COLLABORATIVE SOLUTIONS FOR STORMWATER MANAGEMENT

Mark Newton (Cawthron Institute), Jim Sinner (Cawthron Institute), Annika Wagenhoff (Cawthron Institute), Jon Cunliffe (Marlborough District Council)

SUMMARY

The Murphys Creek Collaborative Stormwater project arose in response to mounting public opposition to a stormwater resource consent discharge proposal in an urban catchment in Blenheim. The project employed a people-centred, collaborative decision making approach to explore alternative solutions to stormwater infrastructure challenges. By bringing together a range of stakeholders and local iwi representatives to form the Murphys Creek Collaborative Stakeholder Group (MCCSG), the project worked through a structured decision making process to ultimately resolve the controversy, restore damaged council-community relationships, and arrive at a solution that carried the endorsement of all. This abstract provides an overview of the project, including the background and context in the leadup to the project's initiation, through to its conclusion. It is intended to be of interest to council stormwater planners, stormwater engineers, urban freshwater and social scientists, and anyone affected by or involved in stormwater management and decision making.

BACKGROUND

In mid-2013, residents of a Blenheim neighbourhood became concerned about a proposed greenfield development that would increase stormwater discharge to a highly valued local stream, Murphys Creek. The development would meet Blenheim's commercial expansion needs, and would provide employment and economic growth to the expanding regional centre. The stormwater the development would generate, however, needed to be managed, and Marlborough District Council (MDC) proposed piping it offsite for discharge into the nearby stream, Murphys Creek. To discharge into the stream, MDC would need to apply for a resource consent which would require consultation with the local community. Several attempts at consultation were made, but these were not well received—evident by residents' numerous submissions in opposition on MDC's Annual Planning process.

The issue became increasingly charged throughout 2014. Newspaper headlines reported that local residents were feeling 'left out of the loop' in discussions of solutions to the stormwater management challenge (Bell, 2014, Winter, 2014). The residents formed the Friends of Murphys Creek group, and counter-proposed an alternative solution to MDC's, but neither camps' proposed solution was acceptable to the other. Mounting tensions between the two parties suggested that a costly court case with a win-lose outcome was imminent.

In late 2014, MDC commissioned a Cawthron Institute report to clarify stakeholders' and iwi issues with, and values in relation to, MDC's proposed solution to the stormwater challenge. The report found a wide range of values and concerns, including flooding, water quality, sediment and weeds, future development uncertainties, stream bank erosion, and exacerbation of these issues by climate change, among others (Newton and Wagenhoff, 2015). One effect of these findings was to broaden the conversation about solutions to the challenge, which went from being of a purely engineering nature to

recognising that decision making processes and human values may hold the key to finding a workable solution. Given the issue's complexity, the breadth of values, and the multiple stakeholders and iwi affected by stormwater management, the report recommended a collaborative planning approach.

COLLABORATIVE PLANNING

Collaborative planning is a multi-stakeholder decision-making approach that, theoretically, can achieve joint learning, build capacity for problem-solving and adaptation, and generate more durable solutions that are accepted by the wider community (Innes and Booher, 2010). Collaborative planning is promoted as well suited to complex freshwater management issues (Scholz and Stiftel, 2005, Pahl-Wostl et al., 2008). A 2017 amendment to the Resource Management Act 1991 provides for collaborative freshwater planning as an alternative to a full consultation process. Collaborative freshwater planning is currently being trialled in Canterbury, Hawke's Bay, Northland, Tasman, Waikato, and Wellington.

THE MURPHYS CREEK COLLABORATIVE STORMWATER PROJECT

In early 2016, MDC adopted a collaborative planning process that sought to bring stakeholders and three local iwi (Ngati Rarua, Ngati Toa, and Rangitane) together to seek a consensus solution to the stormwater challenge, and ultimately make a recommendation to MDC. This particular collaborative planning project followed the Structured Decision Making (SDM) process. Structured Decision Making is 'the collaborative and facilitated application of multiple objective decision making and group deliberation methods to environmental management and public policy problems' (Gregory et al., 2012 p 6). The approach provides 'a comprehensive framework for identifying, understanding, assessing, and balancing values' (Sinner et al., 2014 p 60) and, as such, is an effective tool for implementation of the National Policy Statement for Freshwater Management. Structured Decision Making has also been used for collaborative freshwater planning in other parts of New Zealand, including in the TANK process in Hawke's Bay[1].

