

Chapter 3

Approach and methods

3.1 Introduction

In broad terms the study was conducted in six phases as follows:

- an initial literature review
- fieldwork consisting of two days of ground-based inspections and a catchment flyover
- a condition and trends study-team workshop
- a data analyses and consolidation phase
- a flows and ecological outcomes workshop
- final reporting.

3.2 Catchment and reach breakdown

The drainage network in each catchment was subdivided into management reaches. The purpose of this exercise was to identify individual reaches in each catchment that had similar biophysical attributes and values, could be considered homogeneous for management purposes, and that were of a scale appropriate for WRP purposes. There are a number of different methods and models available for subdividing drainage networks and catchments. Geomorphology is used in many studies as a basis for a reach breakdown because reaches that are characterised by the same geology, slope, flow rate and so on may generally be expected to change in a similar way following management intervention. However, the most appropriate method to use depends on the particular issues and characteristics of the catchment under consideration.

For the plan area a reach breakdown was applied to each of the main river channels. Within each catchment, reaches were subdivided based on consideration of the following attributes:

- bioregion or subregion (includes geomorphology and land use)
- channel pattern (includes confluences and distributaries)
- regulated or unregulated
- freshwater or tidal
- base geology
- physical barriers (including bridges, crossings and lateral barriers such as the Proserpine River levee system)
- the reaches of particular interest identified by NRW; these were reaches with existing water resource development or where demand exists for additional water use.

For each reach a number of key ecosystem characteristics were considered with particular reference to identifying flow-dependent ecosystems, critical processes and critical habitats. The reach breakdown was broadly based on regional ecosystem information, geomorphology and area of particular interest with regard to water resource development (e.g., regulated reaches, reaches bounded by levees, and tidal and freshwater land use

zones). Reaches were defined by group consensus during a TAP workshop based on these attributes and consideration of onsite photographs and notes, maps, satellite imagery and aerial photographs.

Erskine (in FSI 1999) also applied a geomorphic reach breakdown for the Proserpine, O'Connell and Andromache rivers. Although Erskine's reach breakdown was somewhat broad for the purposes of this study, the reach break points in this study were aligned with Erskine where appropriate.

The reach breakdown adopted for this study is shown in Figure 3-1. Text descriptions of each reach and the reach breakdown of Erskine (in FSI 1999) is presented in Appendix 2. A summary is provided in Table 3-1 for the Proserpine, Andromache and O'Connell rivers. A number of minor tributaries were considered as single reaches (e.g., Mares Nest Creek, Happy Valley Creek, Brandy Creek, Fish Creek and Gibson Creek) while reach break points for Thompson Creek and other larger tributaries (e.g., Horse Creek, Myrtle Creek, Six Mile Creek, Boundary Creek and Goorganga Creek) are generally located at tidal and freshwater boundaries, coastal wetlands and other land-use boundaries or barriers (e.g., road crossings).

Table 3-1 Summary of the reach breakdown for the Proserpine, O'Connell and Andromache rivers

River and reach	Description	Basis for reach break
Proserpine River		
PR-1	Unregulated and largely unmodified headwater streams	
PR-2	Approach channel to Lake Proserpine. Break occurs at approximately Ironbark and Quandong creek confluences.	Land use change Geology change Channel geomorphology change
PR-3	Regulated rock reach below dam. Break occurs at approximately Five Mile Creek confluence.	Geology change Channel geomorphology change Land use changing to cane
PR-4	Regulated, mid-catchment. A more sinuous planform. Break occurs at start of levees downstream from Happy Valley Creek confluence.	Channel geomorphology change (to more sinuous and depositional) Reduction in riparian vegetation
PR-5	Regulated reach bounded by levees. Break point at the downstream end of the Breakaway.	Reach bounded by lateral barrier (levees)
PR-6	Estuarine.	Freshwater to estuarine change
O'Connell River		
OC-1	Lower headwater streams with cascades and pools, some clearing. Break occurs near Cathu.	
OC-2	Narrow floodplain with bedrock outcropping in channel. Land use mainly cane. Lower limit of reach is Boundary Creek confluence.	Confluence (Boundary Creek) Mainly land-use change with a mix of forested and cleared areas Geological change
OC-3 / B-2 / AND-3	Wider sand bed channel with reaches characterised by a semi-confined floodplain and discontinuous cane farming.	Confluence (Andromache River)
OC-4	Estuarine	Freshwater to estuarine change
Andromache River		
AND-1	Unregulated and largely unmodified headwater streams, steep slopes. Break occurs near Horse Creek confluence.	
AND-2	Piedmont and foot slope fans, lower slopes transitioning to narrow floodplain with meandering channel and sandbars. Break occurs at Mares Nest Creek confluence.	Channel geomorphology change Near geologic boundary
AND-3	Wider agricultural floodplain, sinuous channel with extensive sandbars.	Land-use change Channel geomorphology change

