

s. 22(1)(a)(ii)

From: s. 47F(1) @tmr.qld.gov.au>
Sent: Thursday, 6 May 2021 10:33 AM
To: s. 22(1)(a)(ii)
Subject: RE: 2020-8646 Stage 1 Coomera Connector - site visit

Great! I'll call you now – from my mobile.

Cheers,

s. 47F(1)


From: s. 22(1)(a)(ii) @awe.gov.au>
Sent: Thursday, 6 May 2021 10:30 AM
To: s. 47F(1) @tmr.qld.gov.au>
Subject: RE: 2020-8646 Stage 1 Coomera Connector - site visit

Hey ^{s. 47F(1)} I'm free now if it suits you?

Cheers

s. 22(1)(a)(ii)

Senior Assessment Officer
Queensland South Assessments Section
Assessments and Governance Branch
Department of Agriculture, Water and the Environment
P: s. 22(1)(a)(ii)
s. 22(1)(a)(ii)@environment.gov.au



We acknowledge the traditional custodians of this land and celebrate their ongoing culture and contribution to society.

From: s. 47F(1) @tmr.qld.gov.au>
Sent: Thursday, 6 May 2021 10:04 AM
To: s. 22(1)(a)(ii) @awe.gov.au>
Subject: RE: 2020-8646 Stage 1 Coomera Connector - site visit

Hi ^{s. 22(1)(a)(ii)}, how are you?

Any chance of me being able to give you a call to chat about a few things? Let me know what time suits if you are OK with that.

Cheers,

s. 47F(1)

From: s. 22(1)(a)(ii) @awe.gov.au>
Sent: Wednesday, 5 May 2021 3:16 PM
To: s. 47F(1) @tmr.qld.gov.au>
Cc: s. 47F(1) @tmr.qld.gov.au>; s. 22(1)(a)(ii) @environment.gov.au>
Subject: 2020-8646 Stage 1 Coomera Connector - site visit

Hello s. 47F(1)

I trust you are well! With the release of the draft PER for 2020-8646 Stage 1 Coomera Connector, we are hoping to organise a site visit within the next 2-3 weeks.

If this is suitable, is there a specific time that may suit you and the team best?

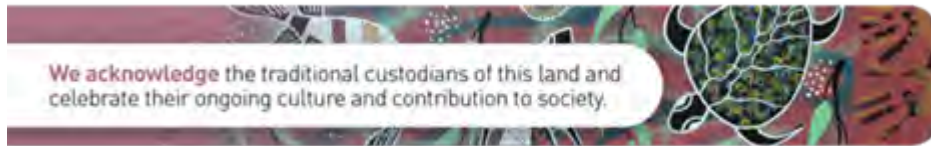
Kind regards,

s. 22(1)(a)(ii)

Senior Assessment Officer
Queensland South Assessments Section
Assessments and Governance Branch
Department of Agriculture, Water and the Environment

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s. 22(1)(a)(ii)

From: s. 47F(1) <planitconsulting.com.au>
Sent: Thursday, 29 April 2021 2:30 PM
To: s. 22(1)(a)(ii)
Subject: RE: Coomera Connector PER

Hi s. 22(1)(a)(ii)

Would a drop box link be appropriate?

Kind regards,



s. 47F(1)

Graduate Environmental Planner

Telephone: s. 47F(1) | **Facsimile:** 07 5526 1502

Level 1, 2247 Gold Coast Hwy, Nobby Beach QLD 4218
PO Box 206, Nobby Beach QLD 4218

Development & Engineering Consultants for Queensland - New South Wales - Victoria - Northern Territory

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From: s. 22(1)(a)(ii) <@awe.gov.au>
Sent: Thursday, 29 April 2021 2:28 PM
To: s. 47F(1) <@planitconsulting.com.au>
Cc: s. 22(1)(a)(ii) <@environment.gov.au>; s. 22(1)(a)(ii) <@environment.gov.au>
Subject: RE: Coomera Connector PER

Hey s. 47F(1), happy for you to send it direct to s. 22(1)(a)(ii), CC'ing myself and s. 22(1)(a)(ii).

Either direct via email or if needed due to size, a cloud type service.

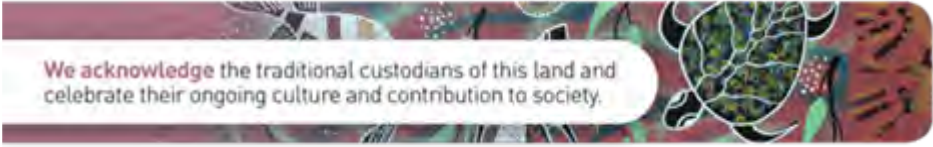
I hope this answers your question?

Kind regards,

s. 22(1)(a)(ii)

Senior Assessment Officer
Queensland South Assessments Section
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Department of Agriculture, Water and the Environment
P: s. 22(1)(a)(ii)

s. 22(1)(a)(ii)@environment.gov.au



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From: s. 47F(1) <[@planitconsulting.com.au](mailto:s.47f(1)@planitconsulting.com.au)>
Sent: Thursday, 29 April 2021 2:17 PM
To: s. 22(1)(a)(ii) <[@awe.gov.au](mailto:s.22(1)(a)(ii)@awe.gov.au)>
Subject: RE: Coomera Connector PER

Good afternoon s. 22(1)(a)(ii)

Hope you're well.

Regarding submitting the Coomera Connector PER and the relevant attachments, how do we go about submitting it tomorrow?

I look forward to hearing back from you,

Kind regards



s. 47F(1)

Graduate Environmental Planner

Telephone: s. 47F(1) | **Facsimile:** 07 5526 1502

Level 1, 2247 Gold Coast Hwy, Nobby Beach QLD 4218
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From: s. 22(1)(a)(ii) <[@awe.gov.au](mailto:s.22(1)(a)(ii)@awe.gov.au)>
Sent: Tuesday, 20 April 2021 9:30 AM
To: s. 47F(1) <[@planitconsulting.com.au](mailto:s.47f(1)@planitconsulting.com.au)>
Cc: s. 47F(1) <[@planitconsulting.com.au](mailto:s.47f(1)@planitconsulting.com.au)>
Subject: RE: Coomera Connector PER

Good Morning s. 47F(1),

That is good to hear! As separate documents please.

Kind regards,

s. 22(1)(a)(ii)

Senior Assessment Officer
Queensland South and Sea Dumping Section
Assessments and Governance Branch
Department of Agriculture, Water and the Environment
P: s. 22(1)(a)(ii)
s. 22(1)(a)(ii)@environment.gov.au



We acknowledge the traditional custodians of this land and celebrate their ongoing culture and contribution to society.

From: s. 47F(1) <@planitconsulting.com.au>
Sent: Tuesday, 20 April 2021 8:42 AM
To: s. 22(1)(a)(ii) <@environment.gov.au>
Cc: s. 47F(1) <@planitconsulting.com.au>
Subject: Coomera Connector PER

Good morning s. 22(1)(a)(ii)

We're in the final stages of completing the PER report for Coomera Connector.

Upon submitting the report, in regard to the attachments, are the attachments submitted as one document or are they submitted as separate documents (i.e. attachment 1 is a single document, attachment 2 is a whole separate document or a flow on document that has all attachments following one after another).

I look forward to hearing back from you.

Kind regards,



s. 47F(1)

Graduate Environmental Planner

Telephone: s. 47F(1) | **Facsimile:** 07 5526 1502

Level 1, 2247 Gold Coast Hwy, Nobby Beach QLD 4218
PO Box 206, Nobby Beach QLD 4218

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From: s. 47F(1) @tmr.qld.gov.au>
Sent: Thursday, 6 May 2021 2:15 PM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii); s. 47F(1)
Subject: 2020-8646 Stage 1 Coomera Connector - current TMR contacts
Follow Up Flag: Follow up
Flag Status: Flagged

Afternoon ^{s. 22(1)(a)(ii)} how are you? It was good to chat to you earlier.

As per our conversation, here is an up to date list of TMR contacts for the Coomera Connector project.

Project Director – s. 47F(1) has recently joined the project and replaces s. 47F(1) as project director, although ^{s. 47F(1)} is still the regional director for South Coast.

Project Manager – Stage 2 – s. 47F(1) is going to be transitioning to the role of Project Manager (Planning) to lead development of the Stage 2 Business Case of the Coomera Connector project. He is still heavily involved with Stage 1 though, so remains a point of contact for DAWE if required.

Project Manager – Stage 1 North (Shipper Drive to Helensvale Road) – s. 47F(1) I think I introduced you to ^{s. 47F(1)} when we had an online meeting before Christmas, but just to confirm that ^{s. 47F(1)} is the PM for this section.

Project Manager – Stage 1 Central (Helensvale Road to Smith Street Motorway) – TBA.

Project Manager – Stage 1 South (Smith Street Motorway to Nerang-Broadbeach Road) – TBA.

Environmental Officer – s. 47F(1) and s. 47F(1) I will remain the main point of contact for DAWE as ^{s. 47F(1)} will primarily be involved with the delivery of Stage 1. He will be copied into key correspondence and may attend meetings from time to time depending on his availability.

As per our chat this morning re: Planit Consulting and recent staff changes, if you could send all Coomera Connector related emails to TMR (to myself as your primary point of contact and cc'd to s. 47F(1) and ^{s. 47F(1)} where appropriate) rather than to Planit Consulting from this point onwards, that would be great.

