# Productive Grazing, Healthy Rivers

## Module 5: Riparian condition and land-use practices: A survey of riparian health and condition on dairy farms

L. Thompson

### Why assess riparian condition?

Intensive grazing reduces environmental quality through the degradation of riparian land, loss of vegetation and biodiversity, and reduced water quality. However, after a detailed review, there was little information available on the current condition of riparian areas in the Gippsland region, nor was there specific information available to dairy farmers in Gippsland regarding best management practices for their riparian land. This lack of information was recognised by the dairy industry as an impediment to successful management of riparian areas.

### What did we do?

The specific aims of this module were to: (1) determine the current condition of riparian habitats across the west and south Gippsland dairy region, (2) to investigate the relationships between landholder management practices and riparian condition, and (3) to make recommendations for management practices that could be investigated at demonstration sites planned for the region.

### Status of this Module

*Completed*

This module commenced in April 2002 and concluded a year later in 2003. This module received funding from DPI, GippsDairy, Dairy Australia and Land and Water Australia. The research activities were developed by research staff at the Johnstone Centre, Charles Sturt University, Wagga Wagga, and were undertaken in conjunction with Productive Grazing, Healthy Rivers project team members. The results reported here have been statistically analysed. A report was prepared which can be accessed via the project website. The project findings were presented at a Field Day held in South Gippsland in April 2003.

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### How?

*Ecological condition and rapid appraisal*

A rapid appraisal index of riparian condition[1] developed in previous studies on the impacts of cattle on riparian habitats was modified for use in the Gippsland dairy region. A total of 107 riparian sites on Gippsland dairy farms were surveyed using this rapid appraisal index. The scoring of variables in the index was based on surveys of seven reference sites in the Gippsland region. Sampling of sites was stratified according to the Gippsland bioregions in this study (Gippsland Plain and Strzelecki Ranges) and the broad management categories for riparian habitats encountered in the region (grazed, planted after fencing, fenced remnants of riparian vegetation).

PROPERTY ID SITE ID

**Riparian Habitat Condition Score Sheet**

Site:
Phone: Date:
Creek name: EVC:
Observer: Northing:
Cowpat count: Easting:
Slope range: Bed Composition:
Comments:

**Longitudinal continuity** of riparian overstorey vegetation (2-5m canopy width)
Score

**0** = <30% vegetated bank, **1** = 30-49%, **2** = 50-69%, **3** = 70-94%, **4** = >95%
(mark exotic sections)

**Width** of riparian vegetation

| Measurement | Channel Width (m) | Vegetation Width (m) |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

**Vegetation cover** Upper Canopy >20m, Sub Canopy>5m, Understorey 1-5m, Ground cover (GC) <1m

| Transect | Upper Canopy | % Native | Sub Canopy | % Native | Understorey | % Native | GC | % Native | # Layers |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |

Cover: **0** = absent, **1** = 1-25%, **2** = 26-50%, **3** = 51-75%, **4** = >75%
% Native: **0** = none, **1** = 1-25%, **2** = 26-50 %, **3** = 51-75%, **4** = >75%

**Debris**

| Transect | Leaf litter | % Native | Snags | Coarse Woody Debris | % Native |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |

Riparian condition score sheet

*Landholder interviews*

Twenty-eight individual farmers were interviewed in relation to their on-farm management practices. Participants were chosen randomly with all farmers answering the same questions that had been set prior to the interview being conducted. Interview questions pertained to both past and present on-farm management practices and did not include any questions relating to social aspects of riparian management (such as, farmer perceptions of riparian areas, why they are important, why restoration has or hasn't been attempted).

### What did we find?

*Ecological condition and rapid appraisal*

The riparian sites on Gippsland dairy farms in 'best' condition were in patches of fenced remnant riparian forest. However, even sites located in remnants did not receive maximum condition index scores owing to the abundance of weeds, the lack of vegetation complexity and only small amounts of organic debris (relative to reference site conditions). The relationship between condition index scores and the width of remnant patches of riparian vegetation indicated that scores approached excellent for widths between 30 and 40 metres. This relationship needs to be considered with caution as the maximum score recorded in the remnants was only 33.25 out of a possible 40. However this information is useful in guiding the design of rehabilitation works.

