



**Methodology**  
**for**  
**Calculating Triple Bottom Line (TBL)**  
**Indicators for Biodiversity Conservation**

**Indicator 11 – Native Vegetation Management**  
**&**  
**Indicator 12 – Riparian Corridor Management**

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>4</b>
1.1	Intention .....	4
1.2	Definitions .....	5
<b>2</b>	<b>INDICATOR 11 - NATIVE VEGETATION MANAGEMENT .....</b>	<b>7</b>
2.1	Interpretation and information for consultants.....	8
2.1.1	Background .....	8
2.2	Indicator 11 Data Elements .....	8
2.2.1	Vegetation Significance - Data Elements 11(a) to (l) .....	8
2.2.2	Revegetation –Data Elements 11(m) and 11(n) .....	9
2.2.3	Threatened Species, Communities and Populations Recorded on Site - Data Element 11(o) .....	10
2.2.4	Vegetation Management Plans - Data Elements 11(p) and 11(q).....	10
2.2.5	Environmental Protection Zoning - Data Elements 11(r) and 11(s).....	11
2.3	Example – Ecological Consultant's Indicator 11 Report for Hillview Estate Development Project .....	12
2.3.1	Data Elements 11(a), (b), (e), (f), (i), (j) and (m) – Threatened Species Habitat – Native Vegetation.....	12
2.3.2	Data Elements 11(c), (d), (g), (h), (k), (l) and (n) – Threatened Ecological Communities .....	13
2.3.3	Data Element 11(o) – Threatened Species, Populations and Communities	13
2.3.4	Data Elements 11(p) and 11(q) – Vegetation Management Plan .....	14
2.3.5	Data Elements 11(r) and 11(s) – Environmental Protection Zoning.....	14
2.3.6	Data Element (t) – Data Sources .....	15
2.4	Instructions for Consultants .....	19
2.5	Reporting Indicator 11 in Landcom's Annual Sustainability Report.....	19
<b>3</b>	<b>INDICATOR 12 - RIPARIAN CORRIDOR MANAGEMENT.....</b>	<b>20</b>
3.1	Interpretation and Information for Consultants.....	21
3.1.1	Background .....	21
3.1.2	Definition .....	21
3.1.3	Determination of Stream Quality .....	22
3.1.4	Stream Length - Data Elements 12(a) to (c), 12(g) to (i) and 12(m) to (o)..	24
3.1.5	In-stream Breaks and Obstructions – Data Elements 12(d), (e), (j), (k), (p) and (q).....	24
3.1.6	Total Area of Riparian Land Retained – Data Element 12(f), (l) and (r).....	24
3.1.7	Aquatic Threatened Species, Communities and Populations – Data Element (s) .....	25
3.1.8	Riparian Corridor Management Plans – Data Elements 12(t) and 12(u) .....	25
3.1.9	Environmental Protection Zoning - Data Elements 12(v) and 12(w) –.....	25
3.1.10	Area for Rehabilitation - Data Element 12(x).....	26
3.2	Example – Ecological Consultant's Indicator 12 Report for Riverside Estate Development Project .....	27
3.2.1	Data Elements 12(a), (b), (c), (g), (h), (i), (m), (n) and (o) – Stream Length Length of Stream.....	27
3.2.2	Data Elements 12(d), (e), (j), (k), (p) and (q) – In-Stream Breaks and Obstructions .....	27
3.2.3	Data Elements 12(f), (l) and (r) – Area of Riparian Land Retained .....	28
3.2.4	Data Element 12(s) - Aquatic Threatened Species, Communities and Populations.....	29
3.2.5	Data Elements 12(t) and 12(u) – Riparian Corridor Management Plan.....	29

3.2.6	<i>Data Elements 12(v) and 12(u) - Environmental Protection Zoning</i> .....	29
3.2.7	<i>Data Element 12(x) – Area for Rehabilitation</i> .....	30
3.2.8	<i>Data Element 12(y) – Data Sources</i> .....	30
3.3	Instructions for Consultants .....	32
3.4	Reporting Indicator 12 in Landcom's Annual Sustainability Report.....	32
<b>4</b>	<b>REFERENCES</b> .....	<b>33</b>
<b>5</b>	<b>GLOSSARY</b> .....	<b>34</b>
	<b>ATTACHMENT A – TABLES TO ACCOMPANY TBL INDICATOR 11 REPORTING</b> .....	<b>35</b>
	<b>ATTACHMENT B - TABLES TO ACCOMPANY TBL INDICATOR 12 REPORTING</b> .....	<b>38</b>

# 1 Introduction

Triple Bottom Line (TBL) reporting is a tool for measuring an organisation's environmental, social and economic/financial performance. TBL reporting will be the key to planning more efficient, resourceful and financially successful projects in the future.

The reporting of relevant data for TBL is dependent on the development of a number of 'indicators'. Each indicator can be used as an effective method of collecting and reporting relevant environmental, social or economic data.

Indicators 11 and 12 were developed as part of Landcom's Triple Bottom Line reporting. Indicators 11 and 12 provide Landcom with data on the environmental performance of projects throughout the year. For Landcom to report effectively on these indicators, consultants need to provide relevant information within their ecological assessment outputs. To ensure consistent data for all Landcom projects, the development of a concise methodology for consultants was essential.

*Methodology for Calculating TBL Indicators 11 & 12* has been developed by Landcom in consultation with NSW National Parks and Wildlife Service (NPWS), the Department of Infrastructure Planning and Natural Resources (DIPNR), Eco Logical Australia Pty Ltd (Eco Logical) and Environmental Resources Management Pty Ltd (ERM). The methodology aims to provide Landcom staff and external consultants with a concise tool for the measurement and reporting of Landcom's Biodiversity Conservation Indicators 11 and 12.

## 1.1 Intention

Landcom's biodiversity indicators are intended to provide:

- Information for the wider community, who are interested in the environment, but are not experts in environmental assessment processes or terminology.
- A statewide snapshot of Landcom's performance in conservation of biodiversity over a given year.
- Comparison of performance over a number of years.

These indicators will not replace the detailed information that agencies receive as part of various approvals processes.

Data for Indicators 11 and 12 will be collected on a project specific basis. However, Landcom's annual sustainability reports will only publish aggregated annual data for each indicator (i.e. aggregated to corporate level from projects delivered in that year), except where a single project is chosen as an example.