Give me a call if you wanted any more info,

Cheers,

s. 47F(1)

s. 47F(1)
Environmental Officer | South Coast Region | Gold Coast Office
Program Delivery & Operations Branch | Department of Transport and Main Roads

Ground Floor | 16 – 18 White Street | Nerang Qld 4211
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From: s. 47F(1) @tmr.qld.gov.au>
Sent: Wednesday, 16 June 2021 7:30 AM
To: s. 22(1)(a)(ii)
Subject: Coomera Connector PER update?
Follow Up Flag: Follow up
Flag Status: Flagged

Morning s. 22(1)(a)(ii), how are you both?

Just thought I'd check in with you now it's a couple of weeks since your site visit to see how you are progressing with the review process for the draft PER.

To date we haven't received any feedback at all, so if there is anything that you can see from your review so far that will need editing prior to public release, if you could let me know so we can make a start on those sections that would be great.

You might also remember me mentioning that I had an updated koala habitat assessment to send through to you. It's a massive file, so I was going to try and set up a Microsoft teams group for us so we can use that to send files. Otherwise I will have to ask Planit to Dropbox it over to you (we are not allowed to use Dropbox on the TMR network for some reason).

Thanks and speak soon,

s. 47F(1)

s. 47F(1)
Environmental Officer | South Coast Region | Gold Coast Office
Program Delivery & Operations Branch | Department of Transport and Main Roads

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s. 22(1)(a)(ii)

Document 5

From: s. 22(1)(a)(ii)
Sent: Thursday, 29 April 2021 3:53 PM
To: s. 47F(1)
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: Updated Impact/Offsets calculator and guide
Attachments: Detailed Offsets Handbook-QLD Version (1).docx; Offsets Assessment Guide (v1.04.00) (1).xlsm

Good afternoon

Please see attached updated information which may be helpful for capturing and scoring the attributes associated with habitat quality assessment for the impact and if required, any offset sites. This is an updated calculator and associated *How to use* guide. Please note that the calculator and methodology hasn't changed, simply descriptions and definitions have been added.

As stated previously, we note that the Department does not have a specified or endorsed methodology for assessing habitat quality in QLD, and generally accepts any method that is well-established, scientifically robust, quantitative, reproducible and consistent with the EPBC Offsets Policy requirements.

If you have any questions, please do not hesitate to contact me.

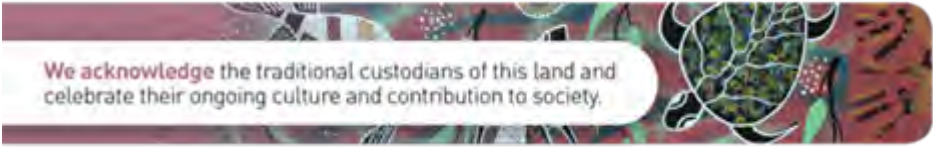
Kind regards,

s. 22(1)(a)(ii)

Senior Assessment Officer
Queensland South Assessments Section
Assessments and Governance Branch
Department of Agriculture, Water and the Environment

P: s. 22(1)(a)(ii)

s. 22(1)(a)(ii)@[environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)



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Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012

Matter of National Environmental Significance	
Name	
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Impact calculator					
Ecological communities					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of community	Yes		Area (Hectares)		
			Quality (Scale 0-10)		
			Total quantum of impact (Adjusted Hectares)	0.00	
Threatened species habitat					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Area of habitat	No		Area (Hectares)		
			Quality (Scale 0-10)		
			Total quantum of impact (Adjusted Hectares)		
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Number of features e.g. Nest hollows, habitat trees	No				
Condition of habitat Change in habitat condition, but no change in extent	No				
Threatened species					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
Birth rate e.g. Change in nest success	No				
Mortality rate e.g. Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator															
Ecological Communities															
Protected matter attributes	Attribute relevant to case?	Total quantum of impact (Adjusted Hectares)	Proposed offset	Time Horizon (Years)	Start area and quality	Future area and quality without offset (adjusted hectares)	Future area and quality with offset (adjusted hectares)	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	Offset Result		Cost (\$ total)	Information source
Area of community	Yes	0.00		Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss without offset (%)	Risk of loss with offset (%)	0.00		0.00	0.00	Overall net present value	0.00		
				Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)	0.00		0.00	0.00	% of impact offset	0.00%		
						Future area without offset	Future area with offset	0.0		0.0	Minimum (90%) direct offset requirement met?		FALSE		
Threatened species habitat															
Protected matter attributes	Attribute relevant to case?	Total quantum of impact (Adjusted Hectares)	Proposed offset	Time Horizon (Years)	Start area and quality	Future area and quality without offset (adjusted hectares)	Future area and quality with offset (adjusted hectares)	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	Offset Result		Cost (\$ total)	Information source
Area of habitat	No			Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss without offset (%)	Risk of loss with offset (%)	0.00		0.00	0.00	Overall net present value	0.00		
				Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)	0.00		0.00	0.00	% of impact offset	0.00%		
						Future area without offset	Future area with offset	0.0		0.0	Minimum (90%) direct offset requirement met?		FALSE		
Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon (years)	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
Number of features e.g. Nest hollows, habitat trees	No							0.00		0.00	0.00	0.00%	FALSE		
Condition of habitat Change in habitat condition, but no change in extent	No							0.00		0.00	0.00	0.00%	FALSE		
Threatened species															
Protected matter attributes	Attribute relevant to case?	Quantum of impact	Proposed offset	Time horizon (years)	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
Birth rate e.g. Change in nest success	No							0.00		0.00	0.00	0.00%	FALSE		
Mortality rate e.g. Change in number of road kills per year	No							0.00		0.00	0.00	0.00%	FALSE		
Number of individuals e.g. Individual plants/animals	No							0.00		0.00	0.00	0.00%	FALSE		

Summary							
Protected matter attributes	Quantum of impact	Net present value	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset	Other compensatory measures	Total
Birth rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Mortality rate	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of individuals	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Number of features	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Condition of habitat	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Area of habitat	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
Area of community	0.00	0.00	0.00	FALSE	0.00	N/A	0.00
					\$0.00	\$0.00	\$0.00

HOW TO USE THE OFFSETS ASSESSMENT GUIDE

1. INTRODUCTION

The *EPBC Act environmental offsets policy* (the policy) outlines the Australian Government's approach to the use of environmental offsets ('offsets') under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The policy is accompanied by the *Offsets assessment guide* (the guide). The guide gives effect to the policy, using a balance sheet approach to estimate impacts and offsets for threatened species and ecological communities.

The policy and guide provide a decision framework to normalise offset determinations. The overarching test in both the policy and the guide is that offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter(s) affected by the proposed action. That is:

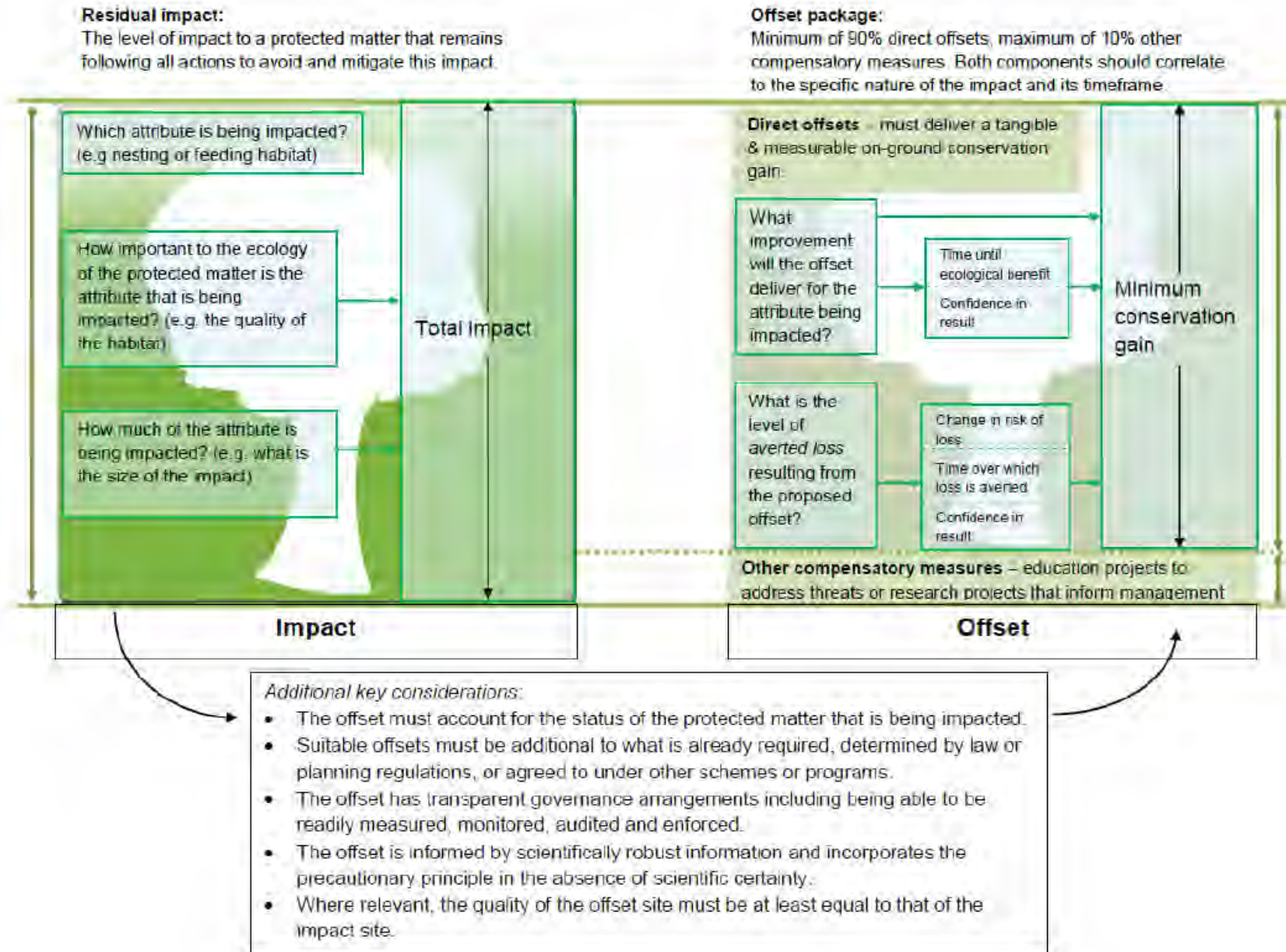
$$\text{Impact} + \text{Offset} = \text{Improvement or maintenance of protected matter}$$

The guide supports application of the offsets policy in the post approval phase of an environmental impact assessment under the EPBC Act. The guide should only be used for considering offsets for impacts to threatened species and/or ecological communities.

