

3. Biological Indicators for freshwater systems.

Organisms living in streams and rivers can tell us about the condition or “health” of waterways. Diverse communities of macroinvertebrates (or water-bugs) indicate a stream in good condition, whereas simple communities of few water-bug types indicate a damaged or degraded stream. Annual monitoring of stream health is currently undertaken in Rapid Creek and uses an assessment system known as AUSRIVAS. This stands for Australian River Assessment System, and works by comparing water-bugs present in a stream with those expected to be present in reference streams of a similar type. AUSRIVAS produces a score based on the number of types found in a sample relative to the number of types expected. To simplify interpretation of these scores a banding system has been developed (Table 2). Band A means streams are equivalent to high quality reference streams; bands B, C, or D indicate that the stream is below reference condition and is degraded to varying degrees.

Table 2 - How to interpret bands from AUSRIVAS.

Band	Description	What it represents
X	More biologically diverse than reference	More types found than expected. Potential biodiversity “hot-spot” or mild organic enrichment.
A	Similar to reference	O/E scores range found at 80% of the reference sites, or equivalent to reference condition.
B	Significantly impaired	Potential impact either on water and/or habitat quality resulting in a loss of types.
C	Severely impaired	Many fewer types than expected. Loss of water and/or habitat quality.
D	Extremely impaired	Few of the expected types and only the hardy, pollution tolerant families remain.

3.1 Rapid Creek 2016

Two macroinvertebrate sites were sampled in 2016. These sites are in the upper reaches of the Rapid Creek system which is a small seasonally flowing stream in the Darwin urban area. Results of the AUSRIVAS scores are described below in Table 3. These results are similar to previous years. The creek has an impoverished macroinvertebrate fauna which is to be expected for a stream with an urbanised catchment.

Table 3 - Rapid Creek AUSRIVAS Scores for 2016.

Site number	2013	2014	2015	2016
RC182	B	C	B	B
RC142	B	B	B	B




Rapid Creek weir downstream of freshwater reach



Figure 2 - Monitoring locations in Darwin Harbour.

Freshwater fish in Rapid Creek



Empire gudgeon (Hypseleotris compressa).

Rapid Creek provides habitat for several species of native freshwater fish.

A survey in May 2016, using underwater video cameras identified seven species which are also commonly found in other coastal streams in the Top End. These included eel-tailed catfish, empire gudgeon, spangled grunter, tarpon, and black-striped rainbow fish. A less common species, the swamp eel, is also known to be present but was not recorded in this survey.

The fish population in Rapid Creek is largely unchanged, with recent sampling producing very similar results to those obtained in 2006. Most of the species live in the freshwater section of the creek, however some species also need to visit the saltwater areas of this waterway. Empire gudgeon, for example, need salt water for their early development, but they then move into the freshwater where they live their adult life.

Happily, Rapid Creek – along with most other freshwater streams and rivers in the Top End, is free of introduced species. Introduced fish and water weeds are a threat to the biodiversity of our Top End waterways, because they displace the native plants and animals.