



DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

BioNet Species Sighting data standard

BioNet Web Services Version 6.1



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1. Introduction

The BioNet Species Sightings Web Service is an open application programming interface (API). It enables IT application developers to integrate Species Sightings data held in the BioNet Species Sightings database with software applications. As an open data initiative, the scope of applications spans the full breadth of potential uses – from mobile apps to organisational decision management business systems.

The web service does not replace the existing BioNet Atlas user interface, as it is intended to be used by software applications, not as a user interface.

This document provides detailed information on the data that are available through the BioNet Species Sightings Web Service. To ensure that this version of the data standard applies to the web service, please check the [online metadata](#) and confirm that the version of this document aligns with the value in '*bioNet:dataStandardVersion*' for '*EntitySetName=SpeciesSightings_CoreData*' (see Figure 1).

```

- <EntitySet Name="SpeciesSightings_CoreData"
  EntityType="BioSvcApp.Models.vwCUBE_SpeciesSightings"
  bioNet:bioNetOpenAPIVersion="3.1.0.0" bioNet:dataStandardVersion="6.1"
  bioNet:dateLastBulkUpdate="03/12/2017">
  <NavigationPropertyBinding Path="SpeciesSightings_AdditionalMeasurementsOrFacts"
    Target="SpeciesSightings_AdditionalMeasurementsOrFacts"/>
</EntitySet>

```

Figure 1 Metadata output

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 following resources provide more background about the OData protocol:

- [Unlock your data with OData](#) – a short high-level explanatory video
- [What is the OData protocol?](#) – a short, more technical explanation of the protocol
- [OASIS Open Data Protocol \(OData\) TC](#) – the OASIS standard specification details
- [OData – the best way to REST](#) – the OData community website.

OData makes data available via entity sets. These can be thought of as tables of data, much like a tab within a spreadsheet. The Species Sightings Web Service has three available entity sets, which are linked by catalogNumber (see Figure 2).

