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ASSESSMENT | PLANNING | MANAGEMENT

SPATIAL DATA GUIDELINES

Gnangara Sustainability Strategy
Biodiversity Values
(Project No. 169-05)

Report prepared for:
WA Department of Environment and Conservation

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1. Introduction

1.1 Background

The Department of Environment and Conservation (DEC) is putting together biodiversity information for use in the assessment of various land use and water use scenarios in the Gnangara Mound System as part of the Gnangara Sustainability Strategy (GSS).

A series of data protocols and standards are required to guide the collection, manipulation, analysis and management of data developed as part of the GSS to maintain information integrity for the process and within the wider DEC operations.

1.2 Data Guidelines

These data guidelines contain information on specifications, guidelines and standards for data, including:

- Spatial data standards (section 5.2)
- Spatial referencing standards (section 5.3)
- Data transfer standards (section 6)
- Metadata (section 7)

In addition, guidelines have been included for consideration for a data supply process and map production standards.

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2. Key Data Issues, Standards and Protocols

2.1 Key Data Issues

A number of key issues should be taken into consideration when developing datasets to support biodiversity assessment.

In particular, it is essential that there is a clear understanding:

- of what information is required for analysis
- of how each dataset is to be used for assessment and analysis
- that all datasets must be properly documented

Generally, problems that arise in the interpretation of information and their fit for use can be attributed to an incomplete understanding of what is required as analysis output or inadequate adherence to data audit procedures or documentation.

2.2 Standards and Protocols

When working with digital spatial data there are a number of standards and protocols to be considered in order to collect and analyse information in a relevant, useful and repeatable manner.

Points to consider include:

- Datasets must be useable
    - For example, a dataset with over 500 fields is too large to be useful
    - Attribute lists and descriptions should be included in the metadata
    - Look up tables and attributes should be accurately and clearly defined
- Appropriate documentation of datasets
    - Intermediate datasets must be identified and be accompanied by metadata if distributed
    - Metadata should be updated with each version of the dataset
    - Metadata should be compiled by the data generator
    - All metadata fields should be completed
- Data standards and quality
    - Care should be taken to avoid, for example, lack of topology, slivers or dangle errors, incorrect attribution, non-unique identifiers, etc (see section 5.2)
    - Datasets should be spatially referenced with the correct projection coordinates and associated projection files (see section 5.3)
    - Datasets should comply with standards specified for data transfer (see section 6)
    - Datasets should comply with appropriate naming conventions (see section 6)

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3. Software

The software outlined in this section includes those which are likely to be used by DEC employees and associated project staff for the collection and derivation of information to be used for biodiversity assessment as part or the GSS. The list is not exhaustive and other systems may be adopted for use as required. A recommendation of these systems is based on several factors including:

- Ease of importing and input data requirements
- Output of information compatibility with other systems
- Reliability and transparency of technology
- Resources required to implement and operate the system
- Fitness for purpose of use
- Compliance with organisational standards

3.1 ArcGIS

ArcGIS is a desktop GIS which operates as a complete GIS solution that allows automation, management, display and quality output of geographic data. Developed by ESRI, ArcGIS provides an extensive selection of functions and tools which allow users to organise data, query data and create new geographic data from existing data, as well as combine local information with data from internet map servers.

A number of licensed extensions are available which operate within the ArcGIS desktop to enable specific value added functionality. Common useful extensions include:

- **Spatial Analysis** – allows grid or raster-based spatial modelling and analysis
- **ArcEditor** – provides a secure editing environment for vector data sets and is able to build topological relationships within datasets in order to maintain data integrity and manage geographic data
- **ArcInfo** - includes all the functionality of ArcEditor and ArcView and adds advanced spatial analysis, extensive data manipulation, and high-end cartography tools

3.2 ArcExplorer / ArcGISExplorer

These packages are free distribution software applications that can display and query GIS data both locally and over the internet. Developed by ESRI, they are an inexpensive way to explore GIS data and a number of common image formats.

This software can perform a number of spatial functions, including the basics, such as pan, zoom, identify, locate and query with geographic and attribute data. The software packages also allow you to download and print maps directly from internet map servers.

3.3 DEC GIS

DEC GIS is an open source customised GIS application used within DEC offices. The application is locally installed on a desktop and allows users some interactive

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functionality with DEC's centralised corporate data sets. The package allows simple dataset creation, but does not build topology.

3.4 Other GIS Products

In addition to the above GIS software, some projects may use a range of other GIS products and extension software to enhance or improve datasets. Examples of these are Spatial Analyst, ERMapper, Imagine and 3D Analyst.

In addition to functioning GIS software packages there are a number of web browser based data viewers which allow the identification and interpretation of data with some simple functionality such as pan zoom and query. An example of this includes the WA Atlas (https://www2.landgate.wa.gov.au/waatlas/waatlas/index.jsp).

3.5 Textual Database

A component of information developed or collected will most likely be textual in nature, which may be linked to a spatial dataset through a locator or identifier. This information will usually be organised in a tabular form within spreadsheets (commonly MS Excel) and database tables (commonly MS Access). In many cases information is stored within a database as an interim measure prior to combining with a spatial layer or as a look up table for a spatial layer.

Relational databases may also be built for complex information, where a number of tables are related through a common identifier, which may also be further linked to a spatial locator or identifier through GIS software. To manipulate, maintain and query such a database, it is usual for custom query, reporting or graphical user interfaces to be developed where the database becomes a common repository for thematic data (ie flora or fauna records, vegetation community and condition information, land management information).

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4. Fundamental Data Sets

There are a number of datasets which are fundamental in the provision of directly relevant information for the identification of biodiversity values for the GSS. These datasets relate directly to the derivation of key biodiversity value criteria components. The criteria components can be broadly defined as:

- **Biodiversity Status** – ecosystems identified as important through legislation or policy (ie threatened ecological communities, threatened species occurrence, ecosystems of importance (RAMSAR etc), key habitat areas, biodiversity hotspot, vegetation rarity)
- **Biodiversity Condition** – good, poor (based on vegetation structure completeness, soil integrity, canopy)
- **Landscape context** – proximity of patch to adjacent or nearby vegetation, important wetland buffer, riparian zone buffer (threshold distance)
- **Security** – formal reservation status, conservation agreements
- **Threats** – surrounding land use, mapped pest and weed species, inappropriate fire, *Phytopthora cinnamomi* extent

The datasets identified which may relate to these criteria are presented in Table 1, below.

