BioNet Species Sightings data standard

Version 6.2

**Department of Climate Change,
Energy, the Environment and Water**

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

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1. Introduction

The BioNet Species Sightings Web Service is an open application programming interface (API). It enables data users to integrate BioNet Species Sightings data with software applications and databases. This open data initiative has many potential uses. These range from mobile apps to organisational decision-management business systems.

The web service complements existing BioNet applications. It provides direct programmatic access to BioNet data holdings.

This document sets out detailed information on the data that are available through the BioNet Species Sightings Web Service. It can help you evaluate whether the web service will meet your data needs.

Please make sure the version of this data standard (6.2) matches the online metadata. Check the value in 'bioNet:dataStandardVersion' for 'EntitySet Name=SpeciesSightings_CoreData':

> **EntitySet Name="SpeciesSightings_CoreData"** EntityType="BioSvcApp.Models.vwCUBE_SpeciesSightings" bioNet:bioNetOpenAPIVersion="4.0.2" **bioNet:dataStandardVersion="6.2"** bioNet:dateLastBulkUpdate="23/04/2020"

> **EntitySet Name="SpeciesSightings_AdditionalMeasurementsOrFacts"** EntityType="BioSvcApp.Models.tblCUBE_MeasurementOrFact" bioNet:bioNetOpenAPIVersion="4.0.2" **bioNet:dataStandardVersion="6.2"** bioNet:dateLastBulkUpdate="23/04/2020"/

> **EntitySet Name="SpeciesSightings_DeletedRecords"** EntityType="BioSvcApp.Models.vwCUBE_SpeciesSightingsDeleted" bioNet:bioNetOpenAPIVersion="4.0.2" **bioNet:dataStandardVersion="6.2"** bioNet:dateLastBulkUpdate="01/02/2025"/

2. Overview of the web service and standard

The web service is an OASIS Open Data (OData) v4.0-based web service. OData provides a standardised RESTful protocol for querying and retrieving data.

The BioNet Web Service developer guide provides more background information about the protocol.

OData makes data available via 'entity sets' structured as tables of data.

The data standard for the CoreData and AdditionalMeasurementsOrFacts entity sets is based on the Darwin Core standard.

Where data provided by the department do not fit into an existing Darwin Core term, we used terms already in use by the Atlas of Living Australia or new proprietary terms. Tables 1 to 3 provide a high-level overview of the categories of data communicated in each entity set.

Table 1   Overview of the categories of data in the SpeciesSightings_CoreData entity set

Category	Description
Metadata	Metadata associated with the record
dynamicProperties	Department specific data not covered by the Darwin Core Standard which applies to the record, e.g. species-level fire management information
Occurrence	Information relating to evidence of the occurrence of the organism in nature. Includes the observers, behaviour of the organism at the time, any associated media such as references
Event	Information about the time that the event occurred, sampling protocols and field notes
dcterms:Location	Information on the location associated with the occurrence, including place names, spatial data such as coordinates, and accuracy of the data
Taxon	Information on the taxonomic details of the organism, including scientific and common names

Table 2 **Overview of the categories of data in the SpeciesSightings_AdditionalMeasurementsOrFacts entity set**

Category	Description
MeasurementOrFacts	Measurements or facts associated with the event or occurrence. E.g. temperature at time of sighting, weight of the individual. There can be one or many measurements or facts for any given record

Table 3 **Overview of the categories of data in the SpeciesSightings_DeletedRecords entity set**

Category	Description
deletedRecords	In the event that a record is removed from the web service, the date of removal and catalogue number is provided here. The data is intended for use by data aggregators who are keeping a local copy of the database in sync with Bionet

3. Specifications for the SpeciesSightings_CoreData entity set

Tables 4 to 9 provide the specifications of the data fields available in each category of the SpeciesSightings_CoreData entity set available via the BioNet Species Sightings Web Service. Each table presents the group of terms that fall within the specified category.

Any reference to Category 2 or 3 species in the 'Access restrictions column' indicates that data are being withheld or obfuscated in accordance with the department's Sensitive species data policy.

Table 4 **Available 'metadata' fields in the SpeciesSightings_CoreData entity set**

