



ACT
Government
Environment and Planning

ACT Environmental Offsets Calculator Operational Manual

10 February 2016

Acknowledgement

This Assessment Methodology and the ACT Environmental Offsets Calculator are based on the former NSW Department of Environment, Climate Change and Water's BioBanking Assessment Methodology and Credit Calculator Operational Manual and the BioBanking Credit Calculator (BBCC) version 1.1. The provision of the calculator, assessment methodology, manual and programming behind the BBCC is gratefully acknowledged.

Information from PlantNET was gratefully used for some plant descriptions incorporated into the calculator.

The Royal Botanic Gardens and Domain Trust (31 May 2011) PlantNET – Visit the [Plant Information Network System of The Royal Botanic Gardens and Domain Trust, Sydney, Australia](#).

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1 INTRODUCTION

Environmental offsets are measurable conservation outcomes resulting from actions designed to compensate for significant adverse environmental impacts arising from project development, after appropriate avoidance and mitigation measures have been implemented. The aim of offsetting is to maintain or improve the likelihood of species, communities and habitat persisting into the future.

The use of the ACT Environmental Offsets Calculator (EOC) will give effect to environmental offset principles¹ in a quantifiable, transparent, repeatable, timely and equitable manner. A result will be that, in most circumstances, ACT and Commonwealth offset requirements can be addressed concurrently and are able to operate effectively together.

The environmental offsets calculator provides a simple user friendly tool which still maintains scientific rigour. To achieve this, the calculator provides a balance between complexity and user friendliness for the assessment of environmental offsets. Because of this it is most appropriately used to assess offsets at individual sites, rather than strategic level assessments.

The ACT EOC provides a rigorous, consistent and credible means of assessing relative values for protected matters. It specifies:

- which species must be surveyed for at a particular location and the survey methodology that must be employed;
- what vegetation or habitat is of more concern and it is unlikely that it would be appropriate to offset; and
- for vegetation and habitat that can be cleared, the offset requirements that can compensate for the environmental impacts caused by the clearance.

The ACT EOC includes data on lowland species and vegetation communities of conservation importance. Lowlands are generally those below 750m.

For proposals that may impact on upland species (above 750m), aquatic or riparian ecosystems or vegetation within Namadgi National Park or Tidbinbilla Nature Reserve, the Commonwealth Offsets Assessment Guide should be used.

The calculator combines stored information with site specific survey data to determine the protected matters values of development and offset sites.

There are two types of credits calculated using the EOC. These are:

- Ecological community credits – these are created or required for impacts on protected matters values that can be reliably predicted by vegetation.
- Species credits – these are created or required for impacts on protected matters that cannot be reliably predicted to use an area of land based on vegetation alone.

¹ The Environmental Offsets Principles are outlined in the ACT Offsets Policy which incorporates the EPBC Act (*Environment Protection and Biodiversity Conservation Act 1999*) Environmental Offsets Policy.

This Environmental Offsets Operational Manual (the manual) provides a guide for using the EOC. The manual provides detailed guidance on how to apply the ACT Environmental Offsets Assessment Methodology (the methodology²) (see **Appendix 1**) and how to use the EOC to determine the number of credits required at a development site or created at an offset site. Users should refer to the methodology for further information on how credits are calculated.

Sections 2 and 3 give detailed information on how to use each step in the EOC. The information in these sections is set out in the order in which information is entered into the EOC.

This manual, the methodology and the EOC are largely based on the NSW Office of Environment and Heritage *BioBanking Assessment Methodology and Credit Calculator Operational Manual* and the BioBanking Credit Calculator (BBCC). The provision of the manual, the BBCC and programming behind the BBCC is gratefully acknowledged.

The major differences between the NSW and ACT offsetting approaches are the ACT calculator:

- includes matters of national environmental significance that are listed under Commonwealth legislation;
- has been populated with information on vegetation communities and species relevant to the ACT;
- specifies the survey techniques that need to be undertaken for significant species;
- provides more detailed consideration of threshold issues for species ('flags') and provides offset rules specifically relating to ACT occurrences; and
- adopts a simplified approach to measuring landscape value.

² The Environmental offsets methodology is a notifiable instrument under the *Planning and Development Act 2007*.

2 HOW TO OPERATE THE CALCULATOR: DEVELOPMENT SITES

Microsoft Access software is required to run the calculator. If Microsoft Access is installed, the calculator requires no installation and it can simply be saved to a local or network drive. The calculator is available on the [EPD Website](#).

PLEASE NOTE (if required)

To ensure that the user interface (UI) display is fully visible on-screen set the computer monitor display properties using the following steps:

Click on the **Start** menu in the bottom left hand corner of your screen. Then select **Settings** and single click on **Control Panel**. Next double click on **Display**. You should now see the **Display Properties** window.

Select the **Settings** tab. Set **Screen Resolution** to at least **1280 x 1024 pixels** by clicking on and dragging the pointer. Click on the **Advanced** button. Select the **General** tab and then from the **DPI Setting** select **Normal size (96DPI)**. Then click **OK**. If there is a compatibility section under this tab then before clicking the OK button you can try to apply the new display settings without restarting, however, if this does not work you will need to restart the computer. It is advisable to first close any other applications you may have open.

2.1 Open the calculator

To open the calculator, simply double click on the .mdb icon from Windows Explorer. Several messages may appear while the EOC is opening. It is unlikely all of the following messages will appear, but they may include:

1. Open File – Security Warning. Do you want to open this file? (Click *Open*).
2. Convert/Open Database (Select *Open* and press *OK*).
3. Do you want to block unsafe expressions (Select *No*).
4. Security Warning (Select *Options* and *Enable this content*).

Once all warnings have been addressed the calculator will open. Click *Next* to proceed through the first page, read the disclaimer and accept the terms if you agree to them. Then select *Development Sites* to begin the assessment of a development site.

To start a new case for assessment, click on the ►✱ button at the bottom of the page.

2.2 Enter proposal details and location information

The details of the proposal are entered into the *Assessment of a Development Site* screen (Error! Reference source not found.).

There are three assessment types. These are:

- full assessment (default option);
- assessment for *Environment Protection and Biodiversity Conservation Act 1999* listed matters only; and
- assessment for *Nature Conservation Act 2014* listed matters only.

The matters included in the assessment will be different for each option. A full assessment should be run unless there is a specific reason for an assessment of matters listed under only one of the Acts.

Warning: The assessment type needs to be selected before any data is entered into the assessment steps. If the assessment type is changed any data which has been entered in the assessment steps will be deleted.

The Proposal ID number is an automatically generated number.

A name for the development should be provided.

Select the ACT District the development occurs within using the dropdown menu. If a proposal occurs over more than one district select the district in which the development is mostly located.

Appendix 2 provides a map of ACT Districts. This map and shapefiles can also be downloaded from the [EPD website](#).

The street address should be provided if the development is in an urban area.

The block, section number and district for each affected block is added by clicking on the *Enter Block Details* button, which opens a new screen. If more than one block and section number is required, additional space will appear once numbers are entered. Block and section numbers can be identified using [ACTMAPi](#).

Complete the proponent and assessor details.

Next, select the name of the ACT region in which the development site is located from the dropdown menu in the Location Details box. **Appendix 3** provides a map of ACT regions. This map and shapefiles can also be downloaded from the [EPD website](#). Follow the same process for selection of the subregions.

Please Note: The calculator will allow only one ACT region to be entered. If the development site occurs mainly within one region and only occurs marginally within another (that is 20ha or less) then treat the development as occurring entirely within the dominant region. If the development extends beyond this then the site must be assessed as separate proposals. This is because different significant species need consideration in different ACT regions.

The *Assessment of a Development Site* screen also contains the assessment steps that must be followed to complete an assessment. Clicking any of the buttons will lead to that part of the assessment (Error! Reference source not found.). Please note the assessment steps must be done in order as each step uses information from previous steps to inform the assessment. Also, if any details in earlier steps are changed, the data in the later steps will be deleted.

Assessment of a Development Site

Assessment Type
The appropriate Assessment Type must be selected before any other data is entered

- ☒ Full Assessment (default)
- ☐ Assessment for Environment Protection and Biodiversity Conservation Act 1999 listed matters only
- ☐ Assessment for Nature Conservation Act 2014 listed matters only

Development Details

Proposal ID:

Development Name:

Development District:

Division and street address:

Proponent Details

Proponent Name:

Proponent Address:

Proponent Phone:

Assessor Details

Assessor Name:

Assessor Address:

Assessor Phone:

☐ Completed ACT Environmental Offsets Calculator training

Location Details

ACT Region:

ACT Subregion:

Assessment Steps

- 1. Landscape Value and Vegetation Zones Not complete
- 2. Identify Geographic and Habitat Features Not complete
- 3. Undertake Site Survey Not complete
- 4. Enter Survey Results Not complete
- 5. Report on Credit Requirements Not complete

Please use the resources in the operational manual to help you identify the location of the site.

Figure 1 Opening screen for assessment of a development site

2.3 Step 1 – Landscape Value and Vegetation Zones

2.3.1 Step 1a – Enter landscape value scores

To enter the details of a sites landscape value score click the *Assessment Step 1 – Landscape Value Scores – Significant Species Zone Data* button.

There are two scores which need to be entered at this step - habitat context and link value. Geographic Information System (GIS) data layers are provided on the [EPD website](#) to support calculation of habitat context and link value scores. A worked example is provided in **Appendix 12** for information.

Further information on the study can be found in the study report and on [ACTMAPi](#).

Please use the data provided on [ACTMAPi](#) and the worked example in **Appendix 12** to calculate percentages for this step. The percentage of the development area within each zone needs to be entered into the relevant table at Step 1a (see **Figure 2**).

Click the *Calculate Landscape Value Score* button to calculate the landscape value for the development proposal. For an explanation of how the landscape value score is determined see **Appendix 12** of this manual and the Assessment Methodology.

The ACT subregion in which the development occurs must be selected from the drop-down menu. If the development site occurs mainly within one subregion and only occurs marginally within another (that is 20ha or less) then treat the development as occurring entirely within the dominant subregion. If a development occurs across more than one subregion, a separate assessment should be conducted for each subregion. A subregion map is provided in **Appendix 4** or it can be downloaded from the [EPD website](#). The shapefiles for the subregions can also be downloaded.

Step 1a - Enter Landscape Value Scores

Landscape score: 27

Neighbourhood Habitat Context Value

% Development within zone(must add up to 100%)	Zone Type	Zone Score
0	Very Low	3
0	Low	10
100	Moderate	15
0	High	28
0	Very High	38

calculate landscape value score

Link Value

% Development within zone(must add up to 100%)	Zone Type	Zone Score
0	Low Linkage	3
100	High linkage	12

Status: In progress

Enter Vegetation Zones

Done

Figure 2 Landscape value scores are entered in Step 1a

2.3.2 Step 1b – Enter vegetation zones

A vegetation zone is the area of vegetation that is assessed initially to determine which significant species are assessed for credits at a site. Vegetation zones are relatively homogenous areas of the same vegetation type in a similar condition. Each zone should be a distinct vegetation type (according to the definitions in the [Vegetation Types Database](#)) and similar broad condition class. A new vegetation zone must be added for each new vegetation type, or where the same vegetation type occurs in both low condition (Native Pasture or Paddock Trees) and moderate to good condition (see **Table 1** for definitions). Vegetation zones are assessed using transects and plots to collect site information, which is used to determine the site value (condition) of the zone.

Vegetation that is substantially outside benchmark due to a recent disturbance, such as fire, flood or prolonged drought, is not considered degraded. Vegetation that has been recently disturbed, or is regenerating after an event such as fire or flood, must be assessed on an equivalent site that is not disturbed in these ways. The equivalent, undisturbed site must be approved by the Conservator prior to issuing approval for a project. Sites that are deliberately degraded prior to an assessment may be subject to investigation by ESDD.

To enter vegetation zones click the button at the bottom of the Step 1a screen.

For operational reasons, the minimum size of a vegetation zone is 0.25 ha. An area of vegetation that is less than 0.25 ha is included in the adjoining vegetation zone. Where more than one zone adjoins an area of vegetation of less than 0.25 ha, then the 0.25 ha area should be included in the zone with the closest condition and percent cleared value in the region. If the total area of native vegetation on the development site is an area of less than 0.25 ha, then the assessor should consult EPD on an appropriate method for assessment.

Vegetation zones must be digitised onto a recent aerial photograph or Spot 5 image (see **Figure 3**) and the information confirmed through a site visit. A Global Positioning System (GPS) should be used in the field to confirm the boundaries of the zones. Aerial photos may be required for greater detail or for non-woody vegetation types.

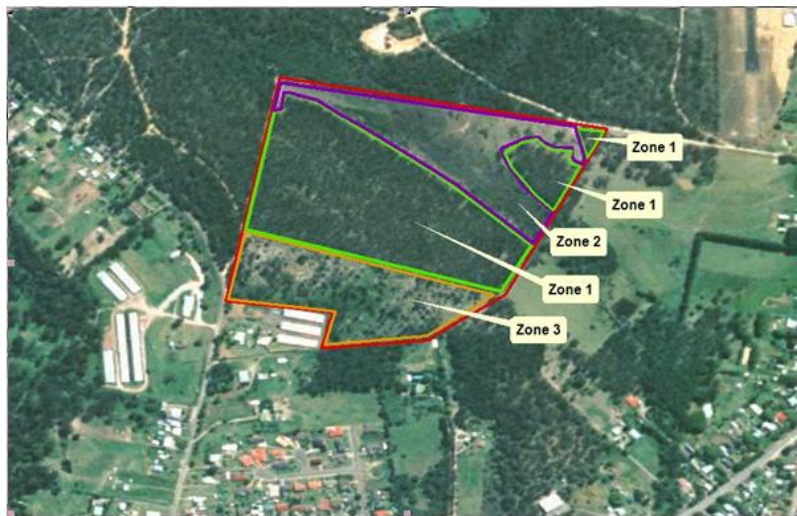


Figure 3 Vegetation Zones

Each vegetation zone must be identified with a name or number (Veg Zone ID). This allows it to be tracked through later steps in the assessment (**Figure 5**). The recommended format for naming the Veg Zone ID is a brief summary of the Vegetation Type followed by the initials of the condition class, e.g. for Yellow-Box Red-Gum Grassy Woodland in a moderate/good condition, please enter BGW_MG.

A vegetation zone is not required for assessing cleared land on a development site. Cleared land is a native vegetation area on which the native over-storey has been cleared, there is no native mid-storey, and less than 50% of the ground cover vegetation is indigenous species, or greater than 90% of the ground cover is cleared. Cleared land does not require assessment.

At an offset site, a vegetation zone may include cleared land (including native groundcover where less than 50% of the ground cover vegetation is indigenous species) when this area is to be revegetated as part of a proposal for an offset. Cleared land is identified, in this case, as having vegetation of 'low condition', and the vegetation type should reflect the original vegetation community that the revegetation is attempting to establish.

Changes to the extent of vegetation may have occurred since the date of the Spot 5 image or aerial photograph. A vegetation zone may be amended or deleted to account for any clearing of native vegetation that has been legally approved or permitted under ACT legislation since the date the imagery was captured.

Vegetation zones can be stratified into smaller zones for survey. A new vegetation zone is also required where the area of a vegetation zone is non-contiguous and different landscape characteristics are associated with different areas of the vegetation zone. This is because a different list of threatened species may be predicted for vegetation zones depending on landscape characteristics.

The threatened species which require assessment at a site are predicted using filters in Steps 1a and 1b. These include:

- ACT subregion in which the site occurs;
- vegetation type and condition; and
- patch size including low condition vegetation.

A new vegetation zone must be mapped whenever the area of the proposal:

- crosses into a new ACT subregion; or
- is in a different vegetation type or condition.

After entering a zone ID the vegetation zone area (in hectares) must be specified. *Patch Size* must then be recorded for each new vegetation zone. *Patch size* (see **Figure 4**) is the area of native vegetation that includes the vegetation zone area, plus any adjoining native vegetation of a similar vegetation structure (e.g. woodland adjoining woodland) in low or moderate to good condition on and off the site that is not separated by more than 100m (for woody vegetation) or more than 30m (for non-woody vegetation).

Patch size is recorded for all vegetation zones, regardless of condition, as shown in **Figure 4**. This attribute is recorded as number of hectares. The EOC uses the following patch size classes to filter particular species: <5 ha, >5–25 ha, >25–100 ha or >100 ha. These class sizes are included in the calculator for each species, and do not need to be selected by the user.



Figure 4 Patch Size

Veg Formation, *Veg Type* and *Condition Class* are then added using the drop-down menus. The *Veg Type Name*, located below the vegetation type pull-down list, is filled automatically. Definitions for the different vegetation types can be seen by clicking the *Veg Type Definitions* button at the bottom of the page. Definitions for the different condition classes are given in **Table 1** below. The condition class field is used to filter species that do or do

not use low condition vegetation. An entry of paddock trees or native pasture in this field will ensure species that regularly occupy low condition vegetation characterised by the respective definitions for paddock trees and native pasture are included in the assessment.

Table 1 Condition Classes

Paddock Trees	<p>Native over-storey percent foliage cover is less than 25% of the lower value of the over-storey percent foliage cover benchmark for that vegetation type and less than 50% of ground cover perennial vegetation is indigenous species.</p> <p>For example Yellow Box- Blakely's Red Gum woodland has a benchmark over-storey cover of between 11 -32%. Where tree cover is less than 2.75% and the understorey is predominately exotic these trees would be regarded as paddock trees.</p> <p>Vegetation benchmarks are provided in Appendix 5. A guide to assessing percent foliage cover is provided in Appendix 11.</p>
Native Pasture	<p>Trees are absent or form less than 1% cover. The understorey is predominately (50% or more) comprised of native grasses, and there are five or less native forbs within the most diverse 20x20m of the area of investigation.</p>
Moderate/Good	<p>If vegetation is not in low condition (paddock trees or native pasture) then it is in moderate to good condition.</p>

If vegetation is lower quality than native pasture, it should be considered exotic.

Please note the vegetation type should be selected using the drop-down menu rather than being typed. This is because each vegetation type is preceded by a unique code (see **Figure 5**).

If more than one vegetation zone is required for the assessment, then select the *Add New Veg Zone* button at the bottom of the screen. To delete a veg zone, select the *Delete this Veg Zone* button at the right of the screen.

An assessor can export the data for each vegetation zone using the *Export Veg Zone Data* button at the bottom of the screen. This makes it easy to review the data entered into the calculator.

After exporting the data (optional) click *Done* to return to Step 1a. Click *Done* again to return to the Assessment of a Development Site screen.

Step 1b - Enter Vegetation Zones					
Veg Zone ID:	<input type="text" value="TUSG_MG"/>	Condition class:	<input type="text" value="Moderate/Good"/>	Status: Completed	<input type="button" value="Delete this Veg Zone"/>
Veg Zone Area:	<input type="text" value="1.35"/> ha	Vegetation Zone:	<input type="text" value="NM_ACT01_Moderate/Good"/>		
Patch Size:	<input type="text" value="100.00"/> ha				
Veg Formation:	<input type="text" value="Grasslands"/>				
Choose veg type from the drop-down menu					
Veg Type:	<input type="text" value="NM_ACT01"/>				
Veg Type Name:	<input type="text" value="Tablelands Dry Tussock Grassland"/>				
Veg Zone ID:	<input type="text" value="TUSG_NP"/>	Condition class:	<input type="text" value="Native Pasture"/>	Status: Completed	<input type="button" value="Delete this Veg Zone"/>
Veg Zone Area:	<input type="text" value="29.00"/> ha	Vegetation Zone:	<input type="text" value="NM_ACT01_Native Pasture"/>		
Patch Size:	<input type="text" value="100.00"/> ha				
Veg Formation:	<input type="text" value="Grasslands"/>				
Choose veg type from the drop-down menu					
Veg Type:	<input type="text" value="NM_ACT01"/>				
Veg Type Name:	<input type="text" value="Tablelands Dry Tussock Grassland"/>				
Veg Zone ID:	<input type="text" value="BGW_MG"/>	Condition class:	<input type="text" value="Moderate/Good"/>	Status: Completed	<input type="button" value="Delete this Veg Zone"/>
Veg Zone Area:	<input type="text" value="10.00"/> ha	Vegetation Zone:	<input type="text" value="NM_ACT16_Moderate/Good"/>		
Patch Size:	<input type="text" value="20.00"/> ha				
Veg Formation:	<input type="text" value="Grassy Woodlands"/>				
Choose veg type from the drop-down menu					
Veg Type:	<input type="text" value="NM_ACT16"/>				
Veg Type Name:	<input type="text" value="Eucalyptus melliodora – E. blakelyi Tableland Grassy Woodland"/>				
<input type="button" value="Add New Veg Zone"/>		<input type="button" value="Veg Type Definitions"/>		<input type="button" value="Export Veg Zone Data"/>	
					<input type="button" value="Done"/>

Figure 5 Step 1b – Enter Vegetation Zones

See the Assessment Methodology for further information on significant species.