The guide is a tool to assist expert users in the Department to determine the suitability of offset proposals. If the Department determines that a proposed offset is not adequate, the Department will advise the approval holder, who will have an opportunity to revise their offset proposal.

The guide is also available to proponents to assist in planning future development proposals and estimating potential future offset requirements. It is an Excel spreadsheet with embedded formulae, which can be downloaded at www.environment.gov.au/epbc/publications/environmental-offsets-policy.html (macros need to be enabled in your browser settings to use it). The overarching decision-making framework of the policy and guide is shown in Figure 1.

Figure 1 – Determining suitable offsets under the EPBC Act



2. DEFINITIONS AND GUIDANCE – IMPACT QUANTIFICATION

This section explains how key features of the calculator work, as well as guidance on how to work out what numbers to use as inputs. It is best worked through in conjunction with the Offsets Assessment Guide (the calculator).

2.1 Matter of National Environmental Significance sub-table

This small sub-table at the top of the calculator asks you to identify the particular MNES being offset, and to assign it a threat level (vulnerable, endangered, or critically endangered). It is reasonably straightforward, but occasionally throws up some odd quirks. The threat level assigned to the species also has large ramifications for the total offset required at the end of the calculation process. Be aware, the calculator will refuse to produce a final offset quantum if you do not enter a value for the *Annual probability of extinction*, and will produce a “DIV/O” error.

What it looks like:

Matter of National Environmental Significance	
Name	
EPBC Act status	
Annual probability of extinction Based on IUCN category definitions	

Enter the name of the matter being offset. It will not interact with other parts of the spreadsheet.

Select the endangerment category corresponding to the appropriate IUCN extinction risk category: vulnerable, endangered, or critically endangered.

Though this cell is labelled “EPBC Act status”, it is actually intended to reflect the degree of genuine endangerment, which could be different to the legal status of the species or ecological community.

This cell will autofill. The value appearing in the cell is used by later sections of the spreadsheet as a discount rate.

Detailed explanations of terms: Annual probability of extinction

The *Annual probability of extinction* is an estimate of the average chance that a species or ecological community will become extinct in the wild each year, based on recent rates of decline. The *Annual probability of extinction* is incorporated into the impact and offset calculation process as a discounting factor (discussed below at *time until ecological benefit*) – that is, it reduces the value of the proposed offset for each year until the final offset benefit is realised (much the same as a negative compound interest rate). The percentage rate is derived from the International Union for the Conservation of Nature (IUCN) Red List for threatened species, as shown below:

Conservation status of MNES	IUCN criteria for probability of extinction in the wild	Annual probability of extinction (geometric mean)	Annual probability of extinction (geometric mean) + probability of catastrophe
Critically Endangered	At least 50% in 10 yrs	6.7%	6.6%
Endangered	At least 20% in 20 yrs	1.1%	1.2%
Vulnerable	At least 10% in 100 yrs	0.1%	0.2%

The discount rate has two consequences. First, it incentivises early offsetting outcomes (particularly for species and ecological communities meeting the threshold for consideration as critically endangered). Second, it produces a requirement for greater offset gains for species and ecological communities that are subject to higher levels of endangerment. Both outcomes are consistent with the EPBC Act Offsets Policy.

Detailed explanation of terms: Legal status vs actual risk of extinction

While the dropdown list items for the 'Annual probability of extinction' included in the calculator align with the legal conservation status of the species or ecological community, there are cases where it may be appropriate to assign a different value. Where a species or ecological community has been found to be eligible for listing at a key threshold, that information justifies using the associated *Annual probability of extinction*, regardless of whether the species or ecological community has been listed at that level. This will generally apply where:

- A species or ecological community has been found eligible for listing by the Threatened Species Scientific Committee (or an equivalent state government body), but has not yet been listed, and the project is being assessed for impacts to the whole of the environment (Please note: the whole of the environment includes unlisted species and ecological communities)
- A species or ecological community has been found eligible for listing by the Threatened Species Scientific Committee (or an equivalent state government body), but has not yet been listed, and the project is being assessed for impacts to one or more natural heritage values that include the species or ecological community, and the Department has agreed that offsets are an appropriate response to the heritage impacts
 - (Please note: heritage impacts are not generally suitable for offsetting. However, for some large heritage places with unusually species- or ecological community-oriented values, offsetting may be not be wholly impossible)
- A species or ecological community is currently listed in one category, has been found eligible for listing in a higher category by the Threatened Species Scientific Committee, but the up-listing decision has not yet been made.
- The controlled action decision was made prior to a subsequent listing or uplisting event, requiring that a species or ecological community is therefore treated as if one of the above situations were occurring
 - (Please note: the EPBC Act requires that the fact of a listing or uplisting decision having been made after the controlled action decisions must be ignored in decisions related to the project. However, the information that led to the listing or uplisting event is relevant information that the Minister may – and in some cases must – consider. The *Annual probability of extinction* relies on the information about the actual degree of endangerment, not the fact of listing or uplisting)

2.2 Impact quantification sub-table - area-based options:

The left-hand side of the calculator asks you to enter the current details for the impact site, and then produces a “Quantum of impact”. Later on, the calculator will be checking to make sure that the offset quantum matches the impact quantum.

What it looks like:

Protected matter categories	Attributes relevant to offset?	Description	Quantum of impact	Units	Information source
Species/communities					
Area of community Description	Yes		Area		
			Quality		
			Total quantum of impact	6.00	
Flora/fauna/vegetation					
Area of habitat Description	Yes		Area		
			Quality		
			Total quantum of impact	6.00	

Name the matter being impacted, or the particular sub-area of impact, if there are multiple impact sites being calculated separately.

Insert the area in hectares being impacted. Please use numerals only. The calculator **will** accept decimal points, though these may not always display.

Insert the quality score out of 10. This must be an integer. Please consult with the Department on how to determine the score out of 10 before submitting offsets calculations.

If these cells are not changed to yes, the relevant row will be locked.

Insert where the impact information was sourced.

Please note: the corresponding cells in both rows operate in the same way. A description of a cell in one row therefore applies equally to a cell in the other.

These cells will autofill. Their values are used later to determine whether the offset liability has been met.

All cells in this column will autofill, but are otherwise cosmetic.

Key concept: What about the other rows?

The left-hand side of the calculator contains several other rows that could theoretically be used to calculate impacts. They are discussed in more detail below, but broadly, the Department generally recommends avoiding those rows. They typically either require an extremely high degree of scientific certainty, or can only cater to a single element within a species’ habitat requirements, and are therefore both more challenging and less effective to use for offset calculations.

Detailed explanation of terms: Adjusted hectares

The unit referred to in the calculator for *total quantum of impact* is described as “adjusted hectares”. This is **not** an area measure. On the impact side calculation, it is:

$$\frac{(Area \times Quality)}{10}$$

On the offset side (noting that a further discount rate will apply later), it is:

$$\left(\frac{Start\ area \times Quality\ with\ Offset}{10} \right) \times \left(\frac{100 - Risk\ of\ Loss\ with\ Offset}{100} \right) - \left(\frac{Start\ area \times Quality\ without\ Offset}{10} \right) \times \left(\frac{100 - Risk\ of\ Loss\ without\ Offset}{100} \right)$$

To avoid confusion regarding units, this guidance only refers to “offset quantum”.

Detailed explanation of terms: Quality

Determining what the appropriate quality score out of 10 should be is often one of the most complex elements of offsets calculations, and varies from matter to matter, and across state boundaries. Where an appropriate set of detailed metrics exists at a state government level to determine quality scores out of 10, the Department will generally seek to rely on those metrics and definitions. However, as relying on state guidelines and standards is not always possible, and the Department will advise on the best way to calculate quality for each matter at each location.

Approval holders need to engage with the Department **early** to make sure their surveys will be adequate for the quality determination method needed in their specific area. Surveys not meeting the Department’s needs is often a project’s largest source of delay, because the Department cannot have confidence in the quality scores being asserted. The Department will encourage that engagement as part of first contact correspondences with approval holders.

Generally, advice on the survey requirements for individual species and ecological communities can be found on the [SPRAT profile](#) for that species or community. However, in some cases, the guidance on those profiles may have been superseded by new information. Departmental advice will be needed to determine whether that applies.

Profile information and supporting documents generally outline the nature of surveys to determine species presence/absence, and sometimes also relative abundance at a site. Determinations of quality scores for sites is a more complex issue, and the nature of the data required varies from state to state. Please see the standalone section below on quality scoring to determine the appropriate scoring method for each state. The data to be collected from field surveys, and the survey effort required, will vary for each method.