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
basisOfRecord	1	The specific nature of the data record.	Darwin Core Controlled vocabulary as follows: • PreservedSpecimen • FossilSpecimen • LivingSpecimen • HumanObservation • MachineObservation	'HumanObservation'	"Edm.String"	None
collectionCode	1	The name, acronym, CODEN or initialism identifying the collection or data	Always 'BioNet Atlas of NSW Wildlife'	'BioNet Atlas of NSW Wildlife'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		set from which the record was derived.				
dataGeneralizations	0–1	Actions taken to make the shared data less specific or complete than in its original form.	Text	'coordinates given in decimalLatitude, decimalLongitude, easting and northing have been rounded to 0.1 DEG. The observer name has been changed to a unique User ID'.	"Edm.String"	None
datasetID	1	An identifier for the set of data. May be a global unique identifier or an identifier specific to a collection or institution.	Alphanumeric	12	"Edm.Int32"	None
datasetName	1	The name identifying the data set from which the record was derived.	Text	'Atlas of Australian Birds 1', 'DPIE Default Sightings', 'Grafton SF EIS Survey'	""Edm.String" Nullable="false""	None
dcterms_bibliographicCitation	1	A bibliographic reference for the	BioNet Atlas of NSW Wildlife	'BioNet Atlas of NSW Wildlife	"Edm.String" Nullable="false"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		resource as a statement indicating how this record should be cited (attributed) when used.	<DD/MM/YYYY> <HH:MM> <AM/PM> + <HH:MM offset from UTC>. Note: The date and time are AEST adjusted for daylight saving and reflect the data and time that the web service data was last refreshed from the source data (BioNet Atlas of NSW Wildlife database).	22/08/2014 12:47 AM + 10:00'		
dcterms_language	1	The language of the resource.	RFC 4646	'en' for English	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
dcterms_modified	1	The most recent date-time on which the resource was changed.	YYYY-MM-DDTHH:MM:SS.000+HH:MM Note: OData only supports DateTimeOffset, which mandates that the offset from Coordinated Universal Time (UTC) is given. For many historical records in the BioNet Atlas of NSW Wildlife we cannot be certain that the server capturing the data at the time was adjusted for daylight savings. To this end, the offset should not be relied on	'2023-09-16T08:35:27.917+10:00.	"Edm.DateTimeOffset"	None
dcterms_available	1	Date that the resource became or will become available.	YYYY-MM-DDTHH:MM:SS.000+HH:MM offset from UTC	'2025-01-30T08:28:19.000+11:00	"Edm.DateTimeOffset"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
dcterms_rights	1	Information about rights held in and over the resource. Typically, rights information includes a statement about various property rights associated with the resource, including intellectual property rights.	Text	'CC-BY 4.0'	"Edm.String"	None
dcterms_rightsHolder	1	A person or organisation owning or managing rights over the resource.	Text	'NSW Dept of Planning and Environment', 'Birds Australia', 'Australian Museum'	"Edm.String"	None
dcterms_type	1	The nature or genre of the resource. For Darwin Core, recommended best practice is to use the name of the class that defines the root of the record.	DCMI Type Vocabulary	'Event', 'StillImage'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
informationWithheld	0–1	Additional information that exists, but that has not been shared in the given record.	Text	'The following fields have been withheld and are only available to licensed or department staff: • locality • locationRemarks • occurenceRemarks'	"Edm.String"	None
institutionCode	1	The name (or acronym) in use by the institution having custody of the object(s) or information referred to in the record.	Text	'NSW Dept of Planning, Industry and Environment'	"Edm.String"	None
ownerInstitutionCode	1	The name (or acronym) in use by the institution having ownership of the object(s) or information referred to in the record.	Text	'NSW Dept of Planning and Environment', 'Birds Australia', 'Australian Museum'	"Edm.String"	None

Table 5   Available 'dynamic properties' fields in the SpeciesSightings_CoreData entity set

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
BFMCS	0–1	The number of bush fire management council areas that the species is found in.	Integer	'8'	"Edm.String"	None
botanicalDivision	1	The name of the botanical division within which the flora record occurs, based on Harden GJ (ed.) 1990, *Flora of New South Wales*, New South Wales University Press, Kensington.	One item from the following controlled vocabulary: • North Coast • Central Coast • South Coast • Northern Tablelands • Central Tablelands • Southern Tablelands • North Western Slopes • South Western Slopes • North Western Plains	'North Coast'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			• South Western Plains • North Far Western Plains • South Far Western Plains			
LLS	1	The name of the Local Land Services area within which the record occurs.	One item from the following controlled vocabulary: • Central Tablelands • Central West • Greater Sydney • Hunter • Murray • North Coast • North West • Northern Tablelands • Riverina • South East • Western	'North Coast'	"Edm.String"	None
floraReserve	0–1	If the record occurs within a flora reserve (as defined in the	Text. Notes: This field does not give the name of reserves	'Fenwicks Scrub Flora Reserve'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		Forestry Act 2012) this field gives the name of that flora reserve.	administered under the *National Parks Wildlife Act 1974*. See the 'reserve' field for information on reserves administered under that act. Note: If the field is marked 'N/A' this indicates that the record does not occur within a flora reserve.			
geogExtent	0–1	The geographic extent of the species for fire management.	One item from the following controlled vocabulary: • W = Widespread; where the species is known from 5 or more BFMCs • R = Restricted; where the species is	'HR'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			known from 2 to 4 BFMCs • HR = Highly Restricted; where the species in only known from 1 BFMC Note: If 'N/A' is given, this indicates that this field does not apply to the record.			
IBRA	1	The name of the IRBA (Interim Biogeographic Regionalisation for Australia) Region within which the record occurs. This is based on IRBA version 7.0.	Controlled vocabulary as per Australia's bioregions (IBRA). Note: If 'N/A' is given, this indicates that this field does not apply to the record.	'New England Tablelands'	"Edm.String"	None
IBRASubregion	1	The name of the IRBA (Interim Biogeographic Regionalisation for	Controlled vocabulary as per Australia's bioregions (IBRA).	'Beardy River Hills'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		Australia) Subregion within which the record occurs. This is based on IRBA version 7.0.	Note: Where a subregion occurs outside NSW, then the subregion name is not given, only the name of the state, e.g. QLD. Note: If 'N/A' is given, this indicates that this field does not apply to the record.			
mechanicalHRDescription	1	Information on any restrictions on the use of mechanical hazard reduction techniques within 100 metres of the occurrence record.	Text. Note: If 'N/A' is given, this indicates that this field does not apply to the record.	'No slashing, trittering or tree removal', 'Slashing in winter, but no trittering or tree removal'	"Edm.String"	None
potentialImpact	1	A categorisation of the information recorded in speciesFireDescription into one of 3 broad categories related to the use of fire as a hazard	One item from the following controlled vocabulary: • Exclude Bush Fire • Restrict Bush Fire	'Restrict Bush Fire'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		reduction technique.	• No Conditions Note: If 'N/A' is given, this indicates that this field does not apply to the record.			
TSProfileID	1	The unique identifier for the related threatened species profile as stored in the Threatened Biodiversity data collection maintained by the NSW Department of Climate Change, Energy, the Environment and Water.	Integer. Note: If 'N/A' is given, this indicates that this field does not apply to the record.	'10484'	"Edm.String"	None
reserve	0–1	If the record occurs within a reserve (as defined in the *National Parks and Wildlife Act 1974*) this field gives the name of	Text. Note: This field does not give the name of reserves administered under the *Forestry Act 2012*. See the	'Cocoparra National Park', 'Bedooba State Conservation Area'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		that reserve. The following types of reserve are covered under this legalisation: • national park • historic site • state conservation area • regional park • karst conservation reserve • nature reserve • Aboriginal area.	'floraReserve' field for information on flora reserves. Note: If the field is marked 'N/A', this indicates that the record does not occur within a reserve.			
speciesFireDescription	1	Information on any restrictions on the use of controlled burning as a hazard reduction technique within 100 metres of the occurrence record.	Text. Note: If 'N/A' is given, this indicates that this field does not apply to the record.	'No burning within 100 metres of streams', 'No burning from 1 August to 31 March, and no more than once every 2 years. Retain logs on ground.', 'No fire'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
stateForest	0–1	If the record occurs within a state forest (as defined in the *Forestry Act 2012*) this field gives the name of that state forest.	Text. Note: If the field is marked 'N/A' this indicates that the record does not occur within a state forest.	'Bom Bom State Forest'	"Edm.String"	None
vulnerability	1	Vulnerability of the species to hazard reduction activities, based on a combination of status on the Threatened Species Conservation Act and the species geographic extent as recorded in GeogExtent.	One item from the following controlled vocabulary: • L = Low • M = Moderate • H = High • VH = Very High Note: If 'N/A' is given, this indicates that this field does not apply to the record	'VH'	"Edm.String"	None

