

# Spatial Pest Attributes

## Standard

## Queensland

## July 2012

V7

Unclassified

Document details

|  |  |                      |                      |
|--|--|----------------------|----------------------|
| <b>Security classification</b>                   | Unclassified   |                      |                      |
| <b>Date of review of security classification</b> | NA   |                      |                      |
| <b>Authority</b>                                 | Invasive Plants and Animals, Biosecurity Queensland, Department of Agriculture, Fisheries and Forestry |                      |                      |
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| <b>Documentation status</b>                      | Working draft  | Consultation release | <b>Final version</b> |

Version history

| <b>Date</b>                    | <b>Version no.</b> | <b>Author</b> | <b>Description</b>  |
|--------------------------------|--------------------|---------------|---|
| 15 <sup>th</sup> Oct 2009      | 1                  | Moya Calvert  | For stakeholder review  |
| 7 <sup>th</sup> January 2010   | 2                  | Moya Calvert  | Following stakeholder review  |
| 13 <sup>th</sup> July 2010     | 3                  | Moya Calvert  | QSIC recommendations (from Laurie Glass and Peter Gersekowski):<br><br>Update metadata to current ANZLIC Metadata Profile 1.1<br><br>Add locality description attribute to a spatial feature. |
| 31 <sup>st</sup> July 2010     | 4                  | Moya Calvert  | Incorporated changes following advice from Spatial Information Unit, Queensland Department of Environment and Resource Management)  |
| 28 <sup>th</sup> October 2010  | 5                  | Moya Calvert  | Data analysis revision by DEEDI I&TS  |
| 16 <sup>th</sup> February 2012 | 6                  | Moya Calvert  | Minor revisions of attribute headers  |
| 6 <sup>th</sup> June 2012      | 7                  | Moya Calvert  | See revision table: Changes to version 7 (next page).   |

The tables in this document are available in MS Excel spreadsheet format. For further information contact:

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### Acknowledgements

The Spatial Pest Attribute Standard was developed through consultation with various representatives from Queensland State government, local government and other organisations with a business interest in this standard. Consideration has also been given to existing spatial standards and established national standards that are directly related to spatial pest attributes.

### Abbreviations

|              |   |
|--------------|---|
| ANZLIC       | The Spatial Information Council of Australia and New Zealand (formerly known as the Australia New Zealand Land Information Council) |
| APVMA        | Australian Pesticides and Veterinary Medicines Authority  |
| AWC          | Australian Weeds Committee  |
| DCDB         | Digital Cadastral Database  |
| DGPS         | Differential Global Positioning System  |
| FAO          | Food and Agricultural Organisation of the United Nations  |
| GDA94        | Geocentric Datum of Australia 94  |
| GIS          | Geographic Information System   |
| GPS          | Global Positioning System   |
| IPPC         | International Plant Protection Convention   |
| MGA          | Map Grid of Australia   |
| NLWRA        | The National Land and Water Resources Audit   |
| OESR         | Office of Economic and Statistical Research, Queensland Treasury  |
| QSIC         | Queensland Spatial Information Council  |
| SPA standard | Spatial Pest Attributes Standard  |
| WONS         | Weeds of National Significance  |

### Changes to version 7

#### Species List

Additional values have been added to Type: Class 1, Class 2 and Class 3 (Declared weeds under the Land Protection (Pest and Stock Route Management) Act 2002).

#### Management strategy table

Weed form (if the target is a weed), common name and species name have been specified.

Additional weed form values have been added: Class 1, Class 2 and Class 3 (Declared weeds under the Land Protection (Pest and Stock Route Management) Act 2002).

Management target has been deleted. Species name attributes replaces management target.

Management status (Proposed / Active / inactive etc) has been moved so that each record is tagged with a status

Strategy type has been added to the Mgt Strategy

Strategy types have been given following values: Management zones / Infestation zones / Barrier fence / Cleandown (public / private / charge / no charge)

Changed Other code from OTHM to VTOT

Added Fence attributes to Mgt Zone: Barrier fence / check fence / top net / no top net

|   |
|---|
| <b>Changes to version 7</b>   |
| Added Vehicle max size to Mgt zone: (All sizes / Raod train / B-dounle / semi trailer / semi dolly and trailer / large truck / medium to small truck / cars & 4WD / headers / harvesters / machinery  |
| Added Other value to Mgt Zone : MSOT  |
| <b>Survey table</b>   |
| Weed form (if the target is a weed), common name and species name have been specified.  |
| Additional weed form values have been added: Class 1, Class 2 and Class 3 (Declared weeds under the Land Protection (Pest and Stock Route Management) Act 2002).  |
| Survey target has been deleted. Species name attributes replaces survey target.   |
| Survey name has been moved so that each feature can record a survey name attribute  |
| Survey purpose has been moved so that each feature can record a purpose attribute   |
| Survey type has been moved so that each feature can record a type attribute   |
| Survey status has been moved so that each feature can record a status attribute: status values have changed from Proposed / Active / Inactive / Closed TO Proposed / Completed / Abandoned / Closed   |
| <b>WeedInfestation / WeedInspection / WeedDetails tables</b>  |
| These 3 tables have been collated into a single table (Weed Infestation). If more than one weed is recorded at an infestation site, then it is added as a minor weed. Similarly, treatment details can be added to the same geometry feature. |
| Weed occurrence has been removed (single plant or cluster)  |
| Weed Status has had the No Infestation Present and Unknown values removed.  |
| Form has additional types: Class 1, Class2 and Class 3 (Declared weeds under the Land Protection (Pest and Stock Route Management) Act 2002).   |
| Density has an additional value of Not Evident  |
| Inspection Type has Data Collection and Treatment Type removed  |
| Attributes specific to Main Roads personnel are listed under the More weeds details section   |
| Inspection ID has been removed > replaced by Infestation ID   |
| Inspection Type, Inspection Source, Weed Phenotype, Weed health, no. mature plants, verification details and re-inspection have been listed under the More Weeds Details section  |
| Weed Health and no. of mature plants have been added as new attributes  |
| 1-Many attribute column has been added to indicate whether the attribute can be recorded more than once   |
| Inspection Source comment has been removed.   |
| Treatment evidence and recommended treatment type method have been removed.   |
| Treatment effectiveness has been moved to weed treatment table  |
| <b>Weed Treatment table</b>   |
| Additional attributes including species name attributes, width and area have been included.   |
| Form has additional types: Class 1, Class2 and Class 3 (Declared weeds under the Land Protection (Pest and Stock Route Management) Act 2002).   |
| A new attribute called Treatment Status has been added, with 5 lookup values  |
| Treatment Type has 2 new attributes called Grazing and Biocontrol, and Biological has been removed  |
| Treatment method has 3 new methods relating to Biocontrol: 3 biocontrol agents. At present these are restricted to 3 agents being tested by the BQ research group: Plectonycha correntina, Oshphilia tenuipes and Acidodes sedi.              |
| 1-Many attribute column has been added to indicate whether the attribute can be recorded more than once into the WeedInfestation table  |
| Treatment effectiveness has been moved to this table. It has been changed form an integer to a drop down  |

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| <b>Changes to version 7</b>  |
| value, consisting of 10% increments; and new values relating to biocontrol evidence have been added.   |
| <b>PestAnimalEvidence / PestAnimalInfestation tables</b>   |
| Merged these 2 tables into a single table: Infestation status, Infestation type, population structure and density have been added to the evidence table. A new field has been created called ARecType, to determine whether the spatial record refers to 'evidence' or 'infested area' |
| Additional attributes including spatial object, species name attributes, width and area for lines and polygons have been included.   |
| Source, Source comment, confidence and sample details have been listed under the More Pest Animal Details section  |
| Evidence and evidence sub-type has been changed considerably:  |
| Evidence = Sighting related / Stock killed or bitten / Domestic animals killed or bitten / agriculture damage / environmental damage / infrastructure damage / illegal pet / other   |
| Evidence sub-type has changed to include values that were previously listed under evidence, and to include some new values (see table for details).  |
| Animal evidence type comments and Animal Evidence Source comments have been deleted. Any comments can be made in a single comments field   |
| <b>Pest Animal Control</b>   |
| Additional attributes included are width and area for lines and polygons   |
| Actual control date has been added (previously was Start and End date). Trap Check date has been removed and this date is used instead.  |
| Baiting method for rabbit has been changed: Pellet 180mg/mL and Other 180 mg/mL has been removed; Grain dosage has increased to 360mg/mL   |
| Feral pig bait dosage has changed to : Meat 144mg/Kg; Grain 288mg/Kg; Other 288mg/Kg.  |
| Dog baits have added PAPP bait and EJECTOR   |
| Fox baits have added FOX-OFF 3mg per bait, PAPP bait and EJECTOR   |
| Cat baits have been added: Meat (injected), 3mg/mL soln and CURIOSITY Cat Bait   |
| Trapping type has changed:   |
| Pen and portable box have been added as pig trap types.  |
| Indian myna trap has been added  |
| Traps for deer have been added: Clover, pen and trap yard  |
| Traps have been added for red eared slider turtle: basking trap, cathedral trap or net   |
| <b>Spatial table</b>   |
| Map base has changed from free text to a drop-down list  |
| <b>Sample and photo tables</b>   |
| No change  |

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# 1 Introduction

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## 1.1 Purpose

The purpose of the Spatial Pest Attribute (SPA) Standard is to facilitate the collection of consistent, standardised spatial information about pests and pest management activities across all jurisdictions throughout the State.

The SPA Standard has been developed to:

- Promote consistency in the location, description and measurement of pest distribution and pest management activities
- Encourage a shared approach to pest management through the sharing of consistent data.
- Facilitate the centralisation of pest data
- Facilitate the provision of data in a format suitable for storage in a spatial relational database

The SPA Standard forms the basis for the storage, update, management and distribution of spatial pest attribute data within Queensland. The SPA standard will be modified as the needs of users change and technology presents new opportunities.

## 1.2 Scope

The SPA Standard focuses on defining how information about pests is described. This includes information about pest infestations, management and control activities, pest strategies and pest surveys. The Standard aims to encompass the essential aspects of pest management.

'Pests' refers to invasive plants and vertebrate animals that cause economic, environmental and social impacts. Specifically, this includes, but is not limited to, the declared pests as defined in the Land Protection (Pests and Stock Route Management) Act 2002. Invertebrate animals that are declared as pests in the Act are not included in this initial draft Standard, but may be considered in future work.

'Spatial information' refers to information that can be geographically referenced, such as the location of pests and pest management activities, strategic management zones and surveyed areas.

The SPA Standard does not define a data model, but is intended to provide the framework for pest managers to develop and implement their own data models which may be platform or software specific, while maintaining the interoperability of the data.

### **1.3 Criteria**

The standard has been developed to apply to spatial locations that define pests and pest management activities, and are sufficiently detailed to be used for on-ground work. Broad-scale grid mapping of pest locations is not part of the standard.

The attributes included in the standard apply to data about pests; including pest locations, descriptions of condition, as well as activities that describe pest control and other forms of pest management, including pest surveys, management zones and containment areas. It does not include data that can be derived from other 'core' datasets, such as administrative and cadastral boundaries, regional ecosystems and other topographic information.

The SPA Standard has been developed in acknowledgement that field data will increasingly be collected in mobile GIS environments, be stored in spatial databases and analysed through a range of GIS applications. Consequently the attributes necessary to fully describe the spatial entities are at the core of the Standard.



## 2 The Pest Management concept space

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### 2.1 Methods

Development of a SPA Standard first necessitated an understanding of what pest management is all about; that is, an understanding of the entities that pest managers deal with and their business processes. There were three core activities undertaken to help develop this understanding. They included: i) research and review of current literature on existing attributes for pests and pest management; ii) research and review of current systems that are used to collect, store and manage spatial pest data; and iii) completion of state-wide workshops to gain information from pest officers from state, regional and local governments about how they conduct their business and their requirements regarding information management.

The results of this investigation are outlined below.

### 2.2 Key themes of pest management

The SPA Standard identifies four main themes that encompass the 'world' of pest management. Each theme involves an activity or business process that forms part of the continuum of pest management. Each theme contains a stand-alone set of attributes, which together form the SPA Standard.

1. **Strategic management activities** determine how and where management effort should be undertaken. They include strategic planning for more effective pest management outcomes, using information gathered from items 2, 3 and 4 below.
2. **Survey activities** describe the search effort involved when looking for weeds or animals. Surveys inform where, when and how the search was conducted.
3. **Inspection activities** define pests and pest locations. These are fundamentally different for plants and animals, and are described in the following section.
4. **Control, treatment and other management activities** define the type and amount of effort used to control and contain invasive plants and animals.

The SPA Standard defines all of the entities encompassed by these activities.

In addition, two common entities were identified that are associated with these main themes, and which also contain a stand-alone set of attributes:

5. **Spatial component:** The SPA Standard includes a spatial component to identify the location of any of the objects or activities described in the above themes.
6. **Photos:** Photos provide visual evidence of an infestation or site over time, and can be associated with most of the themes listed above.

### 2.3 Weeds

The key entities and business processes for weed management are displayed in the following diagram and discussed below.

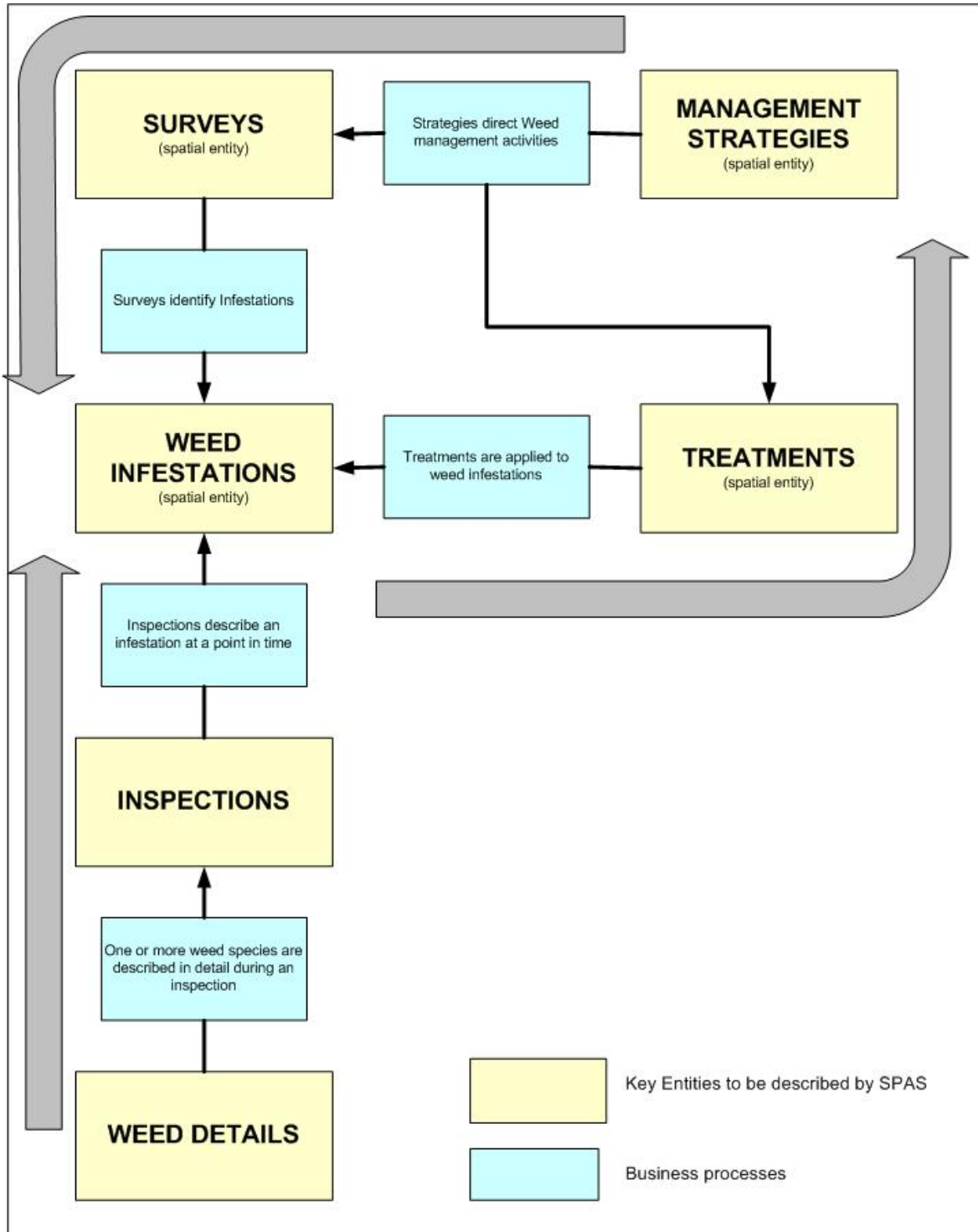


Figure 1: Weeds Management- key entities and business processes.

