

# Ecological Data Exchange Specification (working title)

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**Status: Draft** - while the document is in draft, sections of the document may contain placeholders such as **TBA** and **TBD**.

## 1. Metadata

|                   |   |
|-------------------|---|
| <b>IRI</b>        | <a href="https://linked.data.gov.au/def/r1p/spec">https://linked.data.gov.au/def/r1p/spec</a> (TBC)   |
| <b>Title</b>      | Ecological Data Exchange Specification (working title)  |
| <b>Definition</b> | This document lists the normative requirements for data aiming to conform to the TERN Ecosystem Surveillance Ecological Monitoring Protocols. It is to be used as the authoritative, human-readable list of individual requirements from which profile artefacts such as validators are derived from. |
| <b>Created</b>    | 2022-03-14  |
| <b>Modified</b>   | 2022-03-16  |

|                                   |  |
|-----------------------------------|--|
| <b>Creator</b>                    | <a href="#">TERN</a>   |
| <b>Publisher</b>                  | <a href="#">Department of Agriculture, Water and the Environment</a>   |
| <b>License</b>                    | <a href="#">Creative Commons Attribution 4.0 International (CC BY 4.0)</a>   |
| <b>Further information</b>        | <p>This document is part of the Services Agreement for the provision of standardised ecological monitoring protocols and systems for data collection, storage and management.</p> <p>Procurement Number (PRN): 360 000 5101</p> <p>Commonwealth of Australia as represented by the Department of Agriculture, Water and the Environment<br/>ABN 34 190 894 983 (<b>Department</b>)</p> <p>The University of Queensland as represented by TERN<br/>ABN 63 942 912 684 (<b>Service Provider</b>)</p> |
| <b>Alternate document formats</b> | <a href="#">PDF</a>  |

## 2. Preamble

### 2.1. Abstract

TERN Ecosystem Surveillance have developed 19 modules to standardise ecological monitoring protocols for data collection. The working title for the monitoring protocols is *TERN Ecosystem Surveillance Ecological Monitoring Protocols*.

TERN Data Services and Analytics is developing a standardised data exchange specification to support the exchange of data collected using TERN Ecosystem Surveillance Ecological Monitoring Protocols. The working title for the data exchange specification is *Ecological Data Exchange Specification*.

The Ecological Data Exchange Specification is a profile of the ecological data model known as the [TERN Ontology](#). Data that is conformant to the Ecological Data Exchange Specification is also conformant to the TERN Ontology.

### 2.2. Normative Status

This specification is normative for the exchange of data collected using TERN Ecosystem Surveillance Ecological Monitoring Protocols.

### 2.3. Standard Parts

This specification document is one of many resources that together form the Ecological Data

Exchange Specification Profile.

Other parts of this standard include:

TBA.

## 2.4. Namespaces

| Prefix | Namespace   | Name                  | Description  |
|--------|---|-----------------------|--|
| reg:   | <a href="http://puhl.org/linked-data/registry#">http://puhl.org/linked-data/registry#</a>         | Registry Ontology     | Core ontology for Linked Data registry services. Based on ISO 19135 but heavily modified to suit Linked Data representations and applications. |
| sosa:  | <a href="http://www.w3.org/ns/sosa/">http://www.w3.org/ns/sosa/</a>                               | SOSA                  | Sensor, Observation, Sample, and Actuator (SOSA) is a semantic data model to represent observations and samplings.                             |
| tern:  | <a href="https://www.3id.org/tern/ontologies/tern/">https://www.3id.org/tern/ontologies/tern/</a> | TERN Ontology         | A profile of SOSA and PROV with minor additions to represent ecological field survey data.   |
| unit:  | <a href="http://qudt.org/vocab/unit/">http://qudt.org/vocab/unit/</a>                             | QUDT Units vocabulary | A vocabulary of <i>units of measure</i> defined using the QUDT semantic data model.  |

## 3. Requirements

### 3.1. Domain Model Conformance

Requirements define the rules and constraints which data must conform to in order to be valid.