Detailed explanation of terms: Quantum of impact/Impact quantum

Impact quantum should reflect all impacts resulting from the project, and are not limited to clearing. If effects such as lighting, noise, or urban heat islands will render a portion of retained land uninhabitable for a species, that area is considered impacted. Similarly, thinning and other forms of partial or selective clearing (including under-scrubbing and/or removal of woody debris by whatever means) qualify as impacts, even though they may not be as intensive as clearing. The offsets policy requires that all impacts be offset, not just clearing (or equivalent) impacts.

To calculate the *total quantum of impact*, the calculator establishes two scenarios: what would happen to the site without the offset, and what is anticipated to happen to the site with the offset. The offset quantum provided is the difference between those two scenarios (see the equation in the green box above). A high quality offset site therefore is not necessarily equivalent to a high offset quantum.

The *Total quantum of impact* (that is, the offset liability) is calculated very differently from the quantum of offset being provided (the *Net present value* of the offset), which means the higher the quality of the impact site, the greater the offset required. In particular, where the impact and offset sites are considered to be the same quality, a significantly larger offset area will be needed if that quality is high versus low.

For example:

- 100 ha **impact** at quality 10 requires 100 'adjusted ha' of offset quantum
- 100 ha **impact** at quality 5 requires only 50 'adjusted ha' of offset quantum
- 100 ha **offset** site at quality 10, anticipated to drop to quality 9 without offset, generates approximately 10 offset quantum
- 100 ha **offset** site at quality 5, anticipated to drop to quality 4 without offset, also generates approximately 10 offset quantum

(Note: this example has ignored Risk of Loss, and has not applied any discount rate for 'time until ecological benefit').

The outcome from this is that it is not sufficient for quality assessment methods be the same at the impact and offset sites, because the calculator does not directly compare the sites. Consistent quality assessment methods should be used across projects wherever possible, and the Department generally will not accept bespoke methods. See below for more detail on the calculation processes.

Key concept: Resource-dependent species in area-based offsets:

Some species require access to a specific landscape or habitat feature or resource (such as tree hollows), in addition to other more general habitat needs. Where a species relies on a specific resource, the presence and availability of that resource will be used as an initial acceptability threshold, even where the Department is not requiring an explicit calculation of the total number of instances of the feature. For example, the Greater Glider is a hollow-dependent species, but the Department generally calculates offsets for the species based on habitat area and quality (which is appropriate because the species needs a wide array of habitat elements). If an area could not be shown to have an appropriate density of hollows, then the Department would not consider it as an offset, even if the quality and area calculations would otherwise indicate the area to be an adequate offset.

2.3 Impact quantification sub-table - Protected matter attributes:

The rows shown below provide options to assess offsets for highly targeted habitat features, or for calculating benefits to the species in an area via the total local population of the species itself, rather than changes to the species' habitat. Generally, the Department encourages approval holders to calculate offsets via the *Area of habitat* row instead, as most offsets are built around improvements to habitat as a surrogate for direct changes to the species' population. Habitat is typically much more readily measured, and is usually far more amenable to direct intervention. Additionally, many species are poorly understood, or cryptic, or both. In such situations, the Department generally considers improvements to habitat a more appropriate offset.

The exception to this general position is the *Number of features* row. For some species, calculating offsets primarily or exclusively through the 'quality x area' framework of the *Area of habitat* row is not appropriate, because they also depend on specific features (usually hollows, though other relevant features may apply). In such cases, this row enables the offset to be checked against both the area and quality of habitat, and for the presence of the key feature(s).

Protected matter attributes	Attributes (Always or never)	Description	Quantum of impact	Units	Information sources
Number of features e.g. total hollows, deadwood Classify	Yes				
Condition of habitat (damage to habitat, condition, etc. no change to area) Classify	Yes				
Dispersed species					
Birds etc. e.g. total population Classify	Yes				
Mammals etc. e.g. change in population, etc. Classify	Yes				
Number of individuals e.g. individual Great Crested Newts Classify	Yes				

This cell is cosmetic. Describe the feature being impacted and offset (e.g. 'hollows').

Enter the number of instances of the feature being impacted (e.g. total hollows lost).

Change this cell to "Yes" to unlock the row.

This cell will autofill, but is otherwise cosmetic.

This cell is cosmetic, and for transparency only.

The Department recommends against using this row. The *Area of habitat* row is more appropriate.

The Department recommends against using these rows. They rely on an extremely high degree of scientific certainty, which would generally necessitate extensive, multi-year surveys, as the required data is not available for most species. The Department generally recommends using the *Area of habitat* row instead.

3. DEFINITIONS AND GUIDANCE – SCORING QUALITY

The quality for an area of habitat for a species or an area of a threatened ecological community is expressed in the calculator as a whole number (integer) out of 10.

Consistent, objective quality assessments are crucial because the calculator does **not** simply produce a ratio between the impact and offset sites. It is not enough that the same method be used at both the impact and offset sites; the method should be consistent with wider Departmental practice across all projects (noting that Departmental practice should and does evolve to reflect improved understandings, and newly available options for robust and repeatable assessments. Past projects are not precedents).

For species, the number out of 10 is intended to reflect how well the area supports the species in question. For ecological communities, the number out of 10 is primarily a reflection of how pristine the community is (that is, how close it is to the 'ideal' state of the community). Quality also includes a consideration of how important the site is for the protected matter, for both species and ecological communities. Therefore, it is not simply the quality of the vegetation present on site that gets scored. Instead, three components contribute to habitat quality scoring:

- *Site condition*: This is the condition of a site in relation to the ecological requirements of a threatened species or ecological community. This includes considerations such as vegetation condition and structure, the diversity of habitat species present, and the number of relevant habitat features. (Scored 3/10 for species, 7/10 for ecological communities)
- *Site context*: This is the relative importance of a site in terms of its position in the landscape, taking into account the connectivity needs of a threatened species or ecological community. This includes considerations such as movement patterns of the species, the proximity of the site in relation to other areas of suitable habitat, and the role of the site in relation to the overall population or extent of a species or community. (Scored 3/10 for species and for ecological communities)
- *Species stocking rate*: This is the usage and/or density of a species at a particular site. The principle acknowledges that a particular site may have a high value for a particular threatened species, despite appearing to have poor condition and/or context. It requires an assessment of population density at the site, as well as consideration of the role of the site population for overall species population viability or extent. (Scored 4/10 for species, not used for ecological communities)

For species, the Department has adopted a scoring model that assigns three points to site condition and context, and four points to species stocking rate. This reflects that all three elements are important in understanding the quality and ecological function of a site, while appropriately acknowledging that the best indicator of the value and importance of a site is the density and extent of the species population on site. For ecological communities, the Department assigns seven points to site condition and three points to site context, effectively folding stocking rate into site condition, as condition is an appropriate proxy when considering ecological communities.

The scoring system reflects that not all elements of site quality will be amenable to improvement through management, and this can limit the scope for improvement in a site's quality score. For example, an offset site for a threatened species might be improved by removal of invasive weed species, and by the passage of time causing the vegetation to mature, raising the site condition score from 1.5 to 3. However, if that improvement does not translate into an increase in the size or health of the population of the species, then it is appropriate that the score for species stocking rate remains the same. In this case, a total quality score of 10 out of 10 will not be possible.

Similarly, a site might be in pristine condition, and supporting a maximally large and healthy population of a threatened species, but if it does not have connectivity to other populations, it will not be possible to achieve a maximum score for site context. As a result, a 10 out of 10 score will not be achievable, because over time the isolated nature of the site will produce significant challenges, and because the site is not able to contribute to the wider population of the species.

Be advised, any calculations of quality can only occur after an area has been accepted as suitable habitat. The Department will make a judgement on whether a proposed site is a viable offset location, based on the requirements set out in the Offsets Policy. If viability has not been shown, site quality cannot be considered.

Quality calculations are undertaken differently for matters in each state – the Commonwealth both seeks to align with state government processes wherever possible, and often relies on state government information to enable more precise quantification of habitat and ecological community qualities. The Department will work with you to ensure there is agreement on the most appropriate method of assessing quality.

3.1 Quality scoring in Queensland

For projects in Queensland, the Department will generally require that calculations of habitat quality be undertaken in accordance with the Queensland Herbarium's [Guide to determining terrestrial habitat quality \(2017\)](#), and the published [BioCondition Benchmarks](#). Please note, the Queensland Herbarium has advised the Department of an error in the published *Guide to determining terrestrial habitat quality*. The published guide states that for native plant species richness (for trees, shrubs, grasses, and forbs), the following scoring should be used:

- <25% of the benchmark = 2.5
- ≥25%, but <90%, of benchmark = 3
- ≥90% of benchmark = 5

The Queensland Herbarium has advised that instead those scores should be:

- <25% of the benchmark = 0
- ≥25%, but <90%, of benchmark = 2.5
- ≥90% of benchmark = 5

In accordance with the Queensland Herbarium's advice, the second set of scores must be used.

The Department will provide spreadsheets into which the data and scores must be entered. Be advised, the Department's spreadsheets partially modify the organisation and weightings of scores to align with the EPBC Act Offset Policy's requirement that quality scores should be made up of site condition, site context, and species stocking rate considerations (though the scoring for each element remains the same).

4. DEFINITIONS AND GUIDANCE – OFFSET QUANTIFICATION

This section explores the different elements of the calculator that are used to quantify the offset gain being provided, and to compare that against the impact quantum determined using the process outlined above.

