Biodiversity data guidance

ntepa Northern Territory Environment Protection Authority

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Contents

1. Introduction

The Northern Territory Environment Protection Authority (NT EPA) uses biodiversity data from flora and fauna surveys to inform environmental impact assessment (EIA) decision-making under the *Environment Protection Act 2019* (EP Act), and its advice to government about the acceptability of development proposals and related approval conditions. Biodiversity data are generated from a range of sources, including by proponents of a referred 'proposed action' or 'strategic proposal' (hereafter collectively referred to as a 'proposal') undergoing EIA, and the environmental consultants they engage.

The standard and quality of biodiversity data submitted to the NT EPA for EIA purposes varies considerably which can affect the reliability of derived information products such as maps and reports. The NT EPA seeks to improve the quality of biodiversity data produced for EIA by specifying the minimum standards for submission of data generated from flora and fauna surveys. Guidance about the EIA process is available on the NT EPA website.

1.1. Background

Biodiversity data sharing in line with NT EPA's Biodiversity Data Policy and FAIR principles (Findable, Accessible, Interoperable, and Reusable) can provide significant benefits to industry, government, and the community. It can transform isolated datasets into a discoverable, actionable knowledge base to inform environmental decision-making and promote ecologically sustainable development.

The NT EPA requires proponents to prepare biodiversity data packages to support EIA under the EP Act. This guidance document is published to assist proponents to prepare and submit biodiversity data packages generated from flora and fauna surveys to ensure that data is of an appropriate standard for EIA.

When one or more biodiversity surveys are required for the purpose of EIA, the proponent's data package including the survey report and associated datasets must be submitted to the NT EPA via the method specified at the time of submission. Submission methods may vary depending on the systems in place at the time. Proponents should engage with, and seek pre-referral advice from, the Department of Lands, Planning and Environment (DLPE) to determine whether biodiversity surveys are, or are likely to be, required as part of an EIA process.

2. Purpose

This guidance outlines the NT EPA's requirements and submission process for biodiversity data packages, and options for intellectual property (IP) owners regarding the extent to which their biodiversity data submitted for the purpose of EIA can be accessed, shared and reused. This document has been prepared by DLPE on behalf of the NT EPA and is intended to assist proponents undergoing EIA to prepare and submit biodiversity data packages.

This guidance and related electronic templates and forms will be updated as biodiversity data standards and systems are further developed. Users should consult the NT EPA website to ensure they have the most recent versions of this guidance and the accompanying templates and forms prior to use.

3. Transition period

The NT EPA has determined a transition period and criteria to manage changes to biodiversity data submission requirements for EIA. The transition period for provision of biodiversity data provides flexibility around the format and submission of electronic data files. Provision of a complete set of electronic data files in compliance with the requirements specified in this guidance will optimise the reuse of data and is

strongly encouraged regardless of whether the transition period applies. The transition period is as follows:

- **Earliest field survey commenced prior to 30 June 2026:** The biodiversity data package must contain a Metadata and Licensing Statement, a survey report in .pdf format, and a survey report in .docx format. The provision of electronic data files is optional; if provided, data may be in any file format, and it is not necessary for the files to possess all attributes specified by the minimum data standards in this document.
- **Earliest field survey commenced on or after 30 June 2026, and before 30 June 2027:** The biodiversity data package must contain a Metadata and Licensing Statement, a survey report in .pdf format, a survey report in .docx format, and a complete set of electronic data files. The electronic data files may be provided in any common data format, so long as they possess all attributes specified by the biodiversity data standards in this document.
- **Earliest field survey commenced on or after 30 June 2027:** End of transition period. The biodiversity data package must comply with the biodiversity data standards in this guidance.

During the transition period, the electronic data files submitted as part of a biodiversity data package will be accepted in any file format, provided the electronic data files possess the attributes specified by the biodiversity data standards. After the transition period, electronic data files must be supplied in the file formats specified in this document.

4. Biodiversity data requirements

If a proposal is likely to significantly impact a threatened flora or fauna species listed under the *Territory Parks and Wildlife Conservation Act 1976* (TPWC Act), biodiversity survey data and information should be provided to the NT EPA with the referral and EIA documents.

Provision of the following types of biodiversity data and information will help facilitate decision-making by the NT EPA and the Minister for Lands, Planning and the Environment (Minister) under the EP Act:

- Records of listed threatened species[1] from systematic flora/fauna survey location data relevant to the proposal area.
- Details of systematic flora/fauna survey location data (site/survey details only) relevant to the proposal area.
- Incidental records of listed threatened species in the proposal area.
- Derived maps of observations and potential habitat including breeding habitat and other ecologically important areas.
- Documentation to describe biodiversity data including the taxonomy and survey methods used.
- In the case of a bilateral assessment[2], records of non-listed species under the TPWC Act that are listed as threatened or migratory species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Mandatory data attributes for all biological survey records include:

[1] A 'listed threatened species' is a threatened flora or fauna species listed under the *Territory Parks and Wildlife Conservation Act 1976* (TPWC Act)

[2] An assessment under the NT Bilateral Assessment Agreement between the Australian and Northern Territory governments.

- Scientific or Common name of species
- Geocode of observation location in decimal latitude and longitude
- Datum of the geocode (e.g. GDA 2020)
- Location of the observation
- Precision of the geocode - radius in metres (e.g. GPS coordinates have a precision of 15 – 100 metres) or may be a grid block
- Date of observation
- Identifier of observer
- Number of individuals counted.