## 1.2 Definitions

<i>Post-development:</i>	What is proposed to exist on site at completion of development.
<i>Pre-development:</i>	What Landcom found on site at the time of study prior to development. Where final reports are based on existing work, this may in actual fact be "at the time of review of existing ecological studies".
<i>Threatened Species:</i>	Means a species specified in Part 1 or 4 of Schedule 1 or in Schedule 2 of the NSW <i>Threatened Species Conservation Act 1995</i> (TSC Act) <b>or</b> a species specified in Part 1 (Endangered species) or Part 4 (Species presumed extinct) of Schedule 4 or in Schedule 5 (Vulnerable species) of the <i>Fisheries Management Act 1994</i> (FM Act) or species listed under Section 179 of the <i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) at the time of the study.
<i>Threatened Community:</i>	Means an ecological community specified in Part 3 of Schedule 1 or Part 2 of Schedule 2 of the TSC Act <b>or</b> ecological communities specified in Schedules 4 and 5 of the FM Act or ecological communities listed as threatened under the EPBC Act as determined by the Threatened Species Scientific Committee (TSSC) at the time of the study.
<i>Threatened Population:</i>	Means populations specified in Schedules 1 and 2 of the TSC Act <b>or</b> populations specified in Schedules 4 and 5 of the FM Act or species listed under the EPBC Act* at the time of the study.
<i>Native Vegetation:</i>	Only that vegetation which is a locally occurring community, which may be naturally pre-existing or planted. For the purposes of these data, garden plantings, landscape plantings and pine forests are not native vegetation. <b>For the purposes of Landcom's Indicator 11 reporting, native vegetation will refer only to areas of vegetation recorded as being habitat for threatened species.</b>

<i>Vegetation Management Plan:</i>	A document, often required as a condition of Council's Development Consent, detailing proposed methods of management in order to mitigate impacts on bushland on, or adjacent to, a site during construction and operation of the proposed development. <a href="#">See Section 2.2.4.</a>
<i>Riparian Corridor Management Plan:</i>	A document similar to a Vegetation Management Plan, but specific to Riparian Corridors. May be completed as part of an application for a Part 3a Permit under the <i>Rivers and Foreshores Improvement Act 1948</i> (RFI Act) or the equivalent "Controlled Activity Approval" under the <i>Water Management Act 2000</i> (WM Act), submitted to the Department of Infrastructure Planning and Natural Resources (DIPNR).
<i>Regeneration</i>	Natural (unassisted) recovery of vegetation from a disturbed state.
<i>Revegetation:</i>	The introduction of locally indigenous plant species. These species should be in line with the diversity and structure of the original vegetation community (Little 1999a).

\*Under the EPBC Act, the definition of a species includes sub-species and distinct populations that the Minister has determined to be species for the purposes of the Act.

## 2 Indicator 11 - Native Vegetation Management

**Table 2. Indicator 11 Data Elements**

Note: 'native vegetation' in this methodology refers only to areas of native vegetation within the project recorded as being habitat for threatened species.

Data Element	Type of Data	To be expressed as (units)	Data Element
			<b>High Conservation Significance</b>
a	Number	Hectares	Total area of pre-development native vegetation.
b	Number	Hectares	Total area of native vegetation cleared.
c	Number	Hectares	Total area of pre-development threatened communities.
d	Number	Hectares	Total area of threatened communities cleared.
			<b>Moderate Conservation Significance</b>
e	Number	Hectares	Total area of pre-development native vegetation.
f	Number	Hectares	Total area of native vegetation cleared.
g	Number	Hectares	Total area of pre-development threatened communities.
h	Number	Hectares	Total area of threatened communities cleared.
			<b>Low Conservation Significance</b>
i	Number	Hectares	Total area of pre-development native vegetation.
j	Number	Hectares	Total area of native vegetation cleared.
k	Number	Hectares	Total area of pre-development threatened communities.
l	Number	Hectares	Total area of threatened communities cleared.
m	Number	Hectares	Total area of native vegetation for revegetation
n	Number	Hectares	Total area of threatened communities for revegetation
o	Text	List	List the names of threatened species, communities and populations recorded on site.
p	Yes/No	-	Was a vegetation management plan prepared for the site?
q	Text	-	If yes, please provide details of the Vegetation Management Plan: report title, author, date and location / file number
r	Yes/No	-	Is there an area of native vegetation on site specially zoned for conservation?
s	Number	Hectares	Total area of vegetation under conservation zoning.
t	Text		<i>Data sources</i>

## **2.1 Interpretation and information for consultants**

### **2.1.1 Background**

This section provides guidance for consultants on how to measure the Data Elements for 'Indicator 11 – Native Vegetation Management'. Indicator 11 provides on threatened flora and fauna species, populations and communities and threatened species habitat recorded within the project site.

The Data Elements of the original indicators developed for the 'Towards Sustainability' Landcom Sustainability Report for 2002 have been refined to reflect an improved measurability and practical application. The revised Data Elements (Table 1) were developed in consultation with the Department of Infrastructure and Natural Resources (DIPNR), NSW National Parks & Wildlife Service (NPWS), NSW Fisheries and Environmental Resources Management Pty Ltd (ERM).

The methodology includes areas of native vegetation which have not been classified as threatened, but that provide habitat for threatened species. Therefore, when referring to 'native vegetation', this methodology refers only to areas of native vegetation within the project site recorded as being habitat for threatened species.

All ecological consultants engaged by Landcom must provide data on Indicator 11 as part of their ecological assessment if the site contains native vegetation. The submission of the outputs specified below is required even if the project sites are found to contain no threatened species, communities or populations or threatened species habitat.

### **Outputs**

All data collected on Indicator 11 should be integrated within the consultants independent ecological assessment report. In addition, all Landcom projects require Indicator 11 data to be collected and submitted by consultants as an appendix to the ecological report, and to be submitted electronically to [sustainability@landcom.nsw.gov.au](mailto:sustainability@landcom.nsw.gov.au). This Methodology provides tables for collection of required data as Attachment A. These tables should be submitted to Landcom upon completion of the ecological assessment of the project site. Consultants are also required to complete and submit the Proforma provided by Landcom. The Proforma is to be submitted electronically.

Further information and a worked example are provided in the following sections.

## **2.2 Indicator 11 Data Elements**

### **2.2.1 Vegetation Significance - Data Elements 11(a) to (l)**

Threatened ecological communities and native vegetation providing habitat for threatened species will be presented in terms of absolute area of vegetation of equal quality. Reporting on vegetation of equal quality ensures the data presented for Indicator 11 are a true representation of habitat or vegetation of comparable conservation value.

For this purpose, threatened ecological communities and native vegetation that provide habitat for threatened species will be classified into the following Conservation Significance categories:

- High
- Moderate
- Low

Conservation Significance information is to be based on a Conservation Significance Map for the site. If a site-specific significance map has been generated, use this. Otherwise, use an existing assessment, such as those completed by NPWS (2002) for Western Sydney or Illawarra. The Central Coast and Lower Hunter are covered by the Lower Hunter Central Coast Regional Environmental Management Strategy (LHCCREMS) maps.

Each of the significance assessment maps referred to above have a different approach to identify conservation significance. The NPWS, for example, have carried out a regional conservation significance assessment across the Cumberland Plain, Western Sydney. This assessment evaluates remnant vegetation based on the size of the patch, rarity of community, condition and proximity to other vegetation. It comes up with 'core', 'support for core', 'urban remnant vegetation' and 'other vegetation'. The assessment includes all native vegetation of the Cumberland Plain mapped by NPWS except for remnants on sandstone, unidentified communities and Freshwater Wetlands.