4.1 Offset quantification Part 1 – Bringing across the impact (Area-based rows only)

The first part of the offset quantification process on the right-hand side of the calculator is reasonably straight-forward. It takes the outcome from the impact side quantification and carries it across to the offset side – however, two points are important:

1. The offset side calculation does not at any point directly compare the offset and impact sites. The calculator does not establish ratios or equivalencies between the sites. The quantum of offset generated is not the size of the offset site. Rather, it is the difference between what would occur at the site without the offset being implemented, and what will occur as a result of the offset (the improvement made by the offset). Therefore, demonstrating that an offset will be of sufficient scale to compensate requires more than simply showing that the proposed offset site is of a similar size and quality to the impact site. Similarly, if an approval holder is proposing to substitute one offset site for another, it is not enough to show that the two offset sites are similar sizes and qualities – the approval holder must show that the new offset proposal will make an equivalent difference to what would occur without the offset as did the original proposal.
2. As noted above ‘adjusted hectares’ is not a consistent unit in the calculator. On the impact side, the total quantum of offset is a simple calculation: area is multiplied by quality out of 10. On the offset side, the total quantum is a far more complex calculation that compares what would be expected to occur at the offset site with and without the offsets. Providing an offset site that either is currently, or will in the future, reach a state and size similar to the impact site is not necessarily sufficient to produce an adequate offset (this is explained further in later sections).

What it looks like:

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset
Area of community	Yes		Adjusted hectares	
Area of habitat	Yes		Adjusted hectares	

Change this to "Yes" to unlock the row

This cell will autofill from the *Total quantum of impact* cell on the impact-side calculation.

This cell will autofill, but is otherwise cosmetic.

As above, items in these two rows operate in essentially the same manner, and explanations given for a cell in one row apply equally for the equivalent cell in the other row.

This cell is cosmetic. Insert the name of the offset site, and the particular matter being offset (if more than one MNES applies).

4.2 Offset quantification Part 2 - Risk of loss and related elements (Area-based rows only)

This part of the calculator allows you to quantify the offset gain generated by reducing the likelihood that **all** ecological values at the site will be **permanently** lost (the *Risk of loss*). You will notice that the images below have deliberately not included the cells for considering quality change as an offset component (addressed in Section 4.3). The key thing to remember in working through this part of the offset calculator is that *Risk of loss* is separate from any considerations of quality decline or site degradation. Site degradation is an important consideration, but a high likelihood that a site will decline does **not** necessarily translate to a high *Risk of loss*.

What it looks like

Enter the percentage chance over the full offset period (generally 20 years) that all value at the offset site for the protected matter will be irrevocably lost, if the offset is **not** provided.

Enter the number of years over which the site's *Risk of loss* will be reduced. The value of the offset is reduced for each year until it will be delivered.

Enter the percentage chance over the full offset period (generally 20 years) that all value at the offset site for the protected matter will be irrevocably lost, if the offset is **provided**.

Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain
<i>Ecological Communities</i>								
Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0	0.00
				Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)		

As above, items in these two rows operate in essentially the same manner, and explanations given for a cell in one row apply equally for the equivalent cell in the other row.

Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0	0.00
				Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)		

These cells reduce the *Start area* by the *Risk of loss*.

While these cells are named differently, they amount to the same concept, and the same data should be entered.

Insert the area in hectares of the offset site. The calculator **will** accept decimal points, though these may not always display.

These cells will autofill based on your inputs to other rows, and are equal to:

$$Start\ area \times \frac{Risk\ of\ loss\ without\ offset - Risk\ of\ loss\ with\ offset}{100}$$

These numbers carry through to later stages.

Key concept: Averted loss as an offset

The first method available for generating offset gain is to avert the loss of areas of habitat or ecological community. For any given area, there is assumed to be a chance that **all** ecological value for the relevant species or ecological community will be lost at the site. If that risk can be reduced or removed entirely, the Department considers that constitutes an offset gain.

Detailed explanation of terms: Risk of loss

Crucially, the *Risk of loss* for an area is **not** the risk that part of the area will be lost, nor the risk that the area will degrade or be otherwise impacted. **It is the risk of total loss of all relevant values, such that they will not naturally regenerate.** Generally, this means the risk of clearing or an equivalent degree of harm. However, for some matters, even full clearing of the site may not be equivalent to a total loss of values. For example, Brigalow (*Acacia harpophylla*) regrows rapidly and effectively from root stock. If the clearing process would not prevent the regrowth (e.g. if the vegetation is 'pulled' with a chain), then value is likely to persist, because the site would be expected to regenerate naturally. By contrast, landscape scale poisoning of Brigalow such that regrowth is effectively impossible at any future point would likely constitute total loss of value.

Key concept: Background rates of loss

The National Environmental Science Program (NESP) has recently released a study of the background rates of loss in each local government area across Australia. As the paper was produced by independent scientists it is important to note that it is not a policy statement by the Department, and the Department does not accept all recommendations in that document. However, the Department does accept that the rates of loss tables at the end of that paper provide the best current data on background risks of loss for native vegetation. The Department takes those figures as its starting point in considering what would constitute an appropriate risk of loss for a site, though it also considers other factors. If a patch of vegetation is protected by a state or local government regulation preventing clearing and/or requiring maintenance of that vegetation, the Department generally considers a lower risk of loss should apply (frequently zero). If an approval holder can show that all necessary state and local government development permits have been secured to enable clearing of that site, the Department would generally accept that a higher risk of loss would apply (though still generally not more than 15%-20%, save in extraordinary situations).

Please note, for the majority of Australia, the anticipated risk of loss over 20 years is less than 5%. This is appropriate, as the risk of loss in a region reflects the observed rate of clearing in that region. The NESP paper did not observe a 20 year clearing rate above 15% for any local government area.

Detailed explanation of terms: Risk-related time horizon/Time over which loss is averted

The Department's policy is that offsets should endure and provide benefits for as long as the duration of the impact. Most impacts are permanent, and therefore the Department generally expects that offsets should be likewise. However, recognising the difficulties in decision-making certainty over extended periods, the Department restricts its calculation of risk of loss benefits to at most a 20 year timeframe. The Department therefore considers that the *Risk-related time horizon* or *Time over which loss is averted* should generally be 20 years, even if the *Time until ecological benefit* (discussed below) may be sooner. In exceptional circumstances, the Department may agree to offsets over a shorter timeframe.

Shortening the timeframe for offset provision directly reduces the anticipated offset gain. The NESP paper (see above) provides *Risk of loss* rates both for a single year and for a 20 year period, calculated as a compounding rate of loss. That is, if a site had a 10% *Risk of loss* each year – which would be extraordinary – then at 2 years the risk would be 19%, at 3 years 27%, at 4 years 34%, and so on. If using a non-20 year timeframe, the *Risk of loss* should be calculated as the assumed annual risk of loss, applied as a compounding percentage (as per the previous example).

Detailed explanation of terms: Future area with(out) offset, and raw gain

These cells begin the process of translating the disparate elements of offset calculation into a unified quantum of offset gain. The *Future area without offset* and *Future area with offset* cells have the effect of reducing the starting area by the relevant *Risk of loss*. The formula is:

$$\text{Start area} \times \frac{100 - \text{Risk of loss}}{100} = \text{Future area}$$

While the calculation operates as if the risk of loss in both the with and without offset scenarios equates to a direct reduction in area, that does not reflect an assumption that actual area of the offset site will necessarily be lost. Rather, the *Risk of loss* is the statistical chance that the whole site will be lost in each scenario, considered at a regional level. It is not a prediction that any individual site will or will not be lost. However, even though the *Risk of loss* is a statistical chance, rather than an expectation, the accepted method for evaluating the future state of the offset site both with and without offset is to ‘discount’ (that is, reduce) the final calculated value by the percentage chance of loss.

The *Raw gain* cell then operates very simply – it takes the difference between the two *Future area* cells and declares that to be the expected gain for the offset. The formula is:

$$\text{Future area with offset} - \text{Future area without offset} = \text{Raw gain}$$

Two things are worth noting:

1. The *Future area* cells assert that they provide a value in ‘adjusted hectares’. As noted above, ‘adjusted hectares’ is not a consistent unit across this calculator, and is not an area unit. The Department would generally recommend ignoring references to ‘adjusted hectares’, as they do not assist in understanding the operation of the calculator.
2. The *Raw gain* cell is only a very preliminary stage in converting the *Risk of loss* element of the calculator into the final offset quantum. It will be transformed in subsequent parts of the calculator in ways that can be challenging to follow.

Key concept: Consideration of site-specific factors

The Department recognises that specific sites may be at significantly higher or lower risk of being lost than the average site in the region. However, a high degree of evidence is required to demonstrate this for any given site. Generally, the approval holder or a third party will need to show that the legal status of that site is highly unusual relative to the surrounding area, or that it is currently subject to a usage and management regime that is markedly different from similar sites in the region.

If a third party were seeking to argue that the *Risk of loss* for a site were lower than might be expected from the background observed rates of loss, there are generally two arguments that could be used: that the site is already subject to formal protection; or that the site is already being managed with a high degree of efficacy by an existing organisation (this can be community group management, though evidence would be needed regarding regular and effective management).

If an approval holder were seeking to argue that the *Risk of loss* were higher than for similar sites, they would need to point to a clear and established legal right to clear the site to justify that the risk of loss is not reflective of the surrounding area. A clear, non-hypothetical intent to develop or otherwise clear that specific site must be demonstrated, with evidence that the specific planned activity is already permitted under all applicable laws. The Department cannot pre-empt either Commonwealth or state decision-making processes by assuming that an approval will be issued where the relevant regulator is still considering whether to approve an action. Similarly, the presence of general development in the area is not sufficient to demonstrate that the *Risk of loss* at a site is different than the observed background rates. If clearing is occurring in the area generally, that is accounted for in the observed background rates.

