

Co-ordination and integration of terrestrial vertebrate fauna survey databases for Western Australia: The mining industry perspective

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Abstract

The mining industry understands the need to protect environmental values, and supports the establishment of a fauna database. The database should include vertebrates, and possibly some invertebrates, particularly stygofauna. Locality, habitat, age, sex and where appropriate deformity information should be recorded with data ranked according to reliability of source, with specimens vouchered with the Western Australian Museum ranked highest. Access to the database should vary in a similar fashion to that for the *Florabase* that is managed by the Western Australian Herbarium, and cost of access should take into account the purpose for which data are to be used. Long-term options should be considered when deciding who should establish, manage and maintain the database.

Keywords: database, fauna, mining

Introduction

The environmental impacts of mining operations have come under increased scrutiny as awareness of environmental issues and an understanding of the implications of environmental impacts has grown. As this community awareness has grown over recent years there has been a change in attitude from the community that can be categorised as a progression; *Leave me alone ? tell me ? consult me ? involve me* (Morgan 2000). That is, the community has become more and more interested in the operations of industry.

Highly publicised events such as the Romanian tailings spill have increased the community's distrust of the mining industry. This has come despite the fact that the mining industry, in general, is operating in an environmentally acceptable manner and in many cases has (arguably) been at the forefront of developing best practise in environmental management.

With the development of community awareness has come increased pressure on regulatory authorities to give consideration to issues and concerns on environmental grounds. Additionally, the scientific understanding of environmental impacts has increased and regulatory authorities are increasingly better able to assess the likely impacts of projects provided the appropriate data are available. To ensure that the correct decisions are made, project proponents are required to supply ever more data on the environment in which the project will operate. Given that these data requirements are going to continue to increase, there are two particular aspects that are important to the industry in relation to the establishment of databases to coordinate the data collected:

1. A database will establish a consistent framework for the collection and presentation of the data.

Results should enable comparison among collected data from different projects and also on how these data were utilised in assessment by the Environmental Protection Authority (EPA). While this is an advantage to project proponents in establishing the views of the EPA (and other agencies) it also provides a benchmarking opportunity that will drive continual improvement in the quality of proposals that are submitted.

2. Over time it could be expected that information from a wide variety of sources and studies will be available to provide a much more detailed and rigorous assessment of the distribution of vertebrate fauna.

The presence or absence of species from project areas can then be predicted with greater certainty and efforts to mitigate environmental effects on vertebrate fauna for an area can be more effectively targeted. The possibility of impacting upon threatened species can also be more confidently predicted and steps taken to ensure their protection. As the database develops a greater understanding of the status of species should result. It is possible that this will lead to the removal of some species from the priority species lists. Conversely, some species may be reclassified into a higher priority conservation status. The overall result from a mining company perspective is that a reliable indication of the conservation status of species will be available allowing more effective environmental planning. This also has potential environmental benefits as resources can be directed in the most appropriate fashion for a given area.

What taxa should be covered?

If a fauna database is established, it must cover all vertebrate groups and consideration should also be given to covering invertebrates. Stygofauna is looming as an important issue that has the potential to affect resource development, largely due to a lack of knowledge about such organisms (Playford 2001). In this issue a co-

ordinated approach to the establishment of a database could develop as the knowledge of stygofauna is progressed. That is, we have a unique opportunity to start from scratch and get the collation of data right from the outset.

Which data are important?

Depending on the purpose of the survey, the type of data required is extremely variable and covers a wide range of possibilities. It would seem that as much data as possible should be collected and recorded to allow for the variety of uses to which the database may be put. For the mining industry the database should record;

- Locality; is this species likely to be found in the project area, and if so, is it also found in other areas?
- Habitat; where to look for it, and are there comparable areas outside of the project area. This is particularly important in terms of the regional significance of specific habitats.
- Age classification and sex; these would be useful data to help understand the population dynamics for an area. While these data change, it may allow the status of a population to be assessed over a period of time, particularly in regard to the effects of the introduction of industry.
- Deformities; for data kept on frogs, for example, it would be useful to include details of deformities. This can help to establish background deformity rates allowing the potential effects of industry to be assessed over time (Read & Niejalke 1996).
- Past information; this should be incorporated into the database. The value of such a database is directly linked to the amount of data it contains. That the collection of vertebrate fauna data is not starting from a zero base should be recognised.

What accuracy is appropriate for the data?

