek. This showed selectivity for different plant forms and species being regarded as weedy.  Willows – some landholders regard them as valuable to creek health
7. Aesthetic appeal	Absent	Prominent	None	Social picture values a sensory creek and frontage whereas these features were irrelevant and therefore absent from biophysical picture
8. Personal Access	Absent	Prominent	None	Social picture values a personally accessible creek whereas these features were irrelevant and therefore absent from biophysical picture

**Diagram 1.** Venn Chart showing the positive values afforded to each of the social and biophysical pictures of creeks and frontages in the Maribyrnong Catchment.



**Diagram 2.** Venn Chart showing the negative values linked to each of the social and biophysical pictures of creeks and frontages in the Maribyrnong Catchment.



## **Conclusions and Implications for Management**

This research reflects this need to integrate this ‘social body’ of knowledge to the current ‘scientific problems and solutions’ approach to waterway restoration. The respective social and biophysical knowledge – its similarities and differences - must be better combined to guide restoration practices.

Some key revelations with regard to how such social knowledge may influence the future restoration management of waterways in Maribyrnong Catchment have been identified. Common knowledge and differentiated knowledge existed.

### *Common Ground*

Some social knowledge resonated with the biophysical knowledge. This common ground may be the best place to start this waterway health praxis.

### *The importance of streamside zone*

This is valued unequivocally, albeit for varying reasons. Landholders appreciate overstorey and ground cover and these are important aspects of streamside zone function.

### *Aquatic life as indicators*

The concept of life in the water being a starting point for river condition can be used to examine types of life and sensitivities to condition levels. Iconic wildlife like frogs and Platypuses are appreciated across all knowledge.

### *Weeds in general*

The general concept of weeds as an undesirable element influencing some function of the river is also appreciated. Specific issues are likely to arise shortly thereafter though with dichotomies based on which species, where and definitions of weed problems.

### *Landholder Knowledge*

This section discusses some of the areas that I consider to be ‘unalterable horizon of actions for landholders’. They are not readily compatible with biophysical science knowledge but they need to be somehow assimilated into restoration project planning and design.

### *Eco-visual functionality*

This research showed that landholders are driven by an aesthetic appreciation of their waterway. This needs to be recognized and incorporated into the restoration. This is likely to be a challenge since practices to manage for ecological sustainability and aesthetic can often be conflicting or incompatible. Creeks need be attractive and functional.

### *Accessibility*

Seeing the creek is significant for landholders. Kaplan and Kaplan (1989: p 9) claim that “water is a highly prized element in the landscape”. All landholders surveyed reflected this. Two things in particular facilitate this visual: openness and personal access. This practice is likely to be essential to landholders restoration

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planning and needs to be considered to reduce impacts on sensitive streambank zone functions. Design of revegetation, fencing and other works need to accommodate this desire.

### *The Domesticated Creek*

Landholders imagine a tame waterway; clear and clean enabling relaxing and peaceful relationships. Therefore this is what they practice, taming through 'tidying' long grass and other natural messiness. For some landholders there is fear of the nature of waterways. This will remain a driver of actions to mitigate flooding in particular.

### *Birds as indicators*

Landholders regard birds as positive indicators of creek health. Landholders acknowledge their birds. Where the biophysical knowledge reveals macroinvertebrate data landholders are more interested in birds.

### *Going with the flow*

Flowing water is an essential ingredient of waterway health in the minds of landholders. 'Get the water moving' is an oft spoken aim of restoration practice. Indeed flow regime has been described through this paper as a fundamental descriptor of stream hydrology and one of the ISC sub-indices.

### *Towards further research*

This research can be seen as a pilot study to identify key patterns of knowledge. More research is clearly possible. Certainly the four secondary themes briefly described as common threads of frontage reservation; erosion/vegetative ground cover; drinking quality water and willow tree retention are obvious points of further investigation.

Ways of transforming dialectical thought into conscious consistent and everyday restoration practice by all involved is an area that this research suggests is screaming out to be explored. Considering landholders as 'informants on river health' and allowing them to 'speak for themselves' are good places to start.

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