Transport for NSW

EPBC Act strategic assessment of road and traffic management

5-year review report

August 2024

NSW GOVERNMENT

Executive Summary

The Australian Government and the then Roads and Maritime Services (RMS) have agreed to an *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) strategic assessment of roads and traffic management works assessed under Part 5 Division 5.1 of the NSW *Environmental Planning and Assessment Act 1979*, which was determined (approved) on 24 September 2015 (refer to NSW road and traffic management works strategic assessment - DCCEEW and Strategic Assessment: Environment Protection and Biodiversity Conservation Act 1999 | Transport for NSW for more information). This approval was subsequently transferred to Transport for NSW following the merger of that Agency with RMS in 2019. The strategic assessment considers the impacts of small-scale road and traffic management works on listed threatened species and ecological communities and migratory species. It does not remove the need to consider whether a project is likely to have a significant impact but streamlines the assessment process with NSW requirements.

This report provides the findings of the first five-year review of the strategic assessment approval and addresses whether the program is having an unacceptable impact on Specified Protected Matters. The 18 month review of the strategic assessment was due in March 2017 and subsequently extended as no projects, subject to the strategic assessment approval, had moved to the construction phase. This review was completed in June 2019 and concluded that the program was not resulting in unacceptable impacts to Specified Protected Matters and that the performance of the program cannot be fully reviewed and understood until construction of a project subject to the strategic assessment had been completed and post construction monitoring results obtained.

This report also summarises changes that have occurred since the approval of the strategic assessment, such as legislation, policies, guidelines and procedures, and addresses the 14 program commitments identified in the Strategic Assessment Report (May 2015). Major improvements to Transport's biodiversity assessment processes during this time include:

- Commencement of the Biodiversity Policy in 2022 aimed at achieving no net loss of bioidversity as a consequence of its infrastructure development activities
- Development of the No Net Loss Guidelines to support in implementation of statutory or Biodiversity Policy commitments to provide offsets
- Development of the Tree and Hollow Replacement Guidelines to address the Biodiversity Policy commitment to replace individual trees and hollows removed by Transport's activities
- Update of the Biodiversity Assessment Guidelines and supporting templates to assist Transport to meet its environmental impact assessment resoposibilites under state and Commonwealth legislation
- Update of the Biodiversity Management Guidelines to help inform biodiversity management recommendations in biodiversity assessments.

The outcomes of this five year review of performance indicates that due to the continued implementation of the program commitments Transport projects subject to the strategic assessment are not resulting in an unacceptable impact on Specified Protected Matters. Transport's management arrangements and standards are consistent with the program

commitments as defined in the Strategic Assessment Report. The next five year review report will cover the period from 1 July 2024 to 30 June 2029.

Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the lands, waters and seas and their rich contribution to society.

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1. Background

The Australian Government and the then Roads and Maritime Services (RMS) have agreed to a strategic assessment of roads and traffic management works assessed under Part 5 Division 5.1 of the NSW *Environmental Planning and Assessment Act 1979*. The program was endorsed by the Commonwealth Minister on 7 September 2015 and the class of actions under the program were approved on 24 September 2015.

The strategic assessment considers the impacts of small-scale road and traffic management works on listed threatened species and ecological communities and migratory species. Other matters of national environmental significance (MNES) are not included in the strategic assessment approval.

Background documents relating to the assessment including the signed agreement, terms of reference, impact report, decision notices and post approval reviews can be found here. The EPBC Act strategic assessment program report which details RMS commitments under the program can be found here.

Section 7.1 of the final program report states that the program was to be reviewed within 18 months of endorsement by the Commonwealth Minister to assess its performance. An extension to this review was approved due as no projects triggering the strategic assessment had commenced construction. Following this, a review is required on a five-yearly basis, the first of which is the subject of this report. Table 1 provides a summary of the strategic assessment approval milestones and the associated completion / due dates.

This report provides the findings of the first five-year review of the strategic assessment approval and addresses whether the program is having an unacceptable impact on Specified Protected Matters. Currently, there are seven projects that have triggered the strategic assessment approval, which are discussed in this report.

Changes that have occurred since the approval of the strategic assessment, such as legislation, policies, guidelines and procedures are described in this report. Additionally, the 14 program commitments identified in the Strategic Assessment Report (May 2015) are addressed. Where appropriate, measures have been implemented to improve the operation of Transport for NSW's (Transport) environmental assessment and decision-making processes to ensure the Program commitments are fulfilled. Program commitments and how they have been fulfilled are discussed in Section 5.

The strategic assessment approval does not remove the need to consider whether a project is likely to have a significant impact on nationally listed threatened species and ecological communities. An assessment of significance is still required and all offsets must be calculated in accordance with the method identified in a Bilateral Agreement between the NSW and Australian Government [Program commitment 2]. This method is currently the Biodiversity Assessment Method under the NSW *Biodiversity Conservation Act 2016* (refer section 3.2)). Transport includes details of all projects assessed under the strategic assessment in its Annual Report.

Table 1: Strategic assessment approval milestones

Milestone	Date completed / due
Strategic assessment approval	24 September 2015
18 month review	24 March 2017
Approved extension to 18 month review	25 June 2019
5 year program report (this report)	June 2024

2. Transfer of strategic assessment approval to Transport for NSW

Legislation to dissolve Roads and Maritime Services and transfer its functions to Transport was passed in the NSW Parliament and granted royal assent in November 2019. Roads and Maritime Services was dissolved and merged into Transport on 1 December 2019.

On 29 November 2019, NSW Roads and Maritime Services transferred the strategic assessment approval to Transport. This means that Transport's road and traffic management projects that are likely to have a significant impact on Specified Protected Matters can use the strategic assessment to improve efficiencies in decision-making by avoiding duplication.

It is noted that the strategic assessment approval is only relevant to road and traffic management projects undertaken by Transport and does not apply to light rail, heavy rail, Metro or maritime projects or activities.

3. Legislative changes since approval

3.1 Commencement of the Biodiversity Conservation Act 2016

When the strategic assessment was approved in 2015, the *Threatened Species Conservation Act 1995* (TSC Act) was the NSW legislative framework for the protection and management of threatened species and endangered ecological communities in NSW. Where an activity being assessed under Part 5 Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) was likely to have a significant impact on critical habitat, threatened species, populations or communities listed under the NSW legislation, a Species Impact Statement (SIS) and concurrence from the then NSW Office of Environment and Heritage was required, in addition to the relevant environmental impact assessment documentation. The principle biodiversity assessment and offsetting methodology applied, at that time, was the Framework for Biodiversity Assessment which was a forerunner to the statutory biodiversity assessment methodology in place today.

The *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017 as part of a suite of land management and land use planning related biodiversity conservation reforms. It replaced the repealed TSC Act. The reforms introduced some significant changes to the way we protect our biodiversity, how we regulate a range of development activities on land and how the impacts of these activities on the natural environment are managed.

The legislation established a framework for assessing and offsetting biodiversity impacts from proposed developments. The Biodiversity Offset Scheme (BOS) was established under the BC Act.

3.2 Biodiversity Offset Scheme & Biodiversity Assessment Method

For Transport, the BOS generally applies[1] to projects assessed under Part 5 Division 5.2 of the EP&A Act and Part 5 Division 5.1 projects that are likely to have a significant impact on NSW listed matters. The Biodiversity Assessment Method (BAM) is part of the BOS, which is the legislated framework that is required when addressing impacts on terrestrial biodiversity from development and clearing. It also ensures that land used to offset impacts is secured in the long term.

The BAM provides a consistent method to assess impacts on biodiversity values from a proposed development (including major projects), activity, clearing or biodiversity certification as well as improvements in biodiversity values from management actions undertaken at a stewardship site. The survey and assessment effort required by the BAM is scaled according to the extent and risk of impacts on biodiversity from a proposal, the availability and quality of existing information (such as native vegetation maps), and the area of land being assessed. The BAM outlines how to assess changes in native vegetation, threatened species and their habitats. It also provides the number and class of biodiversity credits that need to be offset to achieve 'no net loss' of biodiversity, but only after attempts to avoid, minimise and mitigate impacts have been considered and addressed.

The BAM underpins the Transport Biodiversity Policy and is the foundation for assessing our impacts and achieving no net loss with the support of our guidelines and procedures (refer section 4, below).

4. Policies, guidelines and procedures

Transport maintains a comprehensive library of guidelines, procedures and other biodiversity related resources. These include corporate documents, technical resources, local Environmental Management System documents and Environment and Sustainability Management Framework (ESMF) resources (refer section 4.6). A summary of these and how they interact is shown in Figure 1. A description of the main biodiversity related policies, guidelines and procedures relevant to the strategic assessment and how Transport fulfil its requirements is included in the following section.

[1] Some projects with no/minor impacts to biodiversity can be granted an exemption from the BOS. See Biodiversity Development Assessment Report waiver | Biodiversity Offsets Scheme | Environment and Heritage (nsw.gov.au)

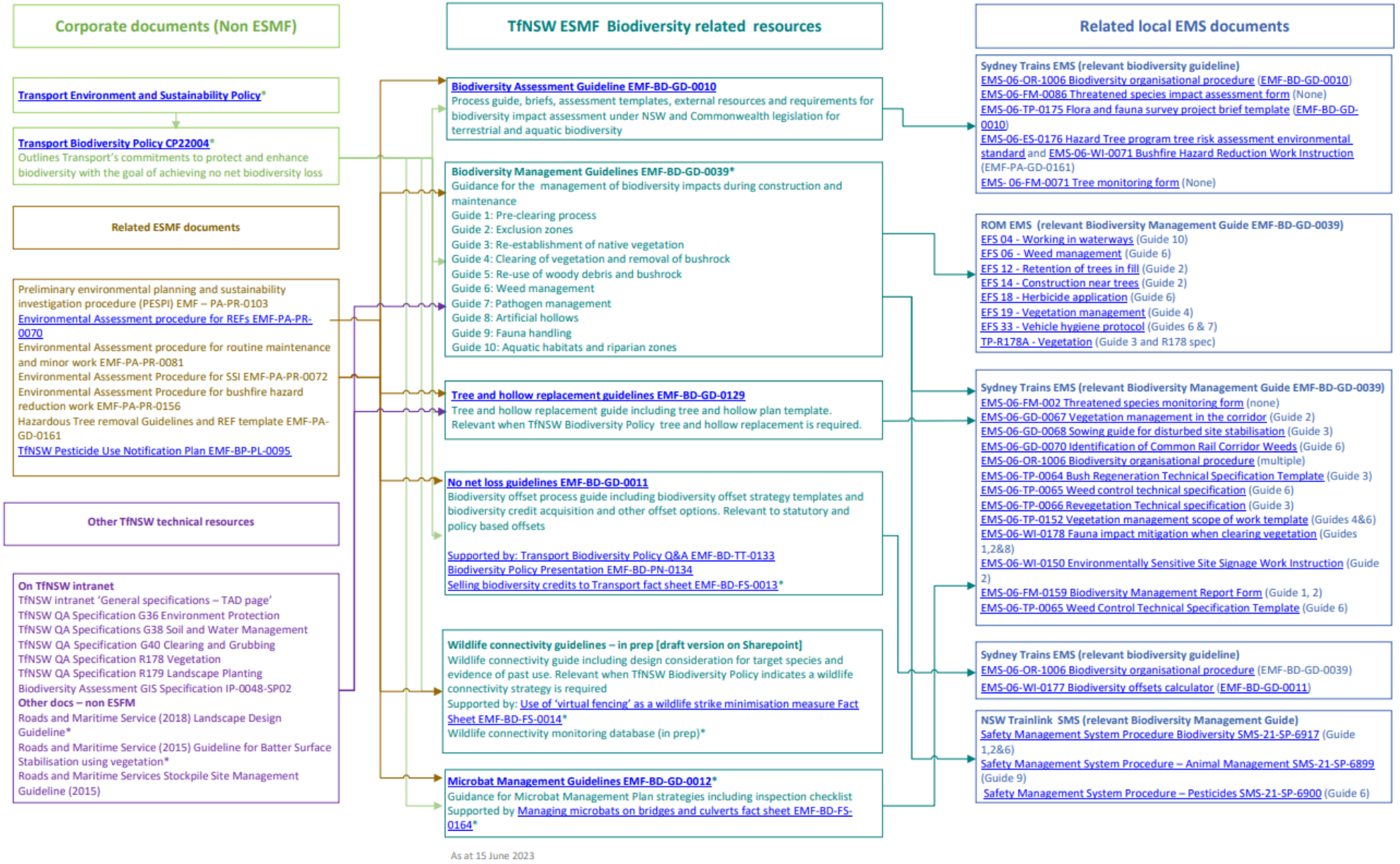


Figure 1: Biodiversity policy, guidelines and procedures

4.1 Transport for NSW Biodiversity Policy 2022

Since the approval of the strategic assessment, Transport have introduced a new Biodiversity Policy, which was came into effect 1 August 2022. Transport strives to protect and enhance biodiversity, with the goal of achieving a no net loss of biodiversity as a consequence of its infrastructure development activities. The Policy outlines what Transport needs to do to protect and enhance biodiversity for NSW. For the purpose of the Policy, no net loss means that in undertaking development activities Transport has:

- Avoided biodiversity impacts to the fullest extent reasonably practicable
- Applied mitigation measures, including measures to reduce habitat fragmentation effects, to the fullest extent reasonably practicable
- Provided offsets through either biodiversity credit purchase or Biodiversity Conservation Fund (BCF) payment of the required number and type of biodiversity credits in accordance with recognised methodologies, and/or
- Delivered conservation measures in accordance with the requirements of the Policy and guidelines.

The Policy introduces two new key guidelines, which provide the requirements for achieving no net loss:

- No Net Loss Guideline (refer section 4.2)
- Tree and Hollow Replacement Guideline (refer section 4.3)

4.2 No Net Loss Guideline

This guideline (Appendix A) was developed to assist Transport in meeting its sustainability goal of achieving no net loss in biodiversity as a result of our infrastructure development activities and to meet our legislative obligations for biodiversity offsetting. The guideline was prepared to support in the implementation of statutory or Transport Biodiversity Policy commitments to provide offsets and/or conservation measures. Specific guidance is included on how to calculate offset requirements, notably that the BAM must be used to calculate the offset requirements for all residual significant impacts on nationally listed species and ecological communities where the EPBC Act strategic assessment approval applies.

As a means for assisting purchasing of biodiversity credits, Transport established the Transport Biobank which holds credits:

- Generated from Transport land but are not yet allocated to a project
- Purchased by projects and were found to be excess to requirements.

The Biobank can assist in obtaining credits to meet statutory obligations, as well as the no net loss objective of the Biodiversity Policy.

Additionally guidance for meeting offset requirements is also included. Payment into the BCF, an alternative to retiring biodiversity credits is available for EPBC Act offsets, including those required by the EPBC Act strategic assessment approval, provided the entity is also listed under the schedules of the BC Act.

4.3 Tree and Hollow Replacement Guideline

This guideline (Appendix B) was developed to address the Biodiversity Policy commitment to replace individual trees and hollows removed by Transport activities subject to certain exemptions for low-risk activities and that are not otherwise subject to offsetting under the Biodiversity Offset Scheme or Transport biodiversity offset thresholds.

4.4 Biodiversity Assessment Guidelines

The Biodiversity Assessment Guidelines were first released in December 2011 (Appendix C), with numerous revisions made to update content to reflect legislative and policy changes and inclusion of new guidelines and information as it becomes available. The guidelines and supporting templates were developed to assist Transport to meet its environmental impact assessment responsibilities under the EP&A Act, BC Act, FM Act and the EPBC Act and our own sustainability commitments as set out in the Transport Biodiversity Policy 2022.

The objectives of these guidelines and accompanying resource documents are to ensure that biodiversity impact assessments are:

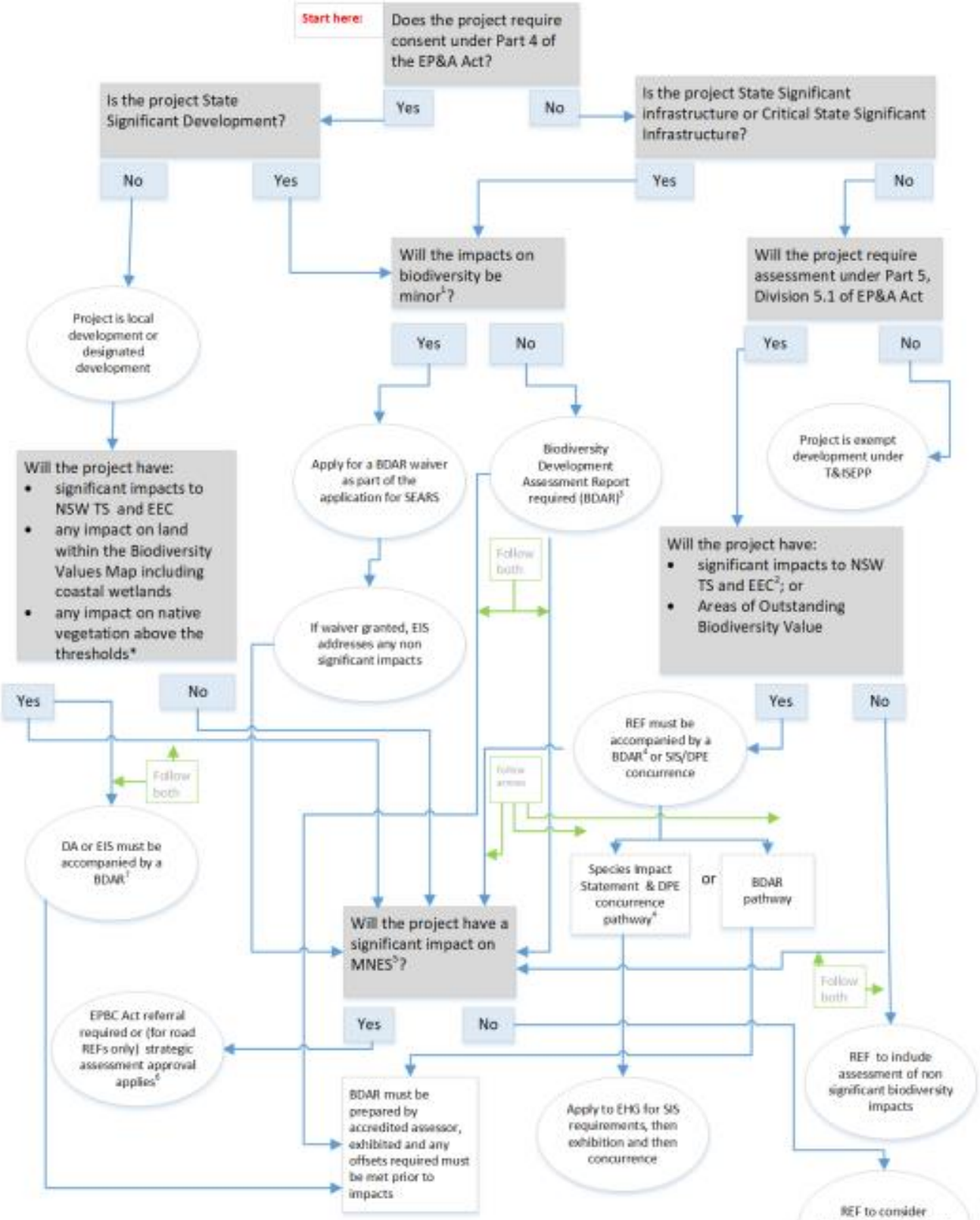
- Carried out in accordance with the relevant legislation and Australian and NSW Government policies and procedures
- Appropriate and proportional to the scale of the project and its expected impacts on biodiversity
- Focused on reducing environmental risk and improving outcomes for biodiversity
- Integrated with environmental impact assessment and environmental management processes.

The guidelines provide specific guidance on addressing threatened species, threatened ecological communities and migratory species listed under the EPBC Act. Section 3.5 of the guidelines identify the various Transport, NSW DCCEEW and Commonwealth DCCEEW biodiversity guidelines that are relevant to biodiversity assessment and need to be considered during the assessment process. This is in line with the requirements of the Strategic Assessment Report, to consider relevant guidelines in relation to MNES (sections 5.3, 5.4 and 5.5).

Figure 2 is included in the guideline and has been prepared to help Transport staff clarify the planning process where biodiversity impacts are anticipated. Figure 3 describes the statutory processes applying to biodiversity assessment under both NSW and Commonwealth legislation.

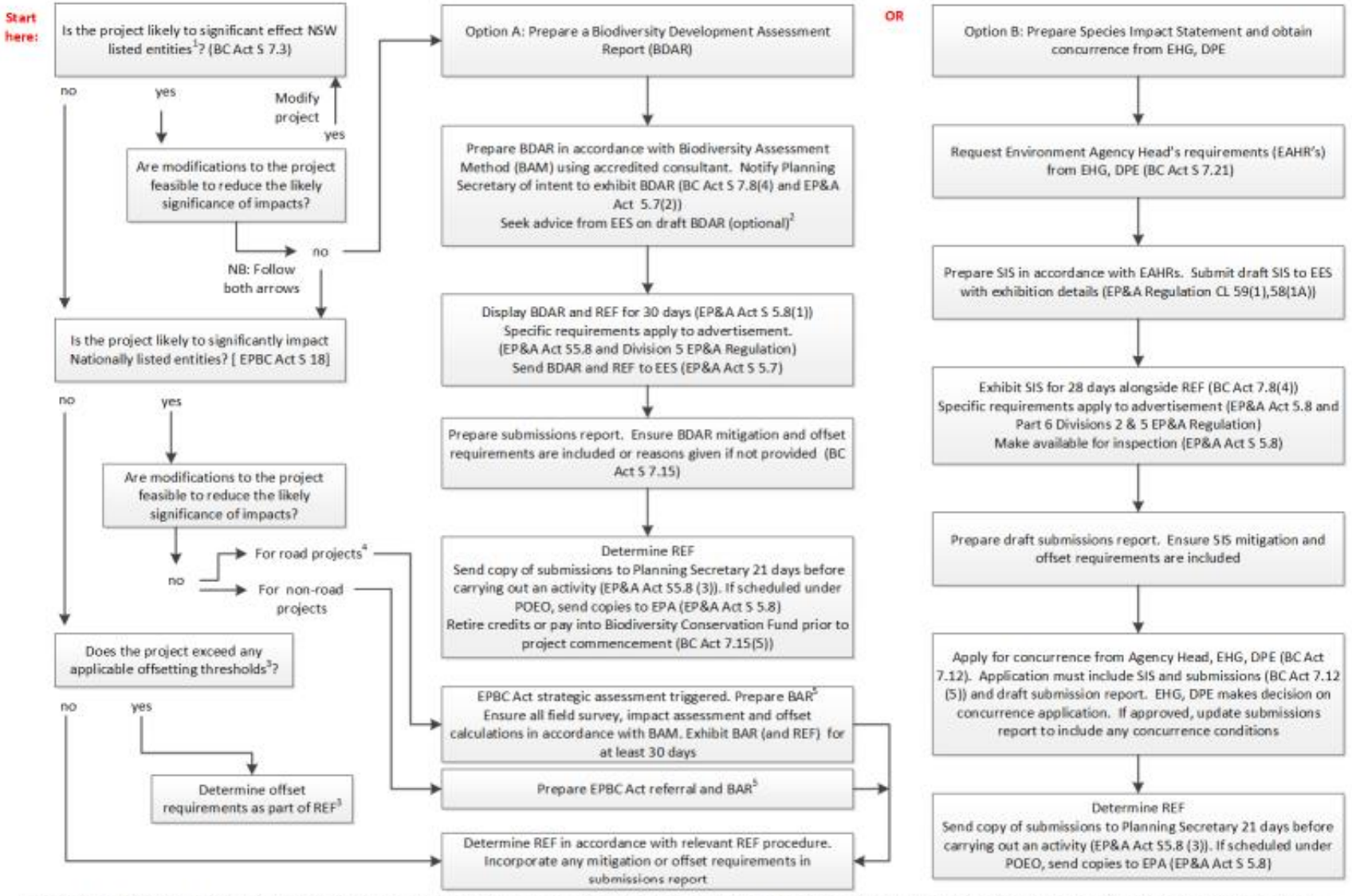
Table 2: Biodiversity assessment guideline resources

Resource	Description
Brief: Biodiversity assessment report (BAR) for REF (template) (Appendix D)	Can be used by the relevant manager to engage an accredited ecological consultant to prepare a biodiversity assessment report (BAR) that will form part of the REF for Division 5.1 proposal.
Brief: Biodiversity development assessment report (BDAR) for SSI (template) (Appendix E)	Can be used by the relevant manager to engage an accredited ecological consultant to prepare a biodiversity development assessment report (BDAR) that will form part of the environmental impact statement (EIS) for a State Significant Infrastructure project.
Preliminary biodiversity investigations report (template) (Appendix F)	Can be provided by the contract manager to an ecologist undertaking preliminary biodiversity investigations for an REF or major project including whether a BDAR waiver would be appropriate. The purpose of this assessment is to determine whether biodiversity is likely to be present requiring further assessment and recommendations for that assessment.
Biodiversity assessment report (BAR) for REFs (template) (Appendix G)	Can be provided by the contract manager to the accredited ecological consultant preparing biodiversity impact assessments for Division 5.1 REF projects. The project manager provides the latest template to the contracted ecologist.
Biodiversity development assessment report (BDAR) for SSI (template) (Appendix H)	Can be provided by the contract manager to the accredited ecological consultant preparing a biodiversity development assessment report (BDAR) that will form part of the environmental impact statement (EIS) for a SSI project. The project manager provides the latest template to the contracted consultant.



1 See section 2.3 for discussion of the BDAR waiver process
2. BC Act Section 7.3 sets out the factors to be considered in determining whether impacts to terrestrial biodiversity are likely to be significant. FMAct Section 221ZV sets out the factors to be considered for aquatic biodiversity.
3 Project SEARs will require BDAR preparation plus assessment of impacts to aquatic species under the FMAct
4. BDAR option only available for impacts to terrestrial biodiversity. Any significant impact under FMAct requires SIS and NSW Fisheries concurrence.
5. Matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
6. Must use BAM to calculate offsets and met EPBC exhibition requirements where EBPC Act strategic assessment for road projects applies
7. Note development applications under Part 4 are excluded from all Transport Biodiversity Policy offset and tree and hollow replacements requirements

Figure 2: Biodiversity assessment requirements according to planning pathway - NSW and Commonwealth



1. Entities includes threatened species and ecological communities. **2.** Environment & Heritage Group, Department of Planning and Environment. **3.** Refer TfNSW Guideline for Biodiversity Offsets **4.** EPBC Act strategic assessment approval applies. Not available for impacts on Commonwealth land. Referral required. **5.** If both BDAR and BAR is triggered by this process, only BDAR is required.

Figure 3: Biodiversity impact assessment process for REF proposals - NSW and Commonwealth legislation

4.5 Biodiversity Management Guidelines

The *Biodiversity Management Guidelines - Protecting and managing biodiversity on Transport for NSW projects* were released in March 2024 as an update to the previous *Biodiversity Guidelines – Protecting and managing biodiversity on RTA projects,* first released in 2011. The new guidelines incorporate information from local environmental management systems, former Transport documents, and other Transport documents and resources. They are an important resource used to inform biodiversity management recommendations in biodiversity assessments and are routinely referred to in REF determinations, providing streamlined benefits across projects. The recommendations in the guideline are used as the basis for Construction Environmental Management Plans (CEMPs) and cover everything from pre-clearing, exclusion zones, habitat and native vegetation management and fauna handling. Major updates from the previous version have been made, mostly due to improvements in knowledge, best practice, and legislative changes.

This guideline is a key mechanism to implementing the first principle of the Biodiversity Policy; avoiding, minimising and mitigating biodiversity impacts as part of the construction process.

4.6 Other new policy documentation and databases

Transport maintains the ESMF, an interactive Sharepoint site, which is managed by the Environment and Sustainability (E&S) Branch. The ESMF provides an aligned and consistent approach to meeting environment and sustainability requirements across Transport and includes:

- Information about each of the E&S teams, which are available to provide support and advice across Transport
- Technical E&S information and resources across various topic areas
- A suite of controlled E&S documents
- Links to useful E&S information, both within and outside Transport.

The ESMF identified 21 Mandatory Requirements to achieve environment and sustainability outcomes. The Mandatory Requirements are minimum outcomes that must be achieved when undertaking all Transport activities.

The ESMF contains two reporting portals, one each for environment and sustainability. Within the environment portal a biodiversity reporting database is maintained that contains a summary of vegetation loss and a corporate biodiversity offset reporting spreadsheet. The latter contains all project information where offsetting has been triggered, including determined REF projects under Part 5.1 that have triggered the strategic assessment and forward estimates prior to approval. The projects that have triggered the strategic assessment and are contained within the database are provided in Section 6.

Construction Environmental Management Plan
CEMPs are used to improve the quality and consistency of post approval environmental management. Transport CEMPs contain project-specific details of actions to be carried out to safeguard the environment. Specific requirements from the REF, decision report and specifications are included along with highlighting environmentally sensitive areas.

Project specific requirements that need to be communicated to site staff at the site-specific induction are included along with a site plan/s to mark the location of any items referred to in the plan. The plan is prepared in accordance with the requirements of Transports environmental

management systems and policy. A hold point is in place to ensure the CEMP is submitted and reviewed prior to the commencement of works. Regulatory requirements and compliance conditions are also included in the plan.

5. Implementation of program commitments

The Transport Biodiversity Policy sets the criteria Transport need to follow to achieve no net loss as a consequence of its infrastructure development activities. To achieve this, associated guidelines and supporting resources have been created to fulfil Transport's requirements under all state and federal legislation (refer section 4) as well as its own policy commitments to offset impacts below legislative thresholds. This includes applying the avoid, minimise, mitigate and offset hierarchy to all project approvals, including those assessed under Part 5 Division 5.1 of the EP&A Act that are likely to have a significant impact on MNES and therefore trigger the strategic assessment.

This section reviews how Transport has implemented the program commitments contained in the program report. Commitments are grouped to improve readability.

5.1 The 'avoid, minimise, mitigate and offset' hierarchy

Program commitment 2: protection hierarchy

Roads and Maritime will apply the 'avoid, minimise, mitigate and offset' hierarchy in undertaking its road and traffic management activities to ensure protection and avoid unacceptable impacts on the Specified Protected Matters.

This will include:
- Seeking to avoid impacts as the highest priority
- Minimising and mitigating actions to reduce the extent and intensity of likely impacts
- Providing offsets where residual significant impacts occur for a Specified Protected Matter, with the appropriate offset for that Specified Protected Matter determined in accordance with a method identified in a Bilateral Agreement between the NSW and Australian Governments or otherwise agreed with, or endorsed by, the Australian Government Minister for the Environment.
- Assessment documentation for the activity provided to the RMS decision-maker will identify proposed offsets and include arrangements and timeframes for the securing of offsets.

In accordance with the strategic assessment approval, Transport is committed to applying best-practice environmental impact assessment for all REF road infrastructure projects. One of the key commitments is to apply the avoid, minimise, mitigate and offset hierarchy, which is set out in the Biodiversity Assessment Guidelines (refer section 4) and specific guidance is provided in the BAR templates to ensure MNES are addressed in accordance with program commitments.

Transports commitment to applying best practice environmental impact assessment for all REF road infrastructure projects includes the commitment to not proceed with projects that may have an unacceptable impact on nationally listed species, ecological communities and migratory species, which is highlighted in Section 2.2.1 of the Biodiversity Assessment Guidelines (refer Section 4.4). During the project planning and assessment process, any potential significant impacts on MNES are identified and the appropriate planning pathway selected (refer Figure 2 and Figure 3). Should any of these impacts be considered potentially unacceptable based on preliminary information to date, which may include targeted surveys, preliminary biodiversity investigation etc., a review of the planning pathway is undertaken. This process includes consideration of all project information and sign-off by Directors of Environment and Sustainability, Policy, Planning and Assessment and

Project Development. Transport does not consider use of the strategic assessment appropriate for projects that have a potential risk of having unacceptable impacts on Specified Protected Matters.

Transport's Biodiversity Assessment Guidelines clearly state that the strategic assessment approval does not remove the need to consider whether a project is likely to have a significant impact on nationally listed entities. An assessment of significance is still required in accordance with the Matters of National Environmental Significance: Significant impact guidelines 1.1 (DoE 2013) and offsets must be calculated in accordance with the BAM.

For more information on offsetting see Section 5.5.

5.2 Environmental impact assessment including biodiversity

Program commitment 4 – environmental impact assessment

Roads and Maritime will undertake best practice and rigorous environmental impact assessment of its activities, in accordance with relevant environmental legislation. To that end, Roads and Maritime will maintain and continually improve its guidelines and procedures for environmental impact assessment, ensuring that consideration of Specified Protected Matters are clearly addressed and that the avoid, minimise, mitigate and offset hierarchy is applied. Roads and Maritime will consider relevant EPBC Act policy, plans and guidance material, including in relation of offsetting, as part of the activity assessment process

Roads and Maritime will also ensure that the environmental impact assessment of road and traffic management activities identifies and incorporates appropriate safeguards and management measures for the Specified Protected Matters. These will follow the SMARTA approach, meaning they will be: specific to the activity and site; measurable; achievable; realistic; time-driven; and auditable. Roads and Maritime will not proceed with an action (that is subject to the strategic assessment) that will have an unacceptable impact on any Specified Protected Matter.

Program commitment 5 – biodiversity assessment

Roads and Maritime will undertake best practice and rigorous assessment of the potential impacts of its activities on biodiversity, as an integral part of project environmental impact assessment, and taking into account current and up-to-date information on species and communities listed under the EPBC Act. To that end, Roads and Maritime will maintain and continually improve its guidelines and procedures for biodiversity assessment, ensuring that consideration of the Specified Protected Matters are clearly addressed, using appropriately qualified and experienced ecologists and taking account of up-to-date information from available sources and targeted field surveys.

Roads and Maritime will ensure its assessment processes reflect accepted methodologies that are robust and repeatable. Roads and Maritime will also maintain and continually improve its procedures with respect to management of biodiversity during the construction, operation and maintenance phases of an activity.

Program commitment 4 – environmental impact

The assessment is undertaken in accordance with the relevant Transport procedure and in consultation with the Transport E&S team.

The environmental assessment complies with the relevant environmental impact assessment and consultation requirements and applicable environmental legislation and environmental planning instruments. The environmental impact assessment includes:

- Description of the proposal based on a minimum 20% concept design or equivalent (not relevant to maintenance work).
- Community and stakeholder engagement or consultation to the extent needed for assessment of environmental impacts of the proposal.
- Mitigation measures are agreed with Transport E&S and project teams.
- Appropriate timeframes allowed for review of environmental impact assessments by Transport E&S or other environment and sustainability professionals as agreed with this branch.
- Statement signed and dated by the person with the principal responsibility for preparing the environmental assessment to certify that the information is not misleading and is in accordance with all legislative requirements.

The Biodiversity Assessment Guidelines provide a consistent approach and mechanism for delivering environmental impact assessments that ensure appropriate consideration of Specified Protected Matters that clearly address the avoid, minimise, mitigate and offset hierarchy. The guidelines and supporting resources specifically detail the requirements necessary (refer Table 2, Figure 2 and Figure 3).

Program commitment 5 – biodiversity assessment
As stated above, Transport follows an environmental assessment process that complies with relevant environmental legislation and environmental planning instruments, and this encompasses biodiversity assessments. The Biodiversity Assessment Guidelines provide specific guidance on addressing the impacts on matters listed under the EPBC Act and ensure appropriate assessment is completed according to legislative requirements and our commitments under the strategic assessment approval.

Resources to support the implementation of the guidelines are contained in Transport's ESMF and include briefs and templates relevant to differing levels of assessment based on project requirements.

5.3 Ecologically sustainable development

Program commitment 1: ecologically sustainable development

Roads and Maritime will demonstrate due diligence in the provision of its services, manage its road and traffic management activities in a manner which is consistent with the principles of ESD, and continually improve environmental performance

Program commitment 3: infrastructure lifecycle

Roads and Maritime will apply an infrastructure lifecycle management approach to undertaking road and traffic management activities, which incorporates measures to consider, assess and

avoid unacceptable impacts to Specified Protected Matters during all relevant phases of a project.

Program commitment 1 – ecologically sustainable development
Transport operates with considerable due diligence in ensuring our transport network is environmentally sustainable and meets the needs of the present without compromising the ability of future generations to do the same. This is evidenced by our Biodiversity Policy commitment of no net loss and continual improvement in our environmental practices and assessment of our project impacts. We design our projects and activities to avoid impacts on biodiversity first, using our Biodiversity Management Guidelines to guide mitigation, and then, if necessary, offset any unavoidable impacts. We work with our project partners to improve the environments that Transport manages and we contribute to the work of local government and communities to protect and enhance roadside reserves.

Transport's ESMF provides an aligned and consistent approach to meeting environmental and sustainability requirements. A suite of environmental procedures, guidelines and training materials accompany the ESMF and are integrated into our local management systems and contracts. Our REF template provides guidance on discussing and integrating the principles of ecologically sustainable development into the assessed proposal and decision-making process. These materials ensure legal requirements and stakeholder expectations are met, supporting our people and contractors to undertake our activities in an environmentally sustainable manner.

Program commitment 3 – infrastructure lifecycle
The Transport Biodiversity Policy commits transport to apply the avoid, minimise, mitigate and offset hierarchy to all Transport infrastructure, through all stages of the infrastructure development lifecycle, specifically:

"Our first priority is to avoid impacts to biodiversity from Transport infrastructure and then to minimise and mitigate remaining impacts as far as practicable. Genuine efforts must be made to achieve this outcome including:

- Strategic planning processes must include consideration of the impacts on biodiversity, including opportunities to avoid, minimise and mitigate those impacts along with the offsetting requirements for unavoidable impacts, and
- Environmental impact assessments including those undertaken as part of a Review of Environmental Factors (REF) and State Significant Infrastructure (SSI) projects must demonstrate the actions taken to avoid, minimise, mitigate and offset impacts on biodiversity as far as practicable. This will include the implementation of a wildlife connectivity strategy where landscape-scale impacts on habitats may occur.
- Design refinements made after completion of the environmental assessment (including those done during detailed design and construction planning) must demonstrate the actions taken to further avoid, minimise, mitigate and offset impact on biodiversity as much as practicable. The ability to offset impacts must not be used to justify biodiversity impacts or fail to avoid, minimise and mitigate impacts in the first place." (Section 3.1)

The strategic planning component of this work is particularly important. Needs and options assessments, including for corridor reservation and projects, consider the environment, social and sustainability risks, issues, opportunities and planning pathways relevant to the proposal and allow for their due consideration and comparison in consultation with Transport E&S.

Options development and identification of a preferred option includes:

- Early and ongoing input from Transport E&S including involvement in value management workshops or equivalent.
- Planning, environmental, social and sustainability issues and opportunities and recommendations are identified.
- The methodology for selecting the preferred option includes environment and sustainability criteria.
- Options reports (if required) address how environment and sustainability impacts are avoided and/or minimised.

5.4 Decision making

Program commitment 8: decision-making

Consistent with statutory requirements and assessment guidelines, Roads and Maritime will ensure that decision-making on whether to proceed with an activity takes into account all relevant consequences for the Specified Protected Matters, including from direct and indirect impacts. Decision-making will be made by appropriately senior level delegates and on the basis of detailed information contained in the REF, supporting technical information and giving consideration to the outcomes from community consultation. Roads and Maritime will make determined REFs and submissions reports publicly available

Transport is committed to ensuring it meets its statutory responsibilities, program commitments and all relevant considerations are addressed during the planning of future infrastructure projects. Specialist teams provide advice and support staff and contractors to ensure project proposals consider and address the impacts of its activities on the environment. Section 3.1 of the Transport Biodiversity Policy commits Transport to adopting the avoid, minimise, mitigate and offset hierarchy, with avoiding impacts to biodiversity our first priority. The assessment, management and assurance process implements industry best practice in environmental assessment, and prioritises our Policy commitments, by:

- Ensuring that environmental assessments identify environmental impacts at an early stage in project development through the strategic planning process
- Assessing the impacts of a proposed activity on the environment before deciding to proceed or not
- Developing and assessing measures to avoid, minimise or offset those impacts. These measures are all documented in the environmental impact assessment and include a wildlife connectivity strategy where landscape-scale impacts on habitats may occur
- Implementing and documenting design refinements made after completion of the environmental assessment, including those done during detailed design and construction planning. These must demonstrate the actions taken to further avoid, minimise, mitigate and offset impacts on biodiversity.

Transport ensures environmental impacts are assessed objectively and comprehensively, by appropriately qualified ecologists and other experts which is evident in our policies, guidelines and procedures embedded into the way we function. Transport and external delivery partners establish and maintain governance structures, systems and reporting to facilitate environment and sustainability outcomes in accordance with relevant delegations, policy and plans.

Transport has an Environment and Sustainability delegations procedure to support the operation of Transport environment and planning delegations. The procedure:

- Details how environment and planning roles and responsibilities are fulfilled when using the Delegations Levels from the Secretary of the Department of Transport *Instrument of Delegation and Authorisation* (June 2023)
- Assists teams to follow assurance processes for non-delegated functions
- Ensures quality practices in our environmental decision making
- Supports the Property and Environment delegations in the Transport for NSW Financial and General Delegations.

Delegations for REFs sit at the Director level and determinations include pre-determination meetings to discuss REF findings and ensure appropriate assessment and process is completed. Where community consultation is required, this is detailed in the REF and considered in the determination. All REFs are made publicly available by publishing on Transports website. Those that have public display requirements include allowance for reporting on comments received via a submissions report.

5.5 Safeguards, management actions and offsetting

Program commitment 9: environmental performance

Roads and Maritime will support the adoption and application of best practice environmental management standards by specifying environmental performance outcomes in contractual arrangements for the delivery of road and traffic management activities. That will include requirements for detailed environmental management plans, compliance with statutory requirements, and implementation of safeguards and mitigation actions identified during the environmental impact assessment process (as documented in the REF).

This includes incorporation of measures for the protection of Specified Protected Matters. Roads and Maritime will ensure that any required offsets for impacts to the Specified Protected Matters are secured in accordance with the arrangements and timeframes identified in the environmental assessment documentation for the activity.

Transport and external delivery partners responsible for delivering assets establish and maintain management systems to achieve the outcomes required by the Transport Environment and Sustainability Policy and Transport ESMF.

Transport and its construction partners have a management plan/s to address relevant environmental and sustainability requirements and provide a structured approach to describing accountabilities, the management of environmental risks, realisation of opportunities, and implementation of mitigation measures during construction.

Transport guidelines and procedures have strong guidance on implementing management and mitigation measures during the project assessment phase and impact assessment templates include specific sections set out to capture all areas of proposed management required to avoid and minimise biodiversity impacts. Templates also include examples of standard mitigation measures Transport implements as standard practice to guide appropriate management.

During the review process measures are thoroughly reviewed in consultation with our external partners to achieve the best possible outcomes for avoiding and minimising the impacts of our projects on all aspects of biodiversity, including threatened species, ecological communities and migratory species. These measures are then incorporated into the project CEMP.

Biodiversity offsets
Transport's No Net Loss Guidelines (Appendix A) sets out how we meet our legislative obligations for biodiversity offsetting (refer Section 4.2). The statutory processes that apply to biodiversity assessment and offsetting are also shown in Figure 2 and Figure 3. Projects assessed under Part 5 Division 5.1 of the EP&A Act, including those subject to the strategic assessment, where a BDAR pathway is chosen, must meet their offset requirements prior to the project impacts in accordance with Section 7.15(3)(4) of the BC Act.

The BAM must be used to calculate the offset requirement for all residual significant impacts on nationally listed species and ecological communities where the EPBC Act strategic assessment approval applies. These projects may also trigger Transport Biodiversity Policy commitments.

There are two main options for meeting terrestrial biodiversity offset requirements for developments and activities that have triggered the BOS and subject to the strategic assessment:

- Make payment into the BCF – only currently available where an entity is also listed under the schedules of the BC Act
- Purchase and retire biodiversity credits including purchasing from the Transport Biobank – where a project is also a controlled action only like-for-like credits may be retired.

Transport tracks its biodiversity offsetting requirements in a corporate biodiversity offset reporting spreadsheet (refer Section 4.6). Extensive consultation between project teams, environmental staff and the biodiversity team is undertaken to ensure appropriate offsetting commitments are calculated and met.

While Transport can aim to acquit offsets within a certain timeframe, purchasing biodiversity credits requires that credits are available on the market or that Transport is able to generate the credits on its own land. Timeframes for both processes are dependent on third parties and are not under the complete control of Transport.

Common difficulties include processing times for credit generation and/or issue and protracted/failed negotiation processes with credit sellers. While these issues have improved over recent years with the advent of the NSW Credit Supply Taskforce (now the Nature Markets and Offsets Division), they have been an issue in the reporting timeframe for this report. The alternative for Transport is to rely on payments to the BCF administered by the NSW Biodiversity Conservation Trust (BCT). Transport, as a matter of Policy, prefers to participate on the biodiversity credit market directly rather than relying on this mechanism.

It is also noted that there can be inherent difficulty in discharging offset obligations for EPBC Act matters using the BOS due to inconsistencies in NSW and Australian Government listings and settings. Whilst new listings of threatened species and ecological communities between the two jurisdictions are well aligned, historical listings are not well aligned because they were developed separately, with different methods of classification and assessment. Currently, where an action will impact on an EPBC Act listed entity that is not listed under the BC Act, biodiversity credits cannot be created or traded under the BOS for these entities as they are not listed under the Schedules of the BC Act. In this case, the offsetting requirement is referred to the Australian Government.

Additionally, offset obligations under the BC Act can be met by payment to the BCF administered by the BCT. Unfortunately, however, the BCT has advised that this mechanism cannot be used for EPBC Act offset obligations, if a parallel NSW offsetting obligation is not also in place.

5.6 Community and stakeholder consultation

Program commitment 7 – consultation

Consistent with its corporate objectives and commitments, Roads and Maritime will ensure that appropriate opportunities are provided for community and stakeholder consultation during the environmental impact assessment process for road and traffic management activities. Specifically, for activities that are assessed as likely to significantly impact on Specified Protected Matters this will include public notification on the Roads and Maritime web-site and an opportunity to provide comment on the project environmental assessment documentation (minimum 30 days).

If a Roads and Maritime activity is already subject to the preparation of a species impact statement (SIS), then public notification of the project environmental assessment documentation will occur at the same time as the SIS (minimum 30 days). Community and stakeholder input to Roads and Maritime activities will be considered and taken into account during the decision-making process on the scope of any refinements to the project or whether a project should proceed. In addition, information regarding activities that have been determined to proceed following completion of relevant environmental assessment requirements will be made publicly available by Roads and Maritime.

Internal and external environmental communication follows relevant Transport processes and are approved in accordance with relevant delegations. Technical environment and sustainability content is developed in consultation with Transport E&S Branch. Planned interactions with environmental regulators and consent/determining authorities include representation from Transport E&S Branch.

The Transport REF report template, which incorporates the biodiversity assessment outcomes, contains a chapter to outline the consultation undertaken for the project and what is proposed for the future. This includes guidance for discussing community involvement, Aboriginal community involvement, State Environmental Planning Policy consultation and government agency and stakeholder involvement.

If a significant impact is likely and a BDAR has been prepared, special public exhibition and Agency consultation requirements apply to the REF. The effect of Section 7.8(4) of the BC Act is that Part 5 of the EP&A Act applies to a BDAR accompanying an REF. Part 5 of the EP&A Act includes provisions relating to the notification, exhibition and inspection or documents. This is further elaborated in the EP&A Regulation, which has provisions relating to the publication.

Additionally, Transport commit to providing appropriate opportunities for community and stakeholder consultation including mandatory public notification, for a minimum of 30 days, for all projects likely to have a significant impact on nationally listed species, ecological communities and migratory species.

5.7 Auditing and incident management

Program commitment 6: environment protection

Roads and Maritime will maintain and continually improve its guidelines and procedures for broader environmental protection during the undertaking of road and traffic management activities, recognising that these support the conservation of the Specified Protected Matters.

Program commitment 10 – inspections and auditing

Roads and Maritime will continue to implement a risk-based system of activity inspections and project audits to ensure compliance with construction contract specifications, construction environmental management plans, statutory requirements, and implementation of safeguards and mitigation actions identified during the environmental impact assessment process. This will ensure any measures relevant to avoiding unacceptable impacts to Specified Protected Matters are delivered.

Program commitment 12 – incident management
Roads and Maritime will continue to implement a system for incident reporting and management. Incidents that potentially impact high biodiversity conservation values, including the Specified Protected Matters, are located within the most serious category and subject to comprehensive reporting and management requirements. Roads and Maritime will also comply with all applicable statutory requirements for incident notification, and will work with relevant authorities to firstly ensure risks to Specified Protected Matters are minimised, and secondly to ensure any inadvertent unauthorised impacts are addressed as soon as practicable.

Program commitment 6– environment protection
Transport is committed to the ongoing improvement of our practices by promoting and supporting continuous improvements, risk control and organisational capability. The ESMF includes performance expectations and governance and assurance mechanisms to measure and continuously improve environment and sustainability outcomes. Key Environment and Sustainability data metrics are regularly collected, analysed and reported across key Transport business areas as part of this continuous improvement process.

Transport and its construction partners have processes in place for the regular appraisal of environment and sustainability performance and the adequacy of the management systems applied to the activity. Performance review and improvement is used to facilitate appropriate environmental decision making, mitigate risk and realise opportunities.

Program commitment 10 – inspections and auditing
Transport and external partners have a risk-based audit schedule to monitor and report on compliance with relevant environmental and sustainability requirements, systems and processes. Copies of audit reports are provided to Transport E&S within one week of the end of the month in which the final report is issued.

Environmental inspections are undertaken to assess compliance with the environmental requirements of operations, premises and projects. A risk-based approach is used to guide the selection and frequency of inspections. Environmental inspection findings are tracked to close out actions within required timeframes. Copies of reports of environmental inspections, undertaken by

the environment and sustainability support resource are provided to Transport E&S within one week of the end of each month. Reports include the following environmental inspection data:

- Date of inspection
- Location
- Project (as applicable)
- Division/agency
- Contractor (as applicable).

Environmental performance review timing is generally contained within and undertaken in accordance with the project CEMP.

The Pacific Highway upgrade Parsons Road to Ourimbah, Lisarow project, subject to the strategic assessment, appointed an Environmental Site Representative to oversee the implementation of the CEMP and carry out ongoing inspections. In accordance with the CEMP, fortnightly inspections were carried out and adaptive management implemented where required. One incident related to MNES was recorded, being damage to two branches of *Melaleuca biconvexa* located just outside the limits of clearing by an excavator. Following this, the site supervisor discussed the issue with the excavator operator and clearing limits were discussed at the toolbox the following morning to ensure no clearing occurred beyond the boundary fencing and clearing limits. No significant issues in relation to MNES were recorded during the remainder of the project. External Safety, Quality and Environment Audits were completed six-monthly between 2019 and 2022.

The New England Highway upgrade between Belford and the Golden Highway, Belford project, also subject to the strategic assessment, implemented CEMP required continuous environmental inspections. In accordance with the CEMP, fortnightly inspections were conducted and adaptive management implemented where required. Specific vegetation impacts, as identified in the REF, were managed via a Flora and Fauna Management Plan, Clearing and Grubbing Plan and Pre-clearing survey and permits. Monthly progress reports were submitted as part of the contractor's requirements, which included environmental aspects such as incidents, high-risk activities and environmental approvals. There were no recorded incidents or unapproved impacts related to MNES, including the Central Hunter Valley Eucalypt Forest and Woodland EEC.

Program commitment 12 – incident management
Environmental incidents and non-compliances are reported and recorded as they occur using local systems. For reporting purposes, environmental incidents are classified in accordance with the highest consequence rating that applies from either the 'Environment', 'Regulations and Compliance' or 'Reputation and Integrity' criteria contained within the Transport Enterprise Risk Management Standard Risk Consequence Table.

Environmental incident and non-compliance data is provided to a Transport E&S environmental operations mailbox, or made available by integration of reporting systems, within one week of the end of each month. The report includes the following data:

- Date of incident
- Location
- Project (as applicable)
- Division/agency
- Contractor (as applicable)

- Incident classification
- Description of incident
- Immediate and corrective actions
- Identify if the event is a 'notifiable incident'.

Non-compliances are then rectified, with the reporting systems ensuring follow up and close-out of all recorded incidents. This includes complying with all statutory requirements for incident notification and working with relevant authorities to ensure risks are minimised and further impacts avoided.

5.8 Monitoring and adaptive management

Program commitment 11 – monitoring

Roads and Maritime will determine the need for environmental monitoring, including but not limited to Specified Protected Matters, during the environmental impact assessment of road and traffic management activities, taking into account advice from appropriately qualified and experienced ecologists. Where a need is identified, Roads and Maritime will develop and undertake appropriate targeted monitoring that is directly relevant to the activity, either during the construction and/or operational phases. To ensure the effectiveness of monitoring, Roads and Maritime may also pool resources for a range of projects into a larger monitoring program that will provide meaningful and useful information to improve overall environmental management.

Program commitment 13 – adaptive management

Roads and Maritime will support implementation of adaptive management measures that facilitate continuous improvement in undertaking road and traffic management activities, through pragmatic and practical steps building on the inspection, audit and monitoring regime applicable to particular projects.

Program commitment 11 – monitoring
Environmental monitoring is undertaken as standard practice for all Transport projects. Monitoring occurs during construction to determine the effectiveness of mitigation and management measures in limiting and reducing impacts. Post construction monitoring is generally completed where higher risks for impacts have been identified, including on Specified Protected Matters, to quantify the impacts on these matters and ensure no unacceptable impacts are occurring.

Two projects the subject of the strategic assessment (refer Section 6) have been completed with one having commenced post construction monitoring as part of concurrence conditions; the Pacific Highway upgrade Parsons Road to Ourimbah, Lisarow project. To account for the impacts to *Melaleuca biconvexa* an additional 30 per cent offsets for indirect impacts were included to account for the potential changes in wetland conditions and levels with a regeneration plan underway. The first 6-monthly monitoring report on progress is yet to be received for review.

Program commitment 13 – adaptive management
Transport's ESMF, policies and procedures promote and support continuous improvement, risk control and organisational capability. Inspections, auditing, monitoring and incidents are recorded in our management systems, which are then used to facilitate improvements to our practices through implementation of adaptive management measures. The ESMF has an information sharing page that

enables project teams to build on learnings from previous lessons learnt. This includes a range of potential improvements including design for improved fauna mitigation and management.

Guidance in the BAR for REFs template indicates that when developing mitigation measures for projects, a description of the objective of each mitigation should be included, along with thresholds for corrective actions and the corrective actions to be implemented should thresholds be exceeded. This guidance sets out the adaptive management implemented at the assessment stage.

5.9 Education and training

Program commitment 14: Education and training

Roads and Maritime will invest appropriate resources to ensure staff and contractors are suitably trained and skilled for the purposes of undertaking tasks relevant to protection of the environment. That includes work actions that support the avoidance of unacceptable risks to Specified Protected Matters, such as practical application of the 'avoid, minimise, mitigate, offset hierarchy' to project delivery, environmental impact assessment, environmental and management and project inspection, auditing, monitoring and incident reporting.

Personnel working for or on behalf of Transport understand their environment and sustainability responsibilities, have the competence, training and capabilities relevant to their role, and use prescribed systems and processes to manage environmental risks and realise opportunities. This includes the use of assessors accredited under the NSW BC Act where BDARs are required.

Managers are responsible for the environmental competency of their staff, including identification of training needs, development of training plans and monitoring and maintenance of individual staff competency.

Transport procedures, policies and templates are made available to staff via the ESMF. Updates and releases of new procedures and guidance are widely advised to staff via emails to circulation lists, team meetings and news items on the intranet. Fact sheets are prepared to address issues such as frequently asked questions and changes to legislation and policy. Transport maintain a suite of environmental training packages and run training sessions regularly to update and refresh staff in the following (as pertinent to the strategic assessment):

- Review of environmental factors
- Biodiversity, including the Transport Biodiversity Policy and new Biodiversity Management Guidelines
- Erosion and sediment control
- Environmental inspections, including the new myHSE Ngara platform for reporting
- Environmental incident classification and reporting

Training packages are maintained and updated as needed to respond to legislative changes and to ensure best practice and provided to project management, environmental and other staff on an as need basis.

Transport maintains contractor panels for a range of environmental technical services with the review of environmental factors panel pertinent to the strategic assessment. Admission to a panel is merit and performance based and subject to assessment by committee.

6. Projects subject to the strategic assessment approval

To date, seven REFs subject to the strategic assessment approval have been determined (approved) by Transport and two activities have commenced construction, as shown in Table 3.

Table 3: Projects subject to the strategic assessment approval

Project	Current status	Project information and updates
Mona Vale Road West Upgrade, McCarrs Creek Road, Terrey Hills to Powderworks Road, Ingleside	Project was determined (approved) by Roads and Maritime Services with concurrence from the NSW Office of Environment and Heritage on 14 November 2017. As of June 2023, some early works have been undertaken in preparation for the start of main construction activities which are yet to be scheduled.	Mona Vale Road West - Mona Vale Road upgrade | Transport for NSW
Pacific Highway upgrade, Parsons Road to Ourimbah, Lisarow	Project determined (approved) by Roads and Maritime Services on 10 July 2018. As of August 2023, the upgrade was complete with finishing work completed as of mid-2024.	Pacific Highway duplication at Lisarow – Pacific Highway | Transport for NSW
New England Highway upgrade between Belford and the Golden Highway, Belford	Project determined (approved) by Roads and Maritime Services on 10 July 2018. Major work for the upgrade was completed in December 2023, with finishing work completed as of January 2024.	Belford to Golden Highway - New England Highway | Transport for NSW
New England Highway Singleton Bypass	Project was determined (approved) in August 2020. An addendum REF was determined in April 2023. As of November 2023, the design and construction contract had been awarded with preparation for the start	Singleton Bypass – New England Highway | Transport for NSW

Project	Current status	Project information and updates
	of major work expected to commence in late-2024.	
HW17 Newell Highway Narrabri to Moree Heavy Duty Pavement Project	The project was originally determined (approved) in September 2018 and the subsequent addendum REF was determined in August 2020. Construction commenced in July 2022 and is ongoing.	Newell Hwy upgrade Narrabri-Moree pavement upgrade | Transport for NSW
HW17 Newell Highway North Moree Heavy Duty Pavements	The project was originally determined (approved) in September 2018 and the subsequent addendum REF was determined in August 2020. As of June 2024, construction had not commenced.	North Moree heavy duty pavements | Transport for NSW
Great Western Highway – Little Hartley to Lithgow	The project was originally determined (approved) in April 2022 and a subsequent addendum REF was determined in June 2023. The project was split into smaller construction packages. The Coxs River Road construction contract commenced in March 2023 with construction beginning in April 2023 and ongoing. In the September 2023 State Budget, the Government reallocated funding commitments for the project. At this time there are no plans to recommence the Little Hartley to Lithgow upgrade.	Little Hartley to Lithgow Upgrade | Transport for NSW Coxs River Road Upgrade | Transport for NSW

Annual reporting and the 2022-23 project summary

The Transport Annual Report aims to keep Transports customers, community, partners, government and industry informed about performance and meet the statutory requirements set out in the

Government Sector Finance Act 2018. It also includes reporting requirements according to Transports statutory obligations.

Transport reports on the implementation of the strategic assessment approval as part of the Annual Reporting process. Reporting commenced in 2015-16 FY and has been undertaken each year since. Following the amalgamation of Roads and Maritime Services with the then Transport for NSW, these reports are included in the Transport for NSW Annual Report.

For all projects that have triggered the strategic assessment approval, reporting includes information about the:

- Extent of likely impacts on MNES included in the strategic assessment approval.
- Details of the mitigation and offset measures
- Public exhibition details
- Current status.

For the 2022/23 Annual report however, three projects that had previously triggered the strategic assessment and were intended for inclusion in the Annual Report were mistakenly removed from the report during the publication process (See Table 30). The projects are included in Table 3 and are:

- Mona Vale Road West Upgrade, McCarrs Creek Road, Terrey Hills to Powderworks Road, Ingleside
- Pacific Highway upgrade, Parsons Road to Ourimbah, Lisarow
- Great Western Highway – Little Hartley to Lithgow.

All associated information for these projects that was to be included in the Annual Report as part of Transports statutory obligations is included in Table 4. Transport has also taken steps to ensure that this oversight does not happen again.

7. Project assessment findings

Table 4 provides a summary of the review of environmental factors findings.

Table 4: Summary of assessment findings

Likely impacts on Matters of National Environmental Significance	Mitigation and offset measures	Public consultation
Mona Vale Road West Upgrade, McCarrs Creek Road, Terrey Hills to Powderworks Road, Ingleside		
Direct: • *Grevillea caleyi* – 3.4 ha potential habitat including 75 known individuals	Principle mitigation measures are: • Implementing Biodiversity Guidelines	A REF and Species Impact Statement were exhibited from 10 February 2017 to 13 March 2017.