2.4 Step 2 – Identify geographic and habitat features

Once all the data for *Step 1* have been entered, the calculator will automatically query the significant species database to identify those species requiring further assessment at the development site. For those species requiring species credits, further information is needed relating to whether particular geographic and habitat features occur on the site. This information needs to be entered into the calculator in *Step 2 – Identify Geographic and Habitat Features*.

In this step, you are asked to identify whether particular geographic or habitat features occur on the site as these are associated with particular species (**Figure 6**). The habitat and geographic features listed on the screen complete the question, *Does any part of the development impact on ...*

Each feature listed at this step will be used to filter for one or more significant species. Select *Yes* if in doubt about whether the feature occurs on site. This allows the potential presence of the species to be discounted through a targeted survey. Several of the geographic features included at Step 2 can be identified on the Geographic Habitat Features map in **Appendix 6**.

To help identify features, print this form and take it into the field to determine whether or not the feature occurs on site. After the site has been field-checked for habitat features, answer *Yes* or *No* to each question. The response to whether these features occur on site will enable the calculator to further filter the list of significant species that require survey. If a question cannot be answered with confidence, the default answer should be *Yes*. This will retain the species in the list requiring survey. Once completed, select the *Done* button.

Step 2 - Identify Geographic and Habitat Features		Print Form
Does any part of the development impact on:		
dense mid-storey present at least in patches	No	▼
hollow bearing trees, coarse woody debris, stumps or dead trees	No	▼
known Superb Parrot habitat tree; hollow bearing tree, hollow >6cm diameter and >4m off ground	Yes	▼

Figure 6 Step 2 – Identify geographic and habitat features

Please note: The geographic and habitat features listed at Step 2 will differ depending on the details entered at Step 1.

2.5 Step 3 – Undertake a site survey

To determine site survey requirements click the *Step 3 - Undertake Site Survey* button on the Assessment of a Development Site Screen. The opening screen in Step 3 contains the *Survey Time Matrix* and links to print; survey guidelines for species requiring further assessment, the list of significant species predicted on site and a list of vegetation zones requiring field survey.

The *Survey Time Matrix* lists all the species that require a targeted survey, as well as the appropriate time of year when the survey can take place. To select the month in which a survey is proposed, click on the box under the *Proposed Survey Times* section. Choose months that satisfy the survey requirements of all species, to the best extent possible.

Because it may not be possible to meet this requirement for all species, the alternatives are to provide an expert report for the species or assume that the species is present. Species that cannot be surveyed at the selected times of year are listed in the *Significant Species Requiring an Expert Report or assumed to be present* box (**Figure 7**). These species, if not surveyed for or checked by an expert, will be assumed to be on the site and therefore included in the final credit calculations.

Step 3 - Undertake Site Survey

Proposed Survey Times

☐ January
☐ February
☐ March
☐ April
☐ May
☐ June

☐ July
☐ August
☐ September
☒ October
☐ November
☐ December

Significant Species Requiring an Expert Report or assumed to be present

Tympanocryptis pinguicollis;

Survey guidelines for species requiring further assessment

Significant species predicted on site

Vegetation zones requiring field survey

Survey Time Matrix

ScientificName:	Common Name:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Delma impar	Striped Legless Lizard										Yes	Yes	Yes
Hieraaetus morphnoides (Nesting)	Little Eagle (Nesting)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leucochrysum albicans var. tricolor	Hoary Sunray (white form)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Polytelis swainsonii	Superb Parrot									Yes	Yes	Yes	Yes
Rutidosia leirolepis	Monaro Golden Daisy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rutidosia leptorrhynchoides	Button Wrinklewort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Swainsona recta	Small Purple Reg									Yes	Yes	Yes	

Note: Species with no suitable survey months have special requirements. Please see the report 'Survey guidelines for species requiring further assessment' for further details.

Done

Figure 7 Step 3 – Undertake site survey

Please note: where a species does not have any suitable months for survey listed, such as the Grassland Earless Dragon (see **Figure 7** above), this may be because distribution is well known. In such cases, see the *Survey guidelines for species requiring further assessment* report (button on this page of the calculator). The survey technique field will provide further details for the species.

For example, the report for the Grassland Earless Dragon states ‘Habitat is well known and should be avoided (please use the map provided on the [EPD website](#) and at **Appendix 7** of the Operational Manual to determine whether it occurs on the site)’. This species does not require survey at development sites as its habitat is well known and must be avoided. Alternatively an expert report can be used. Surveys should be undertaken at offsets sites to confirm suitability and to inform future management. Alternatively, an expert report can be used. This is also the case for the Glossy Black Cockatoo (**Appendix 8**) and the Tarengo Leek Orchid (**Appendix 9**).

Once the intended survey times have been entered into the calculator, a report can be produced showing all the species that require survey. To do this, select the *Survey guidelines for species requiring further assessment* button. The species are organised into groups (e.g. birds, invertebrates) and the list contains the following information for each species (

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Reptiles		
Striped Legless Lizard	Delma impar	
Vegetation Types	Condition	Veg Zone Area (ha)
Tablelands Dry Tussock Grassland	Native Pasture	29
This species is likely to occur on:		
Habitat:		
Geographic:		
Survey Technique: Survey by qualified ecological surveyor in accordance with latest Striped Legless Lizard survey guidelines from ACT Government's Conservation Planning and Research section.		
Suitable Survey Time for this Species: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC		
		Yes Yes Yes

Figure 8):

- the vegetation types the species is likely to occur in on the site (including condition and vegetation zone area);
- the appropriate survey times;
- any habitat and geographic associations for the species; and
- the survey methodology that must be used.

Reptiles		
Striped Legless Lizard	Delma impar	
Vegetation Types	Condition	Veg Zone Area (ha)
Tablelands Dry Tussock Grassland	Native Pasture	29
This species is likely to occur on:		
Habitat:		
Geographic:		
Survey Technique: Survey by qualified ecological surveyor in accordance with latest Striped Legless Lizard survey guidelines from ACT Government's Conservation Planning and Research section.		
Suitable Survey Time for this Species: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC		
		Yes Yes Yes

Figure 8 Example of the information contained in the *significant species requiring survey report*

To get a list of the vegetation zones requiring survey (**Figure 9**), click on the *Vegetation zones requiring field survey* button. The information provided will include:

- vegetation zone name;

- vegetation type;
- total area of the zone;
- condition of the vegetation within the zone; and
- minimum number of transects/plots required to survey the vegetation zone.

ACT Environmental Offsets Calculator

Vegetation Zones Requiring Survey

Proposal ID: **Development Name:** South Lawson

Assessor Name: John Citizen
Assessor Accreditation Number:
Tool Version: 0.2.3
Report Created: 27-Mar-2015 17:34

Vegetation zone name: NM_ACT01_Moderate/Good

Vegetation type: Tablelands Dry Tussock Grassland

Vegetation condition: Moderate/Good

Total area of zone (ha): 1.35 **Veg Zone ID:** TU SG_M G

Minimum number of survey transect/plots required within the zone: 1

Vegetation zone name: NM_ACT01_Native Pasture

Vegetation type: Tablelands Dry Tussock Grassland

Vegetation condition: Native Pasture

Total area of zone (ha): 29 **Veg Zone ID:** TU SG_NP

Minimum number of survey transect/plots required within the zone: 3

Figure 9 Example of the information contained in the list of vegetation zones requiring field survey

After selecting the time of year to carry out the survey for each significant species and printing the reports, return to the *Assessment of a Development Site* screen by clicking the *Done* button.

2.6 Step 4 – Enter survey results

Once field surveys have been completed, the results can be entered into the calculator by selecting the *Step 4 - Enter Survey Results* button on the Assessment of a Development Site screen. The data entered at this step provides an indication as to whether the vegetation type is one that can be cleared and allows site attribute information and the outcomes of targeted species surveys to be entered.

The results are entered in two sections, one being for vegetation and the other for significant species. To enter information on vegetation surveys, select the *Enter Vegetation Survey Data and Flag Status* button. To enter data on significant species, click the *Enter Significant Species Survey Data* button.

2.6.1 Step 4a – Vegetation Zone: Community or condition type and flag status

The opening screen in *Step 4a* lists information for each vegetation zone, including the vegetation type, its percentage cleared according to the Vegetation Types Database and the area of the zone (Figure 10).

At this step, select if the development site contains one of the communities and/or condition types listed in the drop-down menu. If a flag has been triggered for a vegetation zone, the assessment can still continue and the flag will be listed in the final report.

Name	% Cleared	Is it one of the following community and/or condition types?	Flag?	Have minimum number of Transect/ plots been entered?	Area (ha)		
NM_ACT01_Moderate/Good Tablelands Dry Tussock Grassland	95	None of the above	No	No	1.35	Enter Transects/ Plots Not complete	Enter Management Zones Not complete
NM_ACT01_Native Pasture Tablelands Dry Tussock Grassland	95	None of the above	No	No	29.00	Enter Transects/ Plots Not complete	Enter Management Zones Not complete
NM_ACT16_Moderate/Good Eucalyptus melliodora – E. blakelyi Tableland Grassy Woodland	62	None of the above	No	No	10.00	Enter Transects/ Plots Not complete	Enter Management Zones Not complete

Figure 10 Identification of flag status for vegetation zones

Definition of a flag

A flag is raised when an area subject to an impact includes protected matters and the impacts need additional consideration as to whether offsets are appropriate. An area of land is flagged if the vegetation is not in low condition and it contains one or more of the following:

- One or more significant species identified in the significant species database that cannot withstand further loss in the ACT because the species' current occurrence in the ACT is such that it cannot suffer any further loss, without a strong possibility of extinction within the ACT.
- The woodland/forest present is in an "old growth" condition. Old growth forest/woodland is ecologically mature forest/woodland where the effects of disturbance are now negligible. Old growth must have the following attributes:
 - an old growth forest patch must be at least 5ha;
 - the overstorey is in late to over-mature growth stage with the presence of large old trees (many containing hollows and often with the presence of dieback or dead branches in the crown); and
 - the age (growth) structure of the stand measured as relative crown cover consists of less than 10% of regeneration and advance growth, and more than 10% of late to over mature (senescent) growth – "advance growth" comprises any tree regrowth that has become established in advance of regeneration.
- Category 1 or Category 2 grassland as described and mapped in Action Plan No. 28. *ACT Lowland*

Native Grassland Conservation Strategy (2005) Environment ACT, unless it can be demonstrated that the area of clearance is a peripheral component (i.e. on the edge) of a grassland remnant; AND is not habitat of significant grassland fauna (or habitat of the Golden Sun Moth); AND has only five or less native herbs in the most diverse 20x20m of the area of investigation; AND is devoid of any significant or regionally rare plants³.

Please note: If a development site contains an area of native grassland that includes an area of significant or regionally rare plants, the entire area of native grassland should be flagged.

4. Partially modified or moderately modified lowland woodland of high connectivity as described below:

- Partially modified lowland woodland as mapped within Action Plan 27. *ACT Lowland Woodland Conservation Strategy* (2004) Environment ACT, or if unmapped the woodland needs to contain large hollow bearing trees and an understorey in which two or more of the following species are present:

○ <i>Amphibromus nervosus</i>	○ <i>Leucochrysum albicans</i> var. <i>tricolor</i>
○ <i>Arthropodium minus</i>	○ <i>Limosella australis</i>
○ <i>Bossiaea prostrata</i>	○ <i>Lotus australis</i>
○ <i>Brachyscome heterodonta</i>	○ <i>Microseris lanceolata</i>
○ <i>Burchardia umbellata</i>	○ <i>Opercularia hispida</i>
○ <i>Caesia calliantha</i>	○ <i>Ophioglossum lusitanicum</i>
○ <i>Calocephalus citreus</i>	○ <i>Pentapogon quadrifidus</i>
○ <i>Calotis lappulacea</i>	○ <i>Pimelea linifolia</i>
○ <i>Carex bichenoviana</i>	○ <i>Polygala japonica</i>
○ <i>Craspedia variabilis</i>	○ <i>Sorghum leiocladum</i>
○ <i>Cullen microcephalum</i>	○ <i>Stuartina muelleri</i>
○ <i>Cullen tenax</i>	○ <i>Swainsona monticola</i>
○ <i>Dianella longifolia</i> var. <i>longifolia</i>	○ <i>Swainsona recta</i>
○ <i>Dichanthium sericeum</i>	○ <i>Swainsona sericea</i>
○ <i>Desmodium brachypodium</i>	○ <i>Rutidosia leptorrhynchoides</i>
○ <i>Dichopogon fimbriatus</i>	○ <i>Thesium australe</i>
○ <i>Diuris pedunculata</i>	○ <i>Thysanotus tuberosus</i>
○ <i>Leptorhynchos elongates</i>	○ <i>Zornia dyctiocarpa</i> var. <i>dyctiocarpa</i>

- Moderately modified lowland woodland as mapped within Action Plan 27. *ACT Lowland Woodland Conservation Strategy* (2004) Environment ACT, or which has both an overstorey of large hollow-bearing trees and a predominately native understorey present, in which one or more of the species are present:

○ <i>Amphibromus nervosus</i>	○ <i>Leucochrysum albicans</i> var. <i>tricolor</i>
○ <i>Arthropodium minus</i>	○ <i>Limosella australis</i>

³ *The Nature Conservation Act 2014* provides for the listing of protected species and includes a category for rare species. Once species are listed in this category, the list will be included in the Manual, as well as on the Legislation Register. A draft list can be provided on request.

<ul style="list-style-type: none"> ○ <i>Bossiaea prostrata</i> ○ <i>Brachyscome heterodonta</i> ○ <i>Burchardia umbellata</i> ○ <i>Caesia calliantha</i> ○ <i>Calocephalus citreus</i> ○ <i>Calotis lappulacea</i> ○ <i>Carex bichenoviana</i> ○ <i>Craspedia variabilis</i> ○ <i>Cullen microcephalum</i> ○ <i>Cullen tenax</i> ○ <i>Dianella longifolia</i> var <i>longifolia</i> ○ <i>Dichanthium sericeum</i> <i>Desmodium brachypodum</i> ○ <i>Dichopogon fimbriatus</i> ○ <i>Diuris pedunculata</i> ○ <i>Leptorhynchos elongatus</i> 	<ul style="list-style-type: none"> ○ <i>Lotus australis</i> ○ <i>Microseris lanceolata</i> ○ <i>Opercularia hispida</i> ○ <i>Ophioglossum lusitanicum</i> ○ <i>Pentapogon quadrifidus</i> ○ <i>Pimelea linifolia</i> ○ <i>Polygala japonica</i> ○ <i>Sorghum leiocladum</i> ○ <i>Stuartina muelleri</i> ○ <i>Swainsona monticola</i> ○ <i>Swainsona recta</i> ○ <i>Swainsona sericea</i> ○ <i>Rutidosia leptorrhynchoides</i> ○ <i>Thesium australe</i> ○ <i>Thysanotus tuberosus</i> ○ <i>Zornia dyctiocarpa</i> var. <i>dyctiocarpa</i>
---	---

It is possible to export transect/plot data for the whole proposal by selecting the *Export all transect/plot information* button at the bottom of the screen. The data for the export function is in .xlsx file format.

2.6.2 Step 4b – Enter vegetation transect/plot data

Enter site attribute data collected from transects and plots by selecting the *Enter Transects/Plots* button for each vegetation zone. This screen displays the *Vegetation Zone Name* and benchmark data for the vegetation type (**Figure 11**). The benchmark data shown in the screen are taken from the ACT Vegetation Benchmarks Database (see **Appendix 5**).

Additional transects/plots can be added by selecting *Add Transect/Plot* at the bottom of the screen. Select *Done* when all site survey data have been entered.

Survey data sheets are available at **Appendix 11** and on the [EPD website](#). The use of these data sheets is optional.

Step 4b - Enter Vegetation Transect/Plot Data

Vegetation Zone Name NM_ACT01_Moderate/Good

Vegetation Type: Tablelands Dry Tussock Grassland

Enter measurements for each site attribute

Local Benchmark used: No

Native plant species: Native over-storey cover: Native mid-storey cover: Native ground cover (grasses): Native ground cover (shrubs): Native ground cover (other): Exotic plant cover: Number of trees with hollows: Overstorey regeneration: length of fallen logs: Total length of fallen logs: Northing: (MGA): Easting: (MGA): Zone: Plot status:

Benchmarks

Transect/Plot Number/Name: >=30 0 to 1 0 to 0 34 to 63 0 to 3 4 to 17 See Manual >=0 1 >=0

Plot 1	30	0.6	0.0	35.0	3.0	16.0	1.0	0	1.00	2.0	689996	6099912	55	Complete	Delete Transect/Plot
--------	----	-----	-----	------	-----	------	-----	---	------	-----	--------	---------	----	----------	----------------------

Required Plots

Minimum No. required transect/ plots: 1

Figure 11 Vegetation transect/plot information

Please note: Exotic plant cover is calculated as a percentage of total ground cover.

Transect/plot data can also be imported for each vegetation zone by clicking on the *Import Transect/Plot Data* button at the bottom of the screen. This may help to minimise the amount of data entry required if data have already been entered into a spreadsheet. Note that this will add to any existing data already entered into the calculator, rather than overwriting the existing data. Transect/plot data can only be imported using a specific layout and saved in a file that is in CSV format. A template is available on the [EPD website](#).

Steps to import transect/plot data in CSV format for each vegetation zone:

1. Download a copy of the 'Transects_PlotsTemplate.CSV' file from the [EPD website](#), and rename it (any name can be used, e.g. 'BGW_MG.csv'). When saving the file, you should use a name that will easily link it to the vegetation zone and condition, particularly where the site involves many vegetation zones.
2. Open the empty CSV file with Microsoft Excel.
3. Enter all the transect and plot data into the CSV file.
 - Columns labelled 'PlotName', 'Easting (MGA)', 'Northing (MGA)' and 'Zone': allow free text entry, but the fields must not be left empty.
 - Columns labelled 'NPS', 'NOS', 'NMS', 'NGCG', 'NGCS', 'NGCO', 'EPC', 'NLT', 'OR', 'FL': must contain a number (e.g. 18, 2).
4. After you have entered data into the file, save the file (note that these data can still be adjusted after it is imported into the calculator).
5. Saving CSV files in Excel can be tricky. The easiest way is to close Excel, allow Excel to request the user to save the file, and then just overwrite the existing file.
7. Open *Step 4b* of the calculator and delete any existing transect/plot rows, including any that are blank. Then click on the *Import Transect/Plot* button and select the CSV file. This will import all transect/plot data for this vegetation zone.

The data import is now complete and the plot data is displayed on the screen in the calculator.

This process should be repeated for each vegetation zone. Once data is entered click Done to return to Step 4a.