A *status* is assigned to each requirement. The *status* code list used in this document is defined by the [Registry ontology](#) and a subset of the status codes are redefined here:

- **submitted** - A proposed entry which is not yet approved for use for use. Corresponds to ISO 19135:(redraft) 'submitted'.
- **invalid** - An entry which has been invalidated due to serious flaws, distinct from retirement. Corresponds to ISO 19135(redraft) 'invalid'.
- **stable** - An entry that is seen as having a reasonable measure of stability, may be used to mark the full adoption of a previously 'experimental' entry.

#### 3.1.1. Plot Description Module Conformance Class Requirements

Requirements that have been accepted and are **stable** are marked with a green check mark.

For example:

| Property | Value    |
|----------|----------|
| Status   | stable ✓ |

### 3.1.1.1. Aspect Observation

#### 3.1.1.1.1. Feature type

| Property            | Value   |
|---------------------|---|
| Identifier          | urn:shapes:plot-description:aspect:feature-type   |
| Label               | Feature type  |
| Definition          | The value of <code>tern:featureType</code> <i>MUST</i> be <code>landform</code> .   |
| Comment             | TERN's ecologists have determined the feature type is <i>landform</i> , defined by the <a href="#">Australian Soil and Land Survey Field Handbook</a> . |
| Status              | submitted ○   |
| Conformance Classes | TBA   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | /shapes/plot-description/aspect/shapes.ttl  |
| Examples            | Valid: /shapes/plot-description/aspect/valid.ttl<br><br>Invalid: /shapes/plot-description/aspect/invalid.ttl  |

#### 3.1.1.1.2. Simple result

| Property            | Value   |
|---------------------|---|
| Identifier          | urn:shapes:plot-description:aspect:simple-result  |
| Label               | Simple result   |
| Definition          | The observation's <code>sosa:hasSimpleResult</code> <i>MUST</i> have a value that is the same as the value in the value node of <code>sosa:hasResult</code> . |
| Comment             | Value of <code>sosa:hasSimpleResult</code> <i>MUST</i> be the same as the value in <code>sosa:hasResult</code> .  |
| Status              | submitted ○   |
| Conformance Classes | TBA   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | /shapes/plot-description/aspect/shapes.ttl  |
| Examples            | Valid: /shapes/plot-description/aspect/valid.ttl<br><br>Invalid: /shapes/plot-description/aspect/invalid.ttl  |

#### 3.1.1.1.3. Site visit

| Property            | Value  |
|---------------------|--|
| Identifier          | <code>urn:shapes:plot-description:aspect:site-visit</code>   |
| Label               | Site visit   |
| Definition          | Observations <i>MUST</i> have a value for <code>tern:hasSiteVisit</code> .   |
| Comment             | Observations following the Plot Description protocol are made in the context of a site visit.  |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <code>/shapes/plot-description/aspect/shapes.ttl</code>  |
| Examples            | Valid: <code>/shapes/plot-description/aspect/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/aspect/invalid.ttl</code> |

#### 3.1.1.1.4. Unit of measure

| Property            | Value  |
|---------------------|--|
| Identifier          | <code>urn:shapes:plot-description:aspect:unit-of-measure</code>  |
| Label               | Unit of measure  |
| Definition          | The result <i>MUST</i> have <code>unit:DEG</code> as the value for <code>tern:unit</code> .  |
| Comment             | Result value's unit of measure <i>MUST</i> have the value <code>unit:DEG</code> .  |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <code>/shapes/plot-description/aspect/shapes.ttl</code>  |
| Examples            | Valid: <code>/shapes/plot-description/aspect/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/aspect/invalid.ttl</code> |