Table 6   Available 'occurrence' fields in the SpeciesSightings_CoreData entity set

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
associatedReferences	0–1	A list (concatenated and separated) of identifiers (publication, bibliographic reference, global unique identifier, URI) of literature associated with the occurrence.	Free text	'Wassens, S., Michael, D., Spencer, J., Thiem, J., Thomas, R., et al 2021, <i>Commonwealth Environmental Water Office Monitoring, Evaluation and Research Murrumbidgee Evaluation Report 2019-2020</i>, Commonwealth of Australia 2021., Canberra, ACT.'	"Edm.String"	None
catalogNumber	1	A unique identifier for the record within the data set or collection. Provides a linking key to SpeciesSightings_AdditionalMeasurementsOrFacts and	Alphanumeric	'WD9884'	"Edm.String" Nullable="false"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		SpeciesSighitngs_ DeletedRecords.				
consequence	0–1	Final assessment as to the impact of hazard reduction activities on a species.	One item from the following controlled vocabulary: • Mi: Minor • Mo: Moderate • Ma: Major • C: Critical	'Ma'	"Edm.String"	None
establishmentMea ns	1	The process by which the biological individual(s) represented in the occurrence became established at the location.	One item from the following controlled vocabulary: • Alive in NSW, Native • Extinct in NSW, Native • Introduced • Not Known from NSW • Hybrid	'Introduced'	"Edm.String"	None
estimateTypeCode	0–1	Refers to the accuracy of the individualCount field.	One item from the following controlled vocabulary: • At least	'At least'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			• Less than • Greater than • Estimate • Exactly			
individualCount	0–1	The number of individuals represented present at the time of the occurrence.	Whole number	'25'	"Edm.Decimal" Scale="variable" "	None
individualID	0–1	An identifier for an individual or named group of individual organisms represented in the occurrence. Meant to accommodate resampling of the same individual or group for monitoring purposes. May be a global unique identifier or an identifier specific to a dataset.	Alphanumeric code	'DJS019'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
observationType	1	Refers to the mode of observation.	One item from the controlled vocabulary as documented in Appendix A1.3	'Nest/Roost'	"Edm.String"	None
occurrenceID	1	An identifier for the occurrence (as opposed to a particular digital record of the occurrence). In the absence of a persistent global unique identifier, construct one from a combination of identifiers in the record that will most closely make the occurrenceID globally unique.	urn:catalog:[institutionCode]:[collectionCode]:[catalogNumber]	'urn:catalog: NSW Dept of Planning, Industry and Environment: BioNet Atlas of NSW Wildlife: WD9884'.	"Edm.String" Nullable="false"	None
occurrenceRemarks	0–1	Comments or notes about the occurrence.	Free text	'found dead on road'.	"Edm.String"	For public and registered users this field is withheld for Category 2 and 3 species. For licensed users this

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
						field is withheld for Category 2 species.
occurrenceStatus	1	A statement about the presence or absence of a taxon at a location.	One item from the following controlled vocabulary: • Present • Absent	'Present'	"Edm.String"	None
otherCatalogNumbers	0–1	A list (concatenated and separated) of previous or alternate fully qualified catalogue numbers or other human-used identifiers for the same occurrence, whether in the current or any other data set or collection.	Text	'The Australian Museum, Sydney R10694', 'Royal Botanic Gardens & National Herbarium of NSW, Sydney NSW227432'.	"Edm.String"	None
PNFFilter	1	Indicator as to whether the record is relevant to the Private Native	One item from the following	'Y', 'N'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		Forestry Code of Practice. See Private Native Forestry Code of Practice for more details and to download the code of practice.	controlled vocabulary: • Y (Yes) • N (No) Note: This only applies to species listed as threatened in NSW. For unlisted species the field is blank (null).			
populationName	0–1	Where the observation relates to the occurrence of a species within an endangered population as listed under the *Biodiversity Conservation Act 2016*, the name of the threatened population will be given here.	Text	'Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area'	"Edm.String"	
recordedBy	0–n	A list (concatenated and separated) of	Text	'Oliver P. Pearson; Anita K. Pearson'	"Edm.String"	For public, registered and licensed users, the