Alternatively, the approval holder may seek to show the presence of a threat to the ecological values so severe that it could be plausibly expected that within 20 years all ecological value for the protected matter would be extinguished at the site. Weeds such as Lantana and African Olive are known to have the potential to overrun sites in reasonably short periods of time and render those sites unusable for protected species. However, along with demonstrating the presence of the relevant threats, the approval holder must provide evidence regarding any applicable state or local government obligations to manage such weeds. The Department is obliged to consider offset proposals on an assumption that all applicable legal obligations will be complied with. Assertions of decline or loss of site value that rely on weed expansion contrary to such obligations will not be accepted by the Department.

Key concept: Areas no longer constituting habitat, but with the potential to be restored

If an area no longer constitutes habitat for the relevant protected species, or no longer constitutes the relevant threatened ecological community, it is considered to have a *Risk of loss* of zero. Please note: this does not necessarily mean it will be considered to have a quality score of zero. Many ecological communities and habitat definitions include a minimum quality threshold, so a site may cease qualifying as the protected matter before it reaches a zero quality score.

Key concept: Different Risks of Loss for the same site

An area may have different *Risk of loss* scores for different matters, even though the same patch of vegetation is being assessed. This is because the *Risk of loss* is not the risk that the vegetation (or other feature) will be lost, but the risk that the ecological value for the particular MNES will be lost. A threatening process at a site may pose a genuine risk of eradicating one MNES from that site, but not pose a material threat to a second.

For example, the Critically Endangered Golden Sun Moth (*Synemon plana*) regularly overlaps with the Critically Endangered ecological community 'Natural Temperate Grasslands of the South-eastern Highlands' (and similar communities in Victoria and South Australia). The Weed of National Significance Chilean Needlegrass (*Nassella neesiana*) poses a severe threat to Natural Temperate Grassland, regularly invading and overwhelming that ecological community. However, Chilean Needlegrass is a known feed species of the Golden Sun Moth, and a number of projects the Department has assessed have indicated that some patches of Chilean Needlegrass monoculture have been found support extremely high densities of the Golden Sun Moth (in a number of cases, higher than adjacent areas of Natural Temperate Grassland). If the primary threat at a site were Needlegrass invasion, *Risk of loss* may be high for Natural Temperate Grassland, yet still very low for Golden Sun Moth. In cases like this, each MNES may need quite different sizes of offset areas, despite being delivered at the same site.

4.3 Offset quantification Part 3 – Quality decline and improvement elements (Area-based rows only)

This part of the calculator (found directly below the respective rows for the *Risk of loss* elements) allows quantification of the offset gain from quality-related aspects of the site, in particular, preventing the site from declining in quality, and improving the site above its *Start quality*. Because quality improvement is directly multiplied by the size of the offset area (at a later point), this part of the calculator is generally the largest contributor to the total offset gain.

What it looks like

Enter the greater of either the years it will take to achieve the full quality improvement, or the number of years over which the site will be prevented from declining in quality.

This cell specifies the quality out of 10 to which the offset site is expected to decline, for the site elements that are relevant to the specific MNES. Please note: quality decline is distinct from anticipated *Risk of loss*.

Items in these two rows operate in essentially the same manner, and explanations given for a cell in one row apply equally for the equivalent cell in the other row.

Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain
<i>Ecological Communities</i>				
Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)	0.00
<i>Threatened species habitat</i>				
Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)	0.00

This cell specifies the quality out of 10 to which the offset site is expected to improve with management under an approved Offset Plan, for the site elements that are relevant to the specific MNES.

Enter the offset site's current quality score. This cell is purely for transparency purposes, and does not influence the final offset quantum. However, it does enable the delegate and the public to consider the plausibility of the offset proposal.

These cells will autofill based on your inputs to other rows. They are equal to:

$$\text{Future Quality with offset} - \text{Future Quality without offset}$$

Detailed explanation of terms: Time until ecological benefit

This cell applies a discount rate that reduces the expected value of the ecological benefit for each year until the ecological benefit is expected to be realised (the rates are: 0.2% for vulnerable, 1.2% for endangered, 6.8% for critically endangered). So, a benefit to a vulnerable species, to be realised in 1 year, would be discounted by 0.2%. A benefit to an endangered species, to be realised in 10 years, would be discounted by roughly 12.4%. A benefit to a critically endangered species, to be realised in 20 years would be discounted by 75.5%. This is a very deliberate element to both incentivise early offsets, and to recognise compounding uncertainty over time. Please note: where an advanced offset is recognised by the Department, the *Time until ecological benefit* is 0 – the benefit has already been realised.

Ecological benefit is the sum of the averted quality loss **and** the anticipated quality gain. Therefore, the time until ecological benefit is the **greater** of either the time until the offset is expected to complete its quality improvement or the time over which quality decline is being averted.

This is illustrated best if we exclude offset gains from reduced *Risk of loss* (that is, if we set both *Risk of loss* values to 0, for the sake of the example). Having done so, you will notice that changing the *Start quality* does not change the anticipated final offset gain (the right-most *Net present value* cell). Instead, the final offset gain is determined by the difference between *Future quality without offset* and *Future quality with offset*.

Some examples:

- A site is considered to be stable (i.e.: not likely to decline overtime, even without offset). Minor improvements are proposed to increase the quality from 5 to 6 out of 10, and these will take 5 years. Time until ecological benefit is therefore 5 years. Ecological benefit is 1 point out of 10.
 - Assuming 100 ha site and 100% confidence, this would produce 9.90 offset quantum for vulnerable, 9.42 for endangered, 7.20 for critically endangered.
- A site is currently high quality, but is expected to decline rapidly without offset. The offset proposal is therefore no quality improvement works, but instead preventing a decline from 8 to 4 out of 10 (note: this degree of decline would be highly unusual). That decline is expected to take 20 years. Time until ecological benefit is therefore 20 years. Ecological benefit is 4 points out of 10.
 - Assuming 100 ha site and 100% confidence, this would produce 38.43 offset quantum for vulnerable, 31.51 for endangered, 10.73 for critically endangered.
- A site is anticipated to decline without intervention, but not excessively. Not only will the offset prevent a decline from 6 to 4 out of 10, the proposal includes quality improvement from 6 to 7 out of 10. Improvement works will be complete within 10 years. However, it is considered that the site would require 20 years to decline to a quality of 4 out of 10. Because the ecological benefit is both the attainment of 7, and the avoidance of 4, the time until ecological benefit is 20 years. Ecological benefit is 3 points out of 10. Note: this would require 20 years of management, even if major improvement actions would be complete after 10 years.
 - Assuming 100 ha site and 100% confidence, this would produce 28.82 offset quantum for vulnerable, 23.63 for endangered, 8.05 for critically endangered.
 - The approval holder in this situation might decide that 20 years is not a feasible commitment period for management of the offset site, and might instead opt to propose only 10 years of management. That 10 year period would still be enough to improve the site from 6 to 7 out of 10. However, over 10 years, the site would only be expected to decline from 6 to 5, were the offset not imposed. Therefore, time until ecological benefit would here only be 10 years, but ecological benefit would be commensurately reduced to only 2 points out of 10.
 - Assuming 100 ha site and 100% confidence, this would produce 19.60 offset quantum for vulnerable, 17.75 for endangered, 10.36 for critically endangered.

Of note in the last example, the discount rate for critically endangered species and ecological communities is sufficiently high that moving from a 20 year period to avert loss to a 10 year period increases the apparent final offset quantum, even though less management would be required. This is largely an artefact of the calculation process. However, the Department considers that the strong incentive to front-load environmental gains is appropriate, especially as the Department would require that offsets be secured in perpetuity even if the approval holder's direct management obligations are time-limited.

Key concept: The non-effect of site starting quality

As noted above, the cell for the starting quality of the offset site does not affect the final offset quantum. However, it is a key element in the Department's consideration of whether the proposed offset outcomes and predicted declines in the 'without offset' scenario are plausible.

As will be discussed in more detail below, the calculator determines the quantum of the offset by setting up two possible future scenarios for the offset site, one where the offset is established and managed and one where it is not. It assigns a total expected environmental value to each of those scenarios, and the difference between the scenarios becomes the final offset quantum. The calculation therefore ignores the starting quality of the offset site. The major consequence of this is that, in preparing offset management plans, it is not enough for approval holders to specify the site starting quality. The expected *Future quality without offset* must also be stated, because the formula for quantifying the offset gain is:

$$\text{Offset quantum} = \text{Future quality with offset} - \text{Future quality without offset}$$

The *Start quality* only does not affect the offset site. As noted above, the calculator evaluates the *Total quantum of impact* differently, and the *Quality* score is highly important.

Detailed explanation of terms: Raw gain

For these rows, *Raw gain* will be expressed as an integer from 0 to 10, and will not take account of any discount rates or area figures. Those elements are incorporated at later stages of the calculator. Though the *Raw gain* figure here typically appears far lower than the *Raw gain* figure from the *Risk of loss* elements, in the final calculation quality improvement usually becomes significantly more influential than *Risk of loss*, especially as the Department is not aware of a background rate of loss for any area higher than 14% over 20 years.

4.4 Offset quantification Part 4: Converting Raw gain into final offset quantum (Area-based rows only)

This part of the offset calculator requires very little user input, but can be unintuitive and challenging to understand. Broadly, it takes the two raw gain scores from Parts 2 and 3, discounts them (that is, reduces the value of the offset being provided) according to the Department's degree of confidence in the proposed outcomes, discounts them again according to the time it will take to deliver the outcomes, and then combines the scores by multiplying each of them by the offset area. There are, however, good reasons for this, as explained below.

What it looks like

These cells multiply the raw gain by the assumed confidence level.

This cell will have auto-filled as described above in Part 2.