#### 3.1.1.1.5. Used procedure

| Property   | Value  |
|------------|--|
| Identifier | <code>urn:shapes:plot-description:aspect:used-procedure</code> |
| Label      | Used procedure   |

| Property            | Value   |
|---------------------|---|
| Definition          | The observation's <b>sosa:usedProcedure</b> <i>MUST</i> have the value <a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> .  |
| Comment             | IRI of procedure <i>MUST</i> have the value <a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> .<br><br><a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> is the IRI for "Plot Description". |
| Status              | submitted ○   |
| Conformance Classes | TBA   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | <a href="/shapes/plot-description/aspect/shapes.ttl">/shapes/plot-description/aspect/shapes.ttl</a>   |
| Examples            | Valid: <a href="/shapes/plot-description/aspect/valid.ttl">/shapes/plot-description/aspect/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/aspect/invalid.ttl">/shapes/plot-description/aspect/invalid.ttl</a>  |

#### 3.1.1.1.6. Value range

| Property            | Value  |
|---------------------|--|
| Identifier          | <a href="#">urn:shapes:plot-description:aspect:value-range</a>   |
| Label               | Value range  |
| Definition          | The result <i>MUST</i> have a value between 0 exclusive and 360 inclusive.   |
| Comment             | Value <i>MUST</i> be between 0 exclusive and 360 inclusive.  |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <a href="/shapes/plot-description/aspect/shapes.ttl">/shapes/plot-description/aspect/shapes.ttl</a>  |
| Examples            | Valid: <a href="/shapes/plot-description/aspect/valid.ttl">/shapes/plot-description/aspect/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/aspect/invalid.ttl">/shapes/plot-description/aspect/invalid.ttl</a> |

#### 3.1.1.1.7. Value type

| Property   | Value   |
|------------|---|
| Identifier | <a href="#">urn:shapes:plot-description:aspect:value-type</a> |
| Label      | Value type  |
| Definition | The result <i>MUST</i> be an instance of <b>tern:Float</b> .  |

| Property            | Value  |
|---------------------|--|
| Comment             | The value of <code>sosa:hasResult</code> <i>MUST</i> be a <code>tern:Float</code> .  |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <code>/shapes/plot-description/aspect/shapes.ttl</code>  |
| Examples            | Valid: <code>/shapes/plot-description/aspect/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/aspect/invalid.ttl</code> |

### 3.1.1.2. Landform pattern Observation

#### 3.1.1.2.1. Feature type

| Property            | Value  |
|---------------------|--|
| Identifier          | <code>urn:shapes:plot-description:landform-pattern:feature-type</code>   |
| Label               | Feature type   |
| Definition          | Instances of <code>tern:Observation</code> with <code>sosa:observedProperty</code> value TBA <i>MUST</i> have a <code>tern:featureType</code> with the value <code>landform</code> . |
| Comment             | TERN's ecologists have determined the feature type is <i>landform</i> , defined by the <a href="#">Australian Soil and Land Survey Field Handbook</a> .                              |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <code>/shapes/plot-description/landform-pattern/shapes.ttl</code>  |
| Examples            | Valid: <code>/shapes/plot-description/landform-pattern/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/landform-pattern/invalid.ttl</code>                           |

#### 3.1.1.2.2. Result value

| Property   | Value  |
|------------|--|
| Identifier | <code>urn:shapes:plot-description:landform-pattern:result-value</code>   |
| Label      | Result value   |
| Definition | The value of <code>rdf:value</code> <i>MUST</i> exist in the landform pattern codes controlled vocabulary.   |
| Comment    | The value in <code>sosa:hasResult</code> <i>MUST</i> be a value in <code>sh:in</code> , which is the landform pattern codes controlled vocabulary. |

| Property            | Value  |
|---------------------|--|
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <a href="/shapes/plot-description/landform-pattern/shapes.ttl">/shapes/plot-description/landform-pattern/shapes.ttl</a>  |
| Examples            | Valid: <a href="/shapes/plot-description/landform-pattern/valid.ttl">/shapes/plot-description/landform-pattern/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/landform-pattern/invalid.ttl">/shapes/plot-description/landform-pattern/invalid.ttl</a> |