**Management Strategies** are developed to manage weeds for either eradication or control/containment purposes. Defining a management strategy will include a spatial entity that may represent one of the following:

- Exclusion Zones
- Inclusion Zones
- Buffer Zones
- Barriers or containment lines

**Surveys** are proactive activities conducted to identify weed infestations, support proposed control programmes or monitor the effectiveness of completed control programmes.

Surveys may be undertaken in the air, on the ground or in the office (image analysis). Each survey will have a spatial component that will represent for example, the area covered or the lines traversed.

**Weed Infestations** are discrete occurrences of one or more weed species. They can be mapped as follows:

- A point representing a single plant
- A point and an area estimate for small or imprecisely mapped infestations
- A line and an average width for linear infestations as might occur along drainage lines or on road verges
- An area for larger infestations

**Weed Inspections** are undertaken to identify and describe a weed infestation. There may be many inspections of a weed infestation over time.

**Weed details** are recorded at the time of an inspection and will describe the identity, status and condition for the one or more weeds present in an infestation.

**Weed Treatments** may be carried out over a particular infestation or over an area that includes a number of infestations and/or a buffer zone. There may be many treatments applied to an infestation over time.

## 2.4 Animals

The key entities and business processes for pest animal management are displayed in the following diagram and discussed below.

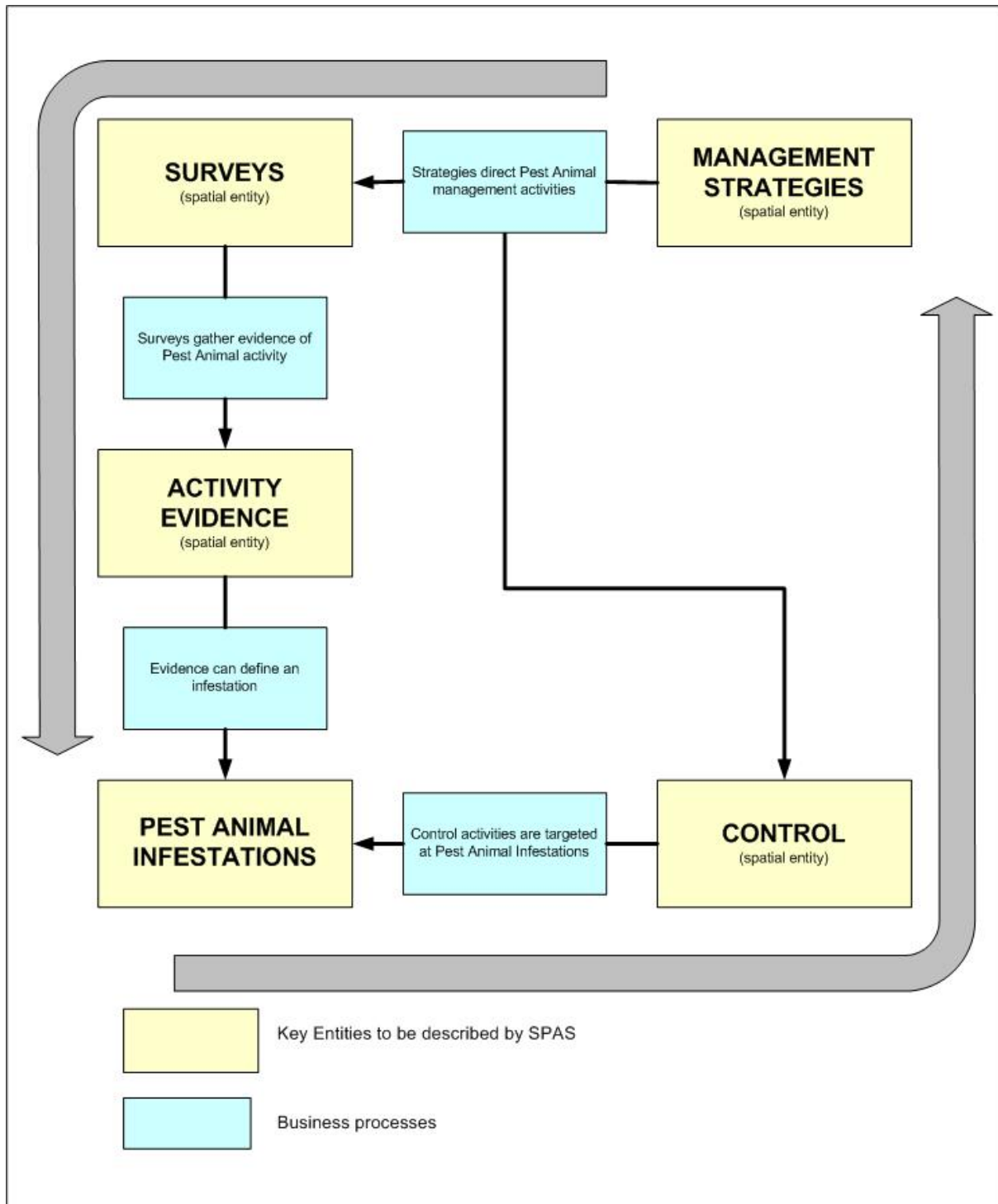


Figure 2: Pest Animal management – key entities and business processes.

**Management Strategies** are developed to manage pest animal infestations for either eradication or control/containment purposes. They are defined in the same way for pest animals as they are for weeds.

**Surveys** are proactive activities conducted to accumulate evidence of pest animals. They are also defined in the same way for pest animals as they are for weeds.

**Activity Evidence** covers all indications of the presence of an animal or group of animals. Evidence includes attributes such as a sighting, track marks, scats, or harbour. Evidence also includes social, economic and environmental impacts, such as crop damage.

**Pest Animal Infestations** define the extent and size of a population of animals at a particular point in time.

**Pest Animal Control** describes the methods employed to reduce or manage pest animal populations and includes shooting, trapping, baiting and removal methods.

### 3 Spatial pest attributes

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The following pages contain the tables that set out the SPA standard for each of the key entities identified above.

Each table contains these columns:

| Classification | Attribute | Type | List Description | List Code | Comments |
|----------------|-----------|------|------------------|-----------|----------|
|----------------|-----------|------|------------------|-----------|----------|

1. **Classification** refers to level of importance of each attribute for the purpose of sharing the information with other parties. There are 3 classification levels:

**Required:** attributes that are fundamental to describing an entity in sufficient detail to make it useful and useable for pest management purposes. If data is to be shared amongst organisations it must contain the "Required" attributes.

**Desirable:** attributes that will increase the value of the data for wider purposes such as planning and analysis.

**Optional:** attributes that are more likely to be useful to individual organisations, rather than the broader pest management community.

2. **Attribute** is name given to each type of information.

3. **Type** refers to the format of each attribute:

**Chr** = character. The number following a Chr refers to the character length. For example, Chr25 indicates a character value of 25 spaces.

**Integer** = Whole number

**Decimal** = Number to specified number of decimal points

**Date** = date value, expressed as yyyy-mm-dd

4. **List description:** where listed values are presented, one of these values must be used to populate the field. This column has been left blank where there are no listed values.

5. **List code** is a 4 character database code for each listed value. The code may be used to facilitate management of the data in a database and to aid data sharing.

6. **Comments** is used to describe the purpose and use of each attribute.

**NOTE:** Any attribute that is not recorded should default to NREC (not recorded).

### 3.1 Species List

A list of weed and pest animal species has been developed by Biosecurity Queensland, DEEDI. The list comprises weed and pest animal species listed under National, State and Local legislation as well as Quarantine and Weed alert lists. The list is published on the Biosecurity Queensland website: [http://www.dpi.qld.gov.au/4790\\_15470.htm](http://www.dpi.qld.gov.au/4790_15470.htm)

Use this list as a reference point for recording pest species names.

**Table 1: Species list**

| Classification | Attribute             | Type    | List Description   | List Code  | Comments  |
|----------------|-----------------------|---------|--|--|---|
| Required       | <b>GENSPCODE</b>      | Chr 8   |  |  | A unique 8 digit code comprising the first 4 letters of the genus/ species. If the organism is a subspecies/ variety, the final 4 letters comprise the 1 <sup>st</sup> 2 letters of the species and sub-species.  |
| Desirable      | <b>ScientificName</b> | Chr 150 |  |  | The complete scientific name of the organism. There may be more than one scientific name per common name.   |
| Optional       | <b>Genus</b>          | Chr 30  |  |  | The genus name  |
| Optional       | <b>Species</b>        | Chr 30  |  |  | The species name  |
| Optional       | <b>SubSpecies</b>     | Chr 30  |  |  | The sub species name (if applicable)  |
| Optional       | <b>Variety</b>        | Chr 30  |  |  | The variety name (if applicable)  |
| Desirable      | <b>CommonName</b>     | Chr 150 |  |  | The common name. There may be more than one common name per scientific name.  |
| Optional       | <b>Type</b>           | Chr 25  | Groundcover<br>Shrub<br>Woody<br>Aquatic<br>Vine<br>Cacti/succulent<br>Animal                                  | GNDC<br>SHRB<br>WODY<br>AQTC<br>VINE<br>CACT<br>ANML |   |
| Optional       | <b>Source</b>         | Chr 25  | C1<br>C2<br>C3<br>U<br>Bylaw<br>LGPMP<br>WONS<br>NAQS<br>NAQS primary<br>NAQS appendix<br>NAQS genera<br>ALERT |  | C1, C2 and C3 are declared under Land Protection (Pest and Stock Route Management) Act 2002. U has been undeclared from this Act (or from previous Acts); Bylaw are declared under Local Government bylaws and include historical declarations; LGPMP are pests listed in Local Government pest management plans; WONS are weeds listed as part of the Weeds of National Significance; NAQS are pests listed in the (1998-2007) Northern Australia Quarantine list. NAQS primary, appendix and genera are pests listed in the current Northern Australia Quarantine list; ALERT species are listed from the National Weed Environmental Alert List (Commonwealth Department of Agriculture, Food and Forestry). |
| Optional       | <b>Authority</b>      | Chr 30  |  |  | Authority on taxonomic ID.  |

## 3.2 Management Strategies

Management strategies developed at a regional, state or national level may contain geographic zones that define specific management areas for weed and pest animals (figures 1 & 2). Management strategies are not required information to share with other agencies, so each information type is ranked as 'desirable' or 'optional'. Each strategy with a geographic component requires the following information:

**Strategy Name (MgtName; desirable):** A short name for the strategy, which should include the target species name.

**Lead organisation (AGID; desirable):** The name of the organisation responsible for the strategy.

**External reference (MgtExtRef; optional):** A reference that might be used or useful to the lead organisation.

**Weed form (WeedForm; Chr 4, optional):** If the surveyed species is a weed, you can use this list to categorise weeds further

**Common name (CommonName, Chr 50, optional):** Common name of weed or pest animal that is the target of the strategy. Common name is referenced from the species list (see Section 3.1: Species list).

**Scientific name (ScientificName, Chr 150, required):** The species name should be referenced from the species list (see Section 3.1: Species list)

**Status of strategy (MgtStatus; desirable):** this can be either:

- Proposed
- Active
- Inactive
- Closed

**Start and/or finish date (MgtStartDate, MgtEndDate; desirable):** the start date is the date of implementation; a finish date should be provided if the strategy is intended for a finite time.

For each strategy, a number of management and infestation zones may be defined. Attributes for these zones for both weeds and pest animals are presented below.



Table 2: Management strategy spatial attributes

| Classification | Attribute            | Type    | List Description   | List Code  | Comments   |
|----------------|----------------------|---------|--|--|--|
| Desirable      | <b>MgtZoneID</b>     | Chr 25  |  |  | Unique identification number   |
| Desirable      | <b>SpatialObject</b> |         |  |  | Refer to Table 9, usually either a line or a polygon   |
| Desirable      | <b>StrategyType</b>  | Chr 4   | Management zone<br><br>Infestation Zone<br><br>Fence<br><br>Other<br><br>Not recorded  | MAZE<br><br>INZE<br><br>BARR<br><br>MSOT<br><br>NRMT             | Area defined by a polygon. Choose 'Management zone' for defining zones according to targets such as eradication, containment, asset protection areas etc)<br><br>Area defined by a polygon. Choose 'Infestation zone' for defining zones according to core / buffer / outlier and pest free areas.<br><br>Defined by a line. Choose 'Fence' for physical barriers, such as the rabbit and dog barrier fences.<br><br>Other = A strategic aim not currently defined. If this option is chosen, the management goal should be described in theMgtComment section, and within the strategy. |
| Desirable      | <b>MgtZone</b>       | Chr 4   | Eradication<br><br>Containment within existing infestation boundaries<br><br>Containment within zone<br><br>Asset protection area<br><br>Pest free high risk<br><br>Pest free low risk | ERAD<br><br>CTEB<br><br>CTDZ<br><br>APAR<br><br>PFHR<br><br>PFLR | <b>Management zone</b><br><br>Choose from the list of strategic management action types.   |
| Optional       | <b>ZoneComment</b>   | Chr 250 |  |  | <b>Strategy comment</b><br><br>Comment on Strategy type, particularly if = "Other"   |
| Desirable      | <b>InfestZone</b>    | Chr 4   | Core infestation<br><br>Buffer<br><br>Outlier control<br><br>Clean area<br><br>Not defined   | CORI<br><br>BUFR<br><br>OCON<br><br>CLAR<br><br>NDFS             | <b>Infestation zone</b><br><br>Choose from the list of zones   |
| Optional       | <b>MgtComment</b>    | Chr 250 |  |  | <b>Comment</b><br><br>Enter any appropriate comments   |

### **3.2.1 Management Zone**

The following management zones are generally described here. Management goals for individual species should be further defined within each strategy.