Supporting data attributes should also be provided where available and applicable, such as:

- Common name of species (where this has not already been provided in mandatory attributes)
- Project (survey) name
- Site and record identifiers – unique identifiers (and visit number as needed) as generated and maintained by the proponent or data custodian
- Time of observation
- Sample method
- Reliability of the observation
- EP Act referral number
- Name of organisation
- Sex
- Multimedia details associated with the occurrence
- Comments.

The formats for providing biodiversity data and metadata are specified in the electronic data templates available on the NT EPA website.

4.1. Data packages

At various stages during the referral and assessment stages of EIA, the NT EPA can require a proponent to undertake one or more flora and/or fauna surveys and submit the associated biodiversity data packages. Flora and fauna survey reports prepared to support EIA must be published on the public register in line with section 284 of the EP Act and cannot usually be withheld.

Each data package should be associated with a single biodiversity survey report. Where a single survey report documents multiple field surveys, the data from the different surveys will be contained in multiple files in a single data package for that report.

Biodiversity data are to be submitted for inclusion in the biodiversity databases maintained by DLPE, accompanied by the relevant biodiversity survey report and collated as part of a data package. Biodiversity data packages are only required for field surveys that have generated new data. Studies based on previously existing observations, such as desktop assessments, do not require submission of a data package.

A biodiversity data package will contain:

- A Metadata and licensing statement
- A survey report in .pdf format
- A survey report in .docx format
- A set of electronic data files, comprising:
  - One or more point-based Species occurrence spatial datasets in .csv, .xlsx, or .xlsm format
  - A systematic survey location details spatial dataset in Geopackage (.gpkg) or ESRI file Geodatabase (.gdb) format
  - Other spatial datasets (e.g. data that are not point-based species occurrence data such as vegetation types, vegetation condition, sample sites, fauna habitat etc.) in Geopackage (.gpkg) or ESRI file Geodatabase format.

Each of the electronic data files within the data package must comply with the data standards provided in this document. Unless otherwise stated the department adopts ISO/TC 211 - Geographic information/Geomatics standards for geospatial data. In naming the files within the data package, the terms used should clearly identify the type of data presented in the dataset.

4.2. Data submissions

Proponents are to submit biodiversity data packages to the NT EPA each time a biodiversity survey report is provided during an EIA process. Any changes or corrections made to the biodiversity survey report or underlying data during an EIA process should be reflected in an updated biodiversity data package submitted to the NT EPA, with reference to the details of the previous submission.

Data packages submitted proponents will be reviewed and validated by DLPE systems and/or staff. Once the data package is deemed to be complete and successfully submitted, written confirmation will be provided to the proponent.

In line with the Biodiversity Data Policy, the NT EPA's position is that biodiversity data should be public, and that restrictions should not be placed on access and sharing unless there is a clearly identified and justified reason to do so. The metadata component of a biodiversity data package will be made publicly available, allowing biodiversity surveys conducted for an EIA process in the NT to be discoverable regardless of whether the electronic datasets themselves are of a confidential or sensitive nature and cannot be made available.

4.2.1. 4.2.4. Data custodianship and publication pathway

For biodiversity data provided as part of an EIA, custodianship and publication are managed as a staged pathway (Table 1). This clarifies who is responsible for the data at each stage, what is published and when, and how confidentiality and sensitive species protections are applied.

Table 1 Data custodianship pathway

Stage	Primary custodian / responsibility	What happens to the data	Publication outcome
1. Collect & compile Field surveys → data package	IP owner / proponent and their consultant(s)	Data are collected, quality checked and packaged with the survey report and Metadata and Licensing Statement.	Not published at this stage.

Stage	Primary custodian / responsibility	What happens to the data	Publication outcome
↓ Submit	NT EPA/DLPE	Package submitted to the NT EPA (submission method as advised at the time).	Not published at this stage.
2. Validate & store Quality assurance	DLPE systems and/or staff (for validation and database intake)	Data are reviewed/validated and stored for assessment use; issues may be returned to the submitter for correction/resubmission.	Not published at this stage.
↓ Assess & categorise	NT EPA / DLPE	Information is considered for EIA and categorised for release: open, confidential, and/or sensitive species (may require denaturing).	Release settings applied.
3. Publish Public register & data access	NT EPA (public register) and DLPE (data access arrangements)	• Survey report is published on the public register (EP Act). • Metadata are made publicly available. • Electronic datasets are released in line with the Metadata and Licensing Statement, subject to confidentiality and sensitive species controls.	• **Open data:** published with licence (default CC BY 4.0 unless otherwise approved). • **Confidential:** withheld from publication, available to NT EPA/ government for assessment. • **Sensitive species:** managed under sensitive data policy; may be denatured or restricted.

Note: IP ownership of submitted datasets is not transferred to the NT EPA; publication and reuse are governed by the licence selected in the Metadata and Licensing Statement, subject to the confidentiality and sensitive species provisions described in sections 4.2.2 and 4.2.3.

4.2.2. Intellectual property rights

Biodiversity data submitted to the NT EPA (with the exception of confidential information and sensitive species data approved to be withheld) will be made publicly available through a Creative Commons Attribution (CC-BY) Version 4.0 International licence. CC-BY is the most open licence option in line with the NTG Creative Commons Policy, and gives users permission under copyright law to copy, redistribute, display and adapt the material for any purpose, provided the user gives appropriate credit to the creator of the work and indicates any changes made.