Likely impacts on Matters of National Environmental Significance	Mitigation and offset measures	Public consultation
• *Microtis angusii* – 1,469 known individuals • *Heleioporus australasicus* – 0.22 ha of breeding habitat and 12.5 ha of potential non-breeding habitat. Indirect: • Fragmentation and isolation of individuals and habitats • Noise, dust and other construction impacts • Hydrological impacts on downstream habitats • Fauna collision and mortality.	(2011) for the pre-clearing process • Construction of a fauna land bridge to connect Ku-ring-gai Chase and Garigal National Parks • Two fauna underpasses supported by fauna-proof fencing and weed management • All residual impacts to nationally listed threatened species will be offset through the purchase of biodiversity credits in accordance with the Framework for Biodiversity Assessment. Offsetting for one species, *Microtis angusii*, is subject to taxonomic and conservation status review.	
Pacific Highway upgrade, Parsons Road to Ourimbah, Lisarow		
Direct: • *Melaleuca biconvexa* – 2.16 ha with estimated 2,163 stems. Indirect: • *Melaleuca biconvexa* – 0.73 ha with estimated 2,575 mature stems	Principle mitigation measures are: • Implementing Biodiversity Guidelines (2011) for the pre-clearing process • Management of water quality and hydrology through a wetland management plan and soil management plan. All residual and indirect impacts to *Melaleuca biconvexa* have been offset through the purchase of biodiversity credits or via payment to the BCF.	A REF including biodiversity assessment was exhibited from 30 June 2017 to 28 July 2017.

Likely impacts on Matters of National Environmental Significance	Mitigation and offset measures	Public consultation
New England Highway upgrade between Belford and the Golden Highway, Belford		
Direct: • Reduce extent of Central Hunter Valley Eucalypt Forest and Woodland CEEC by 8.2 ha. Indirect: • Fragmentation and degradation of remaining Critically Endangered Ecological Communities (CEEC). This CEEC is equivalent to NSW PCT 1601 – Spotted Gum Narrow-leaved Ironbark, Red Ironbark, shrub-grass open forest of the Central and Lower Hunter	Principle mitigation measures for CEEC: • Implementing the Biodiversity Guidelines (2011) for the pre-clearing process including the preparation of a Flora and Fauna Management Plan A statement of Reasonable Equivalence has been obtained from NSW Environment and Heritage which converts former Biobanking credits into BC Act credits. This resulted in 279 BAM credits being required (of a total of 346 credits which included credits required for NSW only listed EEC). Transport for NSW continues to investigate credit availability on the market.	A REF including biodiversity assessment was exhibited from 30 June 2017 to 28 July 2017.
New England Highway Singleton Bypass		
Direct: • 19.55 ha of Central Hunter Valley Eucalypt Forest and Woodland CEEC No EPBC Act threatened or migratory species are likely to be significantly impacted	Principle mitigation measures for CEEC: • Implementing the Biodiversity Guidelines (2011) for the pre-clearing process including the preparation of a Flora and Fauna Management Plan All residual impacts to nationally listed matters are to be offset in accordance with the BAM. Subject to	A REF was exhibited from 16 December 2019 to 1 March 2020.

Likely impacts on Matters of National Environmental Significance	Mitigation and offset measures	Public consultation
	final design, 550 credits for the CEEC are required.	
HW17 Newell Highway Narrabri to Moree Heavy Duty Pavement Project		
Direct: • 16.22 ha of Natural Grasslands on Basalt and Fine-textured Alluvial Plains of Northern NSW and Southern QLD CEEC. Note: significant impacts identified in September 2018 REF to habitat for the perennial grass species Belson's Panic (*Homopholis belsonii*) have been avoided due to design changes outlined in the addendum REF.	Principle mitigation measures for CEEC: • Implementing the Biodiversity Guidelines (2011) for the pre-clearing process including the preparation of a Flora and Fauna Management Plan All residual impacts to nationally listed matters are to be offset in accordance with Transport's biodiversity offset guidelines. Transport is sourcing 486 PCT 52 credits from the market.	A REF was exhibited from 22 June 2018 to 23 July 2018. A subsequent addendum REF was prepared in May 2020 and confirms the impact boundary and offset requirements.
HW17 Newell Highway North Moree Heavy Duty Pavements		
Direct: • 5.94 ha of Natural Grasslands on Basalt and Fine-textured Alluvial Plains of Northern NSW and Southern QLD CEEC Note: significant impacts identified in September 2018 REF to habitat for the perennial grass species Belson's Panic (*Homopholis belsonii*) have been avoided due to design changes outlined in the addendum REF.	Principle mitigation measures for CEEC: • Implementing the Biodiversity Guidelines (2011) for the pre-clearing process including the preparation of a Flora and Fauna Management Plan Additional targeted environmental safeguards to be provided for Belson's Panic including further design refinements to avoid impacts. All residual impacts to nationally listed matters are to be offset in accordance	A REF was exhibited from 22 June 2018 to 23 July 2018. A subsequent addendum REF was prepared in May 2020 and confirms the impact boundary and offset requirements.

Likely impacts on Matters of National Environmental Significance	Mitigation and offset measures	Public consultation
	with Transport's biodiversity offset guidelines. 178 PCT 52 credits are required and will be sourced from the market.	
Great Western Highway – Little Hartley to Lithgow		
Direct: • 4.51 ha of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC. No EPBC Act threatened or migratory species are likely to be significantly impacted.	Principle mitigation measures for CEEC: • Implementing the Biodiversity Guidelines (2011) for the pre-clearing process including the preparation of a Flora and Fauna Management Plan Further consideration for the placement of ancillary facilities (including drainage and sediment basins) during detailed design stage. 176 PCT 1103 and about 13 PCT 1330 credits required to offset the residual impacts on the CEEC. Payment into the BCF for the Coxs River Road works was completed in July 2022.The addendum REF has identified a small amount of additional credits required to be purchased based on changes to the construction footprint. They will be sourced prior to works occurring in new areas.	A REF was exhibited from 23 November 2021 to 16 January 2022. Six public consultation sessions were held between 23 November and 11 December 2021. An updated concept design was displayed for community feedback from October to 20 November 2022. A subsequent addendum REF was determined in June 2023 and published on the project website.

8. Offset obligation status

As at 30 June 2024, one project has fully discharged its offset obligation with another three projects partially completed due to either purchased credits not yet being retired or waiting for credit generation on an identified Biodiversity Stewardship Site. Those projects with no progress to meeting their offset obligation have not received funding for construction. A summary of the project offset obligation and status is included in Table 5.

Table 5: Summary of project offset obligation and status

Project	Offset obligation	Has offset obligation been met?
Mona Vale Road West Upgrade, McCarrs Creek Road, Terrey Hills to Powderworks Road, Ingleside	204 ecosystem credits 458 species credits	No – BOS approval required by 12 months after clearing of EEC vegetation. Partial funding for offset purchase but no construction funding
Pacific Highway upgrade, Parsons Road to Ourimbah, Lisarow	68 ecosystem credits 14 species credits	Yes* – lodgement of BSA accepted as meeting compliance obligations. Residual obligation achieved by BCF payment and transfer of credits from a council BSA *Credits purchased but not yet retired. Retirement process underway.
New England Highway upgrade between Belford and the Golden Highway, Belford	560 ecosystem credits 261 species	Partial – A suitable property has been identified to generate the required ecosystem credits and an agreement is being prepared to purchase the credits once generated (likely 2025). Species credits have been secured and an application to retire the credits has been submitted.
New England Highway Singleton Bypass	550 ecosystem credits 1398 species credits	Partial – a potential BSA property was being investigated to fulfil the requirements for this and the above project with landowner negotiations commenced, however the credits were sold to another party. Another opportunity as been identified

Project	Offset obligation	Has offset obligation been met?
		to fulfil the ecosystem requirement and a purchase agreement is being developed to purchase credits once they have been generated by the landowner. 1144 species credits have been purchased but not yet retired. All of these are for non-EPBC Act listed species
HW17 Newell Highway Narrabri to Moree Heavy Duty Pavement Project	487 ecosystem credits	No – A variation to an existing BSA is currently underway to supply the required credits. Credit generation is expected in August 2024.
HW17 Newell Highway North Moree Heavy Duty Pavements	178 ecosystem credits	No – currently no funding for project. Offset will be investigated when funding becomes available.
Great Western Highway – Little Hartley to Lithgow	2474 ecosystem credits 3333 species credits	Yes – payment made into the BCF to fulfil offset obligation.

9. Program review findings

The 18 month review of the strategic assessment was due in March 2017 and subsequently extended as no projects, subject to the strategic assessment approval, had moved to the construction phase. This review was completed in June 2019 and concluded that the program was not resulting in unacceptable impacts to Specified Protected Matters and that the performance of the program cannot be fully reviewed and understood until construction of a project subject to the strategic assessment had been completed and post construction monitoring results obtained.

Transport committed to review the operation of the strategic assessment five years after the 18 month review (June 2024) to assess its performance and ensure that any impacts from its implementation are, as a minimum, not having an unacceptable impact on Specified Protected Matters. As at June 2024, seven projects have been determined subject to the EPBC strategic assessment approval. To date, two of those projects have been completed, three have works ongoing and two are yet to commence.

The Pacific Highway upgrade Parsons Road to Ourimbah, Lisarow project is currently the only project to complete construction and commence monitoring as per its concurrence conditions. The first monitoring report is yet to be received for review.

The New England Highway upgrade between Belford and the Golden Highway, Belford project has completed construction. There are no ongoing monitoring requirements for the project triggered in the assessment documentation or as part of its approval conditions.

There have been no significant issues identified during inspections and auditing for either completed project, or those that have commenced construction, that would indicate unacceptable impacts have occurred (refer section 5.7). Clearing limits identified in the REF are marked on site and enforced by the Environmental Site Representative. All potential impacts are accounted for in the impact assessment. In the early stages of the Princes Highway upgrade Parsons Road to Ourimbah, Lisarow project two branches of a *Melaleuca biconvexa* were damaged. This resulted in discussion at following toolbox talks reinforcing the importance of staying within clearing limits and boundary fencing. No incidents or unapproved impacts were recorded for the New England Highway upgrade between Belford and the Golden Highway, Belford project in relation to MNES, specifically the Central Hunter Valley Eucalypt Forest and Woodland CEEC.

While not all projects subject to the strategic assessment have acquitted their offset obligation (refer Section 8), progress has been made for each project that is in the construction phase. There has been some difficulty in discharging offset obligations for these projects due to a number of factors. This includes difficulty sourcing available credits on the market and the extensive process of establishing a Biodiversity Stewardship Site to generate credits to then retire (refer Section 8). The Princes Highway upgrade Parsons Road to Ourimbah, Lisarow project was accepted to have met its compliance obligations with the lodgement of the Biodiversity Stewardship Agreement being completed to generate credits.

Transport notes that achieving biodiversity offsetting using the BOS can often be a protracted process but one that does deliver secure, funded, conservation management over typically private lands on a like for like basis.

The outcomes of this five year review of performance indicates that due to the continued implementation of the program commitments Transport projects subject to the strategic assessment are not resulting in an unacceptable impact on Specified Protected Matters. Transport's management arrangements and standards are consistent with the program commitments as defined in the Strategic Assessment Report.

The next five year review will be due in June 2029. The remaining projects subject to the strategic assessment identified in section 6 that are currently under construction, or likely to commence construction in the near future, will be included in this subsequent review in addition to any new project triggering the strategic assessment. The review will better be able to assess these projects against the program commitments and make a conclusion on whether any are having unacceptable impacts. The next review will also be able to provide updated details on the discharge of offset obligations for projects that were completed prior to this review.

10. Appendices

A. No Net Loss Guideline

B. Tree and Hollow Replacement Guideline

C. Biodiversity Assessment Guidelines

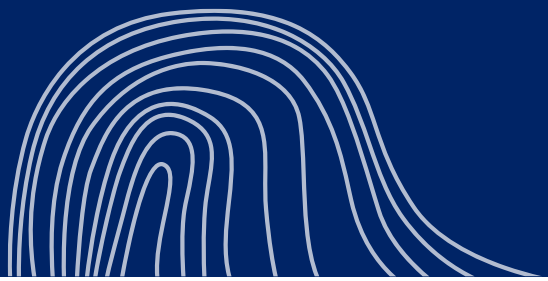
D. Brief: Biodiversity assessment report (BAR) for REF (template)

E. Brief: Biodiversity development assessment report (BAR) for SSI (template)

F. Preliminary biodiversity investigations report (template)

G. Biodiversity assessment report (BAR) for REFs (template)

H. Biodiversity development assessment report (BAR) for SSI (template)



NSW GOVERNMENT

Transport for NSW

No net loss guidelines

A guide for achieving biodiversity offsets and conservation measures

October 2023

NSW GOVERNMENT

transport.nsw.gov.au

Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.

Document control

Document owner	Senior Specialist (Biodiversity), SER
Consultant	N/A
Approved by	Executive Director, Environment and Sustainability
Branch / division	Environment and Sustainability / Safety, Environment and Regulation
Review date	July 2025
Superseded documents	DMS-SD-087 *Vegetation Offset Guide* (Infrastructure and Place) 23 April 2020 DMS-SD-067 *Vegetation Offset Calculator* *Biodiversity Offset Guide* 2016 (Roads and Maritime) and supporting resources.

Versions

Version	Date	Amendment notes
1.0	Jul 2022	First issue
1.1	Aug 2022	Table 3-1 revised to add moderate to good to fauna habitat offset requirement
2.0	Dec 2022	Update to reflect changes to the Biodiversity Conservation Trust's new payment system plus two new resources (8 and 9)
3.0	Oct 2023	Update to clarify wording of offset threshold B1 in Table 3-1 and provide additional advice on BCF Charge System (edits to Section 2.1 and 4.2), credit purchase (edits to Section 4.3) and Transport Biobank operations (edits to Section 4.3.1 and a new Chapter 6). Addition of two new resources; Resource 10 (Transport Biobank credit transfer application) and Resource 11 (Transport Biobank credits available). Slight wording clarifications made throughout.

Related policy and supporting information

- Transport Environment and Sustainability Policy
- Environment & Sustainability Management Framework
- For resources supporting this document refer Section 1.4

This Guideline should be read in conjunction with the following policies and procedures

- Transport Biodiversity Policy
- EMF-BD-GD-0010Biodiversity Assessment Guidelines
- Residue land biodiversity credit procedure (available from Land Divestment, Property)
- Selling Biodiversity Credits to Transport fact sheet for landholders.

Contacts and further information

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Internal Transport users: Biodiversity (sharepoint.com)

Table of contents

1. Introduction

1.1 Purpose

The Guideline has been developed to assist Transport for NSW (TfNSW) in meeting its sustainability goal of achieving no net loss in biodiversity as a result of our activities and to meet our legislative obligations for biodiversity offsetting.

1.2 Scope

These Guidelines have been prepared to support TfNSW in the implementation of statutory or Transport Biodiversity Policy commitments to provide biodiversity offsets and/or conservation measures. Separate guidelines apply where tree and hollow replacement requirements have been triggered [EMF-BD-GD-0129].

Other Transport cluster agencies may find these guidelines helpful in delivering biodiversity offsets and conservation measures.

The land divestment activities of Transport Asset Holding Entity (TAHE) are excluded from the Transport Biodiversity Policy and these guidelines do not apply.

1.3 Objective of these Guidelines

The objective of the Guideline is to assist TfNSW in fulfilling the requirements of the Transport Biodiversity Policy to provide biodiversity offsets and conservation measures through the provision of information and templates.

1.4 Resources

These guidelines are supported by the resources listed at **Table 1-1**.

Table 1-1: Biodiversity Offset Guideline resources

Resource	Title	Description
Resource 1	Biodiversity offset strategy template (BAM trigger)	Prepared by ecological consultants and/or TfNSW staff and details TfNSW proposals for acquitting the offset obligation using the Biodiversity Assessment Method (BAM) where a Biodiversity Development Assessment Report (BDAR) has been prepared
Resource 2	Biodiversity offset strategy template (Policy trigger)	Prepared by ecological consultants and/or TfNSW staff and details TfNSW proposals for acquitting the offset obligation under Transport Biodiversity Policy
Resource 3	Template memo to pay into the BCF	For use when projects are seeking to approval to pay into the Biodiversity Conservation Fund (BCF)
Resource 4	Template memo to commence negotiations to purchase credits	For use when projects are seeking approval for Property and Acquisition Teams to commence credit purchase negotiations
Resource 5	Brief to prepare BSA	Used to engage an accredited person to prepare assessments necessary to apply to the Taskforce (a task formerly undertaken by the BCT) to enter a Biodiversity Stewardship Agreement (BSA).
Resource 6	Template memo to retire credits	For use when projects are seeking approval to retire credits

Resource 7	Brief to prepare a Biodiversity Offset Strategy	Used to engage an accredited person to prepare assessments necessary to prepare a Biodiversity Offset Strategy for offset requirements triggered by either the BAM/BDAR or TfNSW Biodiversity Policy
Resource 8	Application for funding from TfNSW Biobank	Used by TfNSW to seek funding for BSA assessments of land where credits may be generated in addition to project needs
Resource 9	Introductory letter for landholders	Used by TfNSW to confirm arrangements with the landholder for Biodiversity Stewardship Agreement investigations
Resource 10	Transport Biobank credit transfer application	Used by TfNSW to sell credits to the Biobank, purchase credits from the Biobank, or allocate (earmark) credits for future use
Resource 11	Transport Biobank credits available	Used by TfNSW to view credits available in the Transport Biobank.

Additional resources relating to the establishment of a BSA on TfNSW residue land are part of the Biodiversity Offsetting on Residue Land Procedure which is from Land Divestment, Property. These resources include template memos for:

- Entering into a BSA on Transport owned residue land.
- Project request for Property Divestment approval to investigate the ecological qualities of Transport owned residue land.
- Project request for Property Divestment approval to enter into a BSA on Transport owned residue land.
- Project request for Property Divestment approval to acquire land for biodiversity offset.
- Project request for Property Divestment approval to dispose of biodiversity offset land to another Agency.

2. Strategic offset planning

The Biodiversity Policy encourages the estimation and acquisition of biodiversity credits as early as possible in the asset infrastructure lifecycle. Early stages of project development provide the best opportunity for TfNSW to demonstrate that impacts have been avoided as far as practicable.

The TfNSW investment gating and assurance guidelines describes the decision making process by which TfNSW prioritises, enables, monitors and reports on infrastructure investment.

To meet the requirements of the Biodiversity Policy, strategic planning processes, including strategic business cases (Gate 1), must include a provisional amount for biodiversity offsets and consider whether a budget allocation is required to implement a forward biodiversity offset acquisition program in advance of environmental impact assessment and project approvals. These considerations are to be included during the preliminary environmental sustainability and planning investigations (PESPI), where prepared. These estimates and requirements should be reviewed and progressed during concept design development for the business case (Gate 2) at which time an Review of Environmental Factors (REF) or Environmental Impact Statement (EIS) is usually being prepared.

2.1 Estimating the cost of future offset requirements

Estimating the cost of future credit requirements poses some significant challenges due to both uncertainty around the nature and extent of future project impacts, and the likely future costs of credits and Biodiversity Conservation Fund (BCF) payments. At a minimum, projects should estimate likely terrestrial ecosystem and species credit costs at the strategic business case stage with estimates for aquatic offsetting included where relevant and in consultation with DPI.

2.1.1 Terrestrial biodiversity offsets

Estimating offset costs requires two steps:

Step 1 – Estimate a credit requirement. For ecosystem credits, early estimates can simply use a ratio of 30 ecosystem credits per hectare of plant community types (PCTs) to be impacted. This will identify the potential PCTs impacted, and provide an indicative number of ecosystem credits required for each. The accuracy of this estimate will be relative to the project assessment stage. Early estimates may need to be based on a desktop assessment of PCTs (e.g. using the NSW State Vegetation Type Map) and Offset Trading Groups, and a strategic project corridor/boundary (or across multiple route options) to calculate indicative impact areas. Therefore impacts will likely be larger and the PCTs idenitifed may not be accurate without field verification.

As projects progress and more data becomes available, offset estimates will become more accurate. Projects should prioritise the field verification of PCT mapping to improve their credit estimate and revise the impact boundary as the design progresses. Where offset caculations are available for a project, these should be used in leiu of estimates using the 30:1 ratio.

Step 2 – Estimate the cost of the credits. The Department of Planning and Environment's (DPE) Biodiversity Credits Market Sales Dashboard is a searchable tool that allows users to view historical credit sales data and market trends. This tool can be used to estimate the potential cost of purchasing credits from the market. Given the absence of sales data across many credit types, however, the quality of the estimate reduces as other credit types are used as a surrogate for the required credits. To make the best use of available information, it is recommended that credit prices be identified on the Biodiversity Credits Market Sales Dashboard as following:

1. Use the weighted price average for the same credit and, if not available.
2. Use any weighted price average for the same credit within the Offset Trading Group, and, if not available or not relevant.
3. Use the weighted price average for any ecosystem or species credit in that subregion region; and if not available.
4. Use the weighted price average for any ecosystem or species credit in surrounding subregions until you find a relevant sale.

This approach assumes that it is the location of the credit (rather than the type of credit) that drives credit price. That is, two different ecosystem credit types from the same locality are more likely to be a similar price than the same ecosystem credit type seperated by a large geograhical distance.

Market data also exists for trades of the older BioBanking credits (see the BioBanking Credits Sales Dashboard). This market data can be useful for estimating current market value, so long as a conversion factor is applied. TfNSW has observed through our assessments of reasonable equivalence, that on average two Biobanking ecosystem credits is equiavlent to one BAM ecosystem credit. Therefore it is recommended that any Biobanking credit prices used to estimate the cost of BAM credits are at minimum doubled.

Estimating the cost of species credits poses some significant challenges and is not reliable unless targeted threatened species survey has been undertaken. As a general guide, a 30% premimum may be applied to the estimated cost of ecosystem credits to allow for an indicative cost for species credits.

Please note that since the removal of the Biodiversity Offset Payment Calculator (BOPC) in October 2022, the cost of making a payment to the BCF can only be obtained through a quote from the BCT after determination of the REF or approval of a SSI project and is not available for strategic planning purposes. However, there are several tools available to estimate the cost of a BCF payment prior to applying for a quote. The BCT publish a quartlery charge report on their website showing all BCF charge quotes six months after they are issued and also offer a price estimation service for a fee (refer to Section 4.2).

2.1.2 Aquatic biodiversity offsets

Step 1 – Estimate the likely extent of key fish habitat impacted. Early estimates may need to be based on a desktop assessment of aquatic habitats (e.g. using the key fish habitat mapping at Fisheries NSW Spatial Data Portal) and a strategic project corridor/boundary (or across multiple route options) to calculate indicative impact areas.

Step 2 – Estimate the cost of acquitting the aquatic offset requirement. DPI typically require offsetting to be provided at a ratio of 2:1 though further consutlation with DPI would be required to develop a strategic estimate of future offsetting costs.

The TfNSW Biodiversity Specialists are available to assist projects with estimating forward credit estimates. Projects may also wish to engage a consultant to undertake a strategic offset assessment.

2.2 Early credit acquisition

Early credit acquisition can avoid over-reliance on payments to the BCF, which can be considerably more expensive than other offsetting options. It is important to note that, under the BC Act, projects triggering the Biodiversity Offset Scheme that have a condition relating to retiring biodiversity credits must have met their credit obligations (either through credit retirement or BCF payment) prior to impacts occuring. It is also noted that at the time of writing, DPE are considering possible changes to this requirement.

Early credit acquisition investigations can begin as soon as a credit estimate is undertaken. It recommended that credits are only purchased based on a credit estimate that involved field surveys to verify PCTs. This is to ensure the correct type of credits are purchased.

Projects that purchase credits that end up being in excess of the project requirements may be able to sell the surplus credits to the Transport Biobank at the cost price in accordance with the Biodiversity Policy.

3. Calculating offset requirements

3.1 Statutory biodiversity offset requirements

A critical part of any project is determining the appropriate planning pathway for the project. This process should include consideration of the biodiversity assessment requirements of the project and any associated offset requirements.

EMF-BD-GD-0010 Biodiversity Assessment Guidelines includes a flowchart (at Figure 2-1) and supporting text to help TfNSW staff clarify the planning process where biodiversity impacts are anticipated. It describes the statutory processes applying to biodiversity assessment and offsetting under the NSW *Biodiversity Conservation Act 2016* (BC Act), NSW *Fisheries Management Act 1994* (FM Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Further detail on the offsetting component of each planning pathway is provided below.

3.1.1 Major projects assessed under Part 5 Division 5.2 of the EP&A Act

For SSI projects, biodiversity assessment requirements are prescribed by the BC Act (Section 7.9) and these requirements will be reflected in project Secretary's Environmental Assessment Requirements (SEARS).

Unless, TfNSW has applied for a Biodiversity Development Assessment Report (BDAR) waiver, the SEARs will require the preparation of a BDAR in accordance with the Biodiversity Assessment Method (BAM) to assess project impacts on terrestrial biodiversity and detail mitigation and offset requirements. The BAM requires the use of the BAM calculator (BAM-C) for calculating offset requirements in the form of biodiversity credits and specific requirements for field survey including vegetation classification and assessment and threatened species survey, all in accordance with specific BAM survey guidelines.

BDARs must be prepared by an Accredited Assessor. A list of Accredited Assessors can be found on the DPE website. A BDAR template and standard brief are included as resources in the *EMF-BD-GD-0010 Biodiversity Assessment Guidelines*.

Additional SEARs may also require assessment of impacts to aquatic biodiversity, which are typically assessed via a separate technical report.

The BC Act requires that where a condition of approval requires biodiversity credit retirement (or BCF payment), this must be met before any development is carried out that would impact on biodiversity values (Section 7.14(3)(4)). For this reason, early acquisition of credits is desirable as it avoids over-reliance on the (typically more expensive) BCF mechanism. Staging of credit acquisition with impacts may also be possible to allow more time to meet offset requirements.

A Biodiversity Offset Strategy (BAM trigger) can be prepared either pre or post-project approval and explains how TfNSW will meet its offset requirements (See Resource 1 of this guideline). The BOS will:

- Document the credit requirement in accordance with the Biodiversity Assessment Method (BAM) including, if necessary, any approved modifications or post approval changes in credit requirements.
- Identify permissible variations under the BC Regulation (See **Appendix B**).
- Confirm timing of offset delivery in accordance with approval/determination requirements.
- Determine or estimate the equivalent payment to the BCF, where required, or detail the process of obtaining a quote (see **Section 4.2**).
- Confirm the availability of issued credits with the credit owners including by a public tender process if required (see **Section 4.3**).
- Investigate options of generating credits on TfNSW-owned land (see **Section 4.4**) or through sponsoring private landholders (see **Section 4.5**).
- Identify if any local conservation actions (see **Section 4.6**) may be suitable in accordance with the BC Regulation.

A Biodiversity Offset Strategy (BAM trigger) template is available at Resource 1 of this guideline.

SSI projects may also trigger Transport Biodiversity Policy commitments – see **Section 3.2**.

3.1.2 Projects assessed under Part 5 Division 5.1 of the EP&A Act

Where a significant effect on threatened species or ecological communities is likely, the BC Act requires that a BDAR or Species Impact Statement (SIS) be prepared and exhibited for any REF project. Where the BDAR pathway is chosen, offset requirements must be met prior to project impacts in acordance with Section 7.15(3)(4) of the BC Act. This can include staging project impacts so only a proportion of offsets need to be met prior to each stage. See *EMF-BD-GD-0010 Biodiversity Assessment Guidelines* for further information on BDAR requirements. In most cases, TfNSW would choose the BDAR pathway as it is less administratively complex (e.g., DPE no concurrence requirements).

The BAM must be used to calculate the offset requirement for all residual significant impacts on nationally listed species and ecological communities where the EPBC Act strategic assessment approval applies (road projects only) or when the project is determined to be a controlled action under the EPBC Act (unless the EPBC Act approval indicates otherwise).

REF projects may also trigger Transport Biodiversity Policy commitments – see **Section 3.2**.

3.1.3 Developments under Part 4 of the EP&A Act

Some TfNSW projects require development consent under Part 4 of the EP&A Act. This includes State Significant Development (SSD) and local developments that require consent by a Council or local planning panel under the relevant environmental planning instrument.

All SSD projects must prepare a BDAR in accordance with the BAM and offset impacts accordingly (Section 7.9 BC Act) unless a BDAR waiver has been obtained.

All local developments, including designated developments, must assess whether the proposed development meets any of the statutory thresholds for participation in the Biodiversity Offset Scheme (See Appendix A). This includes any development within coastal wetlands or littoral rainforest mapped under the State Environment Planning Policy (Reslience and Hazards) 2021.

If the development exceeds these thresholds, then the development application must be accompanied by a BDAR prepared by an Accredited Assessor and TfNSW must participate in the Biodiversity Offsets Scheme.

3.2 Transport Biodiversity Policy commitments

In addition to statutory requirements, the Transport Biodiversity Policy makes commitments to address the cumulative impacts of projects that do not formally trigger the NSW Biodiversity Offset Scheme, NSW Fisheries offsets or Commonwealth offset requirements.

The TfNSW biodiversity assessment report (BAR) template for REF projects (Resource 4 of *EMF-BD-GD-0010 Biodiversity Assessment Guidelines*) provides the framework to ensure that ecological consultants address Transport Biodiversity Policy commitments. Where Biodiversity Policy requirements are triggered, an environmental safeguard should be included in the REF that requires the preparation and implementation of Biodiversity Offset Strategy (Policy) (See Resource 2) as part of the implementation of the environmental requirements for the project.

Figure 3-1 describes the process required to ensure Biodiversity Policy commitments are implemented for major projects and REF projects. Variations to this process should be discussed with the TfNSW Biodiversity Specialists or your Lead Environmental Advisor.

3.2.1 Offsetting exemptions

The Biodiversity Policy excludes the following works from the requirement to provide biodiversity offsets under the Biodiversity Policy. These exclusions apply regardless of whether other thresholds listed in **Section 3.2.2** are met:

- Exempt development under the State Environmental Planning Policy (Transport and Infrastructure) 2021.

- Works on cleared land, plantations, exotic vegetation where it is unlikely there are threatened species or habitat present.
- Works within the disturbed zone or to maintain required operational clearances.
- Works within areas that are reasonably likely to naturally regenerate.
- Works involving clearing of vegetation planted as part of an infrastructure corridor landscaping program (this includes where threatened species or species comprising listed ecological communities have been used for landscaping purposes).
- Any project that is legally required to participate in the NSW Biodiversity Offsets Scheme, requires a SIS under the FM Act or BC Act or is likely to have a significant impact on MNES.
- All projects requiring Part 5, Division 5.2 of the EP&A Act approval (SSI, CSSI) and all projects requiring development consent under Part 4 of the EP&A Act.
- Any project approved or determined or where an REF has been exhibited prior to the commencement of the Biodiversity Policy (1 August 2022).

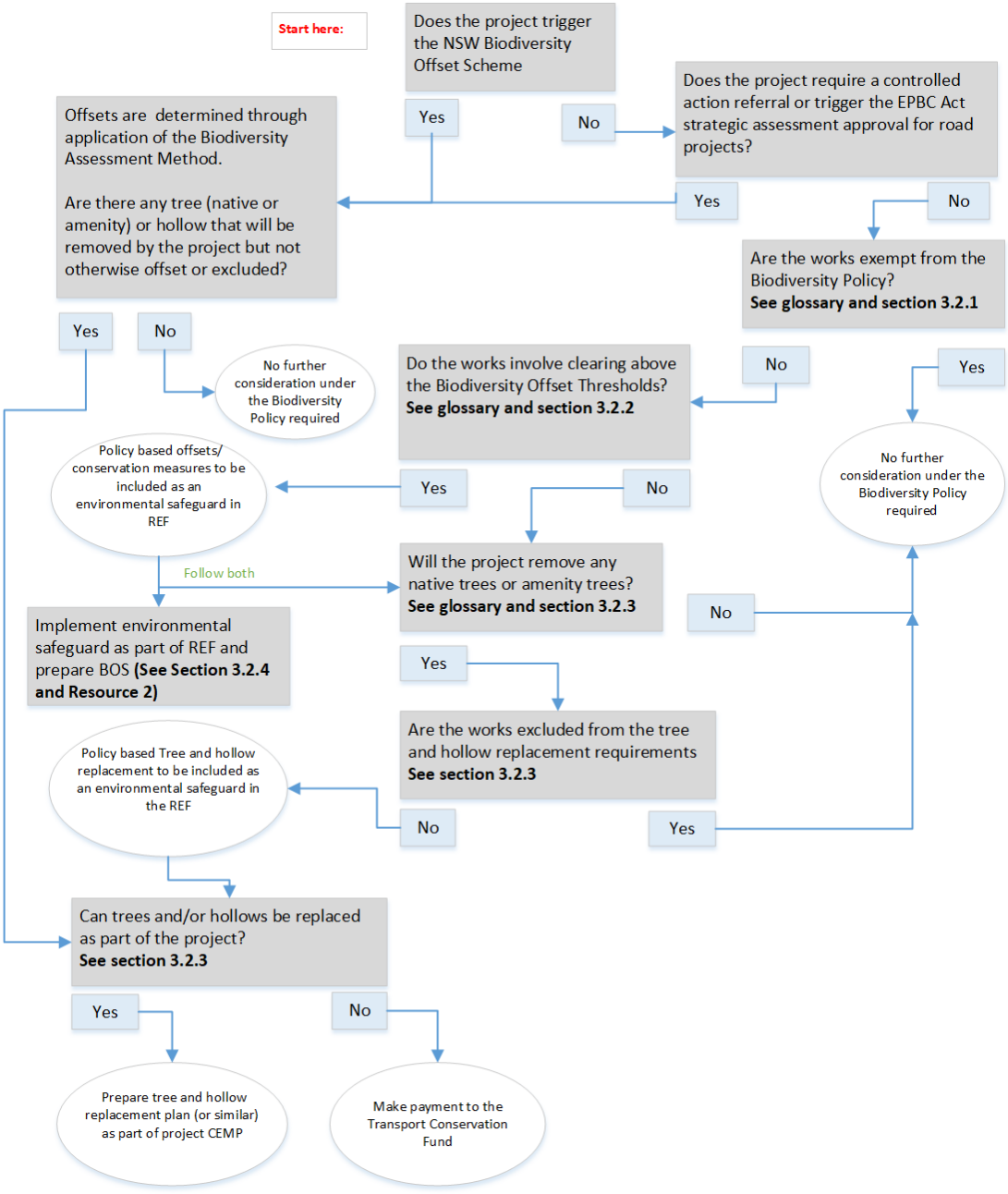


Figure 3-1: Transport Biodiversity Policy requirements

3.2.2 Biodiversity offset thresholds

The Biodiversity Policy establishes impact thresholds which trigger the requirement to provide biodiversity offsets or conservation measures for Part 5 Division 5.1 projects. These are described at **Table 3-1**.

The BAR prepared for the project would identify whether any of these thresholds have been met. Where further avoidance is not possible, a commitment should be made to prepare a Biodiversity Offset Strategy as part of the project's environmental safeguards.

It is recommended that the BAR provide a preliminary calculation of the amount of offsetting required in the form of biodiversity credits. This will allow early planning for offsetting prior to development of a Biodiversity Offset Strategy. The Biodiversity Offset Strategy would then review the credit calculation once the final design and clearing areas are known. This decision to prepare a Biodiversity Offset Strategy should be made on a case by case basis depending on complexity of the offsets required, construction timing and whether a suitably finalised design is available at the time of REF preparation.

Table 3-1: Area based offsetting thresholds for REFs

Category	Description of impact	Consider offsets
A. Threatened ecological communities		
A1	Works involving clearing of an EPBC Act or BC Act listed critically endangered ecological communities (CEEC).	Where there is any clearing of an CEEC in 'moderate to good'[1] [1]' condition.
A2	Works involving clearing of an EPBC Act or BC Act listed endangered ecological community (EEC).	Where clearing of an EEC ≥ 2 hectares in 'moderate to good' condition.
A3	Works involving clearing of a BC Act listed vulnerable ecological community (VEC).	Where clearing of VEC ≥ 5 ha in 'moderate to good' condition.
B. Threatened fauna habitat		
B1	Works involving clearing of threatened fauna habitat for ecosystem-credit species that is also a TEC identified in Category A.	No – covered by Category A TEC thresholds.
B2	Works involving clearing of any habitat (that is not a TEC) for a known species credit fauna species or clearing of breeding habitat (as defined by the TBDC) for dual-credit fauna species (excluding exotic and planted vegetation that cannot be assigned to a plant community type).	Where clearing ≥ 1 hectare in moderate to good condition.
C. Threatened flora and habitat		
C1	Works involving removal of known threatened flora species and their habitat.	Where loss of individuals is ≥ 10 (species that have a 'count of individuals' as the unit of measure) or where clearing of habitat (calculated by a species polygon in accordance with the BAM) is ≥ 1 hectare.
D. Key fish habitat		
D1	Type 1 and Type 2 key fish habitats	Where there is a net loss of habitat

[1] EMF-BD-GD-0010_TT4 Biodiversity assessment report template for REFs provides for the identification of low condition vegetation (Section 2.3.2). All vegetation not identified as low condition, is considered moderate to good condition for the purpose of this threshold.

Note: Additional requirements exist in relation to the replacement of trees and hollows, for any impacts that do not trigger these area thresholds. *EMF-BD-GD-0129 Tree and hollow replacement guidelines* details how these requirements should be calculated and if necessary, how to meet these obligations through payment to the TfNSW Conservation Fund.

3.2.3 Biodiversity Offset Strategy (Policy trigger)

Where biodiversity policy commitments have been included in the REF's environmental safeguards, then a Biodiversity Offset Strategy would be prepared to:

- Confirm which offsetting thresholds have been exceeded based on the final clearing boundary.
- Calculate the offset and/or conservation requirement in accordance with these guidelines.
- Establish what feasible and reasonable steps can be taken to meet this requirement including timing and delivery partners.

Preparation of the BOS can typically commence any time after the project has been determined. However the BOS may not be finalized and implemented until the final impact area is known, which may be after clearing has been completed. Offsets should be secured as soon as practicable following the impacts.

A BOS (Policy) template is provided at Resource 2 to this guideline.

Where offset calculations are required, the preparation of the BOS will require the services of an Accredited Assessor. This involves the use of the BAM-Calculator and requires field data collected in accordance with the BAR template.

Where it is not feasible to obtain the input of an Accredited Assessor, contact the Biodiversity Specialists for further advice and assistance.

3.3 Alignment of aquatic and terrestrial biodiversity requirements

The BAM will generate a credit requirement for certain marine vegetation (see table **Table 3-2** below) even though the BC Act definition of native vegetation does not include marine vegetation[2]. DPI guidelines will also require offsetting impacts to these PCTs and DPI will not necessarily accept BC Act mechanisms to meet their offset expectations. See Fact sheet: Aquatic biodiversity (nsw.gov.au) and Policy and guidelines for fish habitat conservation and management (update 2013) (nsw.gov.au).

Early consultation with DPI and DPE is required to resolve overlapping offsetting requirements for these PCTs. Please contact the Biodiversity Specialists if this applies to your project.

Table 3-2: PCTs that meet the definition of marine vegetation

PCT ID	PCT name	Vegetation formation
Existing PCTs (valid until end of 2022)		
915	Mangrove - Black Mangrove low closed forest of the northern NSW North Coast Bioregion	Saline wetlands
916	Mangrove - Grey Mangrove low closed forest of the NSW Coastal Bioregion	Saline wetlands
917	Mangrove - Milky Mangrove low closed forest of the North Coast	Saline wetlands
918	Mangrove - River Mangrove low closed forest of the NSW Coastal Bioregion	Saline wetlands
919	Mangrove - Spider Mangrove low closed forest of the northern North Coast	Saline wetlands

[2] Unless a declaration under section 14.7 of the BC Act is made. At the time of writing, no such declarations have been made.

920	Estuarine mangrove forest	Saline wetlands
1125	Saltmarsh complex of the NSW North Coast Bioregion	Saline wetlands
1126	Estuarine saltmarsh	Saline wetlands
1746	Saltmarsh Estuarine Complex	Saline wetlands
1747	Grey Mangrove low closed forest	Saline wetlands
1913	Seagrass Meadows	Saline wetlands
Revised PCTs (valid from 2023 onwards)[3]		
4040	South Coast Selliera-Sea Rush Swamp Oak Saltmarsh	Saline wetlands
4090	Far North Estuarine Mangrove-Swamp Oak Forest	Saline wetlands
4091	Grey Mangrove-River Mangrove Forest	Saline wetlands
4092	Coastal Headland Sea Spray Grassland	Saline wetlands
4094	Estuarine Club Rush-Arrowgrass Wetland	Saline wetlands
4095	Paspalum vaginatum-Samphire Saltmarsh	Saline wetlands
4096	Prickly Couch-Sea Rush Saltmarsh	Saline wetlands
4097	Samphire Saltmarsh	Saline wetlands
4101	South Coast Spear-grass Saltmarsh	Saline wetlands
4102	South Coast Bracelet Honey-myrtle Sea Rush Saltmarsh	Saline wetlands
4103	Sporobolus virginicus Saltmarsh	Saline wetlands
4141	Coastal Headland Saltmarsh	Saline wetlands

3.4 Alignment of NSW and Commonwealth offset requirements

The Commonwealth has formally endorsed the NSW Biodiversity Offset Scheme (including calculating credits using the BAM and payments to the Biodiversity Conservation Fund) as an offset mechanism for entities listed under the EPBC Act. This endorsement covers the majority of Commonwealth offset requirements. However, there are situations whereby meeting Commonwealth offset requirements requires additional steps beyond meeting BAM requirements.

One example of this is offsetting impacts to species and ecological communities listed nationally but not in NSW.

While the BAM will generate a credit requirement for these species, making BCF payments is not currently possible and offsetting requires application of the EPBC Act environment offset policy (2012). Purchasing credits may be possible if a clear like-for-like relationship can be demonstrated between the credit and the MNES entity.

Consultation with the Biodiversity Specialists is required should these situations arise.

[3] DPE released the revised classification of Plant Community Types in eastern NSW in April 2023

4. Meeting offset requirements

4.1 Introduction

There are 3 main options available to meet terrestrial biodiversity offset requirements for developments and activities that have triggered the Biodiversity Offset Scheme. These are:

- Make payment into the Biodiversity Conservation Fund (BCF).
- Purchase and retire biodiversity credits including purchasing from the Transport Biobank.
- Arrange for Biodiversity Conservation Actions to be undertaken (subject to DPE approval requirements).

Where the NSW Biodiversity Offset Scheme has not been triggered and the TfNSW Biodiversity Policy applies (including where aquatic offsets are required), conservation measures can also be used.

This section outlines how to secure offsets using these mechanisms. It should be read in conjunction with the TfNSW Property and Environment Delegations (sharepoint.com) and explanatory notes.

4.2 Making payment to the BCF

Under the BC Act, TfNSW may choose to pay into the BCF as an alternative to retiring biodiversity credits. The BCF is available for any project where a BDAR has been prepared.

Payment to the BCF may also be used for:

- EPBC Act offsets, including those required by the EPBC Act strategic assessment approval, provided the entity is also listed under the schedules of the BC Act.
- Policy based offsets triggered by the Transport Biodiversity Policy for Part 5, Division 5.1 projects.

Since the decomissioning of the Biodiversity Offset Payment Calculator (BOPC) in October 2022, the cost of making a payment to the BCF now needs to be obtained from the BCT for individual projects (known as the Biodiversity Conservation Fund Charge System) via a Charge Quote Application.

TfNSW has confirmed with the BCT that the REF and the determination memo (for Part 5 Division 5.1 projects) or EIS and Minister's condition of approval (for Part 5 Division 5.2 projects) must be provided with the application (*in lieu* of a development application) and that the application must be made after determination of the REF or approval of the SSI. A Credit Summary Report and 'Like for Like' Credit Report from the BAM Credit Calculator must also be provided.

This option is the most administratively simple option available to fully acquit an offset obligation, however it is generally more expensive than credit purchase. This is largely due to the administrative overheads, including risk premium (10% - 17%) and delivery cost (5% or $120 per credit, whichever is higher) charged by the fund administrators. A monthly indexation rate of 0.51% is also applied to the price each month following receival of the quote (to account for inflation) until payment is made to the BCF. The BCT adjust the cost of their credit prices annually in October, however quotes issued by the BCT are valid for three years. For more information on the BCF charge system, visit the BCT website.

Several tools are available to estimate the cost of a BCF payment prior to applying for a quote. The BCT publish a quartlery report on their website showing all BCF charge quotes six months after they are issued. If the relevant credits are not included in the quartlery charge report, the BCT also offers a price estimation service for a fee to provide a predicted credit price. The cost of this service is $200 for the application and an additional $100 for each credit type. Note that the prices in the quarterly charge report and price estimation service do not include a delivery fee and risk premium charge on top of the credit price. This could be estimated by adding another 20% on top.

The Transport Biodiversity Policy notes that the BCF will be the appropriate option where:

- No suitable biodiversity credits for sale on the DPE credit registers; and
- Transport's Biobank does not have suitable credits available; or

- Approval conditions do not allow sufficient time for biodiversity credit acquisition (including through options agreements for credits yet to be issued); or
- Credits sought are less than 100 credits and/or are rare and difficult to purchase.

Project Managers should weigh up the relative costs and benefits of using the BCF compared to other options and explore availability of issued credits on the market (See **Section 4.3**).

The administrative steps required for making payments to the BCF is shown at **Figure 4-1**. A template memo to pay into the BCF is at Resource 3 of this guideline.

The Lead Environmental Advisor should confirm roles and responsibilities for each step of the process with the Project Manager.

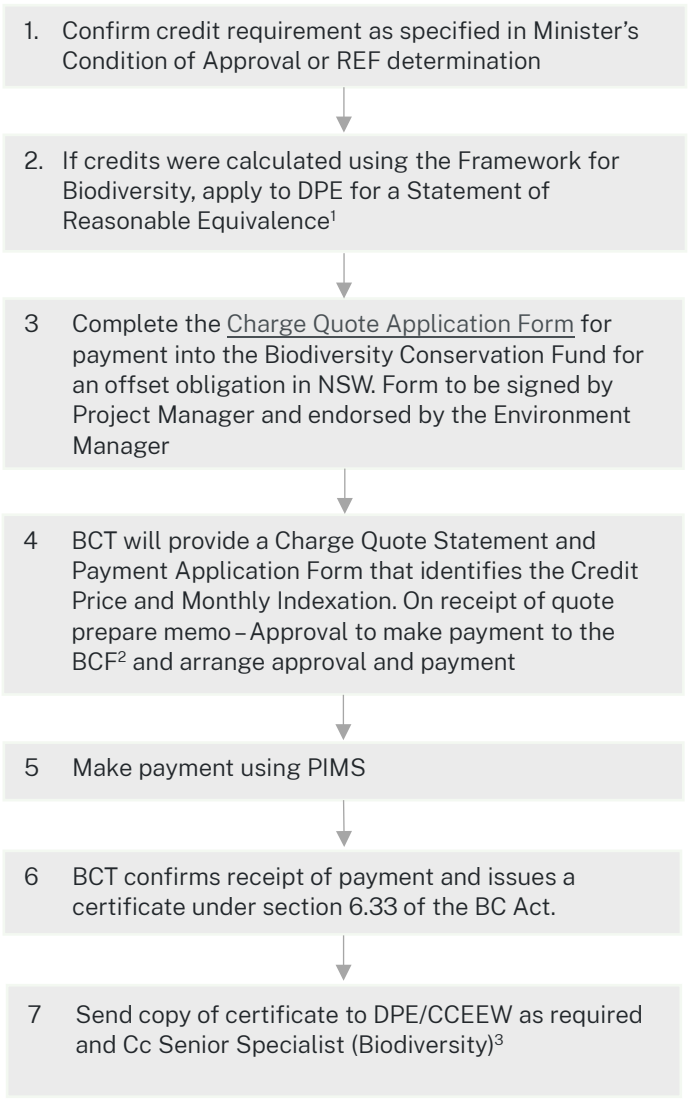


Figure 4-1: Administrative steps involved in making payments to the Biodiversity Conservation Fund (BCF)

[1] Assessment of reasonable equivalence | NSW Environment and Heritage
[2] See Resource 3 for template memo
[3] For more information Pay into the fund to offset development | BCT (nsw.gov.au)
Project Manager.

4.3 Purchasing biodiversity credits

There are four ways available to secure credits for your project:

- Use any suitable and available credits in the Transport Biobank (refer to **Section 4.3.1**).
- Purchase issued credits on the market (refer to **Section 4.3.2**).
- Generate credits from suitable TfNSW land. Could also apply to lands purchased for transfer to NPWS as compensation for revocation (refer to **Section 4.4**).
- Sponsor landholders to enter a BSA on their land and then buy the credits issued from the landholder (refer to **Section 4.5**).

Each of the credit purchase options are discussed below.

4.3.1 Buying credits from the Transport Biobank

TfNSW has established the Transport Biobank which holds credits:

- Generated from TfNSW land but are not yet allocated to a project.
- Purchased by projects and were found to be excess to requirements.

The Transport Biobank is managed by Environment and Sustainability and credits available can be viewed in EMF-BD-GD-0129-TT11 Transport Biobank credits available (Resource 11). An application must be completed to sell credits to the Biobank, purchase credits from the Biobank, or allocate (earmark) credits using EMF-BD-GD-0011-TT10 Transport Biobank credit transfer application (Resource 10). Refer to Resource 10 for more information about who can apply and the information required. Please contact the Biodiversity Specialists in this branch for support.

4.3.2 Buying credits available on the market

DPE maintain the online Biodiversity Offsets Scheme public registers that lists all issued credits available including contact details for sellers. DPE also maintain online registers that detail previous sales information for credits. This register can be found at Biodiversity Credits Market Sales Dashboard | NSW Environment and Heritage.

The online fact sheet Selling biodiversity credits to Transport for NSW explains how TfNSW purchases credits.

The Lead Environmental Advisor should confirm roles and responsibilities for each step of the process with the Project Manager and Project Property Services.

The process of purchasing issued credits on the market is shown at **Figure 4-2**. A template memo seeking approval to commence credit purchase negotiations is at Resource 4 of this guideline.

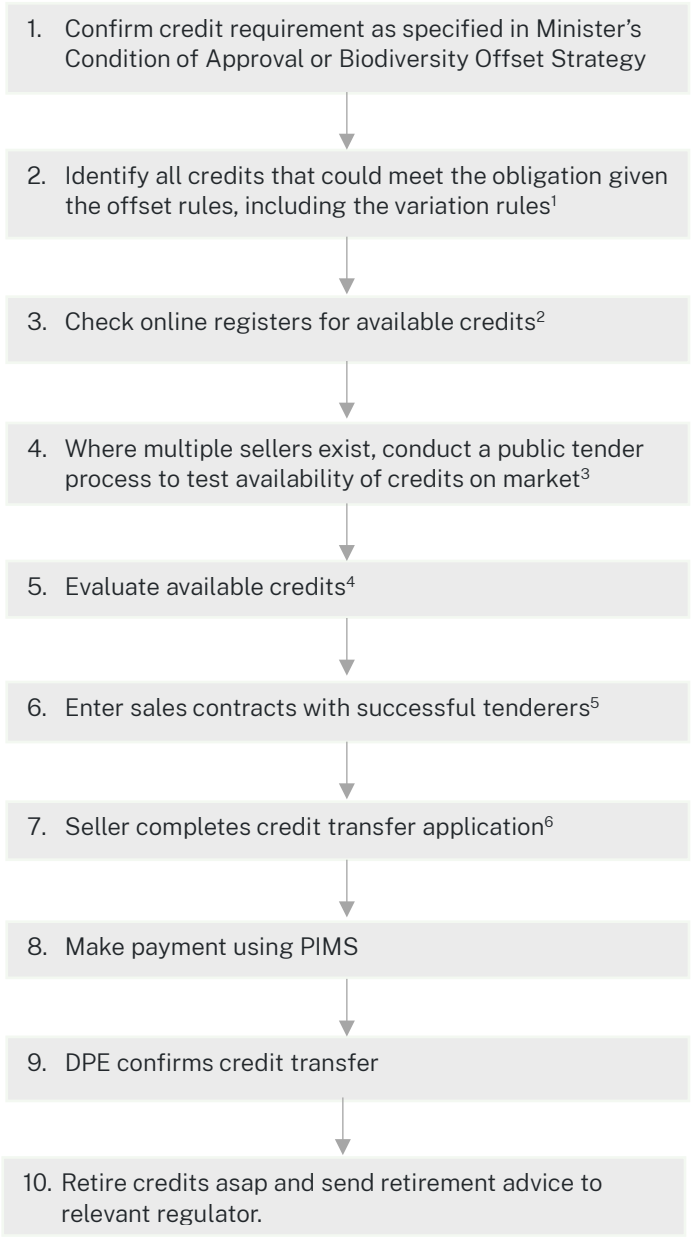


Figure 4-2: Buying credits on market

[1] See **Appendix B**.

[2] Biodiversity Offsets Scheme public registers | NSW Environment and Heritage.

[3] Examples of previous expressions of interest will be saved to SharePoint.

[4] Joint process with procurement and property. Note credits matching variation rules cannot be purchased until requirements for purchasing like-for-like credits are met. See **Appendix B**.

[5] Template contracts available from Legal Services.

[6] Guidance for transferring and retiring Biodiversity Offsets Scheme credits | NSW Environment and Heritage.

4.4 Generating credits on TfNSW owned land

Generating credits on TfNSW-owned land involves working with Project Property Services and Property Divestment to identify project or residue land with suitable biodiversity values and agreeing on a property disposal strategy and then going through the process of entering a biodiversity stewardship agreement over the land.

Funding is available from the Transport Biobank to wholly or partly pay for the generation of credits on land where a project has no (or partial) requirement for the credits that could be generated and the project is purchasing the land for other purposes (e.g. for NPWS compensation or as part of the project). Credits generated through this process will be allocated to the Transport Biobank and made available for future TfNSW projects at cost. Resource 8 of this guideline is an application form for Biobank funding of BSA costs.

Responsibility for assessing BSA applications was transferred from the BCT to a new Credit Supply Taskforce on 1 August 2022. This included changes to the way BSA applications are considered and has resulted in a significant reduction in BSA processing times. The Credit Supply Taskforce is also undertaking demand and supply analysis. To get assistance from the Credit Supply Taskforce in sourcing credits, TfNSW projects can complete a Credit Demand Expression of Interest.

Generating BSAs on TfNSW owned land can be a very cost-effective source of credits (compared to both BCF payments and private purchase of credits).

The Residue Land Biodiversity Offsetting procedure sets out the requirements for entering a BSA on residue land (excluding TAHE lands) including delegations, workflows and approval templates and roles and responsibilities across TfNSW. Resource 5 of these guidelines provides a brief to engage an Accredited Assessor to prepare an application to enter a BSA.

4.5 Sponsoring landholders to participate in the Biodiversity Offset Scheme

Where no credits are available for sale, TfNSW can sponsor landholders to enter a biodiversity stewardship agreement. Generating credits from BSAs can be a cost effective source of credits compared, for instance, to BCF payment.

This process commences by seeking expressions of interest from landholders in relevant local papers and then working with any interested landholders to progress a BSA. Examples of communications material used by previous projects will be saved to Environment & Sustainability Management Framework.

The process of sponsoring private landholders to generate credits is shown at **Figure 4-3**.

The lead environmental advisor should confirm roles and responsibilities for each step of the process with the Project Manager.

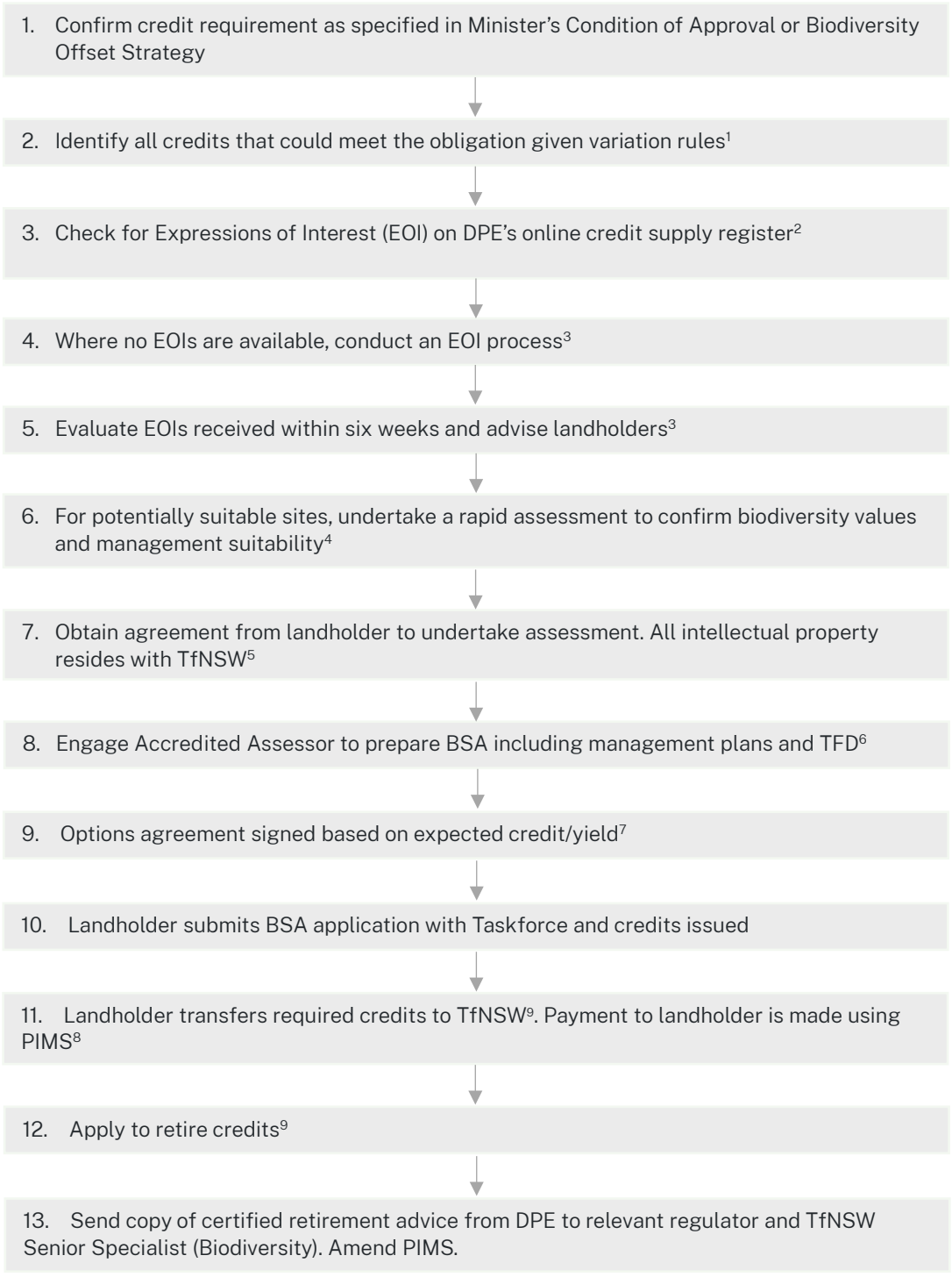


Figure 4-3: Sponsoring private landholders to generate credits

[1] See **Appendix B**
[2] Biodiversity Offsets Scheme public registers | NSW Environment and Heritage.
[3] Examples of both will be saved under SharePoint.
[4] Best undertaken by Accredited Assessor. Contact Biodiversity Specialists for assistance if required.
[5] Resource 9 is a template letter to confirm access and IP arrangements with sponsored landholders.
[6] Accredited assessors | NSW Environment and Heritage
[7] Options agreement template available from Legal Services.
[8] Contact PIMS administrator for further details.
[9] Transfer and retire applications are at Guidance for transferring and retiring Biodiversity Offsets Scheme credits | NSW Environment and Heritage.

4.6 Biodiversity conservation actions

Biodiversity conservation actions can be used to meet statutory offset requirements in some circumstances (BC Regulation 6.2) instead of credit purchase or BCF payment. Ancillary rules apply which prescribe which actions qualify as a biodiversity conservation action (BC Regulation 6.5). See Ancillary rules: Biodiversity conservation actions | NSW Environment and Heritage.

Clause 6.2(2)(c) of the BC Regulation states that the amount required to fund biodiversity conservation actions must be "equivalent to the cost of acquiring the required like-for-like biodiversity credits as determined by the offsets payment calculator".

This approach has not been used by TfNSW to date and consultation with Biodiversity Specialists is recommended.

4.7 Conservation measures including aquatic offsetting

Conservation measures are not an offsetting option available for projects impacting terrestrial biodiversity and have triggered the NSW Biodiversity Offset Scheme. Conservation measures are an option for projects that have triggered the area thresholds under the Transport Biodiversity Policy (see **Table 3-1**).

Conservation measures are designed to deliver improvements in the condition of biodiversity or improve our understanding of the ecology of a species or ecological community.

Conservation measures include:

- Weed control.
- Vegetation rehabilitation activities.
- Habitat augmentation including hollow creation.
- Tree-planting.
- Fencing.
- Bank stabilisation.
- Instream restoration and repair.
- Marine conservation activities including habitat creation and restoration projects.
- Ecological fire management and cultural burning.
- Other activities that support Aboriginal people care for Country.
- Mitigation of vehicle strike.
- Activities required to support achieving these activities.
- Research initiatives relevant to these activities.

Where conservation measures are proposed, the Project Manager, with support from the Lead Environmental Advisor and Biodiversity Specialist should consider what conservation measures can be reasonably provided and then arrange for the conservation measures to be determined and delivered in partnership with local providers (see **Figure 4-4**). Payment to the Transport Conservation Fund is not an available option in this circumstance. This fund can only be used to acquit tree and hollow replacement requirements where local delivery is not possible.

The Biodiversity Policy notes that selecting reasonable measures involves judging whether the overall biodiversity benefits are worthwhile in the context of:

- recent and anticipated impacts of a similar nature in the locality;
- the cost of the measure, including the cost of the measure as a percentage of the total project cost and any ongoing maintenance and operational costs; and
- the level of community interest and engagement with the proposed measure

Relevant conservation measures can also be used for all aquatic offsets in accordance with Section 3.3.3 Rehabilitation and compensation measures of the *Policy and guidelines for fish habitat conservation and management Update 2013* (DPI (Fisheries NSW) 2013) along with payments to the DPI Fish Conservation Fund. Refer to relevant section of the Biodiversity Offset Strategy template for more information on determining offsets for impacts to aquatic habitat.

