

Indicator 4.1b: Management of the risk of soil erosion in forests (2025)



This indicator assesses the extent to which the risk of soil erosion has been explicitly identified and addressed in forest management. The avoidance of soil erosion reflects the extent to which associated values, including soil fertility and water quality, are protected.

Supporting information for Indicator 4.1b: Management of the risk of soil erosion in forests

Case study 4.1b-1: Research designed to increase the knowledge base on soil erosion in New South Wales

'Paired catchment' studies detect the effects of wood harvesting and other disturbances by comparing stream flow and soil erosion in adjacent, similar, disturbed and undisturbed catchments. In one such study, the Forestry Corporation of New South Wales researchers have monitored eight headwater catchments of the Karuah River in the Chichester State Forest since 1974. The catchments, which range from 15 to 100 hectares, were originally predominantly undisturbed tall eucalypt forest from 100 to over 500 years since disturbance, and with little evidence of fire. Weirs were installed at the outlet to each catchment so that stream flow and sediment carried in the streams could be measured.



Stream flow and sediment monitoring weir, Karuah catchment research, NSW.

After an initial period of monitoring to establish a baseline of stream flow and water quality, in 1983 a total of six catchments were subjected to various levels of wood harvesting, plantation establishment, road construction and other disturbance, while two were left undisturbed as controls. Erosion rates ranged from 0.47 to 1.40 tonnes of sediment per hectare per year ($t\ ha\ yr^{-1}$). There was no difference in sediment loads from the harvested and control catchments. The researchers concluded that harvesting in native forests followed by regeneration using best management practices does not cause significant soil

erosion or reduce water quality in the medium-term to long-term (Hancock et al. 2017). Another paired catchment study in the Kangaroo River State Forest, New South Wales conducted between 2001 and 2009 showed similar results (Webb et al. 2012).

In a study of the effects of selective timber harvesting within buffer strips along headwater channels using best management practices in intensively harvested catchments on the south coast of New South Wales, Walsh et al. (2020) reported erosion rates of 0.11 ± 0.07 t ha yr⁻¹ in the harvested catchments. Whilst these erosion rates were greater than the erosion rate recorded in the control catchment (0.034 t ha yr⁻¹), it was still less than the sustainable erosion rate of 0.2 t ha yr⁻¹ recommended by Bui et al. (2010) for Australia, and largely in balance with regional soil production rate estimates (Walsh et al., 2020). These researchers concluded that the implementation of best management practices in the selectively harvested buffer strips along the headwater channels, and in the adjacent general harvest areas were effective in maintaining the water quality status in an intensively harvested eucalypt forest. A 2020 report commissioned by the New South Wales Natural Resources Commission also concluded that there is strong evidence that with best management practices, the effect of harvesting activities on sediment delivery to streams can be effectively managed (Alluvium 2020).

References

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More information

Learn more about the [Criterion 4 of Australia's State of the Forests Report](#).

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Acknowledgement of Country

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