- Containment within existing infestation boundaries = Prevention of spread from an existing infested area within the defined containment area. This may be modified to include prevention of spread from an infested property to an area beyond the property boundary and within the containment area.
- Containment within zone = Prevention of spread beyond a defined containment zone.
- Asset protection area = Protection of identified asset areas in a defined area where the pest is already widespread and abundant.
- Eradication = Eradication of the pest from a defined area.
- Pest free high risk = Area that is currently free of the pest and where there is a high risk of establishment.
- Pest free low risk = Area that is currently free of the pest and where there is a low risk of establishment.
- Other = A strategic aim not currently defined. If this option is chosen, the management goal should be described in the comment section, and within the strategy.

### **3.2.2 Strategy Infestation Zone**

Infestation zones may be defined in a strategy to help identify management zones, and to use as a reporting tool, as these zones may change over time.

- Core infestation = An area that defines the extent to which the pest is already widespread and abundant.
- Buffer = A defined area surrounding a core infestation or outlier control area.
- Outlier control = An infested area that is outside the core infestation area. Outlier control areas may be assigned to a higher priority management zone.
- Clean area = An area that has been identified as not containing the pest.
- Not defined = An area that is not defined as an infestation zone.

### 3.3 Surveys

Surveys are search activities conducted to find one or more pest species. The area surveyed can be geographically captured as a series of points, lines or polygons. Surveys are common to both weeds and pest animal management and appear as entities in Figures 1 & 2. Surveys help to define areas that have been actively searched for a targeted pest species. Surveys can be part of a surveillance program. Surveys are not required information to share with other agencies, so each information type is ranked as 'desirable' or 'optional'.

Each survey with a geographic component requires the following information:

**Survey Name (SvName; desirable):** A short name for the survey, which may include the target species name.

**Lead organisation (AGID; desirable):** The name of the organisation responsible for the survey.

**Survey leader (SvLeader; optional):** The name of the person responsible for the survey.

**Other agencies (OAg; optional):** The name/s of any other agencies that participate in the survey.

**External reference (SvExtRef; optional):** A reference that might be used or useful to the lead organisation.

**Survey method (SvMeth; desirable):** this can be either:

- On location. These are surveys conducted in the field.
- Remote analysis. This includes image analysis, or desktop mapping. If a survey has been conducted using remote analysis, then the survey area's will simply define the areas that were examined. The results of the survey should be included in the weeds or pest animals tables (For weeds, tables 5 and 6; for animals, tables 8 and 9).

**Start and/or finish date (SvStartDate, SvEndDate; desirable):** the start date is first day of the survey. The finish date is required if it is different to the start date. A proposed finish date may be included if the survey is active or inactive.

For each survey, a number of transects or areas may be defined. Attributes for each spatial object for both weeds and pest animals are described in the table below.

**Table 3: Survey Attributes**

| Classification | Attribute            | Type   | List Description  | List Code  | Comments   |
|----------------|----------------------|--------|---|--|--|
| Desirable      | <b>SvFeatID</b>      | Chr 25 |   |  | Unique identification number   |
| Desirable      | <b>SpatialObject</b> |        |   |  | Refer to Table 9   |
| Optional       | <b>WeedForm</b>      | Chr 4  | Class 1<br>Class 2<br>Class 3<br>Groundcover<br>Shrub<br>Woody<br>Aquatic<br>Vine | CLS1<br>CLS2<br>CLS3<br>GNDC<br>SHRB<br>WODY<br>AQTC<br>VINE | Class 1, 2 and 3 weeds are defined in the Queensland Land Protection (Pest and Stock Route Management) Act 2002. |

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| Classification | Attribute              | Type    | List Description   | List Code  | Comments  |
|----------------|------------------------|---------|--|--|---|
|                | <b>WeedForm, cont.</b> |         | Cacti /succulent<br>Not recorded   | CACT<br>NRWF   |   |
| Optional       | <b>CommonName</b>      | Chr 8   |  | Refer to<br>CNAME  | <b>Common Name</b><br>Choose from the Pest Species list   |
| Required       | <b>ScientificName</b>  | Chr 8   |  | Refer to<br>GENSP-CODE   | <b>Scientific Name</b><br>Choose from the Pest Species list   |
| Desirable      | <b>SVPurp</b>          | Chr 4   | Emergency response<br><br>Incident response<br><br>Routine management<br><br>Research<br><br>Other purpose<br><br>Not recorded | EMRE<br><br>INRE<br><br>ROMA<br><br>RSCH<br><br>OTHR<br><br>NRSP | A survey conducted as part of a declared emergency response effort<br><br>A survey conducted as part of a declared incident response effort<br><br>A survey conducted as part of routine management effort<br><br>A scientific survey conducted using scientifically valid methods to measure pest distribution and/or impacts<br><br>If a survey is conducted for another purpose, it should be described here |
| Desirable      | <b>SvStatus</b>        | Chr 4   | Proposed<br><br>Completed<br><br>Abandoned<br><br>Closed   | PRSD<br><br>SCLD<br><br>SABN<br><br>SCLS                         | Current survey status   |
| Desirable      | <b>SVType</b>          | Chr 4   | Baseline<br><br>Delimiting<br><br>Monitoring<br><br>Not recorded   | BSLN<br><br>DLNG<br><br>MTNG<br><br>NSUR                         | Survey conducted to determine infestation areas of one or more pests, for the first time.<br><br>Survey conducted to determine the extent of the entire pest infestation area<br><br>A survey conducted on a regular basis to measure changes pest infestation areas  |
| Desirable      | <b>SvTech</b>          | Chr 4   | Aerial<br><br>Ground vehicle<br><br>On foot<br><br>Boat<br><br>Other   | AERL<br><br>GRDV<br><br>ONFT<br><br>BOAT<br><br>OTTA             | If the survey method = On location, then choose from the list of techniques   |
| Optional       | <b>SvStage</b>         | Chr 4   | Pre-control<br><br>Post control  | PRCN<br><br>POCN   | If the survey is conducted to measure a control event, choose from the survey stage list.   |
| Optional       | <b>SvPartDate</b>      | Date    | Yyyy-mm-dd   |  | Date the survey part is undertaken.   |
| Optional       | <b>SvComment</b>       | Chr 250 |  |  | Enter any appropriate comments  |

### 3.4 Weed Infestations

Weed infestations contain information about infestations, weed inspections, details about weeds and weed treatments, which are all integral to weed management (figure 1). Infestations, inspections and weed details are contained in table 4, while treatments are described in table 5.

**Table 4: Weed Infestation Area Attributes**

| Classification | Attribute             | Type    | List Description   | List Code  | Comments  |
|----------------|-----------------------|---------|--|--|---|
| Required       | <b>WIID</b>           | Chr 25  |  |  | <b>Infestation ID</b><br>Unique infestation identification  |
| Required       | <b>SpatialObject</b>  |         |  |  | <b>Spatial object</b> Refer to Table 9  |
| Desirable      | <b>WIWidth</b>        | Integer |  |  | <b>Width (m)</b><br>If the spatial object type is a line, then enter the average width of the infestation in metres<br>For other object types leave this field blank  |
| Required       | <b>WIArea</b>         | Integer |  |  | <b>Area (m<sup>2</sup>)</b><br>If spatial object type is a point, enter an area<br>If spatial object type is a line then calculate area as line length x Width<br>If spatial object is a polygon then enter area of the polygon |
| Required       | <b>AGID</b>           | Chr 50  |  |  | <b>Organisation</b><br>Organisation doing the inspection, may be "N/A" for "Report by 3 <sup>rd</sup> party"  |
| Optional       | <b>InspOfficer</b>    | Chr 50  |  |  | <b>Officer</b><br>Name of inspecting officer  |
| Required       | <b>InspDate</b>       | Date    | yyyy-mm-dd   |  | <b>Inspection date</b><br>Date on which the inspection was carried out  |
| Optional       | <b>WeedForm</b>       | Chr 4   | Class 1<br>Class 2<br>Class 3<br>Groundcover<br>Shrub<br>Woody<br>Aquatic<br>Vine<br>Cacti/succulent<br>Not recorded | CLS1<br>CLS2<br>CLS3<br>GNDC<br>SHRB<br>WODY<br>AQTC<br>VINE<br>CACT<br>NRWF | <b>Form</b><br>Choose from the Pest Species list (Section 3.1)<br>Class 1, 2 and 3 declared weeds are defined in the Queensland Land Protection (Pest and Stock Route Management) Act 2002                                      |
| Optional       | <b>CommonName</b>     | Chr 8   |  | Refer to<br>CNAME  | <b>Common Name</b><br>Choose from the Pest Species list   |
| Required       | <b>ScientificName</b> | Chr 8   |  | Refer to<br>GENSP-   | <b>Scientific Name</b>  |

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| Classification | Attribute                   | Type  | List Description  | List Code  | Comments   |
|----------------|-----------------------------|-------|---|--|--|
|                | <b>ScientificName cont.</b> |       |   | CODE   | Choose from the Pest Species list  |
| Desirable      | <b>WeedRank</b>             | Chr 4 | Single species<br>Dominant<br>Co-dominant<br>Sub-dominant<br>Not recorded   | SNSP<br>DMNT<br>CDNT<br>SDNT<br>NRDW                             | <b>Weed ranking</b><br>Choose single species if you are only recording one weed species. If more than 1 weed species exists within an infestation, choose from the other values.   |
| Desirable      | <b>InspStatus</b>           | Chr 4 | New Infestation<br>Active infestation<br>Under control<br>Under monitoring<br>Closed<br>Not recorded  | NEWW<br>ACTW<br>UNCW<br>UNMW<br>CLSW<br>NRWI                     | <b>Status</b><br>Choose a Status from the list   |
| Required       | <b>WeedDens</b>             | Chr 4 | Single plant<br>Scattered<br>Low<br>Medium<br>High<br>Not recorded<br>Not evident   | SPLT<br>SCTR<br>LOWW<br>MEDM<br>HIGH<br>UKWD<br>NOTE             | <b>Density</b><br>Groundcover, vines, aquatic weeds and cacti density values are measured as a percentage estimate of ground cover; whilst shrubs and woody weeds are estimated as number of plants per given area (Appendix 1; 6.2). If the density is variable, then chose the greatest density measure. |
| Desirable      | <b>WeedReproStat</b>        | Chr 4 | Flowering<br>Seeding<br>Vegetative & Mature<br>Mature: Male<br>Mature: Female<br>Immature<br>Not recorded                                     | FLWG<br>SEDG<br>VGTV<br>MMAL<br>MFEM<br>IMTR<br>NRRS             | <b>Reproductive Status</b><br>Choose the highest reproductive status from the list: Seeding > flowering > vegetative / mature > immature.  |
| Desirable      | <b>InspType</b>             | Chr 4 | Report by 3 <sup>rd</sup> party<br>Initial Inspection<br>Re-inspection<br><br>Not recorded  | RPTW<br>IISW<br>RESW<br><br>NRWI                                 | <b>Type</b><br>Choose the type of inspection   |
| Desirable      | <b>InspSource</b>           | Chr 4 | Landowner<br>Neighbour<br>Public<br>Weedspotters<br>Councillor<br>Other Government Officer<br><hr/> Weeds Officer<br>Local government Officer | LNDW<br>NEBW<br>PBLW<br>WDSW<br>CNCW<br>OTGW<br><br>WDOW<br>LGOW | <b>Source</b><br>If Type = "Report by 3 <sup>rd</sup> party" then enter a choice from the top list or choose "Other"<br><br>If Type = "Inspection" or "Re-inspection" then enter a choice from the bottom list or choose "Other"   |

**Spatial Pest attribute (SPA) Standard**

| Classification | Attribute                | Type    | List Description  | List Code  | Comments   |
|----------------|--------------------------|---------|---|--|--|
|                | <b>InspSource, cont.</b> |         | Land Protection Officer<br>Biosecurity Officer<br>State Govt Ranger<br>Pest Mgt Officer<br>Environmental Officer<br>Administration Officer<br>Other<br>Not recorded | LPRW<br>BSCW<br>SGRW<br>PMGW<br>ENVW<br>AMNW<br>OTHW<br>NRSW         |  |
| Optional       | <b>WeedPheno</b>         | Chr 50  |   |  | <b>Phenotype</b><br>May be entered if known  |
| Optional       | <b>WeedHealth</b>        | Chr 4   | Healthy<br>Stressed<br>Dead<br>Not recorded   | HLTH<br>STRS<br>DEAD<br>NTRE   | <b>Weed health</b><br>Plant health may be used to record status of control or treatment.   |
| Desirable      | <b>WeedMature</b>        | Integer |   |  | <b>Mature Plants</b><br>Enter the percentage of mature plants within the weed population   |
| Desirable      | <b>WeedConf</b>          | Chr 4   | Very certain<br>Reasonably certain<br>Unsure<br>Not recorded  | VCTW<br>RCTW<br>UNSW<br>NRCW   | <b>Confidence</b><br>This is the confidence the inspector has in the species identification. To be chosen from the list.                                 |
| Optional       | <b>WeedSamTaken</b>      | Chr 4   | Yes<br>No   | YES<br>NO  | <b>Sample Taken</b><br>Was a sample taken for subsequent identification?<br><br>If a sample was taken, use the Sample Table 8 to record further details. |
| Optional       | <b>WeedSamNo</b>         | Chr 50  |   |  | <b>Sample Number</b><br>Number allocated by the inspector if a sample was taken, otherwise Null  |
| Optional       | <b>WeedReInsp</b>        | Chr 4   | None<br>1 month<br>3 months<br>6 months<br>12 months<br>18 months<br>24 months<br>36 months<br>Not recorded   | NORE<br>ONMT<br>THMT<br>SXMT<br>TWMT<br>EGMT<br>TFMT<br>TSMT<br>NRPR | <b>Proposed re-inspection</b><br>Choose from the list  |

**Additional attributes for Main Roads:**

| Classification | Attribute            | Type  | List Description      | List Code            | Comments  |
|----------------|----------------------|-------|-----------------------|----------------------|---|
| Optional       | <b>SoC</b>           | Chr 4 | Left<br>Right<br>Both | LEFT<br>RGHT<br>BOTH | <b>Side of Carriageway</b><br>Relevant to infestations on main roads, and specific to Queensland Department of Main Roads personnel.      |
| Optional       | <b>WeedRdResOnly</b> | Chr 4 | Yes<br>No             | YESR<br>NORR         | <b>Road Reserve Only</b><br>Relevant to Main Roads personnel. Indicate if weed is restricted to the road reserve.                         |
| Optional       | <b>WeedAdjWorse</b>  | Chr 4 | Yes<br>No             | YESJ<br>NOAJ         | <b>Adjacent Worse</b><br>Relevant to Main Roads personnel. If Road Reserve Only = No, indicate if weed density is higher outside reserve. |