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		names of people, groups, or organisations responsible for recording the original occurrence.				recorder name has been replaced with a unique UserID.
recordNumber	0–1	An identifier given to the occurrence at the time it was recorded. Often serves as a link between field notes and an occurrence record, such as a specimen collector's number.	Alphanumeric	'OPP7101'	"Edm.String"	None
reproductiveCondition	0–n	The reproductive condition of the biological individual(s) represented in the occurrence.	One item from the controlled vocabulary as listed in Appendix A1.4	'- Not breeding, A Adult, D Distraction display, E Eggs, I Immature (subadult), M Nestling,	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			N Nesting'			
sex	0–1	The sex of the biological individual(s) represented in the occurrence.	Controlled vocabulary as follows: • Not Recorded • Female • Male • Unknown • Mixed sexes	'Female', 'Unknown'	"Edm.String"	None
stateConservation	1	The legal status of the species within NSW under the *Biodiversity Conservation Act 2016*.	One item from the controlled vocabulary as listed in Appendix A1.5	'Endangered'	"Edm.String"	None
status	1	The status of the record with respect to its validity.	Format: One item from the following controlled vocabulary: • Accepted as valid from quarantine • Invalid, in quarantine • Rejected as certainly incorrect	'Suspect', 'Rejected as certainly incorrect'	"Edm.String"	Public and registered users cannot access rejected records.

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			• Suspect • Vagrant or Escaped Animal or Planted Specimen • Valid and accepted without modification • Valid record from population that is no longer extant			
protectedInNSW	1	The legal status of the species within NSW under the *Biodiversity Conservation Act 2016.*	True or false	True	"Edm.String"	None
sensitivityClass	1	The category of the species in accordance with the Sensitive Species Data Policy (SSDP).	One item from the following controlled vocabulary: • Category 1 • Category 2 • Category 3 • Not Sensitive	'Category 2'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
migratorySpecies Agreement	0–n	The list of migratory species agreements applicable to the species identified in the sighting (Part 5, Commonwealth EPBC Act 1999).	One or more items from the following controlled vocabulary: • CAMBA (China–Australia Migratory Bird Agreement) • JAMBA (Japan–Australia Migratory Bird Agreement) ROKAMBA (Republic of Korea–Australia Migratory Bird Agreement)	'CAMBA'	"Edm.String"	None
countryConservati on	1	The legal status of the species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).	One item from the following controlled vocabulary: • Conservation Dependent • Critically Endangered • Endangered	'Endangered'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			• Key Threatening Process • Vulnerable • Extinct • Extinct in the Wild • Not Listed			

Table 7   Available 'event' fields in the SpeciesSightings_CoreData entity set

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
eventDate	1	The date or interval during which an event occurred. For occurrences, this is the date when the event was recorded.	ISO 8601:2004(E).	'1978-06-01/1978-06-28'	"Edm.String" Nullable="false"	None
eventID	0–1	The unique key assigned to a census. A census is a time-distinct assessment conducted within a survey at a designated site.	Alphanumeric	'CPXEI0000001'	"Edm.String"	For Category 2 & 3 Sensitive species, these data are withheld from public, registered and licensed users.
eventRemarks	0–1	Comments or notes about the Event.	Free text	'after the recent rains the river is nearly at flood stage'	"Edm.String"	None
eventTime	0–1	The time or interval during which an event occurred.	ISO 8601:2004(E).	'10:00:00/10:05:00'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
habitat	0–1	A category or description of the habitat in which the event occurred.	One item from the controlled vocabulary as listed in Appendix A1.1.	'Sod grassland', 'Open tussock grassland'	"Edm.String"	For Category 2 & 3 sensitive species, these data are withheld from public, registered and licensed users.
samplingEffort	0–1	The amount of effort expended during an event.	Free text	'60.00 Trap Nights'	"Edm.String"	For Category 2 & 3 sensitive species these data are withheld from public, registered and licensed users.
samplingProtocol	0–1	The name of, reference to, or description of the method or protocol used during an event.	Free text	'20 by 20 Vegetation Plot (old type)', 'Bat Ultrasound', 'Cage Trapping'	"Edm.String"	For Category 2 & 3 sensitive species these data are withheld from public, registered and licensed users.

Table 8   Available 'location' fields in the SpeciesSightings_CoreData entity set

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
coordinatePrecision	1	A decimal representation of the precision of the coordinates given in the decimalLatitude and decimalLongitude. For example, 2 for coordinates accurate to 2 decimal places.	Integer. Note: be careful with coordinates converted from D:M:S they can have a lot of decimal places that are not warranted by the original coordinates.	'1', '2', '9'	"Edm.String"	None
coordinateUncertaintyInMeters	1	The horizontal distance (in metres) from the given decimalLatitude and decimalLongitude describing the smallest circle within which the location is likely to occur.	Decimal number. For example, a value of 100 would mean that the location is accurate to the nearest 100 metres.	'30.0000', '50'	"Edm.Decimal" Scale="variable"	None
country	1	The name of the country or major administrative unit	Text	'Australia'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		in which the location occurs.				
countryCode	1	The standard code for the country in which the location occurs.	ISO 3166-1-alpha-2 country codes.	'AU' for Australia	"Edm.String"	None
county	1	The full, unabbreviated name of the next smaller administrative region than stateProvince (county, shire, department, etc.) in which the location occurs. In the context of NSW, the local government area.	Text. Note: Where the record does not occur in a NSW LGA this field give the value 'N/A'.	'Clarence Valley', 'Dubbo', 'Tumut'	"Edm.String"	None
decimalLatitude	1	The geographic latitude (in decimal degrees, using the spatial reference system given in geodeticDatum) of the geographic centre of a	Decimal number	'-36.864246125'	"Edm.Decimal" Scale="variable"	For public and registered users, these data are denatured to 0.01 for Category 3 Sensitive species, and 0.1 for Category 2