#### 3.1.1.2.3. Simple result

| Property            | Value  |
|---------------------|--|
| Identifier          | <a href="#">urn:shapes:plot-description:landform-pattern:simple-result</a>   |
| Label               | Simple result  |
| Definition          | Instances of <a href="#">tern:Observation</a> <i>MUST</i> have a <a href="#">sosa:hasSimpleResult</a> where the value is the same as the <a href="#">rdf:value</a> on the value node of <a href="#">sosa:hasResult</a> .   |
| Comment             | Value of <a href="#">sosa:hasSimpleResult</a> <i>MUST</i> be the same as the value in <a href="#">sosa:hasResult</a> .   |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <a href="/shapes/plot-description/landform-pattern/shapes.ttl">/shapes/plot-description/landform-pattern/shapes.ttl</a>  |
| Examples            | Valid: <a href="/shapes/plot-description/landform-pattern/valid.ttl">/shapes/plot-description/landform-pattern/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/landform-pattern/invalid.ttl">/shapes/plot-description/landform-pattern/invalid.ttl</a> |

#### 3.1.1.2.4. Site visit

| Property            | Value   |
|---------------------|---|
| Identifier          | <a href="#">urn:shapes:plot-description:landform-pattern:site-visit</a>   |
| Label               | Site visit  |
| Definition          | Instances of <a href="#">tern:Observation</a> with <a href="#">sosa:observedProperty</a> value TBA <i>MUST</i> have a value for <a href="#">tern:hasSiteVisit</a> . |
| Comment             | Observations following the Plot Description protocol are made in the context of a site visit.   |
| Status              | submitted ○   |
| Conformance Classes | TBA   |



| Property   | Value  |
|------------|--|
| Source     | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators | <a href="#">/shapes/plot-description/landform-pattern/shapes.ttl</a>   |
| Examples   | Valid: <a href="#">/shapes/plot-description/landform-pattern/valid.ttl</a><br><br>Invalid: <a href="#">/shapes/plot-description/landform-pattern/invalid.ttl</a> |

#### 3.1.1.2.5. Used procedure

| Property            | Value   |
|---------------------|---|
| Identifier          | <a href="#">urn:shapes:plot-description:landform-pattern:used-procedure</a>   |
| Label               | Used procedure  |
| Definition          | Instances of <a href="#">tern:Observation</a> with <a href="#">sosa:observedProperty</a> value <i>TBA</i> <i>MUST</i> have a <a href="#">sosa:usedProcedure</a> where the value is <a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> .  |
| Comment             | IRI of procedure <i>MUST</i> have the value <a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> .<br><br><a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> is the IRI for "Plot Description". |
| Status              | submitted <input type="radio"/>   |
| Conformance Classes | <i>TBA</i>  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | <a href="#">/shapes/plot-description/landform-pattern/shapes.ttl</a>  |
| Examples            | Valid: <a href="#">/shapes/plot-description/landform-pattern/valid.ttl</a><br><br>Invalid: <a href="#">/shapes/plot-description/landform-pattern/invalid.ttl</a>  |

#### 3.1.1.2.6. Value type

| Property            | Value   |
|---------------------|---|
| Identifier          | <a href="#">urn:shapes:plot-description:landform-pattern:value-type</a>   |
| Label               | Value type  |
| Definition          | Instances of <a href="#">tern:Observation</a> with <a href="#">sosa:observedProperty</a> value <i>TBA</i> <i>MUST</i> have a <a href="#">sosa:hasResult</a> where the value node is an instance of <a href="#">tern:IRI</a> . |
| Comment             | The value in <a href="#">sosa:hasResult</a> <i>MUST</i> be a <a href="#">tern:IRI</a> .   |
| Status              | submitted <input type="radio"/>   |
| Conformance Classes | <i>TBA</i>  |

| Property   | Value  |
|------------|--|
| Source     | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators | <a href="/shapes/plot-description/landform-pattern/shapes.ttl">/shapes/plot-description/landform-pattern/shapes.ttl</a>  |
| Examples   | Valid: <a href="/shapes/plot-description/landform-pattern/valid.ttl">/shapes/plot-description/landform-pattern/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/landform-pattern/invalid.ttl">/shapes/plot-description/landform-pattern/invalid.ttl</a> |