See also Fact sheet: Aquatic biodiversity (nsw.gov.au) for example of aquatic offsetting.

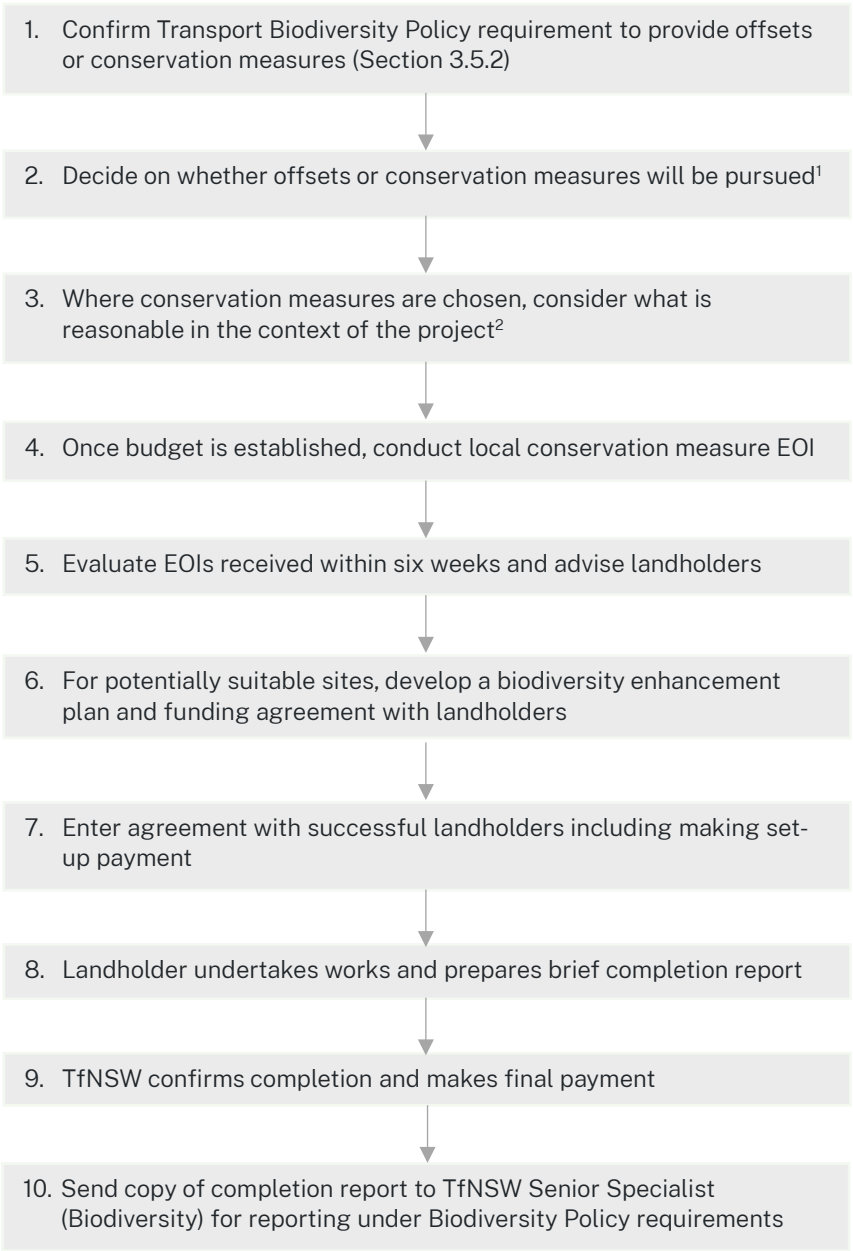


Figure 4-4: Arranging for conservation measures where biodiversity offset thresholds are met[3]

[1] Providing offsets involves purchasing credits or paying into the Biodiversity Conservation Fund. While these are effective offsetting options, the offsets are unlikely to be delivered locally. Where the local community is raising issues of local biodiversity significance, then conservation measures may be the more appropriate pathway.

[2] See **Section 4.7**of this guideline.

[3] Example expressions of interest, evaluation criteria and application forms and agreements will be made available on Sharepoint.

5. Legacy offset obligations

Where TfNSW holds an offset obligation that was calculated using the Framework for Biodiversity Assessment (FBA), they will need to seek an assessment of reasonable equivalence from DPE before paying into the Biodiversity Conservation Fund (BCF) or using credits generated by a BSA.

Payments to the BCF can be made once:

- Credit obligation has been calculated using the BAM or DPE has issued a 'credit equivalence' statement confirming BAM-equivalent credits; **and**
- Project REF has been determined or the major project approval has been granted.

The BCT will review the application and advise the proponent in writing whether the proposed payment can be made (including by providing fund deposit details).

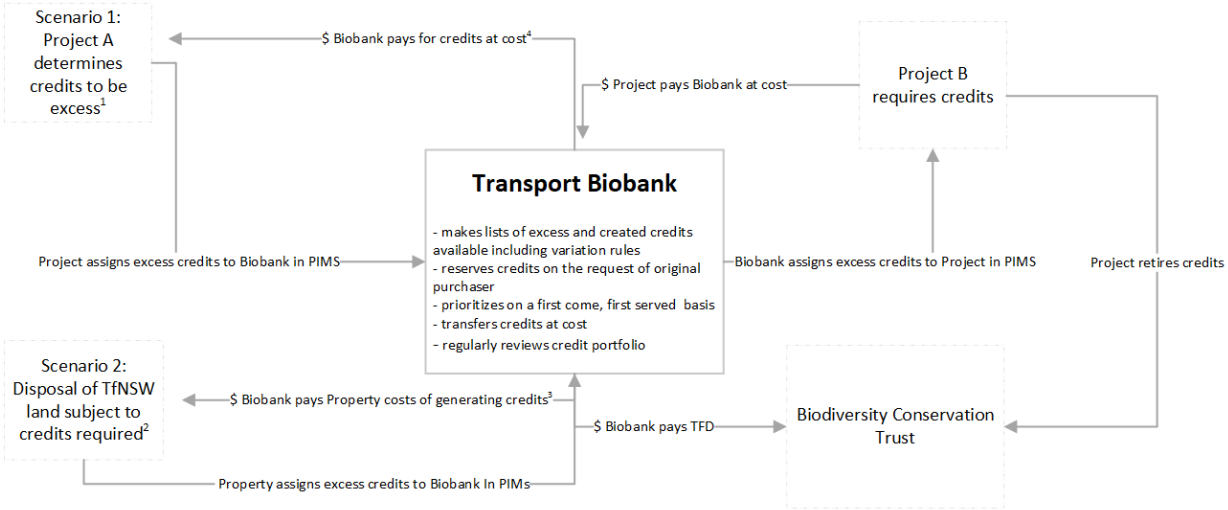
Following receipt of payment, the BCT will issue a certificate under the BC Act.

6. Transferring excess credits to Biobank

Where a project has excess credits at the completion of a project, an application can be made to the Transport Biobank to recoup the costs of these credits. The process is shown as Scenario 1 on **Figure 6-1**. The Transport Biobank will purchase the credits where:

- There is a reasonable prospect that a future TfNSW project will require the credits; **and**
- At a cost equal to what the project paid for the credits.

The Transport Biobank can only trade in biodiversity credits created under the NSW Biodiversity Offsets Scheme. Should you wish to sell older Biobanking credits, you will need to obtain a statement of reasonable equivalence from DPE prior to applying. Applications to transfer excess credits are made by completing the form at Resource 10 of this guideline.



[1] Covers scenario (likely) where credits are purchased by a project on the market and then found to be excess of project requirements. Programs are able to "reserve" these credits for future use
[2] Covers scenario (rare) where credits are generated on residue land, either by the project or by Property in consultation with SER, and Property are disposing of the property prior to project credit retirement timeframes. This requires payment of the Total Fund Deposit (TFD) to BCT which Biobank can cover pending project requirements. Credits can then be retired at a later date according to project requirements.
[3] Project credits Landbank for any loss in value from the creation of the BSA and costs incurred in credit generation in accordance with the Residue Land Biodiversity Offsetting procedure
4 All payments for excess biodiversity credits are returned back to the respective purchasing project

Figure 6-1: Transport Biobank processes

7. References

Department of Environment (DoE) 2013, Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (dcceew.gov.au).

Department of Planning, Industry and Environment (DPIE) 2020, Biodiversity Assessment Method (nsw.gov.au).

Department of Primary Industries (DPI) 2013, Policy and guidelines for fish habitat conservation and management (Update 2013) (nsw.gov.au).

Office of Environment and Heritage (OEH) 2014, NSW Biodiversity Offsets Policy for Major Projects: Framework for Biodiversity Assessment.

Office of Environment and Heritage (OEH) 2017a, Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits (nsw.gov.au).

Office of Environment and Heritage (OEH) 2017b, Ancillary rules: Impacts on threatened species and ecological communities excluded from application of variation rules (nsw.gov.au).

Office of Environment and Heritage (OEH) 2018, Threatened Species Test of Significance Guidelines (nsw.gov.au).

8. Definitions

Term	Definition
Accredited person	Has the same meaning as in the BC Act, referred to in the BAM as 'assessor', i.e., in relation to the preparation of biodiversity assessment reports, means a person accredited under section 6.10 (of the BC Act) to prepare those reports in accordance with the biodiversity assessment method.
Amenity tree	Trees, both native and exotic, that are valued by people due to their beauty, function, historical, biodiversity or cultural significance.
AOBV	Areas of Outstanding Biodiversity Value. AOBV's are declared by the Minister for the Environment. These are special areas that contain irreplaceable biodiversity values that are important to New South Wales, Australia or globally.
Artificial hollow	Artificial hollows, including hollows carved into a tree, nest boxes attached to trees and salvaged hollows can be used to provide supplementary breeding habitat and shelter for hollow-dependent fauna where hollows have been removed. When designed, built, installed and monitored correctly artificial hollows can provide an alternative to natural fauna habitat.
BAM	Biodiversity assessment method established under Part 6 of the Biodiversity Conservation Act 2016. The BAM assesses the likely impact of development proposals on biodiversity and calculates (in biodiversity credits) the likely losses in biodiversity values from development sites. The BAM also calculates (in biodiversity credits) the likely gain in biodiversity values from biodiversity stewardship agreement sites.
BCT	Biodiversity Conservation Trust established under Part 10 of the *Biodiversity Conservation Act 2016.*
BCF	Biodiversity Conservation Fund administered by the Biodiversity Conservation Trust. Payments to the fund are a mechanism to acquit biodiversity offset obligations
BC Act	NSW *Biodiversity Conservation Act 2016*
Biodiversity credit	A biodiversity credit created by (and in accordance with) a biodiversity stewardship agreement as issued by the Taskforce
Biodiversity conservation action	Can be used to offset impacts in some circumstances (BC Regulation 6.2) instead of credit purchase or BCF payment. Ancillary rules prescribe which actions qualify as a biodiversity conservation action (BC Regulation 6.5) Ancillary rules: Biodiversity conservation actions | NSW Environment and Heritage.
Biodiversity offsets	As defined by the Biodiversity Assessment Method - the gain in biodiversity values achieved from the implementation of management actions on areas of land, to compensate for losses to biodiversity values from the impacts of development. See also Biodiversity offset mechanisms.
Biodiversity offset mechanisms	Biodiversity offsets mechanisms are the purchase of biodiversity credits under the Biodiversity Offset Scheme or payment to the Biodiversity Conservation Fund (BCF) administered by the Biodiversity Conservation Trust (BCT).
Biodiversity Offset Scheme (BOS)	Biodiversity Offsets Scheme established under Part 6.2 of the BC Act.
Biodiversity Stewardship Agreement (BSA)	Land that is designated by a biodiversity stewardship agreement to be a biodiversity stewardship agreement for the purposes of the BC Act.

Biodiversity Offset Scheme thresholds (NSW)	Are the legal thresholds to provide biodiversity offsets arising from BC Act. Transport is legally obliged to participate in the Biodiversity Offset Scheme (BOS) for: • All major projects including State Significant Infrastructure (SSI) and Critical State Significant Infrastructure (CSSI) under Part 5, Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act), unless the impacts to biodiversity are not significant. • All REF projects under Part 5, Division 5.1 of the EP&A Act that are likely to have a significant impact on threatened species and threatened ecological communities or impact Areas of Outstanding Biodiversity Value. • All projects permissible with consent under Part 4 of the EP&A Act that exceed the offsetting thresholds for developments under Part 4 (See Appendix A). Transport must also provide offsets where the Commonwealth Minister for Environment has determined the project to be a controlled action under the Environment Protection and Biodiversity Conservation Act 1999 or where the provisions of the EPBC Act strategic assessment approval for road projects applies.
CEEC	Critically Endangered Ecological Community listed under the EPBC Act or BC Act.
Conservation measure	Activities voluntarily undertaken by TfNSW in addition to BOS or EPBC Act requirements to address the ongoing cumulative impacts of TfNSW activities on biodiversity and local environments. Conservation measures are different to biodiversity conservation actions under the BOS. Conservation measures are typically delivered locally and include weed control, vegetation rehabilitation activities, habitat augmentation, tree-planting, fencing, bank stabilisation, instream restoration and repair, ecological fire management, vehicle strike mitigation or supporting research initiatives by a recognised tertiary institution.
Created biodiversity credits	Credits generated from a BSA over Transport-owned land.
CSSI	Critical state significant infrastructure under Part 5, Division 5.2 of the EP&A Act.
Development	For the purposes of the Biodiversity Policy, means projects undertaken by Transport and approved under Part 4, Part 5 Division 5.1 and Part 5 Division 5.2 of the EP&A Act.
Disturbed zone	Has the same meaning as the Routine and Minor Works Procedure and applies to road activities only.
EEC	Endangered Ecological Community listed under the EPBC Act or BC Act.
Environmental Regulators	Includes Environment, Energy and Science Division of the NSW Department of Planning and Environment and Commonwealth Department of Agriculture, Water and Environment.
EP&A Act	*NSW Environmental Planning and Assessment Act 1979.*
EPBC Act strategic assessment approval for road projects	Agreement between Commonwealth Minister for the Environment and Transport for NSW under Part 10 of the EPBC Act. See Strategic assessment of some NSW road and traffic management works - DCCEEW.
Excess biodiversity credits	Credits acquired for a project by Transport and found to be surplus to project requirements.
Feasible	For biodiversity offset requirements, offset delivery is always considered feasible due to the ease of payment to the BCF. For tree and hollow replacement requirements, feasibility relates to practical considerations and involves the consideration of the following preference hierarchy: 1. Modifying works to avoid impacts and reduce requirement. 2. Tree and hollow replacement on land within the infrastructure corridor in proximity to the proposal triggering the requirement. 3. Tree and hollow replacement on land in proximity to the proposal triggering the requirement.

	4. Making a contribution to a TfNSW Conservation Fund.
Habitat tree	Habitat trees are typically native species that provide food and/or shelter for native fauna and flora.
No net loss	For the purpose of the Biodiversity Policy, projects will have achieved a no net loss where the expected loss from infrastructure development has been: • Avoided to the extent reasonably practicable; **and** • Mitigation measures, including measures to reduce habitat fragmentation effects, have been applied to the extent reasonably practicable; **and** • Offsets have been provided through either credit purchase or BCF payment of the required number and type of biodiversity credits in accordance with the BAM or TfNSW guidelines; **and/or** • Conservation measures have been delivered in accordance with the requirements of the Biodiversity Policy and guidelines.
Operational clearances	Means the area required to be maintained for the safe and efficient operation of the infrastructure and applies to rail activities only
PIMS	Transport's Property Information Management System
Reasonable	Selecting reasonable measures from those that are feasible involves judging whether the overall biodiversity benefits are worthwhile in the context of: • recent and anticipated impacts of a similar nature in the locality • the cost of the measure, including the cost of the measure as a percentage of the total project cost and any ongoing maintenance and operational costs • the level of community interest and engagement with the proposed measure. Where the cost of making payment to the BCF to meet TfNSW biodiversity offset requirements is considered excessive, conservation measures will be considered and provided to the extent or value considered appropriate. Where the cost of making payment to the TfNSW Conservation Fund to meet Tree and Hollow replacement requirements is considered excessive, changes must be made to project scope to reduce impacts.
Reasonably likely to naturally regenerate	Means areas capable of natural regeneration as evidenced by the presence of a native understorey including juvenile native trees and shrubs as determined by an appropriately qualified person.
Residue land	Residue land is Transport-owned land that is not required for current or future project requirements and therefore would be available for disposal.
REF	Review of Environmental Factors. Prepared to meet Transport's statutory obligation to consider the impact of its activities on the environment to the fullest extent reasonably practicable for projects considered under Part 5, Division 5.1 of the EP&A Act.
SER	Safety Environment and Regulation, Transport for NSW
SSI	State significant infrastructure under Part 5, Division 5.2 of the EP&A Act
Strategic planning processes	Includes any process intended to establish the scope and merit of a proposed activity including strategic business case development, options analysis, route optioneering exercises and the development of project briefs
Taskforce (the)	The Biodiversity Credits Supply Taskforce is a cross-agency representation that performs the following functions: • Take over responsibility of biodiversity stewardship agreements (BSAs) from the BCT as of 1 August 2022. • Operate the Biodiversity Credits Supply Fund For more information visit https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/about-the-biodiversity-offsets-scheme/about-the-biodiversity-credits-supply-fund

<table>
<tr><td>Transport biodiversity offset thresholds</td><td>
<table>
<tr><th>Impact</th><th>Threshold</th></tr>
<tr><td>Works involving clearing of a CEEC.</td><td>Where there is any clearing of an CEEC in ‘moderate to good’ condition</td></tr>
<tr><td>Works involving clearing of an EEC.</td><td>Where clearing of a EEC ≥ 2 ha in ‘moderate to good’ condition</td></tr>
<tr><td>Works involving clearing of VEC.</td><td>Where clearing of VEC ≥ 5 ha in ‘moderate to good’ condition</td></tr>
<tr><td>Works involving clearing of any habitat for a known species credit fauna species or clearing of breeding habitat (as defined by the TBDC) for dual-credit fauna species (excluding exotic and planted vegetation that cannot be assigned to a plant community type)</td><td>Where clearing ≥ 1 ha in ‘moderate to good’ condition</td></tr>
<tr><td>Works involving removal of known threatened flora species and their habitat</td><td>Where loss of individuals is ≥10 or where clearing of habitat is ≥ 1 ha</td></tr>
<tr><td>Type 1 or Type 2 key fish habitats</td><td>Where there is a net loss of habitat</td></tr>
</table>
The TfNSW Biodiversity Offset Guidelines provides more detail about how these thresholds should be applied.
</td></tr>
<tr><td>TfNSW biodiversity offset threshold exclusions</td><td>Activities excluded from the TfNSW Biodiversity Offset thresholds:
Exempt development under Infrastructure SEPP.
Works on cleared land, plantations, exotic vegetation where it is unlikely there are threatened species or habitat present.
Works within the disturbed zone or to maintain required operational clearances.
Works within areas that are reasonably likely to naturally regenerate.
Works involving clearing of vegetation planted as part of an infrastructure corridor landscaping program (this includes where threatened species or species comprising listed ecological communities have been used for landscaping purposes).
Any project that is legally required to participate in the NSW Biodiversity Offset Scheme, requires a SIS under the FM Act or BC Act or is likely to have a significant impact on MNES.
All projects requiring Part 5, Division 5.2 of the EP&A Act approval (SSI, CSSI) and all projects requiring development consent under Part 4 of the EP&A Act.
Any project approved or determined or where an REF has been exhibited prior to the commencement of the Biodiversity Policy.</td></tr>
<tr><td>TfNSW Conservation Fund</td><td>A Fund managed by TfNSW Safety, Environment and Regulation.
The TfNSW Conservation Fund receives payments from projects that cannot meet the tree and hollow replacement requirements under the Biodiversity Policy within the project boundary or on land in proximity to the project and so elect to make a payment to the TfNSW Conservation Fund in accordance with the Tree and Hollow Replacement Guidelines EMF-BD-GD-0129</td></tr>
<tr><td>TfNSW tree and hollow replacement exclusions</td><td>Activities excluded from the TfNSW tree and hollow replacement requirements:
Exempt development under the Infrastructure SEPP including emergency work.
Projects requiring development consent under Part 4 of the EP&A Act.
Works to remove a traffic hazard on or overhanging a public road.
Works within the disturbed zone (road) or essential to maintain required operational clearances (rail).
Works within areas that are reasonably likely to naturally regenerate.
Non-native trees without amenity value.</td></tr>
</table>

	• Trees that are being otherwise offset including projects that have triggered the Biodiversity Offset Scheme thresholds or the TfNSW biodiversity offset thresholds. Any project approved or determined or where an REF has been exhibited prior to the commencement of the Biodiversity Policy.
TBDC	Threatened Biodiversity Data Collection managed by DPE as part of NSW BioNet | NSW Environment and Heritage.
Total Fund Deposit (TFD)	Is the amount paid to the Biodiversity Stewardship Payments Fund administered by the BCT. Proceeds of the TFD are used to fund ongoing conservation management of the land in accordance with BSA. TFD amounts are determined by an Accredited Assessor.
Transport	Transport Agencies are: • Transport for NSW • Department of Transport • Sydney Trains • State Transit • NSW Trains • Sydney Metro • The Point to Point Transport Commissioner
Tree and hollow replacement ratios	Trees and hollows will be replaced using the following ratios: • Very large tree (DBH greater than 100cm) – Plant a minimum 16 trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate). • Large tree (DBH between 50cm and 100cm) - Plant minimum eight trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate). • Medium tree (DBH greater than 20 cm, but less than 50cm) - Plant minimum four trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate). • Small tree (DBH greater than 5cm but less than 20 cm) - Plant minimum two trees.
VEC	Vulnerable ecological community under the BC Act.

Appendix A: Biodiversity Offset Scheme thresholds

Biodiversity Offset Scheme thresholds for local and designated development under Part 4 of the EP&A Act are set out in the BC Act and Biodiversity Conservation Regulation and are reproduced below. Determining whether a Biodiversity Offset Scheme threshold has been met would be undertaken by an ecological consultant on behalf of TfNSW as part of the biodiversity assessment phase of the project.

The development involves:

1. Clearing of native vegetation that exceeds the following area thresholds

Minimum lot size of land	Area of clearing
Less than 1 hectare	0.25 hectare or more
Less than 40 hectare but not less than 1 hectare	0.5 hectare or more
Less than 1,000 hectare but not less than 40 hectare	1 hectare or more
1000 hectare or more	2 hectare or more

Clause 7.2 (2) Biodiversity Conservation Regulation 2017

2. Clearing of native vegetation or other prescribed actions[4] on land included on the Biodiversity Values Map

The Biodiversity Values map includes:

- coastal wetlands and littoral rainforests
- core koala habitat
- Ramsar wetlands
- biodiverse riparian land
- high conservation value grasslands or other groundcover
- old-growth forests
- rainforests
- areas of outstanding biodiversity value (formerly critical habitat)
- land that has connectivity value or otherwise important biodiversity value.

BC regulation Clause 7.2 (1)

[4] The other prescribed actions of potential relevance to Transport are actions causing impacts:

- to threatened species or ecological communities habitat present at karst, caves, crevices, cliffs and other geological features of significance, rocks, human made structures and non-native vegetation
- to the movement of threatened species across their range or that maintains their lifestyle
- to water quality, water bodies and hydrological processes
- arising from vehicle strikes.

These impacts are known as prescribed impacts and must be assessed by a BDAR where the action is undertaken on land included on the biodiversity values map. Biodiversity credits may be required to offset these impacts at the discretion of the consent authority.

The Biodiversity Values map can be viewed or downloaded from: Biodiversity Values Map | NSW Environment and Heritage.

or

3. Is likely to have a significant impact on threatened species and ecological communities in accordance with the 5-part test of significance

Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats.

1. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

   (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

   (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

      (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction; or

      (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

   (c) in relation to the habitat of a threatened species or ecological community:

      (iii) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity; and

whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality:

   (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)
   (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

BC Act Section 7.3.

Appendix B: Variation rules

To participate in the Biodiversity Offset Scheme, TfNSW must adhere to the offset rules detailed in Clause 6.2 of the BC Regulation. There are two options relating to the retirement of credits:

- Retirement of the required number and class of like-for-like biodiversity credits (Section 6.3 of the BC Regulation), and
- Retirement of the required biodiversity credits in accordance with the variation rules (Section 6.4 of the BC Regulation).

The Biodiversity Offset Strategy (BAM trigger) must identify the like-for-like and variation options for all offset credit obligations. Table 1 below provides details for how to determine the options for like-for-like and variation rules, however this is also described in detail in Section 6.3 (like-for-like) and Section 6.4 (variation rules) of the BC Regulation 2017.

Satisfying a credit obligation through the retirement of credits must prioritise obtaining the requisite like-for-like credits. Where like-for-like credits are not available, the variation rules may be used for credit retirement, with consideration of the following ancillary rules:

- Ancillary rules: Impacts on threatened species and ecological communities excluded from application of variation rules
- Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules

Before the variation rules can be used, Section 6.4 of the BC Regulation states that a proponent must demonstrate reasonable steps have been taken to source like-for-like credits. Evidence of undertaking reasonable steps must be provided in the Biodiversity Offset Strategy. Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules (OEH 2017a) provides detail on the minimum requirements for applicants to need to show. In general, this may include:

- Checking the public register of biodiversity credits.
- Lodging an entry in the public register of persons seeking biodiversity credits for a minimum specified period.
- Contacting landholders who are entered on the public register of biodiversity stewardship site expressions of interest.

In accordance with Ancillary rules: Impacts on threatened species and ecological communities excluded from application of variation rules (OEH 2017b), impacts to threatened species or threatened ecological communities that are listed as critically endangered under the BC Act or the EPBC Act are excluded from application of the variation rules.

Table 1: Like-for-like and variation rules

Entity	Like-for-like	Variation
Ecosystem credits for PCTs that are TECs	Any PCT: Of the same TEC **AND** Hollow-bearing trees: same as impact **AND** IBRA: the same subregion as impact OR any adjoining subregion OR any subregion within 100 km of the outer edge of the impact site	**All PCTs part of a CEEC listed under BC Act or EPBC Act are excluded from using the variation rules.** EEC and VEC – any PCT: In the same vegetation formation **AND** In the same or higher offset trading group **AND** Hollow-bearing trees: same as impact **AND** IBRA: same region as impact OR any subregion within 100 km of the outer edge of the impact site
Ecosystem credits for PCTs that are not TECs	Any PCT: In the same vegetation class **AND** In the same per cent cleared category **AND** Hollow-bearing trees: same as impact **AND** IBRA: the same subregion as impact OR any adjoining subregion OR any subregion within 100 km of the outer edge of the impact site	Any PCT: In the same vegetation formation **AND** In the same per cent cleared category **AND** Hollow-bearing trees: same as impact **AND** IBRA: same region as impact OR any subregion within 100 km of the outer edge of the impact site
Threatened species credits	Species credits for: The same species **AND** Anywhere in NSW	**All species listed as critically endangered under BC Act or EPBC Act are excluded from using the variation rules.** Vulnerable and endangered species: Any species in the same kingdom (ie plant and animal) with the same or higher listing under Part 4 of the BC Act **AND** IBRA: any adjoining subregion OR any subregion within 100 km of the outer edge of the impact site

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Tree and hollow replacement guidelines

October 2023

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Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.

Document control

Document owner	Senior Specialist (Biodiversity), SER
Consultant	N/A
Approved by	Executive Director, Environment and Sustainability
Branch / division	Environment and Sustainability / Safety, Environment and Regulation
Review date	Five years from release or as recommended by the Steering Committee

Versions

Version	Date	Amendment notes
1.0	Jul 2022	These guidelines (EMF-BD-GD-0129) are referred to as the 'The Tree and Hollow Replacement Program: An implementation plan for payments to and from the Transport for NSW Conservation Fund (2022)' in the Biodiversity Policy.
1.1	October 2023	Addition of section 3.4.4 Ineligible conservation measures and requirements to consult with relevant asset manager and/or property team in developing fund proposals. Edits made at the recommendation of the TCF Steering Committee. Amendment to section 2.3 adding link to Bionet native species growth form data

Related policy and supporting information

- Transport Environment and Sustainability Policy
- Transport Biodiversity Policy
- Transport Sustainability Plan
- Environment & Sustainability Management Framework

The following resources support this document:

- EMF-BD-GD-0129-TT1_Tree and hollow replacement plan template (Resource 1)
- EMF-BD-GD-0129-TT2_Transport Conservation Fund proposal template (Resource 2)
- EMF-BD-GD-0129-TT3_Making payments to the Transport Conservation Fund Form (Resource 3)

This document should be read in conjunction with:

- Biodiversity Assessment Guidelines (EMF-BD-GD-0010)

Contacts and further information

Email: environmentandsustainability@transport.nsw.gov.au

Internal Transport users: Biodiversity (sharepoint.com)

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Resource 1: EMF-BD-GD-0129-TT1 Tree and hollow replacement plan template

Resource 2: EMF-BD-GD-0129-TT2 TfNSW Conservation Fund Proposal Form

Resource 3: EMF-BD-GD-0129-TT3 Making payments to the TfNSW Conservation Fund

1. Introduction

1.1 Why is vegetation within infrastructure corridors important?

Vegetation within infrastructure corridors, including road reserves, hold significant biodiversity values that can form critical habitat corridors across fragmented landscapes and support habitat resources (e.g., tree hollows) that are rare in the surrounding landscape.

Due to the extent of historical land clearing over much of NSW, roadsides in many areas support the only remaining examples of the original vegetation. Vegetation quality varies from biologically diverse remnants in good condition to highly-disturbed areas in poor condition. Significant opportunities exist to repair and reconnect habitats within infrastructure corridors.

The social and functional benefits of maintaining vegetation within infrastructure corridors are many and include:

- Reducing the velocity of water runoff, thus reducing scour and erosion of batters and embankments.
- Providing shade keeps the road cool for transport and road users, particularly pedestrians and cyclists, and by providing shade at rest stops for travellers.
- Preventing the establishment of weeds in the roadside and within adjacent land. Roadsides heavily infested with weeds can be a threat to adjacent properties and may increase wildfire risk.
- Contributing to the scenic quality of the landscape and its rural character.
- Defining curves, creating a safer driving environment.
- Providing valuable shelter for livestock and crops in adjacent land.
- Providing habitat for predatory insects ('farmers helpers') that are commonly found on native vegetation.
- Helping to lower local water tables that may affect the road formation and pavement.

Trees both native and exotic, can be highly valued by people due to their beauty, function, historical, biodiversity or/and cultural significance. Examples of these include rows of trees planted to commemorate fallen soldiers, visually prominent trees that provide local landmarks and trees that have cultural values for Aboriginal people such as scar trees, bush food, medicine plants and other resources. These trees are also subject to replacement requirements subject to appropriate environmental impact assessment and community consultation.

1.2 Policy context

In December 2021, Transport adopted a Sustainability Plan which commits the organisation to achieving protecting and enhancing biodiversity as a result of our activities.

This commitment is supported by the Transport Biodiversity Policy which provides the framework to protect and enhance biodiversity across TfNSW with the goal of achieving no net loss of biodiversity. The Policy commits TfNSW to replace individual trees and hollows removed by TfNSW activities subject to certain exemptions for low-risk activities.

This plan sets out how TfNSW will implement this requirement. This document does not address the environmental impact assessment or community consultation required to inform decision making.

The Biodiversity Policy also requires that biodiversity offsets or conservation measures are provided for impacts to biodiversity above certain area thresholds. Separate guidelines address the implementation of these area thresholds.

1.3 Who should read this plan?

This plan should be read by TfNSW staff involved in infrastructure development and maintenance activities involving the removal of trees. The plan should be considered during the strategic phase of project development and as part of the environment impact assessment process.

This plan does not apply to activities undertaken by Sydney Metro, Sydney Trains, NSW Trains and State Transit or to the land divestment activities of the Transport Asset Holding Entity.

1.4 Exclusions

In accordance with the Biodiversity Policy, the following low-risk activities are excluded from the requirement to provide replacement trees and hollows:

- Exempt development under the Transport and Infrastructure SEPP including emergency works and projects requiring development consent under Part 4 of the EP&A Act.
- Works to remove a traffic hazard on or overhanging a public road.
- Works within the disturbed zone or to maintain required operational clearances.
- Works within areas that are reasonably likely to naturally regenerate.
- Non-native trees without amenity value

In addition, the following circumstances have also been excluded from the requirement to provide replacement trees and hollows:

- Removal of trees that have been otherwise offset including for projects that have triggered the NSW Biodiversity Offset Scheme thresholds or the TfNSW biodiversity offset thresholds. Trees and hollows that have not been offset via these processes (eg trees that are not part of a recognisable plant community type or are below the offset area thresholds) are required to be replaced.
- Any project approved or determined or where an REF has been exhibited prior to the commencement of the Transport Biodiversity Policy.

Please refer to the glossary for definitions of key terms.

2. Tree and hollow replacement requirements

2.1 Introduction

The Biodiversity Policy requires that TfNSW replace trees and hollows removed as a consequence of our activities unless excluded (see Section 1.4). Planning for this requirement commences at the earliest stage of project development and will be ultimately documented in the environmental impact assessment prepared for the project and implemented via the CEMP (or similar) prepared for the project.

Consistent with the Biodiversity Policy, trees and hollows can either be replaced within the project boundary or on nearby land with the consent of the owner or, where this is not feasible, payment can be made to the TfNSW Conservation Fund. E&S will then use the funds collected to deliver conservation measures that deliver landscape scale outcomes in accordance with this plan (See Section 3).

The process of identifying tree and hollow requirements applicable to a project is provided at Figure 1. The following sections provide more detail on each of the steps in flowchart.

2.2 Options to avoid and mitigate impacts to trees

Avoiding tree removal through careful design is a crucial first step in the process. Features of particular significance include large hollow bearing trees, trees providing the only available opportunity for connectivity across the landscape, weed free areas of native vegetation and any areas with records of threatened species and ecological communities plus all trees with Aboriginal and non-Aboriginal heritage value.

Mitigation measures can also reduce the impact of tree removal on biodiversity as recommended by the TfNSW Biodiversity Guidelines. Any proposed removal of trees with potential Aboriginal heritage value requires consultation with the relevant Aboriginal Cultural Heritage officer prior to removal.

2.3 Determining replacement requirements

Where removal cannot be avoided, the number of native and amenity trees and individual hollows to be removed must be counted and used to calculate the number of replacement trees and hollows as per Table 2-1. This should be undertaken by or verified by environment staff in consultation with the project manager. This requirement does not apply to trees within areas that otherwise require offsetting under the TfNSW offsetting guidelines (see Section 1.4 for a full list of exclusions).

A tree is defined as per the Australian Standard 4970-2009 as being a long lived woody perennial plant greater than (or usually greater than) 3m in height with one or relatively few main stems or trunks (or as defined by the determining authority). Where uncertainty exists as to whether a native flora species should be considered a tree or not, the 'BioNet Native Species by Growth Form data' can be used to identify native species that are classified as a tree growth form.

Pre-clearing ground based hollow surveys can be used to identify the number of hollows likely to be impacted.

Hollow bearing trees include living and dead native species that have at least one hollow (DPIE 2020 BAM Operational Manual Stage 1). A tree is considered to contain a hollow if:

a) the entrance can be seen

b) the hollow appears to have depth (i.e., solid wood cannot be seen beyond the entrance)

c) the hollow is at least one metre above the ground.

Trees must be examined from all angles using binoculars. Tree size is determined by measuring the diameter at breast height (DBH), which is taken around the largest trunk (if there are multiple trunks/stems) over top of the bark at a height of 1.3 metres above the ground. It is recommended that tree counting surveys are undertaken using a specific DBH measuring tape. Only living trees are to be counted. [See Appendix A].

The results of this calculation are to be included as a safeguard in the Review of Environment Factors (REF) or similar prepared for the project or a commitment made in the REF to calculate the requirement in accordance with this Plan. **Appendix A** provides an example field sheet to collect data on tree and hollow removal.

Table 2-1: Tree and hollow replacement requirements

Tree size[1]	Tree replacement requirement
Very large tree (DBH[2] greater than 100cm)	Plant minimum 16 trees
Large tree (DBH between 50cm and 100cm)	Plant minimum eight trees
Medium tree (DBH greater than 20 cm, but less than 50cm)	Plant minimum four trees
Small tree (DBH greater than 5cm, but less than 20cm)	Plant minimum two trees
Hollow replacement requirement	Provide three artificial hollows for every occupied hollow removed[3]

[1] For trees with multiple stems/trunks, calculate the payment required for the largest stem DBH. Only one stem requires replacement/payment.
[2] DBH – Diameter at breast height.
[3] Assume 20% occupancy rate. For every five hollows identified (or where less than five hollows will be impacted), assume one hollow will be occupied and requires replacement. Where hollows are inspected during the clearing process, actual occupation can used as the basis for the replacement requirement.

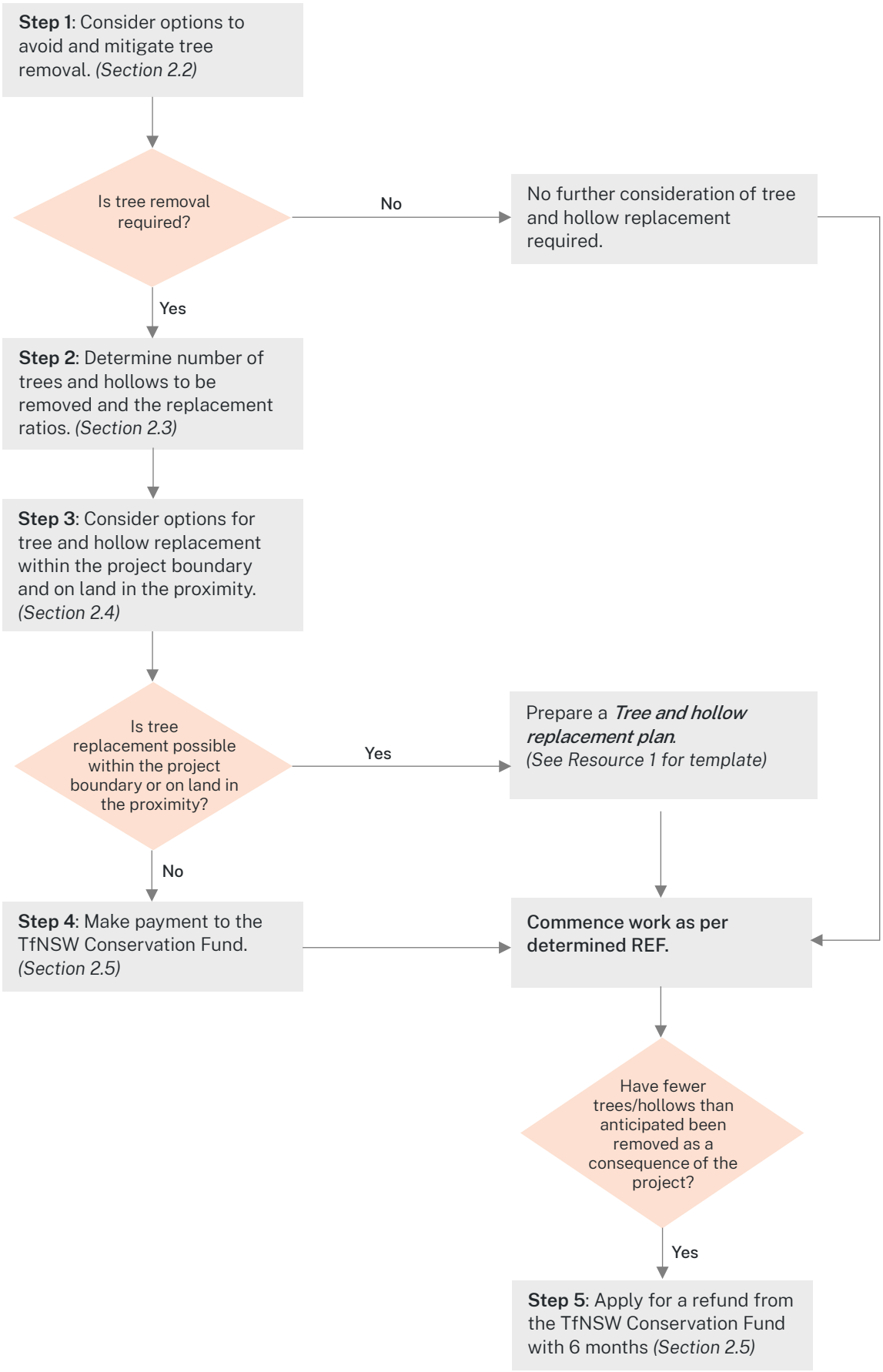

Figure 2-1: Tree and hollow replacement flowchart

2.4 Considering options for local tree and hollow replacement

The next step in the process is to determine whether the project is able to deliver the required tree and hollow replacement within the project boundary or on land adjacent or close to the project with landowner's consent (including travelling stock reserves, crown reserves, council managed reserves and private land).

This option requires the preparation of a *Tree and Hollow Replacement Plan* or similar. A template has been prepared to aid in the preparation of the THRP (See Resource 1) which can be modified as needed. This plan can be prepared as part of the Construction Environmental Management Plan (CEMP), or similar, being prepared for the project. This should be prepared by a person suitably qualified in rehabilitation and restoration techniques and requires review by environment officers. Where replacement is proposed on lands in proximity to the project, then consultation with the relevant land manager is required or an agreement made with the relevant local Council or Local Land Services to undertake this consultation. Implementation should involve a three-year period of monitoring and maintenance for replanted trees and be undertaken in accordance with relevant guidelines.

Where tree and hollow replacement cannot be accommodated locally or can only be partially accommodated, payment must be made to the TfNSW Conservation Fund in accordance with section 2.5.

2.5 Determining TfNSW Conservation Fund payment

Once opportunities for delivery of tree and hollow replacement within the project boundary or on land in the proximity have been determined (as per section 2.4), any remaining requirement can be met by transferring funds into the TfNSW Conservation Fund as per the rates set out at Table 2-2. Transfer of funds to the TfNSW Conservation Fund must occur prior to commencement of works.

Table 2-2: Tree and hollow fund contributions

Tree size	Contribution required per tree/hollow
Very large tree (DBH greater than 100cm)	$2500
Large tree (DBH between 50cm and 100cm)	$1000
Medium tree (DBH greater than 20 cm, but less than 50cm)	$500
Small tree (DBH greater than 5cm, but less than 20cm)	$125
Hollow	$500

2.6 Making payments and arranging refunds from the TfNSW Conservation Fund

Payments are made by completing the form at Resource 3 and emailing it to: ConservationFund@transport.nsw.gov.au.

In some situations, further design changes may reduce the number of trees or hollows required to be replaced as a consequence of the project. In such cases, projects may apply for a refund from the TfNSW Conservation Fund within 6 months of payment using the same form. Information detailing the final clearing footprint and numbers of trees cleared must be included in the application. Applications for refunds must be reviewed by the E&S Regions/Sydney environmental teams.

2.7 Reporting

SER Environment Operations manage environmental performance monitoring on behalf of TfNSW including end of month incident reporting and quarterly biodiversity offset reporting.

From 1 August 2022, embedded teams will be asked to complete the Tree and Hollow Replacement Database which records details of projects triggering tree and hollow replacement requirements under the Biodiversity Policy.

An entry should be made to this database each time a project is REF determined with tree and hollow replacement requirements. Entry to this database does not achieve a payment to the TfNSW Conservation Fund – See Section 2.6.

Appendix A provides a form that can be used in the field to collect the information about trees and hollows that are planned for removal.

3. TfNSW Conservation Fund

3.1 Introduction

The Transport Biodiversity Policy establishes the TfNSW Conservation Fund as an option for projects to achieve tree and hollow requirement requirements where delivery is not possible within project boundary or land in proximity to the project.

The TfNSW Conservation Fund is administered by Environment and Sustainability (E&S) on behalf of TfNSW. This section sets out how E&S will administer the TfNSW Conservation Fund in partnership with other areas within TfNSW.

3.2 Objective of the program

The objective of the TfNSW Conservation Fund is to support projects to conserve and repair native habitats within linear reserves and landscape habitat corridors and to support research activities to help us achieve this; with the overall aim of conserving a diverse, connected, thriving environment across the linear reserves and habitat corridors of NSW.

3.3 Governance

Oversight of payments into and from the TfNSW Conservation Fund will be undertaken by the TfNSW Conservation Fund Steering Committee (the Committee) comprising:

- Two representatives from E&S.
- A representative from Regional and Outer Metropolitan.
- A representative from Greater Sydney.
- A representative of Infrastructure and Place.
- A representative of Customer Strategy and Technology.

The Committee will meet on a six-monthly basis to consider proposals for future expenditure and to evaluate the implementation of the previous funding round. Funding proposal may be considered on an ad-hoc basis by the Committee as required.

Secretariat support to the Committee will be provided by Senior Specialist (Biodiversity) E&S.

3.4 Eligibility

3.4.1 Delivery partners

The Fund will support projects undertaken by:

- TfNSW
- Local Government
- Private individuals under a program managed by Local Lands Services or a recognised conservation organisation.
- NSW National Parks and Wildlife Service
- Other State Agencies
- Aboriginal landowners
- Tertiary institutions or a recognised research organisation.

3.4.2 Location

TfNSW projects would be located within TfNSW operational lands (outside the disturbed zone) or TfNSW residue lands (subject to 3.4.5 below). .

External projects would be located:

- Within existing infrastructure corridors (including roadside reserves) managed by Local Government.
- Within travelling stock reserves and other linear reserves managed by Local Land Services.
- Land reserved for a conservation or related purpose under the *Crowns Land Act 1989*.
- On land within recognised landscape scale corridors.
- Within marine and freshwater environments.
- On freehold land owned by a Local Aboriginal Land Council and crown land under Aboriginal land claim with the agreement of current landowner.

3.4.3 Eligible conservation measures

The following conservation measures are eligible for funding:

1. biodiversity conservation measure delivered as part of a TfNSW project that is not related to the project impact
2. weed control
3. vegetation rehabilitation activities
4. habitat augmentation including hollow creation
5. tree-planting
6. fencing
7. bank stabilisation
8. instream restoration and repair
9. marine conservation activities including habitat creation and restoration projects
10. ecological fire management and cultural burning
11. other activities that support Aboriginal people care for Country
12. mitigation of vehicle strike
13. activities required to support achieving these activities
14. research initiatives relevant to these activities

3.4.4 Ineligible conservation measures

The following activities are not eligible for funding:

1. activities required to mitigate the impact of a TfNSW project on biodiversity, for example to fund a mitigation measure specified in an REF or EIS.
2. activities required to remediate, maintain, operate, decommission or repair biodiversity related mitigation measures installed as part of a project approved or determined prior to 1 August 2022 **unless** the funding is seed funding faciliating transition to a long term funding arrangement or agreement with a third party, for example to rehabilitate neglected habitat created by a past project to a point that ongoing management can be routinely delivered.
3. activities involving the creation of, or changes to, an asset on TfNSW operational land with long term maintenance obligations **unless** the area proposing the project has consulted with the relevant TfNSW asset manager.
4. activities on TfNSW residue land **unless** the area proposing the project has consulted with the relevant TfNSW Property team. This will include an assessment of whether a conservation convenant is required to protect the conservation measures post divestment and an assessment of whether the actions will devalue

the property and require payment from the TCF to Property to cover this loss on divestment. Such assessments will be based on the advice of independent valuer at the time the project is approved for funding by the TCF and paid by the TCF at the time of divestment.

3.5 Funding available

A maximum of $300K is available for projects up to three years.

3.5.1 Key stages

The key stages leading to the final award for funding are described in Table 3-1 and shown in Figure 3-1.

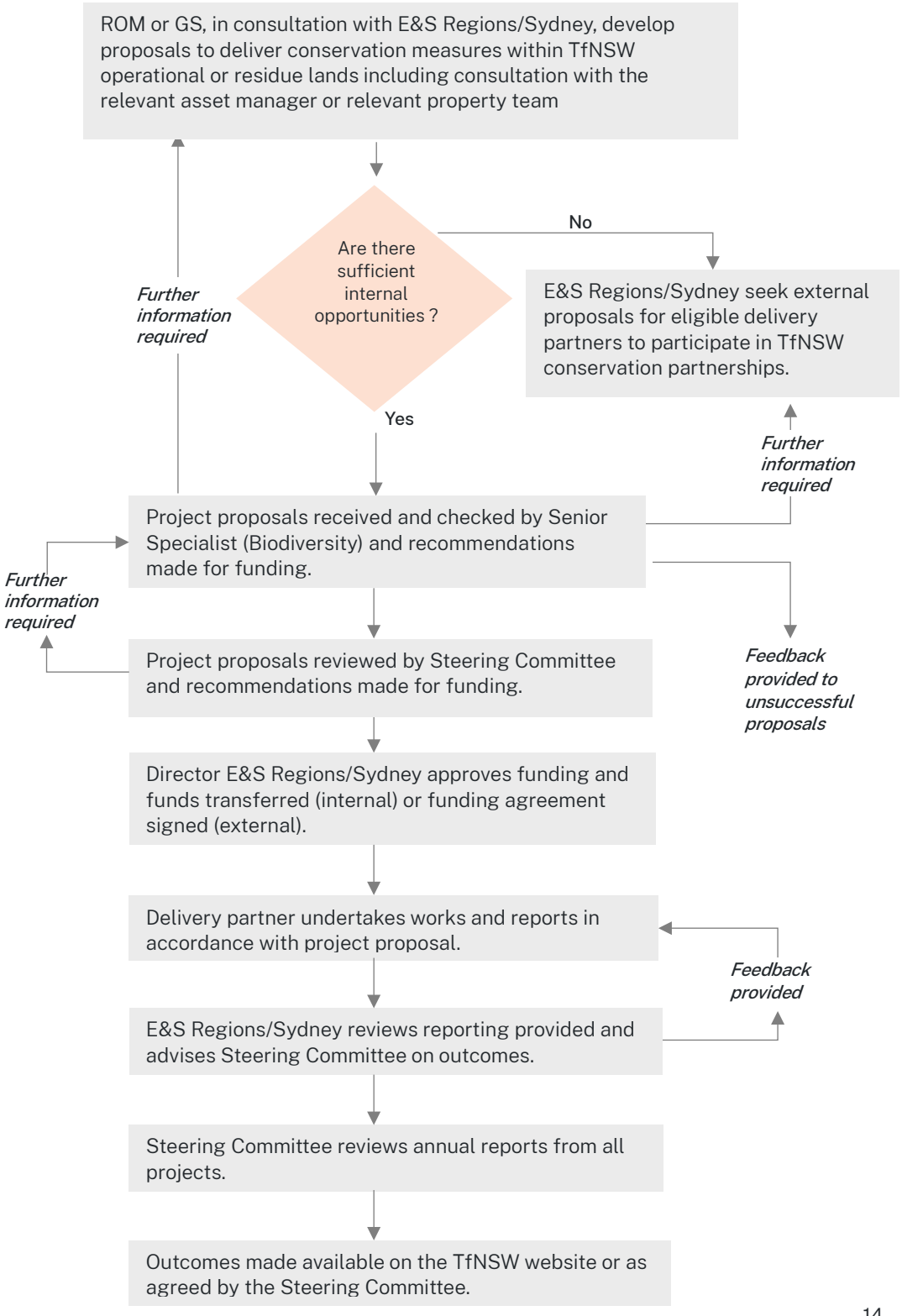

Figure 3-1: Stages in assessment of funding proposals

Table 3-1: Stages in assessment of funding proposals

Stage	Description	Responsibility
1	Development of proposals (see Resource 2) to undertake conservation measures on TfNSW-operational or residue lands in accordance with proposal template and in consultation with the relevant asset manager or property team.	ROM in consultation with E&S Regions/Sydney
2	Where insufficient proposals are generated via Stage 1, seeking external proposals from eligible organisations. SER Regions/Sydney are expected to submit proposals commensurate with the amount of funds flowing to the Transport Conservation Fund from their respective areas.	E&S Regions/Sydney
3	Eligibility and technical assessment to determine whether the applicants are eligible, and the proposal template has been completed and recommendation to support or otherwise	Senior Specialist (Biodiversity)
4	Final review and recommendations for funding	Steering Committee
5	Approve transfer of funds (internal) or funding agreement (external)	Director, E&S, Regions/Sydney
6	Project implementation oversight including reporting and evaluation	E&S Regions/Sydney

3.6 Technical assessment

Proposals from all eligible delivery partners will be assessed on a rolling six-monthly basis and in accordance with Table 3-2 by Senior Specialist (Biodiversity) and made to the Steering Committee in relation to funding. Any unsuccessful proposals will be provided feedback and advised promptly. Proposals may be considered outside this program with the agreement of the Committee.

Table 3-2: Assessment criteria

Stage	Description	Maximum score
Relevance	The proposal involves an eligible conservation measure within an eligible location as per Section 3.4. For research, consideration will be given to research that advances our understanding of: • restoration practices • transport relevant mitigation and management strategies • habitat creation and augmentation techniques	20
Benefit and impact	Consideration will be given to the extent to which the project: • will restore habitat connectivity and protect areas of high conservation value • supports Aboriginal communities to care for and connect to Country • addresses long-standing issues of community concern	20
Sustainability	Consideration will be given to: • technical, organisations and financial capabilities of the delivery partner • necessary licences, permits and approvals available	20

	• likely future ongoing performance of the measure • scope for future scaling up and replication • complementarity with other conservation programs including likelihood of duplication	
Effectiveness	Consideration will be given to: • the extent the project will achieve its expected objectives and outcomes • how realistic and comprehensive are the planned actions • the results framework provided and performance indicators proposed	20
Efficiency	Consideration will be given to whether: • budget proposals reflect proposed activities • budget proposals are realistically estimated • management and administration costs as a percentage of total expenditure	20
Score		**100**

3.7 Reporting and evaluation

Each funded project will have reporting and evaluation requirements.

Each E&S region is responsible for review of these reports and annual reporting to the Steering Committee annually on progress and achievements for each project funded.

Fund balances will be reported quarterly by the Secretariat to the SER Senior Leadership Team and the Steering Committee.

4. Definitions

Term	Definition
Amenity tree	Trees, both native and exotic, that are valued by people due to their beauty, function, historical, biodiversity or cultural significance.
Artificial hollow	Artificial hollows, including hollows carved into a tree, nest boxes attached to trees and salvaged hollows can be used to provide supplementary breeding habitat and shelter for hollow-dependent fauna where hollows have been removed. When designed, built, installed and monitored correctly artificial hollows can provide an alternative to natural fauna habitat.
Conservation measure	Activities voluntarily undertaken by TfNSW in addition to BOS or EPBC Act requirements to address the ongoing cumulative impacts of TfNSW activities on biodiversity and local environments. Conservation measures are different to biodiversity conservation actions under the BOS. Conservation measures are typically delivered locally and include weed control, vegetation rehabilitation activities, habitat augmentation, tree-planting, fencing, bank stabilisation, instream restoration and repair, ecological fire management, vehicle strike mitigation or supporting research initiatives by a recognised tertiary institution.
Disturbed zone	Has the same meaning as the *Routine and Minor Works Procedure* and applies to road activities only.
E&S	Environment and Sustainability, Safety Environment and Regulation, Transport for NSW
Feasible	For biodiversity offset requirements, offset delivery is always considered feasible due to the ease of payment to the BCT's Biodiversity Conservation Fund (BCF). For tree and hollow replacement requirements, feasibility relates to practical considerations and involves the consideration of the following preference hierarchy: 1. Modifying works to avoid impacts and reduce requirement. 2. Tree and hollow replacement on land within the infrastructure corridor in proximity to the proposal triggering the requirement. 3. Tree and hollow replacement on land in proximity to the proposal triggering the requirement. 4. Making a contribution to the TfNSW Conservation Fund.
Habitat tree	Habitat trees are typically native species that provide food and/or shelter for native fauna and flora.
No net loss	Projects will have achieved a no net loss where the expected loss from infrastructure development has been: • Avoided to the extent reasonably practicable; **and** • Mitigation measures, including measures to reduce habitat fragmentation effects, have been applied to the extent reasonably practicable; **and** • Offsets have been provided through either credit purchase or BCF payment of the required number and type of biodiversity credits in accordance with the BAM or TfNSW guidelines; **and/or** • Conservation measures have been delivered in accordance with the requirements of this policy and guidelines.
Operational clearances	Means the area required to be maintained for the safe and efficient operation of the infrastructure and applies to rail activities only
Reasonable	Selecting reasonable measures from those that are feasible involves judging whether the overall biodiversity benefits are worthwhile in the context of: • recent and anticipated impacts of a similar nature in the locality • the cost of the measure, including the cost of the measure as a percentage of the total project cost and any ongoing maintenance and operational costs • the level of community interest and engagement with the proposed measure.

	Where the cost of making payment to the BCF to meet TfNSW biodiversity offset requirements is considered excessive, conservation measures will be considered and provided to the extent or value considered appropriate. Where the cost of making payment to the TfNSW Conservation Fund to meet Tree and Hollow replacement requirements is considered excessive, changes must be made to project scope to reduce impacts.
Reasonably likely to naturally regenerate	Means areas capable of natural regeneration as evidenced by the presence of a native understorey including juvenile native trees and shrubs as determined by an appropriately qualified person.
REF	Review of Environmental Factors. Prepared to meet Transport's statutory obligation to consider the impact of its activities on the environment to the fullest extent reasonably practicable for projects considered under Part 5, Division 5.1 of the EP&A Act.
Residue land	Residue land is Transport owned-land that is not required for current or future project requirements and therefore would be available for disposal.
TfNSW tree and hollow replacement exclusions	Activities excluded from the TfNSW tree and hollow replacement requirements: • Exempt development under the Infrastructure SEPP including emergency work. • Projects requiring development consent under Part 4 of the EP&A Act. • Works to remove a traffic hazard on or overhanging a public road. • Works within the disturbed zone (road) or essential to maintain required operational clearances (rail). • Works within areas that are reasonably likely to naturally regenerate. • Non-native trees without amenity value. • Trees that are being otherwise offset including projects that have triggered the Biodiversity Offset Scheme thresholds or the TfNSW biodiversity offset thresholds. • Any project approved or determined or where an REF has been exhibited prior to the commencement of this Policy.
Tree	Is as per Australian Standard 4970-2009: Long lived woody perennial plant greater than (or usually greater than) 3m in height with one or relatively few main stems or trunks (or as defined by the determining authority)
Tree and hollow replacement ratios	Trees and hollows will be replaced using the following ratios: • Very large tree (DBH greater than 100cm) – Plant a minimum 16 trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate). • Large tree (DBH between 50cm and 100cm) - Plant minimum eight trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate). • Medium tree (DBH greater than 20 cm, but less than 50cm) - Plant minimum four trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate). • Small tree (DBH greater than 5cm, but less than 20cm) – Provide at least two trees Artificial hollows should be provided in accordance with relevant guidelines.

Appendix A: Tree and hollow removal field data sheet

Project:

Person completing form:

TfNSW contact officer:

Date:

Road ID:

Location details:

Comments:

Table A-1: Inventory of tree removal

Tree ID	GPS	Species	'Native' or 'Amenity' tree	DBH[1] (cm)	Tree size category
Insert ID	Insert GPS ref	Insert tree species name	See definitions		E.g. "Very large tree (DBH[4] greater than 100cm)"

Table A-2: Inventory of hollow removal

Tree ID	GPS	Species	DBH (cm)	No. hollows per entrance size (cm)					Comments
				2-4	4-10	10-15	15-30	>30	
		Insert tree species name							Provide any other details to describe the hollow, including type (branch, trunk, etc), height off ground, aspect, evidence of use, etc.

[1] DBH = Diameter at Breast Height

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May 2024

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Document control

Document owner	Senior Specialist (Biodiversity), SER
Approved by	Executive Director / Environment and Sustainability
Branch / division	Environment and Sustainability / Safety, Environment and Regulation
Review date	May 2026

Versions

Version	Date	Amendment notes
1.0	Dec 2011	First issue
1.1	Feb 2021	Addition of sensitive species mapping requirements in section 5.2.2 and standard brief inserted at Appendix 1.
2.0	Sep 2015	Updated structure and content to reflect policy and legislative changes and new requirements for biodiversity assessment.
3.0	Oct 2020	Revised content and templates to reflect: • *Biodiversity Conservation Act 2016* and regulations. • Merger of NSW Roads and Maritime Services with Transport for NSW. • Amendments to the EPBC Act bilateral agreement 24 March 2020.
4.0	Dec 2021	New numbering under Transport for NSW Environment and Sustainability Management Framework. Minor edits to reflect changes to resources and update document hyperlinks. Edits made to section references in Figure 2-1.
4.1	July 2022	Rebranded and amendments to support implementation of the Transport Biodiversity Policy 2022 and to align vegetation and threatened species survey with the Biodiversity Assessment Method (BAM)
4.2	Nov 2022	Inclusion of new NSW DPE Biodiversity Assessment Method and field survey guideline for threatened reptiles.
4.3	June 2023	Minor amendment to Figure 2-2 and text at 2.2.1 re minimum EPBC Act notification requirements
4.4	May 2024	Addition of Appendix A CPCP flowchart and update to NSW government agency names and reference to new Biodiversity Management Guidelines.