For the Cumberland Plain mapping the significance categories assigned would be:

- Core and Urban Remnant Trees = High Significance
- Support for Core = Medium Significance
- Other Vegetation = Low Significance

In the absence of region-specific or site-specific conservation significance maps, the NPWS (2002) Conservation Significance Assessment Guidelines may give an indication as to the significance of remnant vegetation within the project site. These guidelines are available through NPWS. The method by which the conservation significance was determined should be cited within the ecological assessment report for the project site.

### **2.2.2 Revegetation –Data Elements 11(m) and 11(n)**

Data Elements 11(m) and (n) refer to areas of revegetation which can be considered 'green' offsets. These are generally disturbed areas of native vegetation or threatened ecological communities, that will be revegetated or embellished as compensation for clearing as a result of the development.

The ultimate goal of revegetation is to establish an area which is able to sustain itself unassisted in the long-term. Revegetation should be in line with the diversity and structural characteristics of the original ecological community (for more see Little 1999b, 1999a) and should be detailed within a Vegetation Management Plan for the site. This Element does not refer to landscape plantings or other plantings of non-indigenous species.

### **2.2.3 Threatened Species, Communities and Populations Recorded on Site - Data Element 11(o)**

Data Element 11(o) is a list of names of threatened species, communities and populations recorded on site. This Data Element does not include threatened species, communities or populations that may have been assessed in eight-part tests but were not recorded on site.

For example, Red-crowned Toadlet (Species), Cumberland Plain Woodland (Community) or Gang-gang Cockatoos in the Hornsby Shire (Population).

### **2.2.4 Vegetation Management Plans - Data Elements 11(p) and 11(q)**

Vegetation Management Plans (VMPs) are a common condition of Council Development Consent. These are not a strict legal requirement under any state legislation, but they are common practice. Landcom aims to provide VMPs for all project sites containing native vegetation. In some council areas, VMPs are required under a Local Environmental Plan (LEP) or Development Control Plan (DCP). A VMP may also need to address landscaping issues. There are no formal guidelines for content or presentation of VMPs.

The following dot points provide a guide for the content and preparation of VMPs. VMPs should include:

- objectives for the conservation area
- measurement of area for revegetation
- mechanisms to achieve the objectives
- ongoing monitoring to measure performance against the objectives
- reporting of the monitoring
- all information relating to the flora and fauna of the site, including flora and fauna reports prepared in support of the development application
- timing and staging of the proposed works
- proposed means of remediating any damage to existing bushland resulting from construction or operation of the development
- revegetation (using local provenance stock), including proposed locations, species and methods of seed collection, propagation and replanting
- natural regeneration areas
- sedimentation and erosion controls, including nutrient run-off
- strategies to educate and raise the awareness of local residents moving into the area of issues relating to the site, including but not limited to endangered ecological communities, weeds, nutrients, dumping of rubbish, grass clippings and prunings, nutrient run-off and appropriate use of fertilisers, snakes, fire and collection of firewood, trampling of bushland
- vehicle access to undertake works such as maintenance of drainage channels and ponds
- access to the area by local residents
- fire control, including proposed hazard reduction regimes and methods

- maintenance regimes (eg weed management and irrigation), including ongoing resourcing of such activities
- measures to protect existing bushland, including vegetated buffers, bollards, formalised access, fencing, prevention and collection of dead wood

An adequate VMP will include most, if not all, of these objectives.

### **2.2.5 Environmental Protection Zoning - Data Elements 11(r) and 11(s)**

The land use zoning under a local planning instrument, Local Environmental Plan (LEP) differs for each Council area. The aim for these Data Elements is to identify if there is an area within the project site specifically zoned, or rezoned as a result of the development proposal, for conservation (usually one of the sub categories in '7 – Environmental Protection Zone') under the LEP. If so, how much area is allotted to the conservation zoning within the project site?

## 2.3 Example – Ecological Consultant's Indicator 11 Report for Hillview Estate Development Project

The following is a worked example of Indicator 11 data collection and reporting. Data displayed in example tables in **bold** are required to be entered into the Proforma.

### 2.3.1 Data Elements 11(a), (b), (e), (f), (i), (j) and (m) – Threatened Species Habitat – Native Vegetation

**Table 2.1.1 Sample table showing collection and presentation of Data Elements 11(a), (b), (e), (f), (i), (j) and (m)**

Native Vegetation Community – Threatened Species Habitat	Conservation Significance*								
	High		Moderate		Low		All		
	Pre-dev.	Cleared	Pre-dev.	Cleared	Pre-dev.	Cleared	Pre-dev.	Cleared	Revegetated
Castlereagh Scribbly Gum Woodland	9	0					9	0	0
Riparian Scrub			4	1			4	1	4
Sandstone Ridgetop Woodland					6	2	6	2	0
<b>Total (ha)</b>	<b>9</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>2</b>	19	3	<b>4</b>

#### Calculating the Post-Development Total

The total amount of post-development vegetation should be included in the ecological assessment report and can be calculated from the following:

Post-development = Pre-development - cleared.

From the example: native vegetation containing threatened species habitat and being of moderate conservation significance (in this example Riparian Scrub):

Post-development = 4-1  
= 3 hectares

Area for revegetation will be reported separately and should not be added to the post-development total.

From the example:

**4 hectares** of the project site will be revegetated

### 2.3.2 Data Elements 11(c), (d), (g), (h), (k), (l) and (n) – Threatened Ecological Communities

**Table 2.1.2 Sample table showing collection and presentation of Data Elements 11(c), (d), (g), (h), (k), (l) and (n)**

Threatened Community	Conservation Significance*								
	High		Moderate		Low		All		
	Pre-dev.	Cleared	Pre-dev.	Cleared	Pre-dev.	Cleared	Pre-dev.	Cleared	Revegetated
Shale Plains Woodland	9	0	3	1	4	0	16	1	2
Alluvial Woodland	0	0	2	1	3	0	5	1	1
<b>Total (ha)</b>	<b>9</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>0</b>	21	2	<b>3</b>

\* As determined by NPWS Conservation Significance Assessment Guidelines (NPWS 2002).

#### Reading the table:

For the example project:

There were 5 hectares of Alluvial Woodland on the site.

0 hectares of High Significance

2 hectares of Moderate Significance

3 hectares of Low Significance

#### Calculating the Post-Development Total

The total amount of post-development vegetation can be calculated from the following:

Post-development = Pre-development - cleared

Eg. For this example, Alluvial Woodland:

Post-development total: = 5 - 1

= 4 hectares

Overall, 1 hectare of the Alluvial Woodland will be cleared and 4 will be retained. 2 hectares of Alluvial Woodland will be revegetated.

From the example:

**3 Hectares** of total revegetation will occur within the project site

### 2.3.3 Data Element 11(o) – Threatened Species, Populations and Communities

Data Elements 11(o) is a list of threatened species, communities and populations recorded on site (include all vertebrate fauna, except fish, all terrestrial invertebrates and all terrestrial flora).

