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SCIENCE POLICY GUIDELINE 1
Science Plans

Introduction

Development of science plans is recognised by the Department of Environment and Conservation (DEC) as the best method for planning the research done by scientific staff. This planning process has several functions:

- ensuring that the proposed project addresses a high priority for DEC operations;
- ensuring that the planner (scientist) devises projects that address the study objectives and produce results that can be appropriately analysed;
- making the project leader accountable, because the plan specifies what will be researched in a nominated time frame and at what cost;
- enabling evaluation of the project design and its effectiveness in addressing the project aims;
- ensuring that DEC does not waste scarce financial and human resources on unimportant or poorly designed projects. Funds for research projects will be allocated on a priority basis.

Science Project management

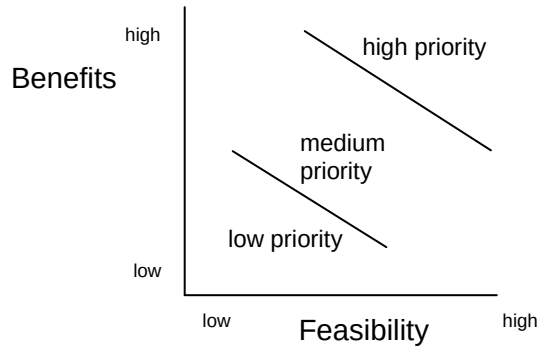
A Science Coordinator will be responsible for coordinating Science Projects within each Division. In Science Division, Program Leaders are responsible for projects within their Program, and the database is maintained by the Executive Assistant to the Director. In Parks and Visitor Services Division, the Social Science Coordinator is the Divisional Science Coordinator. Science coordinators will be identified in other Divisions.

In order to minimize effort in drafting a Science Project Plan (SPP) that may later be rejected, the first step will involve submission of a brief (2 page) Science Concept Plan (SCP) for assessment by the relevant Divisional Coordinator and approval by the relevant DEC service Director. A template for the SCP is provided in Appendix 1.

The Divisional Coordinator will not consider the scientific content but will instead assess the proposal on the basis of DEC service priorities, the relevant Division's priorities, integration with research outside DEC, and other issues listed under Benefits and Feasibility below.

Criteria for priority allocation

The criteria used to assign priority for science projects are based on the benefits of the project and the feasibility of its implementation. The relationship between these two parameters and the allocation of priority for funding are as follows:



It is not anticipated that any particular project will meet all the criteria listed. Should competing projects be otherwise equally matched, decisions will be made on the basis of an assessment of the quality of the proposals concerned, their timeliness, and the strategic advantage their adoption might impart to DEC.

Benefits

Relevance
Science should be relevant to DEC's goals and objectives as enumerated variously in legislation, DEC's Corporate Plan, the Strategic Plan of the relevant Division, regional plans and threatened species recovery plans.

Departmental priorities
Science priorities will reflect overall Departmental priorities as determined by Corporate Executive and service Directors through annual service priorities.

Effectiveness
Science projects should make a significant contribution to knowledge and understanding of biological, physical and social environments in Western Australia or lead to significant improvement in the cost and/or quality of DEC operations and management.

Demand for results
Science proposals that aim to provide explicit information sought urgently by DEC managers or that directly improve Departmental operations will be favoured.

Usefulness
Proposals should demonstrate how they contribute to existing high priority objectives.

Innovativeness
Projects that present a radical advance in conservation, operational effectiveness or sustainable use may be assigned a high priority.

Regional impact
Science should relate to a problem or problems afflicting extensive areas, important industries, important species, many ecosystems or important social interactions and be of long duration or intensive impact.

Immediate benefit
Projects that make an immediate contribution to an issue of high public concern will have higher benefits.

Integration with research outside DEC
It is desirable that research within the Department be coordinated and integrated with related work being conducted by other agencies.

Feasibility

Time frame
The proposal will produce benefits within a reasonable time frame. Open ended projects will not be approved. Projects that require long-term monitoring should be planned so that the monitoring is feasible for the planned time frame.

Budget
The project costs in equipment and/or travel and other expenses should be realistically estimated and the source of any external funding should be determined.

Performance
Work proposed by individuals, project groups or project teams able to demonstrate outstanding achievement in high priority research areas may warrant special consideration.

Team-work
Higher priority will be given to projects involving a collaborative or team-based approach rather than solitary research, as this generally leads to more effective research outcomes.

Speculative or theoretical science
Speculative or theoretical science may be funded where there is sufficient promise of a substantial contribution to knowledge.

Science Project Plan
A Science Project Plan (SPP) is created using the SPP template (see Appendix 2) and forwarded electronically to the Divisional Coordinator for processing. Once approved, the SPP will be allocated a number and be loaded onto a Divisional database by the Divisional Coordinator. The SCP (Science Concept Plan) number is provided for use until final approval.

Explanatory Notes - SPP Form (see Appendix 2)
The numbers below refer to numbered headings on the SPP form.