Table 1 – Biodiversity value fundamental datasets

Dataset	Custodian	Biodiversity Value Criteria
Vegetation		
Vegetation Complexes (pre-European)	DEC	Biodiversity status
Mattiske Vegetation Type	Mattiske Consulting	Biodiversity status Biodiversity Condition
NVIS/Beards vegetation Type (pre-European)	DAFWA	Biodiversity status
Remnant Vegetation Extent	DAFWA	Biodiversity status Biodiversity Condition
Vegetation Complexes with <10% or <30% retention over the Swan Coastal Plain	GSS	Biodiversity status
Wetlands		
Geomorphic wetlands	DEC	Biodiversity status Biodiversity condition
RAMSAR wetlands	DEC	Biodiversity status
Rare and Threatened species and ecological communities		
Declared Rare Flora	DEC	Biodiversity status
Priority Flora	DEC	Biodiversity status

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Dataset	Custodian	Biodiversity Value Criteria
Threatened Ecological Communities	DEC	Biodiversity status Biodiversity condition
Modelled predicted species distributions		Biodiversity Status
Flora & Fauna		
Herbarium specimens	DEC	Biodiversity status
Museum specimens	WA Museum	Biodiversity status
Fauna File	DEC	Biodiversity status
Birds Australia database	Birds Australia	Biodiversity status
Wetland Invertebrates	ECU	Biodiversity status
Stygofauna		Biodiversity status
Ecological Linkages		
Perth Biodiversity Project Regional Ecological Linkages	WALGA (PBP)	Landscape context
LGA Local Linkages	LGA's	Landscape context
Fire		
Fuel Age	DEC	Threats
Fire History		Threats
Pathogens		
Phytopthora occurrence	DEC/NRM Regional Groups	Threats
Phytopthora spread	DEC/NRM Regional Groups	Threats
Groundwater		
Groundwater Contours	DoW	Biodiversity Status
Groundwater Bores (extraction)	DoW Watercorp	Threats
Land Use		
Land Use	DAFWA Watercorp	Threats
Metropolitan Region Scheme	DPI	Threats
Local Government Town Planning Scheme	DPI	Threats
Bush Forever	DPI	Security
DEC Estate	DEC	Security
Regional Parks	DEC	Security

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In addition to these datasets, there are a number of key datasets which provide the basis for the development of an effective biodiversity knowledge base which can be further manipulated and analysed to assist in the derivation of biodiversity values. These datasets include:

- Digital Elevation Model (DEM)
- Terrain Indices (slope, aspect, elevation)
- Topographic indices (topographic position, wetness, ruggedness, solar radiation)
- Land Tenure (public v's private)
- Soil Type & Indices (salinity, acidity, permeability, water retention)
- Landform
- Soil Erosion
- Waterways / hydrography (drainage)
- Groundwater Bores (monitoring)

Further to this there are some common administrative datasets that provide contextual information within which to conduct biodiversity analysis for the GSS. These datasets include:

- GSS boundary
- GSS planning / management units
- LGA boundaries
- Cadastre
- Topographic context data (transport and infrastructure datasets)

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5. Data Quality Standards

When using spatial data for assessment work it is essential that users can have confidence in the quality of the data and its documentation. For this reason it is necessary for assessment data to conform to a set of quality standards.

5.1 Metadata

Metadata guidelines are detailed in Appendix 1. These guidelines are consistent with the Western Australian Land Information System (WALIS) metadata policy (WALIS 2008).

The guidelines and metadata elements are based on the minimum requirements from the Australia New Zealand Land Information Council (ANZLIC) metadata profile (AS/NZS ISO 19115:2005, Geographic information - Metadata) as well as the identified additional WALIS elements to support data transfer and internal data management requirements.

The additional elements include:

- Dataset responsible party
- Spatial resolution of the dataset
- Vertical extent information for the data(set)
- Lineage
- Reference System
- Distribution Format

5.2 Spatial Data Standards

Wherever possible, polygon vector datasets should have topology built with the appropriate extension of ArcGIS in order to minimise error and maintain data integrity for further analysis. This also applies to the editing of vector linework.

5.2.1 Spatial Data Checklist

- The tolerances used when editing/analysing the data should reflect the precision of the data. Fuzzy tolerances and dangle lengths should be appropriate to the scale of the data. Guidelines for setting fuzzy tolerances are presented in Section 5.2.2.
- There should be no dangle errors in the data.
- There should be no slivers in the dataset.
- There should be no unintentional gaps in the data
- There should be no overlapping polygons within the data.
- The data should have topology - i.e. it has been built.
- Projection information should be clearly and appropriately defined in a projection (.prj) file (see Section 5.3).
- Datasets should be useable e.g. a dataset with 500 fields is too large to be useful.
- Make sure all attributes are labelled correctly. Unique identifiers must be unique.
- Make sure datasets are accompanied by lookup tables where relevant.

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- Names of directories and files should comply with the naming conventions outlined in Section 6 (eg character limits, no spaces in names, no capitals etc.). Dataset names should relate as closely as possible to the theme of the data.

5.2.2 Tolerances

Fuzzy Tolerance

When using spatial data the tolerances must be carefully considered.

The fuzzy tolerance is the minimum distance separating vertices (i.e. arc co-ordinates) in a dataset. If two or more vertices are within this distance they are snapped together. This is irrespective of whether they are on different arcs or represent nodes.

For data projected to MGA co-ordinates, the minimum effective fuzzy tolerance is:

Map Scale	Fuzzy Tolerance (metres)
1:1 000	0.050
1:2 500	0.127
1:10 000	0.508
1:25 000	1.270
1:50 000	2.540
1:100 000	5.080
1:250 000	12.700
1:500 000	25.400
1:1 000 000	50.800

A fuzzy tolerance that is too small will result in some intersecting arcs not forming a node or some slivers not being removed. A fuzzy tolerance that is too big will distort arcs and create `knots' by snapping vertices together that shouldn't be snapped.

Other tolerances

As a general rule, the following tolerances (in metres) should be used when digitising:

Map Scale	Snap distance	Weed	Grain
1:1 000	0.5	0.5	0.5
1:2 500	1.3	1.3	1.3
1:10 000	5.8	5.8	5.8
1:25 000	12.7	12.7	12.7
1:50 000	25.4	25.4	25.4
1:100 000	50.8	50.8	50.8
1:250 000	127.0	127.0	127.0
1:500 000	254.0	254.0	254.0
1:1 000 000	508.0	508.0	508.0

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5.3 Spatial Referencing Standards

All data should be stored in Datum - GDA94 as a standard. DEC operates with projected data within the MGA Zones 49 to 52. The region for the Gnangara Sustainability Strategy is contained within projected coordinate MGA Zone 50. This spatial reference is defined below.

Projected Coordinate System: GDA_1994_MGA_Zone_50
Projection: Transverse_Mercator
False_Easting: 500000.00000000
False_Northing: 10000000.00000000
Central_Meridian: 117.00000000
Scale_Factor: 0.99960000
Latitude_Of_Origin: 0.00000000
Linear Unit: Metres

Geographic Coordinate System: GCS_GDA_1994
Datum: D_GDA_1994
Prime Meridian: Greenwich
Angular Unit: Degree

All data for a region should be stored in the same datum and projection in order to minimise potential for error when combining or analysing datasets. Projection files must be created for every data layer.

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6. Data Transfer Standards

Transfer standards identify formats for the transfer of data between different computing environments. They comprise a set of rules for encoding data into fields, records and files for transfer.

For consistent and rational data transfer, formats that are compatible across DEC and other agencies should be used where possible. Any data in transit should be accompanied by a metadata statement indicating the format used if altered from the original format.

6.1 Common Data Formats.

Below is a list of common software formats

6.1.1 GIS - ArcGIS

- Reads standard formats: personal geodatabase, shapefile, AutoCAD (DXF & DWG)
- Imports data from MapInfo (mid/mif)
- Views data from any other spatial format using interoperability tools
- Opens common image data, including: TIFF, JPEG, EPS, BMP, GIF, ERDAS Imagine, MrSID, ECW
- Uses database tables, including: ASCII, dBASE, MDB, SQLServer
- Connects to ESRI Spatial Database Engine (SDE) as a client for geodatabase access (stored in SQLServer, Oracle)

6.1.2 Microsoft Access

Versions of Microsoft Access may affect the transfer of information from one system to another. It may be the case that an older version of the software can not read a database created with a newer version of the software. If this is the case, the data may be saved as an earlier version for transfer or exported to a common format such as CSV.