Intellectual Property (IP) owners may exercise control over whether the data component of a biodiversity data package (i.e. the electronic data files) will be made publicly available, using licences granted by IP owners as part of a Metadata and Licensing Statement. The licences determine how the electronic data component can be accessed, shared and used by third parties.

The NT EPA's position is that biodiversity data be made open and accessible in line with the Biodiversity Data Policy. The Metadata and Licensing Statement explains the licensing options available. It is essential that proponents and environmental consultants understand who the IP owner of the data is before the Metadata and Licensing Statement is completed. Proponents are responsible for ensuring they possess the necessary IP rights or have obtained appropriate permissions for any data, content, or third-party materials

they license for reuse or publication. A clear understanding of IP rights is essential when proponents engage third parties (e.g. environmental consultants) to conduct biodiversity surveys on their behalf. Proponents and environmental consultants should discuss their expectations around data sharing in the early planning stage of a project. Proponents should ensure that their requirements for IP ownership and data sharing are clearly defined during the procurement and contracting process or by formal agreement.

4.2.3. Confidentiality of information

The NT EPA's position is that biodiversity data be made open and accessible in line with the Biodiversity Data Policy. However, some information may be deemed confidential under the EP Act and/or the Northern Territory Public Sector Organisations Records and Information Management Standard. Data deemed to be confidential will be withheld from publication but will still be available to the NT EPA and relevant government authorities for assessment purposes.

4.2.4. Sensitive species data

Sensitive species data is data which, if made available to the public without appropriate controls, may cause harm to species that are at particular risk from threats such as collection and disturbance. Sensitive species data will be managed in accordance with the NTG Sensitive Flora and Fauna Data Policy and may require denaturing prior to public release.

4.3. Data standard

Records of the location and extent of species populations are important to understand how a proposal is likely to impact on biodiversity values. To gather consistent data and information where a proponent is required to conduct biodiversity surveys for EIA, the following data standards are specified.

Biodiversity data is maintained in information databases that collate the NT's animal and plant species occurrence records. To ensure the species information in the biodiversity databases can be collated and used for multiple analyses, information supplied must meet minimum data standards before it can be included in the databases. The data standards in this document broadly align with the internationally recognised Darwin Core standard developed to support the management and sharing of biodiversity data.

4.4. Data types

The NT EPA accepts the following data types of biodiversity data:

Species Occurrence Data

- Information about where a species was observed. Your point-based dataset will contain a list of records by species, with information about the date and place each was observed. Each record in the dataset may refer to one individual of the species or may include a count to indicate how many of the species were observed. The dataset may be generated from a systematic survey of sites, but the data will be arranged by species name.

  Point-based species occurrence data must be supplied in .csv, .xlsx or .xlsm format in line with the electronic data templates. Where delimitation is by commas, double quotes should be placed around any text fields that already include commas. Fields with unknown or null values should be set to blank rather than zero.

Proponents conducting surveys should seek advice from the DLPE Flora and Fauna Division[3] in relation to survey methods and factors affecting the certainty of fauna survey results.

Survey Location Data

- Information about observations of multiple species in a systematic survey location relevant to the proposal. Your systematic survey location data will contain the overarching survey boundary for one or more surveys. These datasets generally contain a list of plots and include information about all the species observed in each plot. In a systematic survey location spatial dataset, a survey boundary is represented as a polygon.
- Systematic survey location data are to be submitted in GeoPackage (.gpkg) or ESRI file Geodatabase (.gdb) format.
- **Vegetation and habitat Data**
    - **Vegetation Type Data**: Information about vegetation types[4]. Your dataset will contain the geospatial data (e.g. polygons) that defines the boundaries of vegetation types mapped during a field survey.
    - **Vegetation Condition Data**: Information about vegetation condition. Your dataset will contain the geospatial data (e.g. polygons) that defines the boundaries of vegetation condition mapped during a field survey.
    - **Fauna Habitat Data**: Information about fauna habitat. Your dataset will contain the geospatial data (e.g. polygons) that defines the fauna habitat boundaries mapped during a field survey.

The level of vegetation classification required to support a land type map for a proposed clearing footprint will require a minimum of NVIS Level 5 attribution, to enable an adequate assessment of potential impacts. Proponents should refer to the DLPE Land Clearing Guidelines under the Northern Territory Planning Scheme[5] for further information.

Vegetation and habitat spatial data are to be submitted in .gpkg or .gdb format. Systematic survey location data and vegetation and habitat data may also be submitted in .csv, .xlsm, or .xlsx file format, only if the series of coordinates that represent the shape boundaries are presented in standard Well-Known Text (.wkt) format. However, Geopackage or ESRI Geodatabase formats are preferred for submission of data for features represented by lines and polygons.

Biodiversity data files up to 500MB will be accepted. If you have data to submit that does not meet the above requirements, please contact the DLPE Environmental Assessment Unit, and one of our technical staff will be in contact to discuss how our systems can integrate your data.

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4 Proponents should in the first instance refer to the NT Guidelines and Field Methodology for Vegetation Survey and Mapping and may also refer to the Australian Soil and Land Survey Handbook for collecting vegetation information: Australian Soil and Land Survey Field Handbook, National Committee on Soil and Terrain.

5 Department of Lands, Planning and Environment, 2026. Land Clearing Guidelines Northern Territory Planning Scheme.

4.4.1. Spatial data

The biodiversity data standards in this document require spatial data to be provided. This enables biodiversity information to be aggregated into a single authoritative spatial database. The initial collection, collation, reporting and submission of output spatial data is the responsibility of the proponent.

