

6. MANAGEMENT REQUIREMENTS

6.1 Background

In order to assess management requirements, discussion sessions were held with a number of senior water quality managers within the Department of Water Affairs and Forestry (see **Appendix D** for list of those interviewed) who are to be the primary users of information from the biomonitoring programme. This section summarises their stated information expectations and the extent to which this planned biomonitoring programme is expected to be able to meet such expectations. Two aspects which relate to this summary are presented below.

First, it was recognised by these water quality managers that the Department has shifted its focus from only managing water quality to a broader perspective of water resource management. It was therefore clear that there is a need to understand how water quality management fits into this new framework; for example, a large amount of money spent improving existing effluent control mechanisms may not lead to a corresponding improvement in the ecosystem health if, say, the sediment layer is badly contaminated. It was also recognised that a wider and deeper insights into the demands and requirements of this new "water resource management" approach is needed. The requirements outlined below should be interpreted in this light.

Second, although the task of this project is to develop a **national** monitoring programme, many requirements were put forward which would probably be better addressed by regional or local monitoring programmes.

6.2 General requirements for biomonitoring programmes

A number of requirements for biomonitoring programmes *in general* were given. These have been split into two sections: firstly, those with a **national** focus; and, secondly, those with a **regional** or **local** focus.

National requirements

- to determine the **status** of protection - this implies a need to rate or classify systems in some way so as to assign a relative value to the status of the system

- to determine **trends** in the status of ecosystems ie. are they improving, recovering, stable, declining etc.

Regional / local requirements

- to identify where **impacts** are taking place, for example, a decline in sensitive species could act as an early warning system using an integrated index-based system
- to help setting of specific **objectives** for rivers, perhaps based on a river classification scheme
- to measure and evaluate the impact of **developments** (planned and actual) on ecosystems
- to monitor the implementation of a development in order to provide data for **predictive modelling** purposes, especially for determining the impact of other, similar developments.

6.3 Scope of the biomonitoring programme

In the previous section, it was noted that managers have stated a wide range of information needs. Clearly, as the role of aquatic ecosystems management develops, such needs will continue to expand. Nonetheless, it is important for the design phase of this monitoring programme that a clear direction be decided on - the failure of monitoring programmes in the past is often linked to a poorly focused goal, or an ad hoc method of development. Further, it is unlikely that one biomonitoring programme will meet all the stated needs. Because the current biomonitoring programme is required to provide information on a national level, its focus cannot be simply on measuring the effects of particular impacts on resources as such impacts are, by nature, ad hoc. For the same reason, cause-effect monitoring is also not appropriate for a national programme. These type of biomonitoring programmes are best suited for local or even regional applications, and a number of such programmes have already been instituted by the Department and other organisations.

On this basis, it was agreed by managers that the primary focus of the first stage of the design should be on a national biomonitoring system to report only on the status of **rivers**. It was noted, however, that, in the long term, monitoring of many different types of resources will ultimately need also to be included in the monitoring programme i.e. dams, estuaries and wetlands.

6.4 Reporting on the biomonitoring programme

Reporting of the success of management activities should be in terms of both interim and long term objectives.

The type and format of information that water quality managers will need includes:

- The relative pristine **status** of each resource, reflecting "the state of the environment"
- The presence of any **trends**

Data should be presented both in tabular and spatial format (eg. via a GIS, with areas or resource being colour-coded).

6.5 Use of information

The information reported on a **national** level will be used by managers for:

- Evaluation of the management of impacts to answer the question "have management actions improved the situation?"
- Evaluation of the suitability of guidelines, in terms of their ability to protect the environment

Additional information that should be derived from **regional** or **local** level programmes would be used by managers for:

- Site specific analyses
- Determining cause-effect relationships between impacts and changes in the environment (particularly with respect to the relationship between chemical water quality and ecosystem health)
- Setting of environmental objectives
- Evaluation of the suitability of guidelines, in terms of their ability to protect the environment

It should be noted that such information is unlikely to be available from a national monitoring programme.

6.6 Management requirements that will be met by the programme

The primary purpose of biomonitoring on a national level will be to support management actions to protect and preserve the biological integrity of natural systems, including the taking of corrective action when the health of such systems is threatened or degraded.

Information that will ultimately be derived from final biomonitoring programme, to support management of the aquatic environment, could be used for:

- Situation analyses (e.g. the "health status" of a catchment)
- Assessment of the effectiveness of management actions at a location, by measurement in terms of objectives (where these exist), guidelines, or values associated with an equivalent, "undisturbed" site
- Comparison of the status of different catchments
- Comparison of the status of different resource types (eg. rivers, wetlands, etc.)
- Deciding on the allocation of resources for the protection of the health of aquatic ecosystems

It also recognised by the Department that there are a number of regional and local biomonitoring programmes already in place, operated by the Department and other bodies. Information derived from these programmes may be of use at a national level.