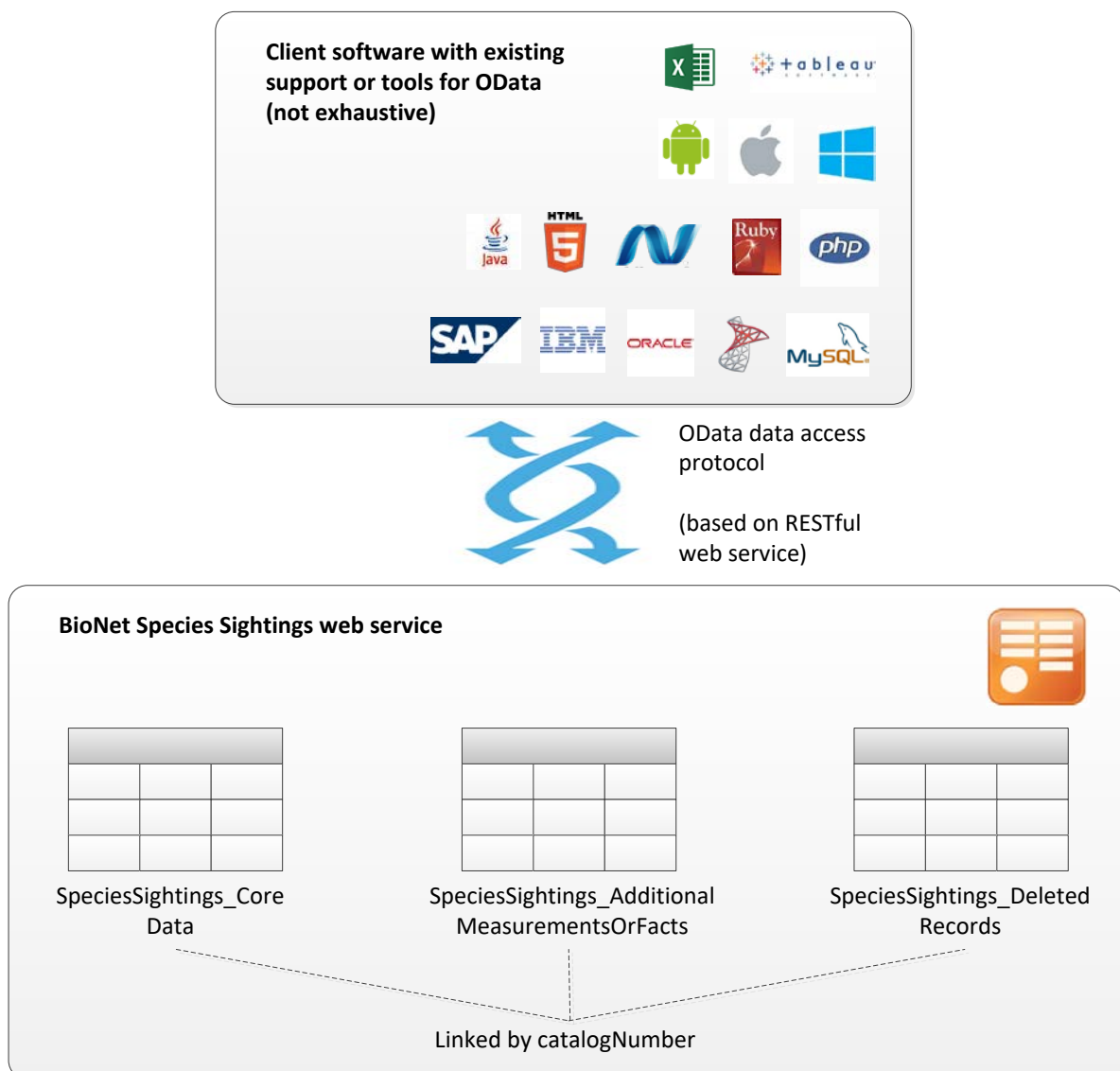


Figure 2 Conceptual overview of data exposure using the OData-based web service

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, terms already in use by the Atlas of Living Australia (ALA), or new proprietary terms, were created. Figures 3–5 provide a high-level overview of the type of data communicated in each of the entity sets.

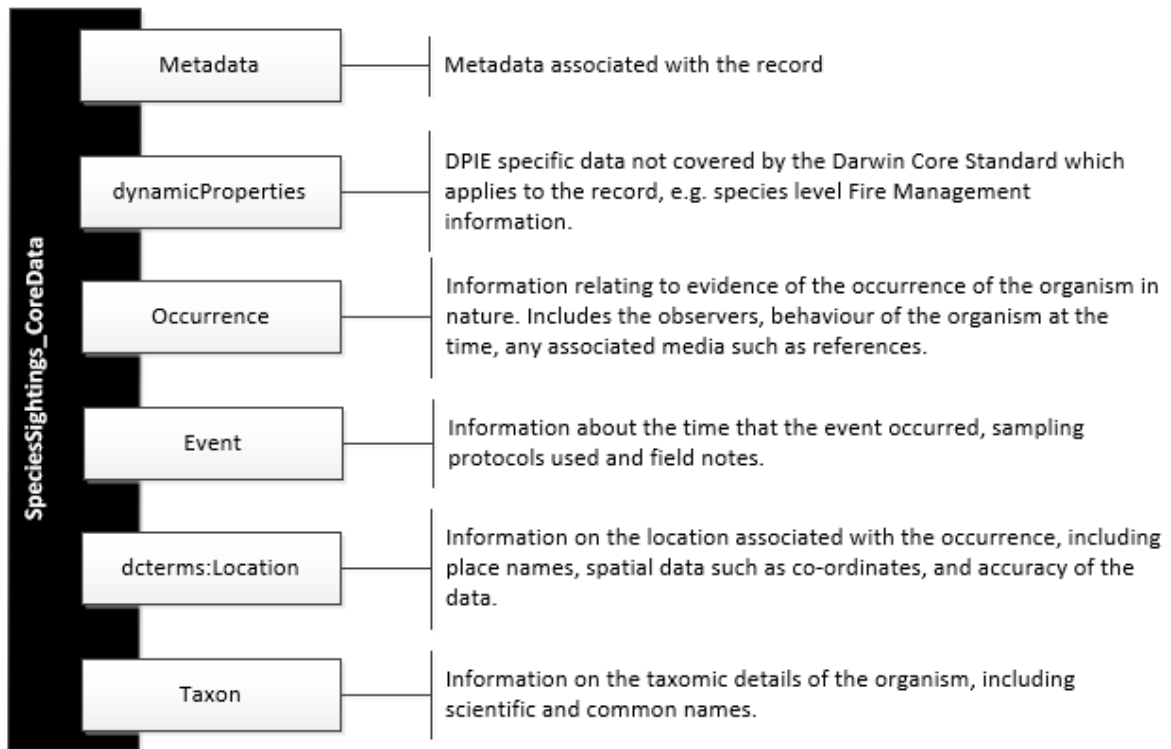


Figure 3 Overview of the categories of data shared via the SpeciesSightings_CoreData entity set