2.6.3 Step 4c – Management zones

To access Step 4c, select the *Enter Management Zones* button. This step allows the assessor to stratify a vegetation zone into different management units by assigning a different area (or extent of impact) for each management zone. This allows consideration of a vegetation zone with two management outcomes, such as an area of total clearing, and an Asset Protection Zone (APZ) (**Figure 12**).

Each management zone must be given a name and assigned to a vegetation zone by selecting a zone from the drop-down menu. The combined area of all management zones must equal the overall area of the vegetation zone. Additional management zones can be added by clicking the *Add Management Zone* button at the bottom of the screen. Once the data entry is complete for this screen, the status will change to *Complete*.

A GPS must be used in the field to confirm the boundaries of the management zones whenever they differ from those of the vegetation zone.

Step 4c - Management Zones

Vegetation zone name: NM_ACT01_Moderate/Good
Vegetation Type: Tablelands Dry Tussock Grassland
Total Vegetation Zone area(ha): 1.35

Veg Zone Area

Veg Zone ID	Area	Vegetation Zone
BGW_MG	10.00	NM_ACT16_Moderate/Good
TUSG_MG	1.35	NM_ACT01_Moderate/Good
TUSG_NP	29.00	NM_ACT01_Native Pasture

Management Zone	Veg Zone	Area(ha)	Status		
Clearance Zone	TUSG_MG	1	Incomplete	Site Value	Delete
APZ	TUSG_MG	0.35	Incomplete	Site Value	Delete

Figure 12 Example of management zones

2.6.4 Step 4d – Enter management zone attribute score with development

Carrying out *Step 4d* requires prediction of the impact of development on each site attribute for each management zone. To enter the score for vegetation after development, select the *Site Value* button. The *Current Site Value Score* will have been calculated from the data that you previously entered for the vegetation zone (**Figure 13**).

In the score with development column enter a score for each site attribute based on the condition of the vegetation after development. If the site is to be completely cleared, then all scores should be reduced to zero but if the management zone is only going to be thinned (e.g. such as for an APZ), the score for each site attribute should be reduced appropriately.

Step 4d – Enter Management Zone Attribute Score with Development

Done

Management Zone: Clearance Zone
Vegetation Zone: NM_ACT01_Moderate/Good
Vegetation Zone Type: Tablelands Dry Tussock Grassland
TS Sub Zone: TUSG_MG

Enter score with development for each site attribute

	Current Score (0-3)	Score with development (0-3)
Native plant species:	3	<input type="text" value="2"/>
Native over-storey cover:	3	<input type="text" value="0"/>
Native mid-storey cover:	0	<input type="text" value="0"/>
Native ground cover (grasses):	3	<input type="text" value="1"/>
Native ground cover (shrubs):	3	<input type="text" value="2"/>
Native ground cover (other):	3	<input type="text" value="0"/>
Exotic plant cover:	3	<input type="text" value="0"/>
Number of trees with hollows:	0	<input type="text" value="0"/>
Overstorey regeneration:	3	<input type="text" value="2"/>
Total length of fallen logs:	0	<input type="text" value="0"/>

Current Site Value Score (out of 100)
83

Future Site Value Score (out of 100)
31

Decrease in Site Value Score
53

Figure 13 Determine Site Value score with development

The final loss of site value is then shown under the heading, *Decrease in Site Value Score*. This score represents the loss of site value for that management zone. Once the *Future Site Value Score* has been determined for each management zone, select the *Done* button on three screens to return to Step 4 – Enter Survey Results screen.

2.6.5 Step 4e – Significant species – survey results

The results from targeted surveys for significant species can now be entered into the calculator by selecting the button, *Enter Significant Species Survey Data*. For each species, answer *Yes* or *No* to the question, *Is the species impacted by the development?* Then select the *Identification Method* using the drop-down menu (see **Figure 14**).

If the species has been found on site, indicate the number of lost units (e.g. individuals or ha) under the *Loss* column. The calculator will also indicate the number and units of loss that is considered to be a loss threshold for that species. If the impact of development exceeds the loss threshold, the calculator will indicate a flag has been triggered. This is because the species is identified in the significant species database as one that is not capable of withstanding further loss in the ACT region. Where the negligible loss column specifies N/A there is either a special offset requirement (**Table 2**) for that species, or offsetting for that species does not have specified limits.

A species polygon should be used to identify and map the area where a species is likely to occur on a development site.

At the development site, a species polygon must be mapped if a threatened species is determined to be present by assuming the species is present, undertaking a threatened species survey or through an expert report.

For fauna species, the species polygon boundary surrounds the area of land where the species is located and is subject to the impact of the development. Within the boundary of the species polygon are the geographical characteristics and/or specific habitat features used by that species on the site. The area of the species polygon is entered into the credit calculator at Step 4e and is used to determine the number of species credits that are required at a development site.

Flora species are recorded as the number of individuals on the site. For small sites this can be calculated by simply counting the number of individuals. For large sites or for species with many individuals, a count can be conducted within representative sample area(s) and then extrapolated over the entire site to count the overall number of individuals. The area over which the threatened flora species occurs is then mapped onto the aerial image of the site as a species polygon.

A species polygon can usually be mapped only at a later stage of the assessment process, as mapping depends on completion of any targeted flora and fauna surveys of species identified for further assessment, or preparation of an expert report. A GPS must be used in the field to confirm the boundaries of the species polygon, and this information should be digitised onto an air photo or SPOT-5 image.

Where an expert report has been used to identify that a species is not present on the site, the expert report will need to be provided with the Development Site Report for the site. The Development Site Report will indicate that the expert report will need to be provided. Please contact the Environment and Planning Directorate for details about the appropriate person to write an expert report on a particular species.

If a significant species is recorded on the site but it was not predicted to occur there, the species must be added to the list at Step 4e by selecting the species from the *Additional significant species found on site* drop-down menu at the bottom of the screen. Only species that require species credits can be added into the assessment.

Once all of the information has been completed, select Next >>.

Step 4e - Significant Species - Survey Results						
		Is the species impacted by the development?	Identification Method	Loss	Units	No. considered a negligible loss
Tympanocryptis pinguicollis	Grassland Earless Dragon	Yes	Expert Report	5	ha	0
Thesium australe	Austral Toadflax	No		0	individuals	0
Synemon plana	Golden Sun Moth	Yes	Survey	65	individuals	N/A
Synemon plana	Golden Sun Moth	Yes	Survey	59	ha	N/A
Swainsona recta	Small Purple Pea	Yes	Survey	24	individuals	0
Rutidosia leptorrhynchoidea	Button Wrinklewort	No		0	individuals	10
Rutidosia leiopis	Monaro Golden Daisy	No		0	individuals	0
Polytelis swainsonii	Superb Parrot	No		0	hollow bearing trees	N/A
Leucochrysum albicans var. tricolor	Hoary Sunray (white form)	No		0	individuals	100
Hieraaetus morphnoides (Nesting)	Little Eagle (Nesting)	No		0	habitat trees	N/A
Delma impar	Striped Legless Lizard	No		0	ha	N/A

Figure 14 Significant species survey results

2.6.6 Step 4f – Significant species – special offset requirements

If there are special offset requirements selecting Next >> at Step 4e will take you to Step 4f – Significant Species – Special Offset Requirements (**Figure 15**). At this step the project is assessed for consistency with the special requirements.

Certain species have a special offset requirement rather than a loss threshold. This is a development site requirement for a species which must be met to allow the species loss to be offset. This applies to some species where N/A is given for the *no. beyond the loss threshold*. Where the development is inconsistent with the special requirement a flag is raised. **Table 2** provides a list of special offset requirements.

Table 2 Special Offset Requirements

Brown Treecreeper	No clearance of vegetation that is part of a woodland patch >100ha of at least partially or moderately modified condition that is historically known to have supported Brown Treecreeper. The woodland patch can extend beyond the development site and consist of several vegetation types in which the Brown Treecreeper can be found.
Golden Sun Moth	No loss of habitat patches >50ha AND supporting populations of more than 50 moths (population must be counted at a time when large populations are observed at nearby known sites). Given this special offset requirement, a survey is required for this species for both the number of individuals as well as the extent of habitat in hectares. Data is required to be entered into the calculator for both of these units. The calculator will supply two rows for the Golden Sun Moth when associated vegetation types have been entered at Step 1. Please complete both rows. See Appendix 13 for further information on this species.
Hooded Robin	No clearance of vegetation that is part of a woodland patch >100ha of at least partially or moderately modified condition that is historically known to have supported Hooded

	Robin. The woodland patch can extend beyond the development site and consist of several vegetation types in which the Hooded Robin can be found.
Grey-headed Flying Fox (Roosting)	No clearing of roosting trees, unless expert advice has been obtained and tree removal is justified on safety grounds.
Little Eagle (Nesting)	No loss of nest and vegetation within 300m of a nest tree or if clearance will occur during breeding event (September to December) then no loss of vegetation within 800m of nest (survey may consider on site vegetation only if access to adjacent sites is not possible).
Pink-tailed Worm-lizard	Up to 10% of a habitat patch may be cleared if habitat patch is greater than 5ha and clearance does not result in increase in the number of patches.
Striped Legless Lizard	No loss of known habitat within Priority 1 and Priority 2 grasslands as specified in Action Plan 28 (see the EPD website).
Superb Parrot	No loss of known habitat tree and trees within surrounding 50m, or within 100m during a breeding event (breeding season September to January) (survey may consider on site vegetation only when access to adjacent sites is not possible).

For each special offset requirement, answer *Yes* or *No* to the question *Is the development consistent with the following special requirement(s)?*

Step 4f - Significant Species - Special Offset Requirements	
Scientific Name:	Synemon plana
Common Name:	Golden Sun Moth
Is the development consistent with the following special requirement(s)?	<input type="text" value="No"/>
Special Requirement:	No loss of habitat patches >50ha AND supporting populations of more than 50 moths (population must be counted at a time when large populations are observed at nearby known sites).

Figure 15 Special offset requirements for significant species

If special requirements are not relevant to the development proposal you will be taken directly to step 4g when you click Next >> at Step 4e.

2.6.7 Step 4g – Significant species – loss summary

A final *Significant Species – Loss Summary* is then displayed, allowing you to check that the data you entered is correct. For each species, the *Significant Species – Loss Summary* shows the total loss and units of loss, and whether the loss triggers a flag (see **Figure 16**).

If the species loss has triggered a flag because the species is identified in the significant species database as one that is not capable of withstanding further loss in the ACT region, this will appear on the *Environmental Offset Credit Report*.

After confirming all data are correct, select *Done* twice to return to the *Assessment of a Development Site* screen.

Step 4g - Significant Species - Loss Summary				
		Total Loss	Units	Flagged? Development is not consistent with the following Special Requirement(s)
Delma impar	Striped Legless Lizard	0	ha	No
Hieraaetus morphnoides (Nesting)	Little Eagle (Nesting)	0	habitat trees	No
Leucochrysum albicans var. tricolor	Hoary Sunray (white form)	0	individuals	No
Polytelis swainsonii	Superb Parrot	0	hollow bearing trees	No
Rutidosia leiopis	Monaro Golden Daisy	0	individuals	No
Rutidosia leptorrhynchoidea	Button Wrinklewort	0	individuals	No
Swainsona recta	Small Purple Pea	24	individuals	Yes
				Done

Figure 16 Significant species loss summary

2.7 Step 5 – Report on credit requirements

The final step in the assessment process performs all the calculations for ecological community credits and species credits (Figure 17).

Step 5 - Report on Credit Requirements

Calculations

Calculate Credit Requirements

Complete

Final Reports

Report on Credit Requirements

Export this proposal

Done

Figure 17 Step 5 – Report on credit requirements

2.7.1 Calculate credit requirements

The Offset Credit Report will outline the credit requirements for the proposed development, provide the credit profile for each group of credits, and indicate whether any additional information is

required or whether an expert report is needed. The Offset Credit Report will also indicate whether a flag has been triggered and list the species or vegetation types that are flagged.

To produce the Offset Credit Report, select Assessment Step 5 – Report on Credit Requirements and then select the *Calculate Credit Requirements* button. Please note that the calculator may take a few moments to work through the data. Once the calculations have been completed, the final report can be produced. Be aware that this step must be re-run if any changes are made to the data.

2.7.2 Development Site Report

To generate the Development Site Report, select the *Report on Credit Requirements* button in the *Final Reports* box (see **Figure 17**).

The Development Site Report shows:

- the number and type of credits required to offset the proposed development; and
- whether any flags have been triggered at the development site.

The final report will also show what additional reports are required to be submitted to EPD. These may include an expert report to confirm the presence or absence of a species. A copy of the Development Site Report should be submitted.

2.7.3 Export development proposal

Once the proposal has been finalised, an .xml file containing all the data can be generated for the proposal by clicking the *Export this proposal* button. A dialogue box will appear allowing you to name the file and select the location where it is to be saved. A copy of the .xml file is required to be submitted to EPD as part of the Development Site Report when applying for approval of an offset through the EIS process.

The *Export this proposal* button can be activated at any time during the assessment process. This allows the case to be transferred into a new version of the calculator if one has been issued, or to efficiently transfer information about a case between different office locations.

2.8 Reset Steps 2 to 5

If a mistake in data entry was made *Steps 2 to 5* need to be reset. As each step in the calculator builds on the previous step if a mistake is made in Step 2, all data for *Steps 2 to 5* will need to be re-entered to ensure the calculator is working with the correct information. The case can be reset by clicking on the *Reset Steps 2–5* button on the *Assessment of a Development Site* screen.

If any data is changed after data has been entered in later steps, a dialogue box will pop up. It states that if proceeding, data from future steps will be deleted. To continue with the change, it is advisable to either save a copy of the calculator or export and save an .xml copy of the proposal before proceeding so that you can refer to the data if necessary.

2.9 Submit results to EPD

The proponent must submit the required documents outlined in the Scoping Document for an Environmental Impact Statement.

For further information on the methodology or about environmental offsets please contact:

Natural Environment Policy Team

Email: envoffsets@act.gov.au

Environment and Planning Directorate

PO Box 158

CANBERRA ACT 2601

3 HOW TO OPERATE THE CALCULATOR: OFFSET SITES

Please note: Some screens which appear the same for both the development and offset site are not outlined in detail in Chapter 3. Please refer to Chapter 2 for more detail.

3.1 Open the calculator

To open the calculator, simply double click on the .mdb icon from Windows Explorer. Several messages may appear while the calculator is opening. It is unlikely all of these messages will be received, but they may include:

1. Open File – Security Warning. Do you want to open this file? (Click *Open*).
2. Convert/Open Database (Select *Open* and press *OK*).
3. Do you want to block unsafe expressions (Select *No*).
4. Security Warning (Select *Options* and *Enable this content*).

Once all warnings have been addressed the calculator will open. Click *Next* to proceed through the first page, read the disclaimer and accept the terms, if you agree to them. Select *Offset Sites* to begin the assessment of an offset site.

To start a new case for assessment, click on the ►* button at the bottom of the page.

3.2 Enter proposed offset site details and location information

The details of the proposed offset site are entered into the *Assessment of an Offset Site* screen (see

Assessment of an Offset Site

Assessment Type
The appropriate Assessment Type must be selected before any other data is entered

☒ Full Assessment (default)
☐ Assessment for Environment Protection and Biodiversity Conservation Act 1999 listed matters only
☐ Assessment for Nature Conservation Act 2014 listed matters only

Offset Site Details

Proposal ID:
Offset Name:
Offset District:
Division and Street Address:
 Combo136:

Location Details

ACT Region:
ACT Subregion:
☐ have checked current ACTMapi map of declared offset areas

Certainty Score
Will the offset be given additional certainty through any of the following options:

Existing Agreement
Is any part of this proposal subject to an existing conservation agreement?
No
What is the type of agreement?

What is the date when the agreement was entered into?
 DD/MM/YYYY

Proponent Details

Proponent Name:
Proponent Address:
Proponent Phone:

Assessor Details

Assessor Name:
Assessor Address:
Assessor Phone:
☐ Completed ACT Environmental Offsets Calculator training

Assessment Steps

1. Landscape Value and Vegetation Zones	Not complete
2. Identify Geographic and Habitat Features	Not complete
3. Undertake Site Survey	Not complete
4. Enter survey results	Not complete
5. Report on Credits to be Created	Not complete

Please use the resources in the operational manual to help you identify the location of the site.

Figure 18).

There are three assessment types. These are:

- full assessment (default option);
- assessment for *Environment Protection and Biodiversity Conservation Act 1999* listed matters only; or
- assessment for declared protected matters only.

The matters included in the assessment will be different for each option. A full assessment should be run unless there is a specific reason for an assessment of matters listed under only one of the Acts.

Warning: The assessment type needs to be selected before any data is entered into the assessment steps. If the assessment type is changed any data which has been entered in the assessment steps will be deleted.

A name for the offset site should be provided.

Select the ACT District the offset site occurs in using the dropdown menu. If a proposal occurs over more than one district select the district in which the offset is mostly located. **Appendix 2** provides a map of ACT districts. This map and shapefiles can also be downloaded from the [EPD website](#).

The street address should be provided if the offset is in an urban area.

The block, section number and district for each affected block is added by clicking on the *Enter Block Details* button, which opens a new screen. Block and section numbers can be identified using [ACTMApi](#).

The *Existing Agreement* box is detailed in **Section 3.2.1** below.

Please complete the proponent details. Please complete the assessor details with your contact information.

Next, select the name of the ACT region in which the offset site is located from the drop-down menu in the *Location Details* box. **Appendix 3** provides a map of ACT regions. This map and shapefiles can also be downloaded from the [EPD website](#). Follow the same process for selection of the subregions.

Please note: The calculator will allow only one ACT region to be entered. If the offset site occurs mainly within one region and only occurs marginally within another (that is 20ha or less) then treat the offset as occurring entirely within the dominant region. If the offset site extends beyond this over two or three regions then the site must be assessed as separate proposals. This is because different significant species need consideration in different ACT regions.

Please ensure you have checked the current map of declared offset areas on [ACTMapi](#) and tick the box to confirm this. This step is required before you can continue to the next page of the calculator.

The *Assessment of an Offset Site* screen also contains the assessment steps that must be followed to complete an assessment. Clicking on any of the buttons will lead to that part of the assessment (see

Assessment of an Offset Site

Assessment Type

The appropriate Assessment Type must be selected before any other data is entered

☒ Full Assessment (default)

☐ Assessment for Environment Protection and Biodiversity Conservation Act 1999 listed matters only

☐ Assessment for Nature Conservation Act 2014 listed matters only

Offset Site Details

Proposal ID:

Offset Name:

Offset District:

Division and Street Address:

Combo136:

Location Details

ACT Region:

ACT Subregion:

☐ have checked current ACTMapi map of declared offset areas

Certainty Score

Will the offset be given additional certainty through any of the following options:

Existing Agreement

Is any part of this proposal subject to an existing conservation agreement?

No

What is the type of agreement?

What is the date when the agreement was entered into?

DD/MM/YYYY

Proponent Details

Proponent Name:

Proponent Address:

Proponent Phone:

Assessor Details

Assessor Name:

Assessor Address:

Assessor Phone:

☐ Completed ACT Environmental Offsets Calculator training

Assessment Steps

1. Landscape Value and Vegetation Zones	Not complete
2. Identify Geographic and Habitat Features	Not complete
3. Undertake Site Survey	Not complete
4. Enter survey results	Not complete
5. Report on Credits to be Created	Not complete

Please use the resources in the operational manual to help you identify the location of the site.

Figure 18). Please note the assessment steps must be done in order as each step uses information from previous steps to inform the assessment.

Assessment of an Offset Site

Assessment Type

The appropriate Assessment Type must be selected before any other data is entered

☒ Full Assessment (default)
☐ Assessment for Environment Protection and Biodiversity Conservation Act 1999 listed matters only
☐ Assessment for Nature Conservation Act 2014 listed matters only

Offset Site Details

Proposal ID:
 Offset Name:
 Offset District:
 Division and Street Address:
 Combo136:

Location Details

ACT Region:
 ACT Subregion:
☐ have checked current ACTMapi map of declared offset areas

Certainty Score

Will the offset be given additional certainty through any of the following options:

Existing Agreement

Is any part of this proposal subject to an existing conservation agreement?