1. Self explanatory.
2. Self explanatory.
3. Nominate
   - who will undertake the research
   - who will analyse the data
   - who will write up the research.
4. Relevant DEC services are: Nature Conservation; Sustainable Forest Management; Parks and Visitor Services; Environmental Regulation, Environmental Sustainability.
5. Identify the areas where the project has relevance, including IBRA, IMCRA, NRM and DEC Regions. If applicable, specify the location(s) of plot/transect etc by naming the Forest Block, Nature Reserve, National Park etc. Importantly, state whether research site(s) have special protection requirements. If there are plots/transects etc requiring protection from fire, logging or other operations, it is the Project Leaders responsibility to forward a copy of the approved SPP (and maps) to the relevant District, Regional Manager(s) or Marine Coordinator with a covering note. Sites should also be documented in the Scientific Sites Register.
6. Does the SPP cross-link with another science project? Provide numbers and titles of these SPPs and indicate to what extent you have consulted other supervising scientists have been consulted.
7. Self explanatory.
8. Self explanatory.
9. The Project Leader should not discuss this matter with the nominee.
10. Partnerships are a powerful way of leveraging value on DEC science investment. Actively seek out potential partners.
11. Biometrician/statistician to comment on design/analysis.
12. Any research involving vertebrate animals requires prior endorsement by the Animal Ethics Committee.
13. Any research involving humans should be designed in accordance with the guidelines in the Human Ethics Handbook produced by the National Health and Medical Research Council.

14. The Program Leader, Flora Conservation and Herbarium, is required to endorse proposals for lodging specimens with the WA Herbarium.
15. Endorsement by Divisional Coordinator.
16. The relevant Divisional Coordinator will manage the approval process and load the document on the Divisional database.
17. Provide evidence that previous research has been reviewed and considered. Explain the scientific value of the proposed research and discuss the innovativeness and regional impact of the work proposed. The impact and outcomes of the research in the context of climate change should be reviewed if relevant.
18. State precisely the hypothesis or question that the study will answer. List (and number) multiple hypotheses so that the methods of analysis can be related to each aim.
19. Describe the anticipated outcome of this project, i.e., how will this information be used, what skills will be acquired, what products and devices will be produced, what are the benefits to DEC?
20. Explain who will use the knowledge gained and how will it be communicated to the user.
21. Describe substantive components/tasks and when they will be completed.
22. Self explanatory.
23. Describe the methodology to be used in the project.

If an experiment:

- List the dependent variables.
- List the experimental treatments and controls, and covariates/blocking factors.
- Provide a map/diagram showing the experimental layout, and those features relevant to the design.
- Give the proposed method(s) of analysis. For ANOVA-type experiments, provide a skeleton ANOVA table showing source of variation, residual/error and total df. Organize the method(s) so that it is clear which portions of the analysis correspond to the experimental aims.
- Indicate why the experiment is of the chosen size.
- Explain if the plots should be permanently marked for future relocation.
- Detail plans for labelling, identifying, mounting and incorporating voucher specimens into the WA Herbarium, or providing voucher specimens or other collections to the WA Museum.

If a survey involving transects/quadrats:

- Specify the nature of the survey (random, systematic, stratified).
- Provide a map/diagram showing the survey layout.
- Explain how the survey points are to be chosen.
- Explain the choice of replication with survey points, within strata (if applicable) and overall.
- Nominate the specific methods of analysis to be used. Organize the methods so that it is clear which portions of the analysis correspond to the survey aims.
- Explain if the transects/quadrats should be permanently marked for future relocation.
- Detail plans for labelling, identifying, mounting and incorporating voucher specimens into the WA Herbarium, or providing voucher specimens or other collections to the WA Museum.

If a reconnaissance:

- Explain what is being assessed or searched for.
- Provide location details/map.
- Explain the design or approach to be taken.
- Detail plans for labelling, identifying, mounting and incorporating voucher specimens into the WA Herbarium, or providing voucher specimens or other collections to the WA Museum.

If a taxonomic or genetic study:

- Explain the approach to be used (cladistics, phenetics, phyletics etc).
- Explain how material will be obtained for study.
- Detail plans for labelling, identifying, mounting and incorporating voucher specimens into the WA Herbarium, or providing voucher specimens or other collections to the WA Museum.

If a questionnaire or social survey instrument:

- Explain the approach to be used (e.g. survey).
- Explain the reasoning behind the proposed methodology including location details, sample size, distribution plan and sample frame.
- Provide a copy of the survey instrument e.g. questionnaire to the Social Science Coordinator for approval.

23. Have proposals for lodging specimens been discussed with the WA Herbarium and/or WA Museum? Have they agreed?
24. Identify location and format of data.
25. Identify data custodian.
26. Anticipated expenditure.

It is the Project Leader's responsibility to check that the completed SPP addresses all 26 items. If an item is not applicable, write N/A. Incomplete SPPs will be returned to the Project Leader for completion.