Remnant riparian sites on Gippsland dairy farms

[1] Jansen and Robertson, 2001. Relationships between livestock management and the ecological condition of riparian habitats along an Australian floodplain river. *Journal of Applied Ecology*, **38**:63-75.

With the exception of sites in patches of remnant vegetation, most riparian sites on dairy farms across south and west Gippsland were in very poor condition (Figure 10), with the severity of degradation similar in the flat terrain of the Gippsland Plain and hilly terrain of the Strzelecki Ranges.



Grazed riparian sites on Gippsland dairy farms.

Grazed sites where livestock had direct access to streams and associated riparian habitats received very low condition scores. Riparian sites that had been fenced off and replanted received relatively low condition index scores. Generally, this reflected the fact that rehabilitation of these sites was recent and at most sites only canopy-forming species were planted (i.e. no understorey). When planted sites of different ages were compared, the results showed that sites fenced and replanted for more than 16 years approached excellent condition.

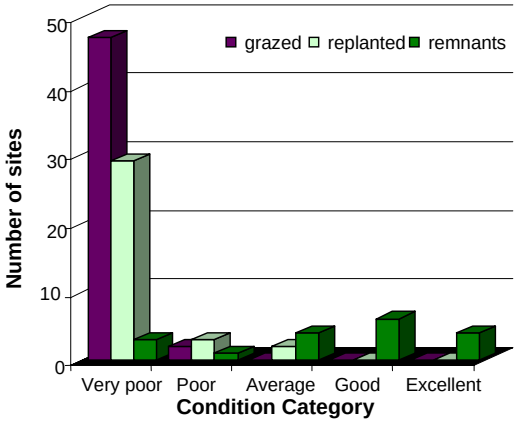


Figure 10. Comparison of the condition score (< 25 Very poor, 25–30 Poor, 30–35 Average, 35–40 Good and > 40 Excellent) for grazed, replanted and

*Landholder interviews*

The majority of farmers interviewed had some portion of their riparian areas fenced from stock, although most paddocks that contained riparian habitat were generally managed in the same way as other paddocks. The exception was when farmers removed stock from very wet paddocks.

Sixty percent of farmers interviewed had ponds to hold milking shed effluent and more than two-thirds of farmers used this effluent to irrigate pastures. Nearly a third of farmers interviewed either allowed effluent to move directly on to pastures from the dairy shed or had no effluent management system. All farmers interviewed used some form of fertiliser to increase production on paddocks adjacent to waterways.

Nearly three-quarters of farmers interviewed indicated that fencing of riparian areas resulted in a significant time saving in stock management, and that fencing and other new resource management initiatives focused on the riparian zone were generally (84% of those interviewed) seen to be positive in terms of cost effectiveness.

*Dairy farm management and riparian condition*

For farms that had accurate information on annual stocking rates, it was clear that no relationship existed between stocking rates and the condition index score for riparian sites subject to livestock grazing.

There was a significant, positive relationship between the riparian condition index score and the distance of the riparian site from the dairy shed. However, there was no relationship between the condition index score and the distance to the nearest artificial water source (such as troughs or dams).

There were no significant relationships between farm size and the area of the farm used by the milking herd with the condition index score of riparian sites. This was observed for sites that were grazed as well as sites that were fenced and replanted.

**What does it mean?**

- **Current condition** of riparian sites on dairy farms in Gippsland is generally **'very poor'**, with no difference between sites on the Gippsland Plain or Strzelecki Ranges.
- Riparian sites in the **best condition** were those contained within **fenced off areas** of **remnant vegetation**, without access to stock.
- Fenced off and replanted riparian sites generally received a low condition score owing to the short amount time elapsed since replanting.
- **Riparian sites** that had been replanted / rehabilitated more than 16 years ago attained **condition scores** within / approaching **'excellent'**.
- **Riparian condition** index scores for fenced off streams containing remnant vegetation reached a plateau when vegetation was **30 metres wide** on each side of the stream.
- **Rehabilitation** of degraded riparian sites currently subject to direct access by stock is best achieved by **fencing the riparian land to exclude stock**. Practices such as the provision of off-stream watering points and the resting of riparian paddocks (that are not fenced to exclude stock) are not effective management practices on dairy farms in Gippsland under current stocking rates.