

Invertebrate indicators and ecosystem restoration

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Things we know

- 1 Invertebrates have many attributes of a good indicator.
- 2 Numerous taxa are available as indicators.
- 3 Invertebrates can indicate a wide range of restoration objectives.
- 4 Invertebrate assemblages rather than single species are typically used as indicators.
- 5 Mine rehabilitation leads the way in the application of invertebrate indicators.

Knowledge gaps

- 6 The 'build it and they will come' paradigm is flawed.
- 7 Multiple indicators are needed for the restoration of multiple ecosystem characteristics.
- 8 Functional approaches show promise.
- 9 Assessment of invertebrate indicators should include control sites and long-term monitoring.
- 10 Choice of invertebrate indicator(s) needs clear conceptual justification.

Introduction

Human activity has degraded or destroyed large areas of land and vegetation, and the ecological restoration of these areas is a major scientific and land management priority (Hobbs and Cramer 2008; Benayas *et al.* 2009). One of the most fundamental research questions in any restoration program is how to measure its progress or success. Biological indicators, such as the abundance of a species or diversity of a set of taxa, are often used in this endeavour. Invertebrates are a useful group of organisms for measuring ecosystem change and are commonly used to indicate either changes in biodiversity or particular ecological processes relative to a reference or control state. In this chapter, we discuss some of the key advances in knowledge of the use of invertebrate indicators, and some areas requiring improvement.