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		location. Positive values are north of the Equator, negative values are south of the Equator. Legal values lie between –90 and 90, inclusive.				sensitive species. For licensed users, these data are denatured to 0.01 for Category 2 sensitive species.
decimalLongitude	1	The geographic longitude (in decimal degrees, using the spatial reference system given in geodeticDatum) of the geographic centre of a Location. Positive values are east of the Greenwich Meridian, negative values are west of it. Legal values lie between -180 and 180, inclusive.	Decimal number	'149.927962884'	"Edm.Decimal" Scale="variable"	For public and registered users, these data are denatured to 0.01 for Category 3 sensitive species, and 0.1 for Category 2 sensitive species. For licensed users, these data are denatured to 0.01 for Category 2 sensitive species.
easting	1	The reference in metres, measured	Integer	'691573'	"Edm.Decimal" Scale="variable"	For public and registered users,

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		east of an arbitrary origin (also referred to as the x-coordinate). The easting provided in Atlas reports has been calculated from the latitude and longitude values. Data provided in Map Grid of Australia (MGA).				these data are denatured to 0.01 (decimal degrees or add degrees symbol as per northing) for Category 3 sensitive species, and 0.1 (decimal degrees) for Category 2 sensitive species. For licensed users, these data are denatured to 0.01 (decimal degrees) for Category 2 sensitive species.
geodeticDatum	1	The ellipsoid, geodetic datum, or spatial reference system (SRS) upon which the geographic coordinates given in decimalLatitude and	Alphanumeric code	'GDA94'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		decimalLongitude are based.				
georeferenceProtocol	0–1	A description or reference to the methods used to determine the spatial footprint, coordinates, and uncertainties. In the context of this data set, it will indicate if GPS was used to determine the location.	Text	'GPS'	"Edm.String"	None
locality	0–1	The specific description of the place. Less-specific geographic information can be provided in other geographic terms (higherGeography, continent, country, stateProvince, county, municipality,	Free text	'Hawkshead Road, 1km W of Hereford Park. Specified Map No: 8824'	"Edm.String"	For Category 2 & 3 sensitive species, these data are withheld from public and registered users. For Category 2 sensitive species, these data are withheld from licensed users.

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		waterBody, island, islandGroup). This term may contain information modified from the original to correct perceived errors or standardise the description.				
locationID	0–1	An identifier for the set of location information (data associated with dcterms:Location). May be a global unique identifier or an identifier specific to the data set.	Alphanumeric code	'7457-HO', '5224-035'	"Edm.String" Nullable="false"	For Category 2 & 3 sensitive species these data are withheld from public and registered users. For Category 2 sensitive species, these data are withheld from licensed users.
locationRemarks	0–1	Comments or notes about the Location.	Free text	'Partially cleared and regenerated'	"Edm.String"	These data are withheld from public and registered users.
mapSheetNumber	1	The Australian Topographic Map Sheet number for the map which	Alphanumeric code	'8824 – BEGA'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		covers the location of the record. Note: Where the record does not overlap a valid NSW map sheet this field gives the value 'N/A'.				
maximumElevation InMeters	0–1	The upper limit of the range of elevation (altitude, usually above sea level), in metres.	Integer	'200'	Type="Edm.Decim al" Scale="variable "	For Category 2 & 3 sensitive species, these data are withheld from public and registered users. For Category 2 sensitive species, these data are withheld from licensed users.
minimumElevationI nMeters	0–1	The lower limit of the range of elevation (altitude, usually above sea level), in metres.	Integer	'100'	Type="Edm.Decim al" Scale="variable "	For Category 2 & 3 sensitive species these data are withheld from public and registered users. For Category 2 sensitive species, these data are

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
						withheld from licensed users.
northing	1	The reference in metres, measured north of an arbitrary origin (also referred to as the y-coordinate). The northing provided in Atlas reports has been calculated from the latitude and longitude values. Data provided in Map Grid of Australia (MGA).	Integer	'6121614'	Type="Edm.Decimal" Scale="variable"	For public and registered users, these data are denatured to 0.01° for Category 3 species, and 0.1° for Category 2 species. For licensed users, these data are denatured to 0.01° for Category 2 species.
stateProvince	1	The name of the next smaller administrative region than country (state, province, canton, department, region, etc.) in which the location occurs.	3-letter code for state. Note: Where the record does not overlap a valid Australian state, this field gives the value 'N/A'.	'NSW'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
zone	1	A 6° band of longitude, divided according to the Universal Transverse Mercator (UTM) coordinate system. NSW Is divided into 4 zones; zone 56 is 150° –156° longitude, which encompasses much of eastern NSW. zone 55 is 144°–150° longitude. Zone 54 is 138°–144° longitude, encompassing most of Western NSW. Zone 57 covers Lord Howe Island. The Zone in Atlas reports has been calculated from the Latitude and Longitude values. Data provided in MGA.	Integer	'55'	"Edm.Decimal" Scale="variable"	None

