

Spatially mapping areas of water convergence to guide mitigation of farm contaminants in the Waituna Catchment

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Overland flow is cited as a key pathway for land based contamination to waterways in New Zealand and other parts around the world (McDowell, 2006; Deakin et al., 2016). However, ephemeral overland flow pathways generally converge before they reach a significant surface waterway or recharge groundwater. If mapped, the enhanced knowledge of these drainage pathways and areas of convergence across the landscape would assist regional councils and farmers to identify and prioritise where nutrient run-off could most effectively be mitigated for water quality improvement. This project evaluates whether Convergent Zone Mapping can be developed reliably through integrating existing information (high resolution Digital Elevation Models (DEMs), the River Environment Classification, soil data) to provide a hierarchy of place based priorities for applying mitigation strategies. The evaluation was carried out using the Land Use Capability Indicator (LUCI) modelling tool in the Waituna catchment in the Southland region of New Zealand. The LUCI tool was augmented to produce additional outputs that target zones of high accumulation of water, sediment and/or nutrients and Strahler stream networks and individual stream reaches of sub-catchments. Areas of water convergence were identified to be widespread around the Waituna catchment. However, at large scale, priority should be placed where the cumulative flow is high, and this coincides with the fifth Strahler order. At farm scale priority should focus on all areas of flow convergence. Low-lying areas where there was no water convergence are mostly covered by forest land cover types or are intercepted by these land cover types which mitigate overland flow.