#### 3.1.1.2.7. Vocabulary

| Property            | Value   |
|---------------------|---|
| Identifier          | <a href="#">urn:shapes:plot-description:landform-pattern:vocabulary</a>   |
| Label               | Vocabulary  |
| Definition          | The value of <a href="#">tern:vocabulary</a> <i>MUST</i> match the pattern <a href="#">19d91a7a-2733-4b84-9d2b-4bda4808c003\$</a> .   |
| Comment             | IRI of <a href="#">tern:vocabulary</a> in <a href="#">sosa:hasResult</a> <i>MUST</i> have the value <a href="https://linked.data.gov.au/def/test/dawe-cv/19d91a7a-2733-4b84-9d2b-4bda4808c003">https://linked.data.gov.au/def/test/dawe-cv/19d91a7a-2733-4b84-9d2b-4bda4808c003</a> .<br><br><a href="https://linked.data.gov.au/def/test/dawe-cv/19d91a7a-2733-4b84-9d2b-4bda4808c003">https://linked.data.gov.au/def/test/dawe-cv/19d91a7a-2733-4b84-9d2b-4bda4808c003</a> is the IRI for "Plot slope codes". |
| Status              | submitted ○   |
| Conformance Classes | TBA   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | <a href="/shapes/plot-description/landform-pattern/shapes.ttl">/shapes/plot-description/landform-pattern/shapes.ttl</a>   |
| Examples            | Valid: <a href="/shapes/plot-description/landform-pattern/valid.ttl">/shapes/plot-description/landform-pattern/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/landform-pattern/invalid.ttl">/shapes/plot-description/landform-pattern/invalid.ttl</a>  |

#### 3.1.1.3. Slope Observation

##### 3.1.1.3.1. Feature type

| Property   | Value   |
|------------|---|
| Identifier | <a href="#">urn:shapes:plot-description:slope:feature-type</a>  |
| Label      | Feature type  |
| Definition | The value of <a href="#">tern:featureType</a> <i>MUST</i> be <a href="#">landform</a> .   |
| Comment    | TERN's ecologists have determined the feature type is <i>landform</i> , defined by the <a href="#">Australian Soil and Land Survey Field Handbook</a> . |
| Status     | submitted ○   |

| Property            | Value  |
|---------------------|--|
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | /shapes/plot-description/slope/shapes.ttl  |
| Examples            | Valid: /shapes/plot-description/slope/valid.ttl<br><br>Invalid: /shapes/plot-description/slope/invalid.ttl |

### 3.1.1.3.2. Simple result

| Property            | Value   |
|---------------------|---|
| Identifier          | urn:shapes:plot-description:slope:simple-result   |
| Label               | Simple result   |
| Definition          | The observation's <b>sosa:hasSimpleResult</b> <i>MUST</i> have a value that is the same as the value in the value node of <b>sosa:hasResult</b> . |
| Comment             | Value of <b>sosa:hasSimpleResult</b> <i>MUST</i> be the same as the value in <b>sosa:hasResult</b> .  |
| Status              | submitted ○   |
| Conformance Classes | TBA   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | /shapes/plot-description/slope/shapes.ttl   |
| Examples            | Valid: /shapes/plot-description/slope/valid.ttl<br><br>Invalid: /shapes/plot-description/slope/invalid.ttl  |

