



Position Statement by the Ecological Society of Australia

Ecological Factors in Environmental Impact Assessment

Coordinated by Kirsten Benkendorff
Department of Biological Sciences
University of Wollongong
NSW, 2522, Australia
Email: kirsten@uow.edu.au
Phone: (02) 4295 6753 or (02) 4221 4503
Fax: (02) 4221 4135

The Ecological Society of Australia and Position Statements

Occasionally there are broad issues of public interest in relation to which most ESA members have formed a similar view, based on their professional expertise. In these cases the Society may formulate and endorse a Position Statement which is intended to inform public debate and policy action. While there may be minor variation of members' opinion in relation to technical details encompassed within a Position Statement, there is widespread general agreement concerning both the importance of the issue and the major points raised within the Statement.

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Summary

The following position statement is confined to those aspects of Environmental Impact Assessment (EIA) that are subject to study and interpretation by ecological consultants. There is much concern over the standard of science during the process of EIA in Australia and many government assessors lack adequate ecological experience. Consequently, the Ecological Society of Australia (ESA) advocates peer review of ecological studies for EIA to help ensure competent work and adequate scales of investigation. Adequate time and funding should be available for comprehensive ecological studies when these are justified for decision-making purposes. The conclusions drawn in ecological reports for EIA should always be substantiated by data or reference to the literature. The proponents of large developments, likely to have significant ecological impacts, should be required to support rigorous scientific monitoring programs. This involves replicated sampling before and after the development commences, at impact and control sites, to detect human impacts above those which could be attributed to natural variation. However, there is no single correct way to design a sampling, monitoring or experimental survey program. The ecological data collected for EIA should be incorporated into a database to build up a better knowledge base for each bioregion. It should also be recognised that EIA is heavily reliant on existing ecological research and continuous funding should be available for long-term ecological studies. The ESA supports the formation of professional consulting agencies that enable the accreditation of ecologists, setting standards for the practice of methods and providing a binding code of ethics.

The Structure of the Environmental Profession

Environmental Impact Assessment (EIA) is a necessary process contributing to the management of Ecologically Sustainable Development in Australia. It is one of the main tools used to minimise environmental degradation associated with human activities. The EIA process is complex and involves input from numerous disciplines including science, engineering, social sciences and economics. In addition to the collection and analysis of data, EIA requires the effective communication of information, public consultation, and an appreciation of human needs and values. The environmental profession consists of both general practitioners and specialists such as ecologists. Ecological consultants play an important role in EIA by providing information to guide development decisions. Their level of contribution ranges from minimal to very important, depending on the situation. The role of the specialist ecologist is particularly important in those situations where development impacts are spread over a large area with ecological values, have the potential to interfere with ecological processes, or impact on threatened species or communities. Input from ecologists is also important in

situations where environmental planning is directed at rehabilitating or enhancing ecological communities and processes.

This position statement is confined to those elements of EIA that are relevant to the ecological profession. The following recommendations are intended to apply primarily in situations where specialist ecological input is justified to address issues that cannot be assessed adequately using commonsense judgement. However, elements of this position statement may be applicable in other situations where assessment is undertaken by general practitioners who may have well developed ecological knowledge without regarding themselves as specialists. Projects differ widely in the nature of their ecological impacts and the skills of the personnel involved. A flexible approach is essential in determining how these recommendations should be applied to each situation.

Previous Recommendations by the ESA

Over the past 20 years, there has been much concern over the standard of science in Environmental Impact Statements (EIS). In order to establish some quality control a "Draft Policy Position of the ESA on the Relation of Professional Ecologists to the Environmental Impact Assessment Process" was proposed by Prof. Westoby in 1979 (ESA Bulletin 9(2)). A revised draft policy was published in 1980 (ESA Bulletin 10(1)), preparatory to a vote at the 1981 ESA Annual General Meeting. At this meeting three out of eight proposed policies were passed (ESA Bulletin 11(2)). These policies state that:

1. Ecological data collected for an EIS should be public property in the sense that no party can prevent another from making it public.
2. The responsibility for each section of an EIS should lie with specified individuals. Each section should be signed by the professional(s) actually responsible. A professional need not sign unless he or she agrees with the section.
3. All EIS's should be expected to answer as a minimum the following questions:
 - a) what are the vegetation and habitat types which may be affected, and where are they distributed?
 - b) are any of these not known to be well conserved elsewhere?