Closure of Science Project Plans (SPPs)

Closure of an SPP will involve the following steps:

- review of the achieved outcomes against those stated in the SPP (Project Leader);
- review of the outputs that have been produced – are these adequate, or are more required? (Project Leader); and
- notification to Divisional Coordinator by way of Closure of SPP form.

SCIENCE POLICY GUIDELINE 1
Appendix 1 – Science Project Concept Plan
(2 pages maximum)

1. Project title:

2. Background and Aims:

3. Expected outcome:

4. Strategic context (in relation to Corporate Plan and Business Plan):

5. Expected collaborations:

6. Proposed period of the project:

7. Staff (FTEs):

	Year 1	Year 2	Year 3

8. Indicative Operating Budget ($):

	Year 1	Year 2	Year 3
Consolidated Funds (DEC)*			
External Funds			
Total			

*Indicate the DEC service that is providing the funds

9. Project Leader Date

10. Forward to relevant service Director for comment.

Consideration of SCP. …….. - ……..

Decision: ☐ Rejected (return to Project Leader)
☐ Approved subject to approval of SPP

Comment
……
……
……..
Director …….. Date ……

Concept Plan No: ……. - ……..

Science Project Plan Received: Date ……

(NOTE: SPPS NOT RECEIVED WITHIN 3 MONTHS OF THE SCIENCE PROJECT CONCEPT PLAN BEING APPROVED BECOME VOID)

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SCIENCE POLICY GUIDELINE 1
Appendix 2 – Science Project Plan

Important: Refer to the *Explanatory Notes* (Science Policy Guideline No. 1) when preparing an SPP.

PART A Title and Location

SPP Number:

Concept Plan No: [to be used until the full SPP has been submitted and an SPP number has been allocated]

1. Project Title:

2. DEC Program/Region/Division:

3. Staff [Names and estimates of percentage of time]:
   Project Leader:
   Other Scientists:
   Technical Officers:
   External Collaborators:
   Volunteer(s):

4. DEC Service:

5. a) IBRA/IMCRA Region(s):
   b) NRM Region(s):
   c) DEC Region(s)/District(s):
   d) Plot/transect geocode(s) / location:
   e) Plot/transect protection requirements (fire, logging, earthworks, dieback etc.)

6. Related SPPs:

7. Proposed commencement date: and proposed completion date:

8. Date of submission of this Plan and signature of Project Leader:

9. Nomination of internal or external scientist(s) capable of providing expert advice on the scientific merit of the SPP:

a) ……

b) ……..

PART B Endorsements

10. List the relevant professionals whom you have consulted about the SPP:
What opportunities exist for collaboration with other science programs, other departmental staff, universities, other government agencies, industry, traditional land owners and the broader community? Explain how these linkages were investigated/developed.

11. Biometrician / Statistician:
Return comments to Divisional Coordinator

12. Animal Ethics Committee: (If applicable)
Return comments to Divisional Coordinator

13. Social Science Coordinator for human ethics consideration (if applicable)
Return comments to Divisional Coordinator

14. Program Leader, Flora Conservation and Herbarium (If applicable; see Point 24 below):
Return comments to Divisional Coordinator

15. *Divisional Coordinator*:
Divisional Coordinator arranges that a copy of the SPP is sent to the nominated scientist (See No. 8) for a confidential assessment if required.

16. After endorsement please forward to the relevant Divisional Coordinator.

PART C Relevance and Outcomes

17. Background and literature review:

18. Project aim:

19. Anticipated project outcome(s) including benefits to DEC:

20. Anticipated users of the knowledge to be gained and technology transfer strategy:

21. Major tasks, milestones and outputs:

22. References

PART D Study Design

23. Method [including statistical analysis]:

PART E Data Management and Budget

24. Estimated number of vouchered plant or animal specimens:

25. Data management [how and where are data to be archived/maintained? - see Science Policy Guideline No 4]:

26. Data custodian:

27. Budget Estimate [anticipated expenditure]:

Consolidated Funds (Indicate DEC service providing funds)

	Year 1 ($)	**Year 2 ($)**	**Year 3 ($)**
FTEs – Scientist			
FTEs – Technical			
Equipment			
Vehicle			
Travel			
Other			
TOTAL			

External Funds

	Year 1 ($)	**Year 2 ($)**	**Year 3 ($)**
Salaries/Wages/Overtime			
Overheads			
Equipment			
Vehicle			
Travel			
Other			
TOTAL			

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SCIENCE POLICY GUIDELINE 1
Appendix 3 – Closure of Science Project Plan

SPP Number: .....

SPP title: .....

Project Leader: .....

Status: Completed
Terminated
Suspended

Outputs: (list key publications and documents)
SCIENCE:

KNOWLEDGE TRANSFER:

Data Management:
(see Science Policy Guideline 4)

Hard copy records held at .....

Electronic data stored on: .....

Backup copy stored at: .....

Metadata provided (contact GIS Section Data Administrator):

Signed by Divisional Coordinator .....

