

**Motueka Integrated Catchment Management (ICM) Research Programme
Community Reference Group minutes: 18 June 2003
7.30pm at TDC Meeting Room**

CRG Members Present: Gloria Higgins, Lloyd Faulkner, Guthrie Beatson, Elizabeth Martin, Jan Langford, Geoff Rowling, Alastair Webber, Mick Park, Will Allen, Roger Young, Paul Gillespie, Andrew Fenemor

Guests: Les Basher (Landcare Research, Lincoln), Chris Phillips (Landcare Research, Lincoln), Maggie Atkinson (ICM Arts & Science project), Eric Verstappen (TDC Rivers Scientist), Hugh Blake-Manson (TDC Rivers Engineer)

Apologies: None

Welcome

Andrew welcomed Alastair and Mick as new CRG members. Alastair Webber runs a fishing lodge at the junction of the Baton and Motueka rivers. Mick works with the Te Awhina marae at Motueka and with Te Ati Awa Iwi Trust. Everyone introduced themselves briefly.

River Gravel Research Presentation

Les presented research carried out by Sarina Sriboonlue and himself, assisted by Eric Verstappen, on *Trends in River Bed Level and Gravel Storage in the Motueka River 1957-2001: Results from Analysis of River Cross Section Data from the Upper and Lower Motueka River*. The analysis covered up to 30 resurveyed river cross-sections over 19km of the upper Motueka River above the Wangapeka, and up to 52 cross sections over 13km of the lower Motueka below Alexander Bluffs Bridge. Les concluded that overall riverbed levels in both reaches of the river have lowered over the past 40 years. However the changes over time are very dynamic and gravel extractions don't closely match gravel storage changes. In the upper Motueka, the average bed level lowering between 1960 and 2000 was 0.20m, corresponding to a loss of 715000 cubic metres or 17900 m³/year. In the lower Motueka, the average bed level lowering between 1957 and 2001 was 0.64m or a loss of 1,113,000 m³ which equals 25300 m³/year.

Mick asked whether downriver GPS methods would give more information than cross section surveys. Les said 2-dimensional mapping of riverbeds has been trialled in the Waimakariri River but is expensive. Jan queried how much berm area is included in the calculated mean bed level, and observed that pine trees planted close to upper Motueka riverbanks made the banks unstable and collapsed into the river during the big flood in 1994. Eric and Les said that a narrower Active Channel Width could improve the accuracy of the cross-section method by reducing the amount of berm area included.

Gloria queried whether all riverbeds are naturally degrading and asked how much lowering is natural. Les explained that not all rivers are degrading, for example the Waimak is building up in its lower reaches. The Motueka is degrading because there is much less sediment supply, and extraction contributes to the bed lowering too. Lloyd observed that with few big floods recently, there is no gravel loss off the river beaches, even if they have been manually cleared of vegetation. Guthrie said the huge 1877 flood was reported to have raised the riverbed at the Motueka rivermouth by about 10 feet, and previously they used to ship potatoes out on boats from the rivermouth.

Alastair asked why gravel loss doesn't match extraction, and how accurate are the extraction figures. Les said that gravel is moved during floods and it's not clear how much is moving through the system

or how fast. Chris explained that if more gravel is extracted, yet erosion rates mean the supply into the rivers is lower, the river will compensate by taking gravel from storage in its bed and banks, leading to bed instability. Eric observed that where gravel has been taken is where the Council ends up spending more money on riverbank protection works, e.g. at Tapawera Bridge.

Jan wondered whether adjacent land use affects gravel movement. The effect is limited except where land use is directly affecting riverbanks. Alastair asked whether the results provided guidance on how much gravel should be extracted. Eric confirmed that information like this guides how gravel is currently allocated. Les said the data indicates we should be cautious about extracting gravel. An interesting question is how much gravel would arrive at the coast if there were no extraction. Geoff observed that the fluctuating bed levels show just how variable a river can be.

Paul asked whether degradation could change the character and aquatic habitat in the river. Les did not expect any significant change, and Roger said that even if you ended up with, say, shallower areas, there are aquatic life forms suited to all types of conditions. Will asked what pressures exist for gravel extraction. There are plenty, especially for roading maintenance and commercial gravel sales. Eric commented that gravel extraction can benefit flood control by increasing channel capacity but can also destabilise banks.