Related policy and supporting information

- Transport Biodiversity Policy
- Environment & Sustainability Management Framework

Resource 1: EMF-BD-GD-0100-0001_Brief: Biodiversity assessment report (BAR) for REF (template)

Resource 2: EMF-BD-GD-0100-0002_Brief: Biodiversity development assessment report (BDAR) for SSI (template)

Resource 3: EMF-BD-GD-0100-0003_Preliminary biodiversity investigation (template)

Resource 4: EMF-BD-GD-0100-0004_Biodiversity assessment report (BAR) for REF (template)

Resource 5: EMF-BD-GD-0100-0005_Biodiversity development assessment report (BDAR) for SSI (template)

Contacts and further information

Email: environmentandsustainability@transport.nsw.gov.au

Internal Transport users: Biodiversity (sharepoint.com)

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1. Introduction

1.1 Purpose

The Biodiversity assessment guidelines (EMF-BD-GD-0010) and supporting biodiversity assessment templates have been developed to assist Transport for NSW (TfNSW) meet its environmental impact assessment responsibilities under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), NSW *Biodiversity Conservation Act 2016* (BC Act), NSW *Fisheries Management Act 1999* (FM Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and our own sustainability commitments as set out in the Transport Biodiversity Policy 2022.

Important: These Guidelines should be read in conjunction with:

- procedures, guidance and templates developed as part of the TfNSW Environmental Impact Assessment Guidelines.
- The Transport Biodiversity Policy and No Net Loss Guidelines and supporting resources

1.2 Objectives of these Guidelines

The objectives of these Guidelines and accompanying resource documents are to ensure that biodiversity impact assessments are:

- Carried out in accordance with the relevant legislation and Australian and NSW Government policies and procedures.
- Appropriate and proportional to the scale of the project and its expected impacts on biodiversity.
- Focused on reducing environmental risk and improving outcomes for biodiversity.
- Integrated with environmental impact assessment and environmental management processes.

1.3 Scope

The Guidelines apply to the environmental impact assessment stage of any project that is assessed via:

- Part 5 Division 5.1 of the EP&A Act (Review of Environmental Factors (REF)) including Minor Works REF.
- Part 5 Division 5.2 of the EP&A Act (State Significant Infrastructure (SSI) or Critical State Significant Infrastructure (CSSI).
- Part 4 Division 4.3 of the EP&A Act (development requiring consent including designated development).
- Part 4 Division 4.7 of the EP&A Act (State Significant Development (SSD)).
- The controlled action, bilateral agreement and strategic assessment provisions of the EPBC Act.

These guidelines are relevant to exempt activities under the State Environmental Planning Policy (Transport and Infrastructure) 2021 only to the extent that Resource 3 provides a template for use by ecological consultants to confirm that threatened species and endangered ecological communities are not relevant.

These guidelines do not directly address EPBC Act matters other than threatened species, endangered ecological communities or migratory species (e.g. impacts on Commonwealth land/area or World Heritage) although provision is made in the document templates for assessment of these matters. These guidelines do not address any EPBC Act permit requirements including for works undertaken on Commonwealth land. Contact the TfNSW Planning and Assessment Specialists for further information when undertaking works within a Commonwealth land.

This guidelines do not address the NSW Fisheries permit requirements for harm to seagrasses, mangroves or any other entities listed under the FM Act. Contact the biodiversity specialists should these issues arise on your project.

The Appendices in these Guidelines contain the following resources (Table 1-1).

Table 1-1: Biodiversity Assessment Guideline resources

Number	Resource	Description
Resource 1	Brief: Biodiversity assessment report (BAR) for REF (template)	Can be used by the relevant manager to engage an accredited ecological consultant to prepare a biodiversity assessment report (BAR) that will form part of the Review of Environmental Factors (REF) for Division 5.1 proposal. See Table 3-1
Resource 2	Brief: Biodiversity development assessment report (BDAR) for SSI (template)	Can be used by the relevant manager to engage an accredited ecological consultant to prepare a biodiversity development assessment report (BDAR) that will form part of the environmental impact statement (EIS) for a State Significant Infrastructure project.
Resource 3	Preliminary biodiversity investigations report (template)	Can be provided by the contract manager to an ecologist undertaking preliminary biodiversity investigations for an REF or major project including whether a BDAR waiver would be appropriate. The purpose of this assessment is to determine whether biodiversity is likely to be present requiring further assessment and recommendations for that assessment. See Table 3-1
Resource 4	Biodiversity assessment report (BAR) for REFs (template)	Can be provided by the contract manager to the accredited ecological consultant preparing biodiversity impact assessments for Division 5.1 REF projects. The project manager provides the latest template to the contracted ecologist. See Table 3-1
Resource 5	Biodiversity development assessment report (BDAR) for SSI (template)	Can be provided by the contract manager to the accredited ecological consultant preparing a biodiversity development assessment report (BDAR) that will form part of the environmental impact statement (EIS) for a SSI project. The project manager provides the latest template to the contracted consultant. .

2. Planning pathways

2.1 Introduction

A critical part of any project is determining the appropriate planning pathway for the project. This process should include consideration of the biodiversity assessment requirements of the project including any EPBC Act requirements.

Figure 2-1 has been prepared to help TfNSW staff clarify the planning process where biodiversity impacts are anticipated. It describes the statutory processes applying to biodiversity assessment under the EP&A Act, BC Act, FM Act and the EPBC Act.

Further detail of each planning pathway is provided below.

2.2 REF projects

As part of the REF, TfNSW must assess:

- Impacts on areas of outstanding biodiversity value (formerly critical habitat).
- Whether there is likely to be a significant effect on threatened species or ecological communities, or their habitats.
- Impacts on any other native fauna and flora protected under the NSW *National Parks and Wildlife Act 1974.*

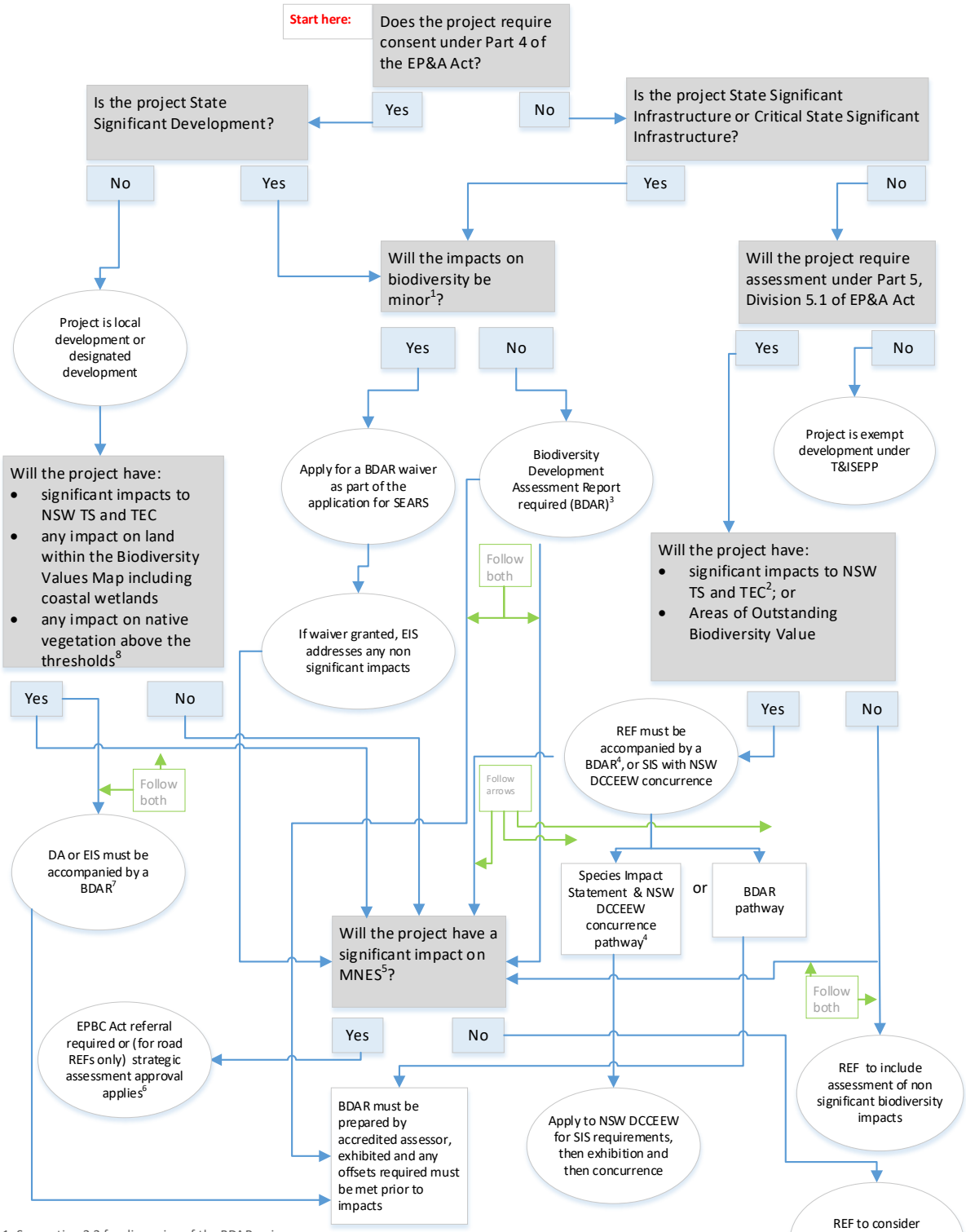
The '5 part test' of significance (Section 7.2 of the BC Act), is used to determine if project is likely to have a significant effect on threatened species and threatened ecological communities. The significance assessment must be prepared with reference to *Threatened Species Test of Significance Guidelines* (OEH 2018) and is undertaken by a person with appropriate qualifications and experience.

If a significant impact is likely for NSW listed matters, either:

- A Biodiversity Development Assessment Report (BDAR) can be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM); OR
- A Species Impact Statement (SIS) is prepared based on the Environment Agency Head's requirements as issued by the NSW Department of Climate Change, Energy Environment and Water (NSW DCCEEW). TfNSW must then apply for concurrence to the Environment Agency Head prior to determining the REF.

This process is shown on Figure 2-2.

If a significant effect is likely for NSW listed matters and a BDAR or SIS has been prepared, special public exhibition and Agency consultation requirements apply to the REF. The effect of Section 7.8(4) of the BC Act is that Part 5 of the EP&A Act (which otherwise applies to an EIS) applies to any SIS or BDAR accompanying an REF. Part 5 of the EP&A Act includes provisions relating to the notification, exhibition and inspection of documents (Section 5.8). This is further elaborated in the EP&A Regulation, which has provisions relating to the publication Part 8 Division 5. Each project is encouraged to discuss these requirements with NSW DPHI and NSW DCCEEW (see Figure 2-2).



1. See section 2.3 for discussion of the BDAR waiver process
2. BC Act Section 7.3 sets out the factors to be considered in determining whether impacts to terrestrial biodiversity are likely to be significant. FM Act Section 221ZV sets out the factors to be considered for aquatic biodiversity.
3. Project SEARs will require BDAR preparation plus assessment of impacts to aquatic species under the FM Act
4. BDAR option only available for impacts to terrestrial biodiversity. Any significant impact under FM Act requires SIS and NSW Fisheries concurrence.
5. Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
6. Must use BAM to calculate offsets and met EPBC exhibition requirements where EBPC Act strategic assessment for road projects applies
7. Note development applications under Part 4 are excluded from all Transport Biodiversity Policy offset and tree and hollow replacements requirements
8. Refer to Section 2.4 of this guideline for Part 4 thresholds.

Figure 2-1: Biodiversity assessment requirements according to planning pathway – NSW and Commonwealth

2.2.1 EPBC Act and REF projects

For road infrastructure projects

Referral of a project to the Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) is no longer required for road infrastructure projects proposed and determined by TfNSW due to the Commonwealth's approval of the *Roads and Maritime Strategic Assessment: EPBC Act*. This applies to impacts on nationally listed threatened species, ecological communities and migratory species only.

In accordance with that approval, TfNSW is committed to applying best-practice environmental impact assessment for all REF road infrastructure projects including commitments to:

- Apply the 'avoid, minimise, mitigate and offset' hierarchy.
- Not proceed with projects that may have an unacceptable impact on nationally listed species, ecological communities and migratory species.
- Incorporate appropriate environmental safeguards and management actions that clearly target nationally listed species, ecological communities and migratory species.
- Provide offsets where residual significant impacts occur for nationally listed species and communities in accordance with a methodology endorsed by the Commonwealth. As at July 2022, the most current endorsed methodology is the BAM.
- Provide appropriate opportunities for community and stakeholder consultation including mandatory public notification (minimum of 30 days) for all projects likely to have a significant impact on nationally listed species, ecological communities and migratory species.
- Undertake appropriate auditing, incident management and ecological monitoring.

The strategic assessment approval does not remove the need to consider whether your project is likely to have a significant impact on nationally listed threatened species and ecological communities. An assessment of significance is still required and all offsets must be calculated in accordance with the BAM. TfNSW includes details of all projects assessed under the strategic assessment in its Annual Report.

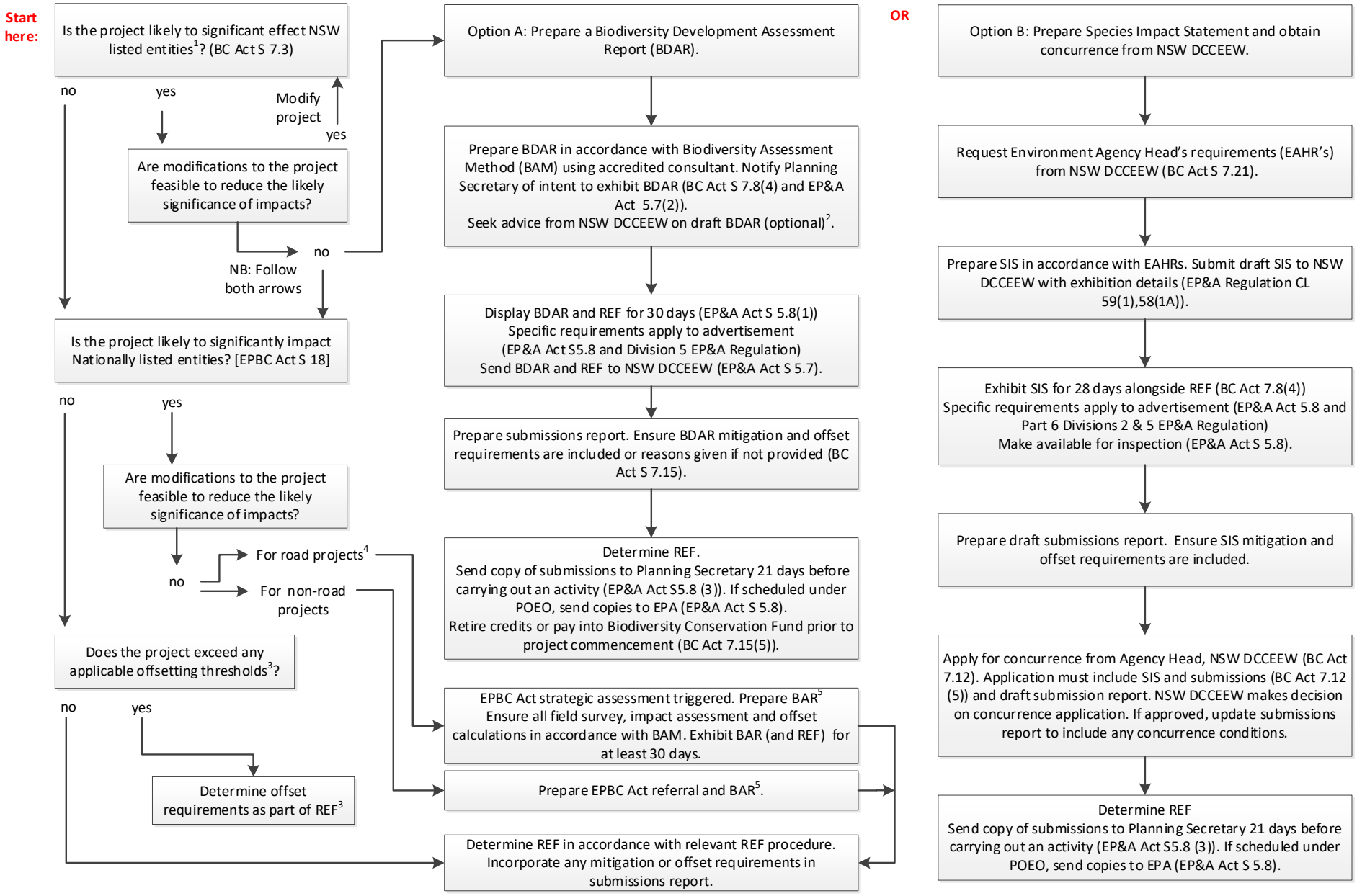
Please contact Biodiversity Specialists for further information as required.

For all other infrastructure projects (non-road)

Non-road infrastructure projects are not covered by the EPBC Act strategic assessment approval for road projects.

The significance of impacts to nationally listed threatened species, migratory species and endangered ecological communities must also be assessed in accordance with the Matters of National Environmental Significance: Significant impact guidelines 1.1 (DoE 2013).

Where a significant impact is likely, a referral is required to the Cth DCCEEW. Please contact TfNSW Biodiversity Specialists for further information as required.



1. Entities includes threatened species and ecological communities. **2**. NSW Department of Climate Change, Energy, Environment and Water. **3**. Refer TfNSW No Net Loss and Tree and Hollow Replacement Guidelines **4**. EPBC Act strategic assessment approval applies. Not available for impacts on Commonwealth land. Referral required. **5**. If both BDAR and BAR is triggered by this process, only BDAR is required.

Figure 2-2: Biodiversity impact assessment process for REF proposals – NSW and Commonwealth legislation

2.3 State Significant Infrastructure projects (SSI)

SSI projects are projects that are likely to have a significant impact on the environment and require the approval of the Minster for Planning. SSI projects are assessed under Division 5.2 of the EP&A Act. An environmental impact statement (EIS) is prepared to assess environmental impacts.

The content of the biodiversity assessment to support the EIS is prescribed by the BC Act (Section 7.6) and will be included in the Secretary's Environmental Assessment Requirements (SEARs).

Generally, this will require the preparation of a BDAR. The BDAR must be prepared by an accredited assessor in accordance with the BAM. SEARs will also require that aquatic species, populations and communities are assessed in accordance with the Policy and guidelines for fish habitat conservation and management (DPI 2013). The BDAR forms part of the EIS and is placed on public exhibition.

The requirement to prepare a BDAR may be waived in certain circumstances. NSW DCCEEW website notes that a BDAR waiver may be issued when a proposal will not clear or remove native vegetation other than:

- A few single trees with no native understorey in an urban context.
- Planted native vegetation that is not consistent with a Plant Community Type (PCT) known to occur in the same Interim Biogeographic Regionalisation of Australia (IBRA) subregion (e.g. street trees, trees in carparks, landscaping)
- Will have negligible adverse impacts on threatened species or ecological communities, considering habitat suitability, abundance and occurrence, habitat connectivity, movement and water sustainability including consideration of any non-natural features, non-native vegetation and human-built structures
- Will have negligible adverse impacts on protected animals because of impacts to flight path integrity.

BDAR waiver can be prepared by an ecological consultant or by accredited assessors working for TfNSW.

The BDAR waiver request can be lodged with the Department at the time of your SSI application (or earlier) via the Major Projects website (or via information@planning.nsw.gov.au). For more information on the BDAR waiver process please see the NSW DCCEEW website.

2.3.1 EPBC Act and SSI projects

In addition to NSW assessment requirements, TfNSW must also consider whether the project is likely to have a significant impact on Matters of National Environmental Significance (MNES). This assessment should be included in the BDAR.

An EPBC Act referral is required where significant impacts are likely. Once the relevant Commonwealth Minister or delegate has made a decision on whether the project is a controlled action under the EPBC Act, the project may be considered under the EPBC Act Assessment Bilateral Agreement for Major Projects. This is a decision for Cth DCCEEW.

The bilateral agreement provides for a concurrent assessment process under both Federal and State legislation. The effect of the bilateral agreement is that the Cth DCCEEW will base their decision on the biodiversity assessment prepared under State legislation and the decision report (including approval conditions) prepared by NSW DPHI.

A separate approval is granted which may include additional conditions to the State planning approval.

On 24 March 2020, amendments were made to the EPBC Act Bilateral Agreement for Major Projects to endorse the NSW Biodiversity Offset Scheme (BOS) including:

- The Biodiversity Assessment Method to assess project impacts and calculate offset requirements.
- Biodiversity Stewardship Agreements to secure offset properties.
- The Biodiversity Conservation Fund payment.

These amendments were facilitated by the Biodiversity Conservation Amendment (Controlled Actions) Regulation 2019 which effectively ensures that all nationally listed species and ecological communities are offset on a 'like for like' basis. It is important to note however that the entity being offset must be also listed in NSW in

order to use the BOS. Nationally listed entities not listed in NSW must apply the EPBC Act environmental offsets policy.

2.4 Local development under Part 4

Some TfNSW projects require development consent under Part 4 of the EP&A Act.

This includes State Significant Development (SSD) (see Section 2.5 below) and local developments that require consent by a Council or local planning panel under the relevant environmental planning instrument.

An environmental planning instrument (or Regulations) may also classify some local developments as designated development which means that an EIS must accompany the application for development consent.

The BC Act requires that local developments, including designated developments, must assess whether the proposed development:

a) Will exceed the biodiversity offset scheme thresholds (Section 7.4 BC Act, Clause 7.1 of the Biodiversity Conservation Regulation 2017). This involves clearing of native vegetation that exceeds the area thresholds listed in clause 7.2 of the Biodiversity Conservation Regulation 2017; or

b) Will clear native vegetation (or other action prescribed by clause 6.1) on land included on the Biodiversity Values Map (7.3 of the Biodiversity Conservation Regulation 2017); or

c) Is likely to have a significant impact on threatened species and ecological communities in accordance with the 5-part test of significance – Section 7.3 BC Act.

If the development exceeds the thresholds in (a-c), the assessment must be accompanied by a BDAR prepared by an accredited biodiversity assessor and participate in the Biodiversity Offsets Scheme.

TfNSW may trigger designated development, requiring an EIS when undertaking work in an area mapped as coastal wetlands in accordance with Chapter 2 (Coastal Management) of State Environmental Planning Policy (Resilience and Hazards) 2021.

2.4.1 EPBC Act and developments under Part 4

All projects must consider the likely significance of impacts to nationally listed threatened species, migratory species and endangered ecological communities in accordance with the Matters of National Environmental Significance: Significant impact guidelines 1.1 (DoE 2013).

Where a significant impact is likely, a controlled action referral must be made to the Cth DCCEEW and the approval of the Cth DCCEEW obtained if required. While this can occur any time prior to project impacts, the referral process should be timed

to coincide with the NSW approval process so that approval conditions can be aligned across NSW and Commonwealth processes.

The EPBC Act strategic assessment approval does not extend to road projects considered under Part 4.

Please contact Biodiversity Specialists for further information as required.

2.5 State Significant Development (SSD)

Some types of development are deemed to have State significance due to the size, economic value or potential impacts that a development may have. State Significant Development (SSD) projects are assessed under Division 4.7 of the EP&A Act.

SSD is identified either by a SEPP (Section 4.36(2)) or by a Ministerial planning order (Section 4.36(3)) and the provisions of State Environmental Planning Policy (Planning Systems) 2021.

The Minister for Planning or the Independent Planning Commission are the consent authorities for SSD projects. An environmental impact statement (EIS) is prepared to assess environmental impacts (Section 4.12(8)).

The content of the biodiversity assessment to support the SSD projects is prescribed by the BC Act (Section 7.9) and is included in the Secretary's Environmental Assessment Requirements (SEARs). The BDAR forms part of the EIS and is placed on public exhibition.

Unless a waiver has been granted, a BDAR will have to be prepared with the EIS. The BDAR must be prepared by an accredited assessor in accordance with the BAM. SEARs will also require that aquatic species, populations and communities are assessed in accordance with *the* Policy and guidelines for fish habitat conservation and management (DPI 2013).

The requirement to prepare a BDAR may be waived in certain circumstances. See Section 2.3 for further information about the BDAR waiver process.

EPBC Act and State Significant Development

All SSD projects must consider the likely significance of impacts to nationally listed threatened species, migratory species and endangered ecological communities in accordance with the Matters of National Environmental Significance: Significant impact guidelines 1.1 (DoE 2013).

Where a significant impact is likely, a controlled action referral must be made to the Cth DCCEEW and the approval of the Cth DCCEEW obtained if required. While this can occur any time prior to project impacts, the referral process should be timed to coincide with the NSW approval process so that approval conditions can be aligned across NSW and Commonwealth processes.

SSD projects can also be considered under the EPBC Act assessment bilateral agreement.

The EPBC Act strategic assessment approval for road projects does not extend to SSD.

Please contact Biodiversity Specialists for further information as required.

2.6 Transport projects within the CPCP

The Cumberland Plain Conservation Plan (CPCP) is a strategic conservation plan that results in additonal planning and assessment requirements for certain projects in Western Sydney, whilst also removing the normal biodiversity assessment requirements for infrastructure projects on biodiversity certified lands. The CPCP was approved by the NSW Government in August 2022 and the Commonwealth Government in March 2024.

All TfNSW REF proposals within the 'CPCP area' must now adhere to the biodiversity assessment requirements applying to the different land categories. The flowchart in Appendix A steps out the additional requirements for each land category. Mapping of the different land categories can be viewed on the CPCP spatial viewer.

TfNSW Major Projects within the CPCP should note in their SEARs application if the project is in a Major Transport Corridor (i.e certified or strategically assessed only). Assessment requirements for these projects will be set out in the SEARs.

The Western Sydney strategic assessment approval for transport projects defines four projects for which EPBC Act referrals are not required. Transport projects as defined in the Cumberland Plain Conservation Plan including all activities associated with the design, construction and operation of:

- Metro rail line extension from Western Sydney Aerotropolis to Macarthur (except for those areas in the South West Growth Area).
- Western Sydney Freight Line.
- M7 /Ropes Crossing Link Road.
- Outer Sydney Orbital between Box Hill and the Hume Motorway near Menangle.

These projects must however implement the commitments set out in the DPIE and TfNSW MOU, including the Schedule B – CPCP commitments and actions relevant to TfNSW.

3. Biodiversity assessment process

3.1 Level of assessment

All SSI/SSD projects and certain Part 4 developments must be accompanied by a BDAR unless a BDAR waiver has been obtained – See sections 2.3 - 2.5. Biodiversity assessment requirements for Part 4 applications that have not triggered BDAR requirements should be established in consultation with the relevant consent authority.

Each Part 5, Division 5.1 project determined by TfNSW must decide on the appropriate level of biodiversity assessment given the nature of the site, the scale of the project and our existing knowledge of the environment of the proposed project. Table 3-1 provides guidance to assist this decision-making process based on the risk of threatened species, threatened ecological communities and other biodiversity values being present.

The level of assessment will also influence the documentation prepared. Each project must decide if a standalone biodiversity report (e.g. BDAR, BAR or Preliminary Biodiversity Investigation Report) is necessary to document the assessment. Alternatively, where impacts are expected to be small, it may be suitable for the biodiversity assessment to be included in the applicable section of the minor works REF.

Projects can use the following desktop mapping resources combined with local knowledge and field inspection/s determine the environmental context of the site:

- NSW State Vegetation Type Map (click link to view in the SEED portal) shows modelled mapping of native plant community types (PCTs) across all NSW.
- Fisheries NSW Spatial Data Portal (click link to view DPI portal) – shows mapped aquatic habitats such as coastal management areas and key fish habitat.

Table 3-1: Guidance for the appropriate level of biodiversity assessment for REF projects

Environmental context	Appropriate level of assessment	Personnel	Documentation
Cleared land	Field inspection and review of relevant databases/past reports	Person with general experience in environmental assessment and management	Include assessment outcomes as part of the environmental impact documentation.
Built structures	Field inspection and review of relevant databases/past reports Where microbat habitat potentially present, see TfNSW Microbat Guidelines	Person with general experience in environmental assessment and management Where microbat habitat potentially present, refer to TfNSW Microbat Guidelines	Include assessment outcomes as part of the environmental impact documentation. A separate Microbat Management Plan may be warranted – see TfNSW Microbat Guidelines
Introduced tree species/vegetation Disturbed native vegetation, or scattered native trees	Field inspection and potentially vegetation survey and threatened species survey, review of relevant databases/past reports	Person with terrestrial ecological expertise and experience	Prepare a preliminary biodiversity investigations report and attach to the environmental assessment documentation prepared for the project. A template preliminary biodiversity assessment report is at Resource 3. **OR** Include the biodiversity assessment outcomes from the investigation into the relevant chapter of the environmental assessment documentation.
Intact native vegetation with species in all structural layers	Vegetation survey and assessment and potentially threatened species survey	Person accredited under the BC Act	Include BAR in environmental assessment documentation. Resource 4 provides a BAR template.

Environmental context	Appropriate level of assessment	Personnel	Documentation
			If this assessment concludes that a significant impact is likely, then a BDAR is required
Degraded aquatic habitats including creeks, rivers, streams, marine environments not mapped as key fish habitat	Field inspection and review of relevant databases/past reports	Person with general experience in environmental assessment	Prepare a preliminary biodiversity investigations report and attach to the environmental assessment documentation prepared for the project. A template preliminary biodiversity assessment report is at Resource 3. **OR** Include the biodiversity assessment outcomes from the investigation into the relevant chapter of the environmental assessment documentation.
Relatively intact and intact aquatic habitats including creeks, rivers, streams, marine environments – including mapped key fish habitat	Field inspection including underwater survey and assessment, review of relevant databases/past reports	Person qualified and experienced in aquatic assessment	BAR if terrestrial impacts also anticipated Stand-alone aquatic assessment report if aquatic impacts are the only anticipated impact

3.2 Engaging a contractor

Where a stand-alone BAR is being prepared (as per Table 3-1) for a Part 5, Division 5.1 REF project, a standard brief is available to assist the process of engaging a contractor (See Resource 1).

Where a BDAR is required for an SSI project, a standard brief is available to assist the process of engaging a contractor (See Resource 2). REF projects that require a BDAR will need to slightly modify this brief to suit.

Both briefs include requirements that assessments be undertaken in accordance with either the REF BAR template (Resource 4) or BDAR template (Resource 5). The text within these briefs relating to the planning pathway can be amended as necessary for SSD and local developments requiring an EIS and BDAR or for REFs requiring a BDAR.

A standard brief has not been developed for preliminary biodiversity investigations (See Table 3-1). The preliminary biodiversity investigation template at Resource 3, however, can be used as the basis for a reverse brief.

In an effort to improve the process of contracting ecological expertise, the Environment and Sustainability Branch has created a database of ecological consultants to facilitate Project Managers contacting other Project Managers (and other proponents) so they can discuss their experiences of the services delivered. You can find the ecological consultants database on the Environment and Sustainability SharePoint or contact the Biodiversity Specialists.

The contractor's methods, personnel and assessment approach should be reviewed by environment staff.

TfNSW Biodiversity Specialists are available to participate in the tender assessment and assist in the preparation of tender documentation.

3.3 Ecological field survey requirements

There are statutory requirements and related guidelines that must be met for certain types of developments and activities as per Table 3-2.

Table 3-2: Ecological field survey requirements and related guidelines

Type of project	NSW and Commonwealth survey requirements
Any project requiring a BDAR	Surveys to be undertaken in accordance with the BAM and relevant survey guidelines
Any project requiring an SIS	Surveys to be undertaken in accordance with the Environment Agency Head's requirements
Any project triggering the EPBC Act including the strategic assessment approval	Surveys to be undertaken in accordance with a Cth DCCEEW endorsed methodology (i.e. BAM) and relevant EPBC Act survey guidelines

A list of survey guidelines can be found at Section 3.4 of these Guidelines.

NSW and Commonwealth guidelines recommend that surveys to be undertaken when the species is most likely to be detected, which for most species is during spring and summer. It is important to establish as early as possible in the planning process key species to target for seasonal surveys and the implications of these on project timeframes.

Should you need to check seasonal survey constraints for your project check NSW DCCEEW's Bionet database or contact the TfNSW Biodiversity Specialists.

The standard biodiversity assessment report (BAR) template (Resource 4) has been prepared on the basis that vegetation and threatened species survey will be undertaken in accordance with Stage 1 of the BAM. This allows for the biodiversity assessment to be converted to a BDAR should significant impacts be likely without requiring additional seasonal surveys.

The BAR template requires that all species-credit species listed under the BC Act with a moderate to high likelihood of occuring are targeted by surveys in accordance with relevant survey guidelines. The BAR template also requires that the survey requirements for all threatened species listed under the EPBC Act be considered in accordance with the relevant Commonwealth survey guidelines.

As at July 2022, there are 26 species listed as threatened under the EPBC Act that are classified as ecosystem-credit species (12 species) and dual-credit species (16 species) under the BAM. In accordance with the BAM, targeted survey is not required for ecosystem-credits species and is only required for dual-credit species where breeding habitat has been identified. For these EPBC Act species that are being assessed as ecosystem-credit species (this includes dual-credit species where there is no breeding habitat), Commonwealth guidelines should be considered noting that survey is unlikely to be required and presence may be assumed (noting that TfNSW offset thresholds only apply to species credit species). It is also important that Commonwealth survey requirements are considered for species listed under the EPBC Act that are not listed under the BC Act (around 37 species).

If insufficient survey (i.e., survey that is not in accordance with seasonal requirements and survey guidelines) is completed for any species-credit species (or species listed only under the EPBC Act) with a moderate to high likelihood of occurring, then it may necessary to assume the species is present… Surveys can then be undertaken post REF determination and pre-construction and the likelihood of significant impacts re-assessed. This would require specific safeguards in the BAR detailing this process. It is noted, however, that this approach is not ideal due to the risk of a late finding of significant impacts and consequent requirement to prepare a BDAR, exhibit it and acquit all required offsets prior to project impacts. An alternative approach to compliant survey is to engage a species expert (where available) to review the habitat suitability assessment and confirm it's findings.

Any species-credit species that are associated with PCTs present within a project footprint (i.e. candidate species from the BAM-C) must provide appropriate justification based on fieldwork when assigning a 'low' or 'unlikely' likelihood of occurance based on habitat suitability assessment alone. See EMF-BD-GD-0010-TT4 Biodiversity assessment report for REF template Appendix B Habitat suitability assessment. If this cannot be provided, then the presence of the species may need to be assumed and impacts assessed accordingly.

Should the assessment conclude that significant impacts are likely (thus triggering the need for a SIS with DCCEEW concurrence or a BDAR), then consultation should occur with TfNSW Biodiversity Specialists.

The NSW DCCEEW Biodiversity Assessment Method Operatinal Manual Stage 1 (2022) requires that BDARs be based on field surveys undertaken within five years of the lodgement of the BDAR. This standard provides a useful guide to TfNSW in preparing BARs.

Where addendum REFs are being prepared, field survey should be revisited where notable changes have occurred in the environment (e.g. recent clearing), new threatened species or ecological communities listed or new legislative or policy requirements introduced.

3.4 Templates for assessment

To promote consistency between TfNSW projects, biodiversity assessments should be completed in accordance with the following templates:

- Template for preliminary biodiversity investigations report (Resource 3 of these Guidelines).
- Template for Biodiversity Assessment Report (BAR) for REFs (Resource 4 of these Guidelines).
- Template for Biodiversity Development Assessment Report (BDAR) for SSIs (Resource 5 of these Guidelines).

The Biodiversity Specialists are available to review biodiversity assessments prior to exhibition. This can be particularly helpful when:

- The assessment concludes that significant impacts on NSW listed threatened species and ecological communities are likely thus triggering the need for an SIS or BDAR (REF projects).
- The assessment concludes that significant impacts on nationally listed threatened species and ecological communities is likely thus triggering the need for an EPBC Act referral (SSI projects/bilateral) or triggering the EPBC Act strategic assessment approval (REF road project) or triggering the EPBC Act controlled action provisions (REF non-road projects).
- A BDAR has been prepared (including all SSI and SSD projects with no BDAR waiver).
- Novel and/or untested mitigation strategies are proposed (any project).
- A microbat management plan has been prepared (any project).
- Where landscape-scale impacts are identified and a wildlife connectivity strategy is required.
- Offsetting or conservation measures are required and a Biodiversity Offset Strategy is being prepared (any project).
- Tree and hollow replacement is required and a Tree and Hollow Replacement Plan is being preapred (any project).

3.5 Guidelines and spatial databases

Table 3-3 lists TfNSW, NSW DCCEEW and Cth DCCEEW biodiversity guidelines that are relevant to biodiversity assessment.

Table 3-3: Biodiversity guidelines and spatial databases

Transport for NSW Guidelines – available on the intranet or by request	
Transport for NSW guidelines for protecting and managing biodiversity during construction	Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (EMF-BD-GD-0039).
Transport for NSW guidelines for assessing biodiversity in accordance with relevant legislation	Biodiversity assessment guidelines EMF-BD-GD-0010 (this document) and five resources. Available at Biodiversity (SharePoint.com).

Routine and minor works environmental assessment procedure (roads and maritime activities only)	Environmental Assessment Procedure for Routine and Minor Works. Available at Environmental Planning and Assessment (SharePoint.com).
Project REF environmental assessment procedure (roads and maritime activities only)	Environmental Assessment Procedure Project review of environmental factors. Available at Environmental Planning and Assessment (SharePoint.com).
State Significant Infrastructure environmental assessment procedure (roads and maritime activities only)	Environmental assessment procedure State significant infrastructure. Available at Environmental Planning and Assessment (SharePoint.com).
Transport for NSW guidelines to assist in the provision of connectivity measures for fauna	Roads and Traffic Authority (RTA) (2011), Draft Wildlife Connectivity Guidelines. *[This document is under active review: Please contact Biodiversity Specialists].* Koala connectivity report and associated monitoring reports (Available from the TfNSW website).
Transport Biodiversity Policy and supporting Guidelines	Transport Biodiversity Policy 2022. No Net Loss Guidelines (EMF-BD-GD-0011) and 11 resources. Tree and Hollow Replacement Guidelines (EMF-BD-GD-0129) and three resources. Available at Biodiversity (SharePoint.com).
Transport for NSW guideline for projects involving structures with microbats	Microbat Management Guidelines (EMF-BD-0012) (nsw.gov.au) A guide for undertaking works in culverts, bridges and other structures. Managing microbats factsheet (EMFBD-FS-0164)
Best practice examples of bat management plans	Supporting information to the Microbat Management Guidelines Available at Biodiversity (SharePoint.com).
Significant impact guidelines – NSW and Commonwealth	
NSW DCCEEW guidelines for Part 5 Division 5.1 assessments	Guidelines for Division 5.1 assessments (nsw.gov.au)
NSW significant impact guidelines – terrestrial biodiversity	Office of Environment and Heritage (OEH) (2018), Threatened Species Test of Significance Guidelines
NSW significant impact guidelines – aquatic biodiversity	Threatened Species Assessment Guidelines - Assessment of Significance (nsw.gov.au)
EPBC Act significant impact guidelines	Commonwealth of Australia (2013a), Matters of National Environmental Significance Significant Impact Guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999*
NSW DCCEEW field survey guidelines	
NSW threatened species survey and assessment guidelines (draft)	Department of Environment and Conservation (2004), Threatened biodiversity survey and assessment. Guidelines for developments and activities (working draft)
NSW guidelines for Amphibian survey	Department of Environment and Climate Change (2009), Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians
NSW DCCEEW Biodiversity Assessment Method and field survey guidelines **See Assessor resources | NSW Environment and Heritage for a complete list of assessor resources**	
Biodiversity Assessment Method	DPIE (2020), Biodiversity Assessment Method

Manual to assist accredited assessors apply Stage 1 of the BAM	DPIE (2020), Biodiversity Assessment Method Operational Manual – Stage 1
Manual to assist accredited assessors apply Stage 2 of the BAM	DPE (2023), Biodiversity Assessment Operational Manual Stage 2
NSW guide to BAM threatened plant survey	DPIE (EES) (2020), Surveying threatened plants and their habitats. NSW survey guide for the Biodiversity Assessment Method
NSW Guide for BAM threatened bat survey	OEH (2018), 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method
Koala Biodiversity Assessment Method Survey Guide	Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide | NSW Environment and Heritage
NSW guide for decision makers dealing with SAII impacts	DPIE (EES) (2019), Guidance to assist a decision-maker to determine a serious and irreversible impact
NSW Survey Guide for Threatened Frogs	DPIE (EES) (2020), NSW Survey Guide for Threatened Frogs A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method
Threatened Reptiles Biodiversity Assessment Method Survey Guide	Threatened reptiles: Biodiversity Assessment Method survey guide (nsw.gov.au)
Commonwealth DCCEEW field survey guidelines	
Bat survey	Commonwealth of Australia (2010), Survey Guidelines for Australia's Threatened Bats
Bird survey	Commonwealth of Australia (2010), Survey Guidelines for Australia's Threatened Birds
Frog survey	Commonwealth of Australia (2011), Survey Guidelines for Australia's Threatened Frogs
Mammal survey	Commonwealth of Australia (2011), Survey Guidelines for Australia's Threatened Mammals
Reptile survey	Commonwealth of Australia (2011), Survey Guidelines for Australia's Threatened Reptiles
Fish survey	Commonwealth of Australia (2011), Survey guidelines for Australia's threatened fish
Orchid survey (draft)	Survey Guidelines for Australia's Threatened Orchids
NSW Department of Primary Industries Guidelines	
NSW guidelines for groundwater dependent ecosystems	Risk Assessment Guidelines for Groundwater Dependent Ecosystems
NSW policy, assessment, survey and management guidelines for fish	Policy and guidelines for fish habitat conservation and management (DPI 2013) and Threatened Species Assessment Guidelines - Assessment of Significance (nsw.gov.au)

Spatial databases	
BioNet - species sightings	About BioNet Atlas | NSW Environment and Heritage
National Protected Matters Search Tool	Protected Matters Search Tool: Interactive Map (awe.gov.au)
NSW DPI Fisheries Spatial Data Portal	Fisheries Spatial Data Portal (nsw.gov.au)
Biodiversity Values Map under Part 7 of the BC Act	Biodiversity Values Map | Dataset | SEED (nsw.gov.au)
Coastal management areas identified by Chapter 2 (Coastal Management) of State Environmental Planning Policy (Resilience and Hazards) 2021	State Environmental Planning Policy (Resilience and Hazards) 2021 | Dataset | NSW Planning Portal
Core Koala Habitat identified by State Environmental Planning Policy (Biodiversity and Conservation) 2021	State Environmental Planning Policy (Biodiversity and Conservation) 2021 - NSW Legislation
Groundwater Dependent Ecosystems Atlas	GDE Atlas Map: Water Information Bureau of Meteorology (bom.gov.au)
National Flying-fox monitoring viewer.	National Flying-fox monitoring viewer (environment.gov.au)
NSW State Vegetation Type Map	SVTM | Dataset | SEED (nsw.gov.au)
Other databases	
Ecological consultants' database for project managers	Available at Biodiversity (SharePoint.com).
Vegetation classification – Bionet	About BioNet Vegetation Classification | NSW Environment and Heritage
NSW Threatened Biodiversity Profile Search – Bionet	Threatened biodiversity profile search | NSW Environment, Energy and Science
Species Profile and Threats database	Species Profiles (SPRAT) (environment.gov.au)

4. Glossary

Term	Definition
Accredited person or assessor	Means as person accredited under section 6.10 (of the BC Act) to prepare reports in accordance with the BAM.
Biodiversity Assessment Method	The Biodiversity Assessment Method is established under section 6.7 of the BC Act. The BAM is established for the purpose of assessing certain impacts on threatened species and threatened ecological communities (TECs), and their habitats, and the impact on biodiversity values.
Biodiversity offsets	The gain in biodiversity values achieved from the implementation of management actions on areas of land, to compensate for losses to biodiversity values from the impacts of development (DPIE 2020a).
Biodiversity Assessment Method Calculator	Biodiversity Assessment Method Calculator (BAM-C) – the online computer program that provides decision support to assessors and proponents by applying the BAM and referred to as the BAM-C.

	The BAM-C contains biodiversity data from the BioNet Vegetation Classification and the Threatened Biodiversity Data Collection that the assessor is required to use in a BAM assessment. The BAM-C applies the equations used in the BAM, including those to determine the number and class of biodiversity credits required to offset the impacts of a development, or created at a biodiversity stewardship site. It is published by the Department (DPIE 2020a).
Biodiversity credit report	The report produced by the BAM-C that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site (DPIE 2020a).
Biodiversity Offsets and Agreement Management System	The online system used to administer the Biodiversity Offsets Scheme. The BOAMS is used by accredited assessors (to carry out specific BAM-related tasks involving access to the BAM-C to perform assessments, submit data, generate credits and calculate a credit price), by landholders (to apply for a Biodiversity Stewardship Agreement and manage ongoing reporting obligations for their agreement) and by proponents of developments (to view their credit obligation or the payment required to the Biodiversity Conservation Fund).
Biodiversity Stewardship site	Refers to land which is the subject to a Biodiversity Stewardship Agreement under the BC Act.
BioNet Atlas	The DPIE database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish (DPIE 2020a).
BioNet Vegetation classification	Refers to the vegetation community-level classification for use in vegetation mapping programs and regulatory biodiversity impact assessment frameworks in NSW. Refer About BioNet Vegetation Classification | NSW Environment and Heritage (DPE 2020a).
Construction footprint	The area to be directly impacted by the proposal during construction activities. See also definition for subject land.
Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. See EP&A Regulation Section 171
Direct impact	Direct impacts on biodiversity values include those related to clearing native vegetation and threatened species habitat and impacts on biodiversity values prescribed by BC Regulation 2017
Ecosystem credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for ecosystem credits. This is analogous with the definition of 'predicted species'.
Ecosystem credits	A measurement of the value of threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a PCT, and PCTs generally. Ecosystem credits measure the loss in biodiversity values at a development, activity, clearing or biodiversity certification site and the gain in biodiversity values at a biodiversity stewardship site (DPIE 2020a).
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component (DPIE 2020a).

Indirect impact	Impacts that occur when the proposal affects native vegetation and threatened species habitat beyond the development footprint or within retained areas (e.g. transporting weeds or pathogens, dumping rubbish). This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts (DPIE 2020a).
Key fish habitat	Habitats that are defined by Table 1 of the Fisheries NSW Policy and guidelines for fish habitat conservation and management (Update 2013). Key fish habitat mapping has been developed by DPI and available via the Fisheries Spatial Data Portal to "*Include all marine and estuarine habitats up to highest astronomical tide level (that reached by 'king' tides) and most permanent and semipermanent freshwater habitats including rivers, creeks, lakes, lagoons, billabongs, weir pools and impoundments up to the top of the bank.* *Small headwater creeks and gullies (known as first and second order streams), that only flow for a short period after rain are generally excluded, as are farm dams constructed on such systems. Wholly artificial waterbodies such as irrigation channels, urban drains and ponds, salt and evaporation ponds are also excluded except where they are known to support populations of threatened fish or invertebrates.*"
Local population	The population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions: – *The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area.* – *The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.* – *The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time or return year to year (OEH 2018).*
Matter of national environmental significance	A matter of national environmental significance (MNES) is any of the nine defined components protected by a provision of Part 3 of the EPBC Act (Commonwealth).
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (DPIE 2020a).
Mitigation	Action to reduce the severity of an impact.
Native vegetation	Has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act. In summary, a) trees (including any sapling or shrub or any scrub) b) understorey plants c) groundcover (being any type of herbaceous vegetation) d) plants occurring in a wetland. A plant is native to New South Wales if it was established in New South Wales before European settlement (BC Act). Native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). Marine vegetation is covered by the provisions of the FM Act.

Operational footprint	The area that will be subject to ongoing operational impacts from the proposal. This includes the road, surrounding safety verges and infrastructure, fauna connectivity structures and maintenance access tracks and compounds.
Patch size	An area of native vegetation that: – *occurs on the development site or biodiversity stewardship site* – *includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems).* Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site (DPIE 2020a).
PlantNET	An online database of the flora of New South Wales which contains currently accepted taxonomy for plants found in the State, both native and exotic.
Population	A group of organisms, all of the same species, occupying a particular area (DPIE 2020a).
Spatial datasets	Spatial databases required to prepare a BDAR – BioNet NSW (Mitchell) Landscapes – Version 3.1 – NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7 – NSW soil profiles – hydrogeological landscapes – acid sulfate soils risk – digital cadastral database – Vegetation Information Systems maps – Geological sites of NSW.
Species credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for species credits (DPIE 2020a). This is analogous with the definition of 'candidate species'.
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection (DPIE 2020a).
Species polygon	An area of land identified in Chapter 5 (of the BAM) that contains habitat or is occupied by a threatened species (DPIE 2020a).
Subject land	Land subject to a development, activity, clearing, biodiversity certification or a biodiversity stewardship proposal. It excludes the landscape assessment area which surrounds the subject land (i.e., the area of land in the 1500 m buffer zone around the subject land or 500m buffer zone for linear proposals). In the case of a biodiversity certification proposal, subject land includes the biodiversity certification assessment area (DPIE 2020a). See also definition for construction footprint.
Study area	The area directly affected by the proposal (subject land or construction footprint) and any additional areas likely to be affected by the proposal, either directly or indirectly.
Threatened Biodiversity Data Collection	A publicly assessable online database (registration required) which contains information for listed threatened species, populations and ecological communities (DPIE 2020a). Part of the BioNet database, published by the DCCEEW and accessible from the BioNet website at www.bionet.nsw.gov.au.

Vegetation integrity (score)	The condition of native vegetation assessed for each vegetation zone against the benchmark for the PCT. The vegetation integrity score is the quantitative measure of vegetation condition calculated by the BAM-C (DPIE 2020a).
Vegetation zone	A relatively homogeneous area of native vegetation on a development site, clearing site, land to be biodiversity certified or biodiversity stewardship site that is the same PCT and has the same broad condition state (DPIE 2020a).

5. Abbreviations

Term	Definition
AOBV	Area of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method calculator
BC Act	*Biodiversity Conservation Act 2016 (NSW)*
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BCS	Biodiversity, Conservation and Science Group within the NSW Department of Climate Change, Energy, the Environment and Water
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offset Scheme
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
CPCP	Cumberland Plain Conservation Plan
DCCEEW (Cth)	Commonwealth Department of Climate Change, Energy, the Environment and Water
DCCEEW (NSW)	NSW Department of Climate Change, Energy, the Environment and Water (formerly part of the Department of Planning and Environment)
DPHI	NSW Department of Planning, Housing and Industry (formerly part of the Department of Planning and Environment)
DPI	Department of Primary Industries within the NSW Department of Primary Industries and Regional Development (DPIRD)
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
Fisheries NSW Policy and guidelines	Fisheries NSW Policy and guidelines for fish habitat conservation and management (Update 2013)
FM Act	*Fisheries Management Act 1994* (NSW)
GDE	Groundwater dependent ecosystems
MNES	Matters of national environmental significance
PCT	Plant community type
PMST	Protected Matters Search Tool
REF	Review of Environmental Factors
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TBDC	Threatened Biodiversity Data Collection
TECs	Threatened ecological communities (VECs, EECs and CEECs)
TfNSW	Transport for NSW
VEC	Vulnerable Ecological Community

6. References

Commonwealth of Australia (2010a), Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act - DCCEEW.

Commonwealth of Australia (2010b), Survey guidelines for Australia's threatened birds (awe.gov.au).

Commonwealth of Australia (2011a), Survey Guidelines for Australia's threatened frogs (awe.gov.au).

Commonwealth of Australia (2011b), Survey guidelines for Australia's threatened mammals (awe.gov.au).

Commonwealth of Australia (2011c), Survey guidelines for Australia's threatened reptiles (awe.gov.au).

Commonwealth of Australia (2011d), Survey guidelines for Australia's threatened fish (awe.gov.au).

Commonwealth of Australia (2013a), Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (awe.gov.au) Environment Protection and Biodiversity Conservation Act 1999.

Commonwealth of Australia (2013b), Draft survey guidelines for Australia's threatened orchids (awe.gov.au).

Department of Environment and Climate Change (2009), Threatened species survey and assessment guidelines: field survey methods for fauna. Amphibians. (nsw.gov.au).

Department of Environment and Conservation (2004) Threatened biodiversity survey and assessment guidelines for developments and activities (working draft).

Department of Environment, Climate Change and Water (2009), Sensitive species data policy | NSW Environment and Heritage.

DPI (2008), Threatened Species Assessment Guidelines: The Assessment of significance. Available on the DPI (Fisheries) website: Threatened Species Assessment Guidelines - Assessment of Significance (nsw.gov.au).

DPI (2012), Risk Assessment Guidelines for Groundwater Dependent Ecosystems. Available for download from researchgate.net.

DPI (2013), Policy and guidelines for fish habitat conservation and management (Update 2013) (nsw.gov.au).

DPIE (2020a), Biodiversity Assessment Method (nsw.gov.au).

DPIE (2020b), NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method.

DPIE (2020c), Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method.

DPE (2022a), Biodiversity Assessment Method 2020 Operational Manual – Stage 1 (nsw.gov.au).

DPE (2022b), Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide | NSW Environment and Heritage.

DPE (2022c), Threatened reptiles Biodiversity Assessment Method Survey Guide

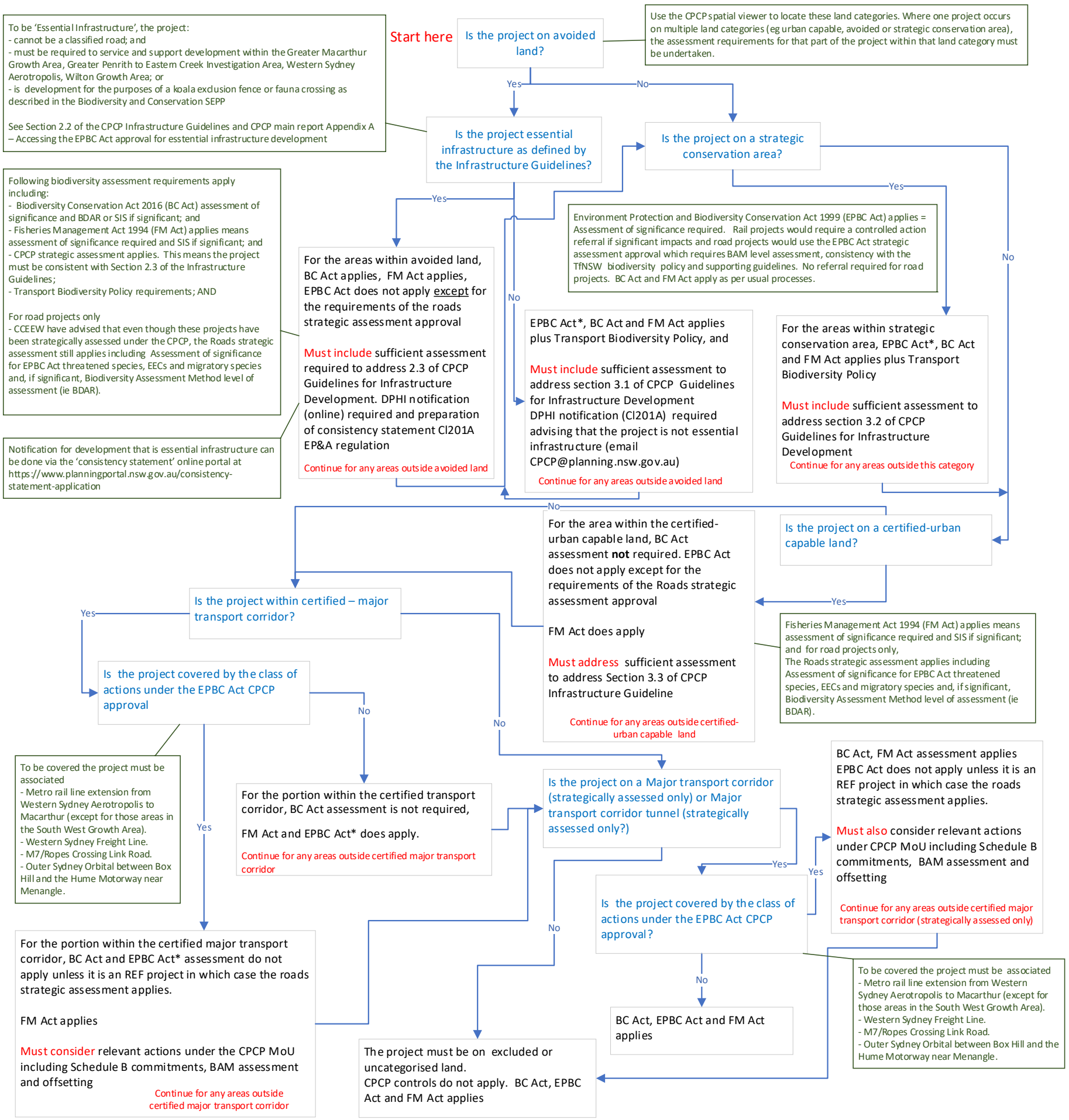
DPE (2023), Biodiversity Assessment Method Operational Manual - Stage 2 (nsw.gov.au).

OEH (2017b), Guidance to assist a decision-maker to determine a serious and irreversible impact (nsw.gov.au).

OEH (2018), 'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method.

TfNSW (2024), Biodiversity Management Guidelines: Protecting and managing biodiversity on Transport for NSW projects (2024). Available at Biodiversity Management Guidelines (SharePoint.com)..

Appendix A: CPCP flowchart - REF projects



*EPBC Act applies means either making a referral to Cth CCEEW for any significant impacts to nationally listed species and communities or (for road projects) the Strategic assessment approval for roads projects applies
** There are no other land categories left within the CPCP.

Notes and links

This flowchart details the biodiversity assessment requirements of the Cumberland Plain Conservation Plan (CPCP), *Environmental Planning and Assessment Act 1979* (EP&A Act), *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* and the *Environment Protection and Biodiversity Conservation Act 1999* Cth (EPBC Act) for REF projects within CPCP area.

Maps referred to in the flowchart can be found at the CPCP spatial viewer. EP&A Regulation Division 7, 201A, CPCP Infrastructure guidelines, Cumberland Plain Conservation Plan, CPCP Sub-Plan A: Conservation program and implementation and CPCP Sub-Plan B: Koalas, Order conferring strategic biodiversity certification CPCP and EPBC Act strategic approval, TfNSW and DPIE MOU Schedule B – CPCP commitments and actions relevant to TfNSW, Essential infrastructure on avoided land notification and consistency statement.

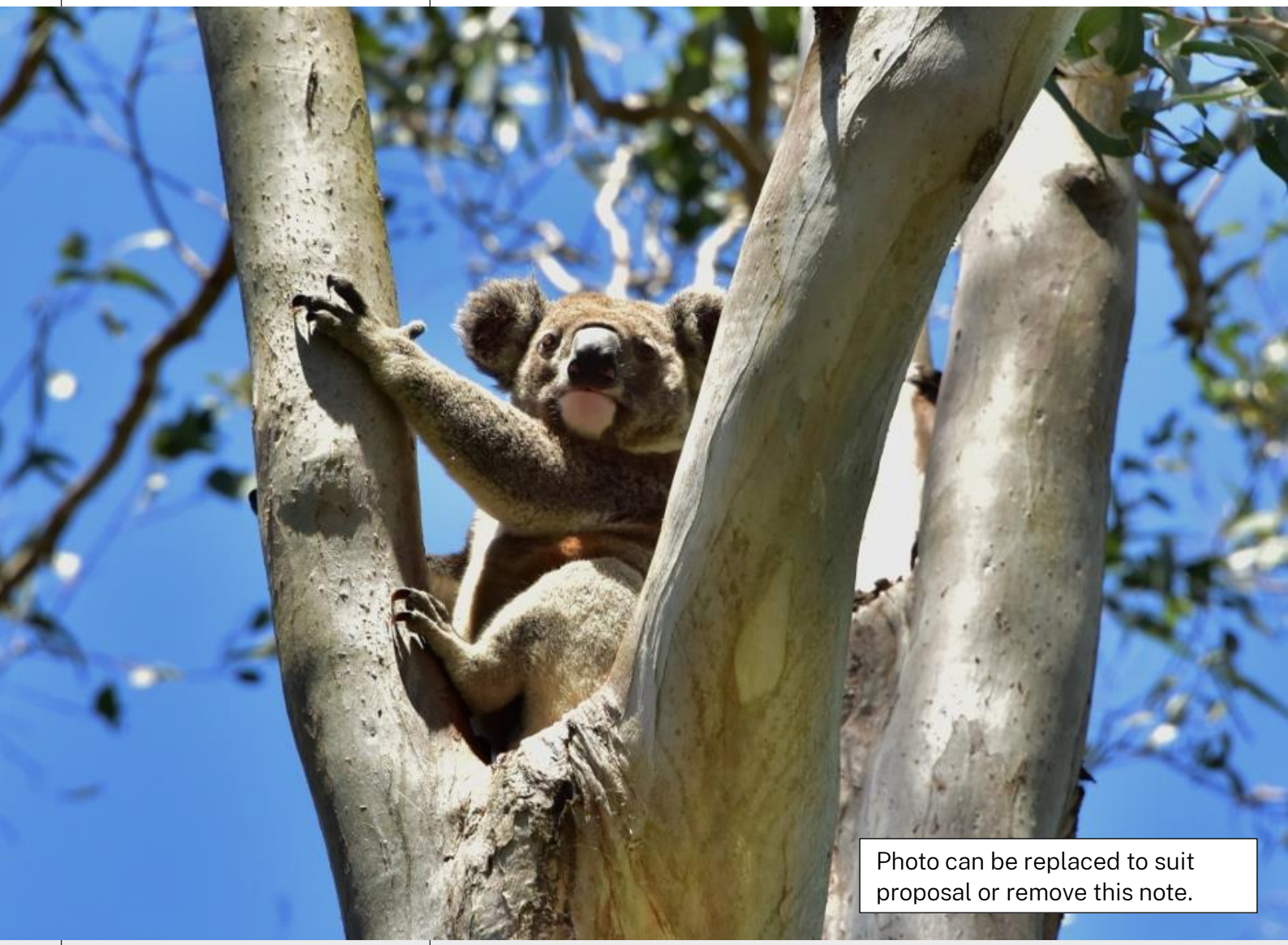
NSW GOVERNMENT

Transport
for NSW

Name of proposal

Brief: Biodiversity assessment report for a review of environmental factors (REF)

Month Year



NSW GOVERNMENT

transport.nsw.gov.au

Document control

Document owner	Senior Specialist (Biodiversity)
Approved by	Executive Director / Environment and Sustainability
Branch / division	Environment and Sustainability / Safety, Environment and Regulation
Review date	May 2026
Parent document	**EMF-BD-GD-0010 Biodiversity Assessment Guidelines**

Version	Date	Amendment notes
1.0	Nov 2021	First issue
2.0	Feb 2023	Minor amendments and addition of new GIS specification for biodiversity assessments and template file structure
3.0	May 2024	Minor amendments

This template should be read in conjunction with EMF-BD-GD-0010 Biodiversity Assessment Guidelines.