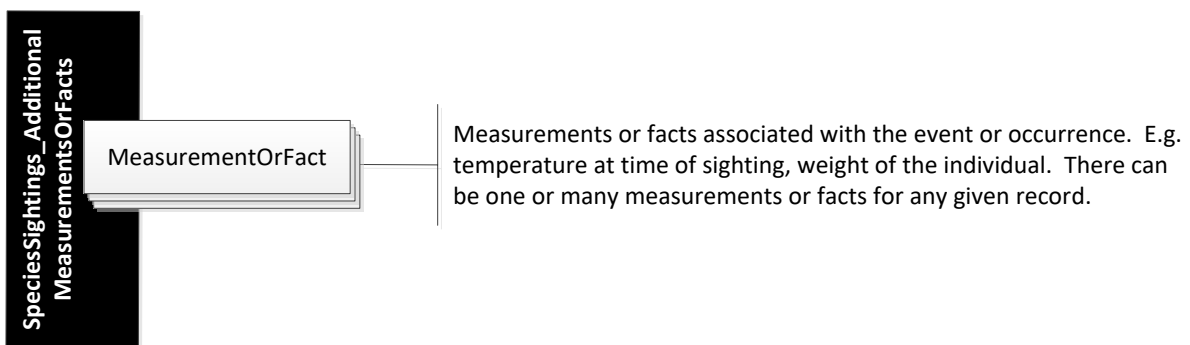


Figure 4 Overview of the categories of data shared via the SpeciesSightings_AdditionalMeasurementsOrFacts entity set

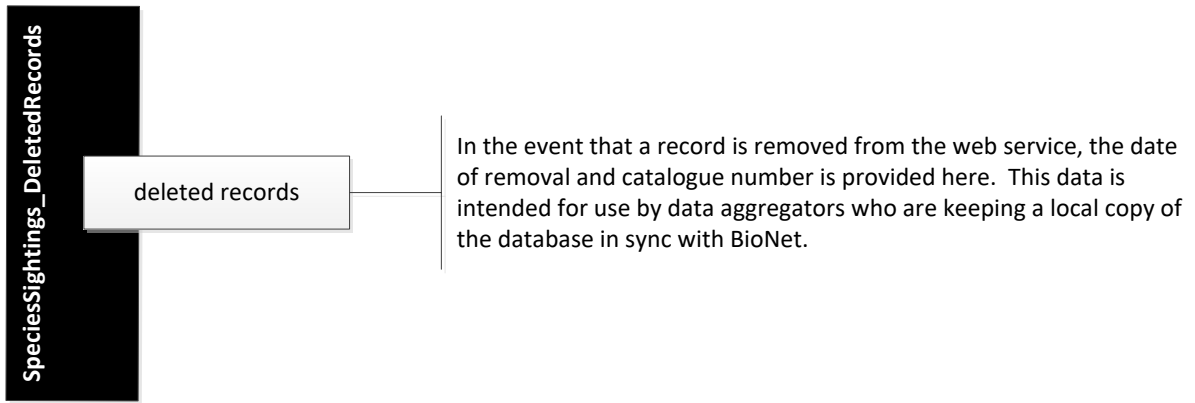


Figure 5 Overview of the categories of data shared via the SpeciesSightings_DeletedRecords entity set

3. Specifications for the SpeciesSightings_CoreData entity set

Tables 1–6 provide the exact specifications of the data fields available via the Species Sightings Web Service. Each table presents the group of terms that fall within the relevant 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 1 Available 'metadata' fields via the Species Sightings Web Service

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: <ul style="list-style-type: none"> • PreservedSpecimen • FossilSpecimen • LivingSpecimen • HumanObservation • MachineObservation 	'HumanObservation'	VARCHAR (30)	None
collectionCode	1	The name, acronym, coden or initialism identifying the collection or data set from which the record was derived.	Always 'BioNet Atlas of NSW Wildlife'	'BioNet Atlas of NSW Wildlife'	VARCHAR (50)	None
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'.	VARCHAR (300)	None