Date:

SCIENCE POLICY GUIDELINE 2
Implementing Research Results

Introduction

Typically science undertaken through the Department of Environment and Conservation (DEC) is considered applied science. Research is conducted to fulfil the Mission and Objectives set out in the DEC Corporate Plan and the relevant Division Strategic Plans. Thus, research is conducted so that it can be used (i.e. applied), either by DEC field staff following operational prescriptions, through changes in Government or Department policy or by the general public having a better knowledge and understanding of the facts.

To be most effective, completed research findings and recommendations must be:

- published in the scientific literature,
- publicised and promoted, and
- implemented.

Research results that do not become known to the target audience or are not implemented are of little value to DEC. It is the responsibility of each scientist, of the Project Leader and of the relevant Divisional Coordinator to ensure that implementation occurs.

Methods for implementation of research

Implementation (or technology transfer) can be achieved by a variety of means, e.g.:

- participation in teams preparing tools for management, such as draft regional or area management plans, Interim Management Guidelines, draft wildlife management programs, draft Department Policy Statements, etc.,
- preparation of briefing papers for the Corporate Executive and/or the Minister,
- steering the strategic direction of agency objectives and related projects toward more effective outcomes,
- preparing articles for *Landscope*, *Conservation News*, or other publications that will reach the target audience, and working with the major news media outlets, and/or
- ensuring that relevant management prescriptions are prepared or updated and assisting DEC staff in implementing them.

Often the last of these is the most important. Some methods of achieving this are:

- presenting seminars to operational staff in DEC regions and districts and to external audiences;
- conducting demonstrations in the field for selected regional and district staff;
- preparing, in association with regional staff, new operational plans and job prescriptions incorporating the new research findings;
- participating in the training of staff.

Role of the Project Leader

Where research findings need to be implemented by DEC operations staff it is essential that the Project Leader assumes a lead role in promoting change in a collaborative and cooperative manner, through advice and direct assistance as required.

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SCIENCE POLICY GUIDELINE 3
Publications, Reports and Manuscripts

Introduction

The practice of the Department of Environment and Conservation (DEC) is that express approval must be obtained to publish research findings and educational articles. The authority to approve publications has been delegated to the relevant Divisional Coordinator. Approval to publish is sought by submitting electronically an Approval to Publish form with a copy of the publication to the Divisional Coordinator, and the Biometrician and/or the Herbarium Curator if applicable. Approval to publish is required for all publications including divisional reports and other DEC forms of publication.

The purpose of this process is to ensure that:

- all publications and reports produced are of high quality and are assessed for policy implications prior to publication;
- papers are published in appropriate outlets, especially (where possible) in high standard, widely-circulated, refereed journals;
- publicity material including published reports, brochures, pamphlets etc. conform to government and corporate design and layout (consult Strategic Development and Corporate Affairs Division for advice).

Approval to publish

The Department will always support DEC staff who wish to publish research as long as it is sound science and/or up-to-date information. However, research results acquired while employed by DEC or while using DEC's funds are the property of DEC and a draft paper or report does not become an official Department document until such time as it has been approved for publication via the Approval Form.

Often the results of DEC research are politically sensitive, because they indicate that previously unknown environmental problems exist or that past policies or practices need modification. (There's nothing wrong with this - indeed it is the function of research to challenge the existing order). Lobby groups may want to use research results to obtain action by Government or, sometimes, simply to embarrass policy-makers or politicians. For these reasons it is essential that DEC has the opportunity to review research findings and their implications before they are widely released. Also it is essential that people who wish to use knowledge have the appropriate context for that knowledge.

Some publications will have no or minor management or policy implications. In these cases there will be little or no delay in obtaining approval to publish if the paper is of sufficient quality (sound science etc.) and the target journal is appropriate. In other cases there may be major management or policy implications. These should be considered by managers and policy-makers before approval to publish a final draft is sought and, again, there will be little or no delay. If this is not done there may be some delay in assessing and possibly amending the publication.

It is also recognized that many publications arise from collaboration with one or more external colleagues. In such arrangements DEC input may only result in junior authorship in any publications, and the internal review process will be undertaken, as is appropriate, within

the senior author's organization. In such situations, DEC officers are expected to keep track of the progress of any such publications and complete the Approval to Publish Form as appropriate, and attach a draft manuscript.

Authors intending to submit a paper to DEC journals, Conservation Science Western Australia and Nuytsia, must also obtain approval to publish. Approval to publish and submission of the paper to the journal editor are separate processes.

Publication Process

Scientists are sometimes not clear when to publish. Some err on the side of publishing too much preliminary work and later have to admit that their initial results did not hold up over a longer time frame. Others insist on dotting every *i* and crossing every *t* before publishing and tend to publish too little and too late. Either of these extremes should be avoided, and advice from more experienced scientists or managers should be sought if necessary.