Data are pieces of information, such as measurements, observations and counts. In the context of a biodiversity data package, the data are the pieces of biodiversity information that were collected in the field, such as records of a threatened flora species observed at specific times and places, or a resulting derived dataset such as a vegetation map. There may be large amounts and different types of data in a biodiversity data package, depending on the size and complexity of the survey.

4.4.2. Spatial data metadata

Metadata summarises information about data and provides context by describing aspects of how data were obtained. The metadata contains basic details about the survey itself, i.e. when, where and by whom it was conducted. Spatial output data must be accompanied by a Metadata and Licensing Statement consistent with the concepts and guidance developed by the Australia New Zealand Land Information Council (ANZLIC). A set of mandatory core ANZLIC standard metadata elements are required. Any additional information that is deemed relevant to interpret the data supplied should also be provided in an accompanying document.

4.5. Data accuracy

Spatial data should be as accurate as possible, and the level of accuracy reported in the metadata statement. Proponents should ensure the accuracy and precision of their data is adequate for its intended use in the EIA process. Positional accuracy should provide a reasonable guide to the location of records and clearly distinguish the location of one record from another.

Accuracy and precision are important for data interpretation and analysis. The more accurate a record is, the higher it's quality, as it has more potential for re-use across a wider range of situations. Data accuracy can be reduced for a particular use, but it cannot be enhanced. Therefore, the more accurate you can be at the point of making a record, the greater the utility of the data record.

4.6. Data verification

Biodiversity data submitted to the NT EPA will be verified by DLPE systems and/or staff. Only species information that meets the standards in this document will be accepted as records in the DLPE biodiversity databases. Any records that require further information or checking will be forwarded to the data supplier to check and resubmit.

5. Dataset requirements

5.1. Species occurrence data

The standard fields in Table 2 describe what is required for a species occurrence record and will assist you in collecting the minimum required attributes so your records can be easily shared and compiled into the DLPE biodiversity databases.

Outputs for reporting species occurrence data should be provided in line with any relevant timeline specified by the NT EPA. Proponents are to provide data directly through the Data Submission portal and

upload the electronic data files. Contact the DLPE Environmental Assessment Unit to request a copy of the latest version of the templates and any further guidance required on how to prepare your data.

This document, together with the electronic data templates and the Metadata and Licensing Statement, make up the NT EPA biodiversity data standard. A minimum required set of attributes are specified for species occurrence data. Electronic data files that contain additional attributes will also be accepted.

Biodiversity data packages should be provided containing all required files. Biodiversity data packages that are incomplete, or do not otherwise comply with the minimum data standards, will be returned to the proponent for correction.

The NT EPA data submission process includes a routine quality assurance check to validate the structure of species occurrence data files. Please read the requirements below and check your file beforehand to ensure an efficient submission process.

- .csv, .xlsx, and .xlsm files are arranged in rows and columns, with the top row containing headers.
- The file contains an event date field in yyyy-mm-dd format.
- The file contains data in the latitude and longitude fields (decimal degrees) and geodetic datum field.
- The file contains a field that identifies the organism scientific species name.
- Column headers/field names are unique.
- Column headers/field names cannot be just a number. For instance, a column header of '1' will not be accepted, but 'one' or '_1_' will be.
- For .xlsx and .xlsm files, all data must be contained on the first worksheet (additional worksheets will not be processed).
- Mandatory fields are populated for every record in the file, although it is acceptable to have blank cells in optional fields.
- Mandatory date and coordinate fields contain data in the specified format.
- The file contains at least one record.
- The file does not contain special characters (files may only contain UTF-8 encoded characters).

If you have difficulty in submitting your data to meet the submission requirements, please contact DLPE for support and to communicate how the submission process may be improved.

Table 2 Minimum dataset field descriptions for each species occurrence

Field	Description	Required or optional	Darwin Core link
RecordID	The unique ID assigned to each record	Required	N/A
SciName	Scientific name of species observed (refer to NT species checklist) e.g. *Limnodynastes convexiusculus*	Required (if available)	http://rs.tdwg.org/dwc/terms/scientificName
VerName	Common name of species observed (refer to NT species checklist) e.g. Marbled Frog	Desirable (records must include either the Scientific or Common name)	http://rs.tdwg.org/dwc/terms/vernacularName