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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	INT	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'	VARCHAR (100)	None
dcterms_bibliographicCitation	1	A bibliographic reference for the resource as a statement indicating how this record should be cited (attributed) when used.	BioNet Atlas of NSW Wildlife <current date> <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).	'BioNet Atlas of NSW Wildlife 22/08/2014 12:47 AM + 10:00'	VARCHAR (50)	None
dcterms_language	1	The language of the resource.	RFC 4646 [RFC4646]	'en' for English	VARCHAR (3)	None
dcterms_modified	1	The most recent date-time on which the resource was changed.	ISO 8601:2004(E). Note: OData only supports datetimeoffset, which mandates that the offset from Coordinated Universal Time (UTC) is given. For many historical	'2001-02-15T16:29:56+11:00'	VARCHAR (50)	None

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			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			
dcterms_available	1	Date that the resource became or will become available.	DD/MM/YYYY HH:MM:SS AM/PM +HH:MM offset from UTC	'16/04/2010 4:02:29 PM +11:00'	DATETIME	None
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'	VARCHAR (300)	None
dcterms_rightsHolder	1	A person or organisation owning or managing rights over the resource.	Text	'NSW Department of Planning, Industry and Environment', 'Birds Australia', 'Australian Museum'	VARCHAR (150)	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	<u>DCMI Type Vocabulary</u>	'Event', 'StillImage'	VARCHAR (20)	None

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		defines the root of the record.				
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: <ul style="list-style-type: none"> • locality • locationRemarks • occurrenceRemarks’ 	VARCHAR (300)	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’	VARCHAR (200)	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	‘Dept of Planning, Industry and Environment’, ‘Birds Australia’, ‘Australian Museum’	VARCHAR (150)	None

Table 2 Available 'dynamicProperties' fields via the Species Sightings Web Service

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'	VARCHAR (5)	None
botanicalDivision	1	The name of the Botanical Division within which the flora record occurs, based on Harden GJ (ed.) 1990, <i>Flora of New South Wales</i> , New South Wales University Press, Kensington.	One item from the following controlled vocabulary: <ul style="list-style-type: none"> • North Coast • Central Coast • South Coast • Northern Tablelands • Central Tablelands • Southern Tablelands • North Western Slopes • South Western Slopes • North Western Plains • South Western Plains • North Far Western Plains • South Far Western Plains 	'North Coast'	VARCHAR (100)	None
LLS	1	The name of the Local Land Services area within which the record occurs.	One item from the following controlled vocabulary: <ul style="list-style-type: none"> • Central Tablelands • Central West • Greater Sydney • Hunter • Murray • North Coast • North West • Northern Tablelands • Riverina • South East • Western 	'North Coast'	VARCHAR (100)	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
floraReserve	0–1	If the record occurs within a flora reserve (as defined in the <i>Forestry Act 2012</i>) this field gives the name of that flora reserve.	Text. Notes: This field does not give the name of reserves administered under the <i>National Parks Wildlife Act 1974</i> . 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.	'Fenwicks Scrub Flora Reserve'	VARCHAR (100)	None
geogExtent	0–1	The geographic extent of the species for fire management.	One item from the following controlled vocabulary: <ul style="list-style-type: none"> • W = Widespread; where the species is known from 5 or more BFMCs • R = Restricted; where the species is known from 2 to 4 BFMCs • HR = Highly Restricted; where the species is only known from 1 BFMC Note: If 'N/A' is given, this indicates that this field does not apply to the record.	'HR'	VARCHAR (5)	None
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 <u>Australia's bioregions (IBRA)</u> . Note: If 'N/A' is given, this indicates that this field does not apply to the record.	'New England Tablelands'	VARCHAR (100)	None
IBRASubregion	1	The name of the IRBA (Interim Biogeographic Regionalisation for	Controlled vocabulary as per <u>Australia's bioregions (IBRA)</u> .	'Beardy River Hills'	VARCHAR (100)	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 of NSW then the subregion name is not given, just 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'	VARCHAR (200)	None
potentialImpact	1	A categorisation of the information recorded in speciesFireDescription into one of three broad categories related to the use of fire as a Hazard Reduction technique.	One item from the following controlled vocabulary: <ul style="list-style-type: none"> Exclude Bush Fire Restrict Bush Fire No Conditions Note: If 'N/A' is given, this indicates that this field does not apply to the record.	'Restrict Bush Fire'	VARCHAR (20)	None
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 Planning, Industry and Environment.	Integer. Note: If 'N/A' is given, this indicates that this field does not apply to the record.	'10484'	VARCHAR (10)	None
reserve	0-1	If the record occurs within a reserve (as defined in the <i>National Parks and Wildlife Act 1974</i>) this field gives the name of that	Text. Notes: This field does not give the name of reserves administered under the <i>Forestry</i>	'Cocoparra National Park', 'Bedooba	VARCHAR (100)	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		<p>reserve. The following types of reserve are covered under this legalisation:</p> <ul style="list-style-type: none"> • national park • historic site • state conservation area • regional park • karst conservation reserve • nature reserve • Aboriginal area. 	<p><i>Act 2012</i>. See the 'floraReserve' field for information on flora reserves.</p> <p>Note: If the field is marked 'N/A', this indicates that the record does not occur within a reserve.</p>	State Conservation Area'		
speciesFireDescription	1	Information on any restrictions on the use of Controlled Burning as a Hazard Reduction Technique within 100 metres of the Occurrence record.	<p>Text.</p> <p>Note: If 'N/A' is given, this indicates that this field does not apply to the record.</p>	'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'	VARCHAR (200)	None
stateForest	0-1	If the record occurs within a state forest (as defined in the <i>Forestry Act 2012</i>) this field gives the name of that state forest.	<p>Text.</p> <p>Note: If the field is marked 'N/A' this indicates that the record does not occur within a state forest.</p>	'Bom Bom State Forest'	VARCHAR (100)	None
vulnerability	1	Vulnerability of the species to Hazard Reduction activities, based on a combination of Status on the Threatened Species Conservation	<p>One item from the following controlled vocabulary:</p> <ul style="list-style-type: none"> • L = Low • M = Moderate 	'VH'	VARCHAR (5)	None

