

RESEARCH

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## CATCHMENT TO REEF JOINT RESEARCH PROGRAM

### Task 4: Frameworks for integrated catchment management

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Integrated catchment management is a major goal of natural resources management in the Wet Tropics bioregion, where many forms of land and water use co-occur. Within sub-catchments there are usually several disparate forms of land use, tenure, protection, and disturbance.

Managing the quantity and quality of riparian and catchment forest cover within such landscapes has been linked to outcomes of improved water quality and river health, maintenance of water quality in estuaries and the GBR Lagoon, and many terrestrial processes including biodiversity and microclimate regulation. Hence, the restoration of riparian vegetation cover is increasingly advocated as a key component of regional natural resource management. However, forest restoration is costly (around \$20,000/ha), so it is important that restoration efforts optimise environmental benefits and are monitored to test achievement of water quality and environmental goals.

Rivers are characterised by longitudinal, lateral and surface to groundwater linkages, set in a matrix of spatial and temporal variability, which includes the effects of varying intensities of deforestation and land-use, often differing across catchments, as well as extreme hydrological variation due to the generally very high, but seasonal, rainfall. Complex interactions among these factors must be considered in planning for development, conservation and rehabilitation. Frameworks that achieve integrated management are rare, and there is presently no clear set of guidelines on what might constitute "best practice" in integrated catchment management in the Wet Tropics. Major issues are usually considered individually as isolated programs of research or action (e.g. riparian restoration, water quality management, environmental flows) and outcomes for a catchment may be fragmented and inadequate to protect the component ecosystems.