6.1.3 Microsoft Excel

Versions of Microsoft Excel may affect the transfer of information from one system to another. It may be the case that an older version of the software can not read a spreadsheet/workbook created with a newer version of the software. If this is the case, the data may be saved as an earlier version for transfer or exported to a common format such as CSV.

6.1.4 Microsoft Word

Versions of Microsoft Word may affect the transfer of information from one system to another. It may be the case that an older version of the software can not read a document created with a newer version of the software. If this is the case, the data may be saved as an earlier version for transfer or exported to a common format such as RTF.

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6.2 Naming Conventions and Directory Structures

To minimise potential software and operating system conflict it is recommended that GIS datasets should comply with the following naming conventions:

- Directory names should be a maximum of 8 characters without spaces and capitals.
- File names should be a maximum of 10 characters.3 characters without spaces or capitals.
- An underscore should be used in place of spaces in a folder or file name.
- The name should relate as closely as possible to the "theme" of the dataset, not its purpose.

6.3 Recommendations for Data Transfer

Electronic transfer is the most efficient media for the transfer of data. This includes file transfer or FTP across an internal network or FTP across the internet (requires dedicated FTP site) and email. Each of these options has advantages and disadvantages.

Alternatively data can be transferred using available physical media, such as optical media (CD-ROM, DVD), magnetic media (tape, hard disk drive) or solid state media such as a flash or thumb drive or flash card (such as compact flash, SD card, etc)

Table 2, below contains a summary of the affecting factors for each of these media options.

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Table 2 – Data transfer media

Method	Affecting Issue
Internal file transfer across a secure WAN or LAN	Rapid and secure internal access to information Can place information directly in an appropriate file structure Speed and efficiency dependant on network bandwidth Large file transfers may affect the local network usage
File Transfer Protocol (FTP) across the internet	Accessible transfer of information outside the internal network for external stakeholders Rapid access to information Requires a dedicated managed FTP site Requires internet access and appropriate bandwidth Need to manage security
Email	Rapid and simple transfer of information both internal and external Requires internet access Limited by file size
Optical Media (eg CD-ROM, DVD)	Needs to be physically copied and transferred – not immediate Provides a physical data backup File size only limited by media capacity (up to 8GB for dual layer DVD) Storage integrity of media is approximately 2-8 years
Magnetic Media (tape)	Needs to be physically copied and transferred– not immediate Provides a physical data backup Can be slow and cumbersome – tape drives not as common as other media readers File size only limited by media capacity Storage integrity of media is approximately 1-3 years
Magnetic media (HDD)	Needs to be physically copied and transferred– not immediate Fast to transfer Portable hard disk drives are common and have common interface (USB2 or Firewire) Portable drives do not require additional power source (draw power from host machine) Desktop drives require additional power source File size only limited by media capacity Susceptible to shock
Solid State Media	Needs to be physically copied and

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Method	Affecting Issue
	transferred – not immediate Commonly available in a number of formats and capacities (cards/thumb drives) Cards require a specific reader Thumb drives use USB2 File size only limited by media capacity Very portable and rugged (not as susceptible to shock)

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7. Metadata guidelines for GSS – ISO/ANZLIC

7.1 Metadata and documentation

Metadata are perhaps most simply defined as "data about the data". A more formal definition is that metadata are descriptive information about the content, quality, condition and other characteristics of data that has been collected for a particular purpose.

Metadata are an important aspect of data maintenance and are important in providing information about data to potential users. When stored with a dataset, metadata can inform potential users of, for example:

- the availability of a dataset on a particular subject and who to contact for the data;
- the limitations and accuracies of the dataset;
- the date of capture for the dataset
- the fitness of a dataset to meet a specific need;
- means of accessing a dataset; and
- information required for the processing and use of a dataset.

The WALIS Interrogator+ (http://www.walis.wa.gov.au/interragator) is the receptacle for metadata for datasets within WA.

If potential users are ignorant of the existence of a dataset, or if there is insufficient information available to assess the suitability of the dataset, valuable resources may be wasted in reproducing data.

The need for data to be accompanied by quality documentation has been recognised for some time, both in Australia and overseas. Several agencies have developed guidelines for metadata content, for example the US Federal Geographic Data Committee (FGDC, 1994) and the Australia and New Zealand Land Information Council (ANZLIC, 2001). The ANZLIC Metadata Guidelines: Core metadata elements for geographic data in Australia and New Zealand - Version 2 (February 2001) form the basis for metadata documentation in the WRA process.

Metadata contents can vary between datasets, depending on database design and the type of data being documented (e.g. digital/non-digital, spatial/non-spatial, etc). However, certain fundamental elements are suitable for most purposes, regardless of the type or level of data. These common elements include the key technical characteristics of the data, access conditions and procedures, and how to obtain further information.

7.2 Metadata Requirements

The need for information to support decision making is common across all projects and activities being undertaken within DEC. There is generally a great diversity of data generated across projects. Datasets are not only valuable to the initial user but may also be useful to other potential users both within DEC, the GSS process and

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beyond. Acquisition of data is made easier because a preview of the technical attributes is available before obtaining the actual data.

As information is collated and developed, it is important that all datasets are documented. In this way, existing data can be used for other purposes if they are suitable. This reduces duplication of effort and provides a technical standard for developing new datasets

It is important that anyone planning to utilise source datasets for DEC projects should first acquire metadata:

- to allow proper assessment of the fitness of the source data for the projects(s); and
- to promote usage of the same dataset where two or more similar datasets exist

A uniform approach to data documentation will ensure that datasets are documented in a consistent manner according to the requirements of DEC and WALIS policies.

7.3 Completing metadata

It is essential that all persons who develop data within DEC or for the GSS process complete metadata for each dataset. In all cases, the metadata compiler should be the dataset creator. For a given project, the person nominated as Project Manager in the project specifications has responsibility for ensuring data documentation requirements for that project are met.

More detailed information to assist with the correct completion of Metadata is contained in the Appendix, comprising:

- Appendix 1: Guidelines for completing Metadata. The guidelines are set out as tables containing details of what is required to be documented in each field
- Appendix 2: Search Words Picklist. A list of words likely to be used for searching by a person who does not necessarily have expertise in the subject matter being searched.

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8. Process for data supply

Data developed within DEC as part of the GSS or broader DEC requirements may be required by other organisations or groups, both as part of the GSS or otherwise. The custodian of the data set will vary depending on the nature of the data and should be defined within metadata for the dataset. It is the custodian's role to coordinate licensing and distribution of the dataset as appropriate. A summary of the process to be carried out for data supply is defined in Figure 1 below.

Prior to distribution of a dataset, the following issues/questions should be considered for dataset completeness:

- Is the data to be provided consistent with the requested information?
- Does the dataset comply with appropriate spatial data standards (as identified in section 5.2)?
- Does the dataset comply with spatial referencing standards (as identified in section 5.3)?
- Does the dataset have metadata which complies with the appropriate standards?
- Are all lookup tables and additional documentation provided with the dataset?
- Are all data attributes listed and explained in the metadata and/or lookup table?
- Is the dataset name logical and related to the theme of the data?