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		Act and the species Geographic Extent as recorded in GeogExtent.	<ul style="list-style-type: none"> • H = High • VH = Very High <p>Note: If 'N/A' is given, this indicates that this field does not apply to the record</p>			

Table 3 Available 'occurrence' fields via the Species Sightings Web Service

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	'Christopher J. Conroy, Jennifer L. Neuwald. 2008. Phylogeographic study of the California vole, <i>Microtus californicus</i> Journal of Mammalogy, 89(3):755-767.'	VARCHAR (500)	None
catalogNumber	1	An identifier (preferably unique) for the record within the data set or collection.	Alphanumeric	'WD9884'	VARCHAR (20)	None
consequence	0–1	Final assessment as to the impact of Hazard Reduction activities on a species.	One item from the following controlled vocabulary: <ul style="list-style-type: none"> • Mi: Minor • Mo: Moderate • Ma: Major • C: Critical 	'Ma'	VARCHAR (5)	None
establishmentMeans	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: <ul style="list-style-type: none"> • Alive in NSW, Native • Extinct in NSW, Native • Introduced 	'Introduced'	VARCHAR (150)	None

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			<ul style="list-style-type: none"> • Not Known from NSW • Hybrid 			
estimateTypeCode	0–1	Refers to the accuracy of the individualCount field.	One item from the following controlled vocabulary: <ul style="list-style-type: none"> • At least • Less than • Greater than • Estimate • Exactly 	'At least'	VARCHAR (20)	None
individualCount	0–1	The number of individuals represented present at the time of the Occurrence.	Whole number	'25'	NUMERIC (18)	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'	VARCHAR (100)	None

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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 1	'Nest/Roost'	VARCHAR (50)	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 Department of Planning, Industry and Environment: BioNet Atlas of NSW Wildlife: WD9884'.	VARCHAR (300)	None
occurrenceRemarks	0–1	Comments or notes about the Occurrence.	Free text	'found dead on road'.	VARCHAR (1000)	For Public and Registered users this field is withheld for Category 2 & 3 species. For licensed users this 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	'Present'	VARCHAR (20)	None

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			<ul style="list-style-type: none"> Absent 			
otherCatalogNumbers	0–1	A list (concatenated and separated) of previous or alternate fully qualified catalog 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'.	VARCHAR (2000)	None
PNFFilter	1	Indicator as to whether the record is relevant to the Private Native Forestry Code of Practice. See Private Native Forestry Code of Practice for more details and to download the code of practice.	One item from the following controlled vocabulary: <ul style="list-style-type: none"> Y (Yes) N (No) Note: This only applies to species listed as threatened in NSW. For unlisted species the field is blank (null)	'Y', 'N'	VARCHAR (1)	None
populationName	0–1	Where the observation relates to the occurrence of a species within an endangered population as listed under the <i>Biodiversity Conservation Act</i>	Text	'Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area'	VARCHAR (255)	