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Table of contents

Before issuing brief, remove previous page then update table of contents.

1. Objective

Transport for NSW (TfNSW) requires qualified personnel to prepare a Biodiversity Assessment Report (BAR) for the [insert proposal name] project. Where terrestrial biodiversity impacts are anticipated, TfNSW requires that the biodiversity assessment be prepared by, or under the supervision of, a person accredited under Section 6.10 *Biodiversity Conservation Act 2016*.

The biodiversity assessment forms part of the Review of Environmental Factors (REF) that is being prepared to fulfil the requirements of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), and to take into account all matters affecting or likely to affect the environment as a result of the proposal. The REF will be placed on public display. The biodiversity assessment will be displayed as an appendix to the REF [delete if no exhibition proposed].

The assessment will identify and assess the likely impacts to species and ecological communities listed as threatened under the *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and where relevant, the requirements of the *Biosecurity Act 2015*, and relevant State Environmental Planning Policies (SEPPs).

The assessment will also consider whether any Transport Biodiversity Policy thresholds have been met for the provision of biodiversity offsets, conservation measures or tree and hollow replacement.

2. Key issues

Insert any background information to set the scene for the works. This might include a brief description of the site and surrounding locality, any issues arising from community consultation or preliminary environmental assessment and any known biodiversity constraints.

Detail any additional specific information that could be provided to the tenderer to assist in the response to this brief. This could include any biodiversity assessments previously completed, aerial photography etc.

Ensure that the biodiversity assessment report (BAR) template (EMF-BD-GD-0010-TT4) is appended to this brief.

3. Tasks

The biodiversity assessment is to be completed in line with the TfNSW Biodiversity Assessment Guidelines (EMF-BD-GD-0010) including the Biodiversity Assessment Report (BAR) template (EMF-BD-GD-0010-TT4).

TfNSW requires survey and assessment to closely follow the Biodiversity Assessment Method (DPIE 2020) for REF projects that require a BAR. This includes the use of the BAM Calculator (BAM-C) to guide the development of targeted threatened species surveys, and to calculate vegetation integrity scores, biodiversity risk weighting (BRW) and preliminary credit calculations (if offsetting is required). The BAR must be prepared by, or under the supervision of, a person that is accredited under the BC Act.

This includes undertaking the following tasks:

3.1 Task 1: Site visit

Accompany the relevant TfNSW manager on a site visit to discuss the proposal and establish clear lines of communication.

3.2 Task 2: Database searches

Define the study area being the area likely to be directly and indirectly impacted by the proposal. Undertake full database searches and desktop review to refine target species list and field survey locations as per the BAR template.

3.3 Task 3: Field surveys

In an effort to maintain assessment consistency across TfNSW projects, field surveys are to be conducted in accordance with guidance in the biodiversity assessment report (BAR) template (EMF-BD-GD-0010-TT4), which closely aligns with Stage 1 of the Biodiversity Assessment Method (BAM) (DPIE 2020). Specifically the requirements of Chapter 4 of the BAM (vegetation assessment) and Chapter 5 of the BAM (threatened species assessment). Full details of the proposed survey effort and timing are to be included in your response.

Field surveys aim to ground-truth the results of the background research and threatened species habitat suitability assessment. Section 2.3 of the BAR template (EMF-BD-GD-0010-TT4) describes the survey and data required to assess vegetation in the study area. This includes plot-based vegetation surveys in accordance with subsection 4.3.4 of the BAM and the identification of plant community types (PCTs) and vegetation zones. This requires the use of the BAM calculator (BAM-C) to calculate the vegetation integrity (VI) score and biodiversity risk weighting (BRW) of each vegetation zone. Only assessors accredited to apply the BAM have access to the BAM-C within the Biodiversity Offsets Assessment Management System (BOAMs). However a publicly accessible version of the BAM-C is available at BAM Calculator.

With the release of the Transport Biodiversity Policy 2022, applicable TfNSW projects are now required to replace trees and hollows removed that do not require offsets in accordance with the Tree and Hollow Replacement Guidelines (TfNSW 2022), subject to exclusions. This includes amenity trees (both native and exotic). To fulfil this requirement, TfNSW requires the collection of additional specific data during biodiversity assessment surveys, to enable preliminary estimates of tree and hollow replacement requirements as part of the BAR. Chapter 2 of the BAR template contains details on the additional survey and data required, which includes counting amenity trees and a count of trees in each stem size class within applicable vegetation plots.

Threatened species survey and assessment requirements are described in Section 2.4 of the BAR template (EMF-BD-GD-0010-TT4). This specifically includes consideration all threatened 'predicted' (ecosystem-credit) and 'candidate' (species-credit) species identified by the BAM-C as requiring assessment based on the PCTs that are present. Initial field surveys are an important component of the threatened species habitat suitability assessment (as described by subsection 2.4.1 of the BAR template), which determines the threatened 'candidate' species that require further assessment by targeted surveys.

Targeted surveys should be completed for all threatened flora species identified from the desktop assessment as having a moderate to high likelihood of occurring in accordance with Section 2.4.2 of the BAR template (EMF-BD-GD-0010-TT4). It is recommended that targeted surveys are considered for all flora species identified by the BAM-C due to the difficulty in predicting their presence. Exclusion of BAM-C species based on habitat suitability (e.g. degraded habitat) must be justified in the BAR and based on a habitat survey. Flora species with a moderate to high likelihood of occurring that cannot be surveyed sufficiently must be assessed for impact significance and may require offsets (unless justified otherwise, e.g. expert report).

Targeted surveys should be completed for all threatened species-credit fauna species identified as having a moderate to high likelihood of occurring in accordance with subsection 2.4.3 of the BAR template (EMF-BD-GD-0010-TT4). The exception to this is EPBC Act listed threatened species that are either ecosystem-credit or dual-credit species under the BAM, which may not require targeted surveys following habitat suitability assessment. Species-credit fauna species that cannot be surveyed sufficiently must be assessed for impact significance and may require offsets (unless justified otherwise, e.g. expert report).

Surveys are also required to characterise the habitat value of each waterway (i.e., habitat sensitivity and classification of waterways for fish passage) in accordance with NSW DPI (Fisheries) *Policy and guidelines for fish habitat conservation and management* (2013 update).

A short report is required which summarises the surveys completed, effort and outcomes immediately upon completion of surveys. A map should accompany the letter to show any areas of biodiversity significance for avoidance. The letter must identify if any threatened biodiversity found are at risk of a significant impact from the proposal and recommendations for reducing the potential for a significant impact. Preliminary assessment of the range of mitigation measures likely to be required (such as connectivity structures) should also be included. A map should accompany the letter to show any areas of biodiversity significance for avoidance and recommendations for any additional survey work, if required. Provision should be made to brief the project team should a significant impact finding be likely.

3.4 Task 4: Prepare draft Biodiversity Assessment Report

Prepare the BAR in accordance with the BAR template (EMF-BD-GD-0010-TT4).

3.4.1 Significant impact assessments

Significant impact assessments are required for any BC Act and EPBC Act listed threatened species, populations and ecological communities that have been identified from targeted surveys (or have been assumed present) in the study area in accordance with the *Threatened Species Test of Significance Guidelines* and *EPBC Act Significant Impact Guidelines 1.1* (if applicable). If a significant impact is likely for any biodiversity values, communicate this with the relevant TfNSW manager.

3.4.2 Mitigation measures

Develop mitigation measures for all impacts identified in the impact chapter of the BAR. Where further work is required to develop mitigation (e.g. connectivity structure proposals), include a commitment to develop the relevant strategy or management plan in consultation with TfNSW. All mitigation measures should be based, at a minimum, on the TfNSW Biodiversity Management Guideline (EMF-BD-GD-0039) and draft RTA Wildlife Connectivity Guidelines.

3.4.3 Offsets and tree/hollow replacement

Identify if offsets, conservation measures or tree and hollow replacement are required for the project in accordance with the No Net Loss Guidelines (EMF-BD-GD-0011) and Tree and Hollow Replacement Guidelines (EMF-BD-GD-0129). Refer to Chapter 7 of the BAR template (EMF-BD-GD-0010-TT4) for information requirements and relevant documents relating to offsets and tree/hollow replacement.

Where relevant, undertake BAM-C credit calculations to identify credit obligations in accordance with and for those biodiversity values that meet the triggers in the BAR template (EMF-BD-GD-0010-TT4). Estimates of tree and hollow replacement requirements are to be informed by additional survey data as outlined in Chapter 2 of the BAR template.

Present the results to the TfNSW project team.

3.5 Task 5: Submit draft BAR for TfNSW comment

Present the results of the draft BAR to the TfNSW project team. TfNSW will review draft reports and provide feedback following the meeting.

3.6 Task 6: Addressing comments

Address TfNSW comments in the biodiversity assessment report and prepare a table setting out how comments have been addressed. Initiate a meeting with TfNSW should significant issues arise.

3.7 Task 7: Submit final BAR

Submit final biodiversity assessment report, plot data and spatial files to TfNSW. Lodge threatened species records with NSW DCCEEW.

4. Outputs

4.1 Reports

The report must follow the biodiversity assessment report template (EMF-BD-GD-0100-TT4) for Division 5.1 projects which is a resource supporting the TfNSW Biodiversity Assessment Guidelines (EMF-BD-GD-0010). Where a contractor seeks to amend the standard template, agreement must be obtained from TfNSW.

The draft and final copies of reports must be professionally edited and vetted for typographical and grammatical errors before submission to TfNSW. The reports must follow the TfNSW *Editorial Style Guide* (August 2022) with spelling consistent with the *Australian Macquarie Dictionary*.

All reports must be written in clear and concise plain English avoid repetition, cross reference to primary assessment reports where duplication occurs, and be as brief as possible. Jargon, acronyms and technical words must be clearly explained at the first point of reference in the reports. Acronyms that are not generally common knowledge must be avoided throughout the report and written in full. Time delays and associated costs as a result of any inadequate reports submitted to TfNSW will be the responsibility of the contractor.

The outputs required for this project include the following:

a) Electronic copy (MS Word 2013) of all required reports including all appendices and figures for TfNSW review and comment.

b) Electronic comments register for feedback and tracking.

c) Plot data, threatened species records and all digital GIS data provided to TfNSW.

d) Insert any other project output as required.

4.2 Data and figures

Figures, tables and graphs must be used instead of text descriptions where possible. Titles, scales and legends (including north points) must be included in all graphics. Digital shape files for all maps and spatial data (ESRI (shape file or geodatabase) must be provided to TfNSW in accordance with Biodiversity Assessments GIS Specification | Transport for NSW and Template file structure for Biodiversity Assessments | Transport for NSW.

Full floristic data collected at each vegetation integrity plot must be supplied in an MS Excel format spreadsheet, detailing each species, their growth form and cover in the plot.

Additionally, all data collected at each vegetation integrity plot is to be provided in a separate MS Excel format spreadsheet using the BAM-C plot data template import spreadsheet at BAM Calculator. Scanned plot data sheets (or copies of digital sheets) must also be provided as an appendix to the BAR.

5. Response to brief

The scope of the work proposed must be clearly restated in the words of the tenderer. A detailed methodology including survey timing, intensity and methods must be included with any limitations and assumptions made (e.g., number of plots to be completed).

Responses to this brief will be evaluated against the following assessment criteria:

a) **Understanding of the brief** – based on knowledge of the biodiversity issues, the location in which the project occurs and previous similar projects. The proposed detailed methodology will be reviewed to ensure that all potential biodiversity issues are covered off.

b) **Technical skills** – provide qualifications of the project team members and CVs and the proposed time members of the project team will spend on the project. Where applicable, demonstrate expertise, qualifications and experience in areas relevant to the biodiversity assessment for the project. Where terrestrial biodiversity impacts are anticipated, TfNSW requires that the biodiversity assessment be prepared by or under the supervision of a person accredited under Section 6.10 *Biodiversity Conservation Act 2016.*

   Details of personnel completing the survey work, reporting and technical review need to be included. The project team must identify the primary biodiversity assessment writer and include an accredited senior staff member who will be responsible for certifying the quality of all deliverables. Identify any sub-consultants in this section and outline their qualifications and contribution. Outline supervisory arrangements in place for effective management of all sub-consultants.

   Evidence that appropriate scientific licences, animal care and ethics approvals and BAM accreditation are held by the investigators proposed for the field survey.

c) **Recent experience** – recent relevant experience and a listing of relevant projects undertaken by the nominated project team.

d) **Estimated costs** – addressing the requirements of the brief and the estimated costs are adequate and realistic to achieve the purpose of the brief.

e) **Time performance** – including a detailed program of works and due dates.

f) **Quality assurance process** – internal quality assurance processes.

g) **Additional information** – including any other additional information that may be relevant in the selection of the successful tenderer.

6. Definitions

<INSTRUCTION: Do not include words or terms that have a commonly understood meaning -delete message.>

Term	Definition

Delete definitions if not required.

Appendix A:

Paragraph text

Delete Appendix if not required.

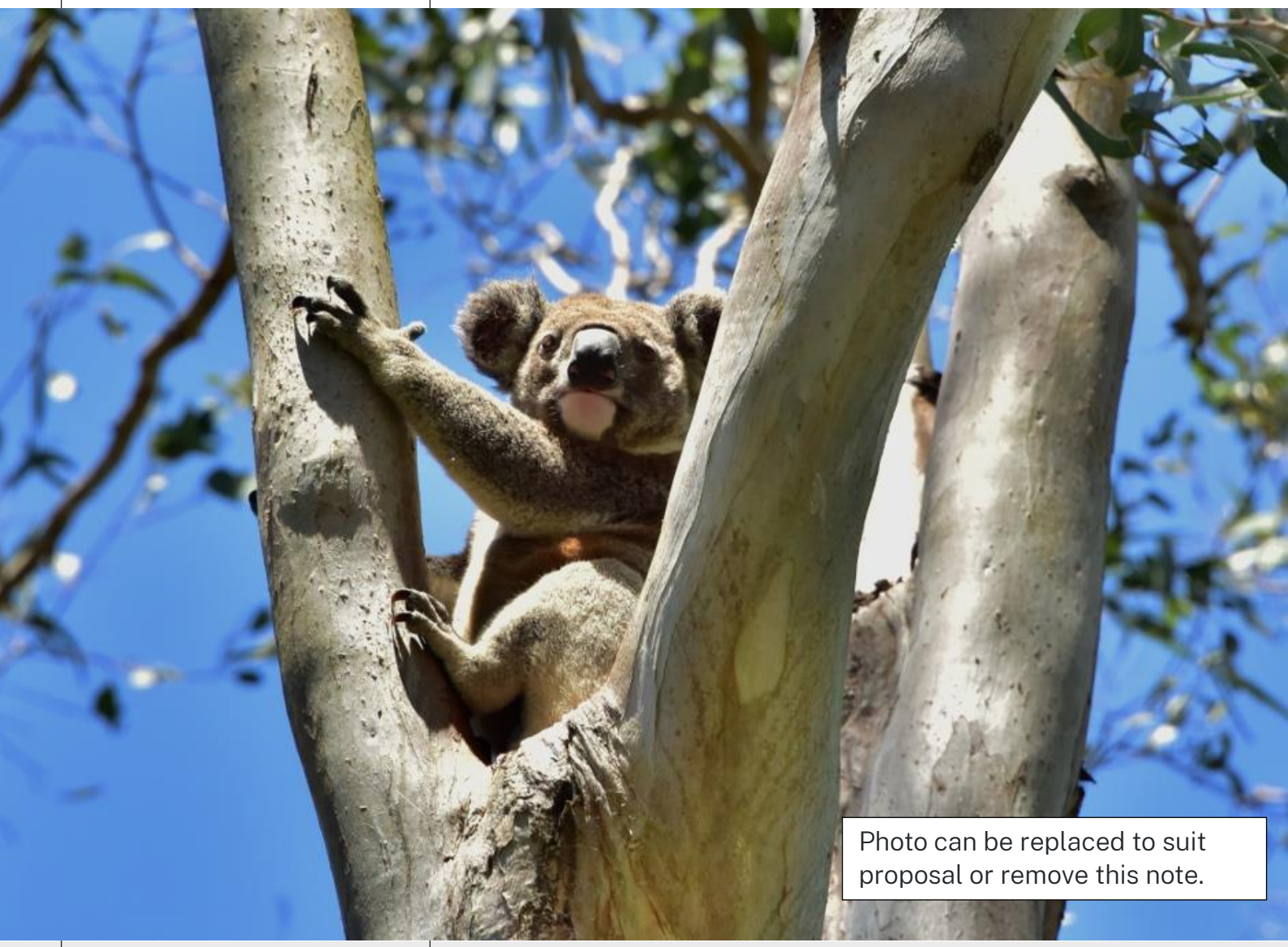
NSW GOVERNMENT

Transport
for NSW

Name of proposal

Brief: Biodiversity development assessment report for SSI

Month Year



NSW GOVERNMENT

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Document control

Document owner	Senior Specialist (Biodiversity)
Approved by	Executive Director / Environment and Sustainability
Branch / division	Environment and Sustainability / Safety, Environment and Regulation
Review date	May 2026
Parent document	**EMF-BD-GD-0010 Biodiversity assessment guidelines**

Versions

Version	Date	Amendment notes
1.0	Nov 2021	First issue
2.0	Feb 2023	Minor amendments and addition of new GIS specification for biodiversity assessments and template file structure
3.0	May 2024	Minor amendments

This template should be read in conjunction with EMF-BD-GD-0010 Biodiversity Assessment Guidelines

This page is to be deleted from the brief.

Table of contents

Before issuing brief, remove previous page then update table of contents.

1. Objective

Transport for NSW (TfNSW) requires qualified personnel to prepare a Biodiversity Development Assessment Report (BDAR) for the [insert proposal name].

The BDAR forms part of the environmental impact statement (EIS) that is being prepared to fulfil the requirements of Part 5 Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The BDAR must address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project [Appendix X – include any supplementary SEARs issued for EPBC Act controlled action referrals being assessed in accordance with the NSW bilateral assessment agreement]. The EIS will be placed on public display. The BDAR will be displayed as an appendix to the EIS.

The assessment will identify species and ecological communities listed as threatened under the *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and will address other relevant legislation including the *Biosecurity Act 2015* and relevant State Environmental Planning Policies (SEPPs).

The assessment will also consider whether any tree and hollow replacement is required in accordance with the Transport Biodiversity Policy.

2. Key issues

Insert any background information to set the scene for the works. This might include a brief description of the site and surrounding locality, any issues arising from community consultation or preliminary environmental assessment and any known biodiversity constraints.

Detail any additional specific information that could be provided to the tenderer to assist in the response to this brief. This could include any biodiversity assessments previously completed, aerial photography etc.

Include a copy of the SEARs including any requirements from the NSW Department Climate Change, Energy, Environment and Water (NSW DCCEEW) Environment and Heritage Group (EHG) and if the project is subject to the EPBC Act bilateral agreement, any supplementary SEARs issued by the NSW DCCEEW in response to the Commonwealth Department of Climate Change, Energy, Environment and Water (Cth DCCEEW) requirements.

3. Tasks

The biodiversity assessment is to be completed in line with the Biodiversity Assessment Method (DPIE 2020) and the TfNSW Biodiversity Assessment Guidelines (EMF-BD-GD-0010) including the standard Biodiversity Development Assessment Report (BDAR) for State Significant Infrastructure (SSI) template (EMF-BD-GD-0010-TT5).

This includes undertaking the following tasks:

3.1 Task 1: Site visit

Accompany the relevant TfNSW manager on a site visit to discuss the proposal and establish clear lines of communication. The site visit must be attended by the person(s) managing, writing and reviewing the BDAR.

3.2 Task 2: Database searches

Define the study area being the area likely to be directly and indirectly impacted by the proposal. Undertake full database searches and desktop review to refine target species list and field survey locations in accordance with the BDAR template.

3.3 Task 3: Field surveys

Field surveys must be undertaken in accordance with the requirements of Stage 1 of the Biodiversity Assessment Method (BAM) (DPIE 2020). Field surveys aim to ground-truth the results of the background research and habitat assessment. As such, any threatened species or communities that are likely to occur within the study area, should be targeted during the field surveys to determine presence. Full details of the proposed survey effort and timing are to be included in your response.

Under the BAM, threatened species to be targeted are those identified by the BAM Calculator (BAM-C) based on the plant community types (PCTs) present. Any targeted surveys required for species-credit species must meet the requirements for each species detailed in the relevant BAM guidelines and the BioNet Threatened Biodiversity Data Collection (TBDC). Where this includes surveys for cryptic species (e.g., orchids and frogs), a reference population should also be visited during the targeted surveys to ensure that the species is active/flowering and detectable during the survey. If insufficient survey (that is not in accordance with BAM or Commonwealth guidelines) is completed for any identified species, then the species must be presumed to occur, unless sufficient evidence can be provided to show that it would not.

Vegetation surveys must be completed in line with Chapter 4 of the BAM. The required number of plot-based full floristic surveys must be completed. Location of plots must be within the study area and mapped. Where possible, plots should be undertaken within the impact area so that the vegetation to be removed is sampled. It is recommended that more plots are allowed for than needed, to allow for flexibility and provide an accurate sample of vegetation condition.

With the release of the Transport Biodiversity Policy 2022, applicable TfNSW projects are now required to replace trees and hollows removed that do not require offsets under the BAM in accordance with the Tree and Hollow Replacement Guidelines (TfNSW 2022), subject to exclusions. This includes amenity trees (both native and exotic). To fulfil this requirement, TfNSW requires the collection of additional specific data during biodiversity assessment surveys, to enable preliminary estimates of tree and hollow replacement requirements as part of the BDAR. Section 4.1 of the BDAR template contains details on the additional survey and data required, which includes counting amenity trees and a count of trees in each stem size class within applicable vegetation plots.

Surveys are also required to characterise the habitat value of each waterway (i.e., habitat sensitivity and classification of waterways for fish passage) in accordance with NSW DPI (Fisheries) document *Policy and guidelines for fish habitat conservation and management* (2013 update).

Arrange for access to private lands as required in consultation with TfNSW.

3.4 Task 4: Short letter report

Provide survey methods, effort and outcomes in a short letter report immediately upon completion. A map should accompany the letter to show any areas of biodiversity significance for avoidance.

Identify important biodiversity matters for impact avoidance and minimisation. This includes threatened species that have a high biodiversity risk weighting, native vegetation that is an endangered (EEC) or a critically endangered ecological community (CEEC), any potential serious and irreversible impact entities and any potential prescribed biodiversity impacts in accordance with the BAM. Estimates of potential offset liability should also be presented where appropriate, with recommendations for areas to avoid and reduce offsetting costs.

Present findings to the TfNSW project team and submit letter for review.

3.5 Task 5: Prepare draft Biodiversity Development Assessment Report

Prepare the BDAR in accordance with the BDAR template (EMF-BD-GD-0010-TT5).

3.5.1 Significant impact criteria assessments

Prepare significant impact criteria assessments for any nationally listed threatened species and communities that are known or are likely to occur in the study area in accordance with the EPBC Act Significant Impact Guidelines 1.1. If significant impacts on Matters of National Environmental Significance (MNES) are likely, communicate with the relevant TfNSW manager about preparing an EPBC Referral if required.

3.5.2 Mitigation measures

Develop mitigation measures for all impacts identified in the impact chapter of the BAR. Where further work is required to develop mitigation (e.g. connectivity structure proposals), include a commitment to develop the relevant strategy or management plan in consultation with TfNSW. All mitigation measures should be based, at a minimum, on the TfNSW Biodiversity Management Guideline (EMF-BD-GD-0039) and draft RTA Wildlife Connectivity Guidelines.

3.5.3 Offsets and tree/hollow replacement

Quantify requirements for biodiversity offsets to compensate for project impacts by using the BAM-C and BAM. Identify if tree and hollow replacement is required for the project in accordance with the Tree and Hollow Replacement Guidelines (EMF-BD-GD-0129). Refer to Chapter 10 of the BDAR template (EMF-BD-GD-0010-TT5) for offsetting and tree/hollow replacement information requirements.

Present the results to the TfNSW project team.

3.6 Task 6: Submit draft BDAR and BAM-C case for TfNSW comment

Present the results of the draft BDAR to the TfNSW project team. Add TfNSW to the BAM-C case as a 'consent authority' case party and submit for review. TfNSW will review draft reports and provide feedback following the meeting, and prior to submission for consistency assessment.

3.7 Task 7: Addressing comments

Address TfNSW comments in assessment report and prepare table setting out how comments have been addressed. Initiate a meeting with TfNSW should significant issues arise.

3.8 Task 8: Submit draft BDAR and BAM-C case to BCS

Notify TfNSW when the draft BDAR and BAM-C are ready to be submitted to Biodiversity Conservation and Science (BCS) group. Remove TfNSW as the consent authority case party and add the relevant BCS planning division. Submit the draft BDAR and BAM-C case and all applicable spatial data through the Biodiversity Offset Assessment Management System (BOAMs) in accordance with BAM requirements. The BAM-C case must be 'finalised' prior to being submitted.

3.9 Task 9: Revise addressing BCS comments

Provide a summary of BCS review to TfNSW. Revise draft BDAR/BAM-C in response to agency comments.

3.10 Task 10: Submit final BDAR and BAM-C case

Finalise BDAR with certification by accredited assessor. Submit final BDAR to TfNSW and BCS. Within 14 days of finalising BDAR (see Section 6.15(1) of the BC Act), submit final BAM-C case and all associated data (e.g. plot data and spatial files) through BOAMs. Provide all digital data to TfNSW.

4. Outputs

4.1 Reports

The report must follow the BDAR template (EMF-BD-GD-0010-TT5) appended to the TfNSW Biodiversity Assessment Guidelines (EMF-BD-GD-0010). Where a contractor seeks to amend the standard template, agreement must be obtained from TfNSW.

The draft and final copies of reports must be professionally edited and vetted for typographical and grammatical errors before submission to TfNSW. The reports must follow the *Transport Editorial Style Guide* (August 2022) with spelling consistent with the *Australian Macquarie Dictionary*.

All reports must be written in clear and concise plain English avoid repetition, cross reference to primary assessment reports where duplication occurs, and be as brief as possible. Jargon, acronyms and technical words

must be clearly explained at the first point of reference in the reports. Acronyms that are not generally common knowledge must be avoided throughout the report and written in full. Time delays and associated costs as a result of any inadequate reports submitted to TfNSW will be the responsibility of the contractor.

The outputs required for this project include the following:

a) Electronic copy (MS Word 2013) of all required reports including all appendices and figures for TfNSW review and comment.

b) Comments register for feedback and tracking.

c) Plot data, threatened species records and all digital GIS data provided to TfNSW.

d) Insert any other project output as required.

4.2 Data and figures

Figures, tables and graphs must be used instead of text descriptions where possible. Titles, scales and legends (including north points) must be included in all graphics. Digital shape files for all maps and spatial data (ESRI (shape file or geodatabase) must be provided to TfNSW in accordance with Biodiversity Assessments GIS Specification | Transport for NSW and Template file structure for Biodiversity Assessments | Transport for NSW.

Full floristic data collected at each vegetation integrity plot must be supplied in an MS Excel format spreadsheet, detailing each species, their growth form and cover in the plot.

Additionally, all data collected at each vegetation integrity plot is to be provided in a separate MS Excel format spreadsheet using the BAM-C plot data template import spreadsheet at BAM Calculator. Scanned plot data sheets (or copies of digital sheets) must also be provided as an appendix to the BDAR.

All threatened species recorded must be uploaded to BioNet. Evidence of upload must be provided to TfNSW.

5. Response to brief

The scope of the work proposed must be clearly restated in the words of the tenderer. A detailed methodology including survey timing, intensity and methods must be included with any limitations and assumptions made (e.g., number of plots to be completed).

Responses to this brief will be evaluated against the following assessment criteria:

a) **Understanding of the brief** – based on knowledge of the biodiversity issues, the location in which the project occurs and previous similar projects. The proposed detailed methodology will be reviewed to ensure that all potential biodiversity issues are covered off.

b) **Technical skills** – provide qualifications of the project team members and CVs and the proposed time members of the project team will spend on the project. Where applicable, demonstrate expertise, qualifications and experience in areas relevant to the biodiversity assessment for the project. All accreditation requirements of the *Biodiversity Conservation Act 2016* in relation to BDARs must be met.

   Details of personnel completing the survey work, reporting and technical review need to be included. The project team must identify the primary biodiversity assessment writer and include an accredited senior staff member who will be responsible for certifying the quality of all deliverables. Identify any sub-consultants in this section and outline their qualifications and contribution. Outline supervisory arrangements in place for effective management of all sub-consultants.

   Evidence that appropriate scientific licences, animal care and ethics approvals and accreditation are held by the investigators proposed for the field survey.

c) **Recent experience** – recent relevant experience and a listing of relevant projects undertaken by the nominated project team.

d) **Estimated costs** – addressing the requirements of the brief and that the estimated costs are adequate and realistic to achieve the purpose of the brief.

e) **Time performance** – including a detailed program of works and due dates.

f) **Quality assurance process** – internal quality assurance processes.

g) **Additional information** – including any other additional information that may be relevant in the selection of the successful tenderer.

6. Definitions

<INSTRUCTION: Do not include words or terms that have a commonly understood meaning -delete message.>

Term	Definition

Delete definitions if not required.

Appendix A:

Paragraph text

Delete Appendix if not required.

NSW GOVERNMENT

[Insert date]

[Insert reference number]
[Insert file number]

Dear [Insert name]

[Insert name of proposal] preliminary biodiversity investigations

This report documents the confirmed and likely presence of national and NSW listed threatened species and their habitats and threatened ecological communities, aquatic and marine biodiversity and other significant biodiversity features for [insert name of works] at [insert location].

Insert a summary of the main findings and outcomes of your investigations:

- Include: key features of the study area such as Plant Community Types (PCTs) and important habitat features present, particularly recorded or presumed present threatened species, and threatened ecological communities (TECs).
- Include recommendations regarding further assessment requirements (if required) under Part 5 Division 5.1 of the *Environmental Planning and Assessment Act 1979*

Yours sincerely

[Insert sender name]
[Insert sender position]

Drafting guidance:

This document, **EMF-BD-GD-0010-TT3: Preliminary Biodiversity Investigation template (Resource 3),** should be read in conjunction with EMF-BD-GD-0010 Biodiversity Assessment Guidelines.

Delete this cell prior to submission

Transport for NSW

Preliminary biodiversity investigations (TEMPLATE)

<Name of proposal>

Month Year

Photo can be replaced to suit proposal.

NSW GOVERNMENT

transport.nsw.gov.au

1 Introduction and purpose of report

This report has been prepared to investigate the potential occurrence of national (*Environment Protection and Biodiversity Conservation Act 1999*) and NSW (*Biodiversity Conservation Act 2016* and *Fisheries Management Act 1995*) listed threatened species and threatened ecological communities (TECs) and other significant biodiversity values including aquatic biodiversity for [insert name of works] at [insert location].

The results of this report will be used by Transport for NSW (TfNSW) to determine whether further biodiversity assessment is required for the activity in accordance statutory requirements under [Delete as necessary]

- Part 5 Division 5.1 of the EP&A Act (Review of Environmental Factors (REF) projects).
- Part 5 Division 5.2 of the EP&A Act (State Significant Infrastructure (SSI) or Critical State Significant Infrastructure (CSSI).
- Part 4 Division 4.3 of the EP&A Act (development requiring consent including designated development).
- Part 4 Division 4.7 of the EP&A Act (State Significant Development (SSD)).

In addition, for SSI and SSD projects, whether a Biodiversity Development Assessment Report (BDAR) waiver is warranted[1].

2 The proposal and study area

Briefly describe the proposed activity and describe and justify the study area boundary.

3 Methods of investigation

3.1 Database searches

Background research is required to collect and review information on the presence or likelihood of occurrence of:

- Threatened and protected terrestrial and aquatic flora and fauna species and their habitat.
- Plant Community Types (PCT) and Threatened ecological communities (TEC)
- Important habitat for migratory species
- Areas of Outstanding Biodiversity Value.

The following database searches must be performed as a minimum.

NSW Government datasets:

- NSW BioNet – Species sightings (NSW Department of Climate Change, Energy, Environment and Water (NSW DCCEEW)).
- NSW Fisheries Spatial Data Portal (Department of Primary Industries (DPI)).
- SEED datasets including Biodiversity Values Map and available PCT mapping (e.g. State Vegetation Type Map).
- Coastal management areas identified by the Resilience and Hazards SEPP 2021 (NSW State Environmental Planning Policy (Resilience and Hazards) 2021 – maps) (NSW DCCEEW).
- Core Koala Habitat identified by the Biodiversity and Conservation SEPP 2021 (NSW DCCEEW).

Commonwealth datasets:

- Protected Matters Search Tool (Commonwealth Department of Climate Change, Energy, Environment and Water (Cth DCCEEW))

[1] For further information, see the Biodiversity development assessment report waiver process.

- Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems (GDE) (Cth)
- National flying-fox monitoring viewer

A threatened biodiversity profile search should be undertaken, and the profiles considered for all threatened species potentially occurring. Profiles for NSW BC Act listed species are available at Threatened biodiversity profile search and for nationally EPBC Act listed species at Species Profile and Threats Database.

A minimum search area of 10 kilometres is required. A search area larger than 10 kilometres may be appropriate, depending on the availability of existing data, regional vegetation and fauna movement patterns. Provide the dates each database was accessed, and search area used (a table is a useful way to present this information). All identified species should be assessed in the habitat assessment (see below for further details).

3.2 Habitat assessment

A habitat suitability assessment table must be completed to assess the likelihood of each threatened species or ecological community (threatened biodiversity) identified with the potential to occur in the study area. Consider the likelihood of occurrence of all threatened biodiversity identified by literature and database searches. An example of the preferred table format is provided in Appendix A. Identify the likely occurrence of threatened biodiversity based on the presence, condition and type of habitat and previous records, using the criteria provided in Appendix A.

Species should be considered likely to occur where:

- the geographic distribution of the species is known or predicted to include the IBRA subregion in which the development site is located; and
- the development site contains habitat features or components associated with the species; or
- past surveys undertaken at the development site indicate that the species is present.

For SSI and SSD projects, consideration should be given to the requirements of the BDAR waiver guidelines at https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/biodiversity-offsets-scheme/applying-for-a-biodiversity-development-assessment-report-waiver.

3.3 Field survey

Field surveys aim to ground-truth the results of the background research and habitat assessment. As such, any threatened species or ecological communities that are likely to occur (moderate to high likelihood) within the study area, should be targeted during the field surveys to determine presence or likely occurrence.

[Project to determine if tree counting is required as part of the preliminary assessment. This will be required at this stage for projects that do not need a BAR. Delete if not required.] Field surveys must also include counting of native and amenity trees within each tree size class in accordance with the TfNSW Tree and Hollow Replacement Guidelines (EMF-BD-GD-0129).

This section of the report should detail survey effort, timing and conditions. Survey timing should adhere to the months detailed in the BioNet threatened biodiversity data collection (TBDC) for threatened biodiversity. Survey effort should follow industry accepted guidelines (e.g. state and national guidelines).

3.4 Limitations and assumptions

This section should outline all limitations and assumptions used in preparing the report.

4 Results

A figure should be included showing any plant community types (PCTs), threatened species records and habitat features.

4.1 Vegetation present

A description of plant community types (PCTs) recorded in the study area. This must include the following information:

- area (ha) for each PCT vegetation zone and condition description
- justification for the identification/selection of PCTs using BioNet Vegetation Classification

Where vegetation does not conform to a described PCT, a description of the type (indigenous, non-indigenous), species, size class and number of trees within the study area should be provided.

Identify which of the PCTs meet the description of BC Act and EPBC Act listed threatened ecological communities (TECs) and the reasoning for this including reference to the relevant NSW Scientific Committee determination and Commonwealth Conservation Advice.

4.2 Threatened species

The results of the habitat assessment and any threatened species surveys completed must be outlined. The report must include a summary of all recorded or potentially occurring (moderate or high likelihood) threatened species in Table 4-1 (based on the habitat suitability assessment – see Appendix A).

Table 4-1: Habitat assessment and surveys result

Scientific name	Common name	Status			Likelihood of occurrence (Recorded, Moderate or High)
		BC Act	FM Act	EPBC Act	

Key species should be discussed in a short paragraph, explaining the condition and type of habitat within the study area and proposal, details on the species in the locality and the importance of habitat to the species (e.g., breeding observed, known roost site, key fish habitat etc.).

If more detailed surveys are required to confirm the presence of threatened species as the next stage of the assessment, any survey timing constraints should be identified and discussed (e.g., cryptic species that can only be surveyed when flowering etc.). Important areas of habitat should be identified so that TfNSW can take steps to avoid and minimise impacts.

4.3 Areas of outstanding biodiversity value

Add the results of the search of the register and discuss any areas of outstanding biodiversity value in proximity to the project area.

4.4 Matters of National Environmental Significance (MNES)

This section should identify any recorded or presumed present threatened species, populations and communities listed under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

It should also include a discussion of the following MNES:

- World and national heritage
- Wetlands of international importance
- Migratory species

4.5 Likely impacts on biodiversity values (SSD and SSI projects only)

This section should identify if the project is a candidate for a BDAR waiver considering the criteria set out in the Biodiversity development assessment report waiver.

4.6 Conclusion

A statement is to provide details about the confirmed and likely presence of threatened species and their habitats and threatened ecological communities and any other biodiversity value present including aquatic biodiversity.

4.7 Further assessment recommendations (if required)

This section should include recommendations for further assessment under the *Environment Planning and Assessment Act 1979*.

This must include:

- Recommendations for further targeted threatened species survey.
- A list of national and NSW listed species and threatened ecological communities which have a moderate or high likelihood of occurrence or which are known to be present that warrant an assessment of significance under national and NSW guidelines.
- Any restrictions or considerations for undertaking these assessments such as seasonal survey constraints.
- Any critical areas to avoid in order to reduce further assessment requirements and the likely significance of impacts.

For Part 5 Division 5.1 projects

- Where no threatened species or their habitats and no threatened ecological communities were found (or any threatened biodiversity values have a low likelihood of being impacted), include a statement that works within the study area would be unlikely to result in a significant impact.

For Part 5 Division 5.2 projects

- Where no 'biodiversity values' were found, or have a low likelihood of being impacted, include a statement that works within the study area would be unlikely to significantly impact biodiversity values and are therefore a candidate for a BDAR waiver.

Appendix A: Habitat suitability assessment

Likelihood of occurrence criteria

Likelihood criteria	Likelihood criteria
Recorded	The species was observed in the study area during the current survey or has been recorded within the past five years (known from a reputable source).
High	A species is considered highly likely to occur in the study area if: • There are previous credible records on BioNet within the study area from the last 10 years and suitable habitat is present. **or** • The species is highly mobile, dependent on identified suitable habitat within the study area (i.e., for breeding or important life cycle periods such as winter flowering resources) and has been recorded recently (within five years) on BioNet in the locality. This also includes species known or likely to visit the study area during regular seasonal movements or migration.
Moderate	A species is considered moderately likely to occur in the study area if: • Any suitable habitat (e.g., foraging) is present in the study area, the species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. The species may be unlikely to maintain sedentary populations, however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area. **or** • The species is not highly-mobile, dependent on identified suitable habitat features (e.g., hollows, rocky outcrops) within the study area and has been recorded in the locality in the last 10 years on BioNet. **or** • For flora species identified by the BAM-C or recorded in the locality in the last 10 years on BioNet – the associated PCT/habitat present in the study area is not degraded and the species was not targeted by surveys in accordance with the BAM and relevant survey guidelines. In addition, for flora species known to occur in disturbed areas (e.g., orchids), records from any time within the locality may warrant inclusion in this category.
Low	A species is considered to have a low likelihood of occurring in the study area if: • For highly mobile species, the species may be an occasional visitor, but habitat similar to the study area is widely distributed in the locality, meaning that the species is not dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitats in the study area and the species has not been recorded in the locality in the last 10 years on BioNet. **or** • The species is not highly-mobile, dependent on identified suitable habitat features (e.g., hollows, rocky outcrops) within the study area and has not been recorded in the locality in the last 10 years on BioNet. **or** • For flora species identified by the BAM-C, suitable associated habitat (see the TBDC) is present in the study area and the species was not identified following targeted surveys in accordance with the BAM and relevant survey guidelines. For flora species not identified by the BAM-C, though have been recorded in the locality on BioNet at any time, the associated suitable habitat (see the TBDC) is not present in the study area though similar habitats of the same vegetation formation is present in the study area.
Unlikely	Suitable habitat for the species is absent from the study area.

Habitat suitability assessment table

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Plants							
			E.g., 'Species', 'Ecosystem' or 'Dual credit'		Include the best-known information of distribution and habitat requirements, typically listed in the species NSW or Commonwealth (SPRAT) profile. For species-credit species, also list the 'Habitat constraints' and 'Geographic limitations' contained within the TBDC	E.g., '10 – BioNet', 'PMST',	Include the likelihood of occurrence with a brief description. More detail can be provided in the main body of the report where required. Specify whether any habitat constraints are present, particularly for 'dual-credit' species that may have a moderate to high likelihood of occurring in foraging habitat though no breeding habitat is present.
Birds							
Mammals							
Amphibians							
Reptiles							
Invertebrates							
Fish							
Migratory species							

Appendix B: Insert title of appendix

Delete this appendix if not required

Transport for NSW

Name of proposal

Biodiversity assessment report for review of environmental factors (REF)

Month Year

NSW GOVERNMENT

transport.nsw.gov.au

Document control

Document owner	Senior Specialist (Biodiversity); Senior Environment Officer (Biodiversity)
Approved by	Executive Director / Environment and Sustainability
Branch / division	Environment and Sustainability / Safety, Environment and Regulation
Review date	May 2026
Parent document	**EMF-BD-GD-0010 Biodiversity Assessment Guidelines**

Versions

No	Date	Description
1.0	Feb 2021	First issue to reflect: • *Biodiversity Conservation Act 2016, Biodiversity Conservation Regulation 2017, Biodiversity Conservation (Savings and Transitional) Regulation 2017, Biodiversity Conservation Amendment (Controlled Actions) Regulation 2019, and minor amendments to Environmental Planning and Assessment Act 1979.* • *Merger Roads and Maritime with Transport for NSW.*
2.0	Dec 2021	Further detail on components of the Biodiversity Assessment Method 2020. New numbering under TfNSW Environment and Sustainability Management Framework
3.0	Jul 2022	Rebranded and minor changes to vegetation and threatened species survey (Section 3), environmental safeguards (Section 6) and offsets (Section 7) to reflect TfNSW Biodiversity Policy 2022 commitments
4.0	Feb 2023	Changes to accommodate transition to new Plant Community Type classification and clarification of Biodiversity Policy Tree and hollow replacement requirements
5.0	May 2024	Updates to address release of TfNSW Biodiversity Management Guideline (including updated Chapter 6 Mitigation), clearer triggers for the preparation of a wildlife connectivity strategy and new NSW department names.

Using this document:

- This template should be read in conjunction with EMF-BD-GD-0010 Biodiversity assessment guidelines.
- Delete all blue boxes
- Guidance and text that can be altered to suit each proposal are in [box brackets] and/or highlighted grey.
- **Before issue of report**: a) remove this page and any drafing guidance cells; b) update table of contents *(click on table>select update from top of table>update entire table)*; and c) update lists of tables and figures *(tab over table or figure list then right click>update field>updae entire table).*

***Note**: Locate table caption above a table. Locate figure caption below a figure.*

Delete 'Document control', 'Versions' and blue guidance box above from submitted report and update the table of contents.

Table of contents

List of tables

List of figures

Executive summary

Summarise the key findings of the biodiversity assessment report (BAR) in non-technical terms using the following headings as a guide. The content and length of the executive summary should be relevant to the main body of the report and generally no more than two pages.

Introduction

Briefly introduce the proposal, the planning context and the location of proposal including its landscape context (e.g., Interim Biogeographic Regions of Australia (IBRA).

Native vegetation

Description of the vegetation (i.e., Plant community types (PCTs), planted native vegetation) and threatened ecological communities (TECs) (at both NSW and Commonwealth levels) identified. Briefly describe the vegetation survey effort (i.e., number of vegetation integrity plots) and the number of vegetation zones identified.

Threatened species

State the threatened species targeted during surveys, and species that were recorded or that have a moderate or high likelihood of occurring.

Impact assessment

Summary of likely impacts on biodiversity values. Results of significance assessments under Section 7.2 of the BC Act, Division 12 of the FM Act and the EPBC Act Significant Impact Guidelines 1.1. Include any requirement for EPBC Act referral or if the EPBC Act strategic assessment applies.

Impact avoidance and minimisation

High-level description of impact avoidance/minimisation and proposed mitigation (particularly anything addressing a potential significant impact), management and monitoring. Recommendations for wildlife connectivity measures, if required.

Offsetting

Brief summary of offset thresholds met by the proposal.

1. Introduction

1.1 Proposal background

Brief description of the history of the proposal.

Briefly describe the proposal location in a regional context. Refer to Figure 1.1.

1.2 The proposal

Briefly describe the proposal consistent with the REF.

Present a concise description of what is known about the proposal and any key design elements relevant to the biodiversity assessment. The following features may be important when considering potential impacts to biodiversity and should be included where possible:

- The number and type of carriageways or lines.
- Ancillary sites/structures.
- Access roads/tracks.
- Length of works (kilometres).
- If the proposal is an upgrade or a new road or new rail infrastructure.
- Median treatments.
- The amount of vegetation removal required.
- Duration of the works.
- Proposal options (e.g., route options during the strategic or concept phase, or design refinements).

1.2.1 Assessment areas

Define the assessment areas and proposal boundaries that are used in the BAR (with references to specific figures showing details of the proposal), including (as a minimum):

- The proposal (a brief definition that describes the scope of the proposal).
- Subject land or construction footprint (define the boundary that will be used to calculate direct impacts).
- Operational footprint.
- Study area (the subject land including a nominated buffer that captures the land around the Proposal which may be affected by indirect impacts and is subject to biodiversity surveys).
- Landscape assessment area (i.e. the subject land and the area of land within the 1500-meter buffer zone surrounding the subject land (or 500 m buffer zone for linear proposals) that is determined as per Subsection 3.1.2 of the BAM).
- Any other specific boundaries used in the BAR.

Insert a figure that provides the regional context on an aerial/satellite image or topographic map and including IBRA subregions and NSW (Mitchell) landscapes, NPWS estate, subject land (construction footprint) and study area, rivers and wetlands.

Figure 1-1: Proposal context

Insert a figure showing the proposal including the subject land (construction footprint), operational footprint and study.

Figure 1-2: The proposal

1.3 Legislative context

The following legislative description applies to REF proposals assessed under Part 5 Division 5.1 of the EP&A Act. A separate template is available for SSI proposals requiring a BDAR. Amendments to this template will be required for REF assessments prepared for SSD proposals and for local developments.

A Review of Environmental Factors (REF) is prepared to satisfy Transport for NSW (Transport) duties under s.5.5 of the EP&A Act to *"examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity"* and s.5.5 in making decisions on the likely significance of any environmental impacts. This biodiversity impact assessment forms part of the REF being prepared for the [proposal name] and assesses the biodiversity impacts of the proposal to meet the requirements of the EP&A Act.

The BC Act requires that the significance of the impact on threatened species, populations and threatened ecological communities is assessed using the test listed in Section 7.3 of the BC Act. Similarly, Part 7A of the FM Act requires that significance assessments are undertaken in accordance with Division 12 of the FM Act. Where a significant impact is likely to occur, a species impact statement (SIS) must be prepared in accordance with the Environment Agency Head's requirements, or a biodiversity development assessment report (BDAR) must be prepared by an accredited assessor in accordance with the biodiversity assessment method (BAM) (DPIE 2020a).

[Delete for non-road proposals] In September 2015, a 'strategic assessment' approval was granted by the Federal Minister in accordance with the EPBC Act. The approval applies to TfNSW road activities being assessed under Division 5.1 (formerly Part 5) of the EP&A Act with respect to potential impacts on nationally listed threatened species, ecological communities and migratory species.

As a result, TfNSW road proposals assessed via an REF:

- Must address and consider potential impacts on EPBC Act listed threatened species, populations, ecological communities and migratory species, including application of the "avoid, minimise, mitigate and offset" hierarchy
- Do not require referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) for these matters, even if the activity is likely to have a significant impact
- Must use the Biodiversity Assessment Method (BAM) to calculate credits that would offset significant impacts on EPBC Act listed threatened species, populations, ecological communities and migratory species.

Assessments of impact significance are required for all relevant biodiversity values in accordance with the *Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999* (DoE 2013).

2. Methods

Important note (delete after reading):

With the release of the Biodiversity Policy 2022, applicable TfNSW projects (including REF projects) are now required to replace trees and hollows removed that do not require offsets in accordance with the Tree and Hollow Replacement Guidelines (TfNSW 2022), subject to exclusions. This includes amenity trees (both native and exotic).

To fulfil this requirement, TfNSW requires the collection of additional specific data during biodiversity assessment surveys, to enable preliminary estimates of tree and hollow replacement requirements as part of the BAR. Projects with smaller impacts may be able to simply count and categorise each tree and hollow to allow a relatively accurate estimate of the replacement requirement. Other projects with larger impacts will need to take a representative count within each applicable vegetation zone to enable an estimate. As such, this latest BAR template contains the following changes to survey and data:

- All woody vegetation should be mapped, including areas of native and exotic planted vegetation.
- Amenity trees (i.e. trees both native and exotic that are valued by people due to their aesthetic, functional, biodiversity or cultural significance) should be identified (species and DBH) and counted.
- At least one BAM vegetation integrity plot per vegetation zone must include a count of trees within each stem size class. This also requires recording the DBH for all trees in the >80 cm stem size class. Where multiple plots are required in a vegetation zone, the average can be taken to provide a more representative sample. With the hollow count required as part of standard BAM plot, this information will allow a preliminary count of trees and hollows in each vegetation zone that can be used to estimate tree and hollow replacement requirements where applicable.

In some circumstances, some of the information required may be available in an Arborist report. Contact the project Environment Officer to determine if an Arborist report will be available.

The following sections must document the methods used in this assessment. The methods described in Section 2.3 (Vegetation survey and assessment) and Section 2.4 (Threatened species assessment) follow the requirements of Stage 1 of the Biodiversity Assessment Method (BAM) (DPIE 2020a). This includes the use of the BAM calculator (BAM-C). The only variation to the requirements of Stage 1 of the BAM is that targeted surveys for species-credit species are only required for species with a moderate or higher likelihood of occurrence.

Aligning survey effort and data collected with Stage 1 of the BAM allows this assessment to be converted into a Biodiversity Development Assessment Report (BDAR) if a likely significant impact on national or NSW listed entities is identified.

Assessing vegetation in accordance with the BAM also allows for the use of the BAM calculator (BAM-C). Where possible, consultants should be using the BAM-C primarily to determine vegetation integrity scores and biodiversity risk weighting (BRW) for each vegetation zone, though also to provide a preliminary credit calculation for impacts that exceed offsetting thresholds (see Section 7). The BAM-C can only be accessed by accredited assessors.

2.1 Personnel

Include a list of personnel involved in the assessment and an overview of their qualifications and experience in Table 2-1.

Table 2-1: Personnel

Name	Role	Qualifications

2.2 Background research

Background research is required to collect and review information on the presence or likelihood of occurrence of:

- Threatened terrestrial and aquatic species and their habitat.
- Threatened ecological communities.
- Important habitat for migratory species.
- Areas of outstanding biodiversity value.

Previous ecological studies, vegetation mapping and fieldwork undertaken in the same location as the proposal (e.g., for corridor or route selection studies) should be reviewed. Any such reports should be used as background information and the data included with the results from the ecological assessment, including a summary of field survey techniques and effort. In accordance with the BAM Stage 1 Manual (DPE 2022a), reliable survey data less than five years is considered valid for the current assessment.

As a minimum, the following databases and information sources must be reviewed:

- BioNet - the website for the Atlas of NSW Wildlife and Threatened Biodiversity Data Collection (TBDC) – searched [insert download date].
- BioNet Vegetation Classification database – reviewed [insert review date].
- BAM calculator (BAM-C)
- Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) Protected Matters Search Tool – searched [insert download date].
- SEED Layer Intersection Tool – searched [insert download date].
- NSW DPI Fisheries Spatial Data Portal.
- Regional vegetation mapping e.g., 'State Vegetation Type Map: Western Region Version 1.0. VIS_ID 4492 (Office of Environment and Heritage, 2019)'.
- Commonwealth Atlas of Groundwater Dependent Ecosystems (GDE): GDE Atlas Map: Water Information: Bureau of Meteorology (bom.gov.au).
- National Flying-fox monitoring viewer (environment.gov.au).
- Coastal management areas identified by the Resilience and Hazards SEPP 2021.
- Core Koala Habitat identified by the Biodiversity and Conservation SEPP 2021.
- Any previous recent and relevant surveys (e.g., preliminary environmental investigation, options assessments) or studies.

A minimum search radius of 10 kilometres around the study area should be undertaken. A search radius greater than 10 kilometres may be appropriate, depending on regional vegetation and fauna movement patterns, or if the proposal is located in remote regions with less records. Provide the dates each database was accessed and the search area used (a table is a useful way to present this information). All species identified from database searches and previous surveys within the 10-kilometre radius should be assessed in the habitat assessment (see below for further details).

This section should also identify when:

- The preliminary and provisional determinations to list species and ecological communities as threatened under the BC Act were viewed on the NSW Threatened Species Scientific Committee website
- The annual Final Priority Assessment List of nominated species and ecological communities that have been approved for assessment by the Minister responsible for the EPBC Act were viewed on the Cth DCCEEW website.

2.3 Vegetation assessment

Vegetation survey and assessment is to be completed in accordance with Chapter 4 of the Biodiversity Assessment Method (DPIE 2020a). This includes the calculation of vegetation integrity score for each vegetation zone in accordance with Section 4.4. of the BAM, which requires the use of the BAM-C.

Important note (delete after reading):

The revised classification of Plant Community Types in eastern NSW (revised PCTs) are required to be used in the Biodiversity Offsets Scheme from 14 April 2023. From this date, all new BARs will need to use the revised PCT classification. Old PCTs will not be available in the BAM-C after 14 April 2023. All existing Part 5 proposals (including Division 5.1) that had a BAM-C in progress prior to 14 April 2023 may continue to use legacy PCTs under a 24-month transitional arrangement. The NSW DCCEEW website contains more information relevant to the integration of the new PCTs into the Biodiversity Offsets Scheme. Contact a TfNSW Biodiversity Specialist for further information.

2.3.1 Vegetation mapping

Mapping must be in accordance with Section 4.1 of the BAM. This requires mapping the extent of PCTs and vegetation zones using recent aerial imagery and at a scale no greater than 1:10,000 (ideally a scale of 1:1000 or finer is used to create higher quality mapping, particularly where discrete vegetation boundaries must be mapped).

Describe the process of mapping vegetation. Identify available regional vegetation mapping used and include field survey dates. This section should also provide a description of the definition of native vegetation (section 1.6 of the BC Act and Part 5A 60B of the LLS Act) as it relates to the study area. Where the determination of native vegetation may be difficult, plot data should be collected in these areas to provide evidence for its classification.

Areas of non-native vegetation in the study area should be identified and mapped. Specifically, TfNSW requires that native and exotic amenity trees are identified in the BAR as they may need to be replaced in accordance with the TfNSW Tree and Hollow Replacement Guidelines. Assessments for smaller projects are encouraged to identify (i.e. species and DBH) and map each individual amenity tree where possible or be able to provide an estimate of the number of amenity trees within a mapped area.

Prior to surveys, undertake an assessment of the available regional vegetation mapping relevant to the study area. The NSW State Vegetation Type Map is the most recent and relevant mapping of plant community types (PCTs) and should be used where available. This step is critical to informing the plot-based survey effort required prior to field surveys (as detailed in Section 2.4) and will also inform the habitat assessment by identifying threatened species associated with mapped PCTs.

2.3.2 Vegetation survey and classification

This section provides detail on the method of vegetation identification (i.e., PCTs and TECs), assessment of vegetation zones and plot-based survey undertaken in accordance with Chapter 4 of the BAM (DPIE 2020a).

Identification of PCTs must reference current naming conventions and descriptions provided by the BioNet Vegetation Classification database. Native vegetation occurring in the study area should be identified by formation, class and type and the corresponding TEC where applicable (see subsection 3.1.1 for the information required).

Vegetation zones

Where applicable, PCTs must be delineated into vegetation zones based on broad condition states. Disturbance to growth form groups for tree, shrub and ground cover or extent of exotics (or combinations of these) can be used to identify areas of similar condition. This section must detail how vegetation zones were assessed.

Importantly, vegetation in 'low condition' must be separated from higher condition areas when determining vegetation zones. Where vegetation integrity scores have been calculated, these can be used to identify low condition vegetation (i.e. vegetation that is not in moderate to good condition), which is equivalent to vegetation zones that have a (in accordance with Section 9.2.1 of the BAM):

- VI <15, where the PCT is representative of an EEC or a CEEC.
- VI <17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community.
- VI <20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

'Moderate to good' condition vegetation is any vegetation zones with VI scores above these thresholds.

Alternatively, the criteria in the following table can be used to identify areas of low condition vegetation when vegetation integrity scores are not available.

Criteria for assessing vegetation in low condition without a vegetation integrity score

Cat	Vegetation formation	Criteria
A	Rainforest Wet-sclerophyll forest Dry-sclerophyll forest Grassy woodland Semi-arid woodland Forested wetland	Native tree cover <25 % of the tree cover benchmark for the PCT. **AND** Less than 50% of ground cover vegetation consists of either: • *species listed in the BioNet Vegetation Classification PCT profile for medium to high classification confidence PCTs;* ***or*** • *any native species for very low to low classification confidence PCTs.* **OR** Greater than 90% of ground cover vegetation is cleared.
B	Arid Shrubland Heathland Or any PCT from category A where the tree cover benchmark is <10 %	Native shrub cover <50 % of the shrub cover benchmark for the PCT. **AND** Less than 50% of ground cover vegetation consists of either: • *species listed in the BioNet Vegetation Classification PCT profile for medium to high classification confidence PCTs;* ***or*** • *any native species for very low to low classification confidence PCTs.* **OR** Greater than 90% of ground cover vegetation is cleared.
C	Freshwater Wetland Saline Wetland Grassland Alpine Complex Or any PCT from category B where the shrub cover benchmark is <10 %	Less than 50% of ground cover vegetation consists of either: • *species listed in the BioNet Vegetation Classification PCT profile for medium to high classification confidence PCTs;* ***or*** • *any native species for very low to low classification confidence PCTs.* **OR** Greater than 90% of ground cover vegetation is cleared.

Plot-based vegetation survey

Plot-based full floristic survey should be completed in accordance with subsection 4.3.4 of the BAM. In addition to the plot data that must be collected (as described by the BAM), TfNSW also requires the number of trees in each stem size class to be counted in each plot. This data can be used to provide a representative sample of tree counts in each vegetation zone and an estimate of tree replacement requirements where applicable in accordance with the Tree and Hollow Replacement Guidelines (EMF-BD-GD-0129).

Table 2-2 lists the minimum number of plots required per hectare for each vegetation zone. Plots should also be undertaken in areas of non-native and planted vegetation to provide evidence where no PCT determination can be made. Where possible, it is recommended that more plots are undertaken than required to capture variation and allow for flexibility in mapping.

This section must identify the number of plots undertaken and the method of plot location. Although PCTs and vegetation zones are not detailed until the next section, this section should include a summary in Table 2-3 of the number of plots required (in accordance with Table 2-2) and the number of plots undertaken for each vegetation zone.

Table 2-2: Minimum number of plots required per zone area

Vegetation zone area (ha)	Minimum number of plots/midlines
<2	1 plot/midlines
>2-5	2 plots/midlines
>5-20	3 plots/midlines
>20-50	4 plots/midlines
> 50–100	5 plots/midlines
> 100–250	6 plots/midlines
> 250–1000	7 plots/midlines; more plots may be needed if the condition of the vegetation is variable across the zone.
> 1000	8 plots/midlines; more plots may be needed if the condition of the vegetation is variable across the zone.

Table 2-3: Minimum number of plots required and completed per vegetation zone

Veg zone	PCT	Condition	Area (ha)	No. plots required	No. plots completed (plot IDs)
E.g., Zone 1	PCT [insert ID]: [PCT name]	E.g., 'High', 'Moderate', 'Disturbed', 'Revegetation'		See Table 2-2	[list number of plots] plots (Plots: [list plot IDs])

2.3.3 Patch size

Include a summary of the method of patch size calculation for each vegetation zone in accordance with Section 4.3.2 of the BAM. Results are to be provided in Section 3-1.