Table 5: Weed Treatment Attributes

| Classification | Attribute             | Type    | List Description   | List Code  | Comments  |
|----------------|-----------------------|---------|--|--|---|
| Required       | <b>WTreatID</b>       | Chr 25  |  |  | <b>Weed Treatment ID</b><br>Unique identification of treatment event  |
| Required       | <b>SpatialObject</b>  |         |  |  | Refer to Table 9  |
| Desirable      | <b>WTreatWidth</b>    | Integer |  |  | <b>Width (m)</b><br>If the spatial object type is a line, then enter the average width of the infestation in metres<br><br>For other object types leave this field blank  |
| Required       | <b>WTreatArea</b>     | Integer |  |  | <b>Area (m<sup>2</sup>)</b><br>If spatial object type is a point, enter an area<br><br>If spatial object type is a line then calculate area as line length x Width<br><br>If spatial object is a polygon then enter area of the polygon |
| Optional       | <b>WeedForm</b>       | Chr 4   | Class 1<br>Class 2<br>Class 3<br>Groundcover<br>Shrub<br>Woody<br>Aquatic<br>Vine<br>Cacti/succulent<br>Not recorded | CLS1<br>CLS2<br>CLS3<br>GNDC<br>SHRB<br>WODY<br>AQTC<br>VINE<br>CACT<br>NRWF | <b>Form</b><br>Choose from the Pest Species list (Section 3.1)<br><br>Class 1, 2 and 3 declared weeds are defined in the Queensland Land Protection (Pest and Stock Route Management) Act 2002  |
| Optional       | <b>CommonName</b>     | Chr 8   |  | Refer to<br>CNAME  | <b>Common Name</b><br>Choose from the Pest Species list   |
| Required       | <b>ScientificName</b> | Chr 8   |  | Refer to<br>GENSP-CODE   | <b>Scientific Name</b><br>Choose from the Pest Species list   |
| Optional       | <b>WTreatStatus</b>   | Chr 4   | Proposed<br>Completed<br>Abandoned<br>Evident<br>Not recorded  | PROW<br>COMW<br>ABNW<br>EVNW<br>NRAS   |   |
| Desirable      | <b>WTreatType</b>     | Chr 4   | Chemical<br>Physical<br>Mechanical<br>Bio-control<br>Grazing<br>Not recorded   | CHTW<br>PHTW<br>MCTW<br>BITW<br>GZTW<br>NRTW                                 | <b>Treatment Type</b><br>Choose from list   |

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| Classification      | Attribute    | Type  | List Description           | List Code | Comments  |  |
|---------------------|--------------|---|----------------------------|-----------|---|--|
| Desirable           | WTreatMeth   | Chr 4   | Aerial spray               | ASTW      | <p><b>Treatment Method</b></p> <p>If Treatment Type = "Chemical" then choose from first list or choose "Other"</p> <p>Note that additional information on chemical application may need to be recorded under the record keeping requirements of section 26 of the Agricultural Chemicals and Distribution Control Act 1966 (ACDC Act). See section 5.4.</p> |  |
|                     |              |   | Basal barking              | BBTW      |   |  |
|                     |              |   | Boom spray                 | BSTW      |   |  |
|                     |              |   | Cut stump                  | CSTW      |   |  |
|                     |              |   | Cut and swab               | SWTW      |   |  |
|                     |              |   | Foliar spray (hand gun)    | FSTW      |   |  |
|                     |              |   | Soil applied               | SATW      |   |  |
|                     |              |   | Stem scraping              | SSTW      |   |  |
|                     |              |   | Stem injection             | SITW      |   |  |
|                     |              |   | Splatter gun               | SGTW      |   |  |
|                     |              |   | Wick applicator            | WKTW      |   |  |
|                     |              |   | Cutting                    | CTTW      |   | <p>If Treatment Type = "Physical" then choose from second list or choose "Other"</p> |
|                     |              |   | Fire                       | FITW      |   |  |
|                     |              |   | Hand removal               | HRTW      |   |  |
|                     |              |   | Shading (weed suppression) | SHTW      |   |  |
|                     |              |   | Fencing                    | FNTW      | <p>If Treatment Type = "Mechanical" then choose from third list or choose "Other"</p>   |  |
|                     |              |   | Dozing                     | DZTW      |   |  |
|                     |              |   | Chain pulling              | CPTW      |   |  |
|                     |              |   | Stick raking               | SRTW      |   |  |
|                     |              |   | Brush cutter               | BCTW      |   |  |
| Slashing            | SLTW         |   |                            |           |   |  |
| Bio-control Agent 1 |              | <p>If Treatment Type = "Bio-control" then choose from 4<sup>th</sup> list or choose "Other". This field is only used for research purposes.</p> |                            |           |   |  |
| Bio-control Agent 2 |              |   |                            |           |   |  |
| Biocontrol Agent 3  |              |   |                            |           |   |  |
| Other               | OTTW         | <p>Select "Other" if control type is not listed, and describe in "Comment" section</p>  |                            |           |   |  |
| Not recorded        | NRMW         |   |                            |           |   |  |
| Optional            | WTreatEffect | Chr 4   | Biocontrol present         | BPTW      | <p><b>Weed treatment effectiveness</b></p> <p>If Treatment Type = "Bio-control" AND TreatmentStatus = Evident, then choose from this list</p>   |  |
|                     |              |   | Biocontrol absent          | BATW      |   |  |
|                     |              |   | Damage evident             | DETW      |   |  |
|                     |              |   | 0% effective               | 0         | <p>If Treatment Type &lt;&gt; "Bio-control" AND TreatmentStatus = Evident, then choose from this list</p>   |  |
|                     |              |   | 10% effective              | 10        |   |  |
|                     |              |   | 20% effective              | 20        |   |  |
|                     |              |   | 30% effective              | 30        |   |  |
|                     |              |   | 40% effective              | 40        |   |  |
|                     |              |   | 50% effective              | 50        |   |  |
|                     |              |   | 60% effective              | 60        |   |  |
|                     |              |   | 70% effective              | 70        |   |  |
|                     |              |   | 80% effective              | 80        |   |  |
|                     |              |   | 90% effective              | 90        |   |  |

**Spatial Pest attribute (SPA) Standard**

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| Classification | Attribute                  | Type    | List Description               | List Code   | Comments   |
|----------------|----------------------------|---------|--------------------------------|-------------|--|
|                | <b>WTreatEffect, cont.</b> |         | 100% effective<br>Not recorded | 100<br>NRDT |  |
| Required       | <b>AGID</b>                | Chr 50  |                                |             | <b>Organisation</b><br>Organisation doing the inspection, may be "N/A" for "Report by 3 <sup>rd</sup> party" |
| Optional       | <b>WTreatOp</b>            | Chr 50  |                                |             | <b>Operator</b><br>Weed treatment operator's name  |
| Required       | <b>WTreatStDate</b>        | Date    | yyyy-mm-dd                     |             | <b>Treat start date</b><br>Start date the treatment was undertaken   |
| Optional       | <b>WTreatEndDate</b>       | Date    | yyyy-mm-dd                     |             | <b>Treat end date</b><br>End date the treatment was undertaken, if more than 1 day                           |
| Optional       | <b>WTComm</b>              | Chr 250 |                                |             | <b>Comment</b><br>Enter any appropriate comments   |

### 3.5 Pest Animals

Information about pest animals includes evidence about animal activity, known infested areas, inspections and control events. Evidence and infested areas are contained in table 6, while control events are described in table 7.

**Table 6: Pest Animal Evidence Attributes**

| Classification | Attribute             | Type    | List Description   | List Code                            | Comments  |
|----------------|-----------------------|---------|--|--------------------------------------|---|
| Required       | <b>AID</b>            | Chr 25  |  |                                      | <b>Evidence ID</b><br>Unique identification of evidence   |
| Required       | <b>SpatialObject</b>  |         |  |                                      | Can be a point, line or polygon<br>Refer to Table 9   |
| Desirable      | <b>AWidth</b>         | Integer |  |                                      | <b>Width (m)</b><br>If the spatial object type is a line, then enter the average width of the infestation in metres<br>For other object types leave this field blank  |
| Required       | <b>AArea</b>          | Integer |  |                                      | <b>Area (m<sup>2</sup>)</b><br>If spatial object type is a point, enter an area<br>If spatial object type is a line then calculate area as line length x Width<br>If spatial object is a polygon then enter area of the polygon |
| Optional       | <b>ARecType</b>       | Chr 6   | Evidence<br>Infested area  | EVIDEN<br>INFSTT                     | Choose evidence if recording 'evidence' such as a sighting or damage, else choose Infested area if recording a known habitat area.  |
| Optional       | <b>CommonName</b>     | Chr 8   |  | Refer to<br>CNAME                    | <b>Common Name</b><br>Choose from the Pest Species list   |
| Required       | <b>ScientificName</b> | Chr 8   |  | Refer to<br>GENSP-<br>CODE           | <b>Scientific Name</b><br>Choose from the Pest Species list   |
| Required       | <b>AGID</b>           | Chr 50  |  |                                      | <b>Organisation</b><br>Organisation doing the inspection, may be "N/A" for "Report by 3 <sup>rd</sup> party"  |
| Optional       | <b>AOfficer</b>       | Chr 50  |  |                                      | <b>Officer</b><br>Name of inspecting officer  |
| Required       | <b>ADate</b>          | Date    | yyyy-mm-dd   |                                      | <b>Date</b><br>Date when evidence or infested area was gathered or defined  |
| Desirable      | <b>AHabType</b>       | Chr 4   | Breeding site<br>Impact site<br>Movement corridor<br>Other<br>Not recorded | BRSI<br>IMSI<br>MOCO<br>OTIA<br>NRPE | <b>Animal habitat type</b>  |
| Desirable      | <b>AStatus</b>        | Chr 4   | New area   | NEWA                                 | <b>Status</b><br>Choose a Status from the list to   |

**Spatial Pest attribute (SPA) Standard**

| Classification | Attribute             | Type  | List Description   | List Code  | Comments   |
|----------------|-----------------------|-------|--|--|--|
|                | <b>AStatus, cont.</b> |       | Active area<br>Under control<br>Under monitoring<br>Closed<br>Unknown<br>Not recorded  | ACTA<br>UNCA<br>UNMA<br>CLSA<br>UKAA   | describe the infestation status  |
| Desirable      | <b>AEvidence</b>      | Chr 4 | Sighting related<br>Stock bitten<br>Stock killed<br>Domestic animal bitten<br>Domestic animal killed<br>Agricultural damage<br>Environmental impact<br>Infrastructure damage<br>Illegal pet<br>Other (specify)<br>Not recorded | SITR<br>STBT<br>STKL<br>DABT<br>DAKL<br>COPD<br>ENVI<br>INFR<br>ILPT<br>OTEV<br>NRPE | <b>Evidence type</b><br>Choose from the list. More than 1 type of evidence may apply. If "Other" is selected, describe in "Type comment" |
| Desirable      | <b>ASubType</b>       | Chr 4 | Observed<br>Shot<br>Trapped<br>Breeding site<br>Track<br>Feed area<br>Scats<br>Animal calls<br>Skeletal remains<br>Active camera<br>Passive camera   | SGHT<br>SHOT<br>TRAP<br>BRED<br>TRAK<br>FEED<br>SCAT<br>ANCA<br>SKTL<br>ACMS<br>PCMS | <b>Sight type</b><br>If AEvidence = "Sighting related", choose from this list  |

Spatial Pest attribute (SPA) Standard

| Classification | Attribute | Type | List Description   | List Code  | Comments  |
|----------------|-----------|------|--|--|---|
|                |           |      | Calf<br>Weaner<br>Steer<br>Cow<br>Bull<br>Lamb<br>Hogget<br>Wether<br>Ewe<br>Ram<br>Goat<br>Chook<br>Pet dog<br>Pet cat<br>Other animal                                    | CALF<br>WENR<br>STER<br>COWE<br>BULL<br>LAMB<br>HOGT<br>WTHR<br>EWEE<br>RAME<br>GOAT<br>CHOK<br>PDOG<br>PCAT<br>OANI | <b>Stock</b> damage<br>If AEvidence = "Stock or domestic animal impact", choose from this list                              |
|                |           |      | Corn crop damage<br>Forest plantation disturbance<br>Fruit crop damage<br>Grain crop damage<br>Pasture damage<br>Sugar cane damage<br>Vegetable crop damage                | CORN<br>FRPL<br>FRUT<br>GRIN<br>PADM<br>SUCN<br>VEGT   | <b>Agriculture</b> damage<br>If AEvidence = "agriculture damage", choose from this list                                     |
|                |           |      | Soil erosion<br>Habitat destruction<br>Reduction in vegetation cover / overgrazing<br>Water-body contamination<br>Native animal predation<br>Native animal toxic ingestion | SLER<br>HBDS<br>REVC<br>WBCN<br>NAPR<br>NATX   | <b>Environmental</b> damage<br>If AEvidence = "Environmental impact", choose from this list                                 |
|                |           |      | Building site damage<br>Fence damage<br>Heritage site damage   | BUIL<br>FENC<br>HERS   | <b>Infrastructure</b> damage<br>If AEvidence = "Infrastructure damage", choose from this list                               |
|                |           |      | Other evidence<br>Not applicable<br>Not recorded   | OTVV<br>NAET<br>NRTA   | If "other evidence" is chosen, describe evidence in the comments field<br>If AEvidence = Illegal pet, choose Not applicable |

**Spatial Pest attribute (SPA) Standard**

| Classification | Attribute        | Type    | List Description  | List Code  | Comments   |
|----------------|------------------|---------|---|--|--|
| Optional       | <b>ACount</b>    | Integer |   |  | <b>Count</b><br>If ARecType = Evidence AND Evidence = Sighting related or illegal pet, then enter the number of animals. If ARecType = Evidence AND Evidence = Stock bitten or killed, or domestic animals bitten or killed, then enter number of animals. If ARecType = Infestation, enter population count.<br>Else leave Null |
| Optional       | <b>ADens</b>     | Integer |   |  | <b>Density</b><br>Enter the number of animals per km <sup>2</sup>  |
| Optional       | <b>AGender</b>   | Chr12   | MMMM:FFFF:OOOO  |  | <b>Gender</b><br>If Count is populated and gender is known, then enter the ratio of male:female:offspring.<br>Else leave null  |
| Optional       | <b>ADispose</b>  | Chr 150 |   |  | <b>Disposal method</b><br>If Evidence = illegal pet, describe disposal method  |
| Optional       | <b>AComm</b>     | Chr 250 |   |  | <b>Comment</b><br>Enter any appropriate comments   |
| Desirable      | <b>AConf</b>     | Chr 4   | Very certain<br>Reasonably certain<br>Unsure<br>Not recorded  | VCRA<br>RCRA<br>UNSA<br>NRAE   | <b>Confidence</b><br>This is the confidence the inspector has in the species identification. To be chosen from the list.   |
| Desirable      | <b>AInspType</b> | Chr 4   | Report by 3 <sup>rd</sup> party<br>Initial Inspection<br>Re-inspection<br>Not recorded  | RPTA<br>IISP<br>RESP<br>PENR   | <b>Animal Inspection Type</b><br>Choose the type of inspection   |
| Desirable      | <b>ASource</b>   | Chr 4   | Landowner<br>Neighbour<br>Public<br>Councillor<br>Other Government Officer<br><hr/> Local Govt Officer<br>Land Protection Officer<br>Biosecurity Officer<br>State Govt Ranger<br>Pest Mgt Officer<br>Environmental Officer<br><hr/> Administration Officer<br><hr/> Other | LNDA<br>NEBA<br>PBLA<br>CNCA<br>OTGA<br><hr/> LGOA<br>LPRA<br><br>BSCA<br>SGRA<br>PMGA<br>ENVA<br><hr/> AMNA<br><hr/> OTHA | <b>Source</b><br>If Type = "Report by 3 <sup>rd</sup> party" then enter a choice from the top list or choose "Other"<br><br>If Type = "Inspection" or "Re-inspection" then enter a choice from the bottom list or choose "Other"<br><br>Select "Other" if Source is not listed, and describe in Comment section                  |