No

What is the type of agreement?

What is the date when the agreement was entered into?

DD/MM/YYYY

Proponent Details

Proponent Name:
 Proponent Address:
 Proponent Phone:

Assessor Details

Assessor Name:
 Assessor Address:
 Assessor Phone:

☐ Completed ACT Environmental Offsets Calculator training

Assessment Steps

1. Landscape Value and Vegetation Zones	Not complete
2. Identify Geographic and Habitat Features	Not complete
3. Undertake Site Survey	Not complete
4. Enter survey results	Not complete
5. Report on Credits to be Created	Not complete

Please use the resources in the operational manual to help you identify the location of the site.

Figure 18 Opening screen for assessment of an offset site

3.2.1 Existing conservation management obligations

Under the heading *Existing Agreement*, state whether management actions under an existing conservation obligation are required to be carried out on the offset site or any part of it. Where there is an existing agreement the credit allocation for these areas is subject to additionality and is discounted in accordance with the ACT Environmental Offsets Policy and Assessment Methodology (see **Appendix 10**).

Additionality requires credits to be created for management actions that are not already required to be carried out pursuant to existing conservation obligations. Credits cannot be calculated for management actions that are already required to be carried out.

If an offset arrangement is established on land that is subject to one or more of these existing obligations, the allocation of credits for the offset site is discounted according to the number and type of conservation measures and/or management actions required to be carried out in relation to the existing obligation.

Further information on the percentage discount for credits is provided in the Assessment Methodology and the discount tables are available in **Appendix 10** of this manual. For example, if the discount table specifies weed control must be undertaken, then the credit allocation for the offset site is discounted by 7.5% for that management action.

If a proposed offset site is subject to an existing stewardship or offset agreement or is an existing reserve³, answer *Yes* from the drop-down menu in response to the question: *Is any part of this proposal subject to an existing offset agreement?* If the answer is *Yes*, record the type of agreement and indicate when the obligation was entered into.

3.2.2 Certainty score

Given the 99 year leasehold system in place in the ACT the potential for stronger conservation security through reserve creation will lead to long-term certainty gains. These areas also contribute to the existing reserve network, making them highly valuable to nature conservation in the ACT. Therefore a score is included for offsets that establish new reserves with a primary focus on nature conservation at an additional 40% of the current score. Other reserves attract an additional 30%. Offsets secured through zoning mechanisms such as urban open space or hills, ridges and buffers secure an additional score of 20%.

An additional score is also given for new reserves on privately managed land. New reserves on privately managed land gain an additional 10% of the current score.

Under the heading *Certainty* indicate whether the offset will be added to the reserve network. If yes indicate whether the reserve will be on government managed land or on privately managed land.

3.3 Step 1 – Landscape Value and Vegetation Zones

3.3.1 Step 1a – Enter landscape value

To enter site landscape value information click the *Assessment Step 1 – Landscape Value and Vegetation Zones* button.

There are two scores which need to be entered at this step - habitat context and link value. GIS data layers are provided on the [EPD website](#) to support calculation of habitat context and link value scores. A worked example is provided in **Appendix 12** for information.

Please use the data provided on the [EPD website](#) and the worked example in **Appendix 12** to calculate percentages for this step. The percentage of the offset area within each zone needs to be entered into the relevant table at Step 1a (see **Figure 19**).

Click the *Calculate Landscape Value Score* button to calculate the landscape value score for the offset proposal site. For an explanation of how the landscape value score is determined see the Assessment Methodology.

³ For the purpose of the offsets policy, reserves include reserves managed under the *Nature Conservation Act 2014* and include nature reserves, national parks and wilderness areas. **Appendix 10** identifies the appropriate discounts for reserves.

Next, allocate an Assessment Area ID.

The ACT subregion in which the offset occurs must be selected from the drop-down menu. If the offset site occurs mainly within one subregion and only occurs marginally in another (that is 20ha or less) then treat the development as occurring entirely within the dominant subregion. If the offset site occurs partly within a subregion then the subregion should be selected. If the offset occurs across more than one subregion, a separate assessment should be conducted for each subregion. A subregion map is provided in **Appendix 4**.

Step 1a - Enter Landscape Value Scores

Landscape score: 31.7

Neighbourhood Habitat Context Value

% Offset within zone(must add up to 100%)	Zone Type	Zone Score
0	Very Low	3
0	Low	10
50	Moderate	15
50	High	28
0	Very High	38

Calculate landscape value score

Link Value

% Offset within zone(must add up to 100%)	Zone Type	Zone Score
20	Low Linkage	3
80	High linkage	12

Status: New

Enter Vegetation Zones

Done

Figure 19 Landscape value scores are entered in Step 1a

3.3.2 Step 1b – Enter vegetation zones

The information required for the vegetation zones should be mapped initially onto a SPOT-5 image or ortho-rectified air photo using a GIS. This allows identification and recording of distinct vegetation patches, stratifying the vegetation on the site into a broad condition state, and possibly distinguishing the likely vegetation types.

To complete this step, do a preliminary site visit to confirm the vegetation types, conditions, and areas on the site. These data can then be entered into a GIS to confirm the area of the different vegetation zones (see **Figure 3**). During the preliminary site visit the condition of surrounding vegetation should also be validated.

Vegetation zones are created to filter for the significant species that are assessed at the site and to support the site value assessment. They are the area(s) on the offset site where the condition of vegetation will be improved by implementing all of the standard management actions.

A new vegetation zone must be added for each vegetation type, or where the same vegetation type occurs in both low condition (Native Pasture or Paddock Trees) and moderate to good condition (see **Table 1** for definitions). Digitise the vegetation zones onto an aerial photograph or SPOT 5 image to allow accurate recording of the *Veg Zone Area* (see **Figure 3**).

In the calculator click the *Enter Vegetation Zones* button.

Identify each vegetation zone with a name or number (Veg Zone ID) that allows it to be tracked through later steps of the assessment (see **Figure 20**). The recommended format for naming the Veg Zone ID is a brief summary of the Vegetation Type followed by the initials of the condition class, e.g. for Yellow-Box Red-Gum Grassy Woodland in a moderate/good condition, please enter BGW_MG. If more than one vegetation zone is required select the *Add New Veg Zone* button at the bottom of the screen. If you wish to delete a vegetation zone, select the *Delete This Veg Zone* button at the right of the screen.

The next data to be entered in is the *Veg Zone Area (hectares)* and *Patch Size*. *Patch Size* (see **Figure 4**) is the area of native vegetation that includes the offset site vegetation zone area, plus any adjoining native vegetation of a similar vegetation structure (e.g. woodland adjoining woodland) in low or moderate to good condition on or off site that is not separated by more than 100 m (for woody vegetation) or more than 30 m (for non-woody vegetation).

Veg Formation, *Veg Type* and *Condition Class* are then entered using drop-down menus. Definitions for the different vegetation formations and types can be accessed by clicking the *Veg Type Definitions* button at the bottom of the page. Definitions of condition classes are given in **Table 1**.

Note: the vegetation type should be selected using the drop-down menu, rather than by typing the name of the vegetation type. This is because each vegetation type is preceded by a unique code.

An assessor can export the vegetation zone data using the *Export Veg Zone Data* button at the bottom of the screen.

Step 1b - Enter Significant Species Sub Zones

Veg Zone ID:	BGW_MG	Condition class:	Moderate/Good	Status:	Started	Delete This Veg Zone
Veg Zone Area:	15.00 ha	Vegetation Zone:	_Moderate/Good			
Patch Size:	32.00 ha					
Veg Formation:	Grassy Woodlands					
Choose veg type from the drop-down menu						
Veg Type:	NM_ACT16					
Veg Type Name:	Eucalyptus melliodora - E. blakelyi Tableland Grassy Woodland					

Figure 20 Step 1b – Enter Vegetation Zones – to filter for significant species

3.4 Step 2 – Identify geographic and habitat features

Once all the data from Step 1 have been entered, the calculator will automatically query the significant species database to identify those species that could be assessed for species credits on the offset site. For those species that may create species credits, further information is required in

relation to whether particular geographic or habitat features occur on the site. This information is entered into the calculator in *Step 2 – Identify Geographic and Habitat Features*.

In this step, you are asked to identify whether particular geographic or habitat features occur on the site, as these are associated with particular species (see **Figure 21**). The geographic and habitat features listed on the screen complete the question, *Is any part of the offset site on ...* Each feature listed at this step may be associated with one or more significant species. Select *Yes* if in doubt about whether the feature occurs on site. This allows the potential presence of the species to be discounted through a targeted survey. Several of the geographic features included at Step 2 can be identified on the Geographic Habitat Features map in **Appendix 6**.

To help identify these features, print this form and take it into the field to validate whether particular features occur on site. After the site has been field-checked for habitat features, answer *Yes* or *No* to each question. The response to whether these features occur on site or not will enable the calculator to further filter the list of significant species that require survey. If a question cannot be answered with confidence, the default answer should be *Yes*. This will maintain the species within the list requiring survey. Once you are finished, select the *Done* button.

Step 2 - Identify Geographic and Habitat Features		Print Form
Is any part of the offset site on:		
dense mid-storey present at least in patches	No	▼
hollow bearing trees, coarse woody debris, stumps or dead trees	No	▼
known Superb Parrot habitat tree; hollow bearing tree, hollow >6cm diameter and >4m off ground	Yes	▼
Majura Firing Range	No	▼

Figure 21 Step 2 – Identify geographic and habitat features

Please Note: The geographic and habitat features listed at Step 2 will differ depending on the details entered at Step 1.

3.5 Step 3 – Undertake a site survey

To determine site survey requirements click the *Step 3 - Undertake Site Survey* button on the *Assessment of an Offset Site* screen. The opening screen in *Step 3* provides a list of all the significant species that can be surveyed for on the offset site (see **Figure 22**). The requirement to undertake targeted surveys for significant species at an offset site is optional. If a landholder wishes to create species credits for a particular species then targeted surveys must be undertaken. It is recommended that before any surveys are undertaken, landholders should obtain ecological advice about whether any of the species identified for survey are likely to occur on the site.

The *Survey Time Matrix* provides a list of all the species that could be surveyed for on the offset site, as well as the appropriate time of year when the survey can take place. To select the month in which

a survey is proposed, click on the box under the *Proposed Survey Times* section. Choose months that satisfy the survey requirements of all species, to the best extent possible.

Because it may not be possible to meet this requirement for all species, or because there may be reliable records that relate a species to the offset site, the alternative is to provide an expert report for the species.

Species that are not surveyed on the offset site are listed in the *Significant Species that won't be surveyed* box.

Step 3 - Undertake Site Survey

Proposed Survey Times

☐ January
☐ February
☐ March
☐ April
☐ May
☐ June

☐ July
☐ August
☐ September
☒ October
☐ November
☐ December

Significant Species that won't be surveyed

Survey guidelines for species requiring further assessment

Significant species predicted on site

Vegetation zones requiring field survey

Survey Time Matrix

ScientificName:	Common Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Hieraaetus morphnoides (Nesting)	Little Eagle (Nesting)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leucochrysum albicans var. tricolor	Hoary Sunray (white form)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Polytelis swainsonii	Superb Parrot									Yes	Yes	Yes	Yes
Rutidosia leiolepis	Monaro Golden Daisy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rutidosia leptorrhynchoidea	Button Wrinklewort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Swainsona recta	Small Purple Pea									Yes	Yes	Yes	
Synemon plana	Golden Sun Moth										Yes	Yes	Yes
Thesium australe	Austral Toadflax	Yes	Yes							Yes	Yes	Yes	Yes

Note: Species with no suitable survey months have special requirements. Please see the report 'Survey guidelines for species requiring further assessment' for further details.

Done

Figure 22 Step 3 – Undertake site survey

Once the intended survey times for any or all species are entered into the calculator, select the *Survey guidelines for species requiring further assessment* button. This report contains information on the species that are intended to be surveyed for, including:

- the vegetation types the species is likely to occur in on the site (including condition and vegetation zone area);
- the appropriate survey times ;
- any habitat and geographic associations for the species; and

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- the survey methodology that must be used.

The assessor can also print a list of the significant species that are predicted to occur on the offset site based on vegetation. There is no requirement to survey for these species, as they are assessed for ecological community credits. The report is generated by clicking on the *Significant species predicted on site* button on the right of the screen.

The third report relating to the site survey provides information on the vegetation zones that require a site assessment using transects and plots. To get a list of the vegetation zones requiring survey, click on the *Vegetation zones requiring field survey* button.

Once you have selected the time of year to survey and printed the reports, you can return to the opening screen by clicking the *Done* button.

3.6 Step 4 – Enter survey results and management zone scores

Once surveys have been completed, enter the results into the calculator by clicking the Step 4 - *Enter survey results* on the *Assessment of an Offset Site* screen.

The results are entered in two sections, one for vegetation and the other for significant species. To enter vegetation survey data, select the *Enter Vegetation Survey Data and Flag Status* button. To enter significant species survey data, click on the *Enter Significant Species Survey Data* button.

3.6.1 Step 4a – Vegetation zone: community or condition type and flag status

The opening screen in Step 4a lists information for each vegetation zone, including the vegetation type, its percent cleared according to the Vegetation Benchmarks Database and the area of the zone (see **Figure 23**).

At this step answer the question *Is it one of the following community and/or condition types?* using the drop-down menu.

Step 4a - Vegetation Zone: Community or Condition Type and Flag Status						
Name	% Cleared	Is it one of the following community and/or condition types?	Have minimum number of transect/ plots been entered?	Area (ha)	Enter Transects/ Plots	Enter Management Zones
NM_ACT16_Moderate/Good Eucalyptus melliodora - E. blakelyi Tableland Grassy Woodland	62	None of the above	No	15.00	Not complete	Not complete
<div>Pre-existing Management Actions</div>						

Figure 23 Identification of flag status for vegetation zones

Note: for a definition of flags please see the box in **Section 2.6.1**.

3.6.2 Step 4b – Enter vegetation transect/plot data

Next, enter the site attribute data collected from transects and plots by selecting the *Enter Transects/Plots* button for each vegetation zone.

A screen will be presented that has the benchmark data shown for each vegetation type (see **Figure 24**). Enter the transect/plot name and then add the vegetation transect/plot data into the appropriate fields.

The same value for each transect/plot should be entered for *Overstorey Regeneration* as regeneration is assessed for the whole zone. Regeneration is measured as the proportion of overstorey species present at the site that are regenerating (i.e. with dbh < 5cm). For example if there are three tree species present at the site but only one of these species is regenerating, then the value is 0.33. The maximum value for this measure is 1.

Survey data sheets are available at **Appendix 11** and on the [EPD website](#). The use of these data sheets is optional.

Step 4b - Enter Vegetation Transect/Plot Information

Required Plots
Minimum No. required transect/plots: 3

Vegetation Zone Na NM_ACT16_Moderate/Good
Vegetation Type: Eucalyptus melliodora – E. blakelyi Tableland Grassy Woodland
Enter measurements for each site attribute
Local Benchmark used: No

Transect/Plot Number/Name	Benchmarks										Overstorey regeneration length of fallen logs: (Set to 0.0 for Grassland, Wetland or Heathland)	Northing (MGA)	Easting (MGA)	Zone	Plot status
	Native plant species: >=35	Native over-storey cover: 11 to 32	Native mid-storey cover: 0 to 12.5	Native ground cover (grasses): 23 to 63	Native ground cover (shrubs): 0 to 4.5	Native ground cover (other): 8 to 16.5	Exotic plant cover: See Manual	Number of trees with hollows: >=5							
Plot 1	36	11.0	11.0	42.0	0.5	9.0	12.0	7	1.00	36.0	682225	609999	55	Complete	Delete Transect/Plot
Plot 2	38	15.0	2.0	36.0	2.5	9.0	16.0	14	1.00	36.0	699999	6091245	55	Complete	Delete Transect/Plot
Plot 3	44	17.0	10.0	25.0	4.0	12.0	16.0	5	1.00	38.0	689965	6099152	55	Incomplete	Delete Transect/Plot

Figure 24 Vegetation transect/plot information

Note: Exotic plant cover is calculated as a percentage of total ground cover.

Transect/plot data can also be imported for each individual vegetation zone by clicking on the *Import Transect/Plot Data* button at the bottom of the screen. This may help minimise the amount of data entry required if data have already been entered into a spreadsheet. Note that this will add to any existing data already entered into the calculator, rather than overwriting the existing data. See **Section 2.6.2** for more information.

Once data is entered click Done to return to the Step 4a screen. This process should be repeated for each vegetation zone.

3.6.3 Step 4c – Management scores

To access *Step 4c*, select the *Enter Management Zones* button. This step allows the user to stratify a vegetation zone into different management zones. This allows consideration of, for example, a vegetation zone with two management outcomes (e.g. for regeneration and an easement). These

management zones should be mapped to illustrate where standard and/or additional management actions apply.

Each management zone must be given a name and assigned to a vegetation zone (see **Figure 25**). The combined area of all management zones must equal the overall area of the vegetation zone. Additional management zones can be added by selecting the *Add Management Zone* button at the bottom of the screen.

A GPS must be used in the field to confirm the boundaries of the management zones whenever they differ from the vegetation zone.

Step 4c - Management Zones

Vegetation zone name: NM ACT16 Moderate/Good
Vegetation Type: Eucalyptus melliodora – E. blakelyi Tableland Grassy Woodland

Total Vegetation Zone area(ha): 15

Veg Zone Area

Veg Zone ID	Area	Vegetation Zone
BGW_MG	15.00	NM_ACT16_Moderate/Good

Management Zone	Veg Zone	Area(ha)	Status		
Easement	BGW_MG	7	Incomplete	Site Value	Delete
Revegetation zone	BGW_MG	8	Incomplete	Site Value	Delete

Figure 25 Example of management zones

3.6.4 Step 4d – Enter management zone attribute score with offset

The increase in Site Value score at an offset site is automatically calculated on the basis of the management actions that are required for the site (**Figure 26**). The current Site Value score and the predicted future Site Value score are shown by selecting the *Site Value* button. The *Increase in Site Value* shown at the bottom of the screen (**Figure 26**) is the score that is used to determine the number of credits created for that zone on the basis of the improvement in condition of the site through management actions.

Management Zone	Easement
Vegetation Zone:	NM_ACT16_Moderate/Good
Vegetation Zone Type:	Eucalyptus melliodora – E. blakelyi Tableland Grassy Woodland
Veg Zone ID	BGW MG

	Current Score (0-3)	Default Increased Score (0-3)		
Native plant species:	3	3		
Native over-storey cover:	3	3		
Native mid-storey cover:	3	3		
Native ground cover (grasses):	3	3		
Native ground cover (shrubs):	3	3		
Native ground cover (other):	3	3		
Exotic plant cover:	2	3		
Number of trees with hollows:	3	3		
Overstorey regeneration:	3	3		
Total length of fallen logs:	3	3		
			Increase in Site Value	
Total Score (Out of 100):	96	100	4	100

Request additional gain in site value

Request reduced gain
in site value

Done

3.6.5 Enter site attribute score with additional management

The score for any or all site attributes can be increased (or decreased) by choosing the revised score from the drop-down menu. The extent of the increase for any site attribute is limited on the basis of the current condition of the attribute. Any increase (or decrease) in the extent of improvement above default values is limited to the values in the Assessment Methodology. A brief reason should be given for each change. If the Site Value score has been increased, provide full justification in the Offset Assessment Report, demonstrating how the additional management will improve the condition of the vegetation beyond that predicted by the methodology.

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management applied to a site does not meet the standard required for an offset. For example, where an area needs to be maintained as a powerline easement or managed for fuel reduction.