### 3.1.1.3.3. Site visit

| Property            | Value   |
|---------------------|---|
| Identifier          | urn:shapes:plot-description:slope:site-visit  |
| Label               | Site visit  |
| Definition          | Observations <i>MUST</i> have a value for <b>tern:hasSiteVisit</b> .                          |
| Comment             | Observations following the Plot Description protocol are made in the context of a site visit. |
| Status              | submitted ○   |
| Conformance Classes | TBA   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols                                   |
| Validators          | /shapes/plot-description/slope/shapes.ttl   |

| Property | Value  |
|----------|--|
| Examples | Valid: <a href="#">/shapes/plot-description/slope/valid.ttl</a><br><br>Invalid: <a href="#">/shapes/plot-description/slope/invalid.ttl</a> |

#### 3.1.1.3.4. Unit of measure

| Property            | Value  |
|---------------------|--|
| Identifier          | <a href="#">urn:shapes:plot-description:slope:unit-of-measure</a>  |
| Label               | Unit of measure  |
| Definition          | The result <i>MUST</i> have <a href="#">unit:DEG</a> as the value for <a href="#">tern:unit</a> .  |
| Comment             | Result value's unit of measure <i>MUST</i> have the value <a href="#">unit:DEG</a> .   |
| Status              | <a href="#">submitted</a> ○  |
| Conformance Classes | <a href="#">TBA</a>  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <a href="#">/shapes/plot-description/slope/shapes.ttl</a>  |
| Examples            | Valid: <a href="#">/shapes/plot-description/slope/valid.ttl</a><br><br>Invalid: <a href="#">/shapes/plot-description/slope/invalid.ttl</a> |

#### 3.1.1.3.5. Used procedure

| Property            | Value   |
|---------------------|---|
| Identifier          | <a href="#">urn:shapes:plot-description:slope:used-procedure</a>  |
| Label               | Used procedure  |
| Definition          | The observation's <a href="#">sosa:usedProcedure</a> <i>MUST</i> have the value <a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> .   |
| Comment             | IRI of procedure <i>MUST</i> have the value <a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> .<br><br><a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> is the IRI for "Plot Description". |
| Status              | <a href="#">submitted</a> ○   |
| Conformance Classes | <a href="#">TBA</a>   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | <a href="#">/shapes/plot-description/slope/shapes.ttl</a>   |

| Property | Value  |
|----------|--|
| Examples | Valid: <code>/shapes/plot-description/slope/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/slope/invalid.ttl</code> |

#### 3.1.1.3.6. Value range

| Property            | Value  |
|---------------------|--|
| Identifier          | <code>urn:shapes:plot-description:slope:value-range</code>   |
| Label               | Value range  |
| Definition          | The result <i>MUST</i> have a value between 0 and 90 inclusively.  |
| Comment             | Value <i>MUST</i> be between 0 and 90 inclusive.   |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <code>/shapes/plot-description/slope/shapes.ttl</code>   |
| Examples            | Valid: <code>/shapes/plot-description/slope/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/slope/invalid.ttl</code> |

#### 3.1.1.3.7. Value type

| Property            | Value  |
|---------------------|--|
| Identifier          | <code>urn:shapes:plot-description:slope:value-type</code>  |
| Label               | Value type   |
| Definition          | The result <i>MUST</i> be an instance of <code>tern:Float</code> .   |
| Comment             | The value of <code>sosa:hasResult</code> <i>MUST</i> be a <code>tern:Float</code> .  |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <code>/shapes/plot-description/slope/shapes.ttl</code>   |
| Examples            | Valid: <code>/shapes/plot-description/slope/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/slope/invalid.ttl</code> |

#### 3.1.1.4. Slope type Observation

#### 3.1.1.4.1. Feature type

| Property            | Value   |
|---------------------|---|
| Identifier          | <code>urn:shapes:plot-description:slope-type:feature-type</code>  |
| Label               | Feature type  |
| Definition          | Instances of <code>tern:Observation</code> with <code>sosa:observedProperty</code> value <i>TBA</i> <i>MUST</i> have a <code>tern:featureType</code> with the value <i>landform</i> . |
| Comment             | TERN's ecologists have determined the feature type is <i>landform</i> , defined by the <a href="#">Australian Soil and Land Survey Field Handbook</a> .                               |
| Status              | submitted ○   |
| Conformance Classes | <i>TBA</i>  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | <code>/shapes/plot-description/slope-type/shapes.ttl</code>   |
| Examples            | Valid: <code>/shapes/plot-description/slope-type/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/slope-type/invalid.ttl</code>  |