**Spatial Pest attribute (SPA) Standard**

| Classification | Attribute             | Type   | List Description          | List Code    | Comments  |
|----------------|-----------------------|--------|---------------------------|--------------|---|
|                | <b>ASource, cont.</b> |        | Not recorded              | PSNR         |   |
| Desirable      | <b>AESamTaken</b>     | Chr 4  | Yes<br>No<br>Not recorded | YESA<br>NOAS | <b>Sample Taken</b><br>Was a sample taken for subsequent identification? If a sample was taken, use the Sample Table 8 to record details. |
| Optional       | <b>AESamNo</b>        | Chr 50 |                           |              | <b>Sample Number</b><br>Number allocated by the inspector if a sample was taken, otherwise Null   |

**Table 7: Pest Animal – Control Attributes.**

| Classification | Attribute             | Type    | List Description | List Code  | Comments  |
|----------------|-----------------------|---------|------------------|------------|---|
| Required       | <b>ACID</b>           | Chr 25  |                  |            | <b>Animal Control ID</b><br>Unique identification of control event  |
| Required       | <b>SpatialObject</b>  |         |                  |            | Refer to Table 9  |
| Desirable      | <b>ACWidth</b>        | Integer |                  |            | <b>Width (m)</b><br>If the spatial object type is a line, then enter the average width of the infestation in metres<br>For other object types leave this field blank  |
| Required       | <b>ACArea</b>         | Integer |                  |            | <b>Area (m<sup>2</sup>)</b><br>If spatial object type is a point, enter an area<br>If spatial object type is a line then calculate area as line length x Width<br>If spatial object is a polygon then enter area of the polygon |
| Required       | <b>AGID</b>           | Chr 50  |                  |            | <b>Organisation</b><br>The name of the responsible agency.  |
| Optional       | <b>ACOfficer</b>      | Chr 50  |                  |            | <b>Officer</b><br>Officer's name  |
| Optional       | <b>CommonName</b>     | Chr 8   |                  | CNAME      | <b>Common Name</b><br>Choose from the Pest Species list (Section 3.1)   |
| Required       | <b>ScientificName</b> | Chr 8   |                  | GENSP-CODE | <b>Scientific Name</b><br>Choose from the Pest Species list (Section 3.1)   |
| Required       | <b>ACStartDate</b>    | Date    | yyyy-mm-dd       |            | <b>Control Start Date</b><br>Start date of control  |
| Optional       | <b>ACEndDate</b>      | Date    | yyyy-mm-dd       |            | <b>Control end date</b><br>End date of control if more than 1 day   |



**Spatial Pest attribute (SPA) Standard**

| Classification                             | Attribute  | Type                                      | List Description  | List Code  | Comments  |
|--|------------|---|---|--|---|
| Optional                                   | ACPartDate | Date                                      | yyyy-mm-dd  |  | <b>Actual control date</b><br>If ACType = Trapping then this is the day that the trap was checked |
| Desirable                                  | ACType     | Chr 4                                     | Baiting<br>Fumigation<br>Trapping<br>Ground shooting<br>Aerial shooting<br>Removal<br>Mustering<br>Harbour destruction<br>Exclusion fencing<br>Biocontrol<br>Guard animals<br>Other (comment)<br>Not recorded | BAIT<br>FUMI<br>TRPC<br>SHTC<br>ASHT<br>RMVE<br>MUST<br>HBRD<br>EXCL<br>BLGL<br>GARD<br>OTCA<br>NRCA | <b>Control Type</b><br>Type of control to be undertaken   |
| Desirable                                  | ACBaitMeth | Chr 4                                     | Carrot, 180mg/Kg  | CRRT   | <b>Baiting method</b><br>If Control Type = Baiting<br>And Animal = Rabbit                         |
|  |            |   | Grain, 360mg/Kg   | GRAN   |   |
|  |            |   | Pindone   | PNDE   | If Control Type = Baiting<br>And Animal = Feral pig   |
|  |            |   | Meat – 144mg/Kg bait  | METF   |   |
|  |            |   | Grain – 288mg/Kg bait   | GRAI   |   |
| Other – 288mg/Kg bait                      | OTFP       | If ACType = Baiting and Animal = Wild dog |   |  |   |
| PIGOUT – 72mg per bait                     | PIGT       |   |   |  |   |
| Meat (injected) – 10mg/mL sol <sub>n</sub> | METW       |   |   |  |   |
| Meat (mixing) – 10mg/mL sol <sub>n</sub>   | METD       |   |   |  |   |
| Meat (injected) – 6mg/mL sol <sub>n</sub>  | METI       |   |   |  |   |
| Meat (mixing) – 6mg/mL sol <sub>n</sub>    | METM       |   |   |  |   |
| DOGGONE – 6mg per bait                     | DOGN       |   |   |  |   |
| De_K9 – 6mg per bait                       | DEKN       |   |   |  |   |
| Strychnine                                 | STRK       | If ACType = Baiting and Animal = Fox      |   |  |   |
| PAPP bait                                  | PAPP       |   |   |  |   |
| EJECTOR                                    | EJEC       |   |   |  |   |
|  |            |   | Meat (injected) – 3mg/mL sol <sub>n</sub>   | METJ   |   |
|  |            |   | Meat (mixing) – 3mg/mL sol <sub>n</sub>   | METX   |   |
|  |            |   | De-FOX – 3mg per  |  |   |

**Spatial Pest attribute (SPA) Standard**

| Classification | Attribute         | Type    | List Description   | List Code  | Comments   |
|----------------|-------------------|---------|--|--|--|
|                |                   |         | bait<br>FOXOFF – 3mg per bait<br>PAPP bait<br>EJECTOR  | DEFX<br>FXOF<br>PAPP<br>EJEC   |  |
|                |                   |         | Meat (injected)<br>3mg/mL soln<br>CURIOSITY cat bait   | METJ<br>CURO   | If ACType = Baiting and Animal = Cat   |
|                |                   |         | Mouseoff ZP<br>Mouseoff<br>Bromadiolone  | MSZP<br>MSBR   | If ACType = Baiting and Animal = Mouse   |
|                |                   |         | Not recorded   | NRBM   |  |
| Desirable      | <b>ACAmount</b>   | Integer |  |  | <b>Amount</b><br>If Control Type = Baiting And Baiting method = PIGGOUT OR DOGGONE OR De_K9 OR De-Fox OR FOXOFF, then enter number of baits<br>Else enter the amount of bait in Kg   |
| Optional       | <b>ACFum</b>      | Chr 4   | Phosphine<br><hr/> Carbon Monoxide<br><br>Not recorded   | ALPH<br><br>CAMO<br><br>NRCF   | <b>Fumigant</b><br>Phosphine if control type is Fumigation and Animal = Rabbit<br>Carbon monoxide if control type is Fumigation and Animal = Fox   |
| Optional       | <b>ACNoBurrow</b> | Integer |  |  | <b>No. burrows</b><br>If control type is Fumigation and Animal = Fox or Rabbit, enter the number of burrows treated  |
| Optional       | <b>ACTrapType</b> | Chr 4   | Break-back<br>Elliot<br>Pitfall<br>Water trap<br><br>Collarum<br>Padded foot-hold<br>Padded leg-hold<br>Padded leg-hold strychnine<br><br>Cage<br>Treadle<br>Soft net<br>Padded-jaw<br><br>Barrel trap<br>Padded foot-hold<br>Padded leg-hold<br><br>Trap yard | BKBK<br>ELLT<br>PTFL<br>WTRT<br><br>COLL<br>PFHD<br>PLHD<br>PLHS<br><br>CAGE<br>TRED<br>SFTN<br>PJAW<br><br>BTRP<br>PFHD<br>PLHD<br><br>SELF | <b>Trap type</b><br>If Control Type = Trapping and Animal = Mouse<br><br>If Control Type = Trapping and Animal = Wild dog or Fox<br><br>If Control Type = Trapping and Animal = Feral cat<br><br>If Control Type = Trapping and Animal = Rabbit or hare. Padded foot-hold and padded leg-hold are the same values as for Wild dogs and Foxes.<br><br>If ACType = Trapping and Animal = Goat, Donkey or Horse |

**Spatial Pest attribute (SPA) Standard**

| Classification | Attribute         | Type    | List Description                           | List Code            | Comments  |
|----------------|-------------------|---------|--|----------------------|---|
|                |                   |         | Silo<br>Pen<br>Portable box                | SILO<br>PENT<br>PBOX | If ACType = Trapping and Animal = Feral pig   |
|                |                   |         | India myna trap                            | IMYT                 | If ACType = Trapping and Animal = Indian Myna   |
|                |                   |         | Clover<br>Pen<br>Trap yard                 | CLOV<br>PEND<br>TYRD | If ACType = Trapping and Animal = Deer  |
|                |                   |         | Basking trap<br>Cathedral trap<br>Net      | BSTP<br>CTRP<br>NETT | If ACType = Trapping and Animal = Red eared slider turtle   |
|                |                   |         | Other                                      | OTTT                 | Select "Other" if Trap type is not listed, and describe in " Type comment"  |
|                |                   |         | Not recorded                               | NRTT                 |   |
| Optional       | <b>ACNoAnimal</b> | Integer |  |                      | <b>No. animals</b><br>If Control Type = Trapping, Baiting, Shooting, Removal or Mustering, enter the number of animals controlled |
| Optional       | <b>ACBio</b>      | Chr 4   | Calicivirus<br>Myxomatosis<br>Not recorded | CALI<br>MYXO<br>NRBI | <b>Bio-control</b><br>If Control type = Biocontrol and Animal = Rabbit, choose from list  |
| Optional       | <b>ACComm</b>     | Chr 250 |  |                      | <b>Comment</b><br>Enter any appropriate comments  |

Table 8: Weed sample details

| Classification | Attribute        | Type    | List Description   | List Code                                     | Comments   |
|----------------|------------------|---------|--|---|--|
| Optional       | <b>InspID</b>    | Chr 25  |  |   | <b>Inspection ID</b><br>From Inspection table  |
| Optional       | <b>InspDate</b>  | Date    | yyyy-mm-dd   |   | <b>Inspection date</b><br>From Inspection table  |
| Optional       | <b>WorAID</b>    | Chr 8   |  |   | <b>Weed or animal ID</b><br>From Weed details table 4 (if the sample is a weed) or from table 6 if the sample is an animal.              |
| Optional       | <b>SamNo</b>     | Chr 50  |  |   | <b>Sample Number</b><br>Number allocated by the inspector if a sample was taken, otherwise Null  |
|                | <b>VID</b>       | Chr 25  |  |   | <b>Verification ID</b><br>Unique verification number, allocated by verification agency   |
| Optional       | <b>VYN</b>       | Chr 10  | Yes<br>No<br>N/A<br>Not recorded   | YESV<br>NOVV<br>NAPP<br>NRWDV                 | <b>Verification</b><br>Was the sample verified?  |
| Optional       | <b>GENSPCODE</b> | Chr 8   |  | GENSP<br>CODE<br>from<br>species<br>list      | <b>Verified Weed ID</b><br>If verification = Yes, then enter the correct weed code name. Choose from the Pest Species list (Section 3.1) |
| Optional       | <b>VDate</b>     | Date    | yyyy-mm-dd   |   | <b>Verification date</b>   |
| Optional       | <b>VAGID</b>     | Chr 50  | QLD Herbarium<br>QLD Museum<br>Biosecurity Officer<br>Other (comment)<br>N/A<br>Not recorded | QHBM<br>BSWV<br>OTWV<br>NAWV<br>NAPV<br>NRDVB | <b>Identification agency</b><br>Choose from the list. This list could include other State or C'wealth agencies                           |
| Optional       | <b>VOff</b>      | Chr 50  |  |   | <b>Verifying Officer</b><br>Officer's Name   |
| Optional       | <b>VComm</b>     | Chr 250 |  |   | <b>Verification comment</b><br>Comment on verification, particularly if "Other" has been chosen for "Identification agency"              |

### 3.6 Spatial entities

The entities for which a spatial object is a required attribute are shown in Figures 1 & 2.

In the tables above, for each of these entities, there is a single required attribute of "spatial object".

The table below expands on the attributes required to define the spatial object for each of the relevant entities.

**Table 9: Spatial Attributes.**

| Classification | Attribute            | Type          | List Description                        | List Code                    | Comments  |
|----------------|----------------------|---------------|---|------------------------------|---|
| Required       | <b>SpatialObject</b> | Geometry type |   |                              | May be a point, line or polygon stored in Geographical coordinates (latitude and longitude in decimal degrees) on GDA 94<br><br>OR<br>MGA94 coordinates with zone and datum noted                         |
| Required       | <b>LocAcc</b>        | Chr 25        | Drawn<br>GPS<br>DGPS<br>Other (comment) | DRWN<br>GPSS<br>DGPS<br>OTSA | <b>How located</b><br><br>A description as to how the spatial object was created, which will indicate its accuracy and reliability  |
| Desirable      | <b>LComm</b>         | Chr 250       |   |                              | <b>Located comment</b><br><br>Comment on how the spatial object was located, particularly if How Located = "Other" or if GPS or DGPS is located at a distance greater than 5 metres from the actual area. |
| Optional       | <b>MapBase</b>       | Chr 50        | Imagery <5m pixel                       | I10M                         | <b>Map base</b><br><br>If How Located = "Drawn" choose this list or choose "other"  |
|                |                      |               | Imagery 5-20m pixel                     | I20P                         |   |
|                |                      |               | Imagery 20-50m pixel                    | I50P                         |   |
|                |                      |               | Imagery >50m pixel                      | I60P                         |   |
|                |                      |               | Cadastre                                | CADA                         |   |
|                |                      |               | 5-10m                                   |                              | If How Located = "GPS" choose from this list  |
|                |                      |               | <1m<br><0.5m                            |                              | If How Located = "DGPS" choose from this list   |
|                |                      |               | Other                                   |                              |   |
|                |                      |               | Not recorded                            |                              |   |
| Optional       | <b>Locality</b>      | Chr 250       |   |                              | <b>Locality</b><br><br>A short description of locality that helps to describe the general location of a point, line or polygon.   |

### 3.7 Photos

Photos may be taken to help describe any of the entities involved in weed and pest animal management. Photos of the same area may be taken over a period of time to monitor changes to weed cover or weed species or changes in impact.