Table 9   Available 'taxon' fields in the SpeciesSightings_CoreData entity set

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
class	1	The full scientific name of the class in which the taxon is classified.	Text	'Aves', 'Equisetopsida'	"Edm.String"	None
family	1	The full scientific name of the family in which the taxon is classified.	Text	'Cacatuidae', 'Fabaceae'	"Edm.String"	None
genus	1	The full scientific name of the genus in which the taxon is classified.	Text	'Callocephalon', 'Acacia'	"Edm.String"	None
infraspecificEpithet	0–1	The name of the lowest or terminal infraspecific epithet of the scientificName, excluding any rank designation.	Text	'latifolia', 'calcicola'	"Edm.String"	None
kingdom	1	The full scientific name of the kingdom in which the taxon is classified.	One item from the following controlled vocabulary: • Animalia • Plantae	'Plantae'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			• Fungi			
nomenclaturalCode	1	The nomenclatural code (or codes in the case of an ambiregnal name) under which the scientificName is constructed.	One item from the following controlled vocabulary: • ICBN (International Code of Botanical Nomenclature) • ICZN (International Code of Zoological Nomenclature)	'ICBN', 'ICZN'	"Edm.String"	None
order	1	The full scientific name of the order in which the taxon is classified.	Text	'Psittaciformes'	"Edm.String"	None
scientificName	1	The full scientific name, with authorship and date information if known. When forming part of an identification, this should be the name in lowest	Text	'Callocephalon fimbriatum', 'Acacia pycnantha'	"Edm.String"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		level taxonomic rank that can be determined.				
scientificNameAuthorship	0–1	The authorship information for the scientificName formatted according to the conventions of the applicable nomenclaturalCode.	Text	'(Grant, 1803)'	"Edm.String"	None
scientificNameID	1	An identifier for the nomenclatural (not taxonomic) details of a scientific name.	Integer	'0268'	"Edm.String" Nullable="false"	None
sortOrder	1	An integer used to sort species in a sensible taxonomic order.	Integer	'97'	"Edm.Int32	None
specificEpithet	0–1	The name of the first or species epithet of the scientificName.	Text	'fimbriatum', 'pycnantha'	"Edm.String"	None
taxonRank	1	The taxonomic rank of the most	Text	'Subspecies', 'Species', 'Genus'	"Edm.String" Nullable="false"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		specific name in the scientificName.				
vernacularName	1	A common or vernacular name.	Text	'Gang-gang Cockatoo', 'Golden Wattle'	"Edm.String"	None

4. Specifications for the SpeciesSightings_AdditionalMeasurementsOrFacts entity set

4.1 AdditionalMeasurementsOrFacts

Additional measurements or facts associated with a given sighting record are supplied via the SpeciesSightings_AdditionalMeasurementsOrFacts entity set, which can be joined as a table to SpeciesSightings_CoreData using the catalogNumber (Tables 10 and 11).

Table 10   Darwin Core fields available in the SpeciesSightings_AdditionalMeasurementsOrFacts entity set

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
datasetID	1	An identifier for the set of data. May be a global unique identifier or an identifier specific to a collection or institution.	Alphanumeric	12	"Edm.Int32" Nullable="false"	None
occurrenceID	1	An identifier for the occurrence (as opposed to a particular digital record of the occurrence). In the absence of a persistent global unique identifier, construct one from a combination of identifiers in the record that will most closely make the occurrenceID globally unique.	urn:catalog:[institutionCode]:[collectionCode]:[catalogNumber]	'urn:catalog: NSW Dept of Planning, Industry and Environment: BioNet Atlas of NSW Wildlife: WD9884'	"Edm.String" Nullable="false"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
measurementID	1	A unique identifier for the measurementValue.	Alphanumeric	1205	"Edm.String" Nullable="false"	None
measurementType	1	The nature of the measurement, fact, characteristic, or assertion.	Controlled vocabulary as defined in the measurementType table below.	'Aspect'	"Edm.String" Nullable="false"	None
measurementValue	1	The value of the measurement, fact, characteristic, or assertion.	Variable depending on the measurementType. See table below for details on the format per measurementType.	'30'	"Edm.String" Nullable="false"	None
measurementUnit	1	The units associated with the measurementValue. Recommended best practice is to use the International System of Units (SI).	Text	'degrees clockwise from true North'	"Edm.String" Nullable="false"	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
catalogNumber	1	An identifier (preferably unique) for the record within the data set or collection. Provides a linking key to SpeciesSightings_ CoreData and SpeciesSighitngs_ DeletedRecords.	Alphanumeric code	'WD9884'	"Edm.String" Nulla ble="false"	None

4.2 measurementType

Table 11 provides the full list of measurementType values that (where available) will be given for each sighting record.

Table 11   Available 'measurement type' fields in the SpeciesSightings_AdditionalMeasurementsOrFacts entity set

measurementType	Occurrence	Definition	Format	Example
aspect	0–1	The aspect of the location where the observations was made measured in degrees clockwise from true north.	Integer	'30'
microhabitat	0–1	The small-scale habitat (e.g. on ground, or in tree).	Controlled vocabulary as listed in Appendix 1.	'In burrow'
slope	0–1	The slope of the location where the observation was made measured in degrees from horizontal.	Integer	'15'
surfaceGeology	0–1	The surface geology of the location where the observation was made as per the following controlled vocabulary.	One item from the controlled vocabulary as listed in Appendix 1.	'Basalt'