In some circumstances, these policies have been adopted although clear guidelines are required to ensure they are routinely applied by ecological consultants. Furthermore, the adopted policies do not form a comprehensive position statement on the ecological factors relevant to the EIA procedure. Concern over the scientific rigour of EIA in Australia continues (e.g. Buckley 1989, Fairweather 1989, 1994, Fairweather and Lincoln Smith 1993, Pyke 1995, Warnken and Buckley 1998) and it is generally believed that we are not making the most out of the ecological data that are collected. There is also continuing concern over the lack of government resources and experienced people in the assessment phase.

Additional Recommendations

Peer Review

The ESA advocates peer review of ecological studies for EIA. The involvement of independent ecologists in the process of EIA would help ensure that the ecological studies are adequate and that accurate conclusions are drawn. Currently in Australia, Environmental Impact Statements (EIS) are refereed by government assessors. However, these assessors are not always skilled in the necessary subject areas (Warnken and Buckley 1998). An alternative may be to adopt a system of peer review for the supporting technical reports, whereby independent scientific assessors are employed as consultants by the assessing agency. This type of professional evaluation would improve the standard of ecological studies for EIA and could reduce the need for divisive disputes over the adequacy of an EIS.

Guidelines should be established for peer review of the work of ecological consultants (e.g. WA Environmental Consultants Association). A clear two-part reporting system should be adopted whereby the reviewers comment separately on i) the competence of the work and whether the conclusions drawn are substantiated by the evidence provided and ii) the scope of what was done, i.e. whether the scale of investigation was adequate and whether the most appropriate things were investigated. The reviewing consultants should be aware of any limitations in scope set by the originating proponent, so that the work of the ecological consultant is dealt with fairly.

Ecological Surveys

There is a need for scientifically adequate sampling design for ecological studies used in EIA. However, constraints in time and cost may restrict the ability of consultants to conduct comprehensive ecological studies and in many circumstances these are not necessary. The budget allocated towards ecological studies should be proportional to the size of the development or the complexity of potential issues accruing from the development proposal. Proponents should be encouraged to allow adequate time and funding for comprehensive ecological studies when these are justified for decision-making purposes. Experienced scientists within the assessing agencies should provide a clear set of guidelines specific for each development proposal. At very minimum, ecological consultants should be required to visit the development site.

If comprehensive ecological studies are required during the EIA process, then the question of survey design arises. Environmental planners should provide ecological consultants with objectives that translate well into hypotheses and can therefore be tested with scientific rigour. Generally, data collected for ecological studies should be independent and the surveys should be appropriately scaled and replicated.

There is a professional obligation for ecological consultants not to undertake work that is not necessary within the context of the proposal. Ecological consultants have to be able to make decisions within the scope of the project and this requires commonsense judgements about the most

appropriate approach for investigating the issues. In some circumstances, it may be more appropriate to provide ecological advice based primarily on existing information and experience than to rely on superficial surveys, which may be misinterpreted or misused by decision-makers.

Referencing

The conclusions drawn in ecological reports for EIA should be supported by data or reference to the literature (both published and unpublished). If an assertion is made, the reader should be able to track it back to the evidence and make an independent assessment. A lack of referencing appears to be common to many EIS, but this is not standard scientific practice (Fairweather, 1994).

Many ecological processes are site-specific and therefore an EIS should include a review of any relevant ecological studies that have been previously undertaken in the area. Species impact statements should also incorporate a brief review of the biology of each endangered species. An adequate assessment of available literature regarding the significant impacts associated with a proposed development is also essential for EIA. Nevertheless, the reviewing of past studies must be approached with relevance as the primary concern. References should only be used to substantiate conclusions or assist the general understanding of decision-makers and members of the public. The generation of voluminous, peripheral material could be counter-productive to an effective EIA process.