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
		2016, the name of the threatened population will be given here.				
recordedBy	0–n	A list (concatenated and separated) of names of people, groups, or organisations responsible for recording the original Occurrence.	Text	'Oliver P. Pearson; Anita K. Pearson'	VARCHAR (500)	For Public, Registered and Licensed users, the 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'	VARCHAR (30)	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 1	'- Not breeding, A Adult, D Distraction display, E Eggs, I Immature (subadult), M Nestling, N Nesting'	VARCHAR (900)	None

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
sex	0–1	The sex of the biological individual(s) represented in the Occurrence.	Controlled vocabulary as follows: <ul style="list-style-type: none"> • Not Recorded • Female • Male • Unknown • Mixed sexes 	'Female', 'Unknown'	VARCHAR (20)	None
stateConservation	1	The Legal Status of the species within NSW under the <i>Biodiversity Conservation Act 2016</i> or the <i>Fisheries Management Act 1994</i> No. 38 (FM Act 1994).	One item from the controlled vocabulary as listed in Appendix 1	'Endangered'	VARCHAR (150)	None
status	1	The status of the record with respect to its validity.	Format: One item from the following controlled vocabulary: <ul style="list-style-type: none"> • Accepted as valid from quarantine • Invalid, in quarantine • Rejected as certainly incorrect • Suspect • Vagrant or Escaped Animal 	'Suspect', 'Rejected as certainly incorrect'	VARCHAR (200)	Public and Registered users cannot access Rejected records.

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			<ul style="list-style-type: none"> 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 <i>Biodiversity Conservation Act 2016</i> .	True or false	True	VARCHAR (10)	None
sensitivityClass	1	The category of the species in accordance with the Sensitive Species Data Policy (SSDP).	One item from the following controlled vocabulary: <ul style="list-style-type: none"> Category 1 Category 2 Category 3 Not Sensitive 	'Category 2'	VARCHAR (150)	None
migratorySpeciesAgreement	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: <ul style="list-style-type: none"> CAMBA (China-Australia Migratory Bird Agreement) JAMBA (Japan-Australia Migratory Bird Agreement) 	'CAMBA'	VARCHAR (150)	None

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
countryConservation	1	The Legal Status of the species under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (the EPBC Act).	<p>ROKAMBA (Republic of Korea-Australia Migratory Bird Agreement)</p> <p>One item from the following controlled vocabulary:</p> <ul style="list-style-type: none"> • Conservation Dependent • Critically Endangered • Endangered • Key Threatening Process • Vulnerable • Extinct • Extinct in the Wild • Not Listed 	'Endangered'	VARCHAR (150)	None

Table 4 Available 'event' fields via the Species Sightings Web Service

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'	VARCHAR (25)	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'	VARCHAR (20)	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'	VARCHAR (1000)	None
eventTime	0–1	The time or interval during which an Event occurred.	ISO 8601:2004(E).	'10:00:00/10:05:00'	VARCHAR (20)	None
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 1.	'Sod grassland', 'Open tussock grassland'	VARCHAR (150)	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'	VARCHAR (200)	For Category 2 & 3 Sensitive species these data are withheld from

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
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'	VARCHAR (255)	Public, Registered and Licensed users. For Category 2 & 3 Sensitive species these data are withheld from Public, Registered and Licensed users.

Table 5 Available Location' fields via the Species Sightings Web Service

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 two 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'	VARCHAR (5)	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'	NUMERIC (10,4)	None
country	1	The name of the country or major administrative unit in which the Location occurs	Text	'Australia'	VARCHAR (9)	None
countryCode	1	The standard code for the country in which the Location occurs.	ISO 3166-1-alpha-2 country codes.	'AU' for Australia	VARCHAR (2)	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'	VARCHAR (120)	None
decimalLatitude	1	The geographic latitude (in decimal degrees, using the spatial reference system given in geodeticDatum) of the geographic centre of a Location. Positive values are north of the Equator, negative values are south of the Equator. Legal values lie between -90 and 90, inclusive.	Decimal number	'-36.864246125'	NUMERIC (12,9)	For Public and Registered users, these data are denatured to 0.01 for Category 3 Sensitive

Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
						species, and 0.1 for Category 2 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'	NUMERIC (12,9)	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.