An external party (Cawthron Institute) was commissioned to convene and facilitate the SDM process. The Murphys Creek Collaborative Stakeholder Group (MCCSG) was formed, comprising local residents, business owners, iwi representatives, a developer, Marlborough Chamber of Commerce, and the Mayor of Blenheim. Whereas Murphys Creek stormwater management conversations had occurred almost exclusively between MDC and the local resdients until that time, the MCCSG comprised people with different perspectives and values into the conversation.

Over the course of the following year, the MCCSG worked through a collaborative decision making process that involved five workshops and a field trip (*Figure 1*). At Workshop 1, MCCSG members' values associated with stormwater in the Murphys Creek catchment were identified and documented. At Workshop 2, objectives relative to those values were defined. At workshop 3, an MDC stormwater engineer presented the full range of potential solution packages. Workshop 4 saw the presentation of the consequences table—'a summary matrix illustrating the performance of each on each objective '. Finally, in Workshop 5 the group considered each management option using the consequences table in order to make a recommendation to MDC. The following sections provide a detailed account of the SDM process.

[1] https://www.hbrc.govt.nz/hawkes-bay/projects/tank/about-tank/

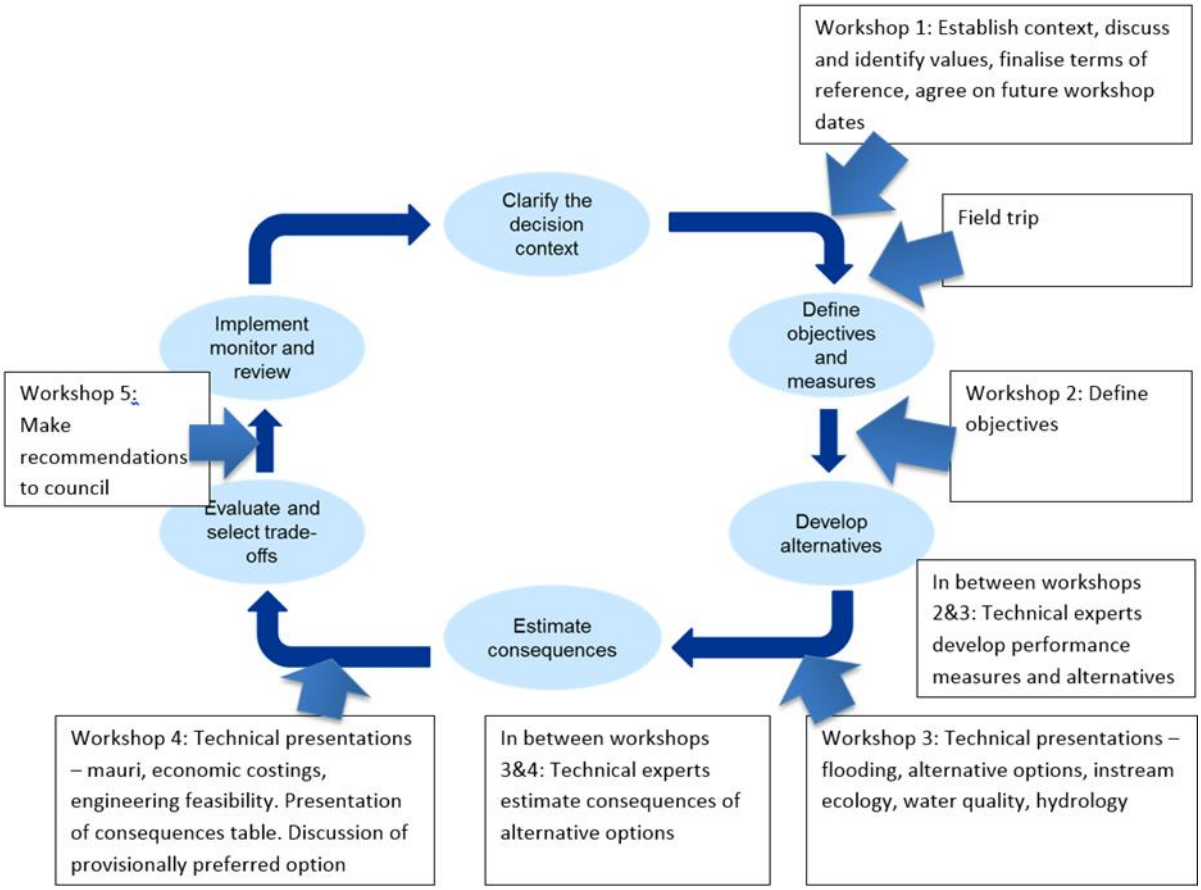

Figure 1 The process followed by the MCCSG, adapted from Gregory et al (2012).

Collaborative decision making takes time both in terms of the overall duration, as well as between workshops. Allowing enough time is essential in that it allows trust to develop, the commissioning of expert studies requested by the group, for the project support team to organise and plan each workshop, and for the full breadth of complex issues and concerns to be comprehensively hashed out. The project occurred over the course of 12 months:

- Workshop 1, 3 March 2016
- Fieldtrip, 22 March 2016
- Workshop 2, 20 April 2016
- Workshop 3, 15 June 2016
- Workshop 4, 14 December 2016
- Workshop 5, 8 March 2017

Throughout the process, MDC staff and other experts supported the process by attending workshops, answering questions, making presentations, and responding to the information requests of the MCCSG. In this way, the project progressed on the basis of 'science on tap, not on top'. Notable expert input included an instream ecological assessment, flood height modelling, economic costings, sediment analysis, development of alternative engineering solution packages, and engineering feasibility assessments. This input enabled the MCCSG's deliberations to occur, and the final recommendation to be arrived at, on the basis of best available scientific and expert information.

A key resource developed during the project was the consequences table, which assisted the group to weigh up the many tradeoffs of the decision to arrive at an informed and transparent decision. A consequences table is a summary matrix that illustrates the performance of each alternative solution on the group's values and objectives (Gregory et al., 2012). MDC stormwater engineers produced a suite of ten alternative solution packages, which included both the residents' and MDC's original proposals.