This Data Element does not include threatened species, communities or populations that may have been assessed in eight-part tests but were not recorded on site.

For Example:

Species

- Grey-headed Flying-fox
- Grey-crowned Babbler

Communities

- Cumberland Plain Woodland

Populations

*Marsdenia viridiflora* R. Br subsp. *viridiflora* in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas.

Enter the data directly into the Proforma.

### 2.3.4 Data Elements 11(p) and 11(q) – Vegetation Management Plan

If an adequate Vegetation Management Plan has been prepared for the site, Data Element 11(p) is "Yes" and Data Element 11(q) will be the details of the plan, for example:

Title: Hillview Vegetation Management Plan  
 Author: Satu Dua Consulting  
 Date: 5 October 2002  
 Location / File Number: Landcom Job No. 12345

An adequate VMP should address most, if not all, of the issues listed in section 2.2.4

### 2.3.5 Data Elements 11(r) and 11(s) – Environmental Protection Zoning

Where all vegetation on the developed site is to be on a single land use zoning or does not support a conservation zone, Data Element 11(r) is "No". Otherwise, where there is a specific conservation zone, Data Element 11(r) is "Yes" and 11(s) will be the total area included within the protection zoning. Zoning information can be obtained from planning documents or Development Managers and should be included in flora and fauna reports for the project site.

For project sites with more than one type of conservation zoning, data should be collected in Table 2.1.5 in Attachment A as shown in the example below, and the total conservation area entered into the Proforma.

**Table 2.1.5 Sample table showing collection of data for Data Element 11(s)**

Land Use Zoning	Area of Site (ha)	Area of Native vegetation (ha)
Environmental Protection	3	3
Bushland Protection	5	5
Conservation	10	10
<b>Area zoned for conservation</b>	18	<b>18</b>
Total Area (ha)	60	20

From the sample table:

-18 hectares of the 20 hectares of native vegetation on site has been zoned for conservation purposes.

### **2.3.6 Data Element (f) – Data Sources**

All sources of data utilised in the collection of Indicator 11 data need to be referenced within the 'Data Sources' cell of the Proforma table. These sources may include flora and fauna assessment reports, species impact statements, Landcom file numbers and locations, masterplans, DA documents and other reference material.

**Table 2.4 Presentation of Indicator 11 Data Elements for Hillview Estate Development Project Example**

Indicator	Project Name (and Precinct if applicable)	Data Element	Type of Data	Data	
11. Native Vegetation Management	Hillview Estate	<b>High Conservation Significance</b>			
		a	Total area of pre-development native vegetation.	Number	9
		b	Total area of native vegetation cleared.	Number	0
		c	Total area of pre-development threatened communities.	Number	9
		d	Total area of threatened communities cleared.	Number	0
		<b>Moderate Conservation Significance</b>			
		e	Total area of pre-development native vegetation.	Number	4
		f	Total area of native vegetation cleared.	Number	1
		g	Total area of pre-development threatened communities.	Number	5
		h	Total area of threatened communities cleared.	Number	2
		<b>Low Conservation Significance</b>			
		i	Total area of pre-development native vegetation.	Number	6
		j	Total area of native vegetation cleared.	Number	2
		k	Total area of pre-development threatened communities.	Number	7
		l	Total area of threatened communities cleared.	Number	0
		m	Total area of native vegetation for revegetation	Number	4
		n	Total area of threatened communities for revegetation	Number	3
		o	List the names of threatened species, communities and populations recorded on site.	Text	Species: Grey-headed Flying-fox, Community: Cumberland Plain Woodland, Population: <i>Marsdenia viridiflora</i> subsp <i>viridiflora</i>
		p	Was a vegetation management plan prepared for the site?	Yes/No	Yes
		q	If yes, please provide details of the Vegetation Management Plan: report title, author, date and location / file number	Text	Title: Hillview Vegetation Management Plan, Author: Satu Dua Consulting, Date:5 October 2002, Location / File Number: Landcom Job No. 12345
r	Is there an area of native vegetation on site specially zoned for conservation?	Yes/No	Yes		
s	Total area of vegetation under conservation zoning.	Number	18		
t	<i>Data sources</i>	Text	NPWS (2002), Landcom Job No: 12345		

NB: all calculations entered into the above Proforma example are based on the examples provided within section 2.3.



## **2.4 Instructions for Consultants**

Follow steps 1 to 6 below:

1. Read Methodology and be aware of the data required for reporting of Indicator 11.
2. Conduct Ecological Assessment of Landcom project site.
3. Refer to Tables provided in Attachment A and complete (tables are available electronically in Microsoft word - email [sustainability@landcom.nsw.gov.au](mailto:sustainability@landcom.nsw.gov.au)).
4. Complete Proforma provided by Landcom for Indicator 11 (Proforma is available electronically in Microsoft Excel - email [sustainability@landcom.nsw.gov.au](mailto:sustainability@landcom.nsw.gov.au)).
5. Submit Ecological Assessment report and completed Tables to Landcom.
6. Submit Proforma electronically to [sustainability@landcom.nsw.gov.au](mailto:sustainability@landcom.nsw.gov.au) and copy to your contact person (i.e. development manager) at Landcom.

## **2.5 Reporting Indicator 11 in Landcom's Annual Sustainability Report**

Individual project Proformas will be prepared by consultants for each project as described, but will not be reported separately in the annual Sustainability Report.

The figures to be presented in the annual Sustainability Report for Indicator 11 will be aggregated from all projects delivered in a given reporting year. These figures will then be used to generate performance data for the annual Sustainability Report.

### 3 Indicator 12 - Riparian Corridor Management

Table 3. Indicator 12 Data Elements

Data Element	Type of Data	To be expressed as (units)	Data Element
<b>High Significance</b>			
a	Number	Metres	Total Length of pre-development stream.
b	Number	Metres	Total Length of post-development stream
c	Number	Metres	Length of stream as piping, filling, channeling, culverts
d	Number	Number	Number of pre-development in-stream breaks
e	Number	Number	Number of post-development in-stream breaks
f	Number	Hectares	Area of riparian land retained
<b>Moderate Significance</b>			
g	Number	Metres	Total Length of pre-development stream.
h	Number	Metres	Total Length of post-development stream
i	Number	Metres	Length of stream as piping, filling, channeling, culverts
j	Number	Number	Number of pre-development in-stream breaks
k	Number	Number	Number of post-development in-stream breaks
l	Number	Hectares	Area of riparian land retained
<b>Low Significance</b>			
m	Number	Metres	Total Length of pre-development stream.
n	Number	Metres	Total Length of post-development stream
o	Number	Metres	Length of stream as piping, filling, channeling, culverts
p	Number	Number	Number of pre-development in-stream breaks
q	Number	Number	Number of post-development in-stream breaks
r	Number	Hectares	Area of riparian land retained
s	Text	List	List the names of aquatic threatened species, communities and populations recorded on site.
t	Yes/No	-	Was a Riparian Corridor Management Plan (RCMP) prepared for the site?
u	Text	-	If yes, please provide details of the Riparian Corridor Management Plan: report title, author, date and location / file number.
v	Yes/No	-	Is there an area of riparian land on site specially zoned for conservation?
w	Number	Hectares	Total area of riparian land under conservation zoning.
x	Text	-	If rehabilitation work was carried out, briefly describe the key features of any rehabilitation work.
y	Text		<i>Data sources</i>

### 3.1 Interpretation and Information for Consultants

#### 3.1.1 Background

This section provides guidance for consultants on the measurement of Data Elements for 'Indicator 12 – Riparian Corridor Management'. To accurately report on Indicator 12, it may be necessary for consultants to liaise with Government agencies such as DIPNR.

