PHOSPHORUS MITIGATION PROJECT: FARM BASED MANAGEMENT OF STORMWATER WITH DETAINMENT BUNDS FOR REDUCING PEAK FLOW AND IMPROVING WATER QUALITY

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High intensity rainfall can result in storm water run-off that raises nearby stream discharge. Peak flows from storm events can overwhelm the potential for stream conveyance (resulting in flooding) and channel stability (resulting in erosion). This increases risks to homes, businesses, infrastructure, and communities. Storm water events also contribute disproportionately to runoff-derived contaminants in receiving environments, principally sediment and phosphorus resulting in degraded water quality.

A key means of mitigating storm-water risks, is the detention and delay or reduction via infiltration, of runoff contributing to stream peak flow. Such approaches are common to urban environments with greater extent of impervious surfaces and more rainfall contributing to runoff. Until recently, storm water interception at source on farmland has been deemed impractical and instead, flood mitigation has been targeted to the at-risk lowland floodplains (e.g., flood embankment networks, pumping stations and impounding areas).

A Sustainable Farming Fund initiative called the "Phosphorus Mitigation Project" has resulted in research into "Detainment Bunds" (DBs) for interception and reduction of storm-water contaminant loads. This project has also raised the potential for other co-benefits from DBs including, flood mitigation through effective interception of storm water runoff *at source* mainly on productive pastoral farmland.

Targeted uptake of DBs might support both water quality and flood management objectives, better enabling integrated water management under the National Policy Statement for Freshwater Management and a source-to-sea contaminant approach.

We present an example of catchment-scale adoption on the Whakapounakau Aggregated Lands Trust property where 20 DB's will service 400 Ha of mixed land use for storm water run-off treatment and flood protection. We describe the use of high-resolution LiDAR for selecting optimal DB sites on-farm and development of a GIS tool to broadly assess the suitability of large catchments for Detainment Bund uptake.

Editor's Note: An extended manuscript has not been submitted for this presentation.