Field	Description	Required or optional	Darwin Core link
ConStatNT	Conservation status of a species. (Note: This is populated based on the most recent threatened and priority species lists maintained by the NTG.	Required	Based on the NTG threat classification listed in the species checklists.
DecLat	The geographic latitude (in decimal degrees, using the spatial reference system given in GeoDatum)	Required	http://rs.tdwg.org/dwc/terms/decimalLatitude
DecLong	The geographic longitude (in decimal degrees, using the spatial reference system given in GeoDatum)	Required	http://rs.tdwg.org/dwc/terms/decimalLongitude
GeoDatum	The ellipsoid, geodetic datum, or spatial reference system upon which the geographic coordinates given in DecLat and DecLong are based.	Required	http://rs.tdwg.org/dwc/terms/geodeticDatum
Accuracy	The horizontal distance (in meters) from the given DecLat and DecLong fields describing the potential error associated with the latitude and longitude. Leave the value empty if the uncertainty is unknown, cannot be estimated, or is not applicable (because there are no coordinates). Zero is not a valid value for this term. Example: “15”.	Required	http://rs.tdwg.org/dwc/terms/coordinateUncertaintyInMeters
Date	The date this taxon was observed or collected. Date format is yyyy-mm-dd e.g. 2024-08-14 = 14 August 2024.	Required	http://rs.tdwg.org/dwc/terms/eventDate
Observer	A person, group, or organization responsible for recording the original occurrence.	Required	http://rs.tdwg.org/dwc/terms/recordedBy
Count	The number of each species present and identified at the time of the observation. Note the field can be left blank to denote presence only. If undertaking camera trap surveys, it is recommended to not include the count. This field can also be zero in the case of a targeted species survey to denote with the effort to find that species it was not discovered	Required	http://rs.tdwg.org/dwc/terms/individualCount
IDby	A person, group, or organization who assigned the taxon to the subject.	Desirable	http://rs.tdwg.org/dwc/iri/identifiedBy
SurvName	The name of the survey project	Desirable	http://rs.tdwg.org/dwc/terms/eventID
SurvType	Text (150) e.g. Detailed Vegetation Survey A description of the type of survey. This should match the survey type stated in the Metadata and Licensing Statement.	Desirable	http://rs.tdwg.org/dwc/terms/eventType
SpeciesTyp	Species Type - a code describing the species group, as follows: A = Amphibian, B = Bird, F = Fish, I = Invertebrate, M = Mammal, P = Plant and R = Reptile.	Desirable	N/A

Field	Description	Required or optional	Darwin Core link
SiteID	The identifier for the site. An identifier for the set of information associated with an event	Desirable	http://rs.tdwg.org/dwc/terms/locationID
Time	The time or interval during which an event occurred.	Desirable	http://rs.tdwg.org/dwc/terms/eventTime
SurvMethod	The name of, reference to, or description of the sampling methods and techniques used during a survey. There can be multiple values associated with each sampling technique.	Required	http://rs.tdwg.org/dwc/terms/samplingProtocol
Habitat	Description of the fauna habitat. e.g. Spinifex grasslands	Desirable	http://rs.tdwg.org/dwc/terms/habitat
Confidence	A categorical indicator of the extent to which the taxonomic identification has been verified to be correct.	Desirable	http://rs.tdwg.org/dwc/terms/identificationVerificationStatus
OccurrStat	A statement about the presence or absence of a species at a location. e.g. present / absent	Desirable	http://rs.tdwg.org/dwc/terms/occurrenceStatus
Submitter	The name in use by the institution having custody of the information referred to in the record	Desirable	http://rs.tdwg.org/dwc/terms/institutionCode
Sex	The sex of the biological individual(s) represented in the occurrence. e.g. male	Desirable	http://rs.tdwg.org/dwc/terms/sex
Introduced	Statement about whether an organism is a native species or has been introduced	Desirable	http://rs.tdwg.org/dwc/terms/establishmentMeans
Comments	Comments about the occurrence	Desirable	http://rs.tdwg.org/dwc/terms/occurrenceRemarks
Multimedia	Description of media associated with the occurrence.	Desirable	http://rs.tdwg.org/ac/terms/Multimedia
DatasetID	An identifier for the set of data e.g. Survey data Survey details (i.e. spatial footprint of survey) Vegetation types (i.e. spatial footprint of vegetation types) Fauna habitat (i.e. spatial footprint of a particular type of habitat	Desirable	http://rs.tdwg.org/dwc/terms/datasetID
FootprtWKT	A Well-Known Text (WKT) representation of the shape (footprint, geometry) that defines a boundary. Note: This field is only required for data that are not point data (i.e. lines and polygons) and the data is submitted in .csv, .xlxm, or .xlsx format (not preferred) rather than. gpkg or .gdb format (preferred).	Desirable (This field is required only for line or polygon datasets that are not submitted in. gpkg or .gdb format)	http://rs.tdwg.org/dwc/terms/footprintWKT

Field	Description	Required or optional	Darwin Core link
Citation	A full citation for the accompanying survey report. This should match the citation provided in the Metadata and Licensing Statement. Text (254) XYZ Consulting (2022). Detailed Vegetation Survey of Lot 123 Gunn Point Rd. Unpublished report prepared for ABC Developments.	Desirable	http://purl.org/dc/terms/bibliographicCitation

5.2. Systematic survey location details

Details of all systematic flora/fauna survey locations (site/survey details only) relevant to the survey report must be submitted to the NT EPA. The purpose of a survey details spatial dataset is to define the physical boundary of a field survey and capture some basic details about the survey itself. The survey details spatial dataset should use the Geocentric Datum of Australia 2020 (GDA2020) datum and be projected using the appropriate Map Grid of Australia zone.

Survey details spatial datasets for data that are not point-based species occurrence data (e.g. lines representing survey transects, polygons representing survey boundaries etc.) are to be submitted in GeoPackage (.gpkg) or ESRI file Geodatabase (.gdb) format. These datasets may also be submitted in .csv, .xlsm, or .xlsx file format, only if the series of coordinates that represent the shape boundaries are presented in standard Well-Known Text (.wkt) format. However, Geopackage or ESRI Geodatabase formats are preferred for submission data for features best represented by polygons.

Within the survey details spatial dataset, a survey boundary should be represented as a polygon (Table 2). The survey details should then be captured as attributes of the polygon (Table 2). All attributes specified in Table 2 are mandatory.

A single biodiversity survey report can often contain information from several field surveys, such as during a two-phase survey, with different survey areas, timeframes, and other details. A survey details spatial dataset should therefore have one polygon and one corresponding row of data in the attributes table for the boundary of each separate field survey documented in the biodiversity survey report.