#### 3.1.1.4.2. Result value

| Property            | Value  |
|---------------------|--|
| Identifier          | <code>urn:shapes:plot-description:slope-type:result-value</code>   |
| Label               | Result value   |
| Definition          | The value of <code>rdf:value</code> <i>MUST</i> exist in the Plot slope codes controlled vocabulary.   |
| Comment             | The value in <code>sosa:hasResult</code> <i>MUST</i> be a value in <code>sh:in</code> , which is the Plot slope codes controlled vocabulary.   |
| Status              | submitted ○  |
| Conformance Classes | <i>TBA</i>   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <code>/shapes/plot-description/slope-type/shapes.ttl</code>  |
| Examples            | Valid: <code>/shapes/plot-description/slope-type/valid.ttl</code><br><br>Invalid: <code>/shapes/plot-description/slope-type/invalid.ttl</code> |

#### 3.1.1.4.3. Simple result

| Property   | Value   |
|------------|---|
| Identifier | <code>urn:shapes:plot-description:slope-type:simple-result</code> |
| Label      | Simple result   |

| Property            | Value  |
|---------------------|--|
| Definition          | Instances of <code>tern:Observation</code> <i>MUST</i> have a <code>sosa:hasSimpleResult</code> where the value is the same as the <code>rdf:value</code> on the value node of <code>sosa:hasResult</code> .                                   |
| Comment             | Value of <code>sosa:hasSimpleResult</code> <i>MUST</i> be the same as the value in <code>sosa:hasResult</code> .   |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <a href="/shapes/plot-description/slope-type/shapes.ttl">/shapes/plot-description/slope-type/shapes.ttl</a>  |
| Examples            | Valid: <a href="/shapes/plot-description/slope-type/valid.ttl">/shapes/plot-description/slope-type/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/slope-type/invalid.ttl">/shapes/plot-description/slope-type/invalid.ttl</a> |

#### 3.1.1.4.4. Site visit

| Property            | Value  |
|---------------------|--|
| Identifier          | <code>urn:shapes:plot-description:slope-type:site-visit</code>   |
| Label               | Site visit   |
| Definition          | Instances of <code>tern:Observation</code> with <code>sosa:observedProperty</code> value TBA <i>MUST</i> have a value for <code>tern:hasSiteVisit</code> .   |
| Comment             | Observations following the Plot Description protocol are made in the context of a site visit.  |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <a href="/shapes/plot-description/slope-type/shapes.ttl">/shapes/plot-description/slope-type/shapes.ttl</a>  |
| Examples            | Valid: <a href="/shapes/plot-description/slope-type/valid.ttl">/shapes/plot-description/slope-type/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/slope-type/invalid.ttl">/shapes/plot-description/slope-type/invalid.ttl</a> |

#### 3.1.1.4.5. Used procedure

| Property   | Value  |
|------------|--|
| Identifier | <code>urn:shapes:plot-description:slope-type:used-procedure</code>   |
| Label      | Used procedure   |
| Definition | Instances of <code>tern:Observation</code> with <code>sosa:observedProperty</code> value TBA <i>MUST</i> have a <code>sosa:usedProcedure</code> where the value is <a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> . |

| Property            | Value   |
|---------------------|---|
| Comment             | IRI of procedure <i>MUST</i> have the value <a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> .<br><br><a href="https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32">https://linked.data.gov.au/def/test/dawe-cv/1ff9e97c-3bdd-44c9-bdd3-401fa31c0b32</a> is the IRI for "Plot Description". |
| Status              | submitted ○   |
| Conformance Classes | TBA   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | <a href="/shapes/plot-description/slope-type/shapes.ttl">/shapes/plot-description/slope-type/shapes.ttl</a>   |
| Examples            | Valid: <a href="/shapes/plot-description/slope-type/valid.ttl">/shapes/plot-description/slope-type/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/slope-type/invalid.ttl">/shapes/plot-description/slope-type/invalid.ttl</a>  |

