




EXECUTIVE SUMMARY

ES.1 SUMMARY

Reach Environs

Condition ratings for reach environs ranged from very poor to very good throughout the Lockyer Creek catchment (Map 3). Very poor or poor condition ratings occurred mostly in the Laidley Creek (Upper and Lower), Woolshed and Plain Creeks, and Lockyer Creek subcatchments, whilst good to very good ratings were recorded mostly in the Lake Clarendon and Buaraba Creek, and Western Tributaries subcatchments. Many areas of Upper Tenthill Creek were also recorded to be in good condition. A poor condition rating for this attribute generally reflected the extent of clearing of vegetation along the stream for cropping, as well as exposure to cattle grazing, irrigation and dry conditions at time of survey.

Similarly, subjective assessments of disturbance within the reach environs indicated that 82% of sites were subject to moderate, high, or very high disturbance. The most commonly identified cause of disturbance was grazing activity (48% of sites), with disturbance from bridge or culvert structures, with water extraction also being identified at a large proportion of sites.

The most commonly recorded land use adjacent to sites in the catchment was cattle grazing on native pastures (mostly in cleared areas).

Bank Stability

The stability of the banks throughout the catchment was generally good, with the majority of banks (90%) being stable or very stable (Map 4).

Erosive processes of various levels were identified throughout the catchment (Map 5), in 86% of subsections. Erosion was most commonly found at bends, at obstacles, or in irregular locations along reach lengths in both upper and lower banks. Slumping processes were also recorded at 38% of sites and were generally found at seepage and runoff points, and in irregular locations along stream lengths in both upper and lower banks. Additionally, aggradation processes were recorded at 14% of sites, mostly all along reach lengths.

Whilst in some cases the occurrence of these processes was consistent with the natural morphology of the streams affected, the occurrence of slumping and erosion in irregular locations and of aggradation all along reach lengths suggests some unnatural damage and disturbance. The major factors affecting the stability of banks within the catchment were the presence of stock (identified at 44% of sites) and clearing of vegetation (37% of sites).

Subjective assessments of instability and susceptibility to erosion at sites were generally low to moderate throughout the catchment.

Bed and Bar Stability

Bed and bar condition ratings within the catchment indicated that the majority of stream lengths were moderate to very stable. Less stable beds were identified in the Tenthill Creek, Flagstone and Ma Ma Creeks, and Lake Clarendon and Buaraba Creek subcatchments (Map 5).

Despite the generally stable bed and bar ratings, subjective assessments of overall stability at sites indicated some evidence of erosion and aggradation (33% and 10% respectively). Bars were recorded in the stream bed at 37% of sites with an average bed coverage of 25%. The bars occurred most commonly at irregular points on alternate sides of the stream channel.

Grazing activities and erodibility of banks were identified as the major factors affecting bed stability. Fallen trees and rock outcrops were recorded as the major factors maintaining bed stability.

Wide ranges of sediment types and levels of organic matter were recorded in stream beds during cross-sections within the catchment. Bar sediments were commonly angular and disc-shaped, and were often packed or displayed moderate compaction.

Channel Diversity, Habitat Types and Dimensions

The majority of stream lengths in the catchment received channel diversity ratings of low or very low, with a small proportion rated as having moderate diversity, mainly in the Laidley Creek and Lockyer Creek subcatchments (Map 6).

Pool habitat was the most commonly identified channel habitat type within the catchment, followed by riffles and runs. For this survey, the channel diversity information was gathered based on the theory that the greater the range of habitats within a stream system, the greater the diversity of instream flora and fauna supported by the system. Therefore, it is assumed that due to the low channel diversity ratings, instream flora and fauna diversity would be comparatively low for this catchment. However, validation of this assumption would require further studies within the catchment.

Additionally, it is not possible to determine whether or not channel diversity is naturally low in the catchment, as historical records on this attribute are not available. Nevertheless, the ratings give a reasonable indication of the current morphology of streams and some indication of the diversity of habitat types that could be expected at any one stream site.

Bed and Bank Sediments

A wide range of sediment types were recorded in stream beds and banks within the catchment. Material sizes ranged from silt to boulders in upper and lower banks, and in stream beds.

Riparian Vegetation

The riparian vegetation throughout the catchment was generally in very poor to poor condition (Map 7). These ratings can be generally attributed to the loss of riparian vegetation through clearing and invasion by weed species. Stream lengths with good or very good ratings mainly occurred in the Western Tributaries, and Lake Clarendon and Buaraba Creek subcatchments.