2.3.4 Native vegetation cover

Briefly summarise the process of calculating the native vegetation cover in the 'landscape assessment area' in accordance with Section 3.2 of the BAM. Add the results into Table 2-4.

Table 2-4: Native vegetation cover in the assessment area

Assessment area (ha)	
Total area of native vegetation cover (ha)	
Percentage of native vegetation cover (%)	
Class (0-10, >10-30, >30-70 or >70%)	

Insert a map of vegetation plot-based survey locations. As a minimum, this figure should display:

- Plot locations displayed by a point symbol showing the start of the plot.
- Plot midline displayed as a line from the start of the plot to the end of the larger plot used to assess function attributes (labelled with the plot name).

Figure 2-1: Vegetation plot-based survey locations

2.4 Threatened species assessment

This section of the BAR should detail the process of threatened species habitat assessment and detail all surveys that were undertaken. The following threatened species assessment aligns with Chapter 5 of the BAM. This involves using the BAM-C during database searches to assist in generating a list of threatened species that require assessment. TfNSW uses the BAM to separate threatened species into two groups for assessment:

- 'Ecosystem-credit' species listed only under the BC Act – these species are assessed by habitat suitability assessment and do not strictly require targeted surveys.
- 'Species-credit' species listed under the BC Act and any species listed under the EPBC Act – any of these species that are associated with PCTs (as defined by the TBDC and BAM-C) being impacted and **have a moderate to high likelihood of occurrence** (an outcome of Appendix B) should be targeted by surveys in accordance with applicable guidelines. Using habitat suitability assessment instead of targeted survey is a slight variation to Chapter 5 of the BAM, that requires targeted survey for all species-credit species identified by the BAM-C.

Targeted surveys for species-credit species should adhere to relevant BAM guidelines and/or information provided in the threatened biodiversity data collection (TBDC) for each species (i.e., the 'threatened biodiversity' tab of NSW BioNet | NSW Biodiversity, Conservation and Science and Threatened biodiversity profile search | NSW Biodiversity, Conservation and Science).

At the time of writing, there are 26 species listed as threatened under the EPBC Act that are classified as ecosystem-credit species (12 species) and dual-credit species (16 species) under the BAM. In accordance with the BAM, targeted survey is not required for ecosystem-credits species and is only required for dual-credit species where breeding habitat has been identified. For these EPBC Act species that are being assessed as ecosystem-credit species (this includes dual-credit species where there is no breeding habitat), Commonwealth guidelines should be considered noting that survey is unlikely to be required and presence may be assumed (noting that TfNSW offset thresholds only apply to species credit species). It is also important that Commonwealth survey requirements are considered for species listed under the EPBC Act that are not listed under the BC Act.

In some cases surveys may be needed for ecosystem-credit species or protected fauna if the species is a key issue for the proposal (e.g. where there is community concern).

Risks associated with not surveying species-credit species or EPBC Act listed species (including the risk of a late finding of a significant impact on nationally or NSW listed species or ecological community) are to be identified and recommendations made regarding further survey. Any further surveys required should be recommended for completion prior to the commencement of construction where timing of the REF preparation does not allow for seasonal targeted surveys.

2.4.1 Habitat suitability assessment

The threatened species assessment process should begin with a habitat suitability assessment to assess the likelihood of each threatened and/or migratory species, identified from the background searches, to occur in the study area. Consider all threatened biodiversity identified by literature and database searches, including 'predicted' (ecosystem-credit) and 'candidate' (species-credit) species identified by the BAM-C. The habitat suitability assessment will be most effective following survey of the study area to identify habitat features of the site.

The preferred table format for habitat assessment is provided in Appendix B. This requires identifying the likely occurrence of threatened biodiversity based on the presence, condition and type of habitat and previous records, using the likelihood of occurrence criteria provided in Appendix B. It should also include consideration of age (i.e., recent = less than five years), currency and location of nearby records, presence of key habitat features/constraints and information about species populations in the area. A species may be considered likely to occur where:

- The geographic distribution of the species is known or predicted to include the IBRA subregion in which the proposal site is located; **and**
- The proposal site contains habitat features associated with the species; **or**
- Past surveys undertaken at the proposal site indicate that the species is present.

The habitat suitability assessment can form the basis for determining when targeted surveys are required for species-credit species. Habitat assessments can be undertaken in two stages, i.e. a preliminary assessment that occurs prior to any field survey and then revisited after initial surveys are complete and specific habitat components have been confirmed in the study area. The assessment should be based on information provided in the habitat profile for the species and any other habitat information in the TBDC and BAM-C, including the potential presence of breeding habitat for 'species-credit' and 'dual-credit' species. Therefore habitat assessment surveys should target the identification of any 'habitat constraints' for each candidate species as defined by the BAM-C and TBDC (e.g., specific sized hollow-bearing trees, large stick nests, caves, etc.). Importantly, to remove a species-credit species from further assessment (i.e. assign a low likelihood of occurrence), **habitat suitability assessment must be informed by field survey**. This is required to describe the impacted habitats and inform a detailed justification for each species, including reference to literature describing habitat requirements.

2.4.2 Targeted flora surveys

This section of the report should detail the surveys undertaken for all threatened flora species identified as requiring survey following the habitat suitability assessment (Section 2.4.1). It is recommended that targeted surveys are considered for all flora species identified by the BAM-C due to the difficulty in predicting their presence. In some cases surveys may be required outside of mapped PCTs where species are known to occur in disturbed habitats (e.g. orchids in cleared roadsides bordering vegetation).

Information required includes survey effort, timing and preceding climatic conditions (i.e., for relevant species provide a brief description of the suitability of the conditions for detection, such as annual rainfall in the region, drought, bushfire, etc.). Survey timing must adhere to the months detailed in the TBDC for each species and should be summarised in the format shown in Table 2-5.

For cryptic species (e.g., orchids) with a high potential for occurrence, surveys should include confirmation of flowering (by either visiting reference populations or getting confirmation of flowering from BCS threatened species officers) to ensure visibility in the assessment area during the chosen survey time.

Surveys should follow recommended survey guides including:

- DPIE (2020c), Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method.
- Commonwealth of Australia (2013b) Draft survey guidelines for Australia's threatened orchids (awe.gov.au).

If insufficient survey (i.e., survey that is not in accordance with seasonal requirements and survey guidelines) is completed for any identified species, then the species may need to be assumed present and assessed accordingly, unless sufficient evidence collected by survey can be provided to show that it would not (e.g., habitat is substantially degraded, or the species is a vagrant to the IBRA subregion). Justification for exclusion must be documented and backed by published data or literature. Note that assuming presence of a species requires an assessment in accordance with the Threatened Species Test of Significance Guidelines and EPBC Act Significant Impact Guidelines 1.1 (if applicable).

There is an alternative option for certain species (i.e., those species for which there is an approved expert listed on the NSW DCCEEW website), where an expert report can be used (in place of targeted surveys) to advise the species potential presence on the subject land. Any intention to obtain an expert report should be discussed with TfNSW.

Document details of flora survey methods in Table 2-5.

Table 2-5: Targeted threatened flora survey details

Species name	Common name	Required survey period	Associated PCTs in the subject land	Minimum survey requirements[1]	Survey completed
e.g., Calotis glandulosa	e.g., Mauve Burr Daisy	State the survey months required by the TBDC,	List the associated PCTs in the subject land listed in the TBDC, e.g., 'PCT 1196 – 5.6 ha'	State the minimum survey effort and technique/s to be used	Demonstrate how the minimum survey effort has been met by the assessment – include weather and seasonal considerations as required

		e.g., 'October to March'			

Note: 1. This should be based on BAM survey guidelines (DPIE 2020c).

2.4.3 Targeted fauna surveys

This section of the report should detail the surveys undertaken for all species-credit fauna species identified as requiring survey following the habitat suitability assessment (Section 2.4.1). Information required includes survey effort, timing and weather conditions during the surveys undertaken. Where undertaken, survey timing should adhere to the months detailed in the TBDC (unless justification is provided otherwise), any relevant survey guidelines for each fauna species and should be summarised in the format shown in Table 2-6.

For cryptic species (e.g., frogs) with a high potential for occurrence, surveys should include confirmation that the species is detectable during the chosen survey time. This may require checking a reference population of the target species to ensure they are active (i.e. calling) and the weather conditions of the survey are suitable for detection.

Surveys should adhere to the methods described in relevant guidelines:

NSW survey guidelines:

- Department of Environment and Climate Change (2009) Threatened species survey and assessment guidelines: field survey methods for fauna. Amphibians. (nsw.gov.au).
- OEH (2018), 'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method.
- DPIE (2020b), NSW Survey Guide for Threatened Frogs - A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method.
- DPE (2022b), Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide | NSW Biodiversity, Conservation and Science
- DPE (2022c), Threatened reptiles: Biodiversity Assessment Method Survey Guide | NSW Biodiversity, Conservation and Science
- Department of Environment and Conservation Threatened biodiversity survey and assessment - Guidelines for developments and activities (2004 working draft).

Commonwealth survey guidelines (on the Cth DCCEEW website):

- Commonwealth of Australia (2010a), Survey Guidelines for Australia's Threatened Bats.
- Commonwealth of Australia (2010b), Survey Guidelines for Australia's Threatened Birds.
- Commonwealth of Australia (2011a), Survey Guidelines for Australia's Threatened Frogs.
- Commonwealth of Australia (2011b), Survey Guidelines for Australia's Threatened Mammals.
- Commonwealth of Australia (2011c), Survey Guidelines for Australia's Threatened Reptiles.

If insufficient survey (i.e., survey that is not in accordance with survey guidelines) is completed for any 'species-credit' species, then these species may need to be assumed present and assessed accordingly, unless sufficient evidence collected by survey can be provided to show that it would not (e.g., habitat is substantially degraded, or the species is a vagrant to the IBRA subregion). Justification for exclusion must be documented and backed by published data or literature. Note that assuming presence of a species requires an assessment in accordance with the Threatened Species Test of Significance Guidelines and EPBC Act Significant Impact Guidelines 1.1 (if applicable).

There is an alternative option for certain species (i.e., those species for which there is an approved expert listed on the NSW DCCEEW website), where an expert report can be used (in place of targeted surveys) to advise about the species potential presence on the subject land. Any intention to seek expert advice should be discussed with TfNSW.

Document details of fauna survey methods in Table 2-6.

Table 2-6: Targeted threatened fauna survey details

Species name	Common name	Required survey period	Associated PCTs in the subject land	Minimum survey requirements[1]	Survey completed
e.g., Ninox connivens	e.g., Barking Owl	State the survey months required by the TBDC, e.g., 'May to December (breeding habitat survey)'	List the associated PCTs in the subject land listed in the TBDC, e.g., 'PCT 300 – 2.3 ha'	State the minimum survey effort (days/nights) and technique/s to be used	Demonstrate how the minimum survey effort has been met by the assessment – include weather and seasonal considerations as required.

Note: 1. This should be based on BAM survey guidelines and any relevant Commonwealth survey guideline.

Insert a figure/s showing the location of all targeted threatened species surveys. Depending on the number of species targeted, this may need to be separated into separate figures for flora and fauna. As a minimum, this figure should display:

- Fauna survey locations (displayed by each survey type) including any fauna habitat features identified (e.g., hollow-bearing trees, rocky outcrops, aquatic habitat).
- Flora survey locations (typically displayed as GPS tracks for each surveyor).
- Broad habitat types (vegetation classes) or PCT mapping as appropriate.

Figure 2-2: Threatened species survey locations

2.5 Aquatic surveys

If appropriate, discuss the methods used to assess habitat threatened species, population and ecological communities listed under the FM Act. The habitat value of each waterway (i.e., habitat sensitivity and classification of waterways for fish passage) should be characterised in accordance with NSW DPI (2013), Policy and Guidelines for Fish Habitat Conservation and Management (2013 update).

Waterway habitat assessment should also include:

- The ecosystem type (e.g., wetlands, floodplains, streams, estuaries, lakes).
- Dimensions of waterway and depth of water.
- Flow characteristics and hydrological features of aquatic habitat, including changes to drainage and filtration and flow regime.
- Bed substrate (e.g., rocks, coral, gravel, sand, mud).
- Habitat features (e.g., pools, riffles, billabongs, reefs).
- Existing infrastructure and barriers to fish movement (natural or artificial).
- Width and species composition of riparian vegetation including the type of vegetation present (e.g., macrophytes, snags, seaweeds, seagrasses, mangroves, saltmarsh) and condition.
- Water quality (i.e., a snapshot using basic water quality indicators at the time of sampling including dissolved oxygen, pH, turbidity, temperature, nutrients and salinity).

A detailed aquatic fauna survey may be required where the proposal is on a Class 1 or 2 watercourse (DPI 2013), where it has been identified there may be a significant impact on a threatened aquatic species or where the proposal crosses 'critical habitat'.

For fish species listed as threatened under the EPBC Act, refer to the Commonwealth of Australia (2011d) Survey guidelines for Australia's threatened fish. https://www.dcceew.gov.au/sites/default/files/documents/survey-guidelines-fish.pdf.

[If required, insert a figure/s showing the location of all aquatic surveys and habitat assessment locations (e.g., key fish habitats - these should align with any sites discussed in main text).

Figure 2-3: Aquatic survey locations

2.6 Limitations

Include a summary of assessment and survey limitations. This section should:

- Detail information on survey techniques employed that vary from relevant guidelines.
- Discuss any variations to survey timing or duration from that detailed in the guidelines and TBDC.
- Discuss if surveys were undertaken during suboptimal times or survey conditions (e.g., drought conditions) for target species and how this has been incorporated into the assessment.
- Any other limitations identified as part of the impact assessment.

3. Existing environment

This section should provide the environmental context of the study area. This should include a discussion of the abiotic and biotic features of the landscape within the study area.

Provide an introduction by describing the broader ecological characteristics of the existing environment including:

- A description of the landscape context, including IBRA bioregions, IBRA subregions, and Mitchell landscapes, catchment areas and any other relevant aspects of the landscape (e.g., National Parks, land-uses).
- A description of abiotic influences such as geology, soils, landforms and climate.
- An assessment of the condition of the study area, including factors (e.g., land use) that have contributed to, and continue to influence its existing condition.

3.1 Plant community types and vegetation zones

A description of the PCTs identified within the subject land needs to be provided. In Table 3-1, list all the PCTs identified within both the subject land and (if applicable) any broader study area that is being assessed for indirect impacts.

Briefly discuss the stratification of PCTs by broad condition variants or other factors (i.e., management regimes) into vegetation zones. Vegetation zones will also be listed in Table 3-1. The table should also list the patch size class for each vegetation zone as it has been entered into the BAM-C and the vegetation integrity (VI) score that is calculated.

Where any marine PCTs are identified in the subject land, these are to be listed as the last vegetation zones in Table 3-1. This is because they may not be considered 'native vegetation' as defined by the *Local Land Services Act 2013* (LLS Act), therefore impact assessment and potential offsetting may require different consideration.

Profiles for each mapped PCT are to be provided as subsections below.

Table 3-1: Plant community types and vegetation zones including patch size and vegetation integrity (VI) score

Veg. zone	Plant community type (PCT)	Threatened ecological community	Area (ha)		Patch size class	VI score
			Subject land	Study area		
e.g., Zone 1	PCT [insert ID]: [PCT name]	E.g. 'Endangered (BC Act and EPBC Act)' or 'Not a TEC'	##	##	'<5 ha' '5–24 ha' '25–100 ha' '>100 ha'	##

Insert a figure that shows the native vegetation extent within the subject land and broader study area. As a minimum, this figure should display:

- Plant community types.
- Vegetation zones.
- Location of vegetation integrity plot start and midline.

Figure 3-1: Plant community types and vegetation zones

3.1.1 PCT [Insert PCT ID]: [Insert PCT name]

Description

Include typical features of the community as per the description in the BioNet Vegetation Classification database and then more specifically within the subject land and study area. This should include the typical form, altitude of occurrence (if known), soil and landscape associations and the distribution of the community within the region. Dominant species in each of the stratum should be provided, including local variations. Dominant weed species should also be included in the description.

PCT ID	
PCT name	
Vegetation class	
Vegetation formation	
Estimate of per cent cleared	## %
Area in subject land	## ha
Conservation status	List the names and status of applicable TEC (both BC Act and EPBC Act) with a reference to the section in the BAR (e.g., Section 4.4 or Section 6) where the assessment is detailed, or 'Not a TEC'.
Vegetation zones (condition) and plots	E.g., Zone 1 (Moderate) – Plots ##, ##, ##

Justification for PCT selection:

The description must include the rationale for the chosen PCT, including identification of other similar PCTs known to occur in the locality. This may involve identifying other PCTs with a similar floristic composition (e.g., dominant canopy species) or simply PCTs of the same vegetation class (e.g., coastal freshwater lagoons) that are mapped in the locality. The rationale must reference the biotic and abiotic features identified on the subject land against features described for each PCT in the BioNet Vegetation Classification, such as:

- IBRA subregion
- Landscape position
- Soil and geology
- Hydrology
- Dominant species in each stratum.

Floristic and structural summary of PCT ## within the study area

Growth form	Typical species
Trees	
Shrubs	
Grass and grass-like	
Forb	
Fern	
Other	
Exotic	
High Threat Exotic	

Condition states

If more than one vegetation zone is present for each PCT (see Section 2.3.2 for guidance on stratifying vegetation zones), the differences must be described in this section e.g. 'Two condition classes were identified within the subject land':

- Good (vegetation zone #) – this condition class includes ... and is located ...
- Low (vegetation zone #) – this condition class includes ... and is located ..."

A photo of each condition class (vegetation zone) in the PCT should also be included with the description – preferably taken at a plot location.

[insert photo]

Photo 3-1: Plot [insert plot identifier] showing vegetation zone [insert zone identifier] (PCT [insert number] - [insert condition]) [Formatting note: to add "Photo" as a caption label, click 'Inset caption' then 'New label']

3.2 Threatened ecological communities

Each of the PCTs that meet the description of TECs under the BC Act must be identified.

A description of why the PCTs meet the definition of a TEC should be provided for each TEC identified, using relevant identification guidelines, listing advice or scientific determinations. NSW Scientific Committee determinations are at NSW Threatened Species Scientific Committee determinations.

The description should include specific details of how the PCT (and in some cases which vegetation zones) meets each element of the scientific determination, such as how many characteristic species occur, and details of the soils/geology associated with the PCT. The description must be evidence based, referencing plot data and showing photos where required.

Insert a map of the TECs identified in the study area. As a minimum, this figure should display:

- Plant community types.
- Vegetation zones.
- Threatened ecological communities (BC Act).

Figure 3-2: Threatened ecological communities

3.3 Groundwater dependent ecosystems

Identify if any groundwater dependent ecosystem (GDEs) occur within the subject land or assessment area and their likely groundwater dependence in accordance with Volume 1, Section 3 of the Risk Assessment Guidelines for Ground Dependent Ecosystems (Department of Primary Industries (DPI), 2012). Assessment should include identification of both aquatic and/or terrestrial GDEs (this may be just an assessment of the PCTs identified in Section 4.2) with a likely degree of groundwater dependence, including:

- Entirely/obligate.
- Facultative (high, proportional or opportunistic).
- Not dependent.

[Insert figure]

Figure 3-3: Groundwater dependent ecosystems

3.4 Threatened species

This section should document all the threatened species recorded on the subject land and broader study area both opportunistically and through targeted surveys. If the subject land cannot be accessed and/or insufficient survey (that is not in accordance with the guidelines and TBDC) is completed for any species with a moderate to high likelihood of occurrence, then the species may need be assumed present. All species recorded or assumed present must be assessed in accordance with the Threatened Species Test of Significance Guidelines and EPBC Act Significant Impact Guidelines 1.1 (if applicable).

Table 3-2 is provided below to guide the level of detail required. The results of targeted surveys for species-credit species must be discussed in more detail either in separate subsections for each species or group of species (e.g., arboreal mammals). Discussion of the results should include where species were recorded on the subject land (or assumed to occur) and detail of the number of individuals or area identified, with a reference to the relevant figure. If applicable, summarise the findings of an expert report. Detail habitat features/components associated with a species and its abundance on site (e.g., hollow-bearing trees and/or PCTs).

Where species-credit species are recorded, species polygons should be used to accurately assess the impact of the proposal and, if required, assist in the calculation of offsets. Species polygons should be considered for the following:

- Threatened flora - species polygons should be created for all threatened flora species recorded (or where species are assumed present in the absence of adequate survey) on the subject land in accordance with the BAM and specific requirements listed for each species in their TBDC profile. A detailed description of how the species polygon was developed must be included.
- Threatened fauna - species polygons are only required for threatened fauna species recorded (or where cryptic species are assumed present in the absence of adequate survey) that are listed as species-credit species, or where breeding habitat for a dual credit species is identified. Create species polygons in accordance with the BAM and specific requirements listed for each species in their TBDC profile. A detailed description of how the species polygon was developed must be included.

If species were targeted by surveys and not recorded, detail potential reasons that may have influenced detection (e.g., habitat suitability, survey conditions and compliance of survey effort, etc.). Where there are no obvious constraints that may have influenced detection, identify if these target species can be excluded from further assessment. Assigning the likelihood of occurrence of target species to 'low' can be supported by either targeted surveys that comply with relevant BAM and EPBC Act survey guidelines, or where habitat is found to be substantially degraded such that the target species is unlikely to use the study area (this needs to be supported by plot data, photos and reference to published literature where available). Target species assigned to a low likelihood of occurring do not need to be considered further in this report.

Table 3-2: Threatened species surveys results

Species name	EPBC Act	BC Act	Identification method (not recorded, assumed, recorded, expert report)	Survey effort compliant?[1]	Results
e.g., Barking Owl (*Ninox connivens*)	E.g., '-'	E.g., 'V'	E.g., 'Not recorded'	E.g., 'Yes'	Discussion of results and habitat suitability. Identify if the species is a species credit or ecosystem credit species. Include where species are recorded or assumed, detail the number of individuals or area identified. Detail results of expert report (if applicable). Detail habitat feature/component associated with species and its abundance on site (e.g., hollow-bearing trees and/or PCTs). For species not recorded, detail potential reasons (e.g., habitat

Species name	EPBC Act	BC Act	Identification method (not recorded, assumed, recorded, expert report)	Survey effort compliant?[1]	Results
					suitability, survey conditions and compliance of survey effort, etc.).

Note: 1. As identified in Section 2.4 of this BAR.

Insert a figure showing the location of all recorded threatened species and associated species polygons (where applicable) including suitable habitat features (e.g., hollow-bearing trees). As a minimum, the figure/s should display:

- Point locations of each threatened species recorded. In reports that will go on public display, maps in the final version must be in accordance with the Sensitive species data policy | NSW Biodiversity, Conservation and Science.
- Species polygons for species credit species, including any data/information used to create the polygons (e.g., buffers, waterways, etc.).

Figure 3-4: Recorded threatened species

3.5 Aquatic results

The habitat value of each waterway (i.e., habitat sensitivity and classification of waterways for fish habitat) and the results of the waterway habitat assessment should be provided. This may be best shown in a table. Photos of each waterway should be provided, showing specific features discussed.

This section should also identify all vegetation classified under the saline wetland vegetation formation. In accordance with the LLS Act, PCTs classified as marine communities do not meet the definition of 'native vegetation'. Marine vegetation is to be assessed in accordance with the FM Act and the Fisheries NSW policy and guidelines.

Results of any detailed aquatic fauna survey including macro-invertebrate survey and analysis should be detailed.

Recorded threatened aquatic species, populations or ecological communities listed under the FM Act, should be identified and discussed. All species with a moderate to high potential to occur (identified from the habitat assessment table) should also be included in the discussion. Details on their occurrence, habitat present and likely abundance should be included.

Include location of all recorded threatened aquatic species and populations and areas of available habitat in the study area (e.g., key fish habitats) in Figure 3-5.

If required, insert a figure/s showing recorded threatened aquatic species and any key fish habitat identified as part of the habitat assessment.

Figure 3-5: Aquatic results

3.6 Areas of outstanding biodiversity value

Identify if areas of outstanding biodiversity value occur within the study area.

3.7 Wildlife connectivity corridors

Identify if any mapped areas of connectivity or corridors occur in the study area. Discuss any local linkages or corridors created by remnant vegetation through the study area. Consider providing a figure showing any local or regional wildlife connectivity corridors, particularly where mitigation is proposed as mitigation to address connectivity impacts.

3.8 SEPPs (if applicable)

Identify any relevant SEPPs applicable to the proposal and the locality. Where applicable, discuss the proposal in the context of the SEPP. Common SEPPs to be considered (where relevant) include:

- Coastal management areas identified by the Resilience and Hazards SEPP 2021.
- Core koala habitat identified by the Biodiversity and Conservation SEPP 2021.

3.9 Matters of national environmental significance

The following MNES protected under the EPBC Act should be considered for their relevance to the proposal:

- World Heritage Properties (sections 12 and 12A).
- National Heritage Places (sections 15B and 15C).
- Wetlands of international importance (sections 16 and 17B).
- Listed threatened species and communities (sections 18 and 18A).
- Listed migratory species (sections 20 and 20A).

- Commonwealth land (for actions outside Commonwealth Land that may impact on the environment on Commonwealth Land) (section 26 and 27A).

This section should identify any threatened species, populations and ecological communities listed under the EPBC Act that are recorded or presumed present. Information listed in the Cth DCCEEW Species Profile and Threats Database must be referenced.

Each of the PCTs that meet the description of TECs listed under the EPBC Act should be identified. The description must include specific details of how the PCT (and in some cases which vegetation zones) meets each element of the conservation advice, including an assessment of the key diagnostics and condition thresholds. The description must be evidence based, referencing plot data and showing photos where required.

Guidelines and policies published by the Commonwealth are available at EPBC Act policy statements - Cth DCCEEW.

Insert a figure/s showing the location of all MNES recorded in the subject land or broader study area.

Figure 3-6: Matters of national environmental significance recorded

4. Avoidance and minimisation

A key component of TfNSW's Biodiversity Policy commitment to no net loss of biodiversity requires the application of the 'avoid, minimise, mitigate and offset' hierarchy as follows:

1. Avoid and minimise impacts.
2. Mitigate unavoidable impacts.
3. Offset residual impacts in accordance with TfNSW guidelines.

To satisfy the first step, this chapter of the BAR must describe all efforts taken to avoid and minimise impacts on biodiversity throughout the life of the project up to this point. This may begin as early as business case development (where strategic offset cost estimates can influence proposal options) and continue through to concept design. This information should be requested from your TfNSW proposal contact.

The discussion can be accompanied by maps where relevant. Guidance for information to include in this section are provided below. This chapter should focus on summarising efforts that have reduced biodiversity impacts, including references to applicable sections of the REF that describe this process in more detail.

Direct impacts on biodiversity can be avoided and minimised by:

- Locating the proposal in areas where there are no biodiversity values.
- Locating the proposal in areas where the native vegetation or threatened species habitat is in the lowest condition (i.e., areas that align with the definition of low condition listed in subsection 2.3.2a).
- Locating the proposal in areas that avoid habitat for threatened species that may be at risk of a significant impact or native vegetation that is part of a critically endangered ecological community (CEEC) or an endangered ecological community (EEC).
- Locating the proposal such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained.

In selecting a proposal location, the following should be addressed, as they apply to the proposal:

- An analysis of alternative modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology.
- An analysis of alternative routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route.
- An analysis of alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location.
- An analysis of alternative sites within a property on which the proposal is proposed that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site.

Proposal design, including the location of temporary and permanent ancillary construction and maintenance facilities, should avoid and minimise clearing of native vegetation and habitat by:

- Reducing the clearing footprint of the proposal.
- Locating ancillary facilities in areas where there are no biodiversity values.
- Locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the lowest condition (i.e., areas that align with the definition of low condition listed in subsection 2.3.2a).
- Locating ancillary facilities in areas that avoid habitat for threatened species and vegetation in high threat status categories (e.g., endangered or critically endangered).

5. Impact assessment

Drafting guidance - Important note (delete after reading):
As a matter of priority, any assessments of significance required (see section 5.4) should be completed as soon as reasonably possible. Where there is potential for a significant impact to NSW or nationally listed species and ecological communities, this must be discussed with the TfNSW contact officer as soon as possible and prior to finalising the assessment. This is so that options to reduce impacts can be further considered and a decision made as to whether a SIS or BDAR will be required.

The impact assessment section should identify and discuss each of the potential impacts of the proposal. The impact assessment section should commence with an introductory paragraph on the range of potential impacts likely to result from the proposal. The impacts identified in this list should form the headings for the sub-sections of this section of the report.

The impact assessment for Division 5.1 proposals does not need to include:

- An assessment of serious and irreversible impacts (SAII)
- Consideration of the Biodiversity Offset Scheme Threshold When does the Biodiversity Offsets Scheme apply? | NSW Biodiversity, Conservation and Science.

The report should clearly distinguish between impacts anticipated during construction and impacts that may arise from the operational phase of the proposal. The following subheadings provide some guidance on the topics that should be covered in the impact assessment:

- Construction impacts:
  - removal of native vegetation
  - removal of threatened fauna species habitat and habitat features
  - removal of threatened flora species
  - aquatic impacts
  - injury and mortality of fauna
  - groundwater dependent ecosystems
- Operation/indirect impacts:
  - wildlife connectivity and habitat fragmentation
  - edge effects on adjacent native vegetation and habitat
  - invasion and spread of weeds
  - invasion and spread of pests
  - invasion and spread of pathogens and disease
  - changes to hydrology
  - noise, light, dust and vibration

Other impacts to be considered in the assessment where relevant include:

- Core koala habitat (Biodiversity and Conservation SEPP 2021).
- Coastal Management Areas (Resilience and Hazards SEPP 2021) – note that impacts to coastal zone mapping may trigger Part 4 of the EP&A Act.
- Other sensitive ecological sites protected by state or local planning instruments (where relevant).

5.1 Construction direct impacts

5.1.1 Removal of native vegetation

The direct impacts of the proposal on native vegetation should be identified and discussed. This should include a discussion of the area of each PCT and vegetation zone that will be impacted, legislative status and area of

impact. This section should also clearly describe how proposal impacts were calculated, including any key assumptions. The discussion should cover relevant key threatening processes related to direct impacts on vegetation.

In accordance with the LLS Act, the definition of native vegetation does not extend to marine vegetation communities (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). Identification of impacts to marine vegetation communities must be documented in subsection 5.1.4.

Summarise the direct impacts of the proposal on native vegetation in Table 5-1, BC Act TECs in Table 5-2 and EPBC Act TECs in Table 5-3..

Table 5-1: Summary of direct impacts on native vegetation

Veg. zone	Plant community type (PCT)	Broad condition class	TEC	Area to be impacted (ha or m²)[1]
e.g., Zone 1	PCT [insert ID]: [PCT name]	e.g., 'High', 'Moderate', 'Disturbed', 'Revegetation'	e.g., 'Endangered (BC Act and EPBC Act)' or 'Not a TEC'	##
Total				**##**
NOTE 1: Area to be cleared based on ground-truthed vegetation mapping within the subject land.				

Table 5-2: Summary of direct impacts on BC Act TECs

BC Act TEC	Veg. zone	Area of veg. zone consistent with TEC (ha or m²)[1]	Total area of TEC to be impacted (ha or m²)[1]
Write name of BC Act TEC (merge cells for all applicable rows)	e.g., Zone 1	##	## (merge cells and state total sum of all veg zones)
NOTE 1: Area to be cleared based on ground-truthed vegetation mapping within the subject land.			

Table 5-3: Summary of direct impacts on EPBC Act TECs

EPBC Act TEC	Veg. zone	Area of veg. zone consistent with TEC (ha or m²)[1]	Total area of TEC to be impacted (ha or m²)[1]
Write name of EPBC Act TEC (merge cells for all applicable rows)	e.g., Zone 1	##	## (merge cells and state total sum of all veg zones)
NOTE 1: Area to be cleared based on ground-truthed vegetation mapping within the subject land.			

5.1.2 Removal of threatened fauna habitat

Direct impacts on threatened fauna species and their habitat should be identified and discussed. The credit type of each species is to be identified as listed in the TBDC. For dual-credit species, only identify the credit that is being impacted (e.g., if Powerful Owl is recorded or likely to occur, but no breeding has been identified, then this species would be listed as an 'ecosystem' species).

The quantification of habitat impacts must reference relevant associated PCTs for each species as identified by the TBDC. It should also include a discussion of impacts on key habitat features such as hollow-bearing trees, rocky outcrops etc. Where key habitat features for a dual-credit species are not present, this must be discussed. The discussion should also cover relevant key threatening processes related to direct impacts on habitat features.

Table 5-4: Summary of direct impacts on threatened fauna and habitat

Species name	EPBC Act	BC Act	Credit type[1]	Potential occurrence (Moderate, High, Recorded)	Associated habitat in subject land	Impact (ha)
[insert scientific name]: ([insert common name])	e.g., '-'	e.g., 'V'	'Ecosystem' or 'Species'		e.g., PCT ## (all zones), PCT ## (zone # only)	##

Note: 1. For dual-credit species, identify the credit type being assessed (ie where there is no breeding habitat present the credit type would be 'ecosystem').

5.1.3 Removal of threatened flora

Direct impacts on threatened flora species and their habitat should be discussed. For species that are recorded by surveys, or presumed to occur, the direct impacts must be quantified in accordance with the BAM, which includes the count of individuals (for certain species, e.g., trees) or the area of habitat as defined by a species polygon.

Table 5-5: Summary of direct impacts on threatened flora

Species name	EPBC Act	BC Act	Potential occurrence (Moderate, High, Recorded)	Associated habitat in subject land	Impact (ha or individuals)
[insert scientific name]: ([insert common name])	e.g., '-'	e.g., 'V'		e.g., PCT ## (all zones), PCT ## (zone # only)	##

5.1.4 Aquatic impacts

Assess the potential for impacts on aquatic biodiversity listed under the FM Act. This section must quantify (where possible):

- Direct impacts to key fish habitat and land identified by the Resilience and Hazards SEPP 2021 – note that impacts to coastal zone mapping may trigger Part 4 of the EP&A Act.
- Direct impacts to marine PCTs (note that marine vegetation does not meet the definition of native vegetation under the BC Act and LLS Act).
- Direct impacts to threatened species, populations, ecological communities and their habitat listed under the FM Act.

Other potential impacts to waterways and aquatic habitats to be addressed also includes:

- Temporary displacement of fauna.
- Loss of riparian and aquatic habitat, including removal or relocation of snags.
- Changes to flooding regimes, hydrology, turbidity and sedimentation.
- Obstruction to fish passage, including temporary in-stream structures and/or temporary diversions.

- Changed hydrology including excessive flow velocities, modified depths of waterways, increase water turbulence, in stream structures, realignment of creeks, alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands, and channelization, piping, concrete lining or scour protection of waterways.
- Changes in shading regime and temperature.
- Acid sulphate soils.
- Potential direct and indirect impacts on aquaculture, commercial and recreational fishing.
- Potential impacts of tannins entering waterways from mulch.

In accordance with the LLS Act, impacts on PCTs classified as a saline wetlands vegetation formation are to be assessed under the FM Act and Fisheries NSW policy and guidelines (DPI 2013).

If threatened aquatic species, populations and ecological communities listed under the FM Act are identified in the study area or are considered likely to occur/presumed present (based on the habitat assessment table), assessments of significance should be completed in accordance with Division 12 of the FM Act. This requires the completion of a 7-part test, which should be included as an Appendix to the BAR and the results summarised in section 5.4.

If impacts on aquatic biodiversity are likely, refer to the Policy and guidelines for fish habitat conservation and management (update 2013) (nsw.gov.au) (DPI 2013) which provides guidance on assessment of impacts on aquatic biodiversity and requirements for avoiding, minimising and offsetting these impacts.

Any requirement to obtain a permit for impacts to aquatic habitats in accordance with DPI (2013) must be identified.

5.1.5 Injury and mortality

Injury and mortality of fauna could occur during construction activities of any new proposals or proposed upgrades. If available, roadkill data could be used to identify species at risk. Roadkill data in a locality can be sourced from BioNet (use the observation type field in the downloaded data). Specific impacts to be addressed include:

- During construction when vegetation and habitat are being cleared.
- Machinery and plant operation.
- Construction traffic.
- Presence of new watering or feed sources or other artificial habitat adjacent to infrastructure.

Injury and mortality impacts can typically be managed through the development of specific and targeted measures. Ensure that specific measures are included in Section 6 for injury and mortality impacts where required.

5.1.6 Groundwater dependent ecosystems

This section should discuss both the direct impacts of clearing on terrestrial GDEs and any expected groundwater drawdown that may occur during certain construction activities (e.g., bridge piling). If available, reference any groundwater assessment that has been undertaken for the proposal. The effects of changes to groundwater flows and depth on groundwater dependent ecosystems needs to be assessed in accordance with the Risk Assessment Guidelines for Ground Dependent Ecosystems (Department of Primary Industries (DPI) 2012).

5.2 Indirect and operational impacts

Indirect impacts occur when the proposal or activities relating to the construction, operation and general change in land-use patterns of the proposal affect native vegetation, threatened ecological communities, threatened species and their habitats beyond the subject land (direct impact area). The following subsections should identify and discuss any indirect and/or operational impacts relevant to the proposal, that haven't already been covered by the impacts described above.

The assessment of all relevant indirect impacts must:

- Describe the nature, extent and duration of short-term and long-term impacts.
- Identify the native vegetation, threatened species, threatened ecological communities and habitats likely to be affected.
- Predict the consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.

5.2.1 Edge effects on adjacent native vegetation and habitat

Discuss the potential for the proposal to create new edges through previously undisturbed native vegetation, which may be subject to future edge effects.

5.2.2 Wildlife connectivity and habitat fragmentation

Potential impacts to wildlife connectivity may occur where roads affect the movement of plants and animals between habitats. Wildlife connectivity issues include blocking or degrading fish passage, preventing migration of a species and decreasing the opportunity for dispersal. The assessment should use a range of data and information to identify potential impacts and species potentially impacted by the proposal.

Specific impacts to be addressed include:

- Any increases in fragmentation of habitat including removal of overhanging canopy.
- Barrier effects, such as those associated with the construction of new roads, access tracks or other ancillary activities, road widening, median treatments (e.g., Jersey barriers), noise walls, cuttings, embankments, erosion and sediment control measures.
- Genetic isolation.
- Timing of construction in relation to any fauna migration.
- Lifecycle requirements of species potentially impacted by the proposal.
- Changes to culverts and bridges resulting in wildlife connectivity impacts.
- The scale, frequency, intensity and duration of potential wildlife connectivity impacts including direct and indirect impacts and the difference between construction (temporary) and operational (long-term) impacts.
- Cumulative impacts on corridors and movement.

Where connectivity measures are proposed by the assessment to mitigate connectivity impacts, the preparation of a Wildlife Connectivity Strategy should be included as the environmental safeguard for the proposal consistent with the requirements of the TfNSW Biodiversity Policy. The purpose of the Wildlife Connectivity Strategy is to inform the final design of the project in relation to wildlife connectivity measures. Indicative locations of connectivity structures should be included on a figure.

5.2.3 Injury and mortality

Although already identified as a potential construction impact, injury and mortality of fauna can also occur during operation and must be discussed. Operational traffic is likely to be the main impact, which can be introduced to an area by a new road proposal or increased by proposed road upgrades. If available, roadkill data could be used to identify species at risk. Roadkill data in a locality can be sourced from BioNet (use the observation-type field in the downloaded data).

A proposal must identify and discuss if fauna fencing for safety is required, and how this may both contribute to and manage the potential for roadkill. Ensure that specific measures are included in Section 6 for injury and mortality impacts where required.

5.2.4 Invasion and spread of weeds

This section should include a discussion of potential impacts relating to the introduction and spread of weeds. This section should provide a table with all the high threat exotic species identified in the study area and their abundance/location. Any weed infestations should be identified and displayed on a figure.

Ensure that specific measures are included in Section 6 for any impacts relating to the invasion and spread of weeds where required.

5.2.5 Invasion and spread of pests

This section should include a discussion of potential impacts relating to the introduction and spread of pests (relating to pest fauna).

Ensure that specific measures are included in Section 6 for any impacts relating to the invasion and spread of pests where required.

5.2.6 Invasion and spread of pathogens and disease

This section should include a discussion of potential impacts relating to the introduction and spread of pathogens and disease. Where available, information on existing pathogen and diseases in the locality should be sought and discussed. Common types of pathogens and disease that may be relevant to a road proposal include:

- Phytophthora (Phytophthora cinnamomi).
- Myrtle Rust (Austropuccinia psidii).
- Chytrid Fungus (Batrachochytrium dendrobatidis).

Ensure that specific measures are included in Section 6 for any impacts relating to the invasion and spread of pathogens and disease where required.

5.2.7 Changes to hydrology

This section should include impacts related to changes in surface hydrology.

Ensure that specific measures are included in Section 6 for any impacts relating to changes in hydrology where required.

5.2.8 Noise, light, dust and vibration

This section should include impacts related to pollution of noise, light, dust and vibration.

Ensure that specific measures are included in Section 6 for any impacts relating to noise, light, dust and vibration where required.

5.3 Cumulative impacts

This section of the report must provide an analysis of the contribution of the proposal to ecological impacts in a local and regional context due to development. The impacts of other TfNSW proposals, major proposals and other large-scale proposals must be considered to an extent that is practical. A quantitative analysis should be prepared where information is readily available (i.e., published).

Cumulative impacts should be considered in terms of vegetation and habitat removal, impacts on threatened species and ecological communities and water quality impacts as a minimum. Cumulative impacts will have a temporal and spatial scale. A cumulative impact assessment should consider impacts of both concurrent and future proposals (where these are known or can be anticipated).

Cumulative impact assessment may be documented using the Table 5-6 template.

Table 5-6: Present and future project/proposals

Project/proposal	Biodiversity value impacted	Construction impacts	Operational impacts
List project/proposals that are part of the broader program of work, other project/proposals or strategic	Include impacted biodiversity values relevant to the project/proposal	This can be set out on a vegetation type and/or species basis. A row should be provided for	Briefly list the construction impacts of the project/proposal, including benefits

proposals being considered by government in the assessment area.		each of the common biodiversity values being impacted.	

Describe the cumulative construction impacts, including benefits, considering the proposal, broader program of work and other nearby projects/proposals described above and in the study area. This includes:

- The sum of all impacts of the proposal (the overall impact of the activity).
- The sum of impacts of the proposal and impacts of other projects/proposals.
- How the proposal has considered other projects/proposals.

Describe the cumulative operational impacts, including benefits, considering the proposal, broader program of works and other nearby projects/proposals described above.

5.4 Assessments of significance

Assessments of significance are required for each threatened species, population or ecological community that have been recorded in the study area or are assumed present as they have a moderate to high likelihood of occurrence. Species should only be grouped into a single assessment where the species share similar life history characteristics and habitat requirements (e.g., threatened woodland birds, cave-roosting microbats, large forest owls, etc.).

Assessments of significance for species, populations and ecological communities listed under the BC Act, FM Act and EPBC Act must comply with the following guidelines (as relevant):

- Threatened biodiversity listed under the BC Act: Threatened Species Test of Significance Guidelines (nsw.gov.au).
- Threatened biodiversity listed under the FM Act: Threatened Species Assessment Guidelines - Assessment of Significance (nsw.gov.au).
- Matters of national environmental significance listed under the EPBC Act: Significant Impact Guidelines 1.1 - Matters of National Environmental Significance – Cth DCCEEW.
- Referral guidelines for species listed under the EPBC Act: EPBC Act policy statements - Cth DCCEEW which may also help assess the significance of impacts.

Where assessments are required, they are to be included in Appendix D (BC Act) and Appendix E (EPBC Act). The results of the significance assessments should be summarised in a table such as that provided in Table 5-5 (BC Act 5-part test), Table 5-6 (EPBC Act assessment) and Table 5-7 (FM Act 7-part test).

Each assessment of significance must include content that is specific to the proposal. Assessments should avoid large amounts of generic text that does not effectively contribute to the assessment questions. Each assessment must also make a concluding statement about the likely significance of the impact.

Note that referrals under the EPBC Act are no longer required for TfNSW road proposals under Division 5.1 of the EP&A Act in accordance with the EPBC act strategic assessment approval. However, significance assessments are still required to be completed and TfNSW reports annually on these findings.

When there is likely to be a significant impact, the TfNSW contact officer must be advised as soon as possible and prior to finalising the assessment so that options to reduce impacts can be further considered and a decision made as to whether a SIS or BDAR will be required.

Table 5-7: Summary of BC Act significance assessments findings

Significance assessment question *(per Section 7.2 of the BC Act and Threatened Species Test of Significance Guidelines (OEH 2018))*						
Threatened species, or communities	**a**	**b**	**c**	**d**	**e**	**Likely significant impact?**

Y *= Yes (negative impact),* ***N*** *= No (no or positive impact),* ***X*** *= Yes/No answer not applicable,* ***?*** *= unknown impact.*

Table 5-8: Summary of EPBC Act significance assessments findings

Threatened species, or communities	Important population *(per Significant Impact Guidelines 1.1 (DoE 2013))*	Likely significant impact?

Y *= Yes (negative impact),* ***N*** *= No (no or positive impact),* ***X*** *= Yes/No answer not applicable,* ***?*** *= unknown impact.*

Table 5-9: Summary of FM Act significance assessments findings

Significance assessment question *(per Threatened Species Assessment Guidelines (DPI 2008))*								
Threatened species, or communities	a	b	c	d	e	f	g	Likely significant impact?

Y *= Yes (negative impact),* ***N*** *= No (no or positive impact),* ***X*** *= Yes/No answer not applicable,* ***?*** *= unknown impact.*

6. Mitigation

This chapter must detail the measures to mitigate and/or minimise impacts on particular threatened species, populations or TECs. All impacts identified in Chapter 5 should have corresponding mitigation measures. A table of measures to be implemented before, during and after construction to mitigate the impacts of the project must be included in the BAR.

Table 6-1 provides a template for the presentation of safeguards and mitigation measures, including example measures. The example measures in Table 6-1 have been developed from best-practice management detailed in TfNSW's *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024) and NSW DPI (Fisheries) *Policy and Guidelines for fish habitat conservation and management* (2013 update) (DPI 2013). The measures in Table 6-1 must be reviewed by BAR authors for relevance and made specific to each project's impacts where required. Additional and/or novel measures may be required to address specific impacts. All measures proposed must have a corresponding impact described in Chapter 5 and identify if residual impacts will be expected.

All environmental management measures should:

- Be supported by TfNSW as feasible and reasonable.
- Respond to potential impacts identified in Chapter 5.
- Be specific and targeted where possible.
- Avoid repetition.

Where specific measures are proposed to reduce the significance of the project's impacts on a threatened species or TEC, those measures must be described here before being summarised in the table. These measures must also be described in the relevant significance assessments (Appendix D and E).

Where measures proposed are novel, large, long-term or expensive, include the following supporting information:

- A description and an assessment of the known, predicted or expected effectiveness of the measures, with reference to previous applications/successes where available.
- Justification of location and design (where applicable), e.g., refer to baseline studies or best available knowledge such as recent literature.
- A description of the objectives of each mitigation measure, thresholds for corrective actions and the corrective actions to be implemented should thresholds be exceeded.

Methods to evaluate the need and scope of such measures are outlined in the draft *Wildlife Connectivity Guidelines for Road Projects* (RTA 2011).

Management measures should be developed in consultation with TfNSW. In some instances, it may be appropriate to involve NSW DCCEEW, DPI and the Cth DCCEEW in these discussions.

The management framework for the proposal should be identified and discussed. This would include any management plans that have been identified as necessary.

See also Section 7 for any environmental safeguards required in relation to the preparation of a Biodiversity Offset Strategy or a Tree and Hollow Replacement Plan.

Table 6-1: Mitigation measures [delete and/or add as required]

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B##	**Identify impacts from Chapter 5 to be mitigated/ managed**	Describe environmental safeguard(s) to mitigate/manage the impact(s). Measures must be as specific as possible. State if further work/investigation is required to develop the mitigation, including timing. State if there are links/requirements with other documents (e.g. management plans).	Specific timing e.g. "Detailed design", "Prior to construction" "During construction" and "Post construction"	E.g. "Proven", "effective", "unknown"	Identify if there will be residual impacts following successful implementation of the measures. These may require further consideration (e.g. offsets).	Identify who is responsible for implementation e.g., Contractor, TfNSW, etc.
B##	**Removal of native vegetation**	Native vegetation removal will be minimised through detailed design. [Note to author – try to make this specific to the proposal. Identify if there are specific high value areas where clearing should be minimised].	Detailed design	Effective		
B##		Pre-clearing surveys and final pre-clearing checks will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	Prior to construction	Effective		
B##		Vegetation removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##		Native vegetation will be re-established in accordance with *Guide 3: Re-establishment of native vegetation* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). [Note to author – discuss this with TfNSW contact prior to including to ensure there is scope for reestablishment of vegetation. Where achievable, state the objective of reestablishment – e.g. restoring a PCT, slope stabilisation, etc].	Post construction	Effective		
B##		An unexpected threatened species finds procedure is to be developed as part of the CEMP using the template in *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). The procedure	During construction	Proven		

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
		is to be followed if threatened ecological communities, either new TECs or new occurrences of known TECs, not assessed in the biodiversity assessment, are identified in the proposal site.				
B##		Where trees and hollows require removal though do not require offsetting, one (or a combination of both) of the following must be undertaken prior to commencement of clearing in accordance with the Tree and Hollow Replacement Guidelines (TfNSW 2022): • Develop a Tree and Hollow Replacement Plan to detail trees and hollows to be replaced (where there is suitable land within or adjacent to the project), OR • Make an equivalent payment to the TfNSW Conservation Fund.	Prior to construction	Effective		
B##	**Direct impacts to threatened species**	Threatened fauna habitat removal will be minimised through detailed design.	Detailed design	Effective		
B##		Fauna encountered on-site during construction will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##		Habitat removal will be undertaken by staged clearing in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). [Note to author – If there are habitat trees to be cleared, first decide if staged habitat removal is appropriate in the context of the project. Include any specific habitat clearing requirements if necessary].	During construction	Effective		
B##		Habitat will be replaced or re-instated in accordance with *Guide 5: Re-use of woody debris and bushrock* and *Guide 8: Artificial hollows* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). [Note to author – specify if an Artificial Hollow Strategy is required, i.e. where threatened hollow-dependent species have been identified and suitable hollows require removal].	During construction	Proven		
B##		An unexpected threatened species finds procedure is to be developed as part of the CEMP using the template in *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). The procedure	During construction	Proven		

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
		is to be followed if threatened fauna, either new species or new occurrences of known species, not assessed in the biodiversity assessment, are identified in the proposal site.				
B##		Pre-clearing surveys and final pre-clearing checks will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Proven		
B##	**Aquatic impacts**	Impacts to aquatic habitat will be minimised through detailed design.	Detailed design	Effective		
B##		Aquatic habitat will be protected in accordance with *Guide 10: Aquatic habitats and riparian zones* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024) and Section 3.3.2 *Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013* (DPI (Fisheries NSW) 2013).	During construction	Effective		
B##	**Groundwater dependent ecosystems**	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Detailed design	Effective		
B##	**Changes to hydrology**	Changes to existing surface water flows will be minimised through detailed design.	Detailed design	Effective		
B##	**Fragmentation of identified habitat corridors and impacts to connectivity and movement**	[Note to author – where connectivity impacts described in Chapter 5 require construction of connectivity structures, a Wildlife Connectivity Strategy is recommended. Indicative locations for structures should be included in the BAR] A Wildlife Connectivity Strategy is to be developed as part of final design to mitigate the connectivity impacts of the proposal on threatened species. Development of the strategy will include assessment of the proposed connectivity measures described in Section ## of this BAR and any further requirements. Connectivity measures will be implemented in accordance with TfNSW's *Draft Wildlife Connectivity Guidelines for Road Projects* (RTA 2011) or equivalent updated TfNSW Guidelines.	Detailed design, during construction and post construction	Proven, effective		
B##	**Edge effects on adjacent native vegetation and habitat**	Exclusion zones will be set up at the limit of clearing in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective	Identify residual edge effects	

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B##	Injury and mortality of fauna	Fauna will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##	Invasion and spread of weeds	Weed species will be managed in accordance with *Guide 6: Weed management* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##	Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with *Guide 7: Pathogen management* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##	Light spill and shading impacts	Shading and artificial light impacts will be minimised through detailed design.	Detailed design	Effective		
B##	Impacts to areas of geological significance					
B##	Impacts to habitat in human-made structures					
B##	Impacts to habitat in non-native vegetation					
B##	Vehicle strike					

7. Offsets and other measures

Consider whether any impacts require the provision of biodiversity offsets, conservation measures or tree and hollow replacement in accordance with:

- No Net Loss Guidelines and supporting resources (TfNSW).
- Tree and Hollow Replacement Guidelines and supporting resources (TfNSW).

7.1 Thresholds

This section must detail the process of identifying the biodiversity impacts in this BAR that trigger thresholds set out by No Net Loss Guidelines (TfNSW 2022). Residual impacts that do not exceed offset thresholds must then consider the requirements of the Tree and Hollow Replacement Guidelines (TfNSW 2022). Identify the direct impacts that require offsetting and any residual impacts that may be subject to tree and hollow replacement (or if works/impacts are excluded in accordance with each guideline) in Table 7-2. 'Moderate to good' condition vegetation is defined in Section 2.3.2 of this template.

Table 7-1: Offset thresholds (TfNSW No Net Loss Guidelines)

Impact	Threshold
Works involving clearing of a CEEC	Where there is any clearing of an CEEC in 'moderate to good' condition
Works involving clearing of an EEC	Where clearing of a EEC ≥ 2 ha in 'moderate to good' condition
Works involving clearing of VEC	Where clearing of VEC ≥ 5 ha in 'moderate to good' condition
Works involving clearing of any habitat for a known species credit fauna species or clearing of breeding habitat (as defined by the TBDC) for dual-credit fauna species (excluding exotic and planted vegetation that cannot be assigned to a plant community type)	Where clearing ≥ 1 ha in 'moderate to good' condition
Works involving removal of known threatened flora species and their habitat	Where loss of individuals is ≥10 or where clearing of habitat is ≥ 1 ha
Type 1 or Type 2 key fish habitats	Where there is a net loss of habitat
Any residual biodiversity impact that doesn't require offsets in accordance with the No Net Loss Guideline is to be assessed against the requirements of the Tree and Hollow Replacement Guideline.	**Any clearing of hollows and/or trees ≥5cm DBH**

Table 7-2: Assessment of vegetation impacts against thresholds

Veg. zone	Plant community type (PCT)	Condition	TEC	Impact area (ha or m^2)[1]	Threshold triggered?
e.g., Zone 1	PCT [insert ID]: [PCT name]	e.g., 'High', 'Moderate', 'Disturbed', 'Revegetation'	e.g., 'Endangered (BC Act and EPBC Act)' or 'Not a TEC'	##	Identify the offset threshold triggered. If none, identify if tree and hollow replacement is required.

There is potential for overlap in offsetting requirements between the thresholds listed in Table 7-1 (e.g., Coastal Saltmarsh EEC also qualifies as Type 1 key fish habitat). In these circumstances, offsets are only required for the most relevant threshold triggered. Refer to the No Net Loss Guidelines for further advice.

For infrastructure proposals within non-certified lands within the Western Sydney Growth Centres or Cumberland Plain Conservation Plan area, consider whether any offsetting requirements or other actions under the relevant Order apply.

7.2 Preliminary offset and tree/hollow replacement calculations

7.2.1 Preliminary offset calculations

If required, this section can provide a preliminary calculation of offsets for each impact triggering a threshold identified in Section 7.1. Offsets for terrestrial impacts (i.e. threatened species and ecological communities listed under the BC Act and EPBC Act) must be preliminarily calculated as credits using the BAM-C. Insert a copy of the relevant BAM-C credit reports in Appendix F.

Calculation of tree and hollow replacement requirements requires counting trees and hollows within areas that do not require offsetting. A preliminary estimate of tree and hollow replacement should be made where feasible.

Where required, offsets for key fish habitat impacts are to be determined in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013) (DPI (Fisheries). Where aquatic offsets are required for impacts to marine PCTs (e.g. saltmarsh or mangroves), include the ecosystem credit calculation in Table 7-3. However, aquatic offsets must be developed in consultation with DPI and ecosystem credits may not be a suitable offset mechanism.

Table 7-3: Preliminary ecosystem credit calculations for impacts to threatened ecological communities

Plant community type	EPBC Act	BC Act	VI score	BRW	HBT	Impact (ha)	Ecosystem credits
PCT [insert ID]: [PCT name]	[insert TEC name]	[insert TEC name]					
Total ecosystem credits							

Table 7-4: Preliminary credit calculations for impacts to species-credit species

Species name	EPBC Act	BC Act	Impact (ha)[1]	Species credits
[insert scientific name]: ([insert common name])				
Total species credits				
NOTE 1: Impact area to be based on species polygons.				

7.2.2 Preliminary tree and hollow replacement estimates

[Delete section if not required]

The requirement to replace trees and hollows removed must be assessed against the requirements of the Tree and Hollow Replacement Guidelines. This includes all vegetation clearing that does not trigger an offset threshold and is not covered by the exclusions in Section 1.4 of the guidelines.

Where applicable, tree and hollow replacement requirements can be estimated using the BAM plot data where tree stem sizes are also counted in each plot (refer to Section 2.3.2 of this template for tree counting method). Noting unless trees in >80 cm DBH class were measured during surveys, all may have to be assumed to be >100cm DBH for the purpose of the tree count estimate. Taking an average of the plot data can provide a representative estimate of the number of trees in each stem size class, and the number of hollows, in each vegetation zone that is subject to tree and hollow replacement (as per Table 7-2).

Table 7-5: Average counts of trees and hollows and estimates per hectare (Note: only required for vegetation zones that do not trigger offset thresholds)

Veg. zone	Impact (ha)	Plots	Average number of trees in stem size classes (cm) and hollows per ha[1]					Average count of tree and hollows in impact area[2]				
			5-19	20-49	50-99	>100	Hollows	5-19	20-49	50-99	>100	Hollows
e.g., Zone 1	e.g., 2 ha"	e.g., Plot 1 and 2	e.g., "150	e.g., "80"	e.g., 10	e.g., 0	e.g., 20	e.g., 300	e.g., 160	e.g., 20	e.g., 0	e.g., 40

NOTE 1: Calculated by the average from the plot data (assuming standard 0.1 ha plot) multiplied by a factor of 10
NOTE 2: Calculated by the average/ha multiplied by the impact

Using the average counts of native trees in Table 7-5 and data collected by counting isolated and amenity trees, estimate the preliminary tree and hollow replacement requirements for all tree removal that does not require offsetting.

Table 7-6: Preliminary estimates of trees and hollow replacement requirements (Note: only required for vegetation zones that do not trigger offset thresholds)

Category	Estimated No. impacted		Replacement requirement per tree/hollow removed[1]		Estimated number to be replaced[2]		Estimated equivalent payment to TfNSW conservation fund[2]
	Native trees	Amenity trees	Planting required	Contribution required	Native trees	Amenity trees	
Very large tree (DBH ≥100cm)	#	#	Plant minimum 16 trees	$2,500	#	#	$#
Large tree (DBH ≥50 to <100cm)	#	#	Plant minimum 8 trees	$1,000	#	#	$#
Medium tree (DBH ≥20 to <50 cm)	#	#	Plant minimum 4 trees	$500	#	#	$#
Small tree (DBH ≥ 5cm to <20 cm)	#	#	Plant minimum 2 trees	$125	#	#	$#
Hollow	#		Provide 3 artificial hollows for every occupied hollow removed*	$500	#		$#
Totals					#		$#

NOTE 1: As per the TfNSW Tree and Hollow Replacement Guidelines
NOTE 2: An equivalent payment to the TfNSW Conservation Fund can be used where replanting is not feasible or fully achievable within the project boundary or adjacent land.

7.3 Biodiversity offset strategy/tree and hollow replacement plan

Where biodiversity offsetting thresholds have been reached under the No Net Loss Guideline then an environmental safeguard should be included to prepare a Biodiversity Offset Strategy. The BOS will include offsets for key fish habitat determined in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013)* (DPI (Fisheries) 2013) and in consultation with DPI. A template for this is included as a resource to the No Net Loss Guidelines.

Where tree and hollow replacement is required under the Tree and Hollow Replacement Guidelines then an environmental safeguard should be included to prepare a Tree and Hollow Replacement Plan. A template for this is included as a resource to the Tree and Hollow Replacement Guidelines.

8. Conclusion

This section of the report should summarise the following information:

- Key features identified in the subject land and study area, such as the PCTs and TECs, important habitat features present, particularly recorded or presumed present threatened species and populations.
- Key findings of the report, including key impacts.
- Whether the proposal is likely to significantly affect any species, populations, communities or their habitats.
- Key mitigation actions and safeguards.
- Whether biodiversity offsets or revegetation is required.
- Whether further work on wildlife connectivity design including the preparation of a Wildlife Connectivity Strategy is required.
- If the EPBC Act strategic assessment is triggered by the proposal or whether EPBC Act referral is required.
- Whether any biodiversity offset thresholds or tree and hollow replacement requirements have been triggered under the No Net Loss Guidelines or Tree and Hollow Replacement Guidelines and whether a Biodiversity Offset Strategy and/or Tree and Hollow Replacement Plan is required.

The conclusion should not introduce any new information or reasoning.