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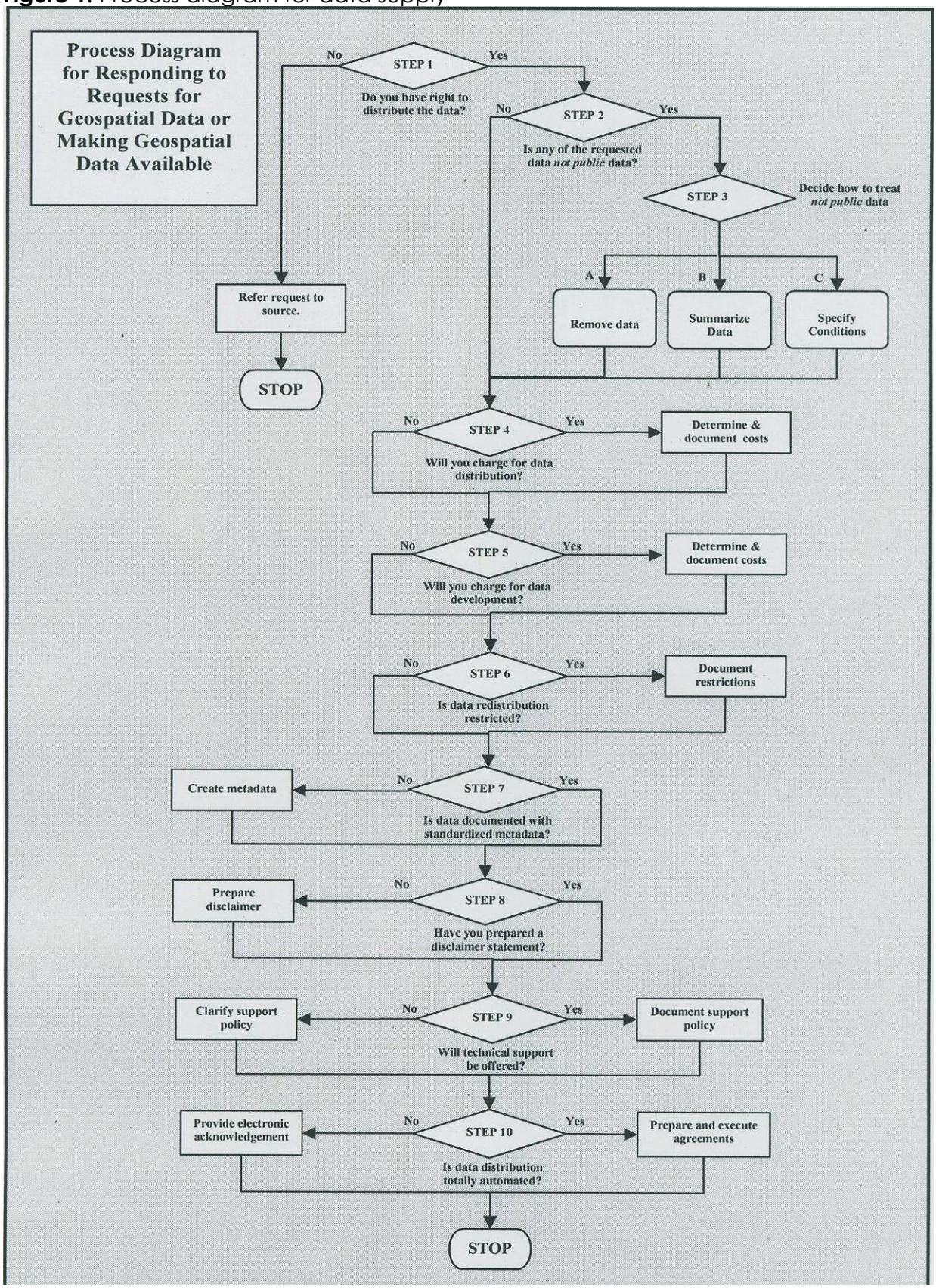
Figure 1: Process diagram for data supply



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9. Mapping standards

The production of effective mapping outputs relies on the quality assurance of the development of the subject information and the manner in which it is compiled. Mapping standards are generally developed to provide a minimum standard for the presentation of mapped outputs.

There are a number of elements which make up an effective mapping product for publication. The following list is a recommendation of key elements:

- **Map title** – descriptive map name
- **Publisher** – name date and place of publications
- **Copyright** – who holds this and year
- **Acknowledgement & source** – origins of data making up the map and currency
- **Scale** – an informative scale bar and/or representative fraction
- **Legend** – clear and descriptive
- **Colours and shading** – as a general rule use light colours for large areas and darker colours for smaller areas
    - When using colour ramps for increasing or decreasing values, use colours of increasing intensity or darkness (this allows for interpretation when printed in black and white)
- **Symbols** – should be simple and clear, use established symbols where possible
- **Font** – minimise the number of different fonts and sizes within a map, fonts that are sans serif are recommended
- **Projection and datum** – note the datum and projection of the data
- **North arrow** – to be shown when advantageous to delineate north, if using a graticule, then north arrow is redundant
- **Map number** – to be used if map is part of a series
- **Status and constraints** – as required for "draft" products etc
- **Caveats** – disclaimers or statement of reliability or restrictions
- **Graticule** – to delineate meaningful geographic coordinates
- **Logo** – should not be overly prominent on the map, where more than one logo is required they should be the same size and prominence and generally be grouped together

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10. References

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APPENDIX 1 - GUIDELINES FOR METADATA PROFORMAS

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
DATASET	Title	The name given to the dataset by the custodial organisation. It should convey a clear impression of the information contained in the dataset, and should provide a unique reference to the dataset.	Text Maximum 160 characters	The name of the dataset followed by, where appropriate, an acronym enclosed in round brackets.
CUSTODIAN	Custodian	The primary organisation associated with the data set and responsible for its maintenance and distribution. The custodian of the data need not necessarily be the holder of the copyright or the originator of the data, nor is the custodian necessarily a government organisation	Text Maximum 120 characters	Full title of the organisation as it is normally recognised or trades under. If the organisation is also known by a common acronym, include this in round brackets at the end of the full name. If the organisation is usually known only by an acronym, use only the acronym without brackets.
	Jurisdiction	The State or Country in which the custodian is domiciled. If the custodian has offices in more than one State of Australia, the jurisdiction "Australia" should be used	Text Maximum 30 characters	One only of the following: Australia; Australian Capital Territory; New South Wales; New Zealand; Northern Territory; Queensland; South Australia; Tasmania; Victoria; Western Australia; Other.
DESCRIPTION	Abstract	A characterisation of the data set and its contents. It may be a brief narrative, a summary or an abstract.	Text Maximum 2000 characters	The Abstract should describe the contents of the dataset for a non-expert user, in plain language. Information contained in the Abstract may include: • a description of the purpose for which the dataset was created • a textual description of the spatial extent of the data contained in the dataset • a listing of the attributes about which data is held • whether the dataset is a stand alone