Indicator 12 provides data on riparian corridor management and threatened aquatic species, communities and populations recorded within Landcom project sites. Data Elements for Indicator 12 (Table 3) were developed in consultation with DIPNR, NSW National Parks & Wildlife Service (NPWS), NSW Fisheries and ERM.

Ecological consultants engaged by Landcom are required to provide data on Indicator 12 as part of their ecological assessment if the project site has a watercourse, whether perennial or intermittent. Tables to assist in data collection for Indicator 12 are provided as Attachment B to this Methodology. Completed tables and the Landcom Proforma should be submitted as separate documents upon completion of the ecological assessment.

#### Outputs

All data collected on Indicator 12 should be integrated within the consultants' independent ecological assessment report. In addition, all Landcom projects require Indicator 12 data to be collected and submitted by consultants separately to the ecological report. This Methodology provides tables for collection of required data as Attachment B. These tables will be submitted to Landcom upon completion of the ecological assessment of the project site. Consultants are also required to complete and submit the Proforma provided by Landcom. The Proforma is to be submitted electronically.

Further information and a worked example are provided in the following sections.

#### 3.1.2 Definition

For the purposes of this data collection, a *River* has been defined under the *Water Management Act 2000* (WM Act), and this definition has been used as a general guide as to what constitutes a 'stream' for Landcom's Indicator 12 reporting.

"River includes:

- (a) any watercourse, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved, and
- (b) any tributary, branch or other watercourse into or from which a watercourse referred to in paragraph (a) flows, and
- (c) anything declared by the regulations to be a river,

but does not include anything declared by the regulations not to be a river" (Section 4 – *Water Management Act 2000* No. 92).

### 3.1.3 Determination of Stream Quality

In considering management of riparian land, it is important to know the existing condition of a stream as well as its strategic value and potential for providing connectivity. As with vegetation, Landcom wish to use a standard, consistent methodology to classify riparian systems. DIPNR is the consent authority for Part 3a Permits under the *Rivers and Foreshores Improvement 1948* (RFI Act). The RFI Act and the Part 3a permits will be repealed by the WM Act once a Regulation for "Controlled Activity Approvals" has been finalised.

DIPNR does not currently have a simplified and publicly available system for stream classification, although several site-specific projects in the greater metropolitan area are working towards this end. Several systems exist (eg. AUSRIVAS), usually requiring detailed consideration of physical, chemical and biological attributes, but these are neither simple to apply, nor consistent across a wide area.

Landcom in consultation with DIPNR has decided to use the classification approach outlined in the Draft Riparian Corridor Management Study for Wollongong Local Government Area. This approach will enable Landcom to carry out site-specific classifications of streams similar to the methodology proposed for vegetation classification in Indicator 11.

Three broad categories for riparian land will be used to reflect the relative importance of a watercourse. DIPNR has already mapped riparian objectives for streams in some areas of Sydney's growth corridors classifying them into the three significance categories. Where mapping information is not available early consultation with DIPNR officers (RFI staff) will assist in classifying the streams on site.

The three categories used reflect the long-term / desired outcomes based on simplified objectives. Achieving each objective via a vegetated riparian area has implications for width of land required adjacent to watercourses. It is these spatial implications that are critical to subdivision and developable footprints.

The three significance categories and their associated environmental objectives are:

#### **Category 1 – Environmental Corridors (High Significance)**

These waterways provide the core means for enabling biological networks to function within and across catchments. Category 1 waterways are those key trunk streams that extend as far as possible through catchments where limited constraints exist. Less significant streams can also gain a Category 1 rating where links to substantial nodes of terrestrial vegetation exist (especially that vegetation recognised by NPWS as 'core' or 'support for core').

Waterways that may be in very good condition (generally due to previous zoning protection or due to difficult topography), have sensitive receiving waters or supply wetlands, and those that may be geomorphically unique (eg. Chain of Ponds) can also warrant Category 1 ranking. Category 1 streams generally need to have 'origins' and 'destinations' (eg. nodes of vegetation) over longer distances wherever possible.

The objective for Category 1 streams is maximising the connectivity of terrestrial and aquatic habitat by:

- Providing a continuous corridor for the movement of flora and fauna

- Providing extensive habitat (and connectivity between habitat nodes) for terrestrial and aquatic fauna
- Maintaining the viability of native riparian vegetation
- Managing edge effects at the riparian/urban interface
- Providing bank stability
- Protecting water quality
- Limiting unsuitable urban incursion into this network to retain its value

Target riparian corridor width > 40 m from top of bank plus additional 10 m vegetated buffer to counter edge effects.

### **Category 2 – Terrestrial and Aquatic Habitat (Moderate Significance)**

The objective for Category 2 streams is maintaining and restoring as much as possible the natural functions of a stream to:

- Maintain the viability of native riparian vegetation
- Provide suitable habitat for terrestrial and aquatic fauna
- Provide bank stability
- Protect water quality

Target riparian corridor width > 20 m from top of bank plus additional 10 m vegetated buffer to counter edge effects.

### **Category 3 – Bank Stability and Water Quality (Low Significance)**

The objective for Category 3 streams is minimising sedimentation and nutrient transfer to:

- Provide bank stability
- Protect water quality
- Protect native vegetation

Target riparian corridor width = 5- 10 m but no prescribed vegetated buffer.

All data on streams is to be presented in reference to the above stream categories.

### **3.1.4 Stream Length - Data Elements 12(a) to (c), 12(g) to (i) and 12(m) to (o)**

In limited instances and where strong justification is provided, streams that are degraded and of low significance to aquatic flora and fauna may be realigned. It is therefore necessary to report Data Elements 12(a), (b), (c), (g), (h), (i), (m), (n) and (o) within the appropriate stream significance category as outlined in Section 3.1.3.

During realignment the natural stream bed is filled and an artificial one is created along a different route. Data Elements 12(a), (b), (c), (g), (h), (i), (m), (n) and (o) provide Landcom with information on the length of stream that may have been removed or realigned due to development. In most cases the length of the stream post-development will be the same as the length pre-development, due to the need to maintain hydraulic balance.