Enter additional site value increase or decrease
Done

Management Zone Easement

Vegetation Zone: NM_ACT16_Moderate/Good

Vegetation Zone Type: Eucalyptus melliodora – E. blakelyi Tableland Grassy Woodland

TS Sub Zone BGW_MG

Any reduced gain in the site value score below the default increase requires approval from the Conservator of Flora and Fauna.

	Current Score (0-3)	Default Increased Score (0-3)	Score with management (0-3)	Reason for score changes
Native plant species:	3	3	3	
Native over-storey cover:	3	3	3	
Native mid-storey cover:	3	3	3	
Native around cover (grasses):	3	3	3	
Native around cover (shrubs):	3	3	3	
Native around cover (other):	3	3	3	
Exotic plant cover:	2	3	3	
Number of trees with hollows:	3	3	3	
Overstorey regeneration:	3	3	3	
Total length of fallen logs:	3	3	3	

Current Site Value (out of 100)	Default Increased Site Value (out of 100)	Future Site Value (out of 100)	Increase in Site Value
96	100	100	4

Figure 27 Site Value increase or decrease

3.6.6 Step 4e – Existing management actions for ecological community credits

If an offset site has an existing conservation agreement, or is public land, it is subject to additionality. A further step will be included (Step 4e) to indicate what management actions are already required on a site. To enter management actions into the calculator, first select the *Pre-existing Management Actions* button at *Step 4a*. This button is only available where the assessor indicated on the *Assessment of an Offset Site* screen that an existing conservation obligation applies to the land. In order to continue, you are asked to confirm that existing obligations apply.

Next, place a tick in the box against each management action that is required at the site according to the existing conservation obligation (see

Step 4e - Management actions for ecological community credi

Please select each management action that is already required to be carried out on the proposed offset area.

Unleased Territory land	Exclusion of fire	<input checked="" type="checkbox"/>
Urban Open Space/	Exclusion of fire	<input type="checkbox"/>
Hills Ridges Buffers/River corridors/	Hills Ridges Buffers/River corridors - Weed control	<input type="checkbox"/>
Privately managed land	Erosion control	<input type="checkbox"/>
	Control feral herbivores(rabbits/deer etc.)	<input type="checkbox"/>
Special Purpose Reserve	Exclusion of fire	<input type="checkbox"/>
	No grazing of domestic stock	<input type="checkbox"/>
	Weed control	<input type="checkbox"/>
	Erosion control	<input type="checkbox"/>
	Control feral herbivores(rabbits/deer etc.)	<input type="checkbox"/>
Existing conservation reserves(wilderness areas/national parks/nature reserves)	Exclusion of fire	<input type="checkbox"/>
	Weed control	<input type="checkbox"/>
	Manage human disturbance	<input type="checkbox"/>
	No collection of fallen timber for commercial purpose	<input type="checkbox"/>
	Erosion control	<input type="checkbox"/>
	Retention of rocks	<input type="checkbox"/>
	Control feral herbivores(rabbits/deer etc.)	<input type="checkbox"/>
	Vertebrate pest management(foxes, pigs etc.)	<input type="checkbox"/>
	Control exotic fish species	<input type="checkbox"/>

New Management Action:

Add

Done

Figure 28). The amount of credits that can be created for that zone will then be discounted by the calculator according to the number and type of management actions already in place.

Further guidance on applying additionality, and the level of discounting that applies to each management action can be found in the Assessment Methodology and **Appendix 10**. Click *Done* on two screens to return to Step 4 – Enter Survey Results.

Step 4e - Management actions for ecological community credi

Please select each management action that is already required to be carried out on the proposed offset area.

Unleased Territory land	Exclusion of fire	<input checked="" type="checkbox"/>
Urban Open Space/	Exclusion of fire	<input type="checkbox"/>
Hills Ridges Buffers/River corridors/	Hills Ridges Buffers/River corridors - Weed control	<input type="checkbox"/>
Privately managed land	Erosion control	<input type="checkbox"/>
	Control feral herbivores(rabbits/deer etc.)	<input type="checkbox"/>
Special Purpose Reserve	Exclusion of fire	<input type="checkbox"/>
	No grazing of domestic stock	<input type="checkbox"/>
	Weed control	<input type="checkbox"/>
	Erosion control	<input type="checkbox"/>
	Control feral herbivores(rabbits/deer etc.)	<input type="checkbox"/>
Existing conservation reserves(wilderness areas/national parks/nature reserves)	Exclusion of fire	<input type="checkbox"/>
	Weed control	<input type="checkbox"/>
	Manage human disturbance	<input type="checkbox"/>
	No collection of fallen timber for commercial purpose	<input type="checkbox"/>
	Erosion control	<input type="checkbox"/>
	Retention of rocks	<input type="checkbox"/>
	Control feral herbivores(rabbits/deer etc.)	<input type="checkbox"/>
	Vertebrate pest management(foxes, pigs etc.)	<input type="checkbox"/>
	Control exotic fish species	<input type="checkbox"/>

New Management Action:

Figure 28 Accounting for existing management actions at an offset site

3.6.7 Step 4f – Significant species – survey results

Information obtained from significant species surveys can now be entered into the calculator by selecting the *Enter Significant Species Survey Data* button. For each species that was surveyed, answer *Yes* or *No* to the question *Is the species present and to be managed at the offset site?* If the species was found, select the identification method (i.e. by survey or expert report), enter the *size of species polygon* (hectares or number of individuals) and the name of the management zone that most closely covers the area of the species polygon (see **Figure 29**). If the location of the species does not relate to a management zone, select the *Default gain in Site Value* box. The default gain in site value is 60%.

A species polygon is used to identify an area of land where specified management actions are required for a species, and to calculate the number of credits created at the offset site.

The species polygon is also used to identify and map the location and habitat area where an expert report has been used to determine that a species is likely to occur on an offset site.

For fauna species, the species polygon boundary surrounds the area of land where the species is located. Within the boundary of the species polygon are the geographical characteristics and/or

specific habitat features used by that species on the site. Ecologists or consultants should use their expertise in determining the appropriate boundaries for species polygons. The area of the species polygon is entered into the calculator at Step 4f and is used to determine the number of species credits that are required at a development site or created at an offset site.

Flora species are recorded as the number of individuals on the site. For small sites this can be calculated by simply counting the number of individuals. For large sites or for species with many individuals, a count can be conducted within representative sample area(s) and then extrapolated over the entire site to count the overall number of individuals. The area over which the threatened flora species occurs is then mapped onto an aerial image as a species polygon. A GPS must be used in the field to confirm the boundaries of any species polygons, and this information should be digitised onto an air photo or SPOT-5 image.

Additional species may be added to the list if the species was recorded on site but was not originally predicted to occur on site; this is done by selecting the species from the drop-down menu at the bottom of the screen. This step is optional on an offset site and is done if the landowner wishes to create species credits for that species. Only species that require species credits may be added.

If an expert report has been used to identify that a species is present on the offset site, it should be provided as part of the Offset Assessment Report for the site. Please contact the Environment and Planning Directorate for details about the appropriate person to write an expert report on a particular species.

Step 4f- Significant Species- Survey Results							
		Is the species present and to be managed at the offset site?	Identification method	Size of species polygon	Units	Name of management zone	Default gain in site value
Hieraaetus morphnoides (Nesting)	Little Eagle (Nesting)	No		0	habitat trees		<input type="checkbox"/>
Leucochrysum albicans var. tricolor	Hoary Sunray (white form)	No		0	individuals		<input type="checkbox"/>
Polytelis swainsonii	Superb Parrot	No		0	hollow bearing trees		<input type="checkbox"/>
Rutidosia leiopis	Monaro Golden Daisy	No		0	individuals		<input type="checkbox"/>
Rutidosia leptorrhynchoides	Button Wrinklewort	Yes	Survey	45	individuals	Revegetation zone	<input type="checkbox"/>
Swainsona recta	Small Purple Pea	No		0	individuals		<input type="checkbox"/>
Synemon plana	Golden Sun Moth	Yes	Survey	0	ha	Revegetation zone	<input type="checkbox"/>
Synemon plana	Golden Sun Moth	Yes	Survey	32	individuals	Revegetation zone	<input type="checkbox"/>
Thesium australe	Austral Toadflax	No		0	individuals		<input type="checkbox"/>
Additional significant species found on site <input type="text"/> <input type="button" value="Add"/> <input type="button" value="Next >"/>							
Significant species survey reports are to be provided							

Figure 29 Significant species survey results

If no significant species surveys were undertaken on the offset site, simply click *Next* to move to the significant species summary screen.

3.6.8 Step 4g – Significant species – summary

A final *Significant Species – Summary* is then displayed (**Figure 30**). This information allows review by the assessor to confirm that the correct information has been entered into the calculator.

Step 4g- Significant Species- Summary				
		Total Size	Units	
Hieraaetus morphnoides (Nesting)	Little Eagle (Nesting)	0	habitat trees	Pre-existing management actions
Leucochrysum albicans var. tricolor	Hoary Sunray (white form)	0	individuals	Pre-existing management actions
Polytelis swainsonii	Superb Parrot	0	hollow bearing trees	Pre-existing management actions
Rutidosia leiolepis	Monaro Golden Daisy	0	individuals	Pre-existing management actions
Rutidosia leptorrhynchoidea	Button Wrinklewort	45	individuals	Pre-existing management actions
Swainsona recta	Small Purple Pea	0	individuals	Pre-existing management actions
Synemon plana	Golden Sun Moth	5	ha	Pre-existing management actions
Synemon plana	Golden Sun Moth	32	individuals	Pre-existing management actions
Thesium australe	Austral Toadflax	0	individuals	Pre-existing management actions

Figure 30 Significant species summary screen

3.6.9 Step 4h – Management Actions for Species Credits

If a user has indicated that an offset site has an existing agreement, it is subject to additionality. A further step will be included (Step 4h) to indicate the management actions that are already required to be performed on the site. To enter management actions into the calculator, first select the *Pre-existing Management Actions* button at *Step 4g*. This button is only available where the assessor indicated on the *Assessment of an Offset Site* screen that an existing conservation agreement or public land management obligation applies to the land.

Next, place a tick in the box against each management action that is required at the site according to the existing agreement (see **Figure 31**). The amount of credits that can be created for that zone will then be discounted by the calculator according to the number and type of management actions already in place.

Step 4h- Management Actions for Species Credits

Please select each management action that is already required to be carried out on the proposed offset site.

☐ Nutrient control

☒ Control of feral herbivores (e.g.rabbits, deer, goats) and/or overabundant natives (e.g. kangaroos)

☒ Vertebrate pest management - foxes and/or miscellaneous species (e.g. cats, pigs)

New Management Action:

Figure 31 Accounting for existing management actions for species credits at an offset site

Once the information has been confirmed click *Done* on three screens to return to the *Assessment of an Offset Site* screen.

3.7 Step 5 – Report on credits created

The final step in the assessment process performs all the calculations for ecological community credits and species credits. To calculate the credits created at the site, select the *Calculate credits to be created* button. The calculator will then perform all the necessary calculations for the site.

3.7.1 Offset Credit Report

The *Offset Credit Report* will list the ecosystem and species credits created for the proposal, provide the credit profile for each group of credits, and indicate whether an expert report is required for any species.

To produce the *Offset Credit Report*, select the *Report on Credits to be Created* button.

Submit a copy of the *Offset Credit Report*.

The Credit Report will indicate the number and type of credits created at the offset site.

The final report will also indicate what additional reports are required to be submitted to EPD.

3.7.2 Export offset proposal

Once the proposal has been finalised you can generate an .xml file that contains all the data for the case by selecting the *Export this proposal* button. A copy of the .xml file must be submitted to EPD.

The *Export this proposal* button can be activated at any time during the assessment process. This allows the case to be transferred into a new version of the calculator if one has been issued, or to efficiently transfer information about a case between different office locations.

3.8 Reset Steps 2 to 5

If a mistake in data entry was made *Steps 2–5* need to be reset. As each step in the calculator builds on the previous step if a mistake is made in Step 2, all data for *Steps 2–5* will need to be re-entered to ensure the calculator is working with the correct information. The case can be reset by clicking on the *Reset steps 2–5* button on the *Assessment of an Offset Site* screen.

If any data is changed after data has been entered in later steps, a dialogue box will pop up. This states that by proceeding, data from future steps will be deleted. To continue with the change, it is advisable to either save a copy of the calculator or perform an export of the proposal as a backup before proceeding.

3.9 Submit results to EPD

The proponent must submit the required documents outlined in the Scoping Document for an Environmental Impact Statement.

For further information on the methodology or about environmental offsets please contact:

Natural Environment Policy Team

Email: envoffsets@act.gov.au

Environment and Planning Directorate

PO Box 158

CANBERRA ACT 2601

4 REFERENCES

The preparation of the Environmental Offset Calculator Operational Manual has fundamentally drawn on:

BioBanking Assessment Methodology and Credit Calculator Operational Manual version 1.1 (2009), Goulburn Street, Sydney. [Available at Biobanking Website.](#)

Other resources used:

ACT Government (2004) *Woodlands for Wildlife: ACT Lowland Woodland Conservation Strategy*. Action Plan No. 27, Environment ACT, Canberra.

ACT Government (2005) *Grassy Plains Extended: ACT Lowland Native Grassland Conservation Strategy*. Action Plan No. 28, Arts, Heritage and Environment, Canberra.

Barrett, T. & Love, J. (2012) *Fine Scale Modelling of Fauna Habitat and Connectivity Values in the Act Region*, Report prepared for Conservation Planning and Research, Environment and Sustainable Development Directorate, ACT Government.

Jenkins, B.R. (2000) 'Soil Landscapes of the Canberra 1:100 000 Sheet Report', Department of Lands

Johnston, L.; Skinner, S.; Ishiyama, L. & Sharp, S. (2009) 'Survey of vegetation and habitat in key riparian zones: Murrumbidgee River, ACT', Department of Territory and Municipal Services, Canberra.

Rehwinkel, R. (2007) 'PATN analysis of grassland associations within the Natural Temperate Grassland Endangered Ecological Community in the Southern Tablelands of NSW', Unpublished report, Department of Environment and Climate Change NSW, Queanbeyan.

Sharp, S.; Macdonald, T.; Kitchin, M. & Dunford, M. (2007) *Setting conservation targets for vegetation communities in the ACT*, Final report to the Natural Resource Management Council, ACT Parks Conservation and Lands.

5 GLOSSARY

ACT region One of three geographic areas used to filter significant species. These are: North of Molonglo River, River Corridor and South of Molonglo River (see **Appendix 3**).

ACT subregion One of nine geographic areas within the three ACT regions which have a particular suite of significant species associated with them (see **Appendix 4**).

Asset protection zone An area surrounding an asset (e.g. building) where the vegetation-based fuel load is managed to reduce the bushfire hazard to an acceptable level.

Benchmarks *see* **Vegetation benchmarks**.

Biodiversity values These include the composition, structure and function of ecosystems, and (but not limited to) significant species and ecological communities, and their habitats. For the purposes of the Environmental Offsets Calculator this does not include aquatic ecosystems or species.

Calculator *see* **Environmental Offsets Calculator**.

Clearing native vegetation (refer Section 234, Nature Conservation Act 2014) includes:

- (a) cutting down, felling, thinning, logging or removing native vegetation; and
- (b) burning native vegetation; and
- (c) doing anything else that kills, or is likely to kill, native vegetation.

Connectivity A measure of the degree to which an area (or areas) of native vegetation is linked with other areas of vegetation.

Credits Ecosystem or species credits required to offset the loss of protected matters values on development sites or created on offset sites from management actions that improve protected matters values.

Credit profile A description of the credit created or required in a vegetation zone, according to the attributes of the subregion, vegetation type, vegetation formation, surrounding vegetation cover, and patch size.

Development site An area of land that is subject to a proposed development for which an offset is proposed.

Ecological community credit The class of protected matters credits created or required for the impact on general protected matters values and some significant species; that is, for protected matters values except significant species that require species credits.

Environmental offsets One or more appropriate actions put in place in an appropriate location to compensate for an impact on protected matters values.

Environmental Offsets Assessment Methodology Provides a technical explanation of how credits are calculated.

Environmental Offsets Calculator (the calculator) A computer program that applies the Environmental Offsets Assessment Methodology and calculates the number and classes of credits required at a development site or created at an offset site.

Environmental Offsets Calculator Operational Manual (This operational manual) provides instructions on how to apply the Assessment Methodology using the Environmental Offsets Calculator.

EOAM Environment Offsets Assessment Methodology

EOC Environmental Offsets Calculator

EPD The Environment and Sustainable Development Directorate.

Expert A person who has the relevant experience and/or qualifications to provide expert opinion in relation to specific protected matters values.

Flag area An area of land (part of a development site) with significant protected matters conservation values. The impact of the development on the protected matters of a flag area cannot be offset by the retirement of environmental credits unless the Conservator of Flora and Fauna determines that strict avoidance of the flag area is unnecessary in the circumstances.

Geographic features Geographic features associated with the occurrence of a species.

Group of credits Credits from a development or an offset site that have an identical credit profile.

Habitat An area or areas occupied, or periodically or occasionally occupied, by a species or ecological community, including any biotic or abiotic component.

Habitat context (nearest neighbour) Assesses how a patch of vegetation sits in relation to other vegetation patches.

Habitat features Habitat features associated with the occurrence of a species.

Indigenous Native, occurring naturally in the ACT, including species that would have occurred naturally prior to European settlement.

Individual A single organism.

Landscape value A measure of fragmentation, connectivity and adjacency of native vegetation at a site. landscape value comprises:

- **habitat context (nearest neighbour)** – a measure of how a patch of vegetation sites in relation to other vegetation patches; and
- **link value** – a measure of how important a patch of vegetation is to linking large patches of vegetation.

Large old trees Trees with a diameter at breast height of 70cm or greater.

Late to over-mature growth stage (Senescent or partly dying) growth stage with the presence of relatively large old trees, many containing hollows and often with the presence of dieback or dead branches in the crown.

Link value A measure of how important a patch of vegetation is to linking large patches of vegetation.

Loss threshold The number of units of loss that is considered negligible. An entry of '0' in this field means that expert(s) have determined that the species cannot withstand the loss of any individual in the region. An entry of 'N/A' in this field means that the impact can be offset without impact size restrictions. In some cases species with an entry of N/A will have a special offset requirement which must be met for the species to be offset.

Low condition vegetation Is:

- **paddock trees** - native over-storey percent foliage cover is less than 25% of the lower value of the overstorey percent foliage cover benchmark for that vegetation type and less than 50% of ground cover perennial vegetation is indigenous species; and
- **native pasture** - trees are absent or form less than 1% cover. The understorey is predominately comprised of native grasses, and there are five or less native herbs within the most diverse 20x20m of the area of investigation.

Management actions An action or proposed action carried out at an offset site in order to improve or maintain protected matter values.

Methodology *see* **Environmental Offsets Assessment Methodology**.

Moderate to good condition vegetation Native vegetation that is not in low condition.

Native pasture Trees are absent or form less than 1% cover. The understorey is predominately comprised of native grasses, and there are five or less native herbs within the most diverse 20x20m of the area of investigation.

Nearest neighbour value *see* **Habitat context (nearest neighbour)**.

Nest tree A hollow bearing live or dead tree and/or any live or dead tree that supports a nest. A nest in relation to a native animal includes a structure or object that is being, or has been within the

previous 2 years, used as a nesting place by the animal; or a partially constructed nest that has not been used as a nesting site by the animal.

Non-woody native vegetation Vascular plants only, less than 1m tall, not grass (e.g. herbs, ferns).

Offset site Land designated by conditions of approval to be an offset site.

Operational manual *see* **Environmental Offsets Calculator Operational Manual**.