It is expected that science undertaken in DEC is published, preferably in high quality, refereed journals. Publication in DEC journal, Conservation Science, should be restricted to papers that, because of their length or limited relevance outside Western Australia, may not be accepted by external journals. If in doubt, seek advice from your Divisional Coordinator. Similarly, educational and/or information papers should be published in quality, reputable journals or magazines. Publication in Divisional reports is an interim measure to facilitate reporting of results and their interpretation to DEC Staff or funding agencies. It is not meant to replace publication in a refereed journal.

Electronic media are increasingly being employed for publication. DEC supports the use of all appropriate media in order to publish the work of its staff. Refer to DEC's Online Publishing Policy Statement for further information on appropriate use of electronic media.

The first step in publishing research results is usually the preparation of a draft manuscript. You should be careful with copies of drafts. There is a general rule on copying drafts that should be followed. Drafts, clearly marked as *draft-in-confidence*, may be sent to colleagues, both within and outside DEC, for critical appraisal but copies may not be supplied to anyone else, including political or lobby organizations, without the approval of the relevant divisional Director. It is not ethical for colleagues to copy or use information in drafts supplied to them for review. Obviously, you should follow the journal rules when you are asked to review or referee a manuscript.

Assignment of copyright or licence to publish

For all papers published by officers of DEC, copyright is held by the State of Western Australia, not by DEC or the individual officer. It is best that this requirement is brought to the attention of the Editor of the journal when the paper is submitted. Attached is a sample letter that provides the appropriate words and tone.

Statistical analysis

It is most important that statistical analysis of the data collected is sound. If improperly analysed papers were to enter the scientific literature, DEC's (as well as the scientist's) reputation and credibility would be exposed to attack. It is therefore sensible to heed the following good advice (taken from Maindonald, *N.Z. J. Agr. Res.* 35: 121-142, 1992):

- describe the statistical analysis in enough detail that another scientist could reproduce the analysis in another data set;
- include standard errors or standard deviations (or their equivalent) and sample sizes wherever relevant. Where there are multiple error strata, be sure to quote the SE that is relevant to the comparison made;

- provide the reader with some reasonable minimum assurance that coarse checks of the assumptions underlying the statistical methods have been made;
- ensure that the statistical analysis correctly reflects the experimental and sampling designs;
- ensure that replication is at the level of whole treatment units, and analyse accordingly.

Explanatory Note – Approval Form

Type of submission:

- Paper for external journal
- Paper for Conservation Science WA
- Paper for *Nuytsia*
- Book chapter
- Book
- Conference paper
- Conference paper - abstract only
- Workshop paper
- Interim Grant Report
- Final Grant Report
- Text for a poster
- Article for *Landscope*
- Article for external popular magazine (e.g. *Geo, Australian Geographic, Australian Natural History*)
- Pamphlet, brochure, guideline, published report etc.
- Any other publication with a DEC author identified in it
- Web pages and other electronic media

Note: book reviews are excluded.

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SCIENCE POLICY GUIDELINE 3
Appendix 1 - Approval to Publish Form

APPROVAL FORM FOR SCIENTIFIC AND TECHNICAL PUBLICATIONS, REPORTS (INCLUDING INTERIM GRANT REPORTS), POSTERS AND CONFERENCE ABSTRACTS, WEBSITE ETC.

Junior authors on publications to be reviewed and submitted by an external senior author must also complete this form.

Type of submission .....

For publication in .....

Author(s) .....

Title .....

.....

Manuscript already read critically by .....

Has manuscript been read by Project Leader (if applicable)? .....

To which SPP does this publication relate? /

Attach the plain English synopsis of <250 words and summary of management implications Yes ☐

Avoid jargon, explain why the research was done, give the main results, and if appropriate indicate the conservation status of the taxon studied.

Submitting AUTHOR'S NAME ...../...../20...

PROGRAM .....

This form and the accompanying manuscript should be submitted to Divisional Coordinator and Biometrician by email simultaneously, and to the Herbarium Curator if it contains a taxonomic component related to plants, algae or fungi.

1. Paper submitted to Biometrician/statisician for review of statistical aspects

Approved by Biometrician/statistician ..../...../20...

OR returned to author for revision ..../..../20...

2. Paper submitted to Herbarium Curator if applicable

Approved by Curator …./…../20…

OR returned to author for revision …./…./20...

3. Paper submitted to Divisional Coordinator for appraisal of policy, economic and management implications in consultation with Senior Managers(s) in other relevant Divisions if required

Approved (or noted) by Divisional Coordinator ..../...../20...

OR returned to author for revision ..../...../20...

4. If approved, the Divisional Coordinator, returns MS to author for submission to external journal, and sends signed approval sheet and Abstract to Librarian for databasing .../...../20...

SCIENCE POLICY GUIDELINE 4
Databases and their Management

Introduction

Databases produced, or maintained, by officers of the Department of Environment and Conservation (DEC) are a key source of information underpinning the Department's operations. In the early stages of their development, databases may embody a significant investment of an officer's time and energy. Although all scientific databases in DEC are corporate, it is recognized that it is unfair to allow "free riders" to use such information for personal advancement.