This cell will autofill according to the following formula:

$$\text{Net present value (Risk of loss)} = \frac{\text{Adjusted gain (Risk of loss)}}{\left(1 + \frac{\text{Annual risk of extinction}}{100}\right)^{\text{Risk-related time horizon}}}$$

Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)
0.00		0.00	#VALUE!
0.00		0.00	#VALUE!

This cell will autofill according to the following (rather complex) formula:

$$\text{Combined NPV} = \frac{\text{NPV(RoL)} \times \text{Future quality with offset}}{10} + \frac{\text{NPV(Quality)} \times \text{Future area without offset}}{10}$$

See detailed explanation below.

This cell will have auto-filled as described above in Part 3.

These cells will autofill according to the following formula:

$$\text{Adjusted gain} = \frac{\text{Raw gain} \times \text{Confidence}}{100}$$

This cell will autofill according to the following formula:

$$\text{NPV(Quality)} = \frac{\text{Adjusted gain(Quality)}}{\left(1 + \frac{\text{Annual risk of extinction}}{100}\right)^{\text{Time to ecological benefit}}}$$

Detailed explanation of terms: Confidence in result:

Confidence in result is a measure of confidence that the raw gain will be achieved. The Department has revised its view of likely confidence in recent years, following a series of offset proposals not adequately catering to natural environmental fluctuations, such as droughts and severe floods. For clarity, confidence in result (along with the risk analysis expected in all offset management plans) score **must** take into account *force majeure* events.

The confidence scores operate as a simple multiplier for the value in the 'raw gain' cell for the relevant row. That is, if the raw gain for risk of loss were 10.00, and the confidence were 90%, the adjusted gain for that row would be 9.00. 85% confidence would produce 8.50 adjusted gain, etc.

The Department has higher confidence in offsets proposals relying on more modest improvements/ averted loss. If confidence is too low, the Department may decide the offset is not appropriate.

Detailed explanation of terms: Net present value (Risk of loss) and Net present value (Quality):

These cells apply a discount to the value of an offset proposal based on the time until the offset gain will be realised (the *Risk related time horizon* and *Time until ecological benefit* respectively), and the assumed *Annual risk of extinction* (0.2% for vulnerable, 1.2% for endangered, 6.8% for critically endangered). The formula in these cells is the standard Present Value formula accepted within the economics and business disciplines:

$$\text{Present value} = \frac{\text{Profit}}{(1 + R)^T}$$

where R is the discount rate (the amount by which value is to be reduced for each year until the outcome is realised) and T is the number of years required to achieve the profit.

Reducing the expected value to be delivered caters to the risk that the value will not be realised. The further away the realisation point, the greater the risk.

In the offset calculator, profit is replaced by *Adjusted gain*, the discount rate is the *Annual risk of extinction*, and the years required to achieve the 'profit' is respectively the *Time until ecological benefit* and the *Risk-related time horizon*. Because a single quantum of discount is applied to the whole of the gain considered in a particular row, the timeframe for the discounting must cover all elements contributing to the *Adjusted gain* for that row. Therefore, as discussed above, the *Time until ecological benefit* score must include the full time-period over which the site would be assumed to decline, should the offset not be delivered, as well as the time taken to achieve improvements to the site.

There are two reasons why this time-related discount is needed. Firstly, it incentivises early provision of offsets (particularly for critically endangered species and ecological communities). Secondly, it recognises the potential for the protected matter to become extinct before the offset is delivered, should the delivery be delayed. If that were to occur, the offset would lose all value for that particular matter. A discount is an appropriate method of pricing the risk.

Detailed explanation of terms: Combined Net present value:

As can be seen in the following example, the *Combined NPV* score is not simply the total of the *NPV(Risk of loss)* and *NPV(Quality)* scores:

Future area without offset	Future area with offset	Future quality without offset	Future quality with offset	Combined NPV
10.00	10.00	1.00	0.99	18.62

(The example ecological community has been assumed to be vulnerable).

The sum of the *NPV(Risk of loss)* and *NPV(Quality)* cells would be 10.88, yet the *Combined NPV* cell reads 18.62. Rather than simply adding the two NPV scores, the *Combined NPV* cell instead:

- takes the *NPV(Risk of loss)* score,
 - multiplies it by *Future quality with offset* score,
 - divides the result by 10 (reflecting that all quality scores are out of 10); and
- takes the *NPV(Quality)* score,
 - divides it by 10 (reflecting that all quality scores are out of 10),
 - multiplies the result by the *Future area without offset* score; and
- adds those two numbers together.

That sequence of manipulations is complex, and somewhat unintuitive. The theory behind the offsets calculator is that it is trying to compare two scenarios (with and without offset), measure the difference between those scenarios, and that difference then becomes the offset quantum. Such a calculation would look like:

$$\frac{(Future\ area\ with\ offset \times Future\ quality\ with\ offset) - (Future\ area\ without\ offset \times Future\ quality\ without\ offset)}{\left(1 + \frac{Annual\ risk\ of\ extinction}{100}\right)^{Time\ until\ ecological\ benefit}}$$

The result would then be subjected to a confidence multiplier, and would be a reasonably simple calculation. However, such a calculation could not cope with:

- different degrees of confidence for *Risk of loss* gains versus quality gains
- different timeframes to deliver *Risk of loss* gains versus quality gains

The more complex version of the *NPV* calculation used in the calculator is required in order to cope with the potential for the *Risk of loss* and quality improvement elements to have different timeframes and confidences. Where the confidence and timeframes scores are the same for both rows, the simplified formula shown above yields the same score as the more complex *NPV* calculation used in the calculator. The calculator therefore operates consistently with the theory underpinning the offsets policy, while allowing greater flexibility for variance between offset elements.

4.5 Offset quantification Part 5: Percentage of impact offset:

These last cells are fairly self-explanatory. The *90% direct offset requirement met?* check relates to the requirement in the EPBC Act Offsets Policy that 90% of all offset liabilities be met through direct offsets (generally area-based offsets). The remaining 10% liability can include other measures (e.g.: research). However, the Department will generally only agree to indirect offsets where it can be demonstrated that 100% direct offsets are not possible for this project.

What it looks like

% of impact offset	Minimum (90%) direct offset requirement met?
#DIV/0!	#DIV/0!

This cell will autofill once all other data is entered. It divides the *Combined NPV* by the *Total quantum of impact*, and displays the result as a percentage.

This cell will autofill once all other data is entered. If the *% of impact offset* is greater than or equal to 90%, it returns 'YES', otherwise, it returns 'NO'.

s. 22(1)(a)(ii)

From: s. 47F(1) @tmr.qld.gov.au>
Sent: Monday, 31 May 2021 8:57 AM
To: s. 22(1)(a)(ii)
Subject: RE: DAWE Coomera Connector 1 site visit 31 April - 3 June 2021

Morning ^{s. 22(1)(a)(ii)} how are you?

Just give me a call – s. 47F(1) .

Do you have an idea yet what time you might arrive on the coast on Wednesday? And do you need directions to our office?

Cheers,

s. 47F(1)

From: s. 22(1)(a)(ii) @awe.gov.au>
Sent: Thursday, 27 May 2021 3:17 PM
To: s. 47F(1) @tmr.qld.gov.au>
Subject: RE: DAWE Coomera Connector 1 site visit 31 April - 3 June 2021

G'day s. 47F(1)

Just putting together our itinerary. Is there a mobile number that is best for us to call on the day?

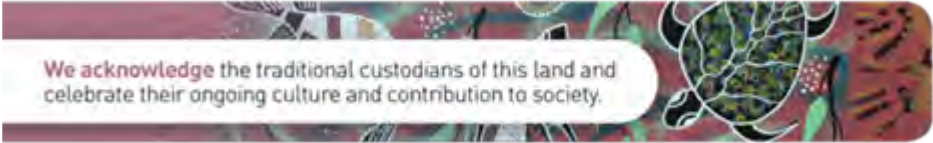
Kind regards,

s. 22(1)(a)(ii)

Senior Assessment Officer
Queensland South Assessments Section
Environmental Assessments (QLD) and Sea-dumping Branch
Department of Agriculture, Water and the Environment

P: s. 22(1)(a)(ii)

s. 22(1)(a)(ii) [@environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)



We acknowledge the traditional custodians of this land and celebrate their ongoing culture and contribution to society.

From: s. 47F(1) @tmr.qld.gov.au>
Sent: Wednesday, 26 May 2021 1:21 PM
To: s. 22(1)(a)(ii) @awe.gov.au>
Subject: RE: DAWE Coomera Connector 1 site visit 31 April - 3 June 2021

Hey ^{s. 22(1)(a)(ii)}

Sorry...have been stuck in meetings for most of the morning.

Can I give you a call now?

Cheers,

s. 47F(1)

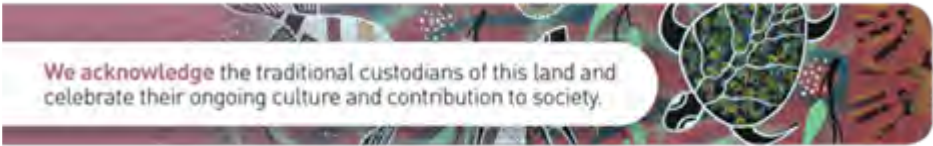
From: s. 22(1)(a)(ii) [@awe.gov.au](mailto:s.22(1)(a)(ii)@awe.gov.au)>
Sent: Wednesday, 26 May 2021 10:31 AM
To: s. 47F(1) [@tmr.qld.gov.au](mailto:s.47F(1)@tmr.qld.gov.au)>
Subject: RE: DAWE Coomera Connector 1 site visit 31 April - 3 June 2021

G'day s. 47F(1)

Would you be free this morning for a chat? We are hoping to update the flights for next week if Wednesday works better for CC1.