Table 3 Attributes required for a survey details spatial dataset

Field	Description	Required	Darwin Core link
SurvName	An identifier for the set of information associated with a survey. Can be built from sampling protocol and date. Example “Greater bilby survey for solar site summer 2024”	Required	http://rs.tdwg.org/dwc/terms/eventID
SurvType	Text (150) e.g. Detailed Vegetation Survey A description of the type of survey. This should match the survey type stated in the Metadata and Licensing Statement.	Required	http://rs.tdwg.org/dwc/terms/eventType
Author	The name of the person or group who authored the survey report and datasets. This should match the author named in the Metadata and Licensing Statement, Text (100) XYZ Consulting	Required	http://rs.tdwg.org/dwc/terms/recordedBy

Field	Description	Required	Darwin Core link
StartDate	Date in yyyy-mm-dd format e.g. 2024-08-15 The date on which the survey commenced.	Required	http://rs.tdwg.org/dwc/terms/year http://rs.tdwg.org/dwc/terms/month http://rs.tdwg.org/dwc/terms/day
EndDate	Date in yyyy-mm-dd format e.g. 2024-08-29 The date on which the survey concluded.	Required	
Citation	A full citation for the accompanying survey report. This should match the citation provided in the Metadata and Licensing Statement. e.g. XYZ Consulting (2022). Detailed Vegetation Survey of Lot 123 Gunn Point Rd. Unpublished report prepared for ABC Developments.	Required	http://purl.org/dc/terms/bibliographicCitation

5.3. Survey data

The purpose of survey data spatial datasets is to document the physical locations of field survey activities and results and capture basic information. Survey data spatial datasets should use the Geocentric Datum of Australia 2020 (GDA2020) datum and be projected using the appropriate Map Grid of Australia zone.

Datasets that are not point-based species occurrence data (e.g. lines representing survey transects, systematic survey location data, polygons representing vegetation types, habitat types, population distribution etc.) are to be submitted in GeoPackage (.gpkg) or ESRI file Geodatabase (.gdb) format. These datasets may also be submitted in .csv, .xlsm, or .xlsx file format, only if the series of coordinates that represent the shape boundaries are presented in standard Well-Known Text (.wkt) format. However, Geopackage or ESRI Geodatabase formats are preferred for submission data for features best represented by lines or polygons.

Within survey data spatial datasets, survey activities and results are to be represented as points, lines or polygons, depending on the data type (Tables 3 to 8). The associated information should then be captured as attributes of those points, lines and polygons (Tables 3 to 8). All attributes specified here are mandatory except for comments fields.

A single biodiversity data package should contain sufficient survey data spatial datasets to represent all the field survey activities undertaken and all the observations or results arising from those activities. The type and number of survey data spatial datasets will therefore depend on the type and complexity of the survey. It is the responsibility of a proponent to ensure that all raw data are represented within the biodiversity data package using appropriate survey data spatial datasets.

5.3.1. Sample sites

A sample sites dataset is used to represent the locations of sites at which samples were taken, or observations were made during the field surveys. If a survey has captured sample sites best represented by a combination of geometry types i.e. points (e.g. observation point), lines (e.g. transects) and/or polygons (e.g. search areas), the geometry types should be clearly identified and file names suffixed with '_pt', '_pl' or '_py' as appropriate. File naming should incorporate "SampleSites".

Table 4 Attributes required for a survey data spatial dataset - sample sites

Field	Description	Required or optional	Darwin Core link
SiteName	The name of the sampling site, as used in the survey report. e.g. Site T-1	Required	http://rs.tdwg.org/dwc/terms/verbatimLocality
SampleType	A description of the type of sampling undertaken, i.e. flora, aquatic, terrestrial vertebrate fauna, terrestrial invertebrate fauna or subterranean fauna. e.g. Terrestrial vertebrate fauna	Optional	http://rs.tdwg.org/dwc/terms/MaterialEntity
SurvMethod	A description of the site type e.g. Trapping	Required	http://rs.tdwg.org/dwc/terms/samplingProtocol
Effort	A brief description of effort expended at the site. e.g. 7 nights x 60 traps	Optional	http://rs.tdwg.org/dwc/terms/samplingEffort
Author	The name of the person or group who authored the survey report and datasets. This should match the author named in the Metadata and Licensing Statement. e.g. ABC Consulting	Required	http://rs.tdwg.org/dwc/terms/recordedBy
Start date	The date the sampling commenced at this site, in yyyy-mm-dd format e.g. 2017-03-16	Required	http://rs.tdwg.org/dwc/terms/year http://rs.tdwg.org/dwc/terms/month http://rs.tdwg.org/dwc/terms/day
End date	The date the sampling concluded at this site in yyyy-mm-dd format e.g. 2017-03-18	Required	
Comments	Additional information about the sample site, if any. e.g. Site included… (etc.)	Optional	http://rs.tdwg.org/dwc/terms/locationRemarks
Citation	A full citation for the accompanying survey report. This should match the citation provided in the Metadata and Licensing Statement. e.g. ABC Consulting (2018). Detailed Terrestrial Vertebrate Fauna Survey of Lot 123 Outback Rd. Unpublished report prepared for XYZ Developments.	Required	http://purl.org/dc/terms/bibliographicCitation

5.3.2. Flora

A flora survey spatial dataset is used to represent the locations of flora records obtained during field surveys. Locations of flora records are to be defined using points and/or polygons. If a survey has produced flora data best represented by a combination of points (e.g. locations of individuals) and polygons (e.g. distribution of a large population) the different geometry types should be clearly identified in the data. If providing data for more than one geometry type each file name should be suffixed with '_pt' or '_py' as appropriate.