Access to data

When approached for information from scientific databases maintained by you, it is essential to obtain in writing from the requester:

- what information is being sought;
- how it will be used;
- whether the requester is an officer of DEC, another state agency, a Federal agency, an academic, a consultant, or an interested member of the public;
- how the information will be acknowledged;
- whether the output requested is a complete or partial hard copy or electronic copy of the database;
- determine whether a third party could on-sell the information.

Then consult the Divisional Coordinator about the sensitivities of the request. For convenience, a sample letter is attached (Appendix 1).

It is recognised that some databases have a purpose associated with timely and direct access by third parties including the general public. To accommodate this, the Divisional Coordinator may approve blanket access/release to data within a database for a specific function and/or purpose

The position taken by DEC is that officers who have been assigned responsibility for the management of scientific data have first right of analysis of the data accrued. However, this is not open-ended. DEC does not approve of this as a means of obstructing legitimate access to data (e.g. for corporate purposes). If no activity (such as data collection or reporting) has occurred within 3 years, then access should be granted subject to the six questions in the appended sample letter being assessed satisfactorily.

Database management

Corporatisation of research, survey and monitoring databases is required. It needs to be emphasised that historical datasets on out-dated hard discs and/or saved in formats that are no longer used are less retrievable than microfiche data from the 1950s or from handwritten records.

Databases that are not corporatised are unlikely to survive in the long-term. This means that officers who resign or retire put at risk their years of labour in maintaining databases if they

have not properly corporatised these databases. It is essential that the issue of data maintenance at the conclusion of a project is adequately addressed. The ongoing management of each database is to be considered explicitly during the annual appraisal (EPDP) of officers.

The State Records Act 2000 requires explicit strategies (Records Management Policy No 61) for managing databases. The following steps in corporatising databases are to be followed:

1. a specific officer is to be nominated as custodian, with responsibility for its management and regular maintenance;
2. a metadata form is to be completed (Appendix 2) and updated into WALIS. WALIS is searchable and updateable on the internet using Interrogator;
3. at each upgrade of hardware and/or software, it is necessary to assess whether migration to new digital formats is required in order to prevent loss of research data.

Historical paper-based datasets are to be lodged with DEC's library for incorporation in the historical collection. Paper-based datasets should be considered for transfer to the archive collection at the State Records Office. Transfer after 25 yrs is mandatory under the State Records Act, but the records may be borrowed if necessary. Liaison should occur with Corporate Information Section, which is responsible for the transfer of DEC's records to the State Records Office.

Government of **Western Australia**
Department of **Environment and Conservation**

Your ref
Our ref:
Enquiries:
Phone:
Fax:
Email:

DRAFT sample letter re access to data.doc

NAME

ADDRESS

HERE

Dear

YOUR REQUEST FOR ACCESS TO DATA

Thank you for your recent enquiry/correspondence (ref:).

Before a decision can be made, I need the following information from you:

1. Which data exactly are being sought?
2. Why do want to access these data?
3. What use is intended for these data?
4. What is the title and authorship of any proposed paper(s) intended to include use of the data requested?
5. When do you anticipate these paper(s) will be (a) submitted and (b) published?
6. If not via a co-authored paper, how is use of the data supplied to be acknowledged?

Please note carefully:

- These data may not be passed or on sold to a third party
- These data will be supplied 'as is'; i.e. data will not be checked further for accuracy or currency of names of taxa
- These data are the property of The State Government of Western Australia and this must be acknowledged explicitly in any report/publication/presentation using the data.

Any disagreements about your responsibilities arising in relation to this reply will need to be settled without delay by consultation with myself and my Divisional Leader.

Yours sincerely

Your name HERE

Your position here

Date here

cc: Your Divisional/RegionalLeader

SCIENCE POLICY GUIDELINE 4
Appendix 2 - Databases and their Management

METADATA FORM (Appended to guideline No. 4) RF2

Name:	**Date:**
Position:	
Program/Division:	
E-Mail address:	**Tel. No.:**

Custodian:
Contributor/s:

Title:

Description

Search words / Subject:
Abstract (Purpose/Description of contents of dataset):

Geographical location (place name/s) OR IBRA/IMCRA Region (code):			
Indicate if 'All of WA'(Yes): OR provide location coordinates defining the area:			
Latitude (Deg/Min/Sec) **Longitude (Deg/Min/Sec)**		**Latitude (Deg/Min/Sec)** **Longitude (Deg/Min/Sec)**	
Latitude (Deg/Min/Sec) **Longitude (Deg/Min/Sec)**		**Latitude (Deg/Min/Sec)** **Longitude (Deg/Min/Sec)**	

Currency and status

Commencement date (of field work/data collection):	**Completion date:**
Status of data: (Complete/In progress):	
Maintenance and update frequency: **Daily** ☐ **Weekly** ☐ **Fortnightly** ☐ **Monthly** ☐ **Annually** ☐ **Irregular** ☐	

Access

Format:
Location / Directory address:
What reports/publications have been produced/Available format types?
Constraints (access/reliability):

Data Quality

Original data source/s:

Additional Metadata

Related information:
SPP No.:
Size of the dataset:
Where has the data been backed up/archived?