9. Glossary

Term	Definition
Accredited person or assessor	Means as person accredited under section 6.10 (of the BC Act) to prepare reports in accordance with the BAM.
Biodiversity Assessment Method	The Biodiversity Assessment Method is established under section 6.7 of the BC Act. The BAM is established for the purpose of assessing certain impacts on threatened species and threatened ecological communities (TECs), and their habitats, and the impact on biodiversity values.
Biodiversity Assessment Method Calculator	Biodiversity Assessment Method Calculator (BAM-C) – the online computer program that provides decision support to assessors and proponents by applying the BAM and referred to as the BAM-C. The BAM-C contains biodiversity data from the BioNet Vegetation Classification and the Threatened Biodiversity Data Collection that the assessor is required to use in a BAM assessment. The BAM-C applies the equations used in the BAM, including those to determine the number and class of biodiversity credits required to offset the impacts of a development, or created at a biodiversity stewardship site. It is published by the Department (DPIE 2020a).
Biodiversity credit report	The report produced by the BAM-C that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site (DPIE 2020a).
Biodiversity offsets	The gain in biodiversity values achieved from the implementation of management actions on areas of land, to compensate for losses to biodiversity values from the impacts of development (DPIE 2020a).
Biodiversity Offsets and Agreement Management System	The online system used to administer the Biodiversity Offsets Scheme. The BOAMS is used by accredited assessors (to carry out specific BAM-related tasks involving access to the BAM-C to perform assessments, submit data, generate credits and calculate a credit price), by landholders (to apply for a Biodiversity Stewardship Agreement and manage ongoing reporting obligations for their agreement) and by proponents of developments (to view their credit obligation or the payment required to the Biodiversity Conservation Fund).
Biodiversity risk weighting	A factor of the formulas used by the BAM to calculate credits. The biodiversity risk weighting (BRW) is a score given to each vegetation zone and species based on the 'sensitivity to loss' versus the 'sensitivity to gain'. The value is set for threatened species and listed in the TBDC. The BRW for vegetation is calculated for each vegetation zone by the BAM-C using a factor of the 'sensitivity to loss' of the PCT or TEC (located in the BioNet vegetation classification) and the 'sensitivity to gain' of the ecosystem credit species (in the TBDC) that are predicted to occur.
Biodiversity Stewardship site	Refers to land which is the subject to a Biodiversity Stewardship Agreement under the BC Act.
BioNet Atlas	The DPIE database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish (DPIE 2020a).
BioNet Vegetation classification	Refers to the vegetation community-level classification for use in vegetation mapping programs and regulatory biodiversity impact assessment frameworks in NSW. Refer About BioNet Vegetation Classification | NSW Biodiversity, Conservation and Science.

Term	Definition
Construction footprint	The area to be directly impacted by the proposal during construction activities. See also definition for subject land.
Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Refer to Clause 228(2) of the EP&A Regulation 2000 for cumulative impact assessment requirements.
Direct impact	Direct impacts on biodiversity values include those related to clearing native vegetation and threatened species habitat and impacts on biodiversity values prescribed by the Biodiversity Conservation Regulation 2017 (the BC Regulation) (DPIE 2020a).
Ecosystem credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for ecosystem credits. This is analogous with the definition of 'predicted species'.
Ecosystem credits	A measurement of the value of threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a PCT, and PCTs generally. Ecosystem credits measure the loss in biodiversity values at a development, activity, clearing or biodiversity certification site and the gain in biodiversity values at a biodiversity stewardship site (DPIE 2020a).
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component (DPIE 2020a).
Indirect impact	Impacts that occur when the proposal affects native vegetation and threatened species habitat beyond the development footprint or within retained areas (e.g. transporting weeds or pathogens, dumping rubbish). This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts (DPIE 2020a).
Landscape assessment area	The area which includes the subject land and a 1500 m buffer surrounding the outside edge of the boundary of the subject land or 500 m along each side of the centre line of a linear-shaped proposal
Local population	The population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions: • *The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area.* • *The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.* • *The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time or return year to year (OEH 2018).*
Matter of national environmental significance	A matter of national environmental significance (MNES) is any of the nine defined components protected by a provision of Part 3 of the EPBC Act (Commonwealth).
Mitigation	Action to reduce the severity of an impact.

Term	Definition
Native vegetation	Has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act. In summary, a) trees (including any sapling or shrub or any scrub) b) understorey plants c) groundcover (being any type of herbaceous vegetation) d) plants occurring in a wetland. A plant is native to New South Wales if it was established in New South Wales before European settlement (BC Act). Native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). Marine vegetation is covered by the provisions of the FM Act.
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (DPIE 2020a).
Operational footprint	The area that will be subject to ongoing operational impacts from the proposal. This includes the road, surrounding safety verges and infrastructure, fauna connectivity structures and maintenance access tracks and compounds.
Patch size	An area of native vegetation that: • *occurs on the development site or biodiversity stewardship site* • *includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems).* Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site (DPIE 2020a).
PlantNET	An online database of the flora of New South Wales which contains currently accepted taxonomy for plants found in the State, both native and exotic.
Population	A group of organisms, all of the same species, occupying a particular area (DPIE 2020a).
Spatial datasets	Spatial databases required to prepare a BAR • *BioNet NSW (Mitchell) Landscapes – Version 3.1* • *NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7* • *NSW soil profiles* • *hydrogeological landscapes* • *acid sulfate soils risk* • *digital cadastral database* • *Vegetation Information Systems maps* • *Geological sites of NSW.*
Species credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for species credits (DPIE 2020a). This is analogous with the definition of 'candidate species'.
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection (DPIE 2020a).
Species polygon	An area of land identified in Chapter 5 (of the BAM) that contains habitat or is occupied by a threatened species (DPIE 2020a).

Term	Definition
Study area	The area directly affected by the proposal (subject land or construction footprint) and any additional areas likely to be affected by the proposal, either directly or indirectly.
Subject land	Land subject to a development, activity, clearing, biodiversity certification or a biodiversity stewardship proposal. It excludes the landscape assessment area which surrounds the subject land (i.e., the area of land in the 1500 m buffer zone around the subject land or 500m buffer zone for linear proposals). In the case of a biodiversity certification proposal, subject land includes the biodiversity certification assessment area (DPIE 2020a). See also definition for construction footprint.
Threatened Biodiversity Data Collection	A publicly assessable online database (registration required) which contains information for listed threatened species, populations and ecological communities (DPIE 2020a). Part of the BioNet database, published by the NSW DCCEEW and accessible from the BioNet website at www.bionet.nsw.gov.au.
Vegetation integrity (score)	The condition of native vegetation assessed for each vegetation zone against the benchmark for the PCT. The vegetation integrity score is the quantitative measure of vegetation condition calculated by the BAM-C (DPIE 2020a).
Vegetation zone	A relatively homogeneous area of native vegetation on a development site, clearing site, land to be biodiversity certified or biodiversity stewardship site that is the same PCT and has the same broad condition state (DPIE 2020a).

10. Abbreviations

Term	Definition
AOBV	Area of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BCS	Biodiversity, Conservation and Science Group within the NSW Department of Climate Change, Energy, the Environment and Water
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offset Scheme
BRW	Biodiversity risk weighting
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DCCEEW (Cth)	Commonwealth Department of Climate Change, Energy, the Environment and Water
DCCEEW (NSW)	NSW Department of Climate Change, Energy, the Environment and Water – previously the Department of Planning and Environment (DPE) and Department of Planning Industry and Environment (DPIE)
DIWA	Directory of Important Wetlands in Australia
DPHI	NSW Department of Planning, Housing and Industry (formerly part of the Department of Planning and Environment)
DPI	Department of Primary Industries within the NSW Department of Primary Industries and Regional Development (DPIRD)
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EP&A Act	*Environment Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
Fisheries NSW Policy and guidelines	Fisheries NSW Policy and guidelines for fish habitat conservation and management (Update 2013)
FM Act	Fisheries Management Act 1994 (NSW)
GDE	Groundwater dependent ecosystems
IBRA	Interim Biogeographically Regionalisation of Australia
MNES	Matters of national environmental significance
PCT	Plant community type
PMST	Protected Matters Search Tool
REF	Review of Environmental Factors
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure

TBDC	Threatened Biodiversity Data Collection
TECs	Threatened ecological communities (VECs, EECs and CEECs)
TfNSW	Transport for NSW
VEC	Vulnerable Ecological Community

11. References

Provide a reference list with documents listed in alphabetical order according to the authors' names. References used in BAR template showing required referencing style:

Commonwealth of Australia (2010a), Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act - Cth DCCEEW.

Commonwealth of Australia (2010b), Survey guidelines for Australia's threatened birds (awe.gov.au).

Commonwealth of Australia (2011a), Survey Guidelines for Australia's threatened frogs (awe.gov.au).

Commonwealth of Australia (2011b), Survey guidelines for Australia's threatened mammals (awe.gov.au).

Commonwealth of Australia (2011c), Survey guidelines for Australia's threatened reptiles (awe.gov.au).

Commonwealth of Australia (2011d), Survey guidelines for Australia's threatened fish (awe.gov.au).

Commonwealth of Australia (2013a), Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (awe.gov.au) Environment Protection and Biodiversity Conservation Act 1999.

Commonwealth of Australia (2013b), Draft survey guidelines for Australia's threatened orchids (awe.gov.au).

Department of Environment and Climate Change (2009), Threatened species survey and assessment guidelines: field survey methods for fauna. Amphibians. (nsw.gov.au).

Department of Environment and Conservation (2004) Threatened biodiversity survey and assessment guidelines for developments and activities (working draft).

Department of Environment, Climate Change and Water (2009), Sensitive species data policy | NSW Biodiversity, Conservation and Science.

DPI (2008), Threatened Species Assessment Guidelines: The Assessment of significance. Available on the DPI (Fisheries) website: Threatened Species Assessment Guidelines - Assessment of Significance (nsw.gov.au).

DPI (2012), Risk Assessment Guidelines for Groundwater Dependent Ecosystems. Available for download from researchgate.net

DPI (2013), Policy and guidelines for fish habitat conservation and management (Update 2013) (nsw.gov.au).

DPIE (2020a), Biodiversity Assessment Method (nsw.gov.au).

DPIE (2020b), NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method.

DPIE (2020c), Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method.

DPE (2022a), Biodiversity Assessment Method 2020 Operational Manual – Stage 1 (nsw.gov.au)

DPE (2022b), Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide | NSW Biodiversity, Conservation and Science

DPE (2022c), Threatened reptiles: Biodiversity Assessment Method Survey Guide | NSW Biodiversity, Conservation and Science

DPE (2023), Biodiversity Assessment Method 2020 Operational Manual – Stage 2 (nsw.gov.au)

OEH (2017b), Guidance to assist a decision-maker to determine a serious and irreversible impact (nsw.gov.au).

OEH (2018), 'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method.

.

TfNSW (2022a), No Net Loss Guidelines

TfNSW (2022b), Tree and Hollow Replacement Guidelines

TfNSW (2024), Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects. Available at: Biodiversity Management Guideline (nsw.gov.au)

Appendix A: Species recorded

Recorded flora

Family	Scientific name	Common name	Status		Cover (%) in each plot*					Incidental observation
			BC Act	EPBC Act	x	x	x	x	x	

*Note: *Cover determined in accordance with the BAM.*

Recorded fauna

Class	Scientific name	Common name	Status	
			BC Act	EPBC Act

Note: Location data can be added in another column or as separate rows if the assessment area is large or to differentiate records between habitat areas.

Appendix B: Habitat suitability assessment

Use the below criteria to determine the likelihood that a threatened species could occur in the study area. The criteria are designed for use in a BAR only and is not applicable for use in a BDAR (i.e., where the BAM-C is being used). Only recorded sightings from BioNet are valid for these criteria.

Likelihood	Criteria
Recorded	The species was observed in the study area during the current survey or has been recorded within the past five years (known from a reputable source).
High	A species is considered highly likely to occur in the study area if: • *There are previous credible records on BioNet within the study area from the last 10 years and suitable habitat is present.* **OR** • *The species is highly mobile, is dependent on identified suitable habitat within the study area (i.e., for breeding or important life cycle periods such as winter flowering resources) and has been recorded recently (within five years) on BioNet in the locality. This also includes species known or likely to visit the study area during regular seasonal movements or migration.*
Moderate	A species is considered moderately likely to occur in the study area if: • *Any suitable habitat (e.g., foraging) is present in the study area, the species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. The species may be unlikely to maintain sedentary populations, however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area.* **OR** • *The species is not highly mobile, is dependent on identified suitable habitat features (e.g., hollows, rocky outcrops) within the study area and has been recorded in the locality in the last 10 years on BioNet.* **OR** • *For flora species that are associated with PCTs in the study area (see TBDC) or have been recorded in the locality in the last 10 years on BioNet – the associated PCT/habitat present in the study area is not degraded and the species was not targeted by surveys in accordance with the BAM and relevant survey guidelines. In addition, for flora species known to occur in disturbed areas (e.g., orchids), records from any time within the locality may warrant inclusion in this category.*
Low	A species is considered to have a low likelihood of occurring in the study area if: • *For highly mobile species, the species may be an occasional visitor, but habitat similar to the study area is widely distributed in the locality, meaning that the species is not dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitats in the study area and the species has not been recorded in the locality in the last 10 years on BioNet.* **OR** • *The species is not highly mobile, is dependent on identified suitable habitat features (e.g., hollows, rocky outcrops) within the study area and has not been recorded in the locality in the last 10 years on BioNet.* **OR** • *For flora species that are associated with PCTs in the study area (see TBDC) and the species was not identified following targeted surveys in accordance with the BAM and relevant survey guidelines. Flora species that have been recorded in the locality on BioNet at any time, associated suitable habitat (see the TBDC) is not present in the study area, though similar habitats of the same vegetation formation is present in the study area.*
Unlikely	Suitable habitat for the species is absent from the study area.

Habitat suitability assessment table

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Plants							
			E.g., 'Species', 'Ecosystem' or 'Dual credit'		Include the best-known information of distribution and habitat requirements, typically listed in the species NSW or Commonwealth (SPRAT) profile. For species-credit species identified by the BAM-C, also list the 'Habitat constraints' and 'Geographic limitations' identified by both the BAM-C and also contained within the TBDC	E.g., '10 – BioNet', 'PMST',	Include the likelihood of occurrence with a brief description. More detail can be provided in the main body of the report where required. Specify whether any habitat constraints are present, particularly for 'dual-credit' species that may have a moderate to high likelihood of occurring in foraging habitat though no breeding habitat is present. Where a species-credit species is listed as 'low', justification must be provided as either BAM-compliant survey or habitat suitability assessment supported by field surveys.
Birds							
Mammals							
Amphibians							
Reptiles							
Invertebrates							
Fish							
Migratory species							

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					

Appendix C: Plot-based field data sheets

Provide copies of all plot data sheets. This can be PDFs of electronic sheets or scanned handwritten sheets (please ensure handwriting in legible).

Appendix D: Tests of Significance (BC Act)

Delete appendix if not required.

Include the full test of significance for all threatened species, population or ecological communities listed under the BC Act that have been recorded in the study area or are assumed present as they have a moderate to high likelihood of occurrence. Assessments are to be completed in accordance with the Threatened Species Test of Significance Guidelines (nsw.gov.au) (OEH 2018).

Appendix E: Assessments of significance (EPBC Act)

Delete appendix if not required.

Include the full assessment of significance for all threatened species, population or ecological communities listed under the EPBC Act that have been recorded in the study area or are assumed present as they have a moderate to high likelihood of occurrence. Assessments are to be completed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (Commonwealth of Australia 2013a).

Appendix F: Biodiversity credit reports

Provide copies of the following BAM-C credit reports:

- Credits summary report
- Biodiversity credit report (Like-for-like)
- Candidate threatened species report
- Predicted species report.

Section break in row below. Take care not to delete this break. Remove this note from report.

NSW GOVERNMENT

Transport
for NSW

Name of proposal

Biodiversity development assessment report (BDAR) for State significant infrastructure (SSI)

Month Year

NSW GOVERNMENT

transport.nsw.gov.au

Document control

Document owner	Senior Specialist (Biodiversity); Senior Environment Officer (Biodiversity)
Approved by	Executive Director / Environment and Sustainability
Branch / division	Environment and Sustainability / Safety, Environment and Regulation
Review date	May 2026
Parent document	**EMF-BD-GD-0010 Biodiversity Assessment Guidelines**

Versions

1.0	Feb 2021	New resource created to reflect: • *Biodiversity Conservation Act 2016, Biodiversity Conservation Regulation 2017, Biodiversity Conservation (Savings and Transitional) Regulation 2017, Biodiversity Conservation Amendment (Controlled Actions) Regulation 2019, and minor amendments to Environmental Planning and Assessment Act 1979.* • Amendments to NSW *Assessment Bilateral Agreement (EPBC Act) Mar 2020* • *Merger Roads and Maritime with Transport for NSW (TfNSW).*
2.0	Dec 2021	Update to better align with the requirements of the Biodiversity Assessment Method 2020. New numbering under TfNSW Environment and Sustainability Management Framework.
3.0	July 2022	Rebranded. Minor changes to declarations section and to environmental safeguards (Section 9) to reflect Transport Biodiversity Policy 2022 commitments to prepare a Wildlife Connectivity Strategy for landscape scale impacts.
4.0	Mar 2023	Changes to accommodate transition to new Plant Community Type classification and clarification of Biodiversity Policy Tree and hollow replacement requirements.
5.0	May 2024	Updates to address release of TfNSW Biodiversity Management Guideline (including updated Chapter 9 Mitigation), clearer triggers for the preparation of a wildlife connectivity strategy and new NSW department names.

Using this document:

- This template should be read in conjunction with EMF-BD-GD-0010 Biodiversity assessment guidelines.
- Guidance and text to be altered to suit each project are in [box brackets] and/or highlighted grey.
- Before issue of report:

  a) remove this page and any drafing guidance cells

  b) update table of contents *(click on table>select update from top of table>update entire table*

  c) update lists of tables and figures *(tab over table or figure list then right click>update field>updae entire table).*

  d) Locate table caption above a table. Locate figure caption below a figure.
- This report template is intended to assist TfNSW personnel and consultants in the development of a Biodiversity Development Assessment Report (BDAR) in accordance with Part 7.9 of the *Biodiversity Conservation Act 2016* (BC Act), as required for an application for development consent under Part 5 Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to carry out State Significant Infrastructure (SSI). All BDARs submitted to TfNSW must be certified by an accredited assessor with a date that is within 14 days of the submission of the applicable BOAMS case.

Amendments would be required to tailor the template where the BDAR is a requirement of Part 5 Division 5.1 REF project.

- The template has been prepared in accordance with the requirements of the Biodiversity Assessment Methodology (BAM 2020) (DPIE 2020a), the Biodiversity Assessment Method 2020 Operational Manual Stage 1 (DPE 2022a) and the Biodiversity Assessment Operational Manual Stage 2 (DPE 2023).
- This template is a BDAR development guideline for consultants and has been structured for projects to follow Stage 1 and Stage 2 of the BAM. The template does not account for the inclusion of any streamlined assessment modules of the BAM (ie Appendix B – Scattered trees assessment, Appendix C – Small area and Appendix D – Planted native vegetation). The structure of this template should be retained as much as reasonably possible. However, the consultant writing and/or certifying this BDAR is responsible for ensuring that all relevant sections of the BAM are adequately addressed.

Delete 'Document control', 'Versions' and blue guidance box above from submitted report and update the table of contents.

Table of contents

List of tables

List of figures

Declarations

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I [insert name of accredited assessor] certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method 2020 and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Signature:

Date:

BAM assessor accreditation number:

The lead or responsible assessor for the project must certify in the BDAR that the report has been prepared on the basis of the requirements of, and information provided under the BAM as at a specified date, and that date is within 14 days of the date the report is submitted to the decision-maker. The date must also be within 14 days of the date that the BAM Calculator (BAM-C) is finalised and submitted within the Biodiversity Offsets and Agreement Management System (BOAMS).

ii Details and experience of author/s and contributors

The development of this BDAR has been carried out by appropriately qualified and experienced environmental professional, ecologists and accredited people as demonstrated below.

Provide details of the person/s responsible for preparing the BDAR plus any surveys and/or investigations on which the BDAR relies (excluding approved biodiversity experts)

Table 0-1: Details and experience of author/s and contributors

Name	BAM assessor accreditation number. (if relevant)	Position/Role	Tasks performed	Relevant qualifications

Provide details of the people involved in undertaking the main tasks required to prepare the BDAR.

Tasks performed may include:

- report preparation
- document review
- BAM-C data entry and analysis
- figure preparation
- BAM plot surveys
- targeted threatened flora surveys
- targeted threatened fauna surveys

iii Conflict of interest

[Delete that which is not relevant]

I, [insert name of accredited assessor], declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

OR

I, [insert name of accredited assessor], wish to openly declare the following actual, perceived or potential conflict of interest and the management strategies employed:

[State the nature of the conflict(s) of interest and describe how it will be/has been managed]

This declaration has been made in the interests of full disclosure to the decision-maker.

Full disclosure has also been provided to the client.

Signature:

Date:

BAM assessor accreditation number:

Assessors must not act in circumstances where there is actual, perceived or potential conflict of interest (Accredited BAM Assessor Code of Conduct). Use this declaration to address any actual, perceived or potential conflicts of interest including any strategies to manage them. The section is also used to declare that there are no actual, perceived or potential conflicts of interest. A detailed description must be provided in an appendix. Guidance on conflict of interest is available on the NSW Department of Climate Change, Energy. Environment and Water website.

This section is also used to declare that there are no actual, perceived or potential conflicts of interest.

Executive summary

Summarise the key findings of the Biodiversity Development Assessment Report (BDAR) in non-technical terms using the following headings as a guide:

- Briefly introduce the project, planning context including any EPBC Act referrals, location of project and the landscape assessment area for the assessment.
- Native vegetation – Description of the vegetation (i.e. PCTs, planted native vegetation) and threatened ecological communities (TECs) (at both NSW and Commonwealth levels) identified. Briefly describe the vegetation survey effort (i.e. number of vegetation integrity plots) and the number of vegetation zones identified.
- Threatened species – List the broad habitat types identified and briefly state how the BAM-C was used to develop the list of threatened species included in the assessment. List the candidate species that were further assessed by targeted surveys and the results of the surveys.
- Biodiversity impacts – Description of the direct impacts should include a table, showing the area of impact native vegetation and TECs, and threatened species where applicable. This section should also briefly describe if any impacts are potential serious and irreversible impacts, aquatic impacts and prescribed impacts, as applicable.
- Impact avoidance and minimisation – High-level description of impact avoidance/minimisation and proposed mitigation, management and monitoring.
- Offsetting – A table displaying the number and type of biodiversity credits (ecosystem and species) required to offset the residual impacts.

For projects that are also controlled actions and subject to the NSW Assessment Bilateral Agreement (EPBC Act) include reference to:

- Any species or threatened ecological communities that may be significantly impacted by the project based on MNES Significant Impact Guidelines 1.1.
- Commonwealth assessment requirements expressed in any supplementary SEARs (if the NSW Assessment Bilateral Agreement (EPBC Act) has applied to the project).

The content and length of the executive summary should be relevant to the main body of the report and generally no more than four pages for large, complex projects.

1. Introduction

1.1 Proposed project background

Brief description of the history of the proposal.

Insert a figure that provides an overview of the project and its major features. Note that this requirement is additional to BAM requirements and is designed to orientate the reader to the project.

Additional contextual information that may be relevant to the project may be included such as local government boundaries, existing infrastructure, sensitive ecological areas such as National Parks and other conservation reserves.

Figure 1-1: Overview of the proposal

1.2 Secretary's Environmental Assessment Requirements (SEARs)

Environmental Impact Statements (EIS) are prepared to assess the impacts of development projects assessed under Division 5.2 of the EP&A Act (State Significant Infrastructure (SSI) or Critical State Significant Infrastructure (CSSI)), Division 4.3 of the EP&A Act (designated development) or Division 4.7 of the EP&A Act (State Significant Development (SSD)).

This BDAR forms part of the EIS being prepared for [insert the project name] under [insert relevant planning provision].

EISs are subject to a range of legislative and policy requirements as set out in the Secretary's Environment Assessment Requirements (SEARs). Table 1.1 sets out how the biodiversity requirements in the SEARs have been addressed in this BDAR.

Biodiversity assessment requirements established by the Biodiversity Conservation Act 2016 (BC Act), require a BDAR to be prepared using a person accredited under the BC Act. These requirements are reflected in the SEARs.

Table 1-1: SEARs for biodiversity

Key issue and desired performance outcome	Requirement (specific assessment requirements in addition to the general requirements)	Section addressed

1.3 EPBC Act assessment requirements

Describe the EPBC Act assessment undertaken including any controlled action referral. Note the status of the project under NSW Assessment Bilateral Agreement (EPBC Act). If the project is a controlled action, list the controlling provisions, date of referral and decision reasoning and referral number. Detail the requirement of any supplementary SEARs and relevant EPBC Act assessment requirements in Table 1.2.

NB: On 24 March 2020, amendments to the NSW Assessment Bilateral Agreement (EPBC Act) commenced. These amendments have endorsed Biodiversity Offset Scheme (including the BAM and payments to the Biodiversity Conservation Fund as a way of offsetting project impacts).

Table 1-2: EPBC Act environmental assessment requirements for biodiversity

Commonwealth assessment requirement	Section addressed

1.4 Assessment guidelines used in this report

Amend list of guidelines as required and add any recent releases.

The assessment presented in this BDAR was undertaken in accordance with the BAM and the survey guidelines specified in the SEARs. These could include:

NSW survey guidelines

Department of Environment and Conservation (2004) (working draft), Threatened biodiversity survey and assessment | NSW Biodiversity, Conservation and Science.

Department of Environment and Climate Change (2009), Threatened species survey and assessment guidelines: field survey methods for fauna. Amphibians. (nsw.gov.au).

DPI (2013), Policy and guidelines for fish habitat conservation and management (Update 2013) (nsw.gov.au).

DPE (2022a), Biodiversity Assessment Method 2020 Operational Manual – Stage 1 (nsw.gov.au).

DPIE (2020a), Biodiversity Assessment Method (nsw.gov.au).

DPIE (2020b), NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method

DPIE (2020c), Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method.

DPE (2022b), Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide | NSW Biodiversity, Conservation and Science

DPE (2022c), Threatened reptiles: Biodiversity Assessment Method Survey Guide | NSW Biodiversity, Conservation and Science

DPE (2023), Biodiversity Assessment Method 2020 Operational Manual – Stage 2 (nsw.gov.au)

OEH (2018), 'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method.

National survey guidelines

Commonwealth of Australia (2010a), Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act – Cth DCCEEW.

Commonwealth of Australia (2010b), Survey guidelines for Australia's threatened birds (awe.gov.au).

Commonwealth of Australia (2011a), Survey Guidelines for Australia's threatened frogs (awe.gov.au).

Commonwealth of Australia (2011b), Survey guidelines for Australia's threatened mammals (awe.gov.au).

Commonwealth of Australia (2011c), Survey guidelines for Australia's threatened reptiles (awe.gov.au).

Commonwealth of Australia (2011d), Survey guidelines for Australia's threatened fish (awe.gov.au).

Commonwealth of Australia (2013b), Draft survey guidelines for Australia's threatened orchids (awe.gov.au).

Also include a list of relevant sources of information used in the assessment including reports.

2. The proposal

2.1 Overview of the proposal

This section should not be a duplication of the information provided in the EIS. Provide a summary of the key components of the project as they relate to potential impacts on biodiversity, with references to the EIS for more information as required. Some content guidance has been provided below.

- Describe the project's objectives.
- Describe the key components of the project as presented in the EIS.
- Present a concise description of the project and all key design elements relevant to the biodiversity assessment. The following features may be important when considering potential impacts to biodiversity and should be included where relevant:
  - number and type of carriageways or tracks
  - ancillary sites/structures
  - access roads/tracks
  - length of works (kilometres)
  - if the project is an upgrade or a new road
  - median treatments
  - duration and timing including staging of the works
  - proposal options (e.g., route options during the strategic or concept phase, or design refinements)
  - construction activities (site establishment, enabling works, tunnelling, surface earthworks and structures, bridge works, drainage, pavement, operational and ancillary facilities, finishing works).

Insert figure showing project components including operational footprint, construction footprint and any other relevant areas that describe the project. Note that this is additional to BAM figure requirements and is designed to orientate the reader to the project (i.e. avoid repetition of similar figures where possible).

Figure 2-1: The proposal

3. Site context

3.1 Assessment areas

Define the key assessment areas and project boundaries that are used in the BDAR (with references to specific figures showing details of the project), including (as a minimum):

- The Project (a brief definition that describes the scope of the project)
- Subject land or construction footprint (define the boundary that will be used to calculate direct impacts)
- Study area (the subject land including a nominated buffer that captures the land around the Project which may be affected by indirect impacts, in accordance with Section 8.2 of the BAM)
- Landscape assessment area (i.e., the subject land and the area of land within the 1500 meter buffer zone surrounding the subject land (or 500 metre buffer zone for linear proposals) that is determined as per Subsection 3.1.2 of the BAM)
- Locality (typically this is the land within a 10 kilometre radius of the subject land, however in some remote regions a larger radius may be more appropriate)

3.2 Landscape features

This section addresses the landscape features assessment component of the BAM (Chapter 3) to establish the site context of the subject land in the surrounding landscape. This section should also include a general description of the topographic and hydrological setting, geology and soils of the subject land.

Include a 'Site map' and a 'Location map' (in section 3.3 below) in accordance with Section 3.1.1 and 3.1.2 of the BAM. These two figures will display the minimum information requirements listed in Table 24 of the BAM, including:

- IBRA Bioregions and subregions.
- NSW (Mitchell) landscapes.
- Cleared areas.
- Rivers, streams and estuaries.
- Wetlands including important wetlands.
- Connectivity of different areas of habitat.
- Areas of geological significance and soil hazard features.
- Areas of outstanding biodiversity value.
- Any additional features identified in any SEARs for the proposal.

Table 3-1: Landscape features

Landscape feature	Landscape assessment area
IBRA bioregions and subregions	
NSW (Mitchell) landscapes	
Native vegetation cover	
Cleared areas	
Rivers, streams and estuaries	
Wetlands	

Landscape feature	Landscape assessment area
Connectivity features	
Areas of geological significance and soil hazard features	
Areas of outstanding biodiversity value	

3.3 Native vegetation cover

Identify and map locations of native vegetation cover, including woody and non-woody vegetation, in the assessment area. Include justification for how the cover was determined, including justification for areas of vegetation that have been excluded from the assessment

Briefly summarise the process of calculating the native vegetation cover in the landscape assessment area (Note: this is not required for proposals that are only using the scattered trees (Appendix B) or planted native vegetation (Appendix D) streamlined assessment modules of the BAM). The methods used to map native vegetation cover can be detailed in section 4.1.2.

Using this data, complete Table 3-2 to summarise the extent of native vegetation cover within the assessment area. Figure 3-2: Location map shows native vegetation cover within the assessment area.

Table 3-2: Native vegetation cover in the assessment area

Assessment area (ha)	
Total area of native vegetation cover (ha)	
Percentage of native vegetation cover (%)	
Class (0-10, >10-30, >30-70 or >70%)	

Insert site map. As a minimum, this figure should display:

- Boundary of subject land
- Cadastre of subject land
- Landscape features identified in Table 3-1

Figure 3-1: Site map

Insert location map. As a minimum, this figure should display:

- Digital aerial photography at 1:1,000 scale or finer
- Boundary of subject land
- Landscape assessment area, (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development
- Native vegetation cover
- Landscape features identified in Table 3-1
- Additional detail (e.g. local government area boundaries) relevant at this scale.

Figure 3-2: Location map

4. Native vegetation

This section sets out the vegetation assessment undertaken for the Project. In an effort to reduce repetition within BDAR documents and to limit cross referencing between sections, this section combines methods with survey findings and analysis.

Note that the content and structure of this chapter will be directed by the size and location of the Project. The information required will also depend on the BAM assessment pathway chosen (i.e., additional sections will be required if streamlined assessment modules (Appendix B and Appendix D of the BAM) are applicable).

Important note (delete after reading):

The revised classification of Plant Community Types in eastern NSW (revised PCTs) are required to be used in the Biodiversity Offsets Scheme from 14 April 2023.

A 24-month transitional arrangement is in place for all Part 5 assessments (both Division 5.1 and Division 5.2) that already had a BAM-C assessment case commenced prior to 14 April 2023. Projects that require Part 4 consent (e.g. development in Coastal Wetlands) have a 12-month transitional period. Old PCTs will not be available in the BAM-C for any assessment case started after 14 April 2023.

The NSW DCCEEW website contains more information relevant to the integration of the revised PCTs into the Biodiversity Offsets Scheme. Contact a TfNSW Biodiversity Specialist for further information including transitional arrangements.

4.1 Method

Important note (delete after reading):

With the release of the Transport Biodiversity Policy 2022, applicable TfNSW projects including SSI projects are now required to replace trees and hollows removed that do not require offsets under the BAM in accordance with the Tree and Hollow Replacement Guidelines (TfNSW 2022), subject to exclusions. This includes amenity trees (both native and exotic).

To fulfil this requirement, TfNSW requires the collection of additional specific data during biodiversity assessment surveys, to enable preliminary estimates of tree and hollow replacement requirements as part of the BDAR. Tree and hollow replacement is only required for impacts that do not require offsetting under the BAM, therefore this will only apply to:

- Vegetation zones that have a vegetation integrity score under the thresholds listed in Subsection 9.2.1 of the BAM and are not covered by species-credit requirement, and
- Any trees that have not been assigned to a PCT and have amenity value

Projects with smaller impacts may be able to simply count and categorise each tree and hollow to allow a relatively accurate estimate of the replacement requirement. Other projects with larger impacts will need to take a representative count within each applicable vegetation zone to enable an estimate. As such, this latest BDAR template contains the following changes to survey and data:

- All woody vegetation should be mapped, including areas of native and exotic planted vegetation
- Amenity trees (i.e. trees both native and exotic that are valued by people due to their aesthetic, functional, biodiversity or cultural significance) should be identified (species and DBH) and counted.
- At least one BAM vegetation integrity plot per low condition vegetation zone (i.e. zones where VI will potentially be lower than the BAM threshold for offsetting) must include a count of trees within each stem size class. This also requires recording the DBH for all trees in the >80 cm stem size class. Where multiple plots are required in a vegetation zone, the average can be taken to provide a more representative sample. With the hollow count required as part of standard BAM plot, this information will allow a preliminary count of trees and hollows in each vegetation zone that can be used to estimate tree and hollow replacement requirements where applicable.

In some circumstances, some of the information required may be available in an Arborist report. Contact the project Environment Officer to determine if an Arborist report will be available.

4.1.1 Background research

Previous regional and local vegetation community mapping, ecological studies and field work undertaken in the same location as the project (e.g., for corridor or route selection studies) must be reviewed and relevant information presented. Where available, the relevant State Vegetation Type map (DPIE) is to be used for regional vegetation mapping.

4.1.2 Mapping extent of native vegetation

Mapping must be in accordance with Section 4.1 of the BAM. This requires mapping the extent of PCTs and vegetation zones using recent aerial imagery and at a scale no greater than 1:10,000 (ideally a scale of 1:1000 or finer is used to create higher quality mapping, particularly where discrete vegetation boundaries must be mapped).

Describe the process of mapping native vegetation within the assessment areas. Identify available regional vegetation mapping used and include field survey dates. This section should also provide a description of the definition of native vegetation (section 1.6 of the BC Act and Part 5A 60B of the LLS Act) as it relates to the study area (i.e., identification of parts of the subject land that do not contains native vegetation).

4.1.3 Vegetation identification

This section provides detail on the method of vegetation identification (i.e., PCTs and TECs), assessment of vegetation zones and plot-based survey undertaken in accordance with Chapter 4 of the BAM (DPIE 2020a).

Identification of PCTs must reference current naming conventions and descriptions provided by the BioNet Vegetation Classification database.

Vegetation zones

Where applicable, PCTs must be delineated into vegetation zones based on broad condition states. Disturbance to growth form groups for tree, shrub and ground cover or extent of exotics (or combinations of these) can be used to identify areas of similar condition. This section must detail how vegetation zones were assessed. To adequately assess VI scores across large areas, PCTs should be separated into multiple vegetation zones identifying different condition differences where possible, rather than lumping into broad similar condition states.

Importantly, low condition areas MUST be separated from other higher condition areas when determining vegetation zones. The BAM does not define 'low condition', therefore the criteria in the following table has been adapted.

Criteria for assessing vegetation in low condition

Cat	Vegetation formation	Criteria
A	Rainforest Wet-sclerophyll forest Dry-sclerophyll forest Grassy woodland Semi-arid woodland Forested wetland	Native tree cover <25 % of the tree cover benchmark for the PCT. **AND** Less than 50% of ground cover vegetation consists of either: • *species listed in the BioNet Vegetation Classification PCT profile for medium to high classification confidence PCTs;* ***or*** • *any native species for very low to low classification confidence PCTs.* **OR** Greater than 90% of ground cover vegetation is cleared.
B		Native shrub cover <50 % of the shrub cover benchmark for the PCT.

	Arid Shrubland Heathland Or any PCT from category A where the tree cover benchmark is <10 %	**AND** Less than 50% of ground cover vegetation consists of either: • *species listed in the BioNet Vegetation Classification PCT profile for medium to high classification confidence PCTs;* ***or*** • *any native species for very low to low classification confidence PCTs.* **OR** Greater than 90% of ground cover vegetation is cleared.
C	Freshwater Wetland Saline Wetland Grassland Alpine Complex Or any PCT from category B where the shrub cover benchmark is <10 %	Less than 50% of ground cover vegetation consists of either: • *species listed in the BioNet Vegetation Classification PCT profile for medium to high classification confidence PCTs;* ***or*** • *any native species for very low to low classification confidence PCTs.* **OR** Greater than 90% of ground cover vegetation is cleared.

Plot-based vegetation survey

A brief section which describes the plot-based floristic vegetation survey effort. This section must identify the number of plots undertaken and the method of plot location. Although PCTs and vegetation zones are not detailed until the next section, this section should include a table summary of the minimum number of plots required and the number of plots undertaken for each vegetation zone in accordance with Table 3 of the BAM.

In addition to the plot data required by the BAM, TfNSW also requires the number of trees in each stem size class to be counted in each plot. This data can be used to provide a representative sample of tree counts in each vegetation zone and an estimate of tree replacement requirements where applicable in accordance with the Tree and Hollow Replacement Guidelines (EMF-BD-GD-0129).

Table 4-1: Minimum number of plots required and completed per vegetation zone

Veg zone	PCT	Condition	Area (ha)	No. plots required	No. plots completed (plot IDs)
E.g., Zone 1	PCT [insert ID]: [PCT name]	E.g., 'High', 'Moderate', 'Disturbed', 'Revegetation'		See Table 3 of the BAM	[list number of plots] plots (Plots: [list plot IDs])

Insert a map of vegetation integrity (VI) plot locations. As a minimum, this figure should display:

- VI plot locations displayed by a point symbol showing the start of the plot
- VI plot midline displayed as a line from the start of the plot to the end of the larger plot used to assess function attributes (labelled with the plot name)

Figure 4-1: Vegetation integrity plot-based assessments

4.1.4 Patch size

A summary of the method of patch size calculation. Results are to be provided in Section 4.3.

4.1.5 Limitations

A summary of assessment and survey limitations must be included. This section must:

- Detail information on survey techniques employed that vary from relevant guidelines.
- Discuss any variations to survey timing or duration from that detailed in the guidelines.
- Discuss if surveys were undertaken during suboptimal times or survey conditions for target species and how this has been incorporated into the assessment.
- Any other limitations identified as part of the impact assessment.

4.2 Plant community types

A description of the PCTs identified within the subject land needs to be provided. In Table 4-2, list all the PCTs identified within both the subject land and (if applicable) any broader study area that is being assessed for indirect impacts. Note that it may be appropriate to describe PCTs that are in the broader study area, though are not in the subject land and therefore will not become vegetation zones in the BAM-C.

Table 4-2: PCTs identified within the subject land and broader study area

Veg. zone	Plant community type (PCT)	Threatened ecological community (TEC)	Aera in subject land (ha)	Area in study area (ha)
e.g., Zone 1	PCT [insert ID]: [PCT name]	E.g. 'Endangered (BC Act and EPBC Act)' or 'Not a TEC'	##	##

Profiles for each mapped PCT should be provided. An example layout for each PCT description is provided in the following section.

Insert a figure that shows the native vegetation extent within the subject land and broader study area (as described in Section 5.1 of the BAM). As a minimum, this figure should display:

- Plant community types.
- Vegetation zones.
- Location of vegetation integrity plot start and midline.

Figure 4-2: Plant community types and vegetation zones

4.2.1 PCT [Insert PCT ID] [insert PCT name]

Overview

Include typical features of the community as per the description in the BioNet Vegetation Classification database and then more specifically within the subject land and study area. This should include the typical form, altitude of occurrence (if known), soil and landscape associations and the distribution of the community within the region. Dominant species in each of the stratum should be provided, including local variations. Dominant weed species should also be included in the description.

PCT ID	
PCT name	
Vegetation class	
Vegetation formation	
Estimate of per cent cleared	## %
Area in subject land	## ha
Conservation status	List the names and status of applicable TEC (both BC Act and EPBC Act) with a reference to the section in the BDAR (e.g. Section 4.4 or Chapter 6) where the assessment is detailed, or "Not a TEC".
Vegetation zones (condition) and plots	E.g., Zone 1 (Moderate) – Plots ##, ##, ##

Justification of PCT selection

The description must include the rationale for the chosen PCT, including identification of other similar PCTs known to occur in the locality. This may involve identifying other PCTs with a similar floristic composition (e.g., dominant canopy species) or simply PCTs of the same vegetation class (e.g., coastal freshwater lagoons) that are mapped in the locality. The rationale must reference the biotic and abiotic features identified on the subject land against features described for each PCT in the BioNet Vegetation Classification, such as:

- IBRA subregion.
- Landscape position.
- Soil and geology.
- Hydrology.
- Dominant species in each stratum.

Floristic and structural summary of PCT ## within the study area

Growth form	Dominant species
Trees	
Shrubs	
Grass and grass-like	
Forb	
Fern	
Other	
Exotic	
High Threat Exotic	

Condition states

If more than one vegetation zone is present for each PCT, the differences must be described in this section.

E.g., "Two condition classes were identified within the subject land:

- Good (vegetation zone #) – this condition class includes … and is located …

- Low (vegetation zone #)"

A photo of each condition class (vegetation zone) in the PCT should also be included with the description – preferably taken at a plot location.

Photo 4-1: Plot [insert plot identifier] showing vegetation zone [insert zone identifier] (PCT [insert number] - [insert condition])[Formatting note: to add "Photo" as a caption label, click 'Inset caption' then 'New label']

4.3 Vegetation zones and vegetation integrity score

Discuss the stratification of PCTs by broad condition variants or other factors (i.e., management regimes) into vegetation zones. This will require a table summarising the area of each vegetation zone (see the example at Table 4-3). The table should also list the patch size for each vegetation zone as it has been entered into the BAM-C and the vegetation integrity (VI) score that is calculated.

VI survey plot data is to be summarised and provided as appendices to the BDAR, including a species list per plot (Appendix A) and VI plot data (or scanned field sheets) as they are imported into the BAM-C (Appendix C).

Table 4-3: Vegetation zones and vegetation integrity scores

Veg zone	PCT	Broad condition class	TEC?	Patch size class	Area within subject land (ha)	VI score
E.g., Zone 1	PCT [insert ID]: [PCT name]	E.g., 'High', 'Moderate', 'Disturbed', 'Revegetation'	e.g., 'Endangered (BC Act)' or 'Not a TEC'	'<5 ha' '5–24 ha' '25–100 ha' '>100 ha'	##	##

4.4 Threatened ecological communities

Each of the PCTs that meet the description of TECs under the BC Act must be identified.

A description of why the PCTs meet the definition of a TEC must be provided for each TEC identified, using relevant identification guidelines, listing advice or scientific determinations. See NSW Threatened Species Scientific Committee determinations.

The description must include specific details of how the PCT (and in some cases which vegetation zones) meets each element of the scientific determination, such as geographical distribution, species composition, landscape position and details of the soils/geology associated with the TEC. The description must be evidence based, referencing plot data and showing photos where required.

Insert a map of the TECs identified in the study area. As a minimum, this figure should display:

- Plant community types.
- Vegetation zones.
- Threatened ecological communities (BC Act).

Figure 4-3: Threatened ecological communities

4.5 Groundwater dependent ecosystems

Identify if any groundwater dependent ecosystems (GDEs) occur in the subject land or assessment area and their likely groundwater dependence in accordance with Section 3 of the Risk Assessment Guidelines for Ground Dependent Ecosystems (Department of Primary Industries (DPI), 2012). Assessment should include

identification of both aquatic and/or terrestrial GDEs (this may be just an assessment of the PCTs identified in Section 4.2) with a likely degree of groundwater dependence, including:

- Entirely/obligate.
- Facultative (high, proportional or opportunistic).
- Not dependent

Figure 4-4: Groundwater dependent ecosystems

4.6 Other vegetation

Discuss other vegetation that is not consistent with a PCT including scattered trees, native plantings, urban exotics and weeds. Scattered trees and planted native vegetation that is not assigned to a PCT is required to be assessed in accordance with streamlined assessment modules Appendix B and Appendix D of the BAM (note this template does not allow for the inclusion of any streamlined assessment modules).

5. Threatened species

5.1 Background research

Document the background research undertaken in accordance with the BAM. As a minimum, the following databases and information sources reviewed to prepare a list of potential threatened and migratory species for survey:

- Biodiversity Assessment Method Calculator (BAM-C) – case number [insert case number].
- BioNet - the website for the Atlas of NSW Wildlife and Threatened Biodiversity Data Collection (TBDC) – searched [insert download date].
- Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) Protected Matters Search Tool – searched [insert download date].
- NSW Biodiversity Values Map and Threshold Tool - reviewed [insert review date].
- Important Area Maps - reviewed [insert review date].
- Regional vegetation mapping e.g. 'State Vegetation Type Map: Western Region Version 1.0. VIS_ID 4492 (Office of Environment and Heritage, 2019)'.
- Any previous recent and relevant surveys (e.g., preliminary environmental investigation, options assessments) or studies.

This section should also identify when:

- The preliminary and provisional determinations to list species and ecological communities as threatened under the BC Act were viewed on the NSW DCCEEW Threatened Species Scientific Committee website.
- The annual Final Priority Assessment List of nominated species and ecological communities that have been approved for assessment by the Minister responsible for the EPBC Act were viewed on the Cth DCCEEW website.

A habitat suitability assessment table must be completed and provided in Appendix B to assess the likelihood of each threatened species identified in background research to occur on the subject land. A likelihood of occurrence criteria is provided in Appendix B; however this is to provide guidance only and a species must be assessed for its presence on the subject site in accordance with Chapter 5 of the BAM. The assessment should consider information provided for each species in the BioNet Threatened Biodiversity Data Collection (e.g., geographic limitations and habitat constraints), a description of the suitability of habitat against the known habitat requirements and a determination of the likelihood of the species occurring on the subject land. An example of the preferred habitat assessment table format is provided in Appendix B.

5.2 Threatened species habitat assessment

This section describes the process of assessing the habitat types within the subject land and broader study area and the habitat suitability assessment for threatened species as outlined in Chapter 5 of the BAM.

This may involve the identification of the different broad habitat types present on the subject land and surrounding broader study area. Habitat types can be defined using Keith (2004) vegetation formations and vegetation classes.

5.2.1 Habitat suitability for species that can be predicted by habitat surrogates (ecosystem credit species)

Identify the process of assessing habitat suitability for the ecosystem credit species (predicted species) in accordance with Section 5.1 of the BAM. Ecosystem credit species are assessed in conjunction with information collected about the site context of the subject land (Chapter 3 of the BAM), PCTs and vegetation integrity attributes (Chapter 4 of the BAM), and data obtained from the BioNet Threatened Biodiversity Data Collection (TBDC).

The section will provide a table (Table 5-1) showing the list of ecosystem credit species generated by the BAM-C, once PCTs and vegetation zones have been entered. The justification for including or excluding ecosystem credit species from the assessment is required, which can be based on habitat suitability and relevant geographic/habitat constraints for each species. The contents of Table 5-1 must align with the output from the BAM-C. For species that are listed as 'dual credit' species in the TBDC, list their common name followed by the ecosystem credit component of their listing, e.g., 'Little Eagle (foraging)'.

Table 5-1: Summary of predicted ecosystem credit species assessed

Species name	Common name	EPBC Act	BC Act	Justification for inclusion / exclusion	Sensitivity to gain class[1]
e.g., *'Botaurus poiciloptilus'*	e.g., 'Australasian Bittern'	e.g., 'E'	e.g., 'E'	e.g., 'Included for all vegetation zones'	e.g., 'Moderate'
e.g., *'Hieraaetus morphnoides'*	e.g., 'Little Eagle (foraging)"	e.g., '-'	e.g., 'V'	e.g., 'Excluded from vegetation zones 3 and 4'	e.g., 'Moderate'
Note: 1. Information provided by the BAM-C and the TBDC. *Key: CE = Critically Endangered, E = Endangered, V = Vulnerable, M = Migratory*					

5.2.2 Habitat suitability for species that cannot be predicted by habitat surrogates (species credit species)

Identify the process of assessing habitat suitability for the species credit species (candidate species) in accordance with Section 5.2 of the BAM. Species credit species are assessed in conjunction with information collected about the site context of the subject land (Chapter 3 of the BAM), PCTs and vegetation integrity attributes (Chapter 4 of the BAM), and data obtained from the Threatened Biodiversity Data Collection (TBDC). The assessor must review the 'General notes' section of the TBDC for each candidate species as it contains relevant information including survey requirements, serious and irreversible impacts, information to assist with distinguishing between similar species, relevant resources and more.

The transparency of this process is highly important as it demonstrates the development of the final candidate species list (i.e., species that are further assessed by targeted surveys).

Identify threatened species for assessment and assess geographic limitations and habitat constraints

This section describes the first steps of including/excluding candidate species from requiring further assessment based on geographic limitations and habitat constraints (Step 1 and Step 2 of Section 5.2 of the BAM).

List the species credit species generated by the BAM-C in Table 5-2, including specific details for species which the BAM-C and TBDC contains geographic limitations and/or habitat constraints. The accredited assessor must ensure that the information provided in the BDAR is consistent with the BAM-C upon submission (e.g., where species are listed as excluded in the BDAR they must also be excluded in the BAM-C).

Table 5-2: Summary of initial list of predicted species credit species generated by the BAM-C with assessment of habitat constraints and geographic limitations

Species name	Common name	EPBC Act	BC Act	Sensitivity to gain class[1]	Habitat constraint[1]	Geographic limitation[1]	Included or excluded
e.g., '*Calotis glandulosa*'	e.g., 'Mauve Burr Daisy'	e.g., 'V'	e.g., 'V'	e.g., 'High'	e.g., 'n/a' e.g., 'Nest trees - live (occasionally dead) large old trees within vegetation) – No'	e.g., 'North of Eucumbene – Yes'	e.g., 'Included'

e.g., '*Hieraaetus morphnoides*'	e.g., 'Little Eagle (foraging)'	e.g., '-'	e.g., 'V'	e.g., 'Moderate'		e.g., "n/a"	e.g., 'Excluded – refer to Section 5.2.2a'

Note: 1. Information provided by the BAM-C and the TBDC.
Key: CE = Critically Endangered, E = Endangered, V = Vulnerable, M = Migratory

Candidate species excluded from or added to the assessment

Document all species credit species that are excluded/removed from requiring further assessment against the habitat constraints and geographic limitations listed in Table 5-2, including the justification. This information can be provided as dot points:

- E.g., 'Little Eagle breeding habitat is specified as live (occasionally dead) large old trees within suitable vegetation AND the presence of a male and female; or female with nesting material; or an individual on a large stick nest in the top half of the tree canopy. There are no live large old trees within the subject land that contain large stick nests. The habitats within the subject land contain relatively small to moderate-sized Eucalyptus spp. trees that are not suitable as nesting sites for the Little Eagle. Consequently, the Little Eagle was removed from the candidate species list.'

If applicable, this section should also identify any species which have been added to the assessment. This includes species that were not identified by the BAM-C based on PCT associations, however the species is known to occur, has been identified in previous studies as having at least a moderate likelihood of occurring on the subject land or there is a specific requirement to assess the species as directed by the project SEARs. These species are added to the candidate species list using the search function in the BAM-C. These species can be listed and discussed in this section as dot points.

The accredited assessor must ensure that the information provided in the BDAR is consistent with the BAM-C upon submission (e.g., where species are listed as excluded in the BDAR they must also be excluded in the BAM-C).

Candidate species requiring further assessment

Identify the final list of candidate species in Table 5-3 which require further assessment (ie targeted survey or expert report) in accordance with Step 3 of Section 5.2 of the BAM.

Table 5-3: Summary of candidate species credit species included for further assessment

Species name	Common name	EPBC Act	BC Act	Sensitivity to gain class[1]	SAII	Relevant habitat in the study area
e.g., '*Calotis glandulosa*'	e.g., 'Mauve Burr Daisy'	e.g., 'V'	e.g., 'V'	e.g., 'High'	e.g., 'Yes'	e.g., 'Suitable habitat is present within the subject land, represented by the high-quality grassland'

Note: 1. Information provided by the BAM-C and the TBDC.
Key: CE = Critically Endangered, E = Endangered, V = Vulnerable, M = Migratory

5.3 Threatened species survey

Document survey methods for the candidate species listed in Table 5-3, unless an expert report is used, the site falls within a mapped important area, or a species presence is being assumed without survey.

5.3.1 Threatened flora surveys

Document terrestrial flora survey methods for candidate species identified in Table 5-3 in accordance with methods described in Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method (DPIE 2020c) and the Draft survey guidelines for Australia's threatened orchids (Cth DCCEEW 2013).

This section of the report should detail survey effort, timing and preceding climatic conditions (i.e., for relevant species provide a brief description of the suitability of the conditions for detection, e.g., annual rainfall in the region, drought, bushfire, etc.). Survey timing must adhere to the months detailed in the TBDC and BAM-C for each candidate flora species and should be summarised in the format shown in Table 5-4. For cryptic species with a high potential for occurrence, surveys should include visiting reference populations (or getting confirmation of flowering from BCS threatened species officers) to ensure visibility in the assessment area during the chosen survey time.

If the subject land cannot be accessed and/or insufficient survey (that is not in accordance with the guidelines and TBDC) is completed for any species requiring further assessment, then the species may need be assumed to be present. For certain species (i.e., those species for which there is an approved expert listed on the DPIE website), in the absence of suitable survey effort an expert report can be provided to demonstrate that the species is not likely to occur on the subject land. Alternatively, assessment of the subject land may demonstrate that the habitats are degraded in accordance with Subsection 5.2.3 paragraph 2.a.ii of the BAM. This determination must be supported by survey data (e.g., VI plot data) compared to the known habitat requirements of the species.

Table 5-4: Targeted threatened candidate flora survey details

Species name	Common name	Required survey period	Associated PCTs in the subject land	Minimum survey requirements[1]	Survey completed
e.g., '*Calotis glandulosa*'	e.g., 'Mauve Burr Daisy'	State the survey months required by the TBDC, e.g., 'October to March'	List the associated PCTs in the subject land listed in the TBDC, e.g., 'PCT 1196 – 5.6 ha'	State the minimum survey effort and technique/s to be used	Demonstrate how the minimum survey effort has been met by the assessment – include weather and seasonal considerations as required

Note: 1. This should be based on survey guidelines.

5.3.2 Threatened fauna surveys

Document terrestrial fauna survey methods for candidate species identified in Table 5-3 in accordance with survey guidelines (see Section 1.4 for list of guidelines).

This section of the report should detail survey effort, timing and weather conditions during the survey. Survey timing must adhere to the months detailed in the TBDC and BAM-C and any relevant survey guidelines for each candidate fauna species and should be summarised in the format shown in Table 5-5. In some circumstances, it may be appropriate to lump PCTs within the same vegetation class together where they represent the same broad habitat type. This may not be appropriate for all species, however, can be suitable for meeting survey effort requirements for large areas.

If the subject land cannot be accessed and/or insufficient survey (that is not in accordance with the guidelines and TBDC) is completed for any candidate species requiring further assessment, then the species may need be assumed to be present. For certain species (i.e., those species for which there is an approved expert listed on the DPIE website), in the absence of suitable survey effort an expert report can be provided to demonstrate that the species is not likely to occur on the subject land. Alternatively, assessment of the subject land may demonstrate that the habitats are degraded in accordance with Subsection 5.2.3 paragraph 2.a.ii of the BAM. This determination must be supported by survey data (e.g., VI plot data) compared to the known habitat requirements of the species.

Table 5-5: Targeted threatened candidate fauna survey details

Species name	Common name	Required survey period	Associated PCTs in the subject land	Minimum survey requirements[1]	Survey completed
e.g., '*Ninox connivens*'	e.g., 'Barking Owl'	State the survey months required by the BAM-C and TBDC, e.g., 'May – December (breeding habitat survey)'	List the associated PCTs in the subject land listed in the TBDC, e.g., 'PCT 300 – 2.3 ha'	State the minimum survey effort (days/nights) and technique/s to be used.	Demonstrate how the minimum survey effort has been met by the assessment – include weather and seasonal considerations as required.

Note: 1. This should be based on survey guidelines.

A summary of survey effort undertaken for each candidate fauna species must be provided in the BDAR, including:

- A description of the targeted survey areas in the subject land and surrounding broader study area (i.e., the associated PCTs and vegetation zones).
- A description of the survey techniques employed, including the rationale behind the selection of techniques and survey areas/sites selected.
- A summary of the field survey effort (e.g. person hours, kilometres walked, dates, time of day, weather details pertaining to species detection).
- A discussion on any limitations to the field survey effort (e.g., seasonality of survey times, identification of cryptic species, weather, access, etc.).

5.3.3 Limitations

A summary of assessment and survey limitations must be included. This section must:

- Detail if and why survey techniques varied from relevant guidelines.
- Discuss any variations to survey timing or duration from that detailed in the guidelines and TBDC.
- Discuss if surveys were undertaken during suboptimal times or survey conditions (e.g., drought conditions) for target species and how this has been incorporated into the assessment.
- Any other limitations identified as part of the impact assessment.

Insert a figure/s showing the location of all targeted threatened species surveys. Depending on the number of species targeted, this may need to be separated into separate figures for flora and fauna. As a minimum, this figure should display:

- Fauna survey locations (displayed by each survey type) including any fauna habitat features identified (e.g., hollow-bearing trees, rocky outcrops, aquatic habitat).
- Flora survey locations (typically displayed as GPS tracks for each surveyor).
- Broad habitat types (vegetation classes) or PCT mapping as appropriate.

Figure 5-1: Threatened species survey locations

5.4 Threatened species results

This section should document all the threatened species recorded on the subject land and broader study area both opportunistically and through targeted surveys. Ecosystem credit species (predicted species) can be listed briefly as dot points. The results of targeted surveys for species credit species (candidate species) must be discussed in more detail either in separate subsections for each species or group of species (e.g., arboreal mammals) or summarised in a table. If the subject land cannot be accessed and/or insufficient survey (that is not in accordance with the guidelines and TBDC) is completed for any species requiring further assessment, then the species may need be assumed to be present. Table 5-6 is provided below to guide the level of detail required. For candidate species that are recorded or assumed to occur, this section must detail how the species polygon was created with references to the appropriate figures.

Expert reports can be used in place of targeted surveys to assess the likely presence of a species on the subject land. An expert report can only be prepared by a person who, in the opinion of the Secretary of the Department or anyone authorised by the Secretary, has specialised knowledge, which may be based on training, study or experience, to provide an expert opinion regarding the threatened species to which the report relates. More information on experts, including a list of approved experts, is at Biodiversity experts | NSW Biodiversity, Conservation and Science. An expert report must include the information listed in Section 5.3 (Box 3) of the BAM.

Table 5-6: Threatened species credit (candidate) species survey results

Species name	EPBC Act	BC Act	Identification method (not recorded, assumed, recorded, expert report)	Survey effort compliant?[1]	Results
e.g., '*Ninox connivens (Barking Owl)*'	E.g., '-'	E.g., 'V'	E.g., 'Not recorded'	E.g., 'Yes'	Discussion of results and habitat suitability. Where species are recorded or assumed, detail the number of individuals or area identified. Detail results of expert report (if applicable). Detail habitat feature/component associated with species and its abundance on site (e.g., hollow-bearing trees and/or PCTs). For species not recorded, detail potential reasons (e.g., habitat suitability, survey conditions and compliance of survey effort, etc.)

Note: 1. As identified in Section 5.3 of this BDAR.

Insert a figure/s showing the location of all recorded threatened species and associated species polygons including suitable habitat features (e.g., hollow-bearing trees). Multiple figures may be required to clearly display the data. As a minimum, the figure/s should display:

- Point locations of each threatened species recorded. In reports that will go on public display, maps in the final version must be in accordance with the Sensitive species data policy | NSW Biodiversity, Conservation and Science.
- Species polygons for candidate species, including any data/information used to create the polygons (e.g., buffers, waterways, etc.).

Figure 5-2: Distribution of threatened species recorded

5.5 Aquatic habitat and threatened species

If appropriate, provide a discussion of the aquatic and threatened species habitat assessment. The level of detail provided will depend on the site context and proposal. Note that the BAM does not include any specific requirements for this assessment, though may be required by SEARs. The following subsection headings provide some guidance for the detail that can be provided. This assessment may access and reference the following guidelines and databases:

- Policy and guidelines for fish habitat conservation and management (Update 2013) (nsw.gov.au).
- Why do fish need to cross the road? Fish passage requirements for waterway crossings (nsw.gov.au) (Fairfull and Witheridge, 2003)
- The Aquatic Ecology in Environmental Impact Assessment – EIA Guideline (Lincoln Smith, 2003).
- Fisheries Spatial Data Portal.
- Protected Matters Search Tool.
- SEED - NSW Wetlands mapping.
- SEPP (Resilience and Hazards) 2021 – Coastal management area Interactive map viewer.
- Australian Wetlands Database.