During realignment, various breaks and obstructions may be utilised. These breaks and obstructions include culverts, channelling, piping and filling. The total length of in-stream breaks and obstructions is to be reported at Data Element 12(c), (i) and / or (o). Types of in-stream breaks and obstructions are detailed below.

### **3.1.5 In-stream Breaks and Obstructions – Data Elements 12(d), (e), (j), (k), (p) and (q)**

In-stream breaks and obstructions restrict the passage of fish and other aquatic species and can include (depending on the nature of their construction):

- Rock Lining
- Crossings, including Bridges, Culverts and Fords
- Weirs and Dams
- Realignments
- Piping
- Channelisation
- Hard-engineered Bank Stabilisation
- Other obstructions to fish passage and connectivity along and across streams

The number and type of in-stream break / obstructions will be reported for both the pre- and post-development stages of the project. Note: A barrier or obstruction need only create a fall of 10 cm to block fish passage (Fisheries 2003).

### **3.1.6 Total Area of Riparian Land Retained – Data Element 12(f), (l) and (r)**

The total area of riparian land retained can be calculated from the length of the post- development stream and the achieved or target riparian corridor width. The target riparian corridor width will be determined by DIPNR as part of the 3a Permit. Riparian widths are measured from the top of bank on either side of the watercourse.

NB: Due to bends in a stream this calculation will be an approximation of area retained only. An example is provided in Section 4.1.4

### **3.1.7 Aquatic Threatened Species, Communities and Populations – Data Element (s)**

Surveys of stream quality and aquatic threatened species will be carried out for all Landcom projects where Indicator 12 is applicable. Data Element 12(s) is a list of aquatic threatened species, communities and populations recorded within the project site. For example Trout Cod (Species), the Aquatic Ecological Community in the Natural Drainage System of the Lower Murray River Catchment (Community) or western population of Purple Spotted Gudgeon (Population).

### **3.1.8 Riparian Corridor Management Plans – Data Elements 12(t) and 12(u)**

Works that affect the flow of protected waters or involve excavation/removal of material within 40 metres of the top of a riverbank require a Part 3a Permit under the RFI Act. Applications for a Part 3a Permit are assessed by DIPNR and require a Riparian Corridor Management Plan (RCMP). Such plans are similar to Vegetation Management Plans, but are focussed on the land within 40 m of a watercourse.

RCMPs should address the following issues:

- Preventing erosion
- Maintaining bank stability and integrity
- Promote, protect and enhance biodiversity
- Diversity of habitat opportunities – shelter, food resources, corridor opportunities
- Maintain native vegetation and exclude exotic species
- Maintenance and rehabilitation of the full range of biophysical functions of the riparian zone in line with Category objectives
- Protection of water quality – sedimentation, nutrients and other pollutants
- Provision of a vegetated buffer – water quality and visual impact
- Long term management of foreshore values
- Protection of visual amenity
- Identification of bushfire setbacks (ie. Asset Protection Zones) measured from outer edge of vegetation
- Management of water quality / flow conveyance (ie. hydraulic flows/stresses) under the full range of flow events

### **3.1.9 Environmental Protection Zoning - Data Elements 12(v) and 12(w) –**

The land use zoning under a local planning instrument, Local Environmental Plan (LEP) differs for each Council area. The aim for these Data elements is to identify if there is an area within the project site specifically zoned by Council or as a result of the development for conservation (usually one of the sub categories in '7 – Environmental Protection Zone') under the LEP. If so, how much area is allotted to the conservation zoning within the project site?

### **3.1.10 Area for Rehabilitation - Data Element 12(x)**

This Element provides Landcom with information on the type of rehabilitation work being undertaken within the project site. Examples of rehabilitation works to report on include:

- Erosion control measures
- Bank stabilisation
- Revegetation of riparian corridor
- Weed clearance

### 3.2 Example – Ecological Consultant’s Indicator 12 Report for Riverside Estate Development Project

The following is a worked example of Indicator 12 data collection and reporting. Data displayed in **bold** in example tables are those that consultants will enter into the Proforma.

#### 3.2.1 Data Elements 12(a), (b), (c), (g), (h), (i), (m), (n) and (o) – Stream Length

##### Determination of Stream Quality

DIPNR may need to be consulted to determine the category of a stream. Objectives for the post-development stream should be contained within a RCMP for the site. Condition of the stream should be addressed within an Aquatic Assessment report.

The target riparian corridor width can be reported once the Category of the stream has been decided. The achievement of the target will be included within Table 3.2.1 in Attachment B as shown in the example below.

##### Length of Stream.

The length of the pre- and post-development stream can be entered directly into the Proforma.

**Table 3.2.1 Sample table showing collection and presentation of Data Elements 12(a), (b), (c), (g), (h), (i), (m), (n) and (o) and target corridor width**

Stream Quality and Significance	Pre-development Length	Post development Length	Length of Obstructions	Target Corridor Width	Target Achieved?
Category 1 - High				40m	
Category 2 - Moderate				20m	
Category 3 – Low	800	900	90	5-10m	Yes
<b>Total (m)</b>	<b>800</b>	<b>900</b>	<b>90</b>		100%

#### 3.2.2 Data Elements 12(d), (e), (j), (k), (p) and (q) – In-Stream Breaks and Obstructions

All types of in-stream breaks and obstructions, whether they create an obstruction to species passage through the waterway or not, will be reported at Elements 12(d), (e), (j), (k), (p) and (q). The length of all in-stream breaks and obstructions should be totalled for the project site and entered into the Proforma at Data Elements 12(c), (i) and / or (o).

The total number of in-stream breaks and obstructions should be reported within the Proforma at Data Elements 12(d), (e), (j), (k), (p) and (q).

**Table 3.2.2 Sample table for collection and presentation of Data Elements 12(d), (e), (j), (k), (p) and (q)**

Stream Quality and Significance	Number of pre-development in-stream breaks	Type of in-stream breaks pre-development	Length of pre-development in-stream breaks (m)	Number of post-development in-stream breaks	Type of in-stream breaks post-development	Length of post-development in-stream breaks (m)
Enter Stream Category and Significance						
	2	Dam	2 * 30 = 60	2	Dam	60
	1	Culvert	10	1	Culvert	10
	2	pipng	2* 15 = 30			
<b>Total</b>	<b>5</b>		<b>100</b>	<b>3</b>		<b>70</b>

### 3.2.3 Data Elements 12(f), (l) and (r) – Area of Riparian Land Retained

The area of retained riparian land can be calculated from the length of the post-development stream and the riparian corridor width. This calculation will be an approximation of area only, due to the likelihood of bends occurring along the stream length. However it is expected the stream bends will be of a gentle nature and therefore the approximation should be close to the true area. If a stream runs through a site (as opposed to bordering) the data need to be multiplied by 2 (for either side of the bank).