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
				dataset or part of an integrated system.
	Search Word(s)	One or more common words or phrases that describe the dataset, chosen from a predefined list. Search words should be selected from the searcher's standpoint, and should be words likely to be used by person who does not necessarily have expertise in the subject matter. Where several terms may be relevant to the content of the dataset, the most concise term should be used. When a dataset contains diverse information, multiple search words may be allocated	Text Maximum string 60 characters	At least one search word must be used, selected from the Search Word Picklist in Appendix 2. The main search word should be capitalised. Qualifier words are intended to allow the searcher to be very specific. For example, for a dataset described by the Search Words WATER Quality Monitoring a searcher selecting the Search Words WATER, or WATER Quality, or WATER Quality Monitoring, will identify the dataset a searcher selecting the words WATER Supply or Water Supply Monitoring will not pick up the dataset
	Geographic Extent Name	Geographic Extent Name(s) is the ordinary name of one or more pre-defined, known geographic objects that reasonably show the extent of the geographic coverage of the dataset. This element is usually implemented as three discrete elements as listed below. The geographic extent of a dataset may be described by this element or the Geographic Extent Polygon element but not both	Text Maximum 100 characters per Extent Name	At least one entry must be selected from the Geographic Extent Name(s) Picklist in Appendix 2. Multiple entries may be selected from the picklist. If none of the picklist choices is a suitable representation of geographic extent, then the Geographic Extent Polygon field should be used
	GEN Category	Category to which the Geographic Extent Name belongs, including map series, local government area and drainage divisions and major river basins	Text Maximum 80 characters	Choose from the GEN_CATEGORY picklist in Appendix 2 These are the categories recognised at National level. Other categories may be used (e.g. CRA region) but they will not be contained in the Geographic Extent Name thesaurus that supports the metadata element

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	GEN Custodial Jurisdiction	Country, state or territory that is responsible for maintaining the detail of the geographic object	Text Maximum 30 characters	Choose from the GEN_CUSTODIAL JURISDICTION picklist in Appendix 2
	GEN Name	Name of the Geographic Object	Text Maximum 80 characters	This refers to the name of the mapsheet, LGA, BRA region etc. Refer to the Table in Appendix 2 to assist in selecting an entry for this field
	Geographic Extent Polygon(s)	A set (or sets) of at least four co-ordinate pairs (i.e. a closed polygon) to record the latitude and longitude in decimal degrees of the geographic extent of the dataset where there is not a suitable predefined geographic extent available in the element Geographic Extent Name	Real number. Maximum 1,000 character string per polygon	Any number of sets of at least four coordinate pairs, where each polygon is closed by the repeat of the first pair. The coordinate pairs are to record latitude and longitude in decimal degrees to up to four decimal places of precision.
	Geographic Bounding Box	A rectangle defining the minimum and maximum coordinates of the entire dataset. These coordinates may be used to filter datasets according to the area of interest and to generate a box showing the approximate coverage of a dataset. This element is implemented as four discrete elements as listed below	NA. See below	See below
	North Bounding Latitude	Northern-most coordinate of the limit of the dataset expressed in latitude, in decimal degrees	Signed Real Number	Express longitude and latitude coordinates in decimal degrees up to five decimal places (approx. 1 metre) that reflect the accuracy of the source data. Latitudes in the southern hemisphere gave negative coordinates. Negative coordinates will be signed, that is, have a leading negative prefix "-" while positive coordinates will be unsigned
	South Bounding	Southern-most coordinate of the limit of the dataset expressed in latitude, in	Signed Real Number	Express longitude and latitude coordinates in decimal degrees up to five decimal

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	Latitude	decimal degrees		places (approx. 1 metre) that reflect the accuracy of the source data. Latitudes in the southern hemisphere gave negative coordinates. Negative coordinates will be signed, that is, have a leading negative prefix "-" while positive coordinates will be unsigned
	East Bounding Longitude	Eastern-most coordinate of the limit of the dataset expressed in longitude, in decimal degrees	Signed Real Number	Express longitude and latitude coordinates in decimal degrees up to five decimal places (approx. 1 metre) that reflect the accuracy of the source data. Negative coordinates will be signed, that is, have a leading negative prefix "-" while positive coordinates will be unsigned
	West Bounding Longitude	Western-most coordinate of the limit of the dataset expressed in longitude, in decimal degrees	Signed Real Number	Express longitude and latitude coordinates in decimal degrees up to five decimal places (approx. 1 metre) that reflect the accuracy of the source data. Negative coordinates will be signed, that is, have a leading negative prefix "-" while positive coordinates will be unsigned
DATA CURRENCY	Beginning date	The earliest date from which information contained in the dataset Is current i.e. the earliest date at which the phenomena in the dataset actually occurred. This is not necessarily the date on which a record was entered into a database	Text Maximum 10 characters	A date expressed as ddmmmyyyy, or the words "Not Known". Where the year and month are known, but the day is not known, use 01 as the default day Where the year is known but the day and month are not known, use 01JAN as the default day and month. For example01 JAN 1885
	Ending date	The last date for a record contained within the dataset. If the dataset is ongoing, use the word "Current" to indicate that no final date is applicable	Text Maximum 10 characters	A date expressed as ddmmmyyyy, or the word "Current" if the dataset is continuing. Where the year and month are known, but the day is not known, use 28, 29, 30 or 31 as the default day (as appropriate to the

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				month concerned). Where the year is known but the day and month are not known, use 31 DEC as the default day and month. For example 30APR1992
DATASET STATUS	Progress	Progress status of the creation of the dataset	Text Maximum 20 characters	Select one only of the following four options: Complete, In Progress, Planned, Not Known. If the dataset collection has concluded, pick "Complete". If the dataset collection is underway at the time of creation of the metadata record, pick "In Progress". If the dataset collection has been proposed but has not commenced, pick "Planned". If the status of dataset creation is unknown pick "Not Known
	Maintenance and update frequency	The frequency with which changes or additions are made to the dataset after its initial completion. The changes to the data should be recorded, not the frequency of re-issue or publication	Text Maximum 20 characters	Select one only of the following: Continual, Daily, Weekly, Monthly, Quarterly, Bi-annually, Annually, As required, Irregular, Not planned, Not Known. If, for example, a dataset is maintained both monthly and daily, the most frequent rate of changes, i.e. daily should be recorded
ACCESS	Stored Data Format	A description of the format in which the dataset is stored by the custodian. This field must include whether the dataset is held in digital and/or non digital form, and should include the format type in which the dataset is stored (e.g. transparency, paper, microfiche, ASCII Text, ARC/INFO, DXF, Oracle database, Excel spreadsheet). Software version number (if applicable) may be included	Text Maximum 500 characters	The word DIGITAL and free text extension if desired, and/or the word NONDIGITAL and free text extension if desired. Write the mandatory part of the element DIGITAL and NONDIGITAL in upper case.

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
	Available format Type(s)	A description of the formats in which the dataset is available. This field must include whether the available in digital and/or non digital form, and should include the format types, both digital and non-digital, in which the dataset is available. Software version number (if applicable) may be included	Text Maximum 240 Characters per Type	The word DIGITAL and free text extension if desired, and/or the word NONDIGITAL and free text extension if desired Write the mandatory part of the element DIGITAL and NONDIGITAL in upper case per type
	Access constraints	Any restrictions or legal prerequisites that may apply to obtaining or using the dataset. For example, whether the dataset is classified Restricted (ie the data is considered sensitive by a data owner and only available from the custodian by agreement of data owners); or Licensed (available to third parties under a license agreement with the custodian); or Unrestricted. If payment is required , this should be stated.	Text Maximum 500 characters	Free text describing and restrictions or legal prerequisites that may apply to accessing or using the dataset.
DATA QUALITY	Lineage	Lineage is a history of both the source and the processing steps used to produce the dataset. The source data to produce the dataset may consist of one or more data sources. The history of the source data generally includes: • A description of the source data • The scale(s) of the source data • The media type(s) of the source data • The date(s) of the source data	Text Maximum 2,000 characters	Sentences are preferred. If no answer is possible, select one of the following: Not known, Not Documented, Not relevant.

