




EXECUTIVE SUMMARY

ES.1 SUMMARY

Reach Environs

The condition of the reach environs for the Border Rivers and Moonie River catchments showed a wide variety of ratings within and between the subcatchments. The Lower Moonie River rated good and the majority of the Dumaresq River, Lower Weir River and the Upper Weir River subcatchments rated good to very good. The reach environs of the other subcatchments mainly rated moderate. The Macintyre River and Severn River subcatchment was the only subcatchment with ratings in the very poor category.

Throughout the catchments the most common land use recorded was grazing on cleared land, closely followed by grazing in thinned native vegetation. Similarly, grazing was recorded as the most common local disturbance in the reach environs. Roads and stream crossings were also frequently recorded; however, this could be attributed to the need for easy access into the streams for survey purposes. Overall, the greater part of the reach environs was considered to have moderate to high disturbance.

Bank Stability

The stream banks throughout the catchment were considered to be predominantly stable. Only small percentages of the subcatchments were given very unstable (1% to 4%) and unstable (2% to 15%) ratings for the stream banks.

Erosion of the banks occurring at various levels was recorded along 85% of the stream length. Erosion was most commonly recorded either all along the reach length or at bends for both the upper and lower banks. However, erosion of the upper banks was recorded at a significantly higher percentage of sites. Aggradation was mainly recorded at bends while slumping occurred mainly at seepage points.

Throughout the catchment the factors which were considered to affect the stability of the stream banks were mainly the presence of stock and the removal of stream bank vegetation.



• Stock was identified to be the major disturbance affecting stream condition: Callandoon Creek

Bed and Bar Stability

Most of the stream beds in the catchments were considered to be stable or very stable; however, ratings across the range were recorded. The Dumaresq River and the Macintyre Brook subcatchments rated lower than the rest of the catchments with the majority of their stream beds rating moderate to poor.

Aggradation was the dominant process within the stream beds, occurring along 52% of the stream length. Bars within the stream bed occurred mainly at alternate points along the stream. Point bars, mid-channel islands and islands with encroaching vegetation were also frequently recorded along the stream reach. The predominant factors recorded as affecting the stability of the bed were bank erosion and agriculture/grazing.

Channel Diversity

The channel habitat diversity for the entire catchment was rated low to very low. The Lower Moonie and the Lower Weir subcatchments rated very low for their entire stream length. Small percentages of the stream length in the Macintyre River and Severn River subcatchment (2%) and in the Dumaresq River subcatchment (4%) had high channel habitat diversity.

Pools were the most common habitat type recorded throughout the catchment, followed by runs. The substrate in the beds, lower banks and upper banks tended to be mainly fine sands, but ranged from fines to boulders.

Too much significance should not be attached to the low channel diversity rating within the catchment. The analysis of the data collected during the survey is based on the principle that the more habitat types recorded within a surveyed reach, the better the rating. Due to the factors which play a role in the formation of the streams within the catchment and to the size of the run and pool habitats, only two



• Moderately stable banks: Booroondoo Creek (#33)

or three habitat types from a potential of eight were recorded at the survey sites. This produced the generally low channel diversity ratings. This should not, however, be interpreted as indicating that any particular problem exists within the streams; it simply indicates that the stream habitat types surveyed in the stream reaches were not diverse.

Riparian Vegetation

The riparian vegetation within the catchments ranged from a rating of very poor for 17% of the stream length to very good for 20%. Ratings for the individual subcatchments were also across the range. The Upper Weir River subcatchment, for example, was rated mainly as good to very good, while the Macintyre River and Severn River subcatchment and the Macintyre Brook subcatchment rated predominantly poor to very poor. The poorer classifications can be attributed to the very narrow width of the riparian vegetation and to the prevalence of exotic species within the area. The mean width for riparian vegetation for the entire catchment was 55 m, but ranged from 0.5 m in the Macintyre River and Severn River subcatchment and the Dumaresq River subcatchment to well over 50 m in a number of the other subcatchments.

Due to the inaccessibility of some areas within the catchment, such as areas with dense forests or steeper slopes, stretches of better riparian vegetation possibly escaped assessment by the survey team.

The most common native riparian vegetation species recorded in the catchment were *Eucalyptus* spp. followed by *Casuarina* spp., *Callitris* spp., *Callistemon* spp. and *Acacia* spp. The structure was generally good where these communities occurred, with tall, medium and low trees, shrubs, vines, rushes, herbs and grasses. Exotic species consisted of a mean of 25% of the riparian vegetation, and were mainly herbs, vines, shrubs and trees. The exotic species most frequently recorded were milky weeds, burrs, thistles, African Boxthorn (*Lycium ferocissimum*), Blackberry (*Rubus* sp.), and Willow (*Salix* spp.).



• Aquatic vegetation: Moonie River (#120)

Aquatic Vegetation

At the time of survey, the condition of the aquatic vegetation in streams across the catchment was rated mainly as very poor. This low rating is in part attributable to the ephemeral nature of the streams and in part to the fact that where vegetation was present, it tended to provide a low percentage of stream-bed cover. Additionally, because the Border Rivers catchment was extremely dry at the time of survey, the results for aquatic vegetation condition are biased towards the very poor rating and, consequently, few data were collected.