5. Specifications for the SpeciesSightings_DeletedRecords entity set

5.1 DeletedRecords

The SpeciesSightings_DeletedRecords entity set (Table 12) lists records that have been deleted. This enables data aggregators to keep local copies of their BioNet Species Sightings data in sync using a daily delta process rather than redownloading unchanged records every time.
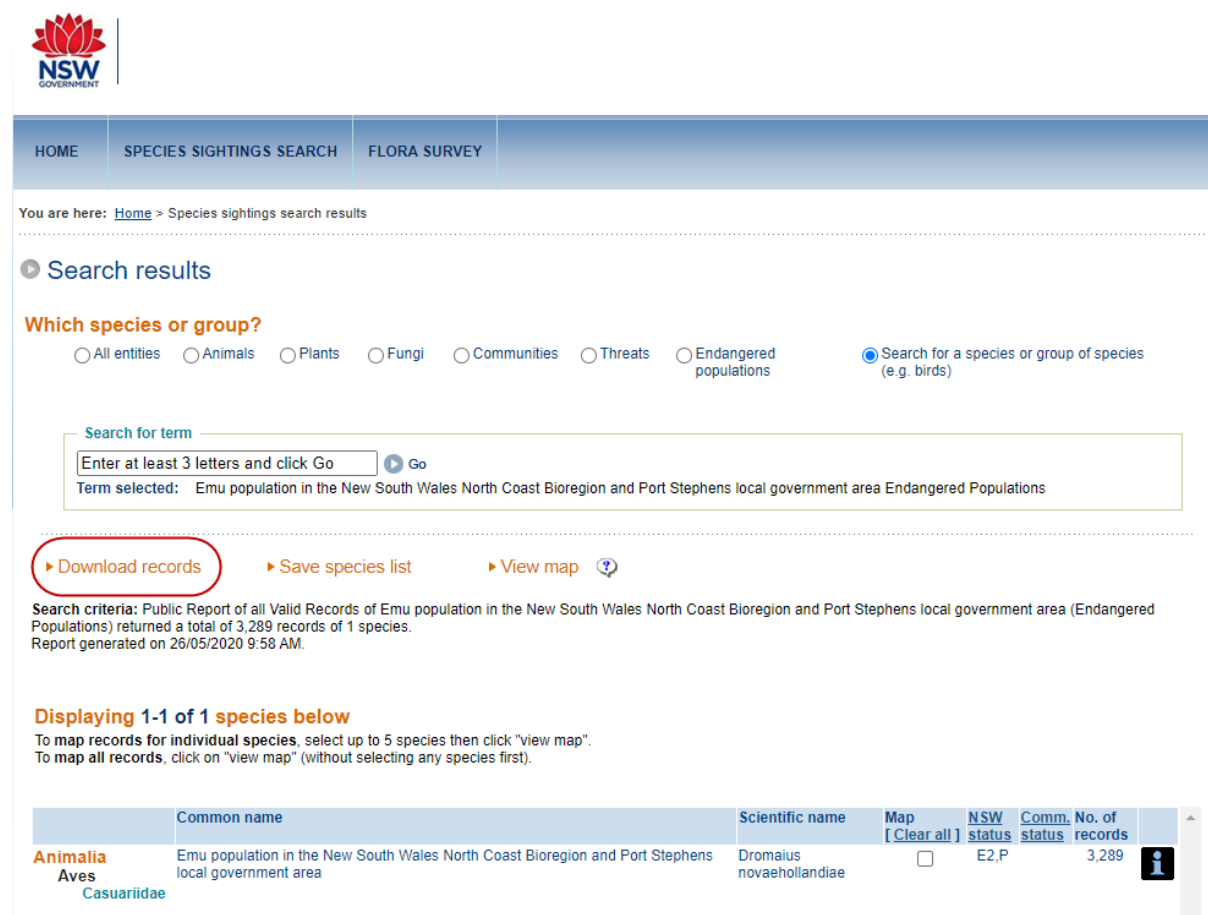
Table 12 Records deleted during the daily delta data sync

Field name	Occurrence	Definition	Example	Data type	Access restrictions
catalogNumber	1	An identifier (preferably unique) for the record within the data set or collection. Provides a linking key to SpeciesSighitngs_CoreData and SpeciesSightings_AdditionalMeasurementsOrFacts.	'WD9884'	"Edm.String" Nullable ="false"	None
date	1	The date when the record was removed from the SpeciesSightings_CoreData and (if present)	'2018-10-16T02:57:35.387+11:00'	"Edm.DateTimeOffset"	None

Field name	Occurrence	Definition	Example	Data type	Access restrictions
		the SpeciesSightings_AdditionalMeasurementsOrFacts entity sets based on ISO 8601:2004(E).			

6. Mapping to existing BioNet Atlas field names

Figure 1 shows how to manually search for and download records using the BioNet Atlas application.

Figure 1   **Screenshot of how to manually search for and download records**

Table 13 provides mapping between the field names in the BioNet Atlas record download and the new standardised field names in the Species Sightings Web Service.

Table 13   Field name mapping

BioNet Atlas website download field name	Web Service field name
Accuracy	coordinateUncertaintyInMeters
CensusKey	eventID
ClassName	class
CommonName	vernacularName
CommStatus	countryConservation
DatasetName	datasetName
DateFirst	eventDate
DateLast	eventDate
Description	locality
Easting	easting
Effort	samplingEffort
EstimateTypeCode	estimateTypeCode
Exotic	establishmentMeans
FamilyName	family
KingdomName	kingdom
Latitude_GDA94	decimalLatitude
LocationNotes	locationRemarks
Longitude_GDA94	decimalLongitude
MicrohabitatType	MicrohabitatType
Northing	northing
NSWStatus	stateConservation
NumberIndividuals	individualCount
ObservationType	observationType
Observers	recordedBy
ProfileID	TSProfileID
ScientificName	scientificName
SensitivityClass	sensitivityClass
SightingKey	catalogNumber
SightingNotes	occurrenceRemarks
SortOrder	sortOrder
SourceCode	basisOfRecord

BioNet Atlas website download field name	Web Service field name
SpeciesCode	scientificNameID
Status	status
TechniqueType	samplingProtocol
Zone	zone