Table 1 The consequences table: an assessment of management options A through H++ against MCCSG values and objectives.

Value -->	Objective -->	Performance Measure	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E	OPTION F	OPTION G	OPTION H	OPTION H+	OPTION H++
			Existing Situation	Baseline Future	Partial Storage Mitigation	Existing Upgrades Forgone and Partial Storage Mitigation	Partial Storage and Diversion to Taylor Mitigation	As for E but with Aston Street Upgrade included	Full Storage and other Mitigation	Maximum (Flow) Mitigation	Maximum (Flow) Mitigation plus Treatment	Maximum (Flow) Mitigation plus Attenuation AND Treatment
Streambed	Reduce streambed sediment	Deposited sediment cover (% cover of streambed)	-	--	o	o	+	++	++	-	++	++
	Reduce presence of invasive species	Aquatic plant cover (% cover of streambed)										
Aesthetic value	Increase aesthetic value of Murphys Creek	Water clarity	-	--	-	-	++	++	++	o	++	++
		Number of times people observed recreating in stream										
		Amount of rubbish in stream										
Water Quality	Improve water quality	Temperature (°C)	-	--	-	-	++	++	++	--	++	++
		Dissolved Oxygen (mg/L)										
		Water clarity										
		Chemicals/pollutants/contaminants (number of spill incidents per year)										
		E. coli										
Stable stream banks	Reduce extent of bank erosion	Extent of bank erosion (meters)	-	--	-	-	o	o	+	++	++	++
Flood control	No increase in flood height/impacts of flooding	Peak flood height in lower Murphys Creek reaches (m above sea level)	o	--	-	-	-	o	+	+	++	++
		Amount of debris deposited on private properties after flood (X% of current)										
		Area of surface flooding in catchment (ha)										
Healthy ecosystem	Improve ecosystem health	Presence and number of trout, eel, and crayfish	-	--	-	-	++	++	++	--	++	++
		Invertebrate health (MCI score)										
		Habitat suitable for desired species (quality score)										
Mauri	"Te he mauri ora"; meaning life, wellbeing,	Mana	--	--	--	--	+	++	++	--	++	++
		Whakapapa										
		Whanaungatanga										
Economic factors	Sustainable development	% GDP growth	--	+	+	+	++	++	+	-	-	--
	Increase job opportunities for younger generation	Number of jobs										
Cost	Cost-effective and affordable stormwater solutions to council/ratepayers AND residents/businesses/developers in Murphys Creek catchment	Cost of solutions ($) to council/ratepayers residents/businesses/developers in Murphys Creek catchment	++	++	+	+	o	o	-	--	--	--
	Costed Option - Ref Davidson Group Report, updated for H++	Developer Cost PLUS MDC (Ratepayer) Cost					$2,907,000	$3,364,600	$3,817,100	$4,093,600	$5,823,200	$6,355,700
Recreation	Improve or enhance recreational opportunities in stream	Number of people undertaking recreational activity (fishing/eeling, swimming, tubing etc) in the creek per week	-	-	-	-	-	-	-	-	-	-
Ownership												