Paddock trees Where the native over-storey percent foliage cover is less than 25% of the lower value of the overstorey percent foliage cover benchmark for that vegetation type and less than 50% of ground cover perennial indigenous species. For example Yellow Box- Blakely's Red Gum woodland has a benchmark overstorey cover of between 11-32%. Where tree cover is less than 2.75% and the understorey is predominately exotic these trees would be regarded as paddock trees.

Patch size The area of a native vegetation type that includes the development or offset site vegetation zone area, plus any adjoining native vegetation of a similar vegetation structure (e.g. woodland adjoining woodland) in low or moderate to good condition on and off the site that is not separated by more than 100m (for woody vegetation) or more than 30m (for non-woody vegetation).

Percent foliage cover The percentage of ground that would be covered by a vertical projection of the foliage, and branches and trunk of a plant or plants.

Profile ID Unique identifier for each species or threatened ecological community used in the ACT Environmental Offsets Calculator (EOC).

Plot An area in which some of the 10 site attributes are assessed in a vegetation zone.

Region *see* ACT region

Required landscape size The minimum patch area (or contiguous vegetation area) class which the species regularly uses as habitat based on expert advice. This field is applied to fauna and flora species Types A and B. Thresholds are identified as one of three classes: a) < 5 ha; b) 5 - 25 ha; c) 25 - 100 ha. This is used to filter for ecosystem and survey species.

Significant Species Database A database containing information on habitat characteristics, range, response to management actions, survey requirements, and the class of protected matter credits required for the species. It contains information used in the calculation of ecosystem or species credits, filtering to determine the likely presence of significant species, information on significant species' ability to withstand loss, and significant species' response to management.

Significant species survey A targeted survey for a significant species, undertaken in accordance with ACT government guidelines to determine if the species is present.

Site attributes Attributes used to assess site value and significant species habitat. The 10 site attributes are native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.

Site value A quantitative measure of structural, compositional and functional condition of native vegetation, measured by site attributes.

Special offset requirement A special development site requirement for a species which must be met to allow the species to be offset. Where the development is inconsistent with the special requirement a flag is raised.

Species credit The class of environmental offset credit created or required for the impact on significant species that cannot be reliably predicted to use an area of land based on vegetation. Species that require species credits are listed in the Significant Species Database.

Species polygon The actual area of habitat, or number of individuals of a significant species, impacted by development at the development site or by management actions at the offset site.

Subregion see ACT subregion

Tg value the ability of a species to respond to improvement in Site Value or other habitat improvements at an offset site due to management actions. The lower the Tg value the less able the species is to respond to improvements and the greater the number of credits required.

Transect A line or narrow belt along which environmental data is collected.

Unit of loss units against which surveys are recorded. These include: campsites, hectares, individuals, habitat trees and hollow bearing trees.

Vegetation Benchmarks Database A database of benchmarks for vegetation classes and some vegetation types.

Vegetation type The finest level of classification of native vegetation used in the methodology. Vegetation types are assigned to vegetation classes, which in turn are assigned to vegetation formations. There are 14 vegetation types within the ACT.

Vegetation Types Database A database which contains the information on each vegetation type used in the methodology and comprises a description of each vegetation type, its class and formation, the region within which the vegetation type occurs, the percent cleared value of the vegetation type, and the source of the information.

Vegetation Benchmarks Quantitative measures of the range of variability in vegetation condition where there is relatively little evidence of modification by humans since European (post-1750)

settlement. Benchmarks are defined for specified variables for vegetation communities. Vegetation with relatively little evidence of modification generally has minimal timber harvesting (few stumps, coppicing, cut logs), minimal firewood collection, minimal exotic weed cover, minimal grazing and trampling by introduced or overabundant native herbivores, minimal soil disturbance, minimal canopy dieback, no evidence of recent fire or flood, not subject to high-frequency burning, and evidence of recruitment of native species.

Vegetation zone A relatively homogenous area in a proposal area (development or offset site) that is of the same vegetation type and broad condition. A single zone must not contain a mix of vegetation in low condition and not in low condition. Zones with the same vegetation type and in moderate to good condition (that is, not in low condition) can be combined within one ecological community credit profile (as a sub zone). A zone may comprise one or more discontinuous areas. The area of vegetation that is initially assessed to determine which significant species will be assessed for biodiversity credits at a development site and an offset site.

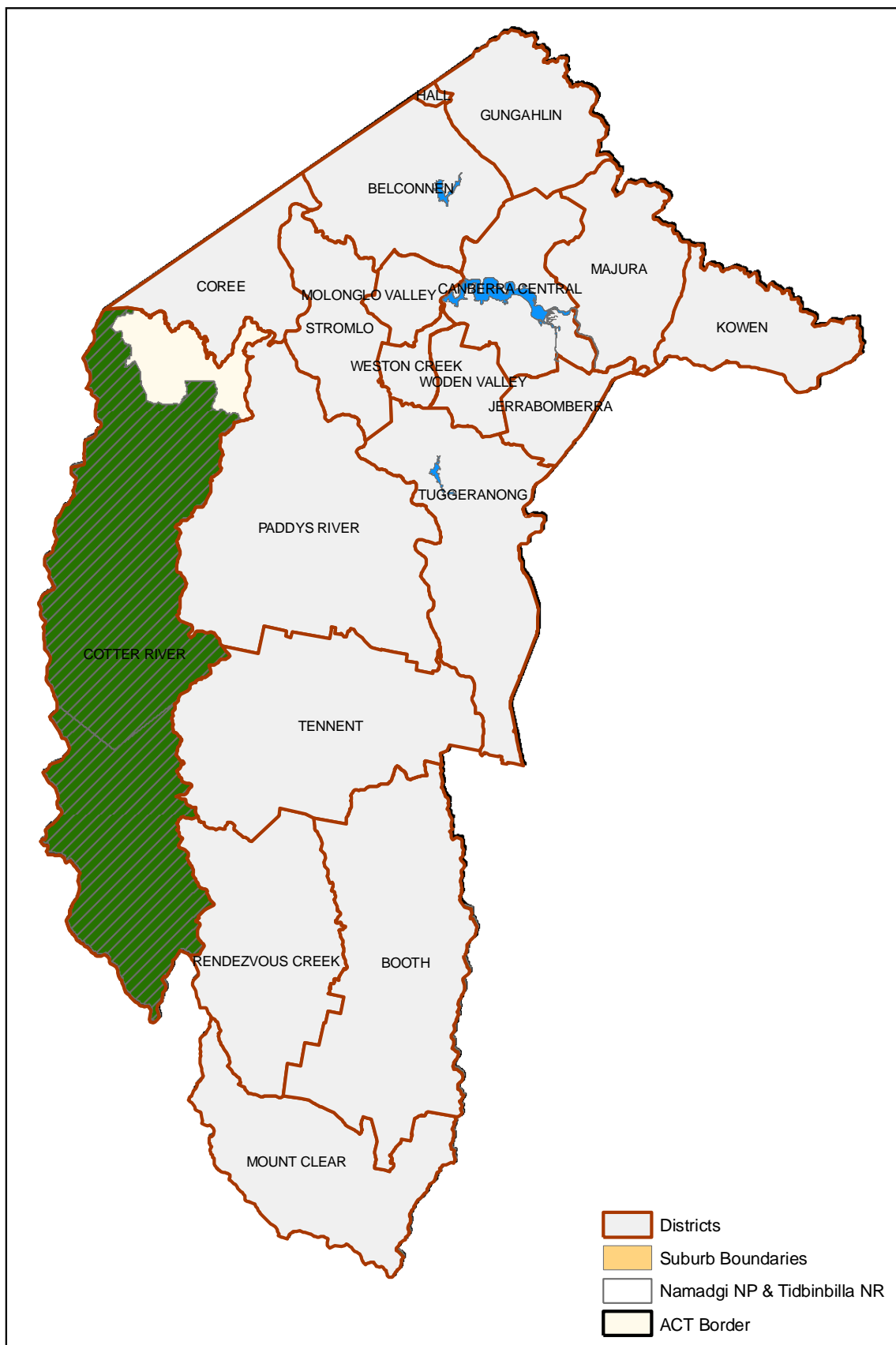
Woody native vegetation Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs.

Zone *see* **Vegetation zone**.

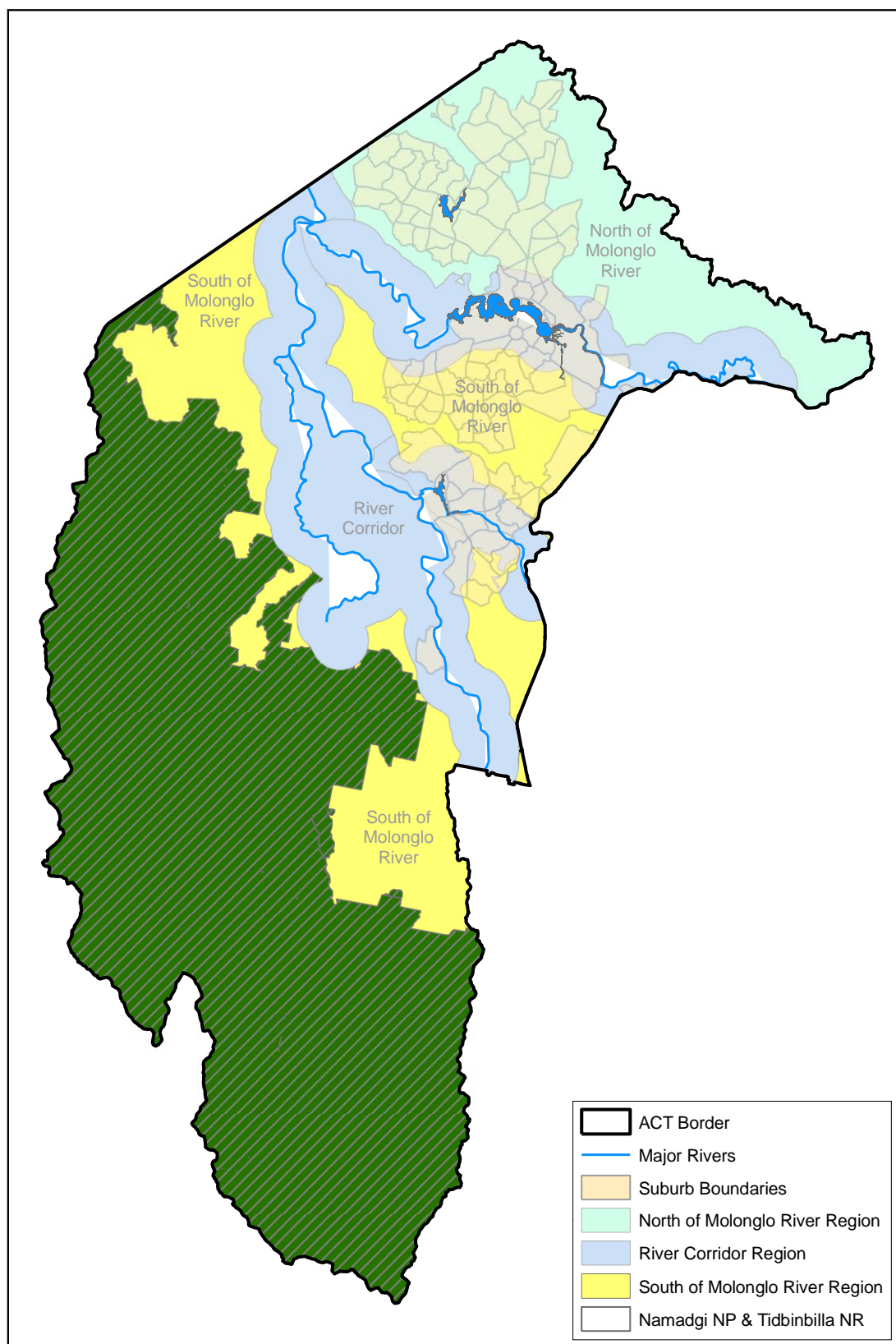
APPENDIX 1 ENVIRONMENTAL OFFSETS ASSESSMENT METHODOLOGY

[See Legislation register website for current notifiable instrument](#)

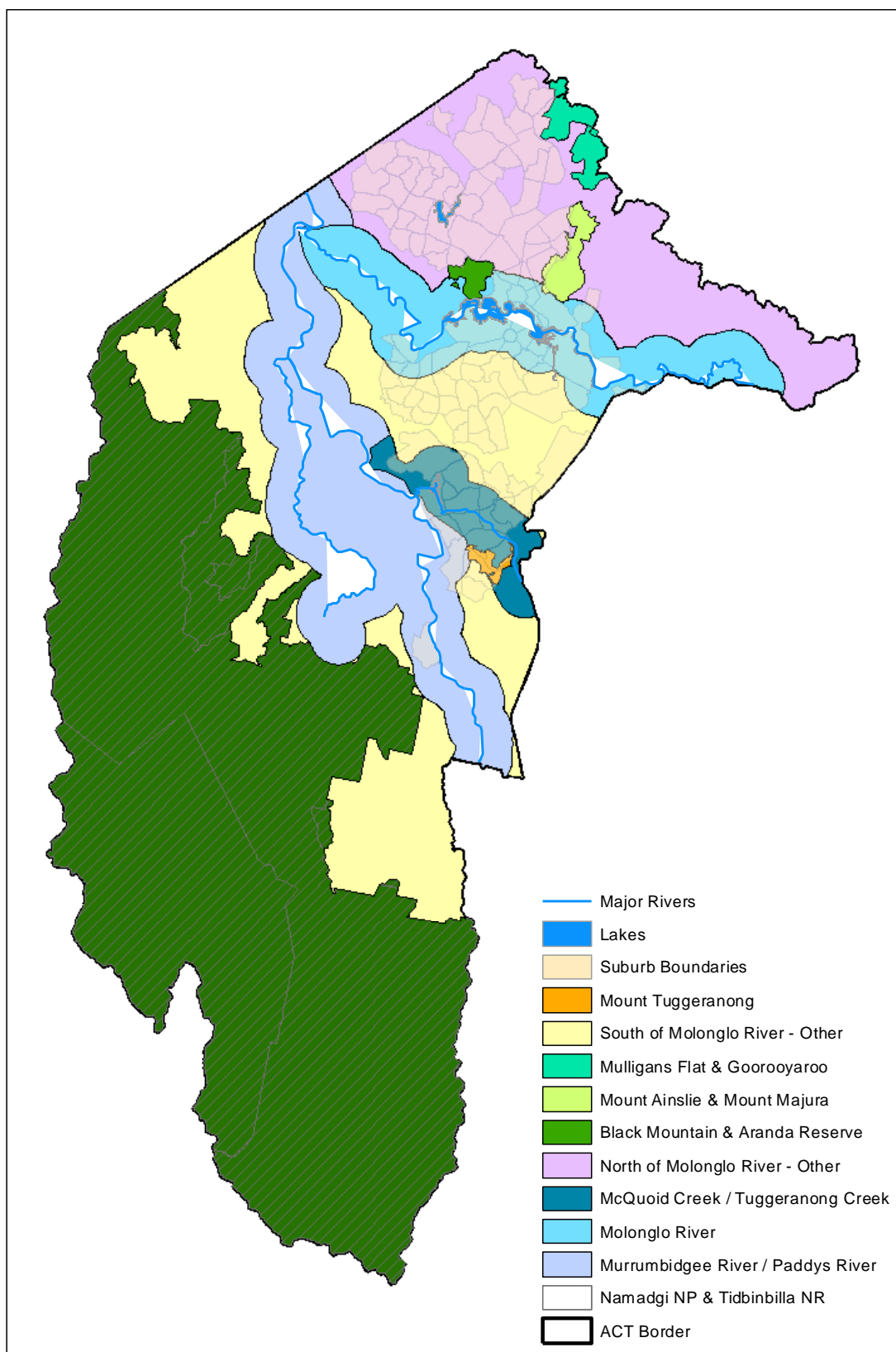
APPENDIX 2 ACT DISTRICTS



APPENDIX 3 ACT REGIONS



APPENDIX 4 ACT SUBREGIONS



APPENDIX 5 VEGETATION BENCHMARKS

Veg Type ID	Vegetation type	Native plant species richness		Native over-storey cover		Native mid-storey cover		Native ground cover (grasses)		Native ground cover (shrubs)		Native ground cover (other)		Source - Cover estimates	Number of large trees (NLT) (Circumference >= 150cm @ 1m above ground OR hollow >= 5cm wide @ >=1m above ground)	Total length of fallen logs (>=10cm dia & >=0.5m long) (FL) (m)	Source - Large trees & logs	Percent Cleared (%)	EEC which veg type may relate to
		Richness (IPS) (no. of spp)	Source	Lower (% PFC)	Upper (% PFC)	Lower (% PFC)	Upper (% PFC)	Lower (% PFC)	Upper (% PFC)	Lower (% PFC)	Upper (% PFC)	Lower (% PFC)	Upper (% PFC)						
1	Tablelands Dry Tussock Grassland	30	PCL kangaroo monitoring data	0	1	0	0	34	63	0	3	4	17	PCL kangaroo monitoring data	0	0	N/A	95	Natural Temperate Grassland
3	Tablelands Moist Tussock Grassland	10	PCL kangaroo monitoring data	0	1	0	0	40	55	0	0	3	8	PCL kangaroo monitoring data	0	0	N/A	>95	Natural Temperate Grassland
4	Wet Tussock Grassland	16	NSW BioBanking	0	1	0	0	30	80	0	5	5	40	NSW BioBanking	0	0	N/A	>95	Natural Temperate Grassland
12	Tableland Shrubland	25	Survey of ACT sites	0	1	20	55	2	40	17	40	3	14	Survey of ACT sites	0	2	Survey of ACT sites	0 (Murrumbidgee River Corridor)	
16	<i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland	35	Survey of ACT sites	11	32	0	12.5	23	63	0	4.5	8	16.5	Survey of ACT sites	5	35	Survey of ACT sites for large trees, NSW BioBanking for logs	62	Yellow Box/Red Gum Grassy Woodland
17	<i>Eucalyptus pauciflora</i> - <i>E. rubida</i> Tableland Woodland	22	Survey of ACT sites	14	25	0	14	20	70	0	20	10	33	Survey of ACT sites	2	100	Survey of ACT sites	>70	
18	Tableland Dry Shrubby Woodland	30	Survey of ACT sites	20	40	1	18	18	50	0	20	7	17	Survey of ACT sites	4	40	Survey of ACT sites	50	