SCIENCE POLICY GUIDELINE 5
Scientific ethics and etiquette

Introduction

The ultimate goal of scientific research is to establish the truth about some matter deemed worthy of investigation. In the context of Department of Environment and Conservation (DEC), this translates to developing a truthful, objective and verifiable (i.e. scientific) basis for conservation, management and public enjoyment of the environment in Western Australia.

It is taken as self-evident that all DEC staff are committed to embracing the highest standards of conduct in science. In doing so, the work done and the responsibility shown by staff engaged in scientific endeavour enhances the reputation of DEC.

In the quest for truth, there can be confusion and temptation. Conflicting obligations may arise and misjudgements will inevitably occur. These range from the serious (such as intentional fraud) to the negligent (such as having insufficient replicates because of shortage of resources).

Ethical behaviour in science

DEC recognizes that the following behaviour is unethical and therefore unacceptable. Misconduct does not include honest errors or honest differences in interpretation of data.

- *Concoction and fudging of data to gain support for a hypothesis.* It is quite a normal part of the process of science for most hypotheses to turn out to be incorrect. Therefore it is no disgrace to have spent time and money disproving and having to discard a hypothesis that was formulated.
- *Failure to distinguish between opinion, hypothesis, theory and fact.* In discussing a subject in a meeting or while advising policy or operations staff it is necessary to distinguish between what is known, what is interpretation and what is opinion.
- *Plagiarism*. Ideas, methods etc. taken from another's work must be adequately acknowledged.
- *In priority disputes, falsely imputing plagiarism to others who have independently discovered the same matter.* Independent discovery of the same thing in science is not the rare phenomenon that many imagine it to be.
- *Excessive secretiveness*. There needs to be an appropriate balance between keeping ideas, methods etc. confidential and sharing them with others. However it is proper to exercise care in sharing data, draft manuscripts etc. before a paper has been accepted for publication.
- *Eponyms*. It is unacceptable to name something after yourself, or even suggest to a taxonomist that a new species be named after yourself.
- *Under-acknowledgement of collaborators*, particularly failure to offer co-authorship for technical assistance of a high standard. Usually the person who writes the first draft is first author. Order of other authors should be resolved before writing commences (preferably before a study commences). Minor contributions should be acknowledged in the Acknowledgments section.

- *Ad hominem attacks.* Debate the issue instead of criticizing the proponent of some issue that you disagree with. It is possible to be controversial without being argumentative.
- *Excessive self-publicity.* This is an exaggerated form of egotism, and represents gross imbalance between advancement of self and advancement of knowledge.
- *Issuing research results in least publishable units* in order to increase one's publication rate. A persohn's scientific reputation will suffer as employment of this gambit as it is transparently obvious to other scientists.
- *Honorary authorship.* Adding gratuitous co-authors, often one's hierarchical superiors, to a paper is unacceptable practice. It is also unprincipled to accept honorary authorship if it is offered.
- *Failure to acknowledge intellectual predecessors*. Although it is not usual to reference Darwin every time we talk about evolution through natural selection (because his ideas are now the backbone of biological theory), it is wrong to promote someone else's ideas as your own.
- *Irresponsibility with research funds*. This includes wasting time and money on low priority research or poorly conceived research.
- *Inadequate knowledge of the literature.* The scientific literature is large enough without adding your misconceptions, supposed breakthroughs, or re-inventions to it. A comprehensive and up to date knowledge of the scientific literature.is required to know truly the significance of research.
- *Publishing the same data more than once.* This is unacceptable practice to publish the same data in different publications.
- *Not publishing at all*. Lack of publication means the results are not available to others, and are not used in advancing knowledge.
- *Inflicting unnecessary pain when collecting or handling organisms for scientific study.* Research on vertebrates must follow procedures approved by DEC's Animal Ethics Committee.
- *Misusing your position as a referee.* It is improper to use ideas, contrivances etc. gained while refereeing a paper to further your own research. Such knowledge should not be used until it becomes public (i.e. the paper is published).
- *Inadequate archiving of data.* It is irresponsible not to be up to date with records management of corporate data.

Several of the above issues are reviewed at greater length in "Scientific Excellence, Effectiveness and Productivity", which is available in the Conservation Library and Information Centre at Kensington.

SCIENCE POLICY GUIDELINE 6
Establishment and documentation of Scientific Sites

Introduction

Scientific sites may be established for a broad range of purposes including experimental research, biological survey, and monitoring. The length of time for which scientific sites remain active varies according to the aims of the project, but in most cases it is important to have an accurate record of the location where data have been collected. Good location information is necessary for proper interpretation of data and allows sites to be revisited at a later date for collection of additional information to address issues that may not be evident at the time when a site is initially established (e.g. monitoring change in ecosystem condition over time).