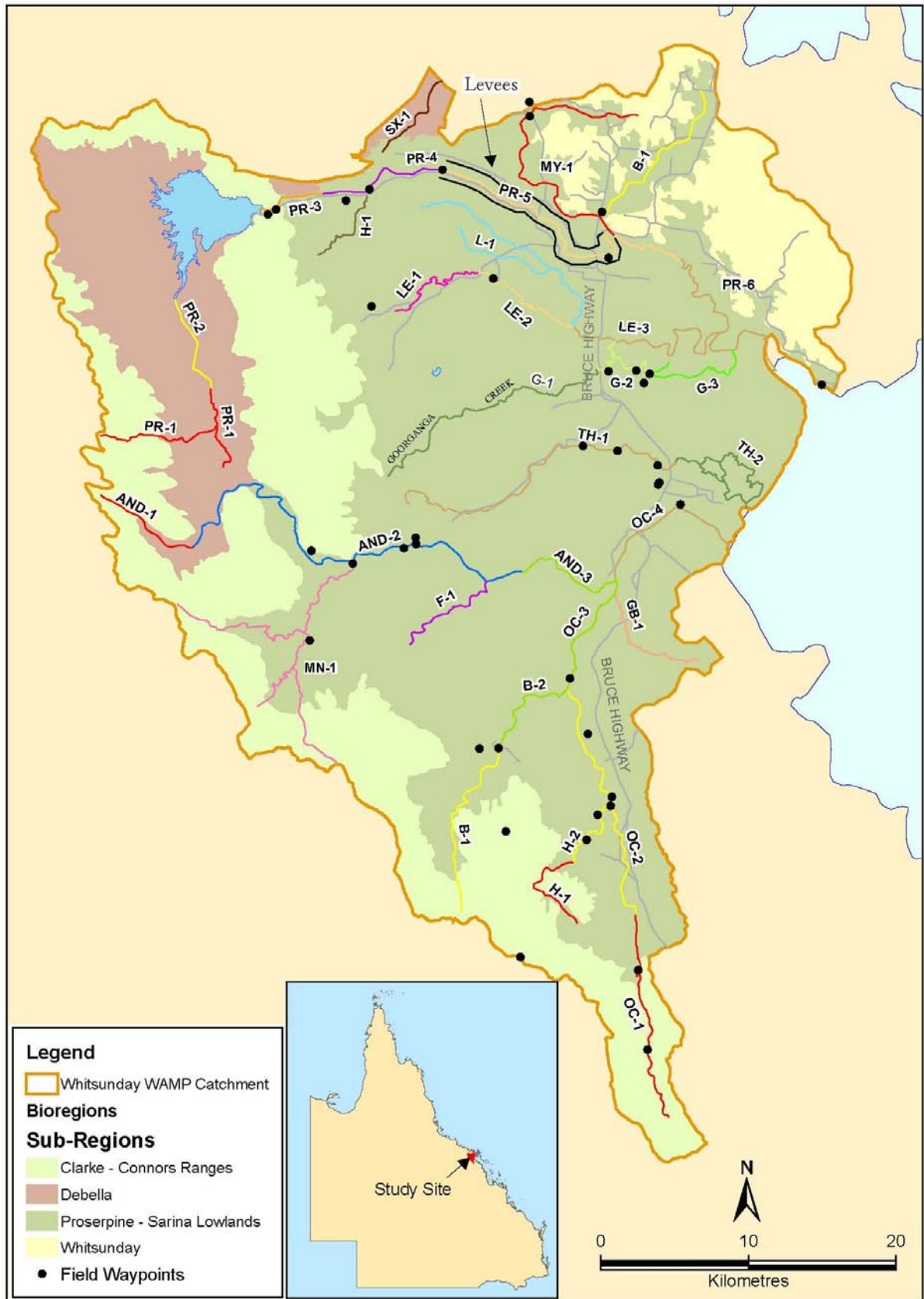


Figure 3-1 Reach breakdown