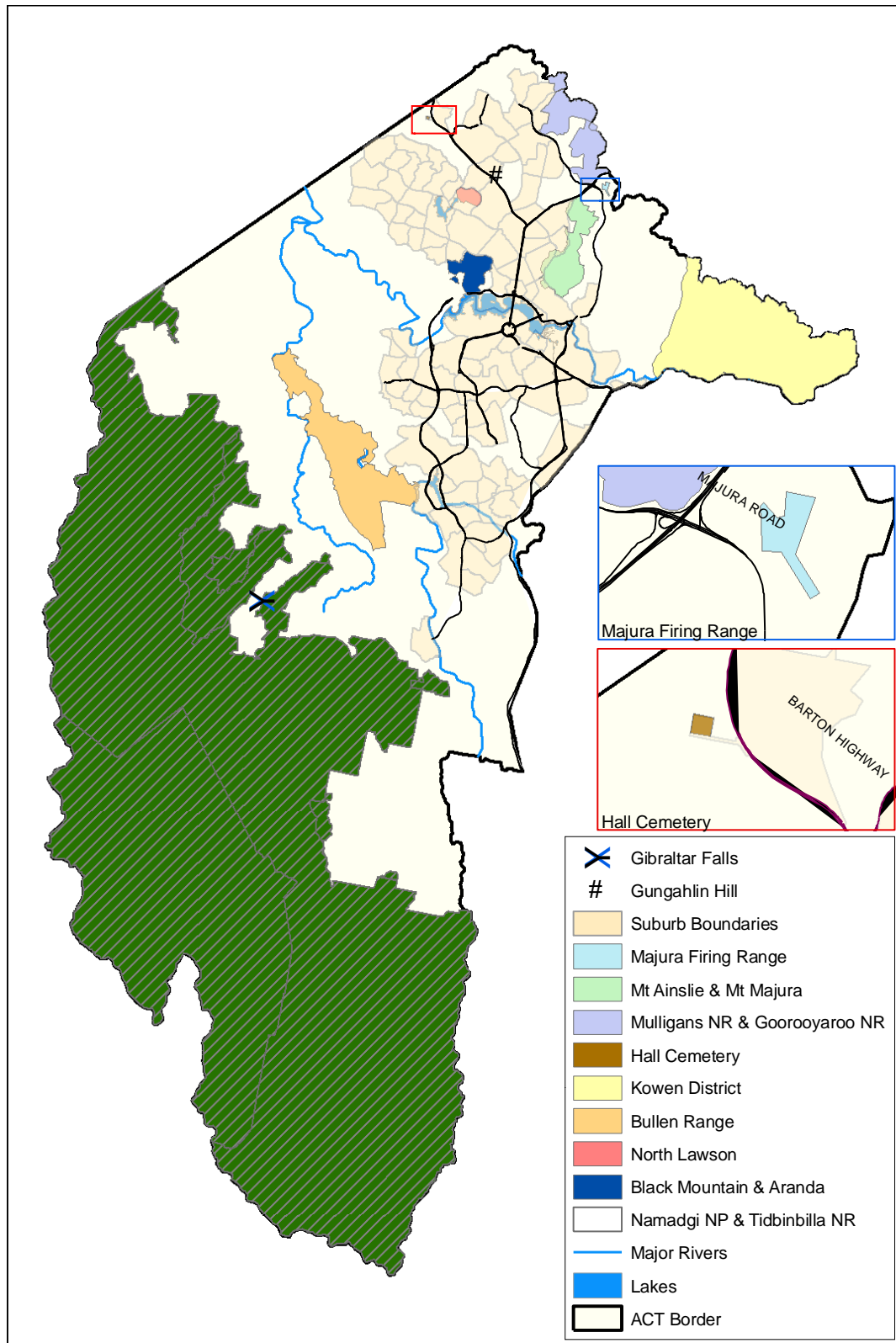
		Native plant species richness		Native over-storey cover		Native mid-storey cover		Native ground cover (grasses)		Native ground cover (shrubs)		Native ground cover (other)							
19	<i>Allocasuarina verticillata</i> Tableland Dry Woodland / Open Forest	25	Survey of ACT sites	20	40	0	16	17	46	0	6	6	16	Survey of ACT sites	1	65	Survey of ACT sites		
22	<i>Casuarina cunninghamiana</i> Tableland Riparian Woodland	15	Survey of ACT sites	20	50	1	35	2	50	0	6	5	20	Survey of ACT sites + NSW BioBanking (Murrumbidgee CMA River Oak Forest and Woodland of the NSW South Western slopes and South Eastern Highlands Bioregions)	5	50	Survey of ACT sites + NSW BioBanking (Murrumbidgee CMA River Oak Forest and Woodland of the NSW South Western slopes and South Eastern Highlands Bioregions)	>70	
23	<i>Callitris endlicheri</i> Dry Woodland / Open Forest	39	Survey of ACT sites	18	42	4	41	10	32	4	24	3	22	Survey of ACT sites	2	40	Survey of ACT sites	>70	
24	<i>Eucalyptus viminalis</i> Tableland Riparian Woodland	15	Survey of ACT site + NSW BioBanking	15	35	15	25	10	40	10	40	20	70	NSW Biobanking - Murray CMA	10	40	NSW Biobanking - Murray CMA	>90	
25	<i>Eucalyptus macrorhyncha</i> Tableland Grass / Shrub Forest	29	Survey of ACT sites	20	36	2	10	14	40	6	22	4	15	Survey of ACT sites + NSW BioBanking (Murrumbidgee CMA Southern tablelands Dry Scelerophyll Forest)	3	60	Survey of ACT sites + NSW BioBanking (Murrumbidgee CMA Southern tablelands Dry Scelerophyll Forest)	>60	

Acronyms

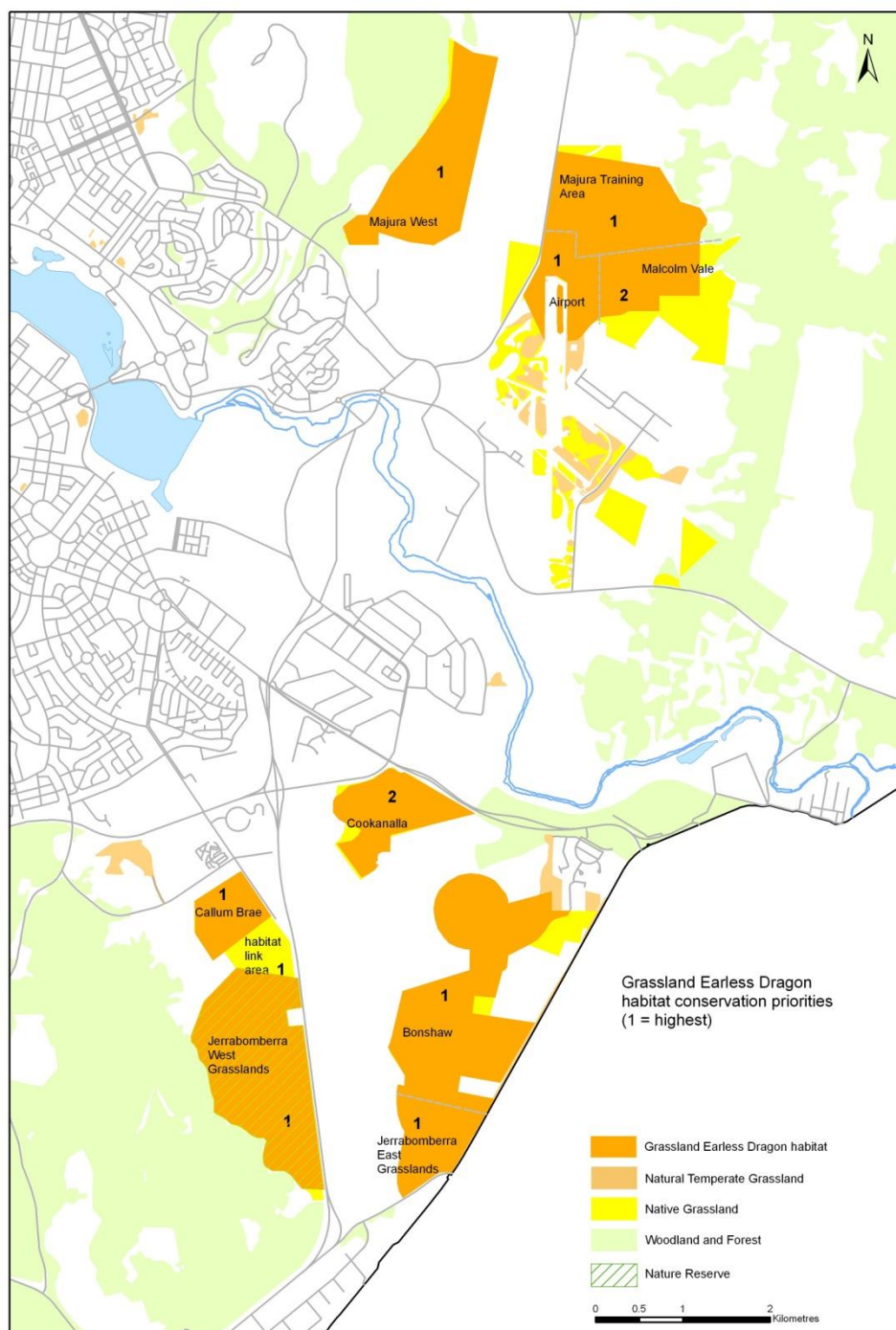
EEC	Endangered Ecological Community
FL	Fallen Logs
IPS	Indigenous Plant Species
NLT	Number of Large Trees
PFC	Percent Foliage Cover

Note: Exotic plant cover is calculated as the percentage of total ground cover.

APPENDIX 6 GEOGRAPHIC HABITAT FEATURES

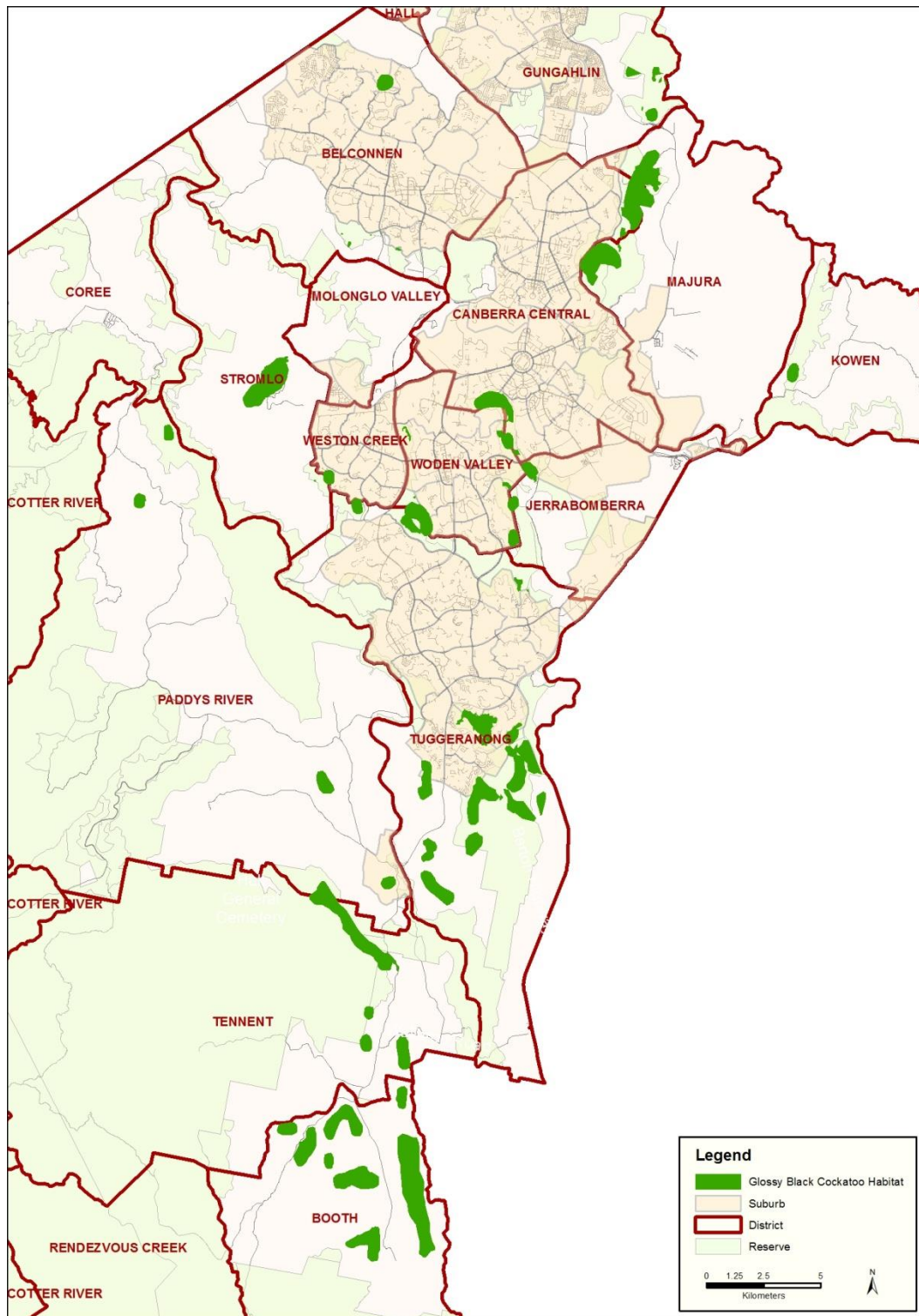


APPENDIX 7 GRASSLAND EARLESS DRAGON HABITAT AREAS



Source: Conservation Planning and Research , May 2010

APPENDIX 8 GLOSSY BLACK COCKATOO HABITAT AREAS



Data source: Conservation Planning and Research, EPD (2012)

APPENDIX 9 TARENGO LEEK ORCHID HABITAT



Data source: Conservation Planning and Research, EPD (2012).

APPENDIX 10 EXISTING CONSERVATION OBLIGATIONS - DISCOUNTS

Source: Assessment Methodology and ACT Environmental Offsets Policy

Existing conservation obligations – leasehold land

Table 1 - Mandatory discount for existing duty of care for leasehold land

Type of land	ACT EOC discounts
Leasehold land	Exclusion of fire 5%

Table 2 - Percentage discount in ecological community credit allocation for existing conservation measures secured through offset management plans, voluntary conservation agreements, biobanking agreements and Commonwealth funded stewardship programs

Conservation measures or actions	Percentage discount in ecological community credit allocation
Manage grazing for conservation	7.5%
No grazing of domestic stock	5%
Manage fire for conservation	7.5%
Weed control	7.5%
Manage human disturbance	7.5%
Retain regrowth	7.5%
Replant/supplementary planting	7.5%
Retain dead timber	
No collection of fallen timber for commercial purposes	1%
Nutrient control	5%
Retention of rocks	5%
Control feral herbivores (rabbits/deer etc)	7.5%
Vertebrate pest management (foxes, pigs and/or miscellaneous species)	7.5%
Control exotic fish species	1%
Maintain natural flow regimes	1%

Table 3 - Percentage discount for species credits - Conservation measures or actions - Percentage discount in species credit allocation for existing conservation measures secured through offset management plans, voluntary conservation agreements, biobanking agreements and Commonwealth funded stewardship programs

Conservation measures or actions	Percentage discount in species credit allocation
Control feral herbivores rabbits, deer and/or miscellaneous species	7.5%
Vertebrate pest management (foxes, pigs and/or miscellaneous species)	7.5%
Manage overabundant native species	7.5%
Control exotic fish species	1%
Maintain natural flow regimes	1%
Nutrient control	1%
Any other management action for species credits	7.5% (for each additional action)

Existing conservation obligations – public land

Table 4 - Percentage discount in ecological community credit allocation for existing conservation measures or actions on public land

Type of land	ACT EOC discounts
Unleased Territory land	Exclusion of fire 5%
Urban Open Space/ Hills Ridges Buffers/River corridors	Exclusion of fire 5% Weed control 7.5% Erosion control 5% Control feral herbivores (rabbits/deer etc.) 7.5%
Special Purpose Reserve	Exclusion of fire 5% No grazing of domestic stock 5% Weed control 7.5% Erosion control 5% Control feral herbivores (rabbits/deer etc.) 7.5%
Existing conservation reserves (wilderness areas/national parks/nature reserves)	Exclusion of fire 5% Weed control 7.5% Manage human disturbance 7.5% No collection of fallen timber for commercial purposes 1% Erosion control 5% Retention of rocks 5% Control feral herbivores (rabbits/deer etc.) 7.5% Vertebrate pest management (foxes, pigs etc.) 7.5% Control exotic fish species 1%

Table 5 - Percentage discount for species credits - Conservation measures or actions - Percentage discount in species credit allocation for Public Land

Conservation measures or actions	Percentage discount in species credit allocation
Control feral herbivores rabbits, deer and/or miscellaneous species	7.5%
Vertebrate pest management (foxes, pigs and/or miscellaneous species)	7.5%
Manage overabundant native species	7.5%
Control exotic fish species	1%
Maintain natural flow regimes	1%
Nutrient control	1%
Any other management action for species credits	7.5% (for each additional action)

APPENDIX 11 SURVEY DATA SHEETS

Field Data Sheets for Calculating Environmental Credits

April 2015

Field data sheet definitions and descriptions

The following information provides definitions and descriptions related to the included field data sheets. Please refer to the Environmental Offsets Calculator Operational Manual and Assessment Methodology for further explanation and instructions.

Vegetation zones

The clearing proposal must be divided into zones that are relatively homogenous areas of the same vegetation type and condition. Each vegetation zone should represent a distinct vegetation type (according to the ACT Vegetation Types Database) and condition state. Vegetation in low condition must always form a separate zone to vegetation that is in moderate to good condition. Zones within proposals do not need to be continuous (i.e. a single zone could occupy two or more areas on the site). Vegetation zones are assessed using transects and plots to collect site information data that is used to determine the site value or condition of the vegetation zone.

For operational reasons, the minimum size of a vegetation zone is 0.25 hectares. In many cases low condition vegetation includes isolated trees within modified landscapes. Vegetation zones should be digitised onto an ortho-rectified air photo or satellite image (SPOT5) using a GPS and labelled, and the same zone labels entered into the calculator.

Definitions for low condition vegetation

Vegetation in Low condition means:

- paddock trees - native over-storey percent foliage cover is less than 25% of the lower value of the overstorey percent foliage cover benchmark for that vegetation type and less than 50% of ground cover perennial vegetation is indigenous species; and
- native pasture - trees are absent or form less than 1% cover. The understorey is predominately comprised of native grasses, and there are five or less native herbs within the most diverse 20x20m of the area of investigation.

If native vegetation is not in low condition, it is in moderate to good condition.

The percentages for the ground cover calculations must be made in a season when the proportion of native ground cover vegetation compared to non-native ground cover vegetation in the area is likely to be at its maximum.

Site value assessment

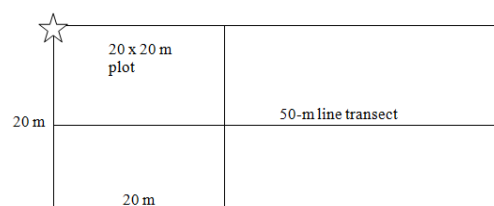
Site value is assessed for each zone by measuring the ten site condition attributes and then comparing the measured values against a benchmark for that vegetation type or class.

The site value assessment is carried out using transects and plots to collect site attribute data. Plot and transect surveys of the offset sites are used to provide quantitative measures of 10 site attributes in each vegetation zone. The site attributes are assessed to calculate the number of ecological community credits that are able to be created at an offset site.

Transects/plots should be established randomly within a zone (or within the different habitat types within a zone). A random selection of sites can be done by: marking points randomly on the imagery within the zone and establishing transects/plots at all, or some, of these points

or pacing a random distance into the zone, establishing a transect/plot at this point and then repeating the process.