Kind regards,

s. 22(1)(a)(ii)
Senior Assessment Officer
Queensland South Assessments Section
Environmental Assessments (QLD) and Sea-dumping Branch
Department of Agriculture, Water and the Environment
P: s. 22(1)(a)(ii)
s. 22(1)(a)(ii) [@environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)



We acknowledge the traditional custodians of this land and celebrate their ongoing culture and contribution to society.

From: s. 47F(1) [@tmr.qld.gov.au](mailto:s.47F(1)@tmr.qld.gov.au)>
Sent: Tuesday, 25 May 2021 7:30 AM
To: s. 22(1)(a)(ii) [@awe.gov.au](mailto:s.22(1)(a)(ii)@awe.gov.au)>
Cc: Js. 22(1)(a)(ii) [@environment.gov.au](mailto:Js.22(1)(a)(ii)@environment.gov.au)>
Subject: RE: DAWE Coomera Connector 1 site visit 31 April - 3 June 2021

Good morning s. 22(1)(a)(ii), how are you both?

Apologies for the delay in getting back to you – am a bit swamped workwise at the moment.

Firstly just wanted to confirm that you are still planning on travelling to Queensland next week? (although I am sure that you, like me, are watching anxiously for more news about the latest Covid outbreak in Melbourne).

Secondly, assuming you are still coming – do you still have flexibility around which day you undertake the Coomera Connector site visit? Planit Consulting have indicated that Tuesday works better than Monday for their ecologists who will be meeting you on site. It also looks like Monday is probably out for a couple of key TMR staff as well. Do you already have other meetings locked in which makes it difficult to change to a different day?

Thirdly (and sorry for all the questions) how long were you planning on spending out on site? Planit have sent me through a draft schedule based on what you mention below about wanting to look at, but scanning through it I feel like what they have proposed will take a full day in the field, maybe longer. So based on how long you wanted to spend on site, I will likely have to ask them to scale this back a bit.

I was also wondering how the PER review process was coming along? I am aware that we still need to send you some updated maps to reflect the Shipper Drive scope change – we are still in the process of updating these at the moment. In the meantime if there is anything else that is jumping out at you as needing more work, please let me know.

Cheers,

s. 47F(1)

From: s. 22(1)(a)(ii) @awe.gov.au>
Sent: Tuesday, 11 May 2021 4:39 PM
To: s. 47F(1) @tmr.qld.gov.au>
Cc: s. 22(1)(a)(ii) @environment.gov.au>
Subject: DAWE Coomera Connector 1 site visit 31 April - 3 June 2021

G'day s. 47F(1)

Apologies for the delay in sending this information through. We are hoping to travel to Brisbane for site visits between Monday 31 April to Thursday 3 June.

Currently we are hoping to allocate Monday to Coomera Connector however we have flexibility. We are likely to arrive around 10 am, so we are happy to meet at your office or straight onto the site visit.

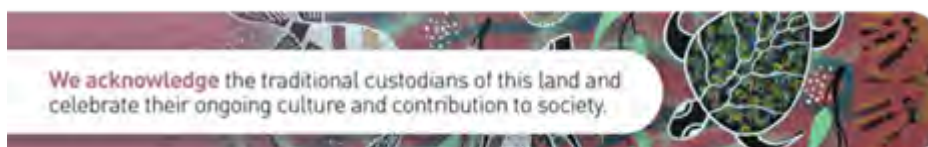
Visit EPBC 2020/8646 Stage 1 Coomera Connector project

- Areas for site visit (in rough order of priority):
 - Area of Moreton Bay Ramsar Site overlap
 - An example of good quality bushland defined as Koala habitat within the project footprint, and an area with low quality regrowth, not defined as Koala habitat. Koala habitat as defined within the *EPBC Act referral guidelines for the vulnerable Koala*.
 - GHFF roost sites within and/or adjacent to the disturbance footprint
 - Areas of coastal Swamp Oak (*Casuarina glauca*) TEC to be removed.
 - If possible, examples of infrastructure and mitigation measures that will be implemented (i.e. culverts for wetlands, Koala movement solutions)
 - Areas that TMR wishes to discuss.

Let me know if this is possible/any changes that should be made.

Kind regards,

s. 22(1)(a)(ii)
Senior Assessment Officer
Queensland South Assessments Section
Assessments and Governance Branch
Department of Agriculture, Water and the Environment
P: s. 22(1)(a)(ii)
s. 22(1)(a)(ii)@environment.gov.au



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s. 22(1)(a)(ii)

From: s. 47F(1) @planitconsulting.com.au>
Sent: Thursday, 27 May 2021 11:00 AM
To: s. 22(1)(a)(ii)
Subject: RE: Draft Coomera Connector PER

Hi s. 22(1)(a)(ii)

Yes, that is correct, should be 4 pages of mapping showing the wetlands of significance.

Kind regards,



s. 47F(1)

Graduate Environmental Planner

Telephone: s. 47F(1) | Facsimile: 07 5526 1502

Level 1, 2247 Gold Coast Hwy, Nobby Beach QLD 4218
PO Box 206, Nobby Beach QLD 4218

Development & Engineering Consultants for Queensland - New South Wales - Victoria - Northern Territory

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From: s. 22(1)(a)(ii) @awe.gov.au>
Sent: Wednesday, 26 May 2021 10:53 AM
To: s. 47F(1) @planitconsulting.com.au>
Subject: RE: Draft Coomera Connector PER

G'day s. 47F(1)

I'm just wanting to check attachment 16 – Wetlands of Significance. The version I received is roughly 4-5 pages. Is this correct?

Kind regards,

s. 22(1)(a)(ii)

Senior Assessment Officer
Queensland South Assessments Section
Environmental Assessments (QLD) and Sea-dumping Branch
Department of Agriculture, Water and the Environment

P: s. 22(1)(a)(ii)

s. 22(1)(a)(ii) [@environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)

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From: s. 47F(1) <@planitconsulting.com.au>
Sent: Thursday, 20 May 2021 12:38 PM
To: s. 22(1)(a)(ii) <@environment.gov.au>
Cc: s. 22(1)(a)(ii) <@awe.gov.au>; s. 22(1)(a)(ii) <@environment.gov.au>
Subject: Draft Coomera Connector PER

Good afternoon s. 22(1)(a)(ii)

I submitted the DRAFT Coomera Connector PER on the 30/04/2021. Just enquiring to see when we would be receiving feedback for this submission?

I know it will take a few weeks and a site inspection is happening late May/early June.

I look forward to hearing back from you,

Kind regards,



s. 47F(1)

Graduate Environmental Planner

Telephone: s. 47F(1) | **Facsimile:** 07 5526 1502

Level 1, 2247 Gold Coast Hwy, Nobby Beach QLD 4218
PO Box 206, Nobby Beach QLD 4218

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s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii) @awe.gov.au>
Sent: Monday, 3 May 2021 4:02 PM
To: s. 47F(1) ; s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii) s. 47F(1)
Subject: RE: Draft Coomera Connector PER Submission

Much appreciated s. 47F(1)

It all looks to be working.

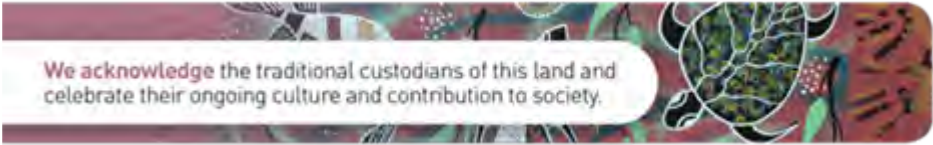
Kind regards,

s. 22(1)(a)(ii)

Senior Assessment Officer
Queensland South Assessments Section
Assessments and Governance Branch
Department of Agriculture, Water and the Environment

P: s. 22(1)(a)(ii)

s. 22(1)(a)(ii) [@environment.gov.au](mailto:s.22(1)(a)(ii)@environment.gov.au)



We acknowledge the traditional custodians of this land and celebrate their ongoing culture and contribution to society.

From: s. 47F(1) @planitconsulting.com.au>
Sent: Friday, 30 April 2021 4:52 PM
To: s. 22(1)(a)(ii) @environment.gov.au>
Cc: s. 22(1)(a)(ii) @awe.gov.au>; s. 22(1)(a)(ii) @environment.gov.au>; s. 47F(1) s. 47F(1)@planitconsulting.com.au>
Subject: Draft Coomera Connector PER Submission

Hi s. 22(1)(a)(ii)

Attached is the link for the DRAFT Coomera Connector PER, along with the attachments.

Please note that the attachments are not in order as we got a last-minute attachment and did not have the time to go an amend all the attachment numbers and cover pages – the attachment numbers throughout the PER will be amended to go in order, sorry for that.

<https://www.dropbox.com/sh/4kqe02s2as530t1/AAAabrF2HWATjvdPL-kHhSrta?dl=0>

I look forward to hearing back from you,

Kind regards,



s. 47F(1)

Graduate Environmental Planner

Telephone: s. 47F(1) | **Facsimile:** 07 5526 1502

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PO Box 206, Nobby Beach QLD 4218

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s. 22(1)(a)(ii)

From: s. 47F(1) (via Dropbox) <no-reply@dropbox.com>
Sent: Friday, 30 April 2021 4:45 PM
To: s. 22(1)(a)(ii)e@awe.gov.au
Subject: s. 47F(1) shared "Coomera Connector PER Draft V1.2 - DAWE to review" with you

Follow Up Flag: Follow up
Flag Status: Flagged



Hi there,

s. 47F(1) (@planitconsulting.com.au) invited you to edit the folder "**Coomera Connector PER Draft V1.2 - DAWE to review**" on Dropbox.

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