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
easting	1	The reference in metres, measured 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).	Integer	'691573'	NUMERIC (6)	For Public and Registered users, 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 decimalLongitude are based.	Alphanumeric code	'GDA94'	VARCHAR (5)	None

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
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'	VARCHAR (5)	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, waterBody, island, islandGroup). This term may contain information modified from the original to correct perceived errors or standardise the description.	Free text	'Hawkshead Road, 1km W of Hereford Park. Specified Map No: 8824'	VARCHAR (500)	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.
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'		For Category 2 & 3 Sensitive species these data are withheld from Public and Registered users. For Category 2 Sensitive species, these data are

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
						withheld from Licensed users.
locationRemarks	0–1	Comments or notes about the Location.	Free text	'Partially cleared and regenerated'	VARCHAR (1000)	These data are withheld from Public and Registered users.
mapSheetNumber	1	The Australian Topographic Map Sheet number for the map which covers the location of the record. Note: Where the record does not overlap a valid NSW mapsheet this field gives the value 'N/A'.	Alphanumeric code	'8824 – BEGA'	VARCHAR (200)	None
maximumElevationInMeters	0–1	The upper limit of the range of elevation (altitude, usually above sea level), in metres.	Integer	'200'	NUMERIC (4)	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.
minimumElevationInMeters	0–1	The lower limit of the range of elevation (altitude, usually above sea level), in metres.	Integer	'100'	NUMERIC (4)	For Category 2 & 3 Sensitive species these data are

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
						withheld from Public and Registered users. For Category 2 Sensitive species, these data are 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'	NUMERIC (7)	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'	VARCHAR (15)	None

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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'	NUMERIC (2)	None

Table 6 Available 'taxon' fields via the Species Sightings Web Service

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'	VARCHAR (150)	None
family	1	The full scientific name of the family in which the taxon is classified.	Text	'Cacatuidae', 'Fabaceae'	VARCHAR (50)	None
genus	1	The full scientific name of the genus in which the taxon is classified.	Text	'Callocephalon', 'Acacia'	VARCHAR (50)	None
infraspecificEpithet	0–1	The name of the lowest or terminal infraspecific epithet of the scientificName, excluding any rank designation.	Text	'latifolia', 'calicicola'	VARCHAR (50)	None
kingdom	1	The full scientific name of the kingdom in which the taxon is classified.	One item from the following controlled vocabulary: <ul style="list-style-type: none"> • Animalia • Plantae • Fungi 	'Plantae'	VARCHAR (150)	None
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: <ul style="list-style-type: none"> • ICBN (International Code of Botanical Nomenclature) • ICZN (International Code of 	'ICBN', 'ICZN'	VARCHAR (5)	None

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Field name	Occurrence	Definition	Format	Example	Data type	Access restrictions
			Zoological Nomenclature)			
order	1	The full scientific name of the order in which the taxon is classified.	Text	'Psittaciformes'	VARCHAR (150)	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 level taxonomic rank that can be determined.	Text	'Callocephalon fimbriatum', 'Acacia pycnantha'	VARCHAR (80)	None
scientificNameAuthorship	0–1	The authorship information for the scientificName formatted according to the conventions of the applicable nomenclaturalCode.	Text	'(Grant, 1803)'	VARCHAR (100)	None
scientificNameID	1	An identifier for the nomenclatural (not taxonomic) details of a scientific name.	Integer	'0268'	VARCHAR (10)	None
sortOrder	1	An integer used to sort species in a sensible taxonomic order.	Integer	'97'	INT	None
specificEpithet	0–1	The name of the first or species epithet of the scientificName.	Text	'fimbriatum', 'pycnantha'	VARCHAR (50)	None
taxonRank	1	The taxonomic rank of the most specific name in the scientificName.	Text	'Subspecies', 'Species', 'Genus'	VARCHAR (150)	None
vernacularName	1	A common or vernacular name.	Text	'Gang-gang Cockatoo', 'Golden Wattle'	VARCHAR (80)	None

4. Specifications for the SpeciesSightings_AdditionalMeasurementsOrFacts entity set

4.1 MeasurementOrFact

As discussed in the overview, additional measurements associated with a given sighting record will be supplied via a linked table using Darwin Core AdditionalMeasurementsOrFacts. Each measurement will be linked back to the sighting record using the catalogNumber with Table 7 documenting the Darwin Core fields that will be made available via the Species Sightings Web Service.