Table 10: Photos

| Classification | Attribute            | Type    | List Description   | List Code                                | Comments  |
|----------------|----------------------|---------|--|--|---|
| Desirable      | <b>PID</b>           | Chr 25  |  |  | <b>Photo ID</b><br>Unique identification number of the photo  |
| Desirable      | <b>EID</b>           | Chr 25  |  |  | The unique identification of the entity being photographed, this should be unique ID from the weed inspection / weed details / weed treatment / pest animal evidence / pest animal infestation / pest animal control tables |
| Optional       | <b>SpatialObject</b> |         |  |  | <b>Spatial object</b><br>Refer to Table 9, but will only be a point   |
| Desirable      | <b>PName</b>         | Chr 50  |  |  | <b>Image name</b><br>The photo name   |
| Optional       | <b>PDir</b>          | Chr 2   | North<br>North-east<br>East<br>South-east<br>South<br>South-west<br>West<br>North-west | N<br>NE<br>E<br>SE<br>S<br>SW<br>W<br>NW | <b>Photo direction</b><br>An estimate of the direction in which the photo was taken   |
| Optional       | <b>PCompass</b>      | Integer |  |  | <b>Compass direction</b><br>Azimuth notation using a number from 0 to 359. 0 = north, 90 = east, 180 = south and 270 = west. This can be used to describe direction of photo more precisely.                                |
| Optional       | <b>PCNth</b>         | Text    | Magnetic<br>True   | MAGN<br>TRUE                             | <b>Compass north</b>  |
| Optional       | <b>PMarker</b>       | Text    | Yes<br>No  | YSPH<br>NOPH                             | <b>Marker peg</b><br>Mark 'yes' if a marker peg has been placed at the point where the initial photo was taken, otherwise 'No'.   |
| Desirable      | <b>PDate</b>         | Date    | yyyy-mm-dd   |  | <b>Photo date</b><br>Date the photo was taken   |
| Optional       | <b>PTime</b>         | Decimal |  |  | <b>Photo time</b><br>Number to 2 decimal points from 0.00 to 23.59, indicating time that photo was taken.   |
| Optional       | <b>PComm</b>         | Chr 250 |  |  | <b>Comment</b>  |

## 4 Underlying Standards for weeds and pest animals

### 4.1 Weeds of National Significance (WONS) core attribute standards

The SPA standard complies with the 7 recommended core attributes for weeds from the Bureau of Rural Sciences, Commonwealth of Australia (McNaught *et. al.*, 2008), that were endorsed by the Australian Weeds Committee (AWC meeting number 10, 2005). It also complies with a further five of a total of 15 recommended attributes, as shown in table 11.

**Table 11: Recommended core attributes for weeds, specifically Weeds of National Significance (WONS) from the Bureau of Rural Sciences, Commonwealth of Australia (McNaught *et. al.*, 2008) and corresponding SPA standard recommendations:**

| Attribute                            | Description   |
|--------------------------------------|---|
| Data record*#                        | Unique identifier for site record   |
| Name of weed*#                       | Common name; genus, species, sub-species, variety, hybrid: Any uncertainty in naming recorded in comments field   |
| Date* <sup>x</sup>                   | Prefer dd-mon-yyyy, eg 12-Dec-2008, as this format is less error prone than pure numeric dates  |
| Latitude*                            | Prefer decimal degrees or MGA94 coordinates with zone and datum noted   |
| Longitude*                           | As for latitude   |
| Cover/density*#                      | Density measured in class intervals. Prefer data that records raw density as a percent. For rapid survey, density data may be collected as classed data eg 51-100% cover = dense.       |
| Treatment/s*#                        | Type/s of control and/or management being used to treat infestation. Management could include sub-categories of mechanical, chemical, biological. No treatment should also be recorded. |
| Source of data#                      | Name of collector or institution, identifies either personal contact details of the name of the institution where the record is derived.  |
| Purpose of visit#                    | Reason site was chosen. For example, to assess type and extent of WONS prior to treatment or monitoring to determine effectiveness of management action after treatment.                |
| Precision of latitude and longitude# | Precision of measurement in locating the site. Measured in meters. Records how latitude and longitude was determined (GPS, topographic map or estimated).                               |
| Area#                                | Area of infestation measured in hectares. Area of the infestation defined by the outside boundary. For infestations measured by transect, indicate length of transect (in meters).      |
| Comments#                            | Comments at the time of survey. Qualifications and factors likely to affect the adequacy of the record eg inadequate time spent. Anecdotal observations of the site or photographs.     |
| Place name or locality#              | Plain language description of locality.   |
| Core site number of records          | Number of records for the site or overlapping site. Records multiple visits spatially or multiple visits over time. May be left blank.  |
| Land use category                    | Land use/s observed at the site according to agreed national classification. Select for Australian Land Use and Management Classification land use categories.                          |

\*Endorsed by the Australian weeds committee (AWC meeting number 10, 2005) as a baseline for national weed mapping (surveillance monitoring) standards, and complied with by the SPA standard.

<sup>x</sup> The International Standard ISO 8601 date notation is YYYY-MM-DD or YYYYMMDD, and the SPA Standard complies with this form of notation.

# Complied with by the SPA standard.

The remaining two attributes are not included in the SPA standard. These are:

1. ***Core site number of records*** - *Number of records for the site or overlapping site. Records multiple visits spatially or multiple visits over time. May be left blank.* This attribute was not included because the information can be inferred from the data model as long as the data is built into a spatial relational database.
2. ***Land use category*** - *Land use/s observed at the site according to agreed national classification. Select for Australian Land Use and Management Classification land use categories.* This attribute was not included because it belongs to a separate, existing dataset called the Queensland Land Use Mapping Project.

### **4.2 National Land and Water Resources Audit significant invasive species assessments**

The National Land and Water Resources Audit (NLWRA) have conducted 2 invasive species assessments (NLWRA, 2008a & NLWRA, 2008b), and have developed a nationally consistent method for identifying the extent and distribution of 98 weeds and 10 animal species (Appendix 2). These assessments are based on standard grid scale mapping using the topographic series map sheets of 1:100 000 (NLWRA, 2008b).

The SPA standard complies with the NLWRA assessment for the following attributes:

- Extent: assessed or not assessed
- Presence: Present or absent

The SPA standard varies from the NLWRA assessment in other respects. This is because the SPA standard applies to spatial locations that define pests or pest management activities in sufficient detail to be used for on-ground work. It does not apply to broad scale grid mapping.



## 5 Additional Information

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### 5.1 Co-ordinate system

The standard requires that spatial pest attribute data is recorded in the Geocentric Datum of Australia 1994 (GDA94) coordinate system (Commonwealth of Australia Gazette GN35).

### 5.2 Spatial Accuracy

Spatial accuracy will vary depending on the method used to capture the spatial entity. Variations in spatial accuracy are allowable as long as the method of capture is documented as specified in the SPA standard (Section 3.5, Table 9).

### 5.3 Pest names

Weeds and pest animals can have more than one common name; some species also have more than one scientific name. A seed list is currently being developed by Biosecurity Queensland that contains nationally recognised species (for example, the Weeds of National Significance), as well as the declared species defined under the *Land Protection (Pests and Stock Routes) Act 2002*. The pest animal list includes all Class 2 and Class 3 declarations, as well as some Class 1 taxa (for example, red-eared slider turtles, ferrets and exotic reptiles).

The scientific name of weed species should be referenced against the Census of the Queensland Flora handbook published by Queensland Herbarium, Department of Environment and Resource Management (Bostock and Holland, 2007).

### 5.4 Weed treatment details

Accurate chemical application records should be kept when weeds are to be controlled by agricultural chemicals. The record keeping requirements of section 26 of the *Agricultural Chemicals Distribution Control Act 1966* (ACDC Act) apply if the weeds are being treated by agricultural chemicals applied by licensed ground distribution contractors and their licensed commercial operators.

### 5.5 Photopoint monitoring

Photopoints are useful for monitoring changes in an area over time. Refer to the Land Managers Monitoring Guide (Queensland Department of Natural Resources and Water, 2006) for more information on using photopoints to monitor changes to infested areas. The document is available online: [www.derm.qld.gov.au](http://www.derm.qld.gov.au) > Topics > Land management > Managing land resources > Land Manager's Monitoring Guide > Indicators > Photopoints.

### 5.6 Metadata

The SPA standard requires that a weed and pest animal spatial data-set collected under the SPA standard, refers to the SPA standard as part of its metadata, particularly for the purposes of data exchange. The data-set should also follow the ANZLIC Metadata Profile provided in section 7.1.

## **5.7 Principles of data exchange**

The SPA standard requires that data be transferred in industry standard interchange formats, defined in the ISO 19100 series by ISO TC 211. The ANZLIC Metadata Profile (section 7.1) provides the structure to assist organisations access and share its data, and to comply with the ISO 19100 series (ANZLIC, 2007).

## **5.8 Conclusion**

The SPA standard will form the basis for the storage, update, management and distribution of spatial pest attribute data within Queensland. The SPA standard will be modified as the needs of users change and technology presents new opportunities.

## 6 APPENDIX 1: Density values

### 6.1 Density values for ground cover species

This group includes grasses and herbs, vines, aquatic weeds and cacti.

Table 12: Percentage ground covers and equivalent look-up categorical value.

| Percentage ground cover | Lookup value |
|-------------------------|--------------|
| < 10                    | Scattered    |
| 10 – 20                 | Low          |
| 20 – 30                 | Moderate     |
| > 30                    | High         |

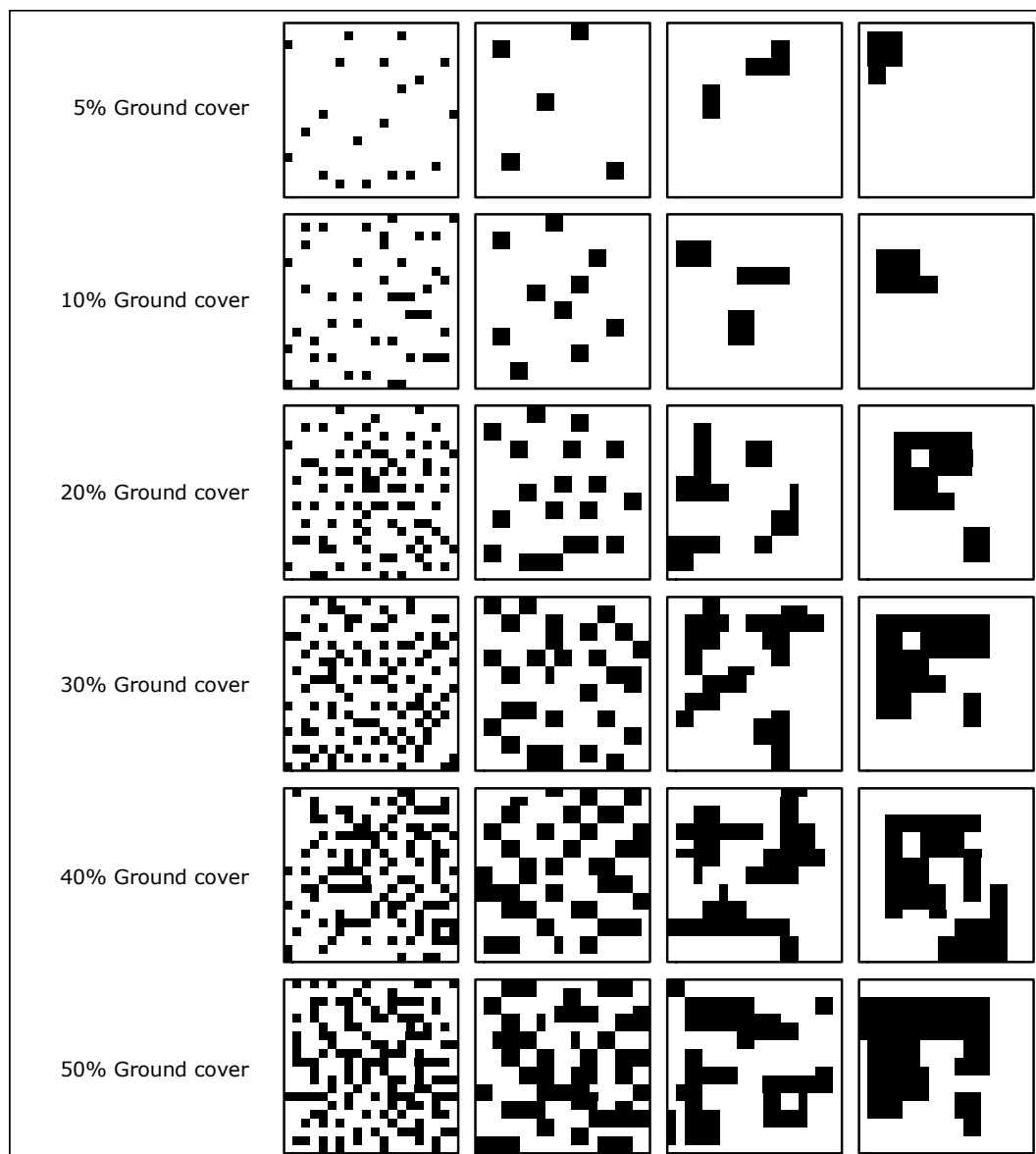


Figure 3: Distribution of ground cover visual aid for helping to assess percentage cover (Source: Bayley, 2001).

## 6.2 Density values for shrubs and woody species

This group includes shrubs and woody vegetation.