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
		The processing steps are the sequence of operational steps performed on the source data to arrive at the final dataset. The history of the processing steps generally includes: • The data capture methods any intermediate processing methods • The method used to generate the final product • Dates of various parts of the process		
	Positional Accuracy	An assessment of the closeness of the location of spatial objects in the dataset in relation to their true positions on the earth's surface. The positional accuracy generally includes: • a horizontal accuracy assessment • a vertical accuracy assessment • an explanation of how the accuracy were determined The horizontal and vertical positional accuracy should be the assessed accuracy after all transformations have been carried out. This can be derived from a statistical analysis of tests eg root square error (RMSE) or standard deviation (SD). A precise positional accuracy assessment may not always be possible. In these cases an intuitive estimate experience or expected likely maximum error is acceptable. In many cases this may be "just a feel" for the data but it is important to state this	Text Maximum 4,000 characters	Sentences are preferred. Positional accuracy may not be relevant to datasets that are indirectly geographically referenced. In case write Not Relevant. If no answer is possible, select one of the following: Not known, Not Documented, Not relevant

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
	Attribute Accuracy	An assessment of the accuracy of identification of entities and the assignment of attribute values in the dataset. The attribute accuracy generally includes: • the classification method used to assign values to features in the dataset • an attribute accuracy assessment of how well the attributes conform to the classification method (generally expressed as a percentage) • an explanation of how the attribute accuracy assessment was determined A precise attribute accuracy assessment may not always be possible. In these cases an intuitive estimate of the expected attribute accuracy or the likely maximum error based on previous experience is acceptable. In many cases this may be "just a feel" for the data but it is important to state this	Text Maximum 4,000 characters	Sentences are preferred. If no answer is possible, select one of Not Known, Not Documented or Not Relevant
	Logical Consistency	Spatial objects can be points, lines or polygons within the dataset that are used to represent true world' features. When recording spatial objects dataset a number of inconsistencies can occur. An assessment for logical consistency documents for these inconsistencies. Tests are generally in the of the following	Text Maximum 4,000 characters	Sentences are preferred. If no answer is possible, select one of Not Known, Not Documented or Not Relevant

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
		questions: • Are all points labelled? • Do lines intersect at nodes? • Do lines cross unintentionally? • Do all lines exist? • Are lines duplicated? • Do lines overshoot or undershoot? • Are all lines labelled? • Do all polygon boundaries close? • Are all polygons labelled? • Do any polygons have duplicate labels? • Are all points, lines and polygons topologically related? If the dataset is stored digitally then the tests for logical consistency can be carried out automatically using geographic information system software. This element can also apply in the case of datasets where there are other logical relationships between items or objects (other than spatial objects) in the dataset. In such cases describe any tests carried out on the relationships.		
	Completeness	An assessment of the extent and range of the dataset with regard to completeness of coverage, classification and verification. Completeness of coverage is an assessment of the proportion of the	Text Maximum 4,000 characters	Sentences are preferred. If no answer is possible, select one of Not Known, Not Documented or Not Relevant

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
		dataset available in its entirety. • Is the spatial data coverage complete for the dataset? • If not what amount of spatial data is incomplete? • Are attribute data available for the entire dataset? • If not, what amount of the attribute data is incomplete? Completeness of classification is an assessment of how well the chosen classification method (refer to attribute accuracy) is able to represent the `real world' features contained within the dataset. • Is the adopted classification method exhaustive? • Does the classification method generalize any features represented in the dataset? For example: • Are there minimum area or minimum width rules used to represent features? (ie. roads less than 30 metres wide are represented as a single line) • Must a lake be a certain area before it is included on a map at a scale of 1:100000? • Are lines smoothed for presentation? If so, what method		

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
		has been used? Completeness of verification assesses the amount of "work" (field work or other) carried out to validate the correct representation of 'real world' features. • What is the extent and method of field verification carried out to validate spatial and attribute data? • Are the positions of any spatial objects in the dataset inferred? • If so, what is the method of inference?		
CONTACT ADDRESS	Contact Organisation	The name of the organization with which contact should be made to obtain the dataset, or to obtain more detailed information about the dataset. The contact organization need not be the same organization as the Custodian Organisation. A business unit within the Custodian Organisation may be the Contact Organisation	Text Maximum 120 characters	Full title of the organization as it is normally recognized or trades under. If the organization is known by a common acronym, include this in round brackets at the end of a full name. If the organization is known only by an acronym, use only the acronym without brackets.
	Contact Position	The position title of the individual within the Contact Organisation who is required to answer questions about the dataset.	Text Maximum 40 characters	The position title of the individual within the organization who is responsible for answering questions about the dataset.
	Mail Address 1	This element is to be used in conjunction with the following element Mail Element 2. These two elements together describe the mailing address of the Contact Position	Text Maximum 40 characters	This element is to be used in conjunction with the following element Mail Element 2, which together describe the mailing address of the Contact Position. The content of these two elements should include street name and number, where applicable. If the address is a post office

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
				bag or box, this information should appear in Mail Address 1. No commas should be used in this field. Postal addresses should be written without spaces or full stops
	Mail Address 2	This is an optional element where the mailing address of the Contact Position requires 2 lines.	Text Maximum 40 characters	Used where the mailing address of the Contact Position requires more than one line. For a significant number of addresses, this element may not need to be used
	Suburb /Place/ Locality	The name of the suburb of the mailing address of the Contact Position, or if the place is not known by a suburb name, the ordinary name of the place or locality.	Text Maximum 60 characters	The suburb, place or locality of the mailing address.
	State/Locality 2	The name of the State or Territory, in acronym form, of the mailing address of the Contact Position	Text Maximum 40 characters	Select one of: AAT, ACT, Christmas Island, Cocos (Keeling) Islands, Norfolk Island, NSW, NT, QLD, SA, TAS, VIC, WA.
	Country	The name of the country where the Contact Position for the dataset is located	Text Maximum 40 characters	Acronyms acceptable where commonly used. Examples: Australia, NZ.
	Postcode	Postcode of the mailing address of the Contact Position	Alphanumeric Maximum 10 characters	4 characters e.g. 2350
	Telephone	The telephone number of the Contact Position	Alphanumeric Maximum 25 characters	One or more of the following three options: STD code local telephone number; Mobile access number plus number; 1800 plus number [freecall]. Do not use commas, brackets or hyphens. Give full STD, Mobile access code, or Freecall, then a space; then up to four numbers of the telephone number; then a space; then the final three or four numbers

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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION	FORM OF ENTRY	DOMAIN/PICKLIST
	Facsimile	The fax number of the Contact Position	Alphanumeric Maximum 25 characters	As for telephone number element
	Electronic mail address	The electronic mailbox address of the Contact Position	Alphanumeric Maximum 80 characters	Addresses in Internet compatible form only should be included. If a compatible email address is not available, the entry "Not known" or "None" should be given.
METADATA DATE	Metadata Date	The date the metadata were created or last updated	Text Maximum 10 characters	DD/MMM/YYYY
ADDITIONAL METADATA	Additional Metadata	This field should contain: • The name(s) of the author(s) of the metadata sheet • A description of the location of the data within the Custodians' file management system (if applicable) Where applicable, the author can also include in this field: • An indication of where additional metadata about the dataset may be accessible; and • Any other information the author wishes to communicate to users which is not covered by the other fields	Text Maximum 240 characters	This field should contain: i) the name(s) of the person(s) who completed the metadata sheet, followed by (optionally) the name of their organisation enclosed in round brackets. ii) A description of the physical location of the data iii) (optionally) information about where additional metadata about the dataset may be accessible e.g. the name of any other directory system(s) where more detailed metadata are recorded; iv) (optionally) any other information the author wishes to communicate to users which is not covered by the other fields.