Table 7 Darwin Core fields available through the Species Sighting Web Service

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	INT	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 Department of Planning, Industry and Environment: BioNet Atlas of NSW Wildlife: WD9884'	VARCHAR (300)	None
measurementID	1	A unique identifier for the measurementValue.	Alphanumeric	1205	INT	None
measurementType	1	The nature of the measurement, fact, characteristic, or assertion.	Controlled vocabulary as defined in the measurementType table below.	'Aspect'	VARCHAR (20)	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'	VARCHAR (20)	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'	VARCHAR (150)	None

BioNet Species Sighting Web Services data standard 6.1

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.	Alphanumeric code	'WD9884'	VARCHAR (20)	None

4.2 .measurementType

Table 8 provides the full list of measurementTypes that (where available) will be given for each sighting record.

Table 8 measurementTypes given for each sighting record

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 deleted records entity set will list records that have been deleted during the daily delta sync of data from the source BioNet Atlas of NSW Wildlife to the data warehouse for the Web Service (Table 9). This enables data aggregators to keep local copies of the entire BioNet Species Sightings collection in sync using a daily delta query rather than downloading the entire collection. Periodically, a full re-sync must be undertaken between the source system and the data warehouse – for instance, during new releases. When this occurs, the deleted records entity set will be reset and cleared.

Table 9 Records to be 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.	'WD9884'	VARCHAR (20)	None
date	1	The date when the record was removed from the SpeciesSightings_CoreData and (if present) the SpeciesSightings_AdditionalMeasurementsOrFacts entity sets based on ISO 8601:2004(E).	'2016-06-18T04:04:56.873+10:00'	VARCHAR (50)	None

6. Mapping to existing BioNet Atlas field names

Figure 6 shows how to manually search for and download records using the [BioNet Atlas](#).

The screenshot shows the BioNet Atlas search results page. At the top left is the NSW Government logo. Below it is a navigation bar with 'HOME', 'SPECIES SIGHTINGS SEARCH', and 'FLORA SURVEY'. The breadcrumb trail reads 'You are here: Home > Species sightings search results'. The main heading is 'Search results'. Underneath, there's a section 'Which species or group?' with radio buttons for 'All entities', 'Animals', 'Plants', 'Fungi', 'Communities', 'Threats', 'Endangered populations', and 'Search for a species or group of species (e.g. birds)'. The 'Search for a species or group of species' option is selected. Below this is a search box with the text 'Enter at least 3 letters and click Go' and a 'Go' button. The search term entered is 'Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area Endangered Populations'. Below the search box are three buttons: 'Download records' (circled in red), 'Save species list', and 'View map'. The search criteria are listed as 'Public Report of all Valid Records of Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area (Endangered Populations) returned a total of 3,289 records of 1 species. Report generated on 26/05/2020 9:58 AM.' Below this, it says 'Displaying 1-1 of 1 species below'. There are instructions on how to map records for individual species versus all records. At the bottom, there is a table with the following data:

	Common name	Scientific name	Map [Clear all]	NSW status	Comm. status	No. of records	
Animalia Aves Casuariidae	Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	Dromaius novaehollandiae	<input type="checkbox"/>	E2,P		3,289	

Figure 6 Screenshot of how to manually search for and download records

Table 10 provides a mapping between the field names in the BioNet Atlas record download and the new standardised field names in the Species Sightings Web Service.

Table 10 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
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 kill
- Crushed Cones
- Dead
- Dog kill
- Flora Record
- Floristics Record from Systematic Flora Survey
- Fox kill
- Hair, feathers or skin
- Heard call
- In raptor/owl pellet
- In scat
- Miscellaneous
- Nest/roost
- Not located
- Observed
- Observed and Heard call
- Road kill
- Scat
- Shot
- Stranding/beached
- Subfossil/Fossil Remains
- Tracks, scratchings
- Trapped or netted
- Ultrasonic recording

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
- G Gravid
- I Immature (subadult)
- J Juveniles
- L Lactating
- M Nestling
- N Nesting

- P Pregnant
- T Tadpoles
- 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

- Protected Fish
- Vulnerable
- Vulnerable Fish
- Vulnerable Ecological Community
- Endangered
- Endangered Fish
- Endangered Ecological Community
- Endangered Ecological Community of Fish
- Endangered Population
- Endangered Population of Fish
- Critical Habitat
- Critically Endangered
- Critically Endangered Ecological Community
- Critically Endangered Fish
- Species presumed Extinct
- Extinct Fish
- Key Threatening Process
- Key Threatening Process of Fish
- 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

BioNet Web Services Species Sighting data standard 6.1

- 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