Calculating riparian area retained for the example Category 3 stream (riparian corridor width of 10m):

$$= 900 \text{ m} * 10 \text{ m} * 2 = 18000 \text{ m}^2$$

$$= \mathbf{1.8 \text{ ha}}$$

**Table 3.2.3 Sample table showing presentation and calculation of Data Element 12(f)**

Stream Quality	Pre-development Stream Length (m)	Post-development Stream Length (m)	Riparian Corridor Width (m)	Area of Riparian Land Retained (ha)
Category 1 – High Significance				
Category 2 – Moderate Significance				

Category 3 – Low Significance	800	900	10	$900 \times 10^2 =$ $18000\text{m}^2 =$ <b>1.8</b>
-------------------------------	-----	-----	----	--

### 3.2.4 Data Element 12(s) - Aquatic Threatened Species, Communities and Populations

Data Element 12(s) is a list of the aquatic threatened species, communities and populations recorded on site. This Element does not refer to threatened species that may have been assessed within eight-part tests but were not recorded within the project site.

#### Species

- River Snail

#### Communities

- (None)

#### Populations

- Western Population of Olive Perchlet

For this example, the number of recorded threatened species is 2. (Do not include terrestrial species).

### 3.2.5 Data Elements 12(t) and 12(u) – Riparian Corridor Management Plan

If an adequate Riparian Corridor Management Plan has been prepared for the site, Data Element 12(t) is “Yes” and Data Element 12(u) will be the details of the plan, for example:

Title:	Riverside Riparian Corridor Management Plan
Author:	Tiga Empat Consulting
Date:	5 October 2002
Location / File Number:	Landcom Job No. 12345

An adequate RCMP should address most, if not all, of the Elements outlined in Section 3.1.8.

### 3.2.6 Data Elements 12(v) and 12(u) - Environmental Protection Zoning

Where all land on the developed site is to be on a single land use zoning or does not support a conservation zone, Data Element 12(v) is “No”. Otherwise, where there is a specific conservation zone, Data Element 12(v) is “Yes” and the total area under the protection zoning should be entered into the Proforma at Data Element 12(u).

For project sites with more than one type of conservation zoning, data should be collected in Table 3.1.6 in Attachment B as shown in the example below, and the *total* conservation area entered into the Proforma at Data Element 12(u).

**Table 3.2.6 Sample table showing collection of data for Indicator 12(u)**

<b>Land Use Zoning</b>	<b>Area of Site (ha)</b>
Environmental Protection	3
Conservation	10
<b>Area for conservation</b>	<b>13</b>
Total Site Area (ha)	60

From the sample table:

**13 hectares** of the project site falls within an environmental protection zone.

### **3.2.7 Data Element 12(x) – Area for Rehabilitation**

Consultants should provide dot points on the types of rehabilitation works being undertaken within the riparian zone of the project site. These should be integrated within the ecological assessment report and entered directly into the Proforma.

### **3.2.8 Data Element 12(y) – Data Sources**

All sources of data utilised in the collection of Indicator 12 data need to be referenced within the 'Data Sources' cell of the Proforma table. These sources may include Landcom File numbers and locations, Masterplans, DA documents and other reference material.

**Table 3.3 Presentation of Indicator 12 Data Elements for Riverside Estate Development Project Example Proforma**

Indicator	Project Name (and Precinct if applicable)	Data Element	Type of Data	Data	
12. Riparian Corridor Management	Riverside Estate Precincts 1 and 2	<b>High Significance</b>			
		a	Total Length of pre-development stream.	Number	
		b	Total Length of post-development stream	Number	
		c	Length of stream as piping, filling, channeling, culverts	Number	
		d	Number of pre-development in-stream breaks	Number	
		e	Number of post-development in-stream breaks	Number	
		f	Area of riparian land retained	Number	
		<b>Moderate Significance</b>			
		g	Total Length of pre-development stream.	Number	
		h	Total Length of post-development stream	Number	
		i	Length of stream as piping, filling, channeling, culverts	Number	
		j	Number of pre-development in-stream breaks	Number	
		k	Number of post-development in-stream breaks	Number	
		l	Area of riparian land retained	Number	
		<b>Low Significance</b>			
		m	Total Length of pre-development stream.	Number	800
		n	Total Length of post-development stream	Number	900
		o	Length of stream as piping, filling, channeling, culverts	Number	70
		p	Number of pre-development in-stream breaks	Number	5
		q	Number of post-development in-stream breaks	Number	3
		r	Area of riparian land retained	Number	1.8
		s	List the names of aquatic threatened species, communities and populations recorded on site.	Text	Species; River Snail, Population: Western Population of Olive Perchlet
		t	Was a Riparian Corridor Management Plan (RCMP) prepared for the site?	Yes/No	Yes
		u	If yes, please provide details of the Riparian Corridor Management Plan: report title, author, date and location / file number.	Text	Title: Riverside Riparian Corridor Management Plan, Author: Tiga Empat Consulting, Date:5 October 2002, Location / File Number: Landcom Job No. 12345
		v	Is there an area of riparian land on site specially zoned for conservation?	Yes/No	Yes
		w	Total area of riparian land under conservation zoning.	Number	13
		x	If rehabilitation work was carried out, briefly describe the key features of any rehabilitation work.	Text	Erosion control, bank stabilisation
		y	<i>Data sources</i>	Text	NPWS (2002), Landcom Job No: 12345

### **3.3 Instructions for Consultants**

Follow steps 1 to 6 below:

1. Read Methodology and be aware of the data required for reporting of Indicator 12.
2. Conduct Ecological/Aquatic Assessment of Landcom project site.
3. Refer to Tables provided in Attachment B and complete (tables are available electronically in Microsoft word - email [sustainability@landcom.nsw.gov.au](mailto:sustainability@landcom.nsw.gov.au)).
4. Complete Proforma provided by Landcom for Indicator 12 (Proforma is available electronically in Microsoft Excel - email [sustainability@landcom.nsw.gov.au](mailto:sustainability@landcom.nsw.gov.au)).
5. Submit Ecological Assessment report and completed Tables to Landcom.
6. Submit Proforma electronically to [sustainability@landcom.nsw.gov.au](mailto:sustainability@landcom.nsw.gov.au) and copy to your contact person (i.e. development manager) at Landcom.

### **3.4 Reporting Indicator 12 in Landcom's Annual Sustainability Report**

Individual project reports will be prepared by consultants for each project, but will not be reported separately in the annual Sustainability Report.

The figures to be presented in the annual Sustainability Report for Indicator 12 will be aggregated from all projects delivered in a given reporting year. These figures will then be used to generate the performance data for the annual Sustainability Report.

## 4 References

Little (1999a) Bush Regeneration on the Cumberland Plain Principles and Current Practice, a report by Debra Little for the South Creek Catchment Management Committee and the Australian Association of Bush Regenerators.

Little (1999b) Bush Regeneration on the Cumberland plain 1999 Best Practice Guidelines Prepared by Debra Little for the South Creek Catchment Management Committee and the Australian Association of Bush Regenerators.