#### 3.1.1.4.6. Value type

| Property            | Value  |
|---------------------|--|
| Identifier          | <a href="#">urn:shapes:plot-description:slope-type:value-type</a>  |
| Label               | Value type   |
| Definition          | Instances of <a href="#">tern:Observation</a> with <a href="#">sosa:observedProperty</a> value TBA <i>MUST</i> have a <a href="#">sosa:hasResult</a> where the value node is an instance of <a href="#">tern:IRI</a> .                         |
| Comment             | The value in <a href="#">sosa:hasResult</a> <i>MUST</i> be a <a href="#">tern:IRI</a> .  |
| Status              | submitted ○  |
| Conformance Classes | TBA  |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols  |
| Validators          | <a href="/shapes/plot-description/slope-type/shapes.ttl">/shapes/plot-description/slope-type/shapes.ttl</a>  |
| Examples            | Valid: <a href="/shapes/plot-description/slope-type/valid.ttl">/shapes/plot-description/slope-type/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/slope-type/invalid.ttl">/shapes/plot-description/slope-type/invalid.ttl</a> |

#### 3.1.1.4.7. Vocabulary

| Property   | Value   |
|------------|---|
| Identifier | <a href="#">urn:shapes:plot-description:slope-type:vocabulary</a>   |
| Label      | Vocabulary  |
| Definition | The value of <a href="#">tern:vocabulary</a> <i>MUST</i> match the pattern <a href="#">d893e669-c530-4bc3-a057-a5799ffcb5db\$</a> . |



| Property            | Value   |
|---------------------|---|
| Comment             | IRI of <b>tern:vocabulary</b> in <b>sosa:hasResult</b> <i>MUST</i> have the value <a href="https://linked.data.gov.au/def/test/dawe-cv/d893e669-c530-4bc3-a057-a5799ffcb5db">https://linked.data.gov.au/def/test/dawe-cv/d893e669-c530-4bc3-a057-a5799ffcb5db</a> .<br><br><a href="https://linked.data.gov.au/def/test/dawe-cv/d893e669-c530-4bc3-a057-a5799ffcb5db">https://linked.data.gov.au/def/test/dawe-cv/d893e669-c530-4bc3-a057-a5799ffcb5db</a> is the IRI for "Plot slope codes". |
| Status              | submitted ○   |
| Conformance Classes | TBA   |
| Source              | TERN Ecosystem Surveillance Ecological Monitoring Protocols   |
| Validators          | <a href="/shapes/plot-description/slope-type/shapes.ttl">/shapes/plot-description/slope-type/shapes.ttl</a>   |
| Examples            | Valid: <a href="/shapes/plot-description/slope-type/valid.ttl">/shapes/plot-description/slope-type/valid.ttl</a><br><br>Invalid: <a href="/shapes/plot-description/slope-type/invalid.ttl">/shapes/plot-description/slope-type/invalid.ttl</a>  |

## 3.2. TERN Ontology Conformance

TBD.

# 4. Editors Notes

## 4.1. Working titles

Both this specification and the ecological field collection protocol do not have canonical names yet. The below will be changed and updated once formal names are provided by DAWE.

- Ecological Data Exchange Specification (this document)
- TERN Ecosystem Surveillance Ecological Monitoring Protocols

## 4.2. Placeholders

### 4.2.1. Placeholder text

Placeholder values TBA, TBD and TBC must be replaced with actual values.

### 4.2.2. Placeholder IRIs

IRIs of controlled vocabularies are currently placeholders with the namespace <https://linked.data.gov.au/def/test/dawe-cv/>. These IRIs must be replaced once the authoritative IRI is known.