Key	Rating	Rating Explained
	--	Fails to meet Objective - dramatically
	-	Fails to meet Objective - slightly
	o	Meets Objective
	+	Meets Objective - slightly improves situation
	++	Meets Objective - dramatically improves situation

THE RECOMMENDATION

At the conclusion of Workshop 5 in March, 2017, the MCCSG arrived at a consensus recommendation that MDC manage stormwater in the catchment on the basis of an option that was developed during the workshop process. Each member of the group partook in a ceremonial signing of the recommendation (Figure 2), which was presented to MDC in April 2017. It was felt that signing their recommendation galvanized the group where they were had been at loggerheads until that earlier that workshop (Newton, 2017). Importantly, each member of the group acquiesced to agree upon this option.

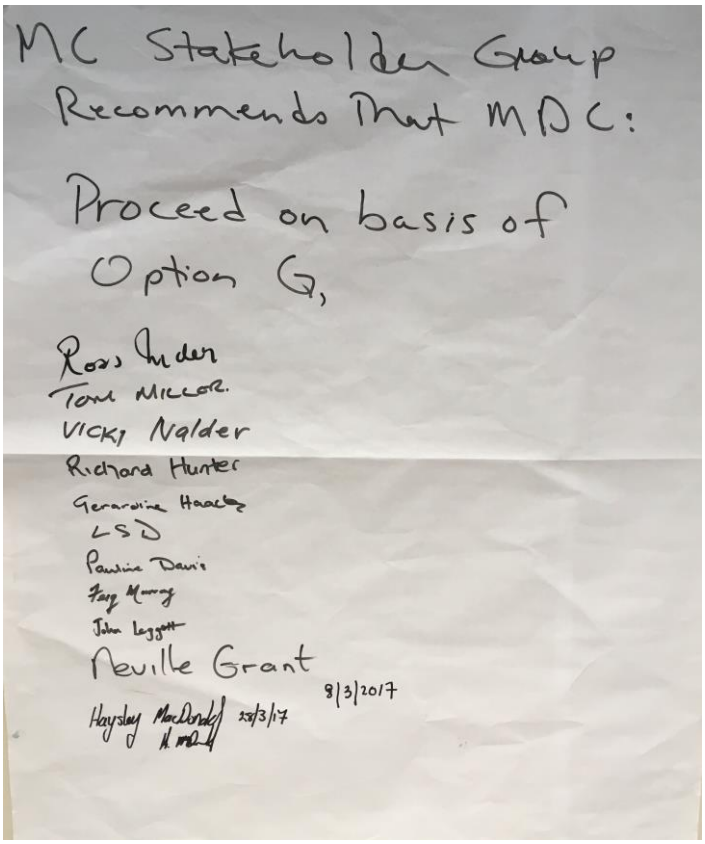

Figure 2 The MCCSG recommendation to MDC signed by eleven members of the group in March 2017.