Alastair said the middle Motueka reach is missing, yet is surely important. There is a lot of gravel being taken there at present for gravelling the West Bank Road. Eric explained the gravel allocation system operated by the Council and the extractions allowed under the Council's general consent for up to 40000 m³/year to be extracted across the region, subject to many conditions. Andrew said he thought the research question guiding gravel allocation needs to be broader, integrating local river protection needs with degradation trends. Eric said as an example that scalping beaches but leaving the scalped gravel in the system is an example of that. Lloyd said one problem with that is complaints about dirty water. Andrew said that even though gravel is extracted from dry beaches, it opens up fine sediment buried below the armouring layer and this gets flushed down with the next fresh, potentially affecting aquatic habitat.

Andrew asked community members for their observations about whether these results correlate with their own observations. Lloyd observed that the old rail bridge piles at Tapawera Bridge were cut off at beach level and now some are buried under half a metre of gravel. Gloria believes cross-sections don't tell the whole story and agreed the management perspective needs to be broadened. The data doesn't show what's coming into the system, only what's going out. After 14 years on their farm at Norths Bridge, they haven't seen the big dirty floods reported by their predecessors. Lloyd agreed the river doesn't flip-flop the way it used to, but having been constrained by the river managers, farming on its banks is much easier now.

Liz commented how the river seemed more unstable where gravel extractions happen in the lower river. Guthrie observed that 40 years is a short time in the scale of changes in rivers. He mentioned a slug of gravel discharged from the Pokororo into the Motueka in the 1974 flood which has only moved about 1.5km downstream since then. Liz mentioned a suicide off the end of Whakarewa St where the person drove off the end of Whakarewa St and drowned – today you would land on a gravel beach. Much of the sediment input in the Upper Motueka is from the weathered Moutere Gravel terrain so it gets ground up in the river. Lloyd mentioned that to get gravel suitable for concrete from below the Motupiko (a Moutere Gravel catchment) you have to go to Tapawera Bridge before the fines have been washed away, and it's again no good below the Tadmor junction.

AGM Planning

To conclude the meeting, Andrew mentioned that our next meeting is likely to be the ICM AGM which is held usually around October. He suggested a field trip with poster displays rather than the static day of presentations which don't attract many community people. There seemed general support for the idea, although Lloyd said September was lambing time. Equally his preference of March is apple picking time, and it suits the research calendar to have it soon after 30 June when many results have been written up.

Meeting concluded at 9.40pm with thanks to Les Basher for his presentation.

Responses to Dr Les Basher's River Gravel presentation to TDC's Environment and Planning Committee, Thursday 19 June:

Cr Tony Fry – as a 60 year resident of the Motueka Plains, he observed that the stopbanks may be too narrow and contribute to riverbed deepening especially between Stephen Beach and Bluegum Corner. The cut put through the river delta also contributes. He mentioned that groundwater levels have fallen with riverbed levels from about 6' to around 20' now.

Cr Tim King – air photo analysis should be done to check what happens between river cross-sections. He mentioned the downcutting within the water channel as the beaches and banks are so resistant. He clarified that gravel extraction figures are all from within the Active Channel used in the calculations.

Mayor Hurley thinks major floods are the drivers of gravel movement and extraction is an insignificant influence on degradation. Les disagreed and pointed out that extraction is a large percentage of gravel volume loss from both the upper and lower Motueka.

Cr Ted O'Regan asked how much sediment discharges as silt. Les said he'd expect gravel to comprise about 10% of the total sediment load discharged from the river.

Cr John Rogers agreed we need to check the effects of floods.

Cr Kempthorne said the results indicate to him TDC needs to focus extraction on the berms and from land-based sources. He agreed we should relate past works programmes to extractions to see whether large extractions are costing more in river protection works in localised areas.

Cr O'Regan asked about using GPS to measure bed level change. Les said a method called laser altimetry has been used in the Waimakariri but costs \$10s-100k. He suggest continuing with cross-sections with aerial photos.

Cr Trevor Norris mentioned a photo of a stocktruck driving under the Tapawera Bridge and said you couldn't do that now (note the original rail bridge was replaced some 20 years ago).

Cr King said TDC needs to respond to localised bank erosion issues after floods so there needs to be sufficient flexibility to do this. Les said the results tell him TDC should be cautious with its gravel allocations. Eric said that moving gravel away from pressure points rather than removing it is a compromise.

Golden Bay Community Board member Joe Bell suggested harvesting gravel from the lowest reaches of the river before it is lost to sea, unless the discharge to the coast is important for coastal stability, which Les and Eric agreed has yet to be proved.

Lloyd Faulkner wondered whether the practice of using large rock for bank protection is creating turbulence which exacerbates bank instability.

Andrew Fenemor concluded by saying Les was able if needed to discuss these independent results with gravel aggregate users and others. He suggested that to progress the research recommendations, a partnership financial contribution should be considered by Council. The Committee decided to adopt the recommendations but they would have to be addressed within the current 03/04 budget or whenever funds permit.