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APPENDIX 2 – METADATA PICKLISTS

Category: Description
Element: SEARCH WORD
Definition of Element:

Words likely to be used for searching by a person who does not necessarily have expertise in the subject matter being searched. The words are created from the user or searchers viewpoint not from that of the writer of the abstract or the Custodian of the dataset. Where a number of terms may be relevant to the content of the dataset, the most concise term should be used. When a dataset contains diverse information, multiple search words may be allocated.

Obligation: Mandatory

Maximum Occurrence: Many

Allowable Content:

AGRICULTURE
AGRICULTURE Crops
AGRICULTURE Livestock
AGRICULTURE Horticulture
AGRICULTURE Irrigation
ATMOSPHERE
ATMOSPHERE Air Quality
ATMOSPHERE Ozone
ATMOSPHERE Greenhouse
ATMOSPHERE Pressure

BOUNDARIES
BOUNDARIES Administrative
BOUNDARIES Biophysical
BOUNDARIES Cultural

CLIMATE AND WEATHER
CLIMATE AND WEATHER Meteorology
CLIMATE AND WEATHER Climate change
CLIMATE AND WEATHER Drought
CLIMATE AND WEATHER El Nino
CLIMATE AND WEATHER Extreme weather events
CLIMATE AND WEATHER Radiation
CLIMATE AND WEATHER Rainfall
CLIMATE AND WEATHER Temperature

DEMOGRAPHY
DISEASE

ECOLOGY
ECOLOGY Community
ECOLOGY Ecosystem
ECOLOGY Habitat
ECOLOGY Landscape

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ENERGY
ENERGY Coal
ENERGY Electricity
ENERGY Petroleum
ENERGY Renewable
ENERGY Use

FAUNA
FAUNA Exotic
FAUNA Insects
FAUNA Invertebrates
FAUNA Native
FAUNA Vertebrates
FISHERIES
FISHERIES Aquaculture
FISHERIES Freshwater
FISHERIES Marine
FISHERIES Recreational
FLORA
FLORA Exotic
FLORA Native
FORESTS
FORESTS Agriforestry
FORESTS Natural
FORESTS Plantation

GEOSCIENCES
GEOSCIENCES Hydrogeology
GEOSCIENCES Geochemistry
GEOSCIENCES Geology
GEOSCIENCES Geomorphology
GEOSCIENCES Geophysics

HAZARDS
HAZARDS Cyclones
HAZARDS Drought
HAZARDS Earthquake
HAZARDS Fire
HAZARDS Flood
HAZARDS Landslip
HAZARDS Manmade
HAZARDS Pests
HAZARDS Severe local storms
HAZARDS Tsunamis
HEALTH
HERITAGE
HERITAGE Aboriginal
HERITAGE Architectural
HERITAGE Natural
HERITAGE World
HUMAN ENVIRONMENT
HUMAN ENVIRONMENT Economics
HUMAN ENVIRONMENT Housing
HUMAN ENVIRONMENT Livability

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HUMAN ENVIRONMENT Planning
HUMAN ENVIRONMENT Structures and Facilities
HUMAN ENVIRONMENT Urban Design

INDUSTRY
INDUSTRY Manufacturing
INDUSTRY Mining
INDUSTRY Primary
INDUSTRY Service
INDUSTRY Other

LAND
LAND Cadastre
LAND Cover
LAND Geodesy
LAND Geography
LAND Ownership
LAND Topography
LAND Use
LAND Valuation

MARINE
MARINE Biology
MARINE Coasts
MARINE Estuaries
MARINE Geology and Geophysics
MARINE Reefs
MARINE Human Impacts
MARINE Meteorology
MINERALS
MOLECULAR BIOLOGY
MOLECULAR BIOLOGY Genetics

OCEANOGRAPHY
OCEANOGRAPHY Physical
OCEANOGRAPHY Chemical

PHOTOGRAPHY AND IMAGERY
PHOTOGRAPHY AND IMAGERY Aerial
PHOTOGRAPHY AND IMAGERY Remote Sensing
PHOTOGRAPHY AND IMAGERY Satellite
POLLUTION
POLLUTION Air
POLLUTION Noise
POLLUTION Soil
POLLUTION Water

SOIL
SOIL Erosion
SOIL Biology
SOIL Chemistry
SOIL Physics

TRANSPORTATION

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TRANSPORTATION Air
TRANSPORTATION Land
TRANSPORTATION Marine

UTILITIES

VEGETATION
VEGETATION Floristic
VEGETATION Structural

WASTE
WASTE Liquid
WASTE Solid
WASTE Toxic
WASTE Sewage
WASTE Greenhouse gas
WASTE Heat
WATER
WATER Groundwater
WATER Hydrology
WATER Hydrochemistry
WATER Lakes
WATER Rivers
WATER Salinity
WATER Supply
WATER Surface
WATER Quality
WATER Wetlands

Qualifier words that may be added to any of the above:
Biodiversity
Classification
Conservation
Distribution
Exploration
Indicators
Inventory
Management
Mapping
Maps
Models
Monitoring
Networks
Planning
Production
Reference
Reports
Research
Reserve
Resources
Statistics
Surveys
Sustainability

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Format Rules: At least one search word must be used. The main search word should be capitalised.

Field Type: Text

Field Length: Maximum string 60 characters.

Other comments:

It is expected that most implementations of these ANZLIC guidelines will provide the above Search Words in a pick list. The sophistication of the search software will vary from system implementation to system implementation. The following operations of the Search Words in the Search Words field should be possible (as a minimum):

- Selecting the word AGRICULTURE should collect all datasets with this word whether alone or in combination, including, for example, AGRICULTURE Crops.
- If, however, the Search Word AGRICULTURE Crops only were selected, any datasets with the Search Word of AGRICULTURE alone, or AGRICULTURE Irrigation, would not be picked up.
- Qualifier words are intended to allow the searcher to be very specific. For instance, a search using WATER Groundwater Research would collect only those datasets where all of those three criteria were entered.

Searching on Qualifier words only (eg searching for all datasets where the word Monitoring is used) will depend on the system implementation and software.

Searching on word combinations in fields other than the Search Word field will also depend upon the system implementation and software.

Do not list a major Search Word ie. "WATER" when a more detailed Search Word ie. "WATER Rivers" is provided. That is, a metadata record would not be described by the Search Words "WATER" and "WATER Rivers; preferably the latter.

