

CHAPTER 11

Biodiversity Research Innovations I: Biodiversity Identification and Monitoring

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Inventories of species at particular sites are essential data sets for conservation and resource management. One needs to know what biodiversity there is in a given area before developing management plans for that resource.

However, it is important to recognise that undertaking thorough surveys is not an easy task. Usually, such surveys reveal large numbers of species, many of which may be undescribed, particularly invertebrates and lower plants. The formal determination of species names can take a long time and, in those groups where the formal taxonomy is poorly developed, may not be possible.

For well-known taxa such as vertebrates and flowering plants, it is relatively straightforward, using experienced biologists (taxonomists), to make an inventory of an area and establish what species occur there. Methods vary for different taxa but species lists are the ultimate results for the different methods. It is important to recognise, however, that vertebrates and flowering plants make up less than 20 per cent of all named species (Wilson 1989). The problem is that we do not quite know the relationships between vertebrate and flowering plant species richness to total biodiversity. It is therefore difficult to establish whether a high vertebrate and flowering plant species diversity corresponds to a high overall biodiversity. Despite this, however, various methodologies have been developed for biodiversity identification. The main ones include the following:

Use of Recognisable Taxonomic Units (RTUs)

RTUs are taxa that are readily separable by morphological differences that are obvious to individuals with less training than professional taxonomists. Such people are called biodiversity technicians in some countries and parataxonomists in others. They work with professional taxonomists to carry out biodiversity assessment.

Use of Indicator Species

Another method is to use several indicator species. A number of taxa may be selected and then specialists in those taxa are used to identify species within those taxa in a particular area. A ranking system can then be used to identify areas of high, medium or low biodiversity.

The methods above are field methods. Accurate identification of biodiversity requires a wide variety of specialist taxonomists who are often not easy to come by. They are usually based in institutions such as universities, research centres, museums of natural history and herbaria. Conventional biodiversity surveys are very demanding in terms of time and resources. It has been estimated, for example, that if the description of new species, using traditional methods, continues at the same rate with the same number of taxonomists as today, the cataloguing of global biodiversity would take several thousand years to complete! (McNeely *et al* 1990).

For practical purposes therefore, most researchers today are using the most convenient taxa as a basis for taxonomic surveys, e.g. birds, mammals, amphibians, butterflies, higher plants and a few others. It is important to note though, that flowering plant and vertebrate biodiversity is not an accurate indicator of the species richness of invertebrates (Oliver & Beattie, 1992).

Monitoring

In natural resources management, it is often necessary to take stock of what resources are available in order to establish the trends; whether the resources are increasing, decreasing or static. When managing biodiversity therefore, it is essential to monitor at regular intervals to enable correct decision-making. It is possible to monitor ecosystems, particular vegetation types, communities or species. Monitoring methods will depend on what is being monitored. The key issue is that there should be a specific purpose for which the monitoring is being done so that one knows exactly when the monitoring should end.

REFERENCES

- Wilson E. O. (ed) 1989. *Biodiversity*, National Academy Press, Washington D. C.
- Oliver I. & A. J. Beattie 1992. "A Possible Method for the Rapid Assessment of Biodiversity". *Conservation Biology* 7(3): 562–568

FURTHER READING

Cooperrider, A. Y. *et al* 1986. *Inventory and Monitoring of Wildlife Habitat*

Chapter 10: *Research and Monitoring Challenges*, in Robbie Robinson "African Heritage 2000: The Future of Protected Areas in Africa"