Suggested transect/plot layout:



Landscape value assessment - survey attributes

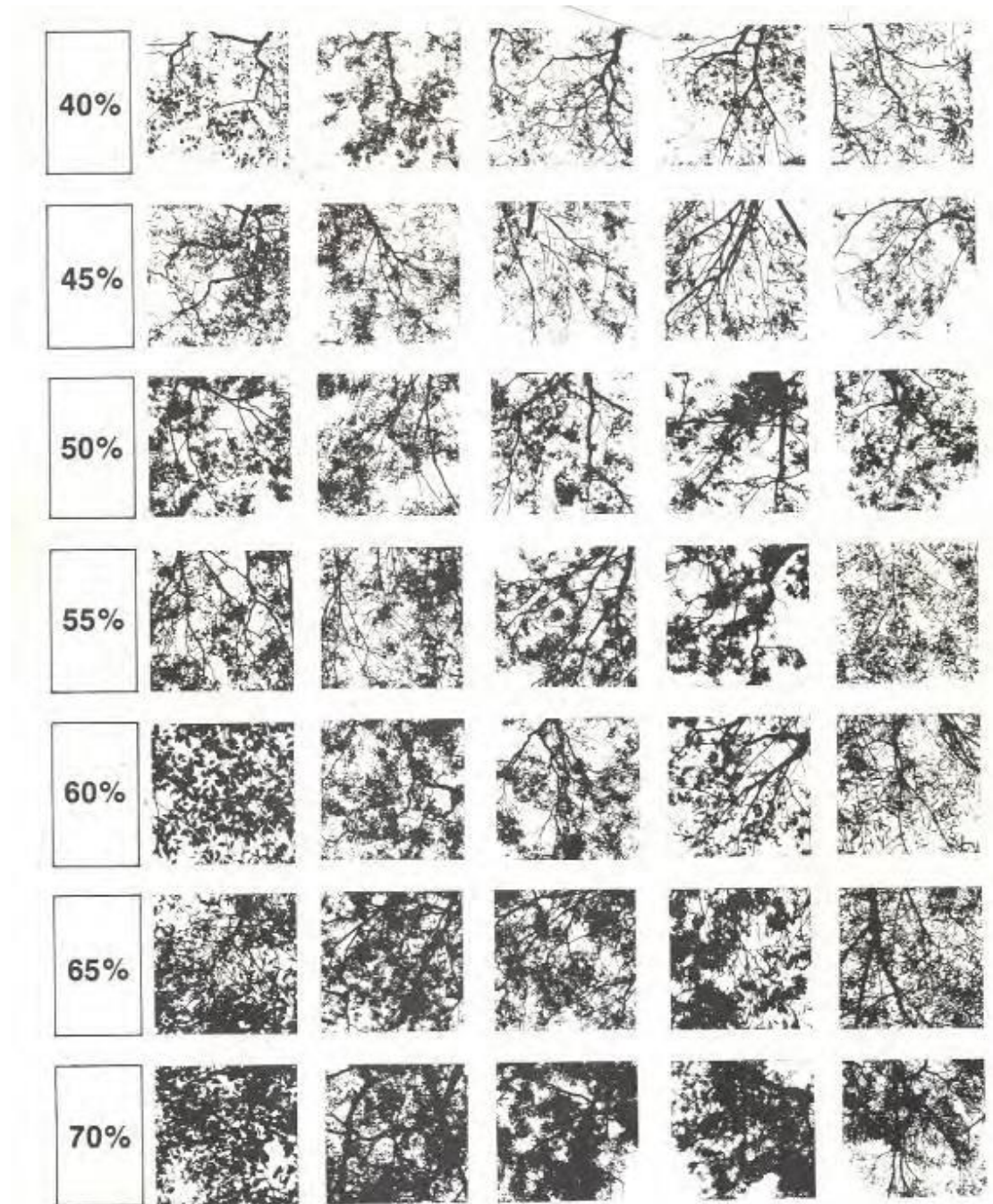
Variable	Plot or transect type	Method
Native plant species richness	20m x 20m plot	<p>Native plant species refers to vascular species local to the area which, if planted, come from a local seed source.</p> <p>Systematically walk the plot counting the number of native plant species for all vascular plants (i.e. the species do not have to be identified).</p>
Native over-storey cover	At 10 points along 50m transects	<p>Native over-storey is the tallest woody stratum present (including emergents) above 1m and includes all species native to the ACT (i.e. native species not local to the area can contribute to overstorey structure). In a woodland community the over-storey stratum is the tree layer, and in a shrubland community the over-storey stratum is the tallest shrub layer. Some vegetation types (e.g. grasslands) may not have an over-storey stratum.</p> <p>Over-storey cover is estimated as per cent foliage cover, which is equivalent to the amount of shadow that would be cast on the ground if there were a light source directly overhead and can be estimated using the following method: At 10 points along the 50m transect (i.e. every 5m) estimate per cent foliage cover directly overhead using the images provided on Page 4. Divide the total by the number of points (i.e. 10) measured along the transect (e.g. 50%, 0%, 0%, 40%, 0%, 45%, 50%, 55%, 0%, 0% = $240/10 = 24\%$ foliage cover).</p>
Native mid-storey cover	At 10 points along 50m transects	<p>The mid-storey contains all vegetation between the over-storey stratum and 1m in height (typically tall shrubs, under-storey trees and tree regeneration) and includes all species native to the ACT (i.e. native species not local to the area can contribute to mid-storey structure). Foliage cover of the mid-storey is expressed as a % and can be measured using the following method:</p> <p>At 10 points along the 50m transect (i.e. every 5m) estimate per cent foliage cover in the mid-storey. Divide the total by the number of points (i.e. 10) measured along the transect (e.g. 50%, 0%, 0%, 40%, 0%, 45%, 50%, 55%, 0%, 0% = $240/10 = 24\%$ foliage cover).</p>

Variable	Plot or transect type	Method
Native ground cover (grasses)	At 50 points along 50m transects	The ground stratum contains all native vegetation below 1m in height and includes all species native to the ACT (i.e. is not confined to species indigenous to the area). The ground stratum (grasses) refers to native grasses (i.e. plants belonging to the family Poaceae). Foliage cover of the ground stratum (grasses) is expressed as a % and can be measured using the following method: At 50 points along the 50m transect (i.e. every 1m) record whether native grass intersects that point. Divide the total of 'hits' by the number of points measured along the transect (i.e. 50).
Native ground cover (shrubs)	At 50 points along 50 m transects	The ground stratum contains all native vegetation below 1m in height and includes all species native to the ACT (i.e. is not confined to species indigenous to the area). The ground stratum (shrubs) refers to native woody vegetation <1m. It is measured in the same way as for native ground cover (grasses) (see above).
Native ground cover (other)	At 50 points along 50m transects	The ground stratum contains all native vegetation below 1m in height and includes all species native to the ACT (i.e. is not confined to species indigenous to the area). The ground stratum (other) refers to non-woody native vegetation (vascular plants only) <1m that is not grass (e.g. herbs, ferns). It is measured in the same way as for native ground cover (grasses) (see above).
Exotic plant cover	At 50 points along 50m transects	Exotic plants are vascular plants not native to Australia. Exotic cover is measured as a % of total standing ground cover vegetation (not ground litter).
Number of large trees	50m x 20m plot	This is a count of the number of living and dead trees within a 50mx20m plot which have a circumference of 150cm, 1m above ground height.
Over-storey regeneration	Entire zone	Regeneration is measured as the proportion of over-storey species present at the site that are regenerating (i.e. with dbh < 5cm). For example if there are three tree species present at the site but only one of these species is regenerating, then the value is 0.33. The maximum value for this measure is 1.
Total length of fallen logs	50m x 20m plot	This is the total length of logs at least 10cm diameter and at least 0.5m long. The diameter is estimated with a measuring tape (or callipers if available) held horizontally immediately above the log and the length is estimated to the nearest metre by measuring with a tape, or pacing, along the part of the log that is at least 10cm diameter. If estimating length by pacing then the actual length of a sample of logs should be measured regularly with a tape so the assessor can calibrate their estimate derived from pacing. Only those parts of logs lying within the plot are measured.

Photos to assist with estimates of percent foliage cover

Photos to assist with estimates of percent foliage cover (Walker and Hopkins 1988, Vegetation, pp. 58–86 in *Australian soil and land survey field handbook*, 2nd edition in Department of Environment and Climate Change (NSW) (2009), *BioBanking Assessment Methodology and Credit Calculator Operational Manual*).

Rows show similar crown types for different leaf sizes (large to small, left to right). *Acacia phyllodes* is in the right-hand row. Most Australian woody plants are in the range 40–70%.



Landscape value assessment

Region

Subregion

Date

Proposal

Proposal

name

Recorder

VEGETATION TYPES (used to determine zone numbers)

Zone no	Vegetation formation	Vegetation type	EEC	Condition class

Notes:

Site value:

Transect plot data sheet

(Start a new sheet for each vegetation zone)

Region	Subregion	Recorder	Date
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Proposal ID	Proposal name	Significant Species Sub Zone ID	
<input type="text"/>	<input type="text"/>	<input type="text"/>	
Vegetation formation	<input type="text"/>		
Vegetation type	<input type="text"/>		
Condition (low or mod/good)	Site/Plot Name (optional)	Geographic/habitat features	
<input type="text"/>	<input type="text"/>	(tick after printing step 2 of calculator) <input type="checkbox"/>	

Coordinates (GPS datum GDA94: _____)

Transect/Plot No	<input type="text"/>
Easting	<input type="text"/>
Northing	<input type="text"/>
Zone AMG	<input type="text"/>

Native plant species richness ¹	<input type="text"/>
Number of large trees	<input type="text"/>
Over-storey regeneration ³	<input type="text"/>
Total length of fallen logs (m) ²	<input type="text"/>

Transect tally table

	Number of hits (tally)
Native Plant Species Richness	<input type="text"/>
Native over-storey cover	<input type="text"/>
Native mid-storey cover	<input type="text"/>
Native ground cover (grasses)	<input type="text"/>
Native ground cover (shrubs)	<input type="text"/>
Native ground cover (other)	<input type="text"/>
Exotic plant cover	<input type="text"/>

Transects

Native over-storey cover (%)	<input type="text"/>
Native mid-storey cover (%)	<input type="text"/>
Native ground cover (grasses) (%)	<input type="text"/>

Native ground cover (shrubs) (%)	<input type="text"/>
Native ground cover (other) (%)	<input type="text"/>
Exotic plant cover (%)	<input type="text"/>

Comments/additional conservation values (riparian areas, special features, geology, etc.):
--

¹ 20 x 20 m plot

² 20 x 50 m plot

³ whole zone

Native species list worksheet

Full species IDs are not required, but may be useful for identification of correct vegetation type and for monitoring and audit purposes.

Site type: Development / Offset Proposal ID: _____ Date: _____ Recorder(s): _____

Vegetation type: _____ AMG Zone _____ Easting/Northing: _____ Photos: _____

Native over-storey species list At 10 points along the 50-m transect	Regen- eration (v) (for the whole zone)	Native mid-storey species list (>1m to <over-storey) At 10 points along the 50-m transect	Native ground cover (grasses) species list (ground stratum <1m) At 50 points along the 50-m transect	Native ground cover (shrubs) species list (ground stratum <1m) At 50 points along the 50-m transect	Native ground cover (other) species list (ground stratum <1m) At 50 points along the 50-m transect	Exotic plants species list At 50 points along the 50-m transect
		Total no of species =	Total no of species =	Total no of species =	Total no of species =	Total no of species =
SITE AND OTHER NOTES:						

NB: Transects / plots should be placed randomly with the minimum number required for the zone in accordance with Table 11 of the Assessment Methodology.

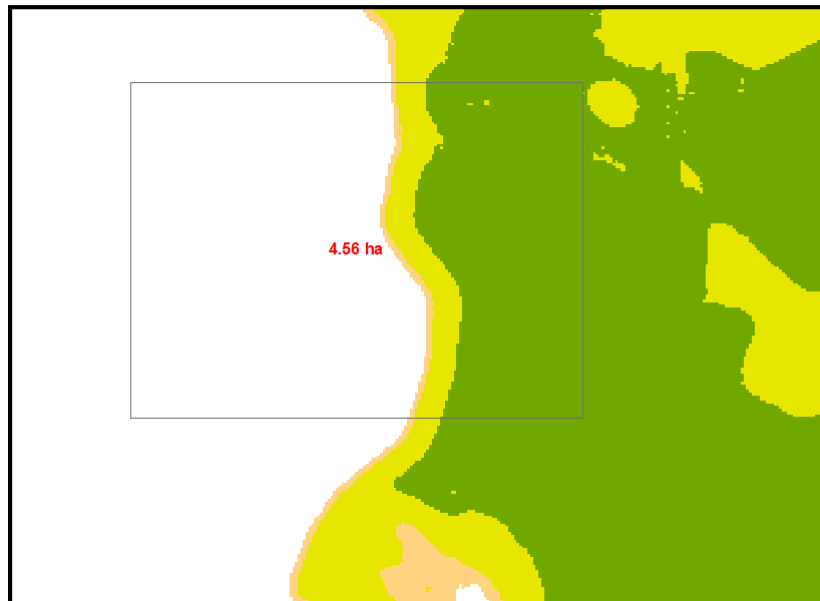
APPENDIX 12 WORKED EXAMPLE OF CALCULATING LANDSCAPE VALUE SCORE

To calculate landscape value two scores need to be entered into the calculator. These are habitat context and link value scores. GIS data layers are provided on the [EPD website](#) to support calculation of habitat context and link value.

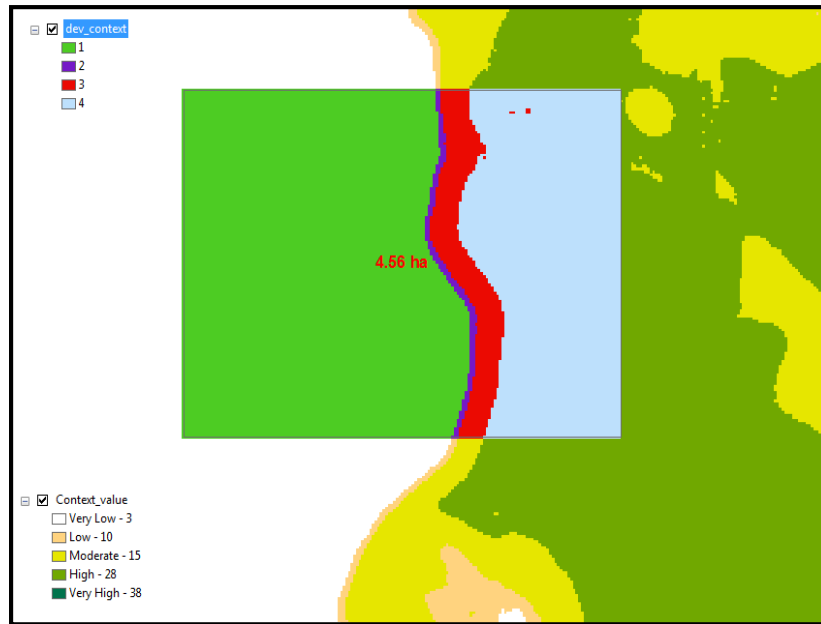
Below is a worked example that illustrates how habitat context and link value scores are calculated using a GIS program.

Habitat Context

Step 1: Create a polygon of the development area



Step 2: Clip the context value raster to the dev site polygon



Step 3: Calculate the area of each context value zone.

Step 4: Calculate the area of the site (the total of each context value zone).

Step 5: Calculate the percentage of the development site impacting on each habitat context zone using the count field in the attribute table.

dev_context			
Rowid	VALUE	COUNT	
1	2	284	
2	3	1354	
3	4	6478	
0	1	12468	

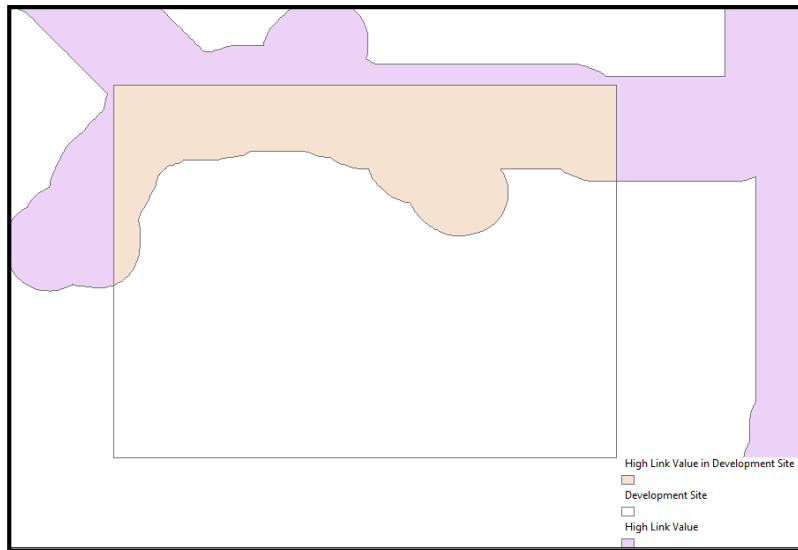
Total Count: 20584			
Value 1 (Very Low)	= 12468/20584	Value 2 (Low)	= 284/20584
	= 61%		= 1%
Value 3 (Moderate)	= 1354/20584	Value 4 (High)	= 6478/20584
	= 7%		= 31%

Value 5 (Very High) = N/A for this development site

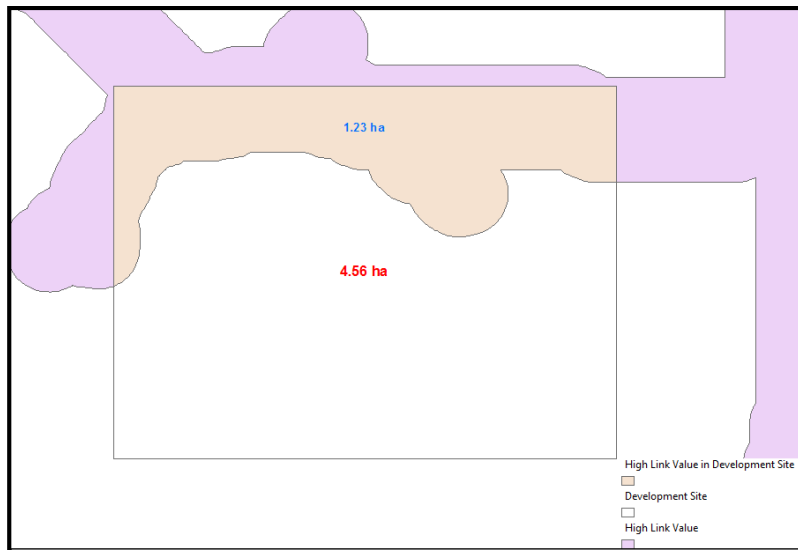
Step 6: Enter these percentage values into the calculator in the habitat context table.

Link Value

Step 1: Clip the link value layer to the development site area.



Step 2: Calculate the area of the development site and the area of the clipped link value layer.



Total development site area = 4.56ha

High link value area = 1.23ha

Step 3: Calculate the percentage values for the low and high link value zones.

Percentage High Value Link = $(1.23/4.56) * 100$
=27%

Percentage Low Value Link = $100-27$
=73%

The GIS layer provides only high link value areas, and all other areas are allocated to the low link value zone.

Step 4: Enter these percentage values into the calculator in the link value table.

Step 1a - Enter Landscape Value Scores

Done

Landscape score: 17.09

Neighbourhood Habitat Context Value

% Development within zone(must add up to 100%)	Zone Type	Zone Score
61	Very Low	3
1	Low	10
7	Moderate	15
31	High	28
0	Very High	38

calculate landscape value score

Link Value

% Development within zone(must add up to 100%)	Zone Type	Zone Score
73	Low Linkage	3
27	High linkage	12

APPENDIX 13 GOLDEN SUN MOTH

The Golden Sun Moth has the following special offset requirement (see Section 2.6.5 for an explanation of special offset requirements):

No loss of habitat patches >50ha AND supporting populations of more than 50 moths (population must be counted at a time when large populations are observed at nearby known sites).

This special offset requirement was requested by the Commonwealth Government. It means that both individuals and habitat hectares need to be recorded, whereas, for most species it is one or the other.

Given this special offset requirement, a survey is required for this species for both the number of individuals as well as the extent of habitat in hectares. Data is required to be entered into the calculator for both of these units. The calculator will supply two rows for the Golden Sun Moth when associated vegetation types have been entered at Step 1. Please complete both rows.

Surveying for both individuals and habitat hectares will result in two lots of species credits for Golden Sun Moth. These species credits can be used interchangeably as long as the total number of species credits is provided on the offset site.

For example: If a proponent was going to clear a site with 10ha of GSM habitat and 10 individuals, then they would require 267 species credits for the habitat ha and 267 species credits for the individuals. The equivalent offset site could consist of only habitat ha (equalling 534 credits), or a mix of habitat ha and individuals in any ratio, as long as the 534 species credits requirement is met.

Given the credits are interchangeable, a small area of habitat with a large number of individuals could be offset by a large area of habitat without any individuals. This applies a fundamental conservation biology principle in which bigger patches are preferred. It also ensures that sites are not avoided for offsets just because individuals were not seen in one survey period.

Early indications suggest that Golden Sun Moth translocation may be an effective management tool. This means that larger sites with good habitat but few or no known moths could be populated. As such, preserving large sites is of good conservation value.