

**Client:** Hornsby Shire Council

**Year:** 2014

**Project Reference:** 2013069

**WRL Technical Report:** [Riverbank Vulnerability Assessment using a Decision Support System: Lower Hawkesbury River \(Wisemans Ferry to Spencer\) \(2014/04\)](#)

Human activities pose a potential threat to estuarine habitats in the lower Hawkesbury River (NSW), particularly on riverbank sections comprised of soft, erodible materials. WRL, working in partnership with [Hornsby Shire Council](#), undertook a detailed riverbank vulnerability assessment of a 29 km section of the Hawkesbury River between Wisemans Ferry and Spencer.

This project was primarily undertaken to provide a new baseline for evidence-based management of riverbank erosion for Hornsby Shire Council. A Decision Support System (DSS) designed by WRL was used to objectively assess and rank the riverbank's susceptibility to erode (Figure 1) based on various environmental factors. The study included a boat-based field campaign to inspect the left and right riverbanks at a total of 348 sites over four days. Specifically, the DSS assessed:

- The current condition of the riverbanks using a robust and repeatable ranking system;
- The effect of natural wind waves and boat wake waves and other contributing causes to riverbank erosion along key reaches of the lower Hawkesbury River;
- The vulnerability of the riverbanks to erosion; and
- Potential management actions that can best address erosion at key sites.

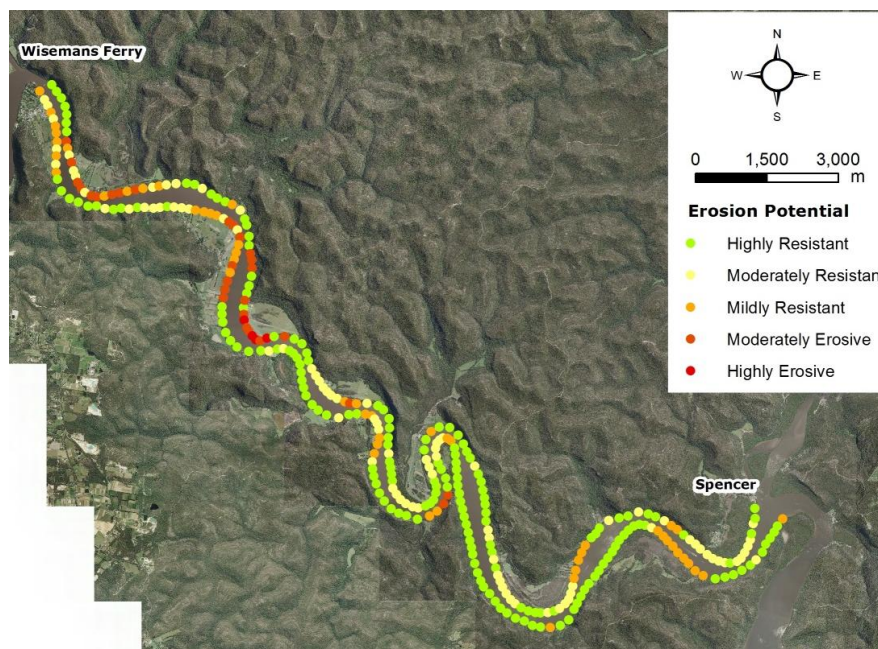
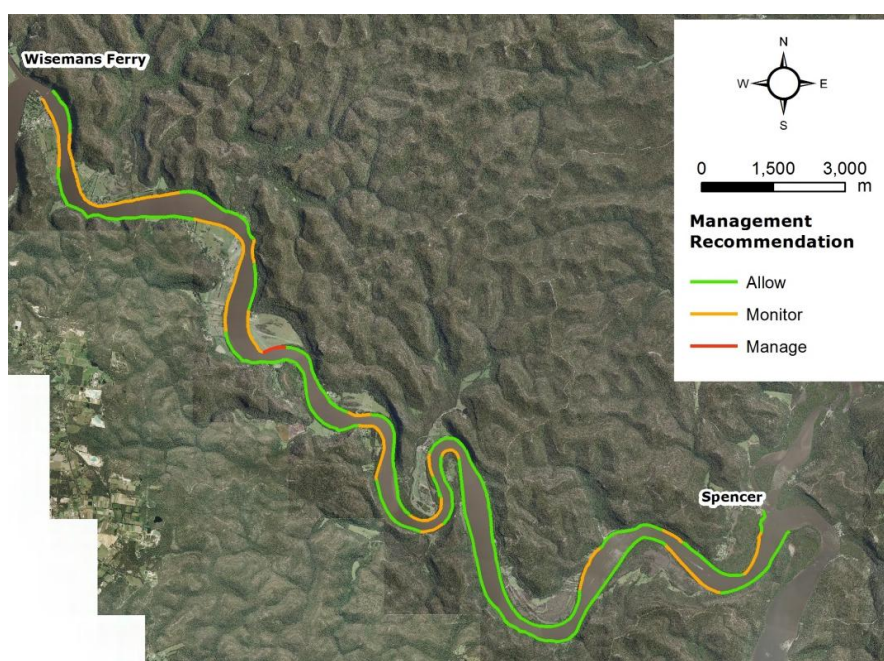


Figure 1: DSS erosion potential

In broad terms, the riverbank's vulnerability in this stretch of the Hawkesbury River (Figure 2) is comparatively low due to several reasons:

1. Natural rock armouring is present along approximately 25% of the riverbanks in the study area (Figure 3a).
2. A significant extent of both the left and right riverbanks is also managed by the NSW National Parks and Wildlife Service. As such, grazing hard hoofed stock is generally absent and native riparian vegetation, particularly mangroves, remains intact.
3. Boat numbers are relatively low in this stretch of the Hawkesbury River, in part due to the absence of public boat ramps between Wisemans Ferry and Spencer.
4. Finally, the lack of inappropriate development along the riverbanks is also a positive factor contributing to its low vulnerability.



**Figure 2: DSS management recommendations**

Several onsite management techniques to improve erosion resistance were recommended for the most vulnerable riverbank sections in the study area (Figure 3b). These included stock access restrictions, planting native riparian vegetation and deploying marker buoys in the river to prevent boats passing too close to the riverbank.



**Figure 3: (a) low vulnerability site – riverbank with natural rock armouring; (b) high vulnerability site – erodible riverbank without native vegetation and stock present**

This study was jointly funded by Hornsby Shire Council and the [NSW Office of Environment and Heritage](#).