3

Measuring and modelling the impacts of land use on ecological river condition

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SUMMARY

This project aimed to understand the influence of land use and land management on the ecological condition ('health') of Tasmanian rivers at local and catchment scales. The five project phases were developing a conceptual model linking land use and other drivers to ecosystem responses, finding evidence to support model parameterisation, constructing a simplified river health model for communication purposes; developing a Bayesian Belief Network (BBN) from the full conceptual model using both expert elicitation and local evidence, and evaluation of the BBN and modelling of management scenarios. A significant finding was a disturbance threshold associated with the area of a catchment upstream of a sampling point classed as 'grazing land', characterised by a change in algal-driven river metabolism and river macroinvertebrate communities. Understanding the spatial scales (site, reach, catchment) at which key drivers of ecological responses operated (e.g. riparian condition, sediment input) was also important. Project outcomes were incorporated into a decision support system containing the BBN, and into fact-sheets describing river health impacts of land use and management scenarios. Key lessons included the importance of a conceptual framework throughout the project, identifying relative inferential strength when integrating evidence for