Documentation of scientific sites

Sites that are measured repeatedly over time represent a substantial investment of staff time and financial resources and therefore may warrant protection from unintended disturbance that may compromise site integrity or the capacity to achieve the aims of a project. The risk of a site being compromised by disturbance can be minimized by planning and consultation at the commencement of a project, and by having information about the site readily available to other sections of the Department who are responsible for planning and implementing operations including prescribed burning, bushfire suppression, timber harvesting and vegetation clearing associated with infrastructure development (e.g. visitor facilities, walk trails).

Important considerations in the selection of a site include:

- For how long will data be collected at the site?
- Does the site need to be permanently marked in a manner that will allow it to be re-located for measurement at some time in the future?
- Is the site sensitive to particular types of disturbance that can be avoided by pre-planning and clear demarcation in the field?
- Is there a need for an area adjoining the site to also remain unaffected by particular disturbance for some period of time as a buffer zone?

It is important that consideration be given to these factors prior to establishing sites in the field. At the same time, it is recognised that for practical reasons the details of individual site locations may not be determined until a project has been approved and field work commenced. Methods used to gather data for a project, and the location of sites at which data will be collected should be documented in a project plan.

Scientific Sites Register

Science Division has developed a Scientific Sites Register (SSR) (http://scientificsites.dec.wa.gov.au), a corporately managed information system for providing consistency in the recording and management of data relating to marine and terrestrial sites used for survey, monitoring and experimental studies throughout Western Australia. The Register makes data visible to a wide range of Departmental users thereby better protecting the investment in scientific sites. The Register also aligns with business processes associated with planning for disturbance activities by providing a formal mechanism for

seeking comment from Divisions/Branches potentially affected by the establishment of new sites prior to their establishment.

Information in the Register is automatically converted to a spatial layer for inclusion in *EcoBase*, DEC's primary corporate spatial data store, and distribution with the Corporate Data Delivery Program (CDDP) as a shape file.

While anyone within DEC can view site and project details without special access, staff wishing to add a site must be registered to do so by contacting the SSR administrator (ssradmin@dec.wa.gov.au).

The procedure for registering a new site is as follows:

1) The officer proposing a new site logs into the Site Register and provides details about the context and location of the proposed site. This includes recognition of potential threats from DEC-managed activities. These are currently identified as timber harvesting, fire and vegetation clearing but can be expanded as required to accommodate new circumstances.

2) If one or more potential threats are recognised, then an automatically generated email is sent to the nominated Threat Contact advising them of the intention to establish a scientific site. Location details are provided in a shape file attached to the email.

3) Nominated Threat Contacts are requested to provide comment back to the proponent within 1 month of notification. In situations where an impact on departmental operations is identified it is expected that there will often be ways by which this can be minimised or eliminated, for example by minor adjustment to the location of the proposed site. Situations may arise where establishment of a site would result in unavoidable impacts on operations, and in this case further negotiation will be required to assess whether the anticipated benefits provided by a site are of sufficient importance to justify these impacts.

4) The site proponent collates responses received from Threat Contacts, explains what actions have been taken to address any issues identified, and forwards these by email to the relevant Divisional Coordinator who then authorises the site or initiates further discussion if some issues are not adequately resolved. The process of authorising a site is completed on-line in the Site Register.

5) Once a site is authorised, automatically generated emails are sent to the Regional and District Managers responsible for the area where the site will be established. Other nominated contacts may also be notified. The site then becomes visible to all users accessing the Site Register.

6) In the event that no threats are identified the relevant Divisional Coordinator are notified by email that a proposed site is awaiting authorisation.

Please note that the requirements of this Guideline do not discharge the project proponent from their corporate and regulatory responsibilities of obtaining the permission of; (a) the owner or occupier of private land; or (b) the Department or Authority controlling Crown land, prior to entering upon or establishing a scientific site on a parcel of land.

Essential documentation for scientific sites

The Science Project Plan (SPP, see Science Policy Guideline No. 1) is the primary control document relating to scientific sites.

Information about the location, dimensions and requirements for buffering around research sites should be specified. The following default settings for spatial data will apply unless otherwise specified:

- sites identified by a centroid will have a 25 m buffer zone applied to them,
- positional accuracy will be assumed to be ±10 m,
- datum will the 1994 Geocentric Datum for Australia (GDA 94).

Information provided will be consistent with the minimum requirements for flora and vegetation survey sites as proposed in the draft Technical Guide for Botanical Surveys being prepared by DEC, the Environment Protection Authority (EPA) and the Office of the EPA.

Sites managed by external organizations

External organizations including other government agencies, universities and mining companies may undertake scientific studies on lands managed by DEC, and it is in the best interests of both parties that sites associated with these studies are dealt with in the same way as sites established by DEC. Having external sites visible on a corporate information system will assist in avoiding inadvertent disturbance, and will allow for continuity of information in the event of staff changes in either organization.

External organizations wishing to establish sites on DEC estate will be required to provide information for the site register and to participate in the process of identifying potential threats and addressing issues that may arise from this process. External organizations will also be required to nominate a DEC officer as a contact point for liaison about management of study sites.