**Table 13: Average number of stems per 10 square metres (10m x 10m). (Source: PestInfo Geographic Information System).**

| No. stems /10m <sup>2</sup> | Lookup value |
|-----------------------------|--------------|
| 1 to 2                      | Scattered    |
| 3 to 4                      | Low          |
| 5 to 6                      | Moderate     |
| > 7                         | High         |

### 6.3 Density values for vertebrate pest animals

**Table 14: Default Animal densities: (Source: PestInfo Geographic Information System).**

| Density | Definition   |
|---------|--|
| High    | Many animals seen at any time and much sign of activity. i.e. Animals always observed, reliable sightings or otherwise evidence of high abundance. |
| Medium  | Some animals seen at almost any time and/or much active sign. i.e. Frequent but unreliable sightings of animals                                    |
| Low     | Few or no sightings and/or little active sign. i.e. Rare sightings /evidence of animals  |
| Nil     | No animals. i.e. Very unusual to see evidence of their presence.   |
| Unknown | Unknown – Unsure, no data, no information  |
|         | Unknown – Impression of low pest density   |
|         | Unknown – Impression of medium pest density  |
|         | Unknown – Impression of high pest density  |

**Table 15: Specific animal densities (Sources: VERTEBRATE PESTS OF QUEENSLAND Prepared from Results of a Survey on Feral Animals of Queensland, 1981/82, A Report by the Stock Routes and Rural Lands Protection Board, October, 1982; Dr Jim Mitchell, Senior Zoologist, Department of Employment, Economic Development and Innovation, pers comm.; Model code of Practise for the Humane Control of Rabbits, NSW Department of Primary Industries, 2005).**

| Animal                                   | Low  | Medium   | High   |
|--|--|--|--|
| Camel, wild cattle, donkey or wild horse | Few signs; few sightings; limited to individuals and small groups                      | Some tracks and droppings; some sightings; smaller groups, herds up to 20                    | Tracks and droppings present; many sightings; large herds, some above 20   |
| Wild Dog                                 | Few tracks and signs; very few sightings: < 1 / 30 km <sup>2</sup>                     | Tracks and signs present; some howling; occasional sightings: 1 – 15 / 30 km <sup>2</sup>    | Abundant tracks, droppings; regular howling; sightings, both day and night: 1 / 30 km <sup>2</sup>                           |
| Goats                                    | Few signs; few sightings; limited to individuals and small groups                      | Some tracks and droppings; some sightings; herds to 100 – many smaller groups                | Tracks and droppings present; many sightings; large herds, some above 100  |
| Fox                                      | Few tracks and signs: 1 / 20km <sup>2</sup>  | Some tracks and droppings; occasional roadside carcasses: 1 / 10km <sup>2</sup>              | Tracks and droppings present; dens and roadside carcasses seen: 1 / 5km <sup>2</sup>   |
| Feral Pig                                | Few signs, mainly old; <1/km <sup>2</sup> ; individuals, occasional groups to 10       | Moderate signs, mainly old: 1– 5/km <sup>2</sup> ; individuals, groups from 10 to 50         | Abundant numbers, fresh diggings and signs: >5/km <sup>2</sup> ; many higher groups (5 to 20) occasional groups of 50 to 100 |
| Rabbit                                   | <1 rabbit per hectare;<br><5 spotlight transect count in open country with low pasture | 1- 4 rabbits per hectare;<br><6-30 spotlight transect count in open country with low pasture | 4 rabbits per hectare;<br>>30 spotlight transect count in open country with low pasture                                      |

## 7 APPENDIX 2

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### 7.1 Summary & Description of ANZLIC Metadata Profile 1

The ANZLIC Metadata Profile 1.1 (2007) (the Profile) defines the appropriate content for metadata for resources and how the metadata is to be implemented in Australia and New Zealand. The Profile is intended to be used by information system analysts and developers and other, in order to understand the basic principles and the overall requirements for standardisation of geographic information. The Profile can be used when creating metadata records that provide information about the identification, spatial and temporal extent, quality, application schema, spatial reference system, and distribution of digital geographic data. The Profile is applicable to cataloguing datasets, clearinghouse activities, and the full description of geographic and non-geographic resources.

The Profile defines

- Mandatory and conditional metadata sections, metadata entities and metadata elements
- The minimum set of metadata elements for any resource in order to conform to the Profile
- The core metadata for geographic datasets
- Optional metadata elements that allow for more extensive standard description of resources
- The option to extend the Profile to cater for specialised needs.

defines the documents the mandatory, conditional and optional elements to be documented in the metadata for a weed and pest animal spatial dataset.

A mandatory (M) obligation means the metadata entity or metadata element shall be documented.

A conditional (C) obligation specifies an electronically manageable condition under which at least one metadata entity or a metadata element is mandatory. 'conditional' is used for one of the three following possibilities:

- Expressing a choice between two or more options. At least one option is mandatory and must be documented
- Documenting a metadata entity if a metadata element if another element has been documented
- Documenting a metadata element if a specific value for another metadata element has been documented

An optional (O) obligation means that the metadata entity or the metadata element may be documented or may not be documented.

### 7.1.1 Minimum metadata requirements

The minimum requirements for recording to metadata to describe geographic datasets in order to conform to the profile are described in table 16. If a Metadata author wishes to be compliant with the ANZLIC Metadata Profile, they must complete these elements. The obligation to record some metadata elements is conditional, and only becomes mandatory under certain conditions.

**Table 16: ANZLIC minimum metadata requirements, from the ANZLIC Metadata Profile 1.1 (ANZLIC, 2007); definitions are sourced from the Queensland Government Metadata Element Set for Datasets (OESR, 2010).**

| Name                             | Path  | Datasets       | Definition  |
|----------------------------------|---|----------------|---|
| Metadata File Identifier         | MD_Metadata.fileIdentifier  | M              | The unique identifier of the metadata record.                                     |
| Metadata Language                | MD_Metadata.language  | C <sup>a</sup> | The language used for documenting the metadata.                                   |
| Metadata Character Set           | MD_Metadata.characterSet  | C <sup>b</sup> | Full name of the character coding set used for the metadata record                |
| Metadata file parent identifier  | MD_Metadata.parentIdentifier  | C <sup>c</sup> | Metadata file identifier of the parent record to which this metadata is a subset. |
| Metadata hierarchy level         | MD.hierarchyLevel   | C <sup>d</sup> | Identifies the scope of the resource which is being described.                    |
| Metadata hierarchy level name    | MD_Metadata.hierarchyLevelName  | C <sup>f</sup> | Provides further details about the name of the hierarchy levels for the resource. |
| Metadata contact individual name | MD_Metadata.contact > CI_ResponsibleParty.individualName  | C <sup>h</sup> | Name of the responsible person/s.   |
| Metadata contact organisation    | MD_Metadata.contact > CI_ResponsibleParty.organisationName  | C <sup>i</sup> | Name/s of the organisation/s responsible for the dataset.                         |
| Metadata contact position        | MD_Metadata.contact > CI_ResponsibleParty.positionName  | C <sup>j</sup> | Position of the responsible person/s.   |
| Metadata contact role            | MD_Metadata.contact > CI_ResponsibleParty.role > CI_RoleCode  | M              | Role of the responsible person/s.   |
| Metadata date stamp              | MD_Metadata.dateStamp   | M              | The dates on which the metadata record was created or modified.                   |
| Resource title                   | MD_Metadata.identificationInfo > MD_DataIdentification.citation > CI_Citation.title                                     | M              | The names, both formal and informal, by which the cited dataset is known.         |
| Resource reference date          | MD_Metadata.identificationInfo > MD_DataIdentification.citation > CI_Citation.date > CI_Date.date                       | M              | Reference date for the cited data.  |
| Resource reference date type     | MD_Metadata.identificationInfo > MD_DataIdentification.citation > CI_Citation.date > CI_Date.dateType > CI_DateTypeCode | M              | Event used for reference date.  |

## Spatial Pest attribute (SPA) Standard

| Name   | Path   | Datasets          | Definition  |
|--|--|-------------------|---|
| Abstract describing the resource                     | MD_Metadata.identificationInfo > MD_DataIdentification.abstract  | M                 | A descriptive summary of the content of the resource (such as major variables, statistical measures and concepts.)              |
| Resource language                                    | MD_Metadata.identificationInfo > MD_DataIdentification.language  | M                 | The language used to document the metadata and the dataset.   |
| Resource character set                               | MD_Metadata.identificationInfo > MD_DataIdentification.characterSet  | M <sup>m</sup>    | The full name of the coding standards used for the metadata and the dataset.  |
| Topic category                                       | MD_Metadata.identificationInfo > MD_DataIdentification.topicCategory   | M                 | Main subject theme(s) of the dataset.   |
| Geographic location of the resource (by description) | MD_Metadata.identificationInfo > MD_DataIdentification.extent > EX_Extent > EX_GeographicDescription.geographicIdentifier > MD_Identifier.code | C <sup>o, p</sup> | Description of the geographic area using identifiers (alphanumeric values); OR<br>Sets of points defining the bounding polygon. |
| West longitude                                       | MD_Metadata.identificationInfo > MD_DataIdentification.extent > EX_Extent > EX_GeographicBoundingBox.westBoundLongitude                        | C <sup>o, p</sup> | Western-most coordinate of the limit of the dataset expressed in longitude in decimal degrees.                                  |
| East longitude                                       | MD_Metadata.identificationInfo > MD_DataIdentification.extent > EX_Extent > EX_GeographicBoundingBox.eastBoundLongitude                        | C <sup>o, p</sup> | Eastern-most coordinate of the limit of the dataset expressed as a longitude in decimal degrees.                                |
| South latitude                                       | MD_Metadata.identificationInfo > MD_DataIdentification.extent > EX_Extent > EX_GeographicBoundingBox.southBoundLatitude                        | C <sup>o, p</sup> | Southern-most coordinate of the limit of the dataset expressed in latitude in decimal degrees.                                  |
| North latitude                                       | MD_Metadata.identificationInfo > MD_DataIdentification.extent > EX_Extent > EX_GeographicBoundingBox.northBoundLatitude                        | C <sup>o, p</sup> | Northern-most coordinate of the limit of the dataset expressed in latitude in decimal degrees.                                  |

a language: documented if not defined by the encoding process

b characterSet: documented if ISO 10646-1, *Information technology – Universal Multiple-Octet Coded Character Set (UCS)* is not used and not defined by the encoding process

c parentIdentifier: documented if the hierarchy of a higher level exists

d hierarchyLevel: assumed to be 'dataset' if MD\_Metadata.hierarchyLevel is omitted

f hierarchyLevelName: assumed to be 'dataset' if MD\_Metadata.hierarchyLevelName is omitted

h individualName: documented if 'organisationName' and 'positionName' not documented

i organisationName: documented if 'individualName' and 'positionName' not documented



- j positionName: documented if 'individualName' and 'organisationName' not documented
- m characterSet: documented if ISO 10646-1 is not used
- o for a geographic dataset, include metadata for the geographic bounding box (West longitude, East longitude, south latitude and North latitude) or the geographic description identifier
- p if any one of west longitude, east longitude, south latitude or north latitude exists, then the remaining three must also be completed

**7.1.2 Core metadata requirements**

In addition to the minimum metadata elements described in table 16, ANZLIC recommends the use of additional metadata for geographic datasets. Table 17 describes this set of core metadata, which includes the minimum set of metadata and some additional optional elements. The use of core metadata enhances interoperability, and enables users to understand without ambiguity the geographic data and the related metadata provided by either the producer of the distributor (ANZLIC, 2007). The core metadata intends to answer the following questions about geographic datasets:

- 'Does a dataset on a specific topic exist ("what")?'
- 'For a specific place ("where")?'
- 'For a specific date or period ("when")?'
- 'A point of contact to learn more about or order the dataset ("who")?'

**Table 17: ANZLIC core metadata for geographic datasets, from the ANZLIC Metadata Profile 1.1 (ANZLIC, 2007); definitions are sourced from the Queensland Government Metadata Element Set for Datasets (OESR, 2010).**

| Name                            | Path  | Datasets | Definition  |
|---------------------------------|---|----------|---|
| Metadata File Identifier        | MD_Metadata.fileIdentifier  | M        | The unique identifier of the metadata record.                                     |
| Metadata Language               | MD_Metadata.language  | Ca       | The language used for documenting the metadata.                                   |
| Metadata Character Set          | MD_Metadata.characterSet  | Cb       | Full name of the character coding set used for the metadata record                |
| Metadata file parent identifier | MD_Metadata.parentIdentifier  | Cc       | Metadata file identifier of the parent record to which this metadata is a subset. |
| Metadata point of contact       | MD_Metadata.contact > CI_ResponsibleParty   | Cd       | Party who can be contacted for information about the metadata.                    |
| Metadata date stamp             | MD_Metadata.dateStamp   | M        | The dates on which the metadata record was created or modified.                   |
| Metadata standard name          | MD_Metadata.metadataStandardName  | O        |   |
| Metadata standard version       | MD_Metadata.metadataStandardVersion   | O        |   |
| Dataset title                   | MD_Metadata.identificationInfo > MD_DataIdentification.citation > CI_Citation.title | M        | The names, both formal and informal, by which the cited dataset is known.         |
| Dataset reference date          | MD_Metadata.identification  | M        | Reference date for the cited data.  |

## Spatial Pest attribute (SPA) Standard

| Name   | Path  | Datasets          | Definition   |
|--|---|-------------------|--|
|  | Info ><br>MD_DataIdentification.citation > CI_Citation.date   |                   |  |
| Abstract describing the data                         | MD_Metadata.identificationInfo ><br>MD_DataIdentification.abstract  | M                 | A descriptive summary of the content of the resource (such as major variables, statistical measures and concepts.)                                 |
| Dataset responsible party                            | MD_Metadata.identificationInfo ><br>MD_DataIdentification.pointOfContact ><br>CI_ResponsibleParty   | O                 | The party's responsibility or actions over the dataset. Describes the function that empowers the organisation to provide this resource or service. |
| Spatial representation type                          | MD_Metadata.identificationInfo ><br>MD_DataIdentification.spatialRepresentationType   | O                 | Method used to spatially represent geographic information.   |
| Spatial resolution of the dataset                    | MD_Metadata.identificationInfo ><br>MD_DataIdentification.spatialResolution ><br>MD_Resolution.distance<br><br>or<br><br>MD_Resolution.equivalentScale  | O <sup>e</sup>    | Level of detail expressed as the scale of a comparable hardcopy map  |
| Dataset language                                     | MD_Metadata.identificationInfo ><br>MD_DataIdentification.language  | M                 | The language(s) used within the dataset.   |
| Dataset character set                                | MD_Metadata.identificationInfo ><br>MD_DataIdentification.characterSet  | C <sup>f</sup>    | Full name of the character coding set used for the dataset.  |
| Dataset topic category                               | MD_Metadata.identificationInfo ><br>MD_DataIdentification.topicCategory   | M                 | Main subject theme(s) of the dataset.  |
| Geographic location of the resource (by description) | MD_Metadata.identificationInfo ><br>MD_DataIdentification.extent > EX_Extent ><br>EX_GeographicDescription.geographicIdentifier ><br>MD_Identifier.code | C <sup>g, h</sup> | Description of the geographic area using identifiers (alphanumeric values); AND OR<br><br>Sets of points defining the bounding polygon.            |
| Temporal extent information for the dataset          | MD_Metadata.identificationInfo ><br>MD_DataIdentification.extent ><br>EX_Extent.temporalElement   | O                 | Defines the time period related to the dataset.  |
| Vertical extent information for the dataset          | MD_Metadata.identificationInfo ><br>MD_DataIdentification.extent ><br>EX_Extent.verticalElement ><br>EX_VerticalExtent                                  | O                 |  |
| Lineage  | MD_Metadata.dataQualityInfo ><br>DQ_DataQuality.lineage ><br>LI_Lineage   | O                 | The history of events used to construct the dataset, as specified by the project scope.  |
| Reference system                                     | MD_Metadata.referenceSystem   | O *               | A code that identifies the parameters  |

## Spatial Pest attribute (SPA) Standard

| Name                | Path  | Datasets | Definition  |
|---------------------|---|----------|---|
|                     | temInfo ><br>MD_ReferenceSystem.refer<br>enceSystemIdentifier ><br>RS_Identifier                                |          | of the reference system defining the geographical coordinates used in spatial data.                         |
| Distribution Format | MD_Metadata.distributionIn<br>fo > MD_Distribution ><br>MD_Format   | 0        | Name of the physical format for distribution or the distribution service.                                   |
| On-line resource    | MD_Metadata.distributionIn<br>fo > MD_Distribution ><br>MD_DigitalTransferOption.o<br>nLine > CI_OnlineResource | 0        | A Uniform Resource Indicator (URI) or Uniform Resource Locator (URL) allowing online access to the dataset. |

- a the Profile imposes a mandatory obligation on the metadata element fileIdentifier
- b language: documented if not defined by the encoding process
- c characterSet: documented if ISO 10646-1, *Information technology – Universal Multiple-Octet Coded Character Set (UCS)* is not used and not defined by the encoding process
- d documented if a higher level of hierarchy level exists (e.g. if the geographic 'dataset' is part of a 'series')
- e distance is preferred over equivalentScale because the scale will change when presented at different sizes on a screen
- f characterSet: documented if ISO 10646-1 is not used
- g include either the geographic bounding box (extents) or the geographic description (ANZLIC prefers the use of geographic bounding box – refer to ANZLIC Metadata Profile 1.1, section 6.5.3 (ANZILC, 2007))
- h if any one west longitude, east longitude, south latitude or north latitude exists, then the remaining three must also be completed.