5.5.1 Habitat assessment

Describe the aquatic habitat in the subject land and broader study area. Habitat value (i.e., habitat sensitivity and classification of waterways for fish passage) must be characterised in accordance with NSW DPI (Fisheries) document Policy and Guidelines for fish habitat conservation and management (2013 update).

Waterway habitat assessment must also include:

- The ecosystem type (e.g. wetlands, floodplains, streams, estuaries, lakes).
- Dimensions of waterway and depth of water.
- Flow characteristics and hydrological features of aquatic habitat, including changes to drainage and filtration and flow regime.
- Bed substrate (e.g. rocks, coral, gravel, sand, mud).
- Habitat features (e.g. pools, riffles, billabongs, reefs).
- Existing infrastructure and barriers to fish movement (natural or artificial).
- Width and species composition of riparian vegetation including the type of vegetation present (e.g. macrophytes, snags, seaweeds, seagrasses, mangroves, saltmarsh) and condition.
- Water quality (i.e. a snapshot using basic water quality indicators at the time of sampling including dissolved oxygen, pH, turbidity, temperature, nutrients and salinity).

5.5.2 Threatened species

List all threatened aquatic species listed under the FM Act and EPBC Act that are identified by background research and provide an assessment of their likelihood of occurrence.

Detailed aquatic fauna surveys may be required where the proposal is on a Class 1 or 2 watercourse (DPI 2013), where it has been identified there may be a significant impact on a threatened aquatic species or where the proposal crosses 'critical habitat' (as defined by the FM Act).

For fish species listed as threatened under the EPBC Act, refer to the Survey guidelines for Australia's threatened fish (Commonwealth of Australia 2011d), available on the Cth DCCEEW website.

5.5.3 Aquatic results

The habitat value of each waterway (i.e., habitat sensitivity and classification of waterways for fish habitat) and the results of the waterway habitat assessment should be provided. Photos of each waterway should be provided, showing specific features discussed. This may be best presented in a table.

Results of any detailed aquatic fauna survey including macroinvertebrate survey and analysis should be detailed.

Recorded threatened aquatic species, populations or ecological communities listed under the FM Act, should be identified and discussed. All species with a moderate to high potential to occur (identified from the habitat assessment table) should also be included in the discussion. Details on their occurrence, habitat present and likely abundance should be included.

Include location of all recorded threatened aquatic species and populations and areas of available habitat in the study area (e.g., key fish habitats) in

.

If required, insert a figure/s showing the location of all aquatic surveys, recorded threatened aquatic species and habitat assessment locations (e.g., key fish habitats - these should align with any sites discussed in main text).

Figure 5-3: Aquatic survey locations and results

6. Matters of national environmental significance

This paragraph is not part of the BAM assessment requirements but has been provided to demonstrate consideration of EPBC Act.

The following MNES protected under the EPBC Act should be considered for their relevance to the project:

- World Heritage Properties (sections 12 and 12A)
- National Heritage Places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Commonwealth land (for actions outside Commonwealth Land that may impact on the environment on Commonwealth Land) (section 26 and 27A).

This section should identify any recorded or presumed present threatened species, populations and communities listed under the EPBC Act within the subject land and landscape assessment area (if appropriate, e.g., RAMSAR wetlands). Other MNES identified above, that are not assessed under the BAM, should also be considered in this section.

Each of the PCTs that meet the description of TECs listed under the EPBC Act should be identified. The description must include specific details of how the PCT (and in some cases which vegetation zones) meets each element of the conservation advice, including an assessment of the key diagnostics and condition thresholds. The description must be evidence based, referencing plot data and showing photos where required.

For projects that are:

- Subject to the NSW Assessment Bilateral Agreement, this section should also address any EPBC Act assessment requirements set out in supplementary SEARS
- Controlled actions outside of the NSW Assessment Bilateral Agreement, this section should also address any EPBC Act assessment requirements set out by Cth DCCEEW.

Insert a figure/s showing the location of all MNES recorded in the subject land or broader study area.

Figure 6-1: Matters of national environmental significance recorded

7. Avoid and minimise impacts

A key component of TfNSW's Biodiversity Policy commitment to no net loss of biodiversity requires the application of the 'avoid, minimise, mitigate and offset' hierarchy as follows:

1. Avoid and minimise impacts.
2. Mitigate unavoidable impacts.
3. Offset residual impacts.

To satisfy the first step, this chapter of the BAR must describe all efforts taken to avoid and minimise impacts on biodiversity throughout the life of the project up to this point. This may begin as early as business case development (where strategic offset cost estimates can influence proposal options) and continue through to concept design. This information should be requested from your TfNSW proposal contact.

7.1 Avoidance and minimisation of impacts on native vegetation, threatened species, threatened ecological communities and their habitat

The BDAR must describe the efforts made to avoid and minimise impacts to biodiversity in accordance with Chapter 7 of the BAM. Depending on the proposal, this can include a discussion of the selection of options, design refinements and selection of construction methods. The discussion can be accompanied by maps where relevant. Reference can be made to other sections of the EIS that discuss avoidance measures.

This section should specifically address how the project has been located and designed to minimise prescribed biodiversity impacts in accordance with Section 7.1 of the BAM (DPIE 2020a). If possible, the requirements of Section 7.1 should be summarised into a table such as the example Table 7-1 provided below.

Table 7-1: Design refinements that have avoided and/or minimised impacts

Design aspect	Options considered	Rationale for design refinement
e.g., 'Compound site locations'	List the different options that may have been considered for each design aspect.	Justify and discuss how the design aspect has considered avoidance and minimisation.

7.2 Avoidance and minimisation of prescribed impacts

The BDAR must also describe the efforts made to avoid and minimise impacts to biodiversity values (as defined by Section 8.3 of the BAM). Similar to the above discussion, the BDAR must identify how it has been located and designed to avoid and minimise impacts to prescribed impacts in accordance with Section 7.2 of the BAM. Provide a table such as Table 7-2 below and provide commentary against each of the prescribed impacts.

Table 7-2: Design refinements that have avoided and/or minimised prescribed impacts

Prescribed impacts	Rationale for design
Karst, caves, crevices, cliffs, rocks and other geological features of significance	Justify and discuss how the design aspect has considered avoidance and minimisation of prescribed impacts If the prescribed impact is not applicable to the proposal, write 'Not applicable'.
Human-made structures or non-native vegetation	
Habitat connectivity	

Water bodies, water quality and hydrological processes	
Vehicle strikes	

8. Impact assessment

Document the assessment of potential impacts on biodiversity values in accordance with Chapter 8 of the BAM, including:

- Direct and relevant indirect impacts on native vegetation, TECs, threatened species and their habitat.
- Prescribed impacts on TECs, threatened species and their habitat.

8.1 Impacts associated with the removal of native vegetation, threatened ecological communities, threatened species and their habitat

The direct and indirect impacts of the project from the removal of native vegetation, threatened ecological communities and threatened species habitat must be identified and discussed. This section should also clearly describe how project impacts were calculated, including any key assumptions.

8.1.1 Direct impacts on native vegetation and threatened ecological communities

This section details the direct impacts of the project on native vegetation and threatened ecological communities. Direct impacts to vegetation are calculated by the area of each vegetation zone within the subject land. The assessor must use change (loss) in the vegetation integrity score of each vegetation zone as a measure of the direct impact on the habitat condition for the species. Total clearing assumes vegetation integrity will become zero, however in some cases where only partial clearing is required (e.g., under scrubbing), it may be appropriate to alter the future vegetation integrity score in the BAM-C to reflect this (see Appendix F for a guide).

Direct impacts to native vegetation and TECs must be quantified and briefly summarised in the text. List the direct impact areas for each vegetation zone in the table format shown by Table 8-1. Vegetation zone numbers and impact areas must be consistent with the data entered into the BAM-C.

Although an assessment of impact significance is not required in accordance with the BAM, this section should include a brief discussion of impact context for TECs, such as the proportional impact to the occurrence of a TEC in the locality.

Table 8-1: Summary of impacts to native vegetation

Veg zone	PCT	Broad condition class	TEC	Area to be impacted (ha)	Change (loss) in vegetation integrity score
E.g., Zone 1	PCT [insert ID]: [PCT name]	E.g., 'High', 'Moderate', 'Disturbed', 'Revegetation'	e.g., 'Endangered (BC Act)' or 'Not a TEC'	##	##
Total				##	-
NOTE: The vegetation zones in this table must be consistent with the BAM-C and match the final credit report.					

8.1.2 Direct impacts to threatened species

This section relates to final candidate species.

For threatened species assessed by area, the assessor must use change (loss) in the vegetation integrity score of each vegetation zone that is within the species polygon as a measure of the direct impact on the habitat condition for the species.

Impacts on threatened flora species and their habitat should be discussed. The direct impact on individuals or area of habitat defined by the species polygon should be measured in accordance with the BAM.

Direct impacts to candidate fauna species must be quantified and briefly described in the text. List the specific direct impacts per candidate species (i.e., area of habitat or number of individuals) in the format shown by Table 8-2. The impacts must be consistent with the data entered into the BAM-C.

Impacts to threatened ecosystem credit species can also be identified, however this information is not required to be quantified in accordance with the BAM.

Although an assessment of impact significance is not required in accordance with the BAM, this section should include a brief discussion of impact context, such as the proportional impact to a population of a threatened flora species, or how the impacts relate to the local availability of key habitat features such as hollow-bearing trees, rocky outcrops, etc.

Table 8-2: Summary of direct impacts on threatened species credit species

Species name	Common name	EPBC Act	BC Act	Sensitivity to gain class	SAII?	Habitat or individuals to be impacted
e.g., '*Ninox connivens*'	e.g., '*Barking Owl*'	E.g., '-'	E.g., 'V'	E.g., 'Moderate	##	##
NOTE: The vegetation zones in this table must be consistent with the BAM-C and match the final credit report.						

8.2 Indirect impacts

The BDAR must also include discussion on the potential indirect impacts of the proposal in accordance with Section 8.2 of the BAM. The content of this assessment will depend on the nature of the proposal and site context.

Indirect impacts occur when the proposal or activities relating to the construction, operation and general change in land-use patterns of the proposal affect native vegetation, threatened ecological communities, threatened species and their habitats beyond the subject land (direct impact area).

Briefly identify the relevance of the different indirect impacts listed in Table 8-3 to the project. Additional discussion below the table is required for all relevant indirect impacts.

The assessment of all relevant indirect impacts must:

- Describe the nature, extent and duration of short-term and long-term impacts.
- Identify the native vegetation, threatened species, threatened ecological communities and habitats likely to be affected.
- Predict the consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.

If possible, indirect impacts should be quantified. Appendix F sets out a procedure for how this can be achieved when credit calculation is being proposed to offset some types of residual indirect impacts. It is likely that most indirect impacts will be able to be avoided or minimised through the development of targeted mitigation measures. Creating a credit obligation to offset residual indirect impacts is not a requirement of the BAM but can be considered when mitigation and management cannot avoid or adequately minimise certain impacts. This approach is described in more detail by Section 8.6 of the BAM, with examples provided in Section 2.4.1 of the BAM Stage 2 Operational Manual (DPE 2023). If this procedure is being considered, it should first involve consultation with TfNSW Biodiversity Specialists.

Table 8-3: Indirect impacts specified by the BAM

Indirect impact	Relevance to the project
Inadvertent impacts on adjacent habitat or vegetation	Briefly describe the relevance to the project
Reduced viability of adjacent habitat due to edge effects	
Reduced viability of adjacent habitat due to noise, dust or light spill	
Transport of weeds and pathogens from the site to adjacent vegetation	
Increased risk of starvation, exposure and loss of shade or shelter	
Loss of breeding habitats	
Trampling of threatened flora species	
Inhibition of nitrogen fixation and increased soil salinity	
Fertiliser drift	
Rubbish dumping	
Wood collection	
Bush rock removal and disturbance	
Increase in predatory species populations	
Increase in pest animal populations	
Increased risk of fire	
Disturbance to specialist breeding and foraging habitat, e.g., beach nesting for shorebirds.	

8.3 Serious and irreversible impacts

This section must identify every and any potential serious and irreversible impact (SAII) entities for the project. All potential SAII entities are identified by the BAM-C, TBDC and addressed in the BAM Stage 2 manual (DPE 2023). Other threatened biodiversity values at risk of SAII can also be identified by the assessor using the four principles outlined in the 'Guidance to assist a decision-maker to determine a serious and irreversible impact' (DPIE 2019b).

All SAII entities identified that would be potentially impacted by the project require additional information to be provided in the BDAR to assist the decision-maker in evaluating the extent and severity of the impact. This requires the provision of information in accordance with the criteria in Subsection 9.1.1 of the BAM for TECs and Subsection 9.1.2 of the BAM for threatened species.

EES has collated best available supporting data from a range of sources to assist reporting on the current status or population of threatened ecological communities or species. Data to support the application of SAII assessments is available on request at Biodiversity Offset Scheme (BOS) Help Desk and support.

Ensure all impacts from the project (i.e., direct, indirect and prescribed) that may affect the SAII entity are identified. Reference locations within the BDAR (e.g., links to relevant figures) that support the information provided.

It is important to note that no determination or recommendation of the potential for a SAII is required. Determination of SAII potential is the responsibility of the consent/determining authority.

A separate section should be included for each threatened ecological community and species identified as SAII entities.

8.3.1 Additional impact assessment provisions for TECs at risk of an SAII

Delete this subsection if not applicable.

[Insert TEC name]

Provide information for the TEC in accordance with the information requirements listed in Subsection 9.1.1 of the BAM. Information is best included in a table format.

8.3.2 Additional impact assessment provisions for threatened species at risk of an SAII

Delete this subsection if not applicable.

[Insert species name]

Provide information for the species in accordance with the information requirements listed in Subsection 9.1.2 of the BAM. Information is best included in a table format.

8.4 Prescribed biodiversity impacts

Provide an assessment of prescribed biodiversity impacts in accordance with Section 8.3 of the BAM. Prescribed biodiversity impacts are impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. This can include impacts on geological features (karst, caves, cliffs, etc.), human-made structures, connectivity of habitat, water quality and hydrological processes, and vehicle strike.

The following should be discussed for prescribed biodiversity impacts:

a) Describing the nature, extent, frequency, duration and timing of prescribed biodiversity impacts relevant to the proposal, including but not limited to:

   i Prescribed biodiversity impacts during construction.

   ii Prescribed biodiversity impacts during operation.

   iii Predictions of prescribed biodiversity impacts where impacts are uncertain.

b) Evaluating the consequences of prescribed biodiversity impacts.

c) Documenting any limitations to data, assumptions and predictions with respect to impacts on biodiversity.

The below sections and tables have been provided as a guide for assessment. If any of the prescribed impacts are not relevant to the proposal or subject land, briefly state this and delete the table.

All prescribed impacts identified are to be presented in

below. Where prescribed impacts relate to an area of land that is not native vegetation, this must be included in the species polygon for any impacted candidate species.

If required, include a figure showing areas associated with prescribed biodiversity impacts including the locations of:

- Habitat corridors.
- Karst, caves, crevices and cliffs.
- Hydrological processes that sustain and interact with the rivers, streams and wetlands mapped in accordance with Paragraph 6.1.4 of the BAM.

Figure 8-1: Areas associated with prescribed biodiversity impacts

8.4.1 Areas of geological significance

Table 8-4: Potential impacts on threatened entities associated with rocks

Threatened entity	Importance of rock for connectivity and refuge	Nature, extent and duration of short and long-term impacts due to rock removal	Consequences of the impacts for the local and bioregional persistence
	Reference relevant literature and other published sources of information.		

8.4.2 Human-made structures and non-native vegetation

Table 8-5: Potential impacts on threatened entities associated with human-made structures and non-native vegetation

Threatened entity	Human-made structures and/or non-native vegetation with potential to be habitat	Nature, extent and duration of short and long-term impacts due to removal of structures and/or non-native vegetation	Importance within the bioregion of the habitat to the threatened entity	Consequences of the impacts for the local and bioregional persistence
	Reference relevant literature and other published sources of information.			

8.4.3 Habitat connectivity

Where connectivity measures are proposed by the assessment, the preparation of a Wildlife Connectivity Strategy should be included as the environmental safeguard for the proposal consistent with the requirements of the TfNSW Biodiversity Policy. The purpose of the Wildlife Connectivity Strategy is to inform the final design of the project in relation to wildlife connectivity measures.

Table 8-6: Potential impacts on connectivity of habitat of threatened entities

Threatened entity	Movement patterns key to the life cycle of the threatened entity	Nature, extent and duration of short and long-term impacts to connectivity	Importance of the area of connectivity within the bioregion and to the lifecycle of the species	Consequences of the impacts for the local and bioregional persistence
	Reference relevant literature and other published sources of information.			

8.4.4 Water bodies, water quality and hydrological processes

Table 8-7: Potential impacts to water quality, water bodies and hydrological processes that sustain threatened entities

Threatened entity	Waterbodies impacted	Nature, extent and duration of short and long-term impacts on water quality and hydrological process	Nature, extent and duration of short and long-term impacts on habitat and life cycle	Importance within the bioregion of the waterbody or hydrological process	Consequences of the impacts for the local and bioregional persistence
	Reference relevant literature and other published sources of information.				

8.4.5 Vehicle strike (road projects only)

Table 8-8: Potential impacts of vehicle strikes on threatened fauna or on any fauna species that are part of a TEC

Species at risk of vehicle strike	Likelihood of vehicle strike	Estimate vehicle strike rates	Consequences of the impacts for the local and bioregional persistence of the species
	Take into consideration mobility, abundance, range and other relevant life history factors	Use supporting data or literature if available	Reference relevant literature and other published sources of information

8.5 Matters of national environmental significance

Impacts on matters of national environmental significance (MNES) listed under the EPBC Act need to be identified and assessed. This includes:

a) World and national heritage.

b) Wetlands of international importance.

c) Listed threatened species and communities.

d) Migratory species.

e) Commonwealth land.

In relation to impacts on MNES, consider the relevance of including the following information:

a) List all real and potential impacts of the action and each MNES likely to be affected by the action

b) Detail assessment of the extent, nature and consequence of the impact to those MNES

c) The extent of the assessment is proportionate to the level of environmental risk

d) Assess impacts having regard to the full extent of the species or community's range

e) Consider approved conservation advice when assessing the impacts of the action

f) Consider bioregional plans when assessing the impacts of the action.

Include a description of how the avoid, mitigate, offset hierarchy of principles were applied when assessing the impacts of the action on each MNES.

In addition, the BDAR must provide assessment of any residual significant impacts on each matter of MNES in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance . These assessments should be included as an Appendix to the BDAR if required, and the conclusions of the assessments presented in this section of the report.

Specific safeguards for MNES need to be detailed in the mitigation chapter of the BDAR, along with the efficacy of the measure and any residual impacts remaining after mitigation on that matter. The NSW Assessment Bilateral Agreement (EPBC Act) endorses the NSW Biodiversity Offsets Scheme. Therefore, residual impacts can be offset for threatened species, populations and communities listed under both the BC Act and the EPBC Act in accordance with the BAM. Additional offsetting may be required for any threatened entities not listed under the BC Act (e.g., Greater Glider).

Table 8-9: Summary of direct impacts on EPBC Act TECs

EPBC Act TEC	Veg. zone	Area of veg. zone consistent with TEC (ha or m²)[1]	Total area of TEC to be impacted (ha or m²)[1]
Write name of EPBC Act TEC (merge cells for all applicable rows)	e.g., Zone 1	##	## (merge cells and state total sum of all veg zones)
NOTE 1: Area to be cleared based on ground-truthed vegetation mapping within the subject land.			

8.6 Aquatic impacts

Assess the potential for impacts on aquatic biodiversity listed under the FM Act. This section must quantify (where possible):

- Direct impacts to key fish habitat and land identified by the SEPP (Resilience and Hazards) 2021.
- Direct impacts to marine vegetation (note that marine vegetation does not meet the definition of native vegetation under the BC Act and LLS Act and therefore is not covered by the BAM and BOS).
- Direct impacts to threatened species, populations, ecological communities and their habitat listed under the FM Act.

Other potential impacts to waterways and aquatic habitats to be addressed also includes:

- Temporary displacement of fauna.
- Loss of riparian and aquatic habitat, including removal or relocation of snags.
- Changes to flooding regimes, hydrology, turbidity and sedimentation.
- Obstruction to fish passage, including temporary in-stream structures and/or temporary diversions.
- Changed hydrology including excessive flow velocities, modified depths of waterways, increase water turbulence, in stream structures, realignment of waterways, alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands, and channelization, piping, concrete lining or scour protection of waterways.
- Changes in shading regime and temperature.
- Acid sulphate soils.

- Potential direct and indirect impacts on aquaculture, commercial and recreational fishing.
- Potential impacts of tannins entering waterways from mulch.

Discussion of the impacts must reference the Fisheries NSW policy and guidelines for fish habitat conservation and management (DPI 2013). The guidelines provide guidance on assessment of impacts on aquatic biodiversity and requirements for avoiding, minimising and offsetting these impacts.

If threatened aquatic species, populations and ecological communities are identified in the assessment area or are considered at least moderately likely to occur/presumed present (based on habitat assessment), assessments of significance in accordance with Division 12 of the FM Act should be completed. This requires the completion of a seven-part test, which should be added as an Appendix to the BDAR, with the results summarised in this section.

8.7 Groundwater dependent ecosystems

Assess the potential for impacts to GDEs. This can include a quantification of the direct impacts to PCTs that were identified in Section 4.5 as having groundwater dependence. The potential for changes to groundwater flows and depth as a result of the project should also be assessed for relevant projects (i.e., where drilling/piling at or below groundwater levels is required). Specialist groundwater assessments should be referenced (if available) for specific data on groundwater levels and the potential for groundwater drawdown during construction. Where drawdown is possible, the effect on potential GDEs needs to be assessed in accordance with the Risk Assessment Guidelines for Ground Dependent Ecosystems (Department of Primary Industries 2012).

8.8 Cumulative impacts

This section of the report must provide an analysis of the contribution of the project to ecological impacts in a local and regional context due to development. The impacts of other TfNSW projects/proposals, major projects and other large-scale developments must be considered to an extent that is practical. A quantitative analysis must be prepared where information is readily available (i.e., published).

Cumulative impacts must be considered in terms of vegetation and habitat removal, impacts on threatened species, populations and ecological communities and water quality impacts as a minimum. Cumulative impacts will have a temporal and spatial scale. A cumulative impact assessment must consider impacts of both concurrent and future proposals (where these are known or can be anticipated).

Cumulative impact assessment may be documented using the following Table 8-10 template.

Table 8-10: Past, present and future projects

Project	Biodiversity value impacted	Construction impacts	Operational impacts
List projects that are part of the broader program of work, other projects or strategic projects being considered by government in the assessment area.	Include impacted biodiversity values relevant to the project.	This can be set out on a vegetation type and/or species basis. A row should be provided for each of the common biodiversity values being impacted.	Briefly list the construction impacts of the project, including benefits.

Describe the cumulative construction impacts, including benefits, considering the proposal, broader program of work and other nearby projects described above and in the study area. This includes:

- The sum of all impacts of the proposal (the overall impact of the activity).
- The sum of impacts of the proposal and impacts of other projects.
- How the proposal has considered other projects.

Also describe the cumulative operational impacts, including benefits, considering the proposal, broader program of works and other nearby projects described above.

9. Mitigation

9.1 Mitigation measures

This chapter must detail the measures to mitigate and/or minimise impacts on particular threatened species, populations or TECs. All impacts identified in Chapter 8 should have corresponding mitigation measures. A table of measures to be implemented before, during and after construction to mitigate the impacts of the project must be included in the BDAR.

Table 9-1 provides a template for the presentation of safeguards and mitigation measures. The example measures in Table 9-1 have been developed from best-practice management detailed in TfNSW's *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024) and NSW DPI (Fisheries) *Policy and Guidelines for fish habitat conservation and management* (2013 update) (DPI 2013). The measures in Table 9-1 must be reviewed by BDAR authors for relevance and made specific to each project's impacts where required. Additional (and potentially novel) measures may be required to address specific impacts. All measures proposed must have a corresponding impact described in Chapter 8 and state if residual impacts will be expected.

All environmental management measures should:

- Be supported by TfNSW as feasible and reasonable.
- Respond to potential impacts identified in Chapter 8.
- Be specific and targeted where possible.
- Avoid repetition.

Where measures proposed are novel, large, long-term or expensive, include the following supporting information:

- A description and an assessment of the known, predicted or expected effectiveness of the measures, with reference to previous applications/successes where available.
- Justification of location and design (where applicable) e.g., refer to baseline studies or best available knowledge such as recent literature.
- A description of the objectives of each mitigation measure, thresholds for corrective actions and the corrective actions to be implemented should thresholds be exceeded.

Methods to evaluate the need and scope of such measures are outlined in the draft *Wildlife Connectivity Guidelines for Road Projects* (RTA 2011).

Management measures should be developed in consultation with TfNSW. In some instances, it may be appropriate to involve NSW DCCEEW, DPI and the Cth DCCEEW in these discussions.

The management framework for the proposal should be identified and discussed. This would include any management plans that have been identified as necessary.

Table 9-1: Mitigation measures [edit, delete and/or add as required]

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B##	Identify impacts from Chapter 8 to be mitigated/ managed	Describe environmental safeguard(s) to mitigate/manage the impact(s). Measures must be as specific as possible. State if further work/investigation is required to develop the mitigation, including timing. State if there are links/requirements with other documents (e.g. management plans).	Specific timing e.g. "Detailed design", "Prior to construction" "During construction" and "Post construction"	E.g. "Proven", "effective", "unknown"	Identify if there will be residual impacts following successful implementation of the measures. These may require further consideration (e.g. offsets).	Identify who is responsible for implementation e.g., Contractor, TfNSW, etc.
B##	Removal of native vegetation	Native vegetation removal will be minimised through detailed design. [Note to author – try to make this specific to the proposal. Identify if there are specific high value areas where clearing should be minimised].	Detailed design	Effective		
B##		Pre-clearing surveys and final pre-clearing checks will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	Prior to construction	Effective		
B##		Vegetation removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##		Native vegetation will be re-established in accordance with *Guide 3: Re-establishment of native vegetation* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). [Note to author – discuss this with TfNSW contact prior to including to ensure there is scope for reestablishment of vegetation. Where achievable, state the objective of reestablishment – e.g. restoring a PCT, slope stabilisation, etc].	Post construction	Effective		
B##		An unexpected threatened species finds procedure is to be developed as part of the CEMP using the template in *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). The	During construction	Proven		

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
		procedure is to be followed if threatened ecological communities, either new TECs or new occurrences of known TECs, not assessed in the biodiversity assessment, are identified in the proposal site.				
B##		Where trees and hollows require removal though do not require offsetting, one (or a combination of both) the following must be undertaken prior to commencement of clearing in accordance with the Tree and Hollow Replacement Guidelines (TfNSW 2022): • Develop a Tree and Hollow Replacement Plan to detail trees and hollows to be replaced (where there is suitable land within or adjacent to the project), OR • Make an equivalent payment to the TfNSW Conservation Fund.	Prior to construction	Effective		
B##	Direct impacts to threatened species	Threatened fauna habitat removal will be minimised through detailed design.	Detailed design	Effective		
B##		Fauna encountered on-site during construction will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##		Habitat removal will be undertaken by staged clearing in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). [Note to author – If there are habitat trees to be cleared, first decide if staged habitat removal is appropriate in the context of the project. Include any specific habitat clearing requirements if necessary].	During construction	Effective		
B##		Habitat will be replaced or re-instated in accordance with *Guide 5: Re-use of woody debris and bushrock* and *Guide 8: Artificial hollows* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024). [Note to author – specify if an Artificial Hollow Strategy is required, i.e. where threatened hollow-dependent species have been identified and suitable hollows require removal].	During construction	Proven		
B##		An unexpected threatened finds procedure is to be developed as part of the CEMP using the template in *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).) The	During construction	Proven		

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
		procedure is to be followed if threatened fauna, either new species or new occurrences of known species, not assessed in the biodiversity assessment, are identified in the proposal site.				
B##		Pre-clearing surveys and final pre-clearing checks will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Proven		
B##	Aquatic impacts	Impacts to aquatic habitat will be minimised through detailed design.	Detailed design	Effective		
B##		Aquatic habitat will be protected in accordance with *Guide 10: Aquatic habitats and riparian zones* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024) and Section 3.3.2 *Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013* (DPI (Fisheries NSW) 2013).	During construction	Effective		
B##	Groundwater dependent ecosystems	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Detailed design	Effective		
B##	Changes to hydrology	Changes to existing surface water flows will be minimised through detailed design.	Detailed design	Effective		
B##	Fragmentation of identified habitat corridors and impacts to connectivity and movement	[Note to author - Where connectivity impacts described in Chapter 8 require construction of connectivity structures, a Wildlife Connectivity Strategy is recommended. Indicative locations for structures should be included in the BAR] A Wildlife Connectivity Strategy is to be developed as part of final design to mitigate the connectivity impacts of the proposal on threatened species. Development of the strategy will include assessment of the proposed connectivity measures described in Section ## of this BAR and any further requirements. Connectivity measures will be implemented in accordance with TfNSW's *Draft Wildlife Connectivity Guidelines for Road Projects* (RTA 2011) or equivalent updated TfNSW Guidelines.	Detailed design, during construction and post construction	Proven, effective		
B##	Edge effects on adjacent native	Exclusion zones will be set up at the limit of clearing in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Management Guideline:*	During construction	Effective	Identify residual edge effects	

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
	vegetation and habitat	*Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).				
B##	Injury and mortality of fauna	Fauna will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##	Invasion and spread of weeds	Weed species will be managed in accordance with *Guide 6: Weed management* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##	Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with *Guide 7: Pathogen management* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (TfNSW 2024).	During construction	Effective		
B##	Light spill and shading impacts	Shading and artificial light impacts will be minimised through detailed design.	Detailed design	Effective		
B##	Impacts to areas of geological significance					
B##	Impacts to habitat in human-made structures					
B##	Impacts to habitat in non-native vegetation					
B##	Vehicle strike					

9.2 Adaptive management for uncertain impacts

Where there is uncertainty of the timing or extent of potential impacts (these include indirect or prescribed impacts), Section 8.5 of the BAM outlines an approach to adaptive management. This process involves the development of an adaptive management plan to address these remaining uncertain impacts where mitigation measures have not been proposed.

An adaptive management plan must identify and describe:

- The threatened species and/or TECs likely to be impacted.
- A monitoring program of sufficient scope and duration to provide data that can inform when direct and indirect impacts on biodiversity occur.
- Thresholds or triggers associated with the monitoring program that identify when a prescribed impact has occurred or is likely to occur.
- Suite of potential adaptive management actions to be implemented during the construction or operational phases.

Section 8.5 of the BAM provides further detail on the development of an adaptive management plan.

10. Offsets

Provide the determination of impacts which require an offset in accordance with Section 9.2 of the BAM. Detail the offset credit requirements as calculated by the BAM-C. Insert a copy of the relevant BAM-C credit reports in Appendix E.

With the release of the Biodiversity Policy 2022, applicable TfNSW projects are now required to replace trees and hollows removed that do not require offsets under the BAM in accordance with the Tree and Hollow Replacement Guidelines (TfNSW 2022), subject to exclusions. This includes amenity trees (both native and exotic). Include a preliminary estimate of tree and hollow replacement requirements in Section 10.5.1 based on the additional survey plot data collected as required by Section 4.1.3.

10.1 Ecosystem credits

Determine the impacts to native vegetation and TECs that require offsetting in accordance with the vegetation integrity score thresholds listed in Subsection 9.2.1 of the BAM. List the credit requirement for these impacts as calculated by the BAM-C in accordance with Chapter 10 of the BAM.

Briefly describe any impacts that do not require offsetting (i.e., which threshold in Subsection 9.2.1 of the BAM is applicable to the impact).

Table 10-1: Ecosystem credits for impacts to native vegetation and TECs which require an offset

Veg zone	PCT	TEC	Area (ha)	VI score	VI threshold	Ecosystem credits required
E.g., Zone 1	PCT [insert ID]: [PCT name]	e.g., 'Endangered (BC Act)' or 'Not a TEC'	##	##	[insert applicable VI threshold as set out in Subsection 9.2.1 of the BAM]	[insert credits from BAM-C or state 'No offset required']

10.2 Species credits

Describe the credit requirement for impacts on threatened species and threatened species habitat in accordance with Chapter 10 of the BAM. List the impacts and associated credit requirement in Table 10.2.

Table 10-2: Species credits for impacts to threatened species

Veg zone	PCT	Area (ha)	Species credits required
[insert species name]			
E.g., Zone 1	PCT [insert ID]: [PCT name]	##	[insert credits from BAM-C]
[insert species name]			

10.3 Credits matching the 'like-for-like' and credit variation rules

Clause 6.2 of the BC Regulation establishes the offset rules ('like-for-like' and variation). To satisfy the like-for-like rule, the BAM allows for impacts to PCTs and threatened species to be offset by other different PCTs and threatened species (respectively) that share the same attributes from a class of credits, which form an offset trading group. The credit class and corresponding offset trading group can be found in the biodiversity credit

report (like-for-like) produced by the BAM-C. The BAM also puts restrictions on where (IBRA region) credits can be sourced and whether hollow-bearing trees must be present at the offset site.

Where like-for-like credits cannot be sourced, the BAM also allows for other credit types to be sourced subject to the variation rules contained in the BC Regulations.

The like-for-like and variation offset options for ecosystem credits are listed in Table 10-3 and Table 10-4. The like-for-like and variation offset options for species credits are listed in Table 10-5.

Table 10-3: Like-for-like offset options for ecosystem credits

Veg zone	PCT	Class	Trading group	HBT	IBRA region
E.g., Zone 1	PCT [insert ID]: [PCT name]	[insert details from credit report]	[insert details from credit report]	[insert details from credit report]	[insert details from credit report]

Table 10-4: Variation offset options for ecosystem credits

Veg zone	PCT	Formation	Trading group	HBT	IBRA region
E.g., Zone 1	PCT [insert ID]: [PCT name]	[insert details from credit report]	[insert details from credit report]	[insert details from credit report]	[insert details from credit report]

Table 10-5: Like-for-like and variation offset options for species credits

Species	Like-for-like offset options	Variation rule offset options		
		Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
[insert species name]	Species: [insert details from credit report] IBRA region: [insert details from credit report]	[insert details from credit report]	[insert details from credit report]	[insert details from credit report]

10.4 Aquatic offsets

This section is only required where there are residual direct impacts to aquatic biodiversity listed under the FM Act (as identified in Section 8.5) that are not included under the BAM (e.g., marine vegetation, key fish habitat).

Aquatic offsets should be identified in accordance with Section 3.3.3 of the *Policy and guidelines for fish habitat conservation and management Update 2013* (DPI (Fisheries NSW) 2013). Identification of adequate and appropriate offsets should involve consultation with TfNSW and DPI (Fisheries NSW).

10.5 Offsetting strategy

The development of an offsetting strategy is not a requirement of the BAM, however TfNSW would like it included in the BDAR. Depending on the complexity of the project, this information can be provided here or as a separate report. If required by TfNSW, a Biodiversity Offset Strategy report template for projects requiring a BDAR is provided as Resource 1 to the TfNSW No Net Loss Guideline.

Describe TfNSW's proposed offsetting strategy. This will include the options listed in Clause 6.2 of the BC Regulation.

Steps taken by TfNSW to date should be included. A table should be provided demonstrating progress made towards meeting the offset obligation and the availability of credits on the market at the time of preparing the report. Search the credit supply register (Biodiversity Offsets Scheme public registers | NSW Biodiversity, Conservation and Science) and list the available like-for-like credits, including any applicable expressions of interest if the required number and type of credits is not available. The purpose of this table is to demonstrate progress towards meeting offset obligations and, if necessary, to support a request to the decisionmaker to apply the variation rules (i.e., evidence that reasonable steps have been undertaken to find the required like-for-like credits in accordance with clause 6.4 of the BC Regulation). In determining which credits meet the variation rules, consideration should be given to the Clause 6.4 of the BC Regulation and any additional Ancillary rules published by the Environment Head.

Credits may be considered secured when there is a signed agreement with a seller to purchase the required credits.

Table 10-6: Progress towards meeting offset requirements

Credit type	Credits required	Number of credits secured, transferred or retired	Outstanding balance	Credits available on public register [insert search date]
[insert species name or PCT]	[insert credit obligation]	[insert details of effort]	[number of credits still required to be retired to meet credit obligation]	[number of credits still insert number of credits available, credit ID and credit status]

Where payment into the Biodiversity Conservation Fund is proposed, ensure both BAM-C like-for-like and variation credit reports are to be provided to the TfNSW project team.

10.5.1 Preliminary tree and hollow replacement estimates

[Delete section if not required]

In addition to the BAM, the TfNSW Biodiversity Policy requires tree and hollow replacement for direct impacts to vegetation that does not require formal offsetting. The requirement to replace trees and hollows removed must be assessed against the requirements of the Tree and Hollow Replacement Guidelines. This includes all vegetation clearing (including non-native amenity trees) that does not trigger an offset under the BAM (including a species-credit requirement) and is not covered by the exclusions in Section 1.4 of the guidelines.

Where applicable, tree and hollow replacement requirements can be estimated for vegetation zones by using the BAM plot data where tree stem sizes are also counted in each plot (refer to Section 4.1.3 of this template for tree counting method). Noting unless trees in >80 cm DBH class were measured during surveys, all may have to be assumed to be >100cm DBH for the purpose of the tree count estimate. Taking an average of the plot data can provide a representative estimate of the number of trees in each stem size class, and the number of hollows, in each vegetation zone that is subject to tree and hollow replacement (as per Table 10-1).

Table 10-7: Average counts of trees and hollows and estimates per hectare (Note: only required for vegetation zones that do not require offsetting)

Veg. zone	Impact (ha)	Plots	Average number of trees in stem size classes (cm) and hollows per ha[1]					Average count of tree and hollows in impact area[2]				
			5-19	20-49	50-99	>100	Hollows	5-19	20-49	50-99	>100	Hollows

e.g., Zone 1	e.g., 2 ha	e.g., Plot 1 and 2	e.g., 150	e.g., 80	e.g., 10	e.g., 0	e.g., 20	e.g., 300	e.g., 160	e.g., 20	e.g., 0	e.g., 40

NOTE 1: Calculated by the average from the plot data (assuming standard 0.1 ha plot) multiplied by a factor of 10
NOTE 2: Calculated by the average/ha multiplied by the impact

Using the average counts in Table 10-7 and data collected by counting isolated and amenity trees, estimate the preliminary tree and hollow replacement requirements for all tree removal that does not require offsetting.

Table 10-8: Preliminary estimates of trees and hollow replacement requirements (Note: only required for vegetation zones that do not require offsetting)

Category	Estimated No. impacted		Replacement requirement per tree/hollow removed[1]		Estimated number to be replaced[2]		Estimated equivalent payment to Transport conservation fund[2]
	Native trees	Amenity trees	Planting required	Contribution required	Native trees	Amenity trees	
Very large tree (DBH ≥100cm)	#	#	Plant minimum 16 trees	$2,500	#	#	$#
Large tree (DBH ≥50 to <100cm)	#	#	Plant minimum 8 trees	$1,000	#	#	$#
Medium tree (DBH ≥20 to <50 cm)	#	#	Plant minimum 4 trees	$500	#	#	$#
Small tree (DBH ≥ 5cm to <20 cm)	#	#	Plant minimum 2 trees	$125	#	#	$#
Hollow	#		Provide 3 artificial hollows for every occupied hollow removed*	$500	#		$#
Totals					#		$#

NOTE 1: As per the TfNSW Tree and Hollow Replacement Guidelines
NOTE 2: An equivalent payment to the TfNSW Conservation Fund can be used where replanting is not feasible or fully achievable within the project boundary or adjacent land.

As a minimum, provide a figure showing the location of all impacts which require an offset and those impacts which do not require an offset. Impacts should simply be split by ecosystem credits (displaying whether the area of impact requires an offset – yes/no) and any areas also requiring species credits.

Figure 10-1: Impacts requiring offsets, impacts not requiring offsets and areas not requiring assessment

11. Glossary

Term	Definition
Accredited person or assessor	Means as person accredited under section 6.10 (of the BC Act) to prepare reports in accordance with the BAM.
Biodiversity Assessment Method Calculator	Biodiversity Assessment Method Calculator (BAM-C) – the online computer program that provides decision support to assessors and proponents by applying the BAM and referred to as the BAM-C. The BAM-C contains biodiversity data from the BioNet Vegetation Classification and the Threatened Biodiversity Data Collection that the assessor is required to use in a BAM assessment. The BAM-C applies the equations used in the BAM, including those to determine the number and class of biodiversity credits required to offset the impacts of a development, or created at a biodiversity stewardship site. It is published by the Department (DPIE 2020a).
Biodiversity credit report	The report produced by the BAM-C that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site (DPIE 2020a).
Biodiversity offsets	The gain in biodiversity values achieved from the implementation of management actions on areas of land, to compensate for losses to biodiversity values from the impacts of development (DPIE 2020a).
Biodiversity Offsets and Agreement Management System	The online system used to administer the Biodiversity Offsets Scheme. The BOAMS is used by accredited assessors (to carry out specific BAM-related tasks involving access to the BAM-C to perform assessments, submit data, generate credits and calculate a credit price), by landholders (to apply for a Biodiversity Stewardship Agreement and manage ongoing reporting obligations for their agreement) and by proponents of developments (to view their credit obligation or the payment required to the Biodiversity Conservation Fund).
Biodiversity Stewardship site	Refers to land which is the subject to a Biodiversity Stewardship Agreement under the BC Act.
BioNet Atlas	The DPIE database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish (DPIE 2020a).
BioNet Vegetation classification	Refers to the vegetation community-level classification for use in vegetation mapping programs and regulatory biodiversity impact assessment frameworks in NSW. Refer About BioNet Vegetation Classification | NSW Biodiversity, Conservation and Science (DPE 2020a).
Candidate species	Also known as 'species credit species', these are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitat. These species are identified in the TBDC. A targeted survey or an expert report is required to confirm the presence of these species on the subject land. Alternatively, for a development, activity, clearing or biodiversity certification proposal only, the proponent may elect to assume the species is present (DPIE 2020a).
Construction footprint	The area to be directly impacted by the proposal during construction activities. See also definition for subject land.

Term	Definition
Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Refer to Clause 228(2) of the EP&A Regulation 2000 for cumulative impact assessment requirements.
Direct impact	Direct impacts on biodiversity values include those related to clearing native vegetation and threatened species habitat and impacts on biodiversity values prescribed by the Biodiversity Conservation Regulation 2017 (the BC Regulation) (DPIE 2020a).
Ecosystem credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for ecosystem credits. This is analogous with the definition of 'predicted species'.
Ecosystem credits	A measurement of the value of threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a PCT, and PCTs generally. Ecosystem credits measure the loss in biodiversity values at a development, activity, clearing or biodiversity certification site and the gain in biodiversity values at a biodiversity stewardship site (DPIE 2020a).
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component (DPIE 2020a).
Important area (mapped)	Mapping of important habitat areas provided by the DPIE for those species for which the habitat constraint in the Threatened Biodiversity Data Collection (TBDC) refers to a mapped important area.
Indirect impact	Impacts that occur when the proposal affects native vegetation and threatened species habitat beyond the development footprint or within retained areas (e.g., transporting weeds or pathogens, dumping rubbish). This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts (DPIE 2020a).
Landscape assessment area	Landscape assessment area includes the subject land and the area of land within the 1500 m buffer zone surrounding the subject land (or a 500-metres buffer zone for linear proposals) that is determined as per Subsection 3.1.2 (DPIE 2020a).
Matter of national environmental significance	A matter of national environmental significance (MNES) is any of the nine defined components protected by a provision of Part 3 of the EPBC Act (Commonwealth).
Mitigation	Action to reduce the severity of an impact.
Native vegetation	Has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act. In summary, a) trees (including any sapling or shrub or any scrub) b) understorey plants c) groundcover (being any type of herbaceous vegetation) d) plants occurring in a wetland. A plant is native to New South Wales if it was established in New South Wales before European settlement (BC Act). Native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). Marine vegetation is covered by the provisions of the FM Act.
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (DPIE 2020a).

Term	Definition
Operational footprint	The area that will be subject to ongoing operational impacts from the proposal. This includes the road, surrounding safety verges and infrastructure, fauna connectivity structures and maintenance access tracks and compounds.
Patch size	An area of native vegetation that: • *occurs on the development site or biodiversity stewardship site* • *includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems).* Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site (DPIE 2020a).
PlantNET	An online database of the flora of New South Wales which contains currently accepted taxonomy for plants found in the State, both native and exotic.
Population	A group of organisms, all of the same species, occupying a particular area (DPIE 2020a).
Predicted species	Also known as 'ecosystem credit species', these are threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. The TBDC identifies the threatened species assessed for ecosystem credits. A targeted survey is not required to identify or confirm the presence of ecosystem credit species.
Prescribed impact	Means the prescribed impacts identified in clause 6.1 of the BC Regulation. Prescribed impacts can be direct or indirect impacts (DPIE 2020a).
Serious and irreversible impact	Impacts likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct in accordance with the principles set out in clause 6.7(2) of the BC regulation.
Spatial datasets	Spatial databases required to prepare a BDAR • *BioNet NSW (Mitchell) Landscapes – Version 3.1* • *NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7* • *NSW soil profiles* • *hydrogeological landscapes* • *acid sulfate soils risk* • *digital cadastral database* • *Vegetation Information Systems maps* • *Geological sites of NSW.*
Species credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for species credits (DPIE 2020a). This is analogous with the definition of 'candidate species'.
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection (DPIE 2020a).
Species polygon	An area of land identified in Chapter 5 (of the BAM) that contains habitat or is occupied by a threatened species (DPIE 2020a).
Study area	The area directly affected by the proposal (subject land or construction footprint) and any additional areas likely to be affected by the proposal, either directly or indirectly.

Term	Definition
Subject land	Land subject to a development, activity, clearing, biodiversity certification or a biodiversity stewardship proposal. It excludes the landscape assessment area which surrounds the subject land (i.e., the area of land in the 1500 m buffer zone around the subject land or 500m buffer zone for linear proposals). In the case of a biodiversity certification proposal, subject land includes the biodiversity certification assessment area (DPIE 2020a). See also definition for construction footprint.
Threatened Biodiversity Data Collection	A publicly assessable online database (registration required) which contains information for listed threatened species, populations and ecological communities (DPIE 2020a). Part of the BioNet database, published by the NSW DCCEEW and accessible from the BioNet website at www.bionet.nsw.gov.au.
Vegetation integrity (score)	The condition of native vegetation assessed for each vegetation zone against the benchmark for the PCT. The vegetation integrity score is the quantitative measure of vegetation condition calculated by the BAM-C (DPIE 2020a).
Vegetation zone	A relatively homogeneous area of native vegetation on a development site, clearing site, land to be biodiversity certified or biodiversity stewardship site that is the same PCT and has the same broad condition state (DPIE 2020a).

12. Abbreviations

Term	Definition
AOBV	Area of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BCS	Biodiversity, Conservation and Science Group within the NSW Department of Climate Change, Energy, the Environment and Water
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offset Scheme
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DCCEEW (Cth)	Commonwealth Department of Climate Change, Energy, the Environment and Water
DCCEEW (NSW)	NSW Department of Climate Change, Energy, the Environment and Water – previously the Department of Planning and Environment (DPE) and Department of Planning Industry and Environment (DPIE)
DIWA	Directory of Important Wetlands in Australia
DPHI	NSW Department of Planning, Housing and Industry (formerly part of the Department of Planning and Environment)
DPI	Department of Primary Industries within the NSW Department of Primary Industries and Regional Development (DPIRD)
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EP&A Act	*Environment Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
Fisheries NSW Policy and guidelines	Fisheries NSW Policy and guidelines for fish habitat conservation and management (Update 2013)
FM Act	Fisheries Management Act 1994 (NSW)
GDE	Groundwater dependent ecosystems
IBRA	Interim Biogeographically Regionalisation of Australia
MNES	Matters of national environmental significance
PCT	Plant community type
PMST	Protected Matters Search Tool
REF	Review of Environmental Factors
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TBDC	Threatened Biodiversity Data Collection

TECs	Threatened ecological communities (VECs, EECs and CEECs)
TfNSW	Transport for NSW
VEC	Vulnerable Ecological Community

13. References

Provide a reference list with documents listed in alphabetical order according to the authors' names.

References used in BDAR template showing required referencing style:

Commonwealth of Australia (2010a), Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act – Cth DCCEEW.

Commonwealth of Australia (2010b), Survey guidelines for Australia's threatened birds (awe.gov.au).

Commonwealth of Australia (2011a), Survey Guidelines for Australia's threatened frogs (awe.gov.au).

Commonwealth of Australia (2011b), Survey guidelines for Australia's threatened mammals (awe.gov.au).

Commonwealth of Australia (2011c), Survey guidelines for Australia's threatened reptiles (awe.gov.au).

Commonwealth of Australia (2011d), Survey guidelines for Australia's threatened fish (awe.gov.au).

Commonwealth of Australia (2013a), Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (awe.gov.au), Environment Protection and Biodiversity Conservation Act 1999.

Commonwealth of Australia (2013b), Draft survey guidelines for Australia's threatened orchids (awe.gov.au).

Department of Environment and Climate Change (2009), Threatened species survey and assessment guidelines: field survey methods for fauna. Amphibians. (nsw.gov.au).

Department of Environment and Conservation (2004), Threatened biodiversity survey and assessment guidelines for developments and activities (working draft).

Department of Environment, Climate Change and Water (2009), Sensitive species data policy | NSW Biodiversity, Conservation and Science.

DPI (2008), Threatened Species Assessment Guidelines - Assessment of Significance (nsw.gov.au).

DPI (2012), Risk Assessment Guidelines for Groundwater Dependent Ecosystems. Available for download from from Researchgate.

DPI (2013), Policy and guidelines for fish habitat conservation and management (Update 2013) (nsw.gov.au).

DPIE (2019b), Guidance to assist a decisionmaker to determine a serious and irreversible impact.

DPIE (2020a), Biodiversity Assessment Method (nsw.gov.au).

DPIE (2020b), NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method.

DPIE (2020c), Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method.

DPE (2022a), Biodiversity Assessment Method 2020 Operational Manual – Stage 1 (nsw.gov.au).

DPE (2022b), Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide | NSW Biodiversity, Conservation and Science

DPE (2022c), Threatened reptiles: Biodiversity Assessment Method Survey Guide | NSW Biodiversity, Conservation and Science

DPE (2023), Biodiversity Assessment Method 2020 Operational Manual – Stage 2 (nsw.gov.au)

OEH (2018), 'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method.

TfNSW (2022a), No Net Loss Guidelines

TfNSW (2022b), Tree and Hollow Replacement Guidelines

Transport (2024), Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects. Available at: Biodiversity Management Guideline (nsw.gov.au).

Appendix A: Species recorded

Recorded flora

Family	Scientific name	Common name	Status		Cover (%) in each plot*					Incidental observation
			BC Act	EPBC Act	x	x	x	x	x	

*Note: *Cover must be reported as a per cent measure in accordance with the BAM.*

Recorded fauna

Class	Scientific name	Common name	Status	
			BC Act	EPBC Act

Note: Location data can be added in another column or as separate rows if the assessment area is large or to differentiate records between habitat areas.

Appendix B: Habitat suitability assessment

Note that the BAM requires all species identified by the BAM-C to be assessed in accordance with Chapter 5 of the BAM. Any determination to include or exclude a species from assessment in this BDAR must comply with the requirements of Chapter 5. This criteria is designed primarily for use by REF proposals, and should only be used as a supplementary guide for a BDAR. Only records from BioNet are applicable to this criteria.

Likelihood	Criteria
Recorded	The species was observed in the study area during the current survey or has been recorded within the past five years (known from a reputable source).
High	A species is considered highly likely to occur in the study area if: • *There are previous credible records on BioNet within the study area from the last 10 years and suitable habitat is present.* **OR** • *The species is highly mobile, is dependent on identified suitable habitat within the study area (i.e., for breeding or important life cycle periods such as winter flowering resources) and has been recorded recently (within five years) on BioNet in the locality. This also includes species known or likely to visit the study area during regular seasonal movements or migration.*
Moderate	A species is considered moderately likely to occur in the study area if: • *Any suitable habitat (e.g., foraging) is present in the study area, the species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. The species may be unlikely to maintain sedentary populations, however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area.* **OR** • *The species is not highly mobile, is dependent on identified suitable habitat features (e.g., hollows, rocky outcrops) within the study area and has been recorded in the locality in the last 10 years on BioNet.* **OR** • *For flora species identified by the BAM-C or recorded in the locality in the last 10 years on BioNet – the associated PCT/habitat present in the study area is not degraded and the species was not targeted by surveys in accordance with the BAM and relevant survey guidelines. In addition, for flora species known to occur in disturbed areas (e.g. orchids), records from any time within the locality may warrant inclusion in this category.*
Low	A species is considered to have a low likelihood of occurring in the study area if: • *For highly mobile species, the species may be an occasional visitor, but habitat similar to the study area is widely distributed in the locality, meaning that the species is not dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitats in the study area and the species has not been recorded in the locality in the last 10 years on BioNet.* **OR** • *The species is not highly mobile, is dependent on identified suitable habitat features (e.g., hollows, rocky outcrops) within the study area and has not been recorded in the locality in the last 10 years on BioNet.* **OR** • *For flora species identified by the BAM-C, suitable associated habitat (see the TBDC) is present in the study area and the species was not identified following targeted surveys in accordance with the BAM and relevant survey guidelines. For flora species not identified by the BAM-C, though have been recorded in the locality on BioNet at any time, the associated suitable habitat (see the TBDC) is not present in the study area though similar habitats of the same vegetation formation is present in the study area.*
Unlikely	Suitable habitat for the species is absent from the study area.

Habitat suitability assessment table

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Plants							
			E.g., 'Species', 'Ecosystem' or 'Dual credit'		Include the best-known information of distribution and habitat requirements, typically listed in the species NSW or Commonwealth (SPRAT) profile. For species-credit species identified by the BAM-C, also list the 'Habitat constraints' and 'Geographic limitations' identified by both the BAM-C and also contained within the TBDC.	E.g., '10 – BioNet', 'PMST',	Include the likelihood of occurrence with a brief description. More detail can be provided in the main body of the report where required.
Birds							
Mammals							
Amphibians							
Reptiles							
Invertebrates							
Fish							
Migratory species							

Appendix C: Vegetation integrity plot field data sheets

Provide copies of all VI plot data sheets. This can be PDFs of electronic sheets or scanned handwritten sheets (please ensure handwriting in legible).

Appendix D: Secretary's Environmental Assessment Requirements (SEARs)

Appendix E: Biodiversity credit reports

Provide copies of the following BAM-C credit reports:

- Credits summary report.
- Biodiversity credit report (Like-for-like).
- Biodiversity credit report (Variations).
- Candidate threatened species report.
- Predicted species report.

Appendix F: Calculation of biodiversity credits to offset an indirect impact

Delete appendix if not required.

This Appendix should be read in conjunction with Biodiversity Assessment Method Operational Manual Stage 2 (DPE 2023). This Appendix provides a recommended method to calculate indirect offsets for linear infrastructure that cannot be avoided or adequately minimised through mitigation and management measures.

Any credit requirements calculated for indirect offsets are to be reported separately to offsets calculated for direct impacts.

STEP 1: Assess the existing condition of vegetation within an indirect impact assessment buffer of 50 metres from the boundary of the subject land:

- Establish an indirect impact investigation area by applying a 50-metre buffer to the boundary of the subject land.
- Classify the native vegetation within the 50-metre buffer into the following categories, based on vegetation mapping undertaken for the assessment or regional vegetation mapping where required.

Category	Description	Next step
Isolated patches	Small fragments of vegetation (<0.25 ha patch size after project clearing) within the buffer that will remain following the completion of the project. These vegetation fragments are considered no longer likely to be viable in the long term.	Assess and offset as if directly impacted (i.e., future VI score reduced to zero)
Existing edge	An existing vegetation edge either adjoins, only slightly overlaps (i.e., 1-2 metres of overlap) or is set back from the subject land. These areas are already subject to existing edge effects, which are unlikely to increase due to the project.	No further assessment or offsetting required
New edge in fragmented and/or disturbed vegetation	Vegetation in any condition that is less than 50 metres wide and/or is currently fragmented and disturbed with modified structure and high exotic cover. Therefore, the creation of new edges is unlikely to result in substantial alteration to remaining areas of this vegetation.	No further assessment or offsetting required
New edge in un-fragmented and undisturbed vegetation	Vegetation patch that meets the vegetation integrity score offset thresholds detailed in Subsection 9.2.1 of the BAM that will be fragmented by the construction footprint to form one or more new edges within previously un-fragmented vegetation that extends over 50 metres from the edge of the subject land.	Further assessment required – proceed to step 2

STEP 2: Determine an appropriate buffer width for calculating the indirect impact of edge effects. Using desktop information, review aerial photographs, any data collected during site inspections and the current extent of edge effects:

- For road widening, the future edge effects are likely to be similar in extent to the edge effects of the existing road, provided the vegetation has the same/similar PCT and landscape values, and that road alignment and general design will also be similar.
- For new road routes, use a nearby reference site to measure the distance of edge effects from the roadside.
- The extent of edge effects would be measured primarily by assessing the difference in cover of exotic species, modified structure and other disturbance at 10-metre increments in a transect extending perpendicularly away from the existing edge.

- Parts of Appendix A of the BAM can be used for guidance in collecting benchmark data from local reference sites.

Once the extent of existing edge effects has been determined, adjust the buffer around the subject land to the appropriate width.

STEP 3: Determine the length of sections of road likely to have indirect impacts on new edges within native vegetation that meets the vegetation integrity score offset thresholds detailed in Subsection 9.2.1 of the BAM, based on review of road design and the table below:

Alignment	Vegetation/landscape attributes	Next step
New route or road widening in fill	Native vegetation that meets the offset thresholds detailed in Subsection 9.2.1 of the BAM.	Further assessment will be required – proceed to step 4
New route or road widening at grade	Vegetation adjoining existing road at grade is not currently subject to edge effects. Vegetation in 50m buffer downslope of construction footprint. Vegetation forming a PCT that is susceptible to edge effects from increased light penetration (e.g., rainforest).	Further assessment will be required – proceed to step 4
	Vegetation adjoining existing road at grade is currently subject to edge effects.	
New route or road widening in cut	Terrestrial groundwater dependent ecosystems corresponding to a vegetation zone that meets the offset thresholds detailed in Subsection 9.2.1 of the BAM.	Further assessment will be required – proceed to step 4
	All other native vegetation that meets the offset thresholds detailed in Subsection 9.2.1 of the BAM.	No further assessment or offsetting required

STEP 4: Using results from steps 1, 2 and 3, map the areas of vegetation considered likely to be subject to indirect impacts as separate vegetation zones. If required, different vegetation zones can be delineated based on the type of indirect impacts expected as a result of the proposal. The most likely indirect impacts are:

- Weed incursion - increase in the cover and abundance of weeds.
- Increased light penetration, which may affect the structure and composition of PCTs.
- Altered hydrology regimes, which may affect the structure and composition of groundwater dependent ecosystems and riparian vegetation.
- Increased human activity, which may result in an increase in the cover and abundance of weeds, changes to the structure and composition of PCTs, and removal of fallen logs and litter.

STEP 5: Determine the likely reduction in vegetation integrity due to indirect impacts by adjusting the condition scores for the zone in the 'Future vegetation integrity score' section of the BAM-C under the 'Vegetation' tab.

Predicted changes are calculated by assuming that vegetation integrity will decline to be similar to existing edge-affected vegetation relevant to the project (e.g., reference site). This can be assessed using the following methods:

- Vegetation integrity plot data will need to be entered into the BAM-C for the new edge-effected zones. Assuming the vegetation that will be edge-effected is contiguous with vegetation zones that will be directly impacted, the plot data for these zones will be relevant to this exercise. In some cases, additional vegetation integrity plot data undertaken within the indirect impact areas may be required.

  Assume a 20 per cent reduction in the vegetation integrity score for the zone. Adjust the condition scores for the zone in the 'Future vegetation integrity score' section of the BAM-C until a 20 per cent reduction is achieved. When adjusting condition scores to obtain the future vegetation integrity, consider which

attributes will likely be modified by the edge effects. For example, a new edge is likely to increase exotic species cover, however the cover of the canopy is unlikely to reduce.

An expected increase in exotic species cover in the new edge (as may have been observed at the reference site) is likely to result in a decrease in the cover of native ground layer species over time, therefore an appropriate method of calculating the future vegetation integrity score would be to manually adjust the management zone structure (cover) scores for 'grass', 'forbs', 'ferns' and 'other' growth forms by a chosen percentage.

An increase in exotic cover may also lead to a decrease in leaf litter cover. Note that the cover of high-threat exotic species cannot be adjusted in the BAM-C.

STEP 6: Estimate the credit requirement by calculating credit value for each vegetation zone based on Step 5. Isolated patches should be offset assuming total loss of vegetation integrity for these patches.

STEP 7: Prepare report section and accompanying figure(s), as well as additional inputs to offsets section.

Appendix G: Assessments of significance (EPBC Act)

Delete appendix if not required.

Include the full assessment of significance for all threatened species, population or ecological communities listed under the EPBC Act that have been recorded in the study area or are assumed present as they have a moderate to high likelihood of occurrence. Assessments are to be completed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (Commonwealth of Australia 2013a).

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NSW GOVERNMENT