The average riparian width at sites was 7.4 m, which is similar to the average upper bank width (9.9 m). Although this comparison of averaged data is not conclusive, it suggests that on average, riparian zones have been cleared approximately to the bank edge.

The major local vegetation types of the riparian zone occurring in the catchment were eucalypt-dominated communities. Grasslands, medium (10–30 m) and small (<10 m) trees were the predominant structural types of vegetation recorded.

The proportion of weed species in riparian zones varied between subcatchments, with the highest proportion of exotics identified in the Woolshed and Plain Creeks and Laidley Creek subcatchments.

Aquatic Vegetation

The survey indicated that the majority of stream lengths within the catchment had aquatic vegetation in very poor condition (Map 8). This reflects the generally low amount of aquatic vegetation encountered in streams, probably because of dry conditions at the time of survey. However, of the aquatic vegetation that was recorded, the most common structural types were submerged filamentous algae and *Elodea* spp., and emergent rushes and sedges.

Further studies would be required to determine the factors influencing the distribution and abundance of aquatic plant species in the Lockyer Creek catchment.

Aquatic Habitat

Condition ratings for aquatic habitat within the catchment indicated that most stream lengths were poor to moderate (Map 9). Similarly, subjective assessment of overall habitat value for aquatic life rated the majority of sites (69%) as poor or very poor.

Leaf and twig cover, individual logs, and rock cover were the most commonly recorded instream habitat attributes, while overhanging stream cover was predominantly provided by canopy cover and vegetation overhang.

At the time of survey, passage for fish and other aquatic organisms was generally completely or very restricted. This can be attributed to the generally dry conditions experienced throughout the survey. When passage at the water mark was assessed, most sites still had some form of restriction in place (commonly logs, branch piles, or rocks), which would require water levels of one-third bank full to allow fish passage.

Scenic, Recreational and Conservation Values

The majority of sites within the catchment (91%) were described as ‘undeveloped rural’ (recreational settings in a rural landscape that have been modified from the original state) or ‘developed rural’ (rural areas cleared/within rural towns). Of the remaining sites, 5% were classed as ‘semi-natural’ (low level disturbances, Native Forestry/Reserves, or remnant areas), and 4% were described as ‘roaded-natural’ (Environmental Parks or camping/rest areas).

Scenic and recreational value ratings in the catchment indicated that most stream lengths had moderate to good value (Map 10). Similarly, subjective assessments rated half of all sites as having moderate to very good value, with most sites valued on the basis of their scenic rural setting. Subcatchments that displayed generally good scenic and recreational value were the Lake Clarendon and Buaraba Creek, and Western Tributaries of Lockyer Creek subcatchments.

Shore fishing and bird-watching were the most commonly recorded potential types of recreation, while horseriding and nature appreciation were commonly identified as activities being currently undertaken at sites.

Overall Condition

The overall condition of most stream lengths in the catchment was moderate. Good or very good overall condition was identified in some areas of the Lake Clarendon and Buaraba Creek and Western Tributaries subcatchments, parts of Lockyer Creek, and in some upper areas of the Flagstone and Ma Ma Creeks, and Tenthill Creek subcatchments (Map 11). Areas where poorer overall condition was reported included some stream lengths within the Woolshed and Plain Creeks, Laidley Creek, and Tenthill Creek subcatchments.



ES.2 CONCLUSIONS

The Lockyer Creek catchment *State of the Rivers* survey produced the following seven major outcomes.

- Most stream lengths displayed high to moderate disturbance of the reach environs.
- Banks were relatively stable throughout the catchment, displaying moderate to low susceptibility to the dominant process of erosion.
- Stream channel habitat types were generally of low diversity.
- Riparian vegetation throughout the catchment was found to be in generally poor condition due to clearing of natural vegetation and the invasion of exotic species, particularly *Lantana* spp.
- Grasses were the most common vegetative structural type recorded in riparian zones (average ground cover at sites of 70%).
- On average, riparian zones have been cleared approximately to the edge of the stream banks for agricultural purposes.
- Aquatic habitat within the catchment was poor to moderate, suggesting a lack of stream features to provide habitat for aquatic organisms.



Site with very stable banks: Ma Ma Creek (# 56)



Good aquatic habitat: Running Creek (# 11)