\* Note that the reference system is required under the SPA Standard.

The QSIC office can be contacted for further information about ANZLIC Metadata requirements and guidelines.

## 8 Glossary

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### *Abundance*

(Relative abundance) is a rough measure of population density, relative to an area. For example, the percentage of sample plots occupied by a species of plant (Collocott, 1971).

### *Active management zone*

An areal zone defined under a pest management strategy. The area indicates where a pest is being actively managed according to a set of goals defined in the associated management plan or management strategy.

### *Active phase*

An infestation that is under an active treatment or control program.

### *Active monitoring*

An infestation that is not under active control, but is currently monitored from time to time.

### *Aquatic (plant)*

Vegetation that lives in or on or near water and forms a groundcover.

### *Azimuth notation*

A number format for recording compass direction. Azimuth notation starts at 0 degrees for north and continues around the compass in a clockwise direction, where east = 90, south = 180 and west = 270 (Schimmrich, 1998).

### *Biological control*

Pest control strategy making use of living natural enemies, antagonists or competitors and other self replicating biotic entities (FAO, 2002). See Appendix 1; 13.4.

### *Buffer zone*

A spatially defined area in which a specific pest does not occur or occurs at a low level and is officially controlled, that either encloses or is adjacent to an infested area, and a pest free area. The buffer zone is managed according to a set of goals defined in the associated management plan or management strategy. (Adapted from FAO, 2002).

### *Cacti*

A plant that has fleshy stems and leaves that are modified as spines.

### *Chemical (control)*

Control measure that employs chemicals to remove weeds (see Appendix 1; 13.4).

### *Co-dominant*

A species that shares contribution to most to the over-all biomass of a particular stratum with another species.

### ***Containment***

Prevention of spread from a defined infested area to an area that is free from the pest; application of Phytosanitary measures in and around an infested area to prevent spread of a pest (FAO, 2002).

### ***Containment line***

Line that spatially defines the containment area boundary, according to a set of goals defined in the associated management plan or management strategy.

### ***Containment zone***

Zone that spatially defines the area of containment, according to a set of goals defined in the associated management plan or management strategy.

### ***Control (of a pest)***

Suppression, containment or eradication of a pest population.

### ***Coordinates***

Two values providing a reference to a point on the ground in an east-west (x) and north-south (y) direction (McNaught *et. al.*, 2008).

### ***Core infestation zone***

Defined infested area where the impacts of the pest are contained and/or reduced, according to a set of goals defined in the associated management plan or strategy.

### ***Dataset***

A representation of facts, concepts or instructions in a formalised manner, suitable for communication, interpretation or processing. A dataset can be:

- statistical (from a survey or administrative source), e.g. one-off or regular surveys and censuses of particular population groups such as Queensland Household Survey or market research, population and demographic data, financial and economic data; or
- spatial (with a specific locational or geographic reference), e.g. land use information, topography, resources, property boundaries, natural resource data, maps or mapping layers, web map services and aerial photography (OESR, 2010).

Identifiable collection of data

NOTE A dataset may be a smaller grouping of data which, though limited by some constraint such as spatial extent or feature type, is located physically within a larger dataset. Theoretically a dataset may be as small as a single feature or feature attribute contained within a larger dataset. A hardcopy map or chart may be considered a dataset. [AS/NZS ISO 19115:2005]

### ***Datum***

The parameters used to define the basis of coordinate systems (McNaught *et. al.*, 2008).

***Delimiting survey***

Survey conducted to establish the boundaries of an area considered to be infested by or free from a pest (FAO, 2002).

***Monitoring survey***

Survey conducted in an area to determine if pests are present (adapted from FAO, 2002).

***Density (weed density)***

Proportion of an area covered by a weed species (CRC for Australian Weed Management, 2004).

***Differential Global Positioning System (DGPS)***

See Global Positioning System (GPS).

***Distribution***

A defined area indicating where a species is present.

***Dominant (species)***

A species that contributes most to the over-all biomass of a particular stratum (Nelder et. al., 2005).

***Ecosystem***

A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (National Biodiversity Strategy Review Task Group, 2009).

***Eradication zone***

A zone where control measures are applied to eliminate a pest from an area (adapted from FAO, 2002).

***Flowering***

A plant that is flowering but is not yet starting to produce seed.

***GDA94 (Geocentric Datum of Australia, 1994)***

A datum is a framework that enables us to define co-ordinate systems, GDA94 is a reference system that is used to define the latitude and longitude co-ordinate system in Australia. The system was introduced in Australia in 1994 and replaces the AGD66 and AGD84 (Australian Geodetic Datum).

***Geographic coordinates***

Coordinates expressed in decimal degrees as latitude and longitude derived from angular lines running east-west and north-south on the earths surface (McNaught *et. al.*, 2008).

### ***Geographic Information System (GIS)***

A computer system for capturing, storing, checking, integrating, manipulating, analysing and displaying data related to positions on the earth's surface. Typically a Geographic Information System used for handling maps of one kind or another. These might be represented as several different layers where each layer holds data about a particular kind of feature. Each feature is linked to a position on the graphical image of a map. Layers of data are organised to be studied and to perform statistical analysis (ANZLIC, 2009).

### ***Global Positioning System (GPS) and Differential GPS (DGPS)***

A satellite-based navigational system allowing the determination of a unique point on the earth's surface with a high degree of accuracy given a suitable GPS receiver. The network of satellites is owned by the US Department of Defence. The accuracy of GPS derived positions can be introduced through the nature of conditions. These errors can be greatly reduced using a technique known as differential GPS (DGPS) (ANZLIC, 2009).

### ***Groundcover***

A plant that occupies the lowest stratum in a vegetation community; for example, grasses or aquatic plants.

### ***Hybrid***

Offspring of plants or animals of genetically different taxa (Parsons and Cuthbertson, 1992)

### ***Imagery***

Air photos or satellite imagery that have been geographically referenced to the earth's surface.

### ***Inactive***

An infestation that is not currently being monitored or actively treated.

### ***Infestation***

Presence of a living pest in a defined geographical area (modified from FAO, 2002). The presence of pests and diseases. (AQIS, undated).

### ***Inspection***

Official visual examination of an area to determine if pests are present and/or to determine compliance with Phytosanitary regulations (modified from FAO, 2002).

### ***Invasive species***

A species occurring as a result of human activities beyond its accepted normal distribution, which threatens valued environmental, agricultural or personal resources by the damage it causes (National Biodiversity Strategy Review Task Group, 2009).

### ***Latitude***

A measure of the angular distance a point on the earth's surface north or south of the equator (0° latitude). The North Pole is expressed as 90° north, the South Pole as 90° south (McNaught *et. al.*, 2008).

***Longitude***

A measure of the angular distance a point on the earth's surface east or west of the prime meridian (0° longitude). The prime meridian is aligned through Greenwich, England, and is used to determine east or west (McNaught *et. al.*, 2008).

***Map***

A systematic representation of all or part of the earth on a flat surface (Nelder *et. al.*, 2005).

***Mechanical (control)***

Control measure that employs mechanical methods to remove weeds (see Appendix 1; 13.4).

***Metadata***

Information about data. Metadata can exist for datasets, web services and project information. (ANZLIC, 2009).

***MGA (Map Grid of Australia) Zone 54, 55, or 56***

MGA94 is a co-ordinate system produced using the Universal Transverse Mercator (UTM) projection and based on the GDA94 datum. Conversion of spatial data from GDA94 to MGA94 via UTM changes the spherical latitude/longitude reference system to a Cartesian co-ordinate system (flat map), and enables measurement of lines and areas in metres (GeoScience Australia, 2007).

***Monitoring survey***

Ongoing survey to verify the (presence and) characteristics of a pest population (FAO, 2002).

***Native (animal or species)***

Taxa that have evolved or migrated to and persist in an area unaided by human intervention (Nelder *et. al.*, 2005)

***Occurrence***

The presence in an area of a pest officially reported to be indigenous or introduced and/or not officially reported to have been eradicated (FAO, 2002).

***Organism***

Biotic entity capable of reproduction or replication, vertebrate or invertebrate animals, plants and micro-organisms (FAO, 2002).

***Outlier control target***

An isolated pest population recently detected and the focus of control efforts, according to a set of goals defined in an associated management plan or strategy.

***Pest***

Any species, strain or biotype of plant, animal or pathogenic agent [injurious to plants or plant products] (FAO, 2002).



### ***Pest animal***

Any animal having, or with the potential to have, and adverse economic, environmental or social impact (Natural Resource Management Ministerial Council, 2007).

### ***Pest free area***

An area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained (FAO, 2002).

### ***Photopoints***

Permanently marked sites at which photographs are taken and vegetation or soil information collected (McNaught *et. al.*, 2008).

### ***Physical (control)***

Control measure that employs physical means such as fire or hand-pulling to remove weeds (see Appendix 1; 13.4).

### ***Point***

In spatial terms, a single location (X, Y coordinates) that represents a geographic feature too small to be displayed as a line or area. An entity with a location in space, but no extent (McNaught *et. al.*, 2008).

### ***Polygon***

A closed plane shape formed by the union of three or more straight lines. In computer graphics a multisided object treated as a single entity which can be linked to conditions or attributes (McNaught *et. al.*, 2008).

### ***Precision***

Description of the level of detail used to take a measurement (McNaught *et. al.*, 2008).

### ***Pre-control survey***

Survey conducted in an area to determine how many pests are present, prior to a pest control event (adapted from FAO, 2002). The purpose of conducting pre-and post control surveys is to determine the impact on pest population as a result of the control event.

### ***Post control survey***

Survey conducted in an area to determine how many pests are present, after a pest control activity has taken place (adapted from FAO, 2002). The purpose of conducting pre-and post control surveys is to determine the impact on pest population as a result of the control event.

### ***Projection***

A mathematical formula used to depict the earth's spherical surface on to a flat map surface. A Universal transverse Mercator (UTM) projection of the GDA94 geographic coordinates produces the Cartesian coordinates Map Grid of Australia 1994 (MGA94) (GeoScience Australia, 1997).

***Research survey***

Survey conducted in an area for pest research purposes.

***Seeding***

A plant that is producing seed and/or flowering.

***Shrub***

A woody perennial usually branched from near the base, smaller than a tree (Parsons and Cuthbertson, 1992).

***Spatial information***

Spatial information (also known as geographic information) is any information that can be geographically referenced, i.e. describing a location or any information that can be linked to a location (ANZLIC, 2009).

***Species***

A taxon comprising one or more populations of individuals capable of interbreeding to produce fertile offspring (National Biodiversity Strategy Review Task Group, 2009).

***Standard***

Document established by consensus and approved by a recognised body, that provides, for common and repeated use, rules, guidelines and characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context (FAO, 2002).

***Stratum***

A layer in a plant community produced by the occurrence at approximately the same level (height) of an aggregation of plants of the same habit (Nelder et. al., 2005, quoting Beadle and Costin, 1952).

***Subdominant***

A species that contributes less cover or density than the dominant species, but individually contributes more than 10% of the total cover or density of the stratum in which it occurs (adapted from Nelder et. al., 2005).

***Succulent***

A plant with leaves and stems that are fleshy and usually soft.

***Surveillance***

An official process which collects and records data on pest occurrence or absence by survey, monitoring or other procedures (FAO, 2002).

***Survey***

An official procedure conducted over a defined period of time to determine the characteristics of a pest population or to determine which species occur in an area (FAO, 2002).

### ***Topographic map***

A map type showing a limited set of features with elevation and landform a minimum component of the display. Examples are contour or elevation maps. Topographic maps are used for reference or navigation maps (McNaught *et. al.*, 2008).

### ***Transect***

A line used to survey the vegetation or substrate across a given area (McNaught *et. al.*, 2008).

### ***Vegetation***

The entirety of the plant cover at a point on the Earth's surface at a particular time. It is the spatial and temporal expression of the flora of an area, as expressed in plant assemblages (communities) which consist of individual species with varied lifeforms (Nelder *et. al.*, 2005, quoting Raunkiaer 1934). The present vegetation is a reflection not only of the site potential as determined by climatic, physiographic, edaphic and biotic factors (Nelder *et. al.*, 2005, quoting Webb *et al.* 1970; Gunn *et al.* 1988), but also the history of land use and disturbance. Irregular catastrophic events, e.g. intense fires, prolonged droughts and clearing, whether natural or human-induced, can be important factors determining the floristic composition and structure of present day vegetation (Nelder *et. al.*, 2005, quoting Mueller-Dombois and Ellenberg 1974, and Neldner 1984).

### ***Vegetation community***

A component of a regional ecosystem that has similar structure and floristics and generally occurs within the same land zone. It is usually distinguished by differences in dominant species composition, frequently in the shrub or ground layers. (adapted from Nelder *et. al.*, 2005).

### ***Vegetative (plant)***

A mature plant that is neither flowering nor seeding.

### ***Vine***

A plant with long slender stems which trail over objects (Parsons and Cuthbertson, 1992).

### ***Weed Spotter Queensland Network***

The Weed spotter Queensland Network is an organisation that aims to find, identify and document new occurrences of potential weeds at an early stage so preventative actions can be taken (Department of Environment and Resource Management, 2009).

### ***Weeds Spotters***

Weed spotters report, collect, identify and deliver specimens of potential, new and emerging weeds in their region. Weeds spotters can include landholders, gardeners, or members of groups such as Landcare, Bushcare and anyone else interested in weeds and plants (Department of Environment and Resource Management, 2009).

### ***WONS (Weeds of national significance)***

A list of nationally significant weeds that were determined through a risk assessment process.

### ***Woody (plant)***

Perennial vegetation usually with a dominant wooden trunk, usually trees.

## 9 Further reading:

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