Monitoring

Biological monitoring is an important part of the EIA process for; i) testing the predictions about likely ecological impacts of a development, ii) detecting unforeseen impacts, and iii) assessing the effectiveness of mitigation measures. The information gained from monitoring is also potentially valuable for assessing the impacts of future developments of a similar nature. However, effective monitoring takes time and money. For large developments likely to have significant ecological impacts, the project proponent should be required to support rigorous scientific monitoring programs. However, it should be recognised that the general society often benefits from development through increased wealth, employment and/or recreational opportunities. There can also be a public benefit associated with learning from EIA monitoring programs (Fairweather and Lincoln Smith 1993). Consequently, Government and/or community input into monitoring programs may be appropriate for some developments. For small developments without sufficient funding for rigorous monitoring programs, casual or structured observations should still be encouraged.

Where extensive monitoring programs are to be implemented, clear hypotheses should be tested using sound methods to collect data before, as well as after, the development commences. The actual methods used in a monitoring program should be tailored to test specific hypotheses related to each development. There is no single correct way to design a monitoring program. Nevertheless, the design philosophy of the "Beyond BACI" environmental impact study (refer to Underwood, 1991; 1992) is generally recommended for detecting human impacts above that which could be attributed to natural

variation. Control sites should be used, randomly selected areas containing habitats similar to those of the impact site but in an area not to be affected by the proposed development. Ecological consultants should provide calculations of statistical power for surveys and/or experiments in environmental monitoring programs so that the likelihood of detecting impacts can be assessed. An estimate of the magnitude of impact should also be provided. Proposed monitoring programs should be subject to a peer review and approved prior to the final approval of the development.

Fundamental Research and Databases

It should be recognised that EIA is heavily reliant on existing ecological data. Research into factors such as ecological processes and cause and effect relationships cannot be realistically undertaken within the time frame of ecological studies for EIA. Consequently, continuous funding should be available for long-term ecological studies to provide the information required to make knowledgeable assessments in the future.

The ecological data collected for EIA could also be used to build up a better knowledge base for each bioregion. At the very minimum, ecological reports for EIA should provide information on the local distribution of habitats and ecological communities (refer to History, above) and provide species lists for taxonomically tractable, readily-surveyed/sampled taxa. This type of information could be incorporated into a State database. Ecological surveys for EIA could also trigger the discovery of new species or rare and endangered species in new locations. Voucher specimens of any new or unidentified species should be deposited in an appropriate institute (i.e. a museum or herbarium).

Associations of Ecological Consultants

The ESA supports the formation of professional consulting associations that enable the accreditation of ecologists. In addition to representing the interests of consulting ecologists, these professional organisations should set standards for the practice of methods and provide a binding code of ethics (conduct). Environmental ethics should incorporate such features as;

- honest interpretation of available data,
- recognition of any inadequacies in the data base,
- understanding of the uncertainties that may be part of any analysis or assessment,
- unbiased statement of findings.

(after *The National Committee on Environmental Engineering, 1992*).

Accredited ecological consultants should maintain their skills and knowledge throughout their careers and only practise in areas in which they are competent. Government departments should be encouraged to employ consultants registered by appropriate ecological associations.

Conclusion

The Ecological Society of Australia recognises the instrumental role of Environmental Impact Assessment in the conservation of Australian biodiversity and ecosystem services. Ecologists play a key role in this process as consultants, researchers, regulators and reviewers. Most ecological consulting work is not controversial. However, occasionally a proposed development is of sufficient scale to create significant ecological problems. In these circumstances there is potential to improve the standard of ecological consulting through adequate funding, scientifically rigorous methodology and peer review. A valid use of ecological information for the purpose of EIA is the interest of the public, the developers, and the decision authorities.

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