NPWS (2002) Guidelines for the Conservation Significance Assessment of the Native Vegetation of the Cumberland Plain, Western Sydney. NSW National Parks and Wildlife Service Hurstville.

## 5 Glossary

DCP	Development Control Plan
DIPNR	Department of Infrastructure Planning and Natural Resources
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ERM	Environmental Resources Management Pty Ltd
LEP	Local Environment Plan
NPWS	NSW National Parks and Wildlife Service
RCMP	Riparian Corridor Management Plan
RFI Act	<i>Rivers and Foreshores Improvement Act 1948</i>
TBL	Triple Bottom Line
TSC Act	<i>Threatened Species Conservation Act 1995</i>
TSSC	Threatened Species Scientific Committee
VMP	Vegetation Management Plan
FM Act	<i>Fisheries Management Act 1994</i>
WM Act	<i>Water Management Act 2000</i>

---

## Attachment A – Tables to Accompany TBL Indicator 11 Reporting

Table A1 – Proforma for Indicator 11 (Proforma will be provided, and should be submitted, electronically)

Indicator	Project Name (and Precinct if applicable)	Data Element	Data Element	Type of Data	Data
11. Native Vegetation Management			<b>High Conservation Significance</b>		
		a	Total area of pre-development native vegetation.	Number	
		b	Total area of native vegetation cleared.	Number	
		c	Total area of pre-development threatened communities.	Number	
		d	Total area of threatened communities cleared.	Number	
			<b>Moderate Conservation Significance</b>		
		e	Total area of pre-development native vegetation.	Number	
		f	Total area of native vegetation cleared.	Number	
		g	Total area of pre-development threatened communities.	Number	
		h	Total area of threatened communities cleared.	Number	
			<b>Low Conservation Significance</b>		
		i	Total area of pre-development native vegetation.	Number	
		j	Total area of native vegetation cleared.	Number	
		k	Total area of pre-development threatened communities.	Number	
		l	Total area of threatened communities cleared.	Number	
		m	Total area of native vegetation for revegetation	Number	
		n	Total area of threatened communities for revegetation	Number	
		o	List the names of threatened species, communities and populations recorded on site.	Text	
		p	Was a vegetation management plan prepared for the site?	Yes/No	
		q	If yes, please provide details of the Vegetation Management Plan: report title, author, date and location / file number	Text	
r	Is there an area of native vegetation on site specially zoned for conservation?	Yes/No			
s	Total area of vegetation under conservation zoning.	Number			
t	<i>Data sources</i>	Text			

**Table 2.1.1 for collection and presentation of Data Elements 11(a), (b), (e), (f), (i), (j) and (m)**

Native Vegetation Community – Threatened Species Habitat	Conservation Significance*								
	High		Moderate		Low		All		
	Pre-dev.	Cleared	Pre-dev.	Cleared	Pre-dev.	Cleared	Pre-dev.	Cleared	Revegetate <sup>d</sup>
<b>Total (ha)</b>									

\* Cite reference for conservation significance assessment within ecological assessment report.

**Table 2.1.2 for collection and presentation of Data Elements 11(c), (d), (g), (h), (k), (l) and (n)**

Threatened Community	Conservation Significance*								
	High		Moderate		Low		All		
	Pre-dev.	Cleared	Pre-dev.	Cleared	Pre-dev	Cleared	Pre-dev.	Cleared	Revegetated
<b>Total (ha)</b>									

\*Cite reference for conservation significance assessment within ecological assessment report.

**Table 2.1.5 for collection of data for Data Element 11(s)**

Land Use Zoning	Area of Site (ha)	Area of Native vegetation (ha)
<b>Area zoned for conservation</b>		
Total Area (ha)		

## ATTACHMENT B - Tables to Accompany TBL Indicator 12 Reporting

Table B1 – Proforma for Indicator 12 (Proforma will be provided, and should be submitted, electronically)

Indicator	Project Name (and Precinct if applicable)	Data Element	Data Element	Type of Data	Data
12. Riparian Corridor Management			<b>High Significance</b>		
		a	Total Length of pre-development stream.	Number	
		b	Total Length of post-development stream	Number	
		c	Length of stream as piping, filling, channeling, culverts	Number	
		d	Number of pre-development in-stream breaks	Number	
		e	Number of post-development in-stream breaks	Number	
		f	Area of riparian land retained	Number	
			<b>Moderate Significance</b>		
		g	Total Length of pre-development stream.	Number	
		h	Total Length of post-development stream	Number	
		i	Length of stream as piping, filling, channeling, culverts	Number	
		j	Number of pre-development in-stream breaks	Number	
		k	Number of post-development in-stream breaks	Number	
		l	Area of riparian land retained	Number	
			<b>Low Significance</b>		
		m	Total Length of pre-development stream.	Number	
		n	Total Length of post-development stream	Number	
		o	Length of stream as piping, filling, channeling, culverts	Number	
		p	Number of pre-development in-stream breaks	Number	
		q	Number of post-development in-stream breaks	Number	
		r	Area of riparian land retained	Number	
		s	List the names of aquatic threatened species, communities and populations recorded on site.	Text	
		t	Was a Riparian Corridor Management Plan (RCMP) prepared for the site?	Yes/No	
		u	If yes, please provide details of the Riparian Corridor Management Plan: report title, author, date and location / file number.	Text	
		v	Is there an area of riparian land on site specially zoned for conservation?	Yes/No	
		w	Total area of riparian land under conservation zoning.	Number	
		x	If rehabilitation work was carried out, briefly describe the key features of any rehabilitation work.	Text	
Y	<i>Data sources</i>	Text			

**Table 3.2.1 for collection and presentation of Data Elements 12(a), (b), (c), (g), (h), (i), (m), (n) and (o) and target corridor width**

Stream Quality and Significance	Pre-development Length	Post development Length	Length of Obstructions	Target Corridor Width	Target Achieved?
Category 1 - High				40m	
Category 2 - Moderate				20m	
Category 3 - Low				5-10m	
<b>Total (m)</b>					

**Table 3.2.2 Sample table for collection and presentation of Data Elements 12(c), (d), (e), (i), (j), (k), (o), (p) and (q)**

Stream Quality and Significance	Number of pre-development in-stream breaks	Type of in-stream breaks pre-development	Length of pre-development in-stream breaks (m)	Number of post-development in-stream breaks	Type of in-stream breaks post-development	Length of post-development in-stream breaks (m)
Enter Stream Category and Significance						
<b>Total</b>						

**Table 3.2.3 for presentation and calculation of Data Element 12(f), (l) and (r)**

Stream Quality	Pre-development Stream Length (m)	Post-development Stream Length (m)	Riparian Corridor Width (m)	Area of Riparian Land Retained (ha)
Category 1 – High Significance				
Category 2 – Moderate Significance				
Category 3 – Low Significance				

**Table 3.2.6 for collection of data for Indicator 12(w)**

Land Use Zoning	Area of Site (ha)
<b>Area for conservation</b>	
Total Site Area (ha)	