The accuracy of data is an important issue if the database is to be useful. However, it is unlikely that a significant body of data will be built up in a reasonable space of time if only data supported by voucher specimens and collected by a select group of ecologists is used. Data collected on an *ad hoc* (or organised) basis by people such as pastoralists and mining industry personnel need to be incorporated where feasible, as in some areas this may represent a significant body of information. To allow for this without impacting upon the accuracy of the database, it may be possible to introduce a rating system that ranks the reliability of each record according to specific criteria.

Is GIS capability necessary?

The database must have a capacity to be utilised by GIS systems. A system that does not have this capability will be outdated before it is even established. Mining industry, land planners, researchers and many others are increasingly turning to GIS systems as important tools of

trade. To ensure the proposed database has long term value it must be in step with the technology that is in widespread use. It is also important to recognise that this type of technology is evolving rapidly and a commitment to continual development should aim to keep pace with advance in GIS capabilities.

Should there be linkages with other databases?

As our knowledge of environmental protection and restoration increases there is shift to considering not just individual aspects of an ecosystem but the interaction of all aspects and to ensure that a functioning ecosystem is maintained or restored (G Thompson, Edith Cowan University, personal communication). In this context the database should be linked as much as possible to other relevant databases, provided the information in these databases is consistent with current regions or interpretations.

How can we resolve issues of ownership, funding and access?

Finally, the issues that I believe will require the most thought and planning are those relating to ownership, access and funding. Who takes responsibility for the administration and maintenance of the database? Who is allowed to use it? Who pays for its upkeep?

The maintenance of the database will require a considerable commitment of resources over a long period of time. The value of this database is likely to increase over time as more and more data are included, therefore it is important that a long term view is taken when considering the funding aspect. It is possible that a pay-for-use system will recover some of the funds; for this reason it is important that usage for commercial gain is not ruled out. I would classify commercial gain as including the use of the data for the development of environmental impact assessments for commercial activities such as mining projects, particularly where this is conducted by a third party on a contract basis. It is difficult, however, to envisage that the demand for such use will enable the costs to be covered while maintaining an acceptable cost for access.

An option for consideration may be to have the database held by a tertiary institution with maintenance of the database incorporated into the program of an appropriate computer science course providing practical experience for students and a long term administrator for the database. This does not resolve the issue of who actually owns the data; the specific institution that administers the database may have some right to claim ownership of the data. To avoid conflicts the owner of the data should be an independent government body such as the Environmental Protection Authority or the Conservation Commission with a *Memorandum of Understanding* (MOU) established with the database administrator.

The usefulness of the database for any group or individual will relate to access and it is important to consider what level of understanding of Australian

native fauna is desirable. Personally, I would like to think that eventually there will be a high level of interest and knowledge of the fauna within even the general public. For this reason access to basic levels of the database should be made available to anyone who has an interest in native fauna.

The *Florabase* project developed by CALM provides a useful example of how the database could have various levels of access. In the *Florabase* example, the information available depends largely on the access level that is purchased but other restrictions could be implemented as appropriate (e.g. rare species). In the *Florabase* example (Table 1), a number of levels are applied:

Table 1

Cost of accessing various levels of the *Florabase* database. (WA Herbarium Schedule of Fees, November 2002).

Features	Standard	Access Type			
		2	3	4	5
Price (AU\$ per annum)	Free	\$200	\$500	\$1000	\$2000
Search Names & Library	✓	✓	✓	✓	✓
View Images	✓	✓	✓	✓	✓
View Maps		✓	✓	✓	✓
View Descriptions		✓	✓	✓	✓
Search Descriptions		✓	✓	✓	✓
View Specimens			✓	✓	✓
Search Specimens				✓	✓
View & Search Specimens of Declared and Priority taxa					✓

Exemptions to this schedule are provided for:

- community groups participating in the Regional Herbarium network;
- students;
- CALM staff, where projects are not the subjects of external grants;
- academics and researchers, where projects are not the subjects of external grants;

- developers of biological information systems in other institutions, scientists and other members of the community can ensure that money is not requested by collaborating in a variety of ways;
- specimen curation;
- providing vouchered plant photographs for use in *FloraBase*;
- inclusion of Herbarium specimen processing costs in grant applications;
- providing descriptions of taxonomic groups for inclusion in *FloraBase* in DELTA format, and
- using *Max* to provide databased information on disk, which saves considerable processing time.

The mining industry understands the need to protect environmental values; therefore, the establishment of a vertebrate (and potentially other) fauna database for Western Australia would be viewed favourably by the mining industry. It is also important that the database can be used for environmental impact assessments. To achieve this access for industry personnel and consultants information derived from the database will need to be approved by the Environmental Protection Department as acceptable for the purposes of project referrals.

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