

Post Flood Event Rehabilitation of Wilsons River Catchment, Lismore NSW

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ABSTRACT

Wilsons River is a perennial, passively meandering, fine grained watercourse located in Lismore, NSW Australia. The river primarily adjusts through meander cutoffs, instantaneous avulsion, and headcut migration through primary channels (driven by other river adjustments) and highly sensitive gully tributaries. High levels of sediment are efficiently sourced from surrounding gully tributaries transferring suspended load through the system. As a result of the 2022 Lismore/Richmond Catchment floods the system experienced widespread degradation, forcing many reaches into a state of 'arrested degradation'.

The Wilsons River Reach Program is an initiative championed by Rous County Council (RCC). The program was primarily developed to manage threats to ecological integrity and water quality within the Wilsons River through targeted river reach-based management. These are long term strategies that aim to continually improve water quality within the Wilsons River and surrounding catchment areas by improving riparian vegetation and reducing impact from land use changes and catchment land degradation.

As part of the program and in response to several flood events, including the 2022 Lismore/Richmond Catchment flood event, a catchment wide geomorphological appraisal of historical and contemporary river character, pattern and behaviour was conducted to determine key processes driving continued degradation and factors preventing the system from entering a stage of recovery. A top-down approach was adopted, first identifying catchment scale processes, and assessing condition before selecting appropriate reaches for detailed geomorphic investigation and development of property based 'Site Action Plans'.

Multiple processes driving degradation were identified throughout the Wilsons River catchment, stemming from the legacy and continued effects of post settlement land clearance. This included low resistance to hillslope and gully erosion processes due to poorly vegetated upland sub-catchments, channelisation/drainage of historically swampy floodplain/valley fill, exacerbated bank erosion due to poor riparian condition, low connection to vertically accreted floodplains through excessive incision, headward translation of knickpoints in response to bed incision, and lack of instream woody debris.

Three adjacent properties were identified for the development of 'Site Action Plans' aimed at providing geomorphologically effective, low-cost, nature-based solutions to improve geomorphic condition across the catchment. Principles of recovery included increasing floodplain connectivity, implementing strategic riparian planting strategies, increasing the resilience of the river to erosion and rapid adjustment, and targeting knickpoint translation through highly sensitive gully tributaries.

REFERENCES

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