Appendix 1   Controlled vocabularies

A1.1 habitat

Closed chenopod shrubland

Isolated chenopod shrub

Isolated clump of chenopod shrubs

Chenopod shrubland

Open chenopod shrubland

Sparse chenopod shrubland

Closed sod grassland

Isolated sod grasses

Isolated clump of sod grasses

Sod grassland

Open sod grassland

Sparse sod grassland

Closed fernland

Isolated ferns

Isolated clumps of ferns

Fernland

Open fernland

Sparse fernland

Closed forbland

Isolated forbs

Isolated clumps of forbs

Forbland

Open forbland

Sparse forbland

Closed tussock grassland

Isolated tussock grasses

Isolated clump of tussock grasses

Tussock grassland

Open tussock grassland

Sparse tussock grassland

Closed hummock grassland

Isolated hummock grass

Isolated clump of hummock grasses

Hummock grassland

Open hummock grassland

Sparse grassland

Closed vineland

Isolated vines

Isolated clump of vines

Vineland

Open vineland

Sparse vineland

Closed mallee forest

Isolated mallee trees

Isolated clump of mallee trees

Open mallee forest

Mallee woodland

Open mallee woodland

Closed lichenland

Isolated lichens

Isolated clump of lichens

Lichenland

Open lichenland

Sparse lichenland

Beach

Billabong or Swamp

Coastal Waters

Estuary

Freshwater Lake

Grazing Land

Saltwater Lake

Mudflat

Open Ocean

Crop Land

Rock Outcrop

Stream or River

Urban

Cave

Closed rushland

Isolated rushes

Isolated clump of rushes

Rushland

Open rushland

Sparse rushland

Closed shrubland

Isolated shrubs

Isolated clump of shrubs

Shrubland

Open shrubland

Sparse shrubland

Closed forest

Isolated trees

Isolated clump of trees

Open forest

Woodland

Open woodland

Closed sedgeland

Isolated sedges

Isolated clump of sedges

Sedgeland

Open sedgeland

Sparse sedgeland

Closed liverwortland

Isolated liverworts

Isolated clump of liverworts

Liverwortland

Open liverwortland

Sparse liverwortland

Closed mossland

Isolated mosses

Isolated clump of mosses

Mossland

Open mossland

Sparse mossland

Closed mallee shrubland

Isolated mallee shrubs

Isolated clump of mallee shrubs

Mallee shrubland

Open mallee shrubland

Sparse mallee shrubland

Closed heathland

Isolated heath shrub

Isolated clump of heath shrubs

Heathland

Open heath

Sparse heath

A1.2 microhabitat

Flying above canopy

In/on bridge

In building

Crevice in rock

Crevice in log

Farm/fire dam

In dead tree (stag)

Edge of water

In/on post or stump

Flying within canopy

On ground

High shrub

In burrow

In cave

In grass

In tree hollow

In litter

In reeds

In soil

In Tree

In water

Lower canopy

Low shrub

Mid canopy

On (beach) sand

On fence

On log

On rock

Over water

Power line

On road

On trunk

Under bark

Upper canopy

Undergrowth

Under log

Under rock

Under iron

Waterhole

A1.3 observationType

Acoustic recording

Bone, teeth or shell

Burnt

Burrow

Camera

Cat Injured

Cat kill

Caught

Crushed Cones

Dead

Dog Injured

Dog kill

Drone Record

eDNA sampling

Flora Record

Floristics Record from Systematic Flora Survey

Fox Injured

Fox kill

Hair, feathers or skin

Heard call

In raptor/owl pellet

In scat

Miscellaneous

Movement Tracking Data

Nest/roost

Not located

Observed

Observed and Heard call

Road Injured

Road kill

Scat

Shot

Stranding/beached

Subfossil/Fossil Remains

Tracks, scratchings

Trapped or netted

Ultrasonic recording

Wildlife Rehabilitation Record

A1.4 reproductiveCondition

For any given record, either the fauna or flora controlled vocabulary applies.

For fauna:

– Not breeding

A Adult

D Distraction display

E Eggs

F Pouch Young

G Gravid

I Immature (subadult)

J Juveniles

L Lactating

M Nestling

N Nesting

P Pregnant

T Tadpoles

X Metamorph

Y Yes, but no details

For flora:

BU Flower Buds

FL Flowering

FR Fresh Fruit

N No Breeding Evident

OF Old Fruit

SD Seeds

SE Seedlings Present

Y Breeding Present, but not specified

A1.5 stateConservation

Vulnerable

Vulnerable Ecological Community

Endangered

Endangered Ecological Community

Endangered Population

Critical Habitat

Critically Endangered

Critically Endangered Ecological Community

Extinct

Extinct in the Wild

Key Threatening Process

Collapsed Ecological Community

Not Listed

A1.6 surfaceGeology

Adamellite

Agglomerate

Altered Substrate Materials

Amphibolite

Andesite

Aplite

Arkose

Ash

Basalt

Breccia

Clay

Chert

Coal

Conglomerate

Coffee Rock

Diorite

Dolomite

Dolerite

Eolianite

Ferricrete

Gabbro

Granodiorite

Greenstone

Granite

Gneiss

Gravel

Graywacke

Hornfels

Unidentified igneous rock

Jasper

Calcrete

Calcareous sand

Laterite

Limestone

Marble

Unidentified metamorphic rock

Marl

Monzonite

Mudstone

No Observation Possible

Not Recorded

Obsidian

Other

Phyllite

Quartz porphyry

Quartzite

Rhyolite

Sand

Sandstone

Silcrete

Sand/Clay/Alluvium

Unidentified sedimentary rock

Shale

Shale/Sandstone

Siltstone

Scoria

Slate

Serpentine

Schist

Syenite

Trachyte

Tuff

Unidentified Unconsolidated Substrate Material

Unknown

Silt