Where aquatic vegetation was present, submerged, floating and emergent forms were recorded. Submerged vegetation consisted mainly of filamentous algae, followed by *Vallisneria* spp., *Myriophyllum* spp. and herb-like species. Water Primrose (*Ludwigia peploides* spp. *Montevidensis*), Nardoo (*Marsilea mutica*), Elodea (*Elodea canadensis*) and Pondweeds (*Potamogeton* spp.) were also recorded.

Azolla spp. were the most common form of floating vegetation, followed by Waterlilies (*Nymphaea* sp.) and Duckweed (*Lemna*, *Wolffia*, and *Spirodela* spp.). Emergent species consisted mainly of rushes and sedges, followed by *Phragmites australis*, *Typha* sp., encroaching Willows (*Salix* spp.), other trees and shrubs and Water Couch (*Paspalum distichum*). The exotics Umbrella Sedge (*Cyperus eragrostis*), Curled Dock (*Rumex crispus*), Para grass (*Urochloa mutica*) were recorded at several sites.

Aquatic Habitat

Across the catchment, the aquatic habitat ratings were mainly poor. Individual logs and branches, and leaves and twigs from riverbank vegetation were the most common instream habitat types recorded within the catchment. Bank physical features and bank vegetation also provide shade and shelter for



• Good scenic values: Macintyre River Falls

the stream. Canopy cover was present at 83% of the sites surveyed, while vegetation overhang was recorded at 59% of sites.

At the time of the survey, several of the streams in the catchment were obstructed by artificial or natural features that restricted the passage of fish and other aquatic organisms. Most of these obstructions could be passed by fish with flow levels at two-thirds of the bank height; however, one dam, weir or waterfall in the Dumaresq River subcatchment was considered passable only in extreme flood conditions. One cascade, rapid or log jam in the Macintyre River and Severn River subcatchment was considered to be impassable. Features which restricted movement were mainly weirs, rapids, fords and log jams.

Scenic, Recreation and Conservation Value


The scenic and recreation value was rated mainly as moderate to good. The most common recreation opportunity recorded was 'undeveloped rural' (that is, recreational settings in rural landscapes that are modified) followed by 'roaded natural' (that is, environmental parks; camping/rest areas with structured sites and facilities) and 'semi-natural' (that is, infrequent, low-level disturbances; native forestry; remnant areas; reserves).

The most popular actual recreational activity recorded throughout the catchment was shore fishing, followed by barbecues and picnics. Several potential recreational activities were identified, such as nature appreciation, birdwatching, photography and dog exercise.

Conservation values throughout the catchment were mainly rated as moderate. The Lower Moonie River subcatchment rated higher than the other subcatchments with 86% of the stream length rated as good. Small percentages of the Macintyre River and Whalan Creek subcatchment (6%), the Macintyre River and Severn River subcatchment (5%) and the Macintyre Brook subcatchment rated as very good.



• Moderate overall condition: Bluff River (#223)

 **ES.2 OUTCOMES**

- The stream reach environs and riparian zone have been subjected to moderate to high levels of disturbance and degradation. The reach environs of the streams in the Macintyre River and Severn River subcatchment are in the worst condition with the majority of the stream lengths being rated as poor to moderate. Management practices within the riparian zone and reach environs of the streams should focus on minimising further degradation and on the rehabilitation and revegetation of degraded areas.
- Stream banks are relatively stable. Erosion of the banks is the dominant process occurring. The stream banks' susceptibility to erosion is considered to be low to minimal.
- The majority of the stream beds are stable to very stable. Aggradation is the major process. The stream beds in the Dumaresq River were considered to be the least stable.
- Riparian vegetation is in moderate condition. The reduced rating is attributed to the narrow width of remaining vegetation in combination with the prevalence of exotic species. The Macintyre River and Severn River subcatchment and the Macintyre Brook subcatchment rated the lowest in the catchment with riparian vegetation condition ratings of low to very low. Retention and management of all existing areas of riparian vegetation should be promoted and the re-establishment of riparian vegetation along streams should be encouraged, particularly where stream bank erosion could occur. In addition, the clearing of vegetation within the riparian zones of watercourses should be restricted.
- The passage of fish and other aquatic organisms was somewhat restricted in most subcatchments by both artificial and natural features – mainly weirs, rapids, fords and log jams. Guidelines need to be developed for the construction of instream structures so that fish and other aquatic organisms can pass these structures.
- Grazing activities were identified to be the major disturbances affecting stream and riparian attributes. Minimisation of these activities in the stream environs and the riparian zone is essential for the maintenance and improvement of the streams within the Border Rivers and Moonie River catchments.
- At the time of the survey, streams within the Border Rivers and Moonie River catchments were predominantly in moderate overall condition. The streams in the Macintyre Brook subcatchment and the Macintyre River and Severn River subcatchment were rated the poorest overall and for most of the key components of the stream environment. This may be associated with the higher levels of past and present development in these areas – for example, grazing, agriculture, urban centres, mining activities and water infrastructure.