Table 5 Attributes required for a survey data spatial dataset - flora

Field	Description	Required or optional	Darwin Core link
SciName	The scientific name of the flora species recorded. e.g. *Corymbia ptychocarpa*	Either the scientific or common name is required	http://rs.tdwg.org/dwc/terms/scientificName
SiteName	Name of the site at which the flora observation/collection was made, as per the Sample Sites Survey Data spatial dataset. Use 'no site' if not made at a named site. e.g. Quadrat East-6	Required	http://rs.tdwg.org/dwc/terms/verbatimLocality
Count	Use '0' if the taxon was present but abundance was not recorded, otherwise populate with abundance (the number of individuals of this taxon observed at this location) e.g. 50	Required	http://rs.tdwg.org/dwc/terms/individualCount
OccurrStat	A statement about the presence or absence of a dwc: Taxon at a location e.g. present / absent	Optional	http://rs.tdwg.org/dwc/terms/occurrenceStatus
HerbRef	Herbarium reference. Leave blank if the specimen has not been collected. If lodged and accessioned, insert the unique accession number assigned by the herbarium. If the specimen has been lodged but not accessioned, use the collector's name and number (or other lodgement reference). e.g. DARWIN 01405728	Optional	http://rs.tdwg.org/dwc/terms/MaterialEntity
ConStatNT	The conservation status category (NT) of the flora species recorded, as published by DLPE. Leave blank if the species has no conservation status.	Optional	threatStatus (GBIF Darwin Core Extension: Species Distribution)
Author	The name of the person or group who authored the survey report and datasets. This should match the author named in the Metadata and Licensing Statement. e.g. ABC Consulting	Required	http://rs.tdwg.org/dwc/terms/recordedBy
Comments	Additional information about the flora observation, if any. e.g. In flower	Optional	http://rs.tdwg.org/dwc/terms/locationRemarks
Citation	A full citation for the accompanying survey report. This should match the citation provided in the Metadata and Licensing Statement. e.g. ABC Consulting (2018). Detailed Flora and Vegetation Survey of Lot 123 Outback Rd. Unpublished report prepared for XYZ Developments.	Required	http://purl.org/dc/terms/bibliographicCitation

5.3.3. Vegetation type

The discrete vegetation units mapped during the field surveys are to be defined using contiguous polygons. Vegetation classification and mapping may be based on multiple surveys, over multiple years, by multiple botanists. As such, it is difficult to attach a precise date to a vegetation map based on survey

timing. However, including the year of creation of the vegetation mapping polygons in this field gives an indication of its currency for future reference. For the dates of the surveys that contributed to the mapping, users should refer to the methodology section of the associated survey report.

Table 6 Attributes required for a survey data spatial dataset - vegetation type

Field	Description	Required or optional	Darwin Core link
VegUnit	Description of the discrete vegetation unit. e.g. Choose from NT vegetation mapping units	Required	http://purl.org/dc/elements/1.1/type
CreationYr	The year the vegetation mapping polygons were created e.g. 2024	Required	http://rs.tdwg.org/dwc/terms/year
Author	The name of the person or group who authored the survey report and datasets. This should match the author named in the Metadata and Licensing Statement. e.g. ABC Consulting	Required	http://rs.tdwg.org/dwc/terms/recordedBy
Comments	Additional information about the vegetation units, if any. e.g. Fire history... (etc.)	Optional	http://rs.tdwg.org/dwc/terms/locationRemarks
Citation	A full citation for the accompanying survey report. This should match the citation provided in the Metadata and Licensing Statement. e.g. ABC Consulting (2018). Detailed Flora and Vegetation Survey of Lot 123 Outback Rd. Unpublished report prepared for XYZ Developments	Required	http://purl.org/dc/terms/bibliographicCitation

5.3.4. Vegetation condition

The discrete vegetation condition areas mapped during the field surveys are to be defined using contiguous polygons. Vegetation condition mapping may be based on multiple surveys, over multiple years, by multiple botanists. As such, it is difficult to attach a precise date to a vegetation condition map based on survey timing. However, including the year of creation of the vegetation condition mapping polygons in this field gives an indication of its currency for future reference. For the dates of the surveys that contributed to the condition mapping, users should refer to the methodology section of the associated survey report.

Table 7 Attributes required for a survey data spatial dataset - vegetation condition

Field	Description	Required or optional	Darwin Core link
VegCond	Observed condition of the vegetation i.e. pristine, excellent, very good, good, poor, degraded, completely degraded.	Required	N/A
CreationYr	The year the vegetation condition mapping polygons were created[6].	Required	http://rs.tdwg.org/dwc/terms/year

Field	Description	Required or optional	Darwin Core link
	e.g. 2024		
Author	The name of the person or group who authored the survey report and datasets. This should match the author named in the Metadata and Licensing Statement. e.g. ABC Consulting	Required	http://rs.tdwg.org/dwc/terms/recordedBy
Comments	Additional information about the vegetation condition, if any. e.g. Grazing, seen… (etc.)	Optional	http://rs.tdwg.org/dwc/terms/locationRemarks
Citation	A full citation for the accompanying survey report. This should match the citation provided in the Metadata and Licensing Statement. ABC Consulting (2018). Detailed Flora and Vegetation Survey of Lot 123 Outback Rd. Unpublished report prepared for XYZ Developments.	Required	http://purl.org/dc/terms/bibliographicCitation

5.3.5. Fauna

A fauna survey spatial dataset is used to represent the locations of fauna records obtained during the field surveys. The locations of fauna records obtained during the field surveys are to be defined using points.