Key features of this option (which became known as Option G) are:

- On land that has been rezoned for urban development, the allowable runoff from that land shall be 6 litres per second per hectare. This is equivalent to the stormwater that would run off the land if it were still in rural use.
- Stormwater outlets from properties in the commercial area east of the Murphys Creek culvert across Middle Renwick Road will be retrofitted with filter/treatment devices.
- Stormwater from these same commercial areas that currently discharge to Murphys Creek will be diverted to the Taylor River via the Pump Station just downstream of the High Street bridge over the Taylor River.
- A proprietary stormwater treatment device will be installed in the Aston Street area as part of the Murphys Road stormwater network upgrade. This will treat stormwater from that section of the catchment before it discharges to Murphys Creek.

The proposed solution improves, or does not detract from, most values relative to originally proposed solutions from the various stakeholders.

The MCCSG's recommendation was accepted by the MDC Stormwater Sub-Committee in April, 2017. If the recommendation is further pursued by MDC, and it is granted formal consent, implementation will likely occur sometime post-2019. As part of the MCCSG's terms of reference, the group has agreed to publicly support and defend the solution

through to implementation. This reduces the political risk for MDC, in that the multi-stakeholder nature of the group lends power to their advocacy.

Some aspects of Option G remained unresolved at the conclusion of the process. For example, who pays for the treatment of stormwater? Will it be the Council or user pays? What standard of treatment will be required?

OUTCOMES

Testomonies from MCCSG members and MDC staff indicate that the project led to repaired relationships, and increased trust, between the parties[2]. This offers the opportunity for further positive collaborations in the Murphys Creek catchment to improve the values of the MCCSG. Indeed, the catchment and stakeholders now form part of a bid to the Ministry of Business, Innovation, and Employment for further research on the collective management of diffuse freshwater pollutants.

KEYWORDS

Collaborative, freshwater, stormwater, planning, community, urban, values, water quality, flooding, conflict resolution, water management, infrastructure, Murphys Creek, Blenheim

REFERENCES

BELL, C. 2014. *Residents left 'out of loop' on creek* [Online]. Blenheim: Marlborough Express. Available: http://www.stuff.co.nz/marlborough-express/news/10117338/Residents-left-out-of-loop-on-creek [Accessed 24 May 2016].

GREGORY, R., FAILING, L., HARSTONE, M., LONG, G., MCDANIELS, T. & OHLSON, D. 2012. *Structured Decision Making: A Practical Guide to Environmental Management Choices,* Chichester, West Sussex, UK, Wiley-Blackwell.

INNES, J. E. & BOOHER, D. E. 2010. *Planning with complexity: an introduction to collaborative rationality for public policy*, Taylor & Francis.

NEWTON, M. 2017. Murphys Creek collaborative stormwater management project. Prepared for Marlborough District Council. Cawthron Report No. 2868. 37 p. plus appendices. .

NEWTON, M. & WAGENHOFF, A. 2015. Stormwater management in the Murphys Creek catchment: Stakeholder perspectives and information stocktake. Prepared for Marlborough District Council. Cawthron Report No. 2735. 28p. plus appedix. .

PAHL-WOSTL, C., TÀBARA, D., BOUWEN, R., CRAPS, M., DEWULF, A., MOSTERT, E., RIDDER, D. & TAILLIEU, T. 2008. The importance of social learning and culture for sustainable water management. *Ecological Economics*, 64**,** 484-495.

SCHOLZ, J. T. & STIFTEL, B. 2005. *Adaptive governance and water conflict: new institutions for collaborative planning*, RFF Press.

SINNER, J., GREENHALGH, S., BERKETT, N. & SHARP, T. 2014. Structured Decision Making for Collaborative Planning. Policy Brief No. 9. Landcare Research.

WINTER, C. 2014. *Residents fight to protect creek* [Online]. Blenheim: Marlborough Express. Available: http://www.stuff.co.nz/marlborough-express/news/10083823/Residents-fight-to-protect-creek [Accessed May 24 2016].

[2] For example, see https://vimeo.com/214937013