Example:

Example 1: Bathymethry of the Gulf of Carpentaria and the Arafura Sea, Edition 1
MARINE Geology and Geophysics

Example 2: Possible Scenarios for the Spread of Rabbit Calicivirus Disease (RCD) to December 1995
DISEASE
FAUNA Exotic
FAUNA Vertebrates
AGRICULTURE

Example 3: Status Report on Water Quality in the Tweed, Brunswick, Richmond and Clarence Rivers
WATER Hydrology
WATER Quality
WATER Quality Monitoring

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Category: Description
Elements: GEOGRAPHIC EXTENT NAME
Definition of Element:

The ordinary name of one or more pre-defined, known geographic objects that will reasonably show the extent of geographic coverage of the dataset. It is not intended that this element will show the exact extent of the dataset.

The geographic extent of a dataset may be described by this element or the Geographic Extent Polygon element but not both.

Where the coordinate pairs have to be manually entered, the Geographic Extent Name element should be completed in preference to the Geographic Extent Polygon element. Where it is possible to calculate the coordinates directly from the dataset, the Geographic Extent Polygon element should be completed in preference to the Geographic Extent Name element.

Multiple entries are possible.

These lists of geographic extent names are usually recorded in a government gazetteer.

The Geographic Extent Name consists of the following three elements that together uniquely identify a geographic object:
• GEN_CATEGORY Category to which the Geographic Extent Name belongs.
• GEN_CUSTODIAL_JURISDICTION
Country, state or territory that is responsible for maintaining the detail of
the geographic object.
• GEN_NAME Name of the geographic object

Obligation: Optional
Maximum Occurrence: Many
Allowable Content for Australia:

The following categories are recognised at a National level. Other categories may be used but they will not be recognised at a National level and they will not be contained in the Geographic Extent Name thesaurus that supports this metadata element.

• GEN_CATEGORY Australia
State or Territory
External Territories
1:1 000 000 Map Series
1:250 000 Map Series
1:100 000 Map Series
1:50 000 Map Series
1:25 000 Map Series
Local Government Areas (LGA)
Statistical Local Areas (SLA)
Drainage Divisions and Major River Basins
Interim Biogeographic Regionalisation of Australia (IBRA)
Interim Marine and Coastal Regionalisation of Australia (IMCRA)
Australian Navigational Charts
Ocean and Sea Regions
Marsden Grid Squares 1 degree
Marsden Grid Squares 5 degrees

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Marsden Grid Squares 10 degrees

- GEN_CUSTODIAL_JURISDICTION
  Australia
  Australian Capital Territory
  New South Wales
  New Zealand
  Northern Territory
  Queensland
  South Australia
  Tasmania
  Victoria
  Western Australia
  Other

Field Type: Text
Field Length:

- GEN_CATEGORY Maximum string 80 characters
- GEN_CUSTODIAL_JURISDICTION Maximum string 30 characters
- GEN_NAME Maximum string 80 characters

Other comments: Repeating values allowed.

A current list of Geographic Extent Names including associated metadata and downloadable files is available at http://www.auslig.gov.au/asdi/genreg.htm

Where the coordinate pairs have to be manually entered, the GEN element has many advantages over the GEP element. These are:

- Reducing the likelihood of making errors when calculating the coordinates of the geographic
- bounding box. This is the primary purpose of the element.
- Quicker to complete.
- Easier to relate to a GEN; an object such as a Local Government Area with which they may be familiar, than a GEP; a set of coordinates.
- Not as complex. There is no need to worry about the format, accuracy and datum of the coordinates. That is latitude, longitude versus longitude, latitude, where the comma and spaces go, how many decimal points and the datum that is to be used.
- More useful when making a free text search
- More meaningful. A user may get a feel for the geographic extent of a dataset from the GEN eg. Hindmarsh LGA, which they probably will not get from a set of coordinates.

The GEN Categories that are recognised at the National Level are described in the following table. The Notes column provides some GEN Category specific formatting and indicates where definitive source information may be found.

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Geographic Extent Names

Category	Custodial Jurisdiction	Notes
Australia	Australia	The only acceptable content is: Australia excluding external territories Australia including external territories
State or Territory	States/Territories	The only acceptable content is one or more of the six States and two Territories
External Territories	Australia	There are seven official external territories administered by Australia. See the listing on AUSLIG's Website: http://www.auslig.gov.au/products/maps/external.htm. The only acceptable content is one or more of the seven external territories
1:1 000 000 Map Series 1:250 000 Map Series 1:100 000 Map Series	Australia	The map sheet name will be listed first, followed by the map sheet number. Both the 1: 1 000 000 and 1:250 000 Map Series includes offshore maps
1:50 000 Map Series	Australia/ States/Territories	The map sheet name will be listed first, followed by the map sheet number. The Commonwealth is custodian for the Army's 1:50 000 series (areas not covered by the States or Territories).
1:25 000 Map Series	States/Territories	The map sheet name will be listed first, followed by the map sheet number
Local Government Areas (LGA)	States/Territories	The Australian Bureau of Statistics Catalogue 1216.0 – Australian Standard Geographical Classification lists Local Government Areas. Latest edition is 17th 1999. Available for download (on subscription) from the ABS Web site: http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/NT0000A726
Statistical Local Areas (SLA)	Australia	See listing in Australian Bureau of Statistics Catalogue 1216.0 – Australian Standard Geographical Classification (as above).
Drainage Divisions and Major River Basins	Australia	There are 12 drainage divisions comprising 244 major river basins. Refer to the listings and terminology in Review of Australia's Water Resources, 1975 (Canberra, AGPS, 1976). The only acceptable content is one or more of these drainage divisions (12) or major river basins (244).
Interim Biogeographic Regionalisation of Australia (IBRA)	Australia	See listing on the Environment Australia Web site: http://www.environment.gov.au/bg/nrs/ibraimcr/ibra_95/app1.htm
Interim Marine and Coastal Regionalisation of Australia (IMCRA)	Australia	See listing on the Environment Australia Web site: http://www.environment.gov.au/marine/mpa/imcra/index.htm

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Category	Custodial Jurisdiction	Notes
Australian Navigational Charts	Australia	See listing on the Australia Hydrographic Office's Web site: http://www.hydro.navy.gov.au/prodserv/index3.htm
Ocean and Sea Regions	Australia	See listing on the Blue Pages Web site: http://www.environment.gov.au/cgidata/mcdd/location.options
Marsden Grid Squares 1 degree Marsden Grid Squares 5 degrees Marsden Grid Squares 10 degrees	Australia	Created by the World Meteorological Organisation and adopted by the Intergovernmental Oceanographic Commission. Available from AODC, ERIN and CSIRO Division of Marine Research

Example:

Example 1:
- GEN_CATEGORY Australia
- GEN_CUSTODIAL_JURISDICTION Australia
- GEN_NAME Australia excluding external territories

Example 2:
- GEN_CATEGORY 1:100 000 Map Series
- GEN_CUSTODIAL_JURISDICTION Australia
- GEN_NAME Bendigo 7724 1:100 000 Map Sheet

Example 3:
- GEN_CATEGORY Local Government Area (LGA)
- GEN_CUSTODIAL_JURISDICTION Queensland
- GEN_NAME Ipswich City Council

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