Table 8 Attributes required for a survey data spatial dataset - fauna

Field	Description	Required or optional	Darwin Core link
SciName	The scientific name of the fauna species observed. e.g. *Dasycercus cristicauda*	Either the scientific or common name is required	http://rs.tdwg.org/dwc/terms/scientificName
SiteName	The name of the site at which the fauna observation was made, as per the 'sample sites' Survey Data spatial dataset. Use 'no site' if not made at a named site. e.g. Trapping site 9	Required	http://rs.tdwg.org/dwc/terms/verbatimLocality
Count	Use '0' if the taxon was present but abundance was not recorded, otherwise populate with abundance (the number of individuals of this taxon observed at this location) e.g. 1	Required	http://rs.tdwg.org/dwc/terms/individualCount
OccurrStat	A statement about the presence or absence of a dwc:Taxon at a location e.g. present / absent	Optional	http://rs.tdwg.org/dwc/terms/occurrenceStatus

Field	Description	Required or optional	Darwin Core link
Museum ref	Museum reference. Leave blank if the specimen has not been vouchered. If the specimen has been vouchered and catalogued, insert the unique catalogue number assigned by the museum. If the specimen has been vouchered but not catalogued, used the voucher number (or other lodgement reference). e.g. WAM M41476, R173115	Optional	http://rs.tdwg.org/dwc/terms/institutionID
ConStatNT	The conservation status category (NT) of the fauna species recorded, as published by DLPE. Leave blank if the species has no conservation status.	Optional	threatStatus (GBIF Darwin Core Extension: Species Distribution)
SurvMethod	The method by which this taxon was observed. e.g. Aluminium box trap	Optional	http://rs.tdwg.org/dwc/terms/samplingProtocol
SpeciesTyp	Type of fauna, i.e. terrestrial vertebrate, terrestrial invertebrate, aquatic, subterranean. e.g. Terrestrial vertebrae	Optional	http://rs.tdwg.org/dwc/terms/occurrenceRemarks
Date	The date this species was observed in yyyy-mm-dd format e.g. 2020-08-17	Required	http://rs.tdwg.org/dwc/terms/eventDate
Author	The name of the person or group who authored the survey report and datasets. This should match the author named in the Metadata and Licensing Statement. e.g. ABC Consulting	Required	http://rs.tdwg.org/dwc/terms/recordedBy
Comments	Additional information about the fauna observation, if any. e.g. Male… (etc.)	Optional	http://rs.tdwg.org/dwc/terms/locationRemarks
Citation	A full citation for the accompanying survey report. This should match the citation provided in the Metadata and Licensing Statement. e.g. ABC Consulting (2018). Detailed Terrestrial Vertebrate Fauna Survey of Lot 123 Outback Rd. Unpublished report prepared for XYZ Developments.	Required	http://purl.org/dc/terms/bibliographicCitation

5.3.6. Fauna habitat

The discrete fauna habitats mapped during field surveys are to be defined using points and/or contiguous polygons. If a survey has produced fauna habitat data best represented by a combination of points (e.g. bat caves) and polygons (e.g. spinifex grassland) a separate file for each geometry type is required. If providing data for more than one geometry type, each file name should be suffixed with '_pt' or '_py' as appropriate.

Fauna habitat mapping may be based on multiple surveys, over multiple years, by multiple zoologists. As such, it is difficult to attach a precise date to a fauna habitat map based on survey timing. However, including the year of creation of the fauna habitat mapping polygons in this field gives an indication of its

currency for future reference. For the dates of the surveys that contributed to the fauna habitat mapping, users should refer to the methodology section of the associated fauna survey report.

Table 9 Attributes required for a survey data spatial dataset - fauna habitat

Field	Description	Required	Darwin Core link
Habitat	Description of the fauna habitat. e.g. Spinifex sand plain	Required	http://rs.tdwg.org/dwc/terms/habitat
CreationYr	The year the habitat mapping polygons were created. e.g. 2017	Required	http://rs.tdwg.org/dwc/terms/year
Author	The name of the person or group who authored the survey report and datasets. This should match the author named in the Metadata and Licensing Statement. e.g. ABC Consulting	Required	http://rs.tdwg.org/dwc/terms/recordedBy
Comments	Additional information about the fauna habitat, if any. e.g. Is disturbed... (etc.)	Optional	http://rs.tdwg.org/dwc/terms/locationRemarks
Citation	A full citation for the accompanying survey report. This should match the citation provided in the Metadata and Licensing Statement. e.g. ABC Consulting (2018). Detailed Terrestrial Vertebrate Fauna Survey of Lot 123 Outback Rd. Unpublished report prepared for XYZ Developments.	Required	http://purl.org/dc/terms/bibliographicCitation

6. Contacts for further advice

- For enquiries about biodiversity data, including sensitive flora and fauna data, contact the DLPE Flora and Fauna Division at biodiversity.dlpe@nt.gov.au or phone (08) 8995 5000.
- For enquiries about accessing environmental data contact the DLPE Land Resources Division at datarequests.dlpe@nt.gov.au or phone (08) 8999 3405.
- For enquiries about the EIA process, contact the DLPE Environmental Assessment Unit eia.ntepa@nt.gov.au or phone (08) 8924 4218.