



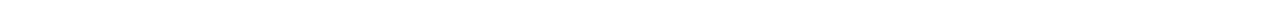
Preliminary Biodiversity Offset Strategy



SIMTA

SYDNEY INTERMODAL TERMINAL ALLIANCE

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SYDNEY INTERMODAL TERMINAL ALLIANCE

MOOREBANK INTERMODAL TERMINAL FACILITY

Preliminary Biodiversity Offsets Strategy

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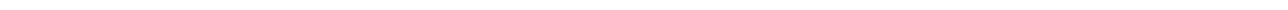
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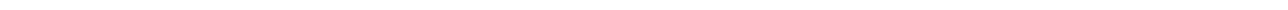
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1 INTRODUCTION

1.1 Background

Status of proposed action

This Preliminary Biodiversity Offsets Strategy has been prepared on behalf of the Sydney Intermodal Terminal Alliance (SIMTA) which is a consortium of Qube Logistics and QR National. It has been developed following the “*Referral Decision and Decision on Assessment Approach*” dated 23 January 2012 made by the delegate of the Australian Government Minister for Sustainability, Environment, Water, Population and Communities (Minister) and “*Guidelines for the Content of a Draft Environmental Impact Statement*” issued on 28 June 2012 (EIS Guidelines).

SIMTA seeks approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) for the development of its Moorebank Intermodal Terminal Facility (SIMTA proposal), to be located on the land parcel currently occupied by the Defence National Storage and Distribution Centre (DNSDC) on Moorebank Avenue, Moorebank, south west of Sydney. SIMTA proposes to develop the DNSDC occupied site into an intermodal terminal facility and warehouse/distribution facility, which will offer container storage and warehousing solutions with direct rail access to Port Botany. Construction of the rail connection from the SIMTA site to the Southern Sydney Freight Line (SSFL) will be undertaken as part of the first stage of works for the SIMTA proposal.

The Minister has determined that the SIMTA proposal is a controlled action requiring assessment and approval under the EPBC Act before it can proceed. The relevant controlling provisions are:

- Listed threatened species and communities (sections 18 and 18A, EPBC Act); and
- Commonwealth land (sections 26 and 27A, EPBC Act).

Planning approval for the SIMTA proposal is also being separately sought from the Minister for Planning and Infrastructure at State level under the *Environmental Planning and Assessment Act* 1979 (NSW) (EP&A Act).

The significance of the SIMTA Intermodal Terminal Facility was recognised in its declaration as a ‘Major Project’ under (the now repealed) Part 3A provisions of the EP&A Act). The Minister for Planning issued correspondence on 9 November 2010, confirming that the proposal was a development of a kind described in Schedule 1, Group 8, Clause 23 of *State Environmental Planning Policy (Major Development) 2005* and a project to which Part 3A of the EP&A Act applied.

The Minister also issued separate correspondence dated 9 November 2010 authorising the submission of a Concept Plan for the proposed development. The Director-General’s Environmental Assessment Requirements (DGRs) for the Concept Plan were subsequently issued by the Department of Planning on 24 December 2010.

Location

The SIMTA site is located in the Liverpool Local Government Area. It is 27 kilometres west of the Sydney CBD, 17 kilometres south of the Parramatta CBD, 5 kilometres east of the M5/M7 Interchange, 2 kilometres from the main north-south rail line and future Southern Sydney Freight Line, and 0.6 kilometres from the M5 motorway.

The SIMTA site (owned by SIMTA), approximately 83 hectares in area, is currently operating as a Defence storage and distribution centre. The SIMTA site is legally identified as Lot 1 in

DP1048263 and zoned as General Industrial under Liverpool City Council LEP 2008. The parcels of land to the south and south west that would be utilised for the proposed rail link are referred to as the rail corridor. The proposed rail corridor covers approximately 75 hectares and adjoins the Main Southern Railway to the north. The rail line is approximately 3.5 kilometres in length, 20 metres in width (variable width) and includes two connections to the SSFL, one south and one north.

The proposed rail corridor is owned by third parties, including the Commonwealth of Australia, RailCorp, private owners and Crown Land held by the Department of Primary Industries, and would link the SIMTA site with the SSFL. Existing uses include vacant land, existing rail corridors (East Hills Railway and Main Southern Railway), extractive industries, and a waste disposal facility. The rail corridor is intersected by Moorebank Ave, Georges River and Anzac Creek. Native vegetation cover includes woodland, forest and wetland communities in varying condition. The proposed rail corridor is zoned partly 'SP2 Infrastructure (Defence and Railway)' and partly 'RE1 - Public Recreation'. The surrounding Commonwealth lands are zoned 'SP2 Infrastructure (Defence)'. The study area for the SIMTA proposal is shown in Figure 1.

Impacts on Threatened Species, Populations and Communities

The SIMTA proposal will have direct impacts on threatened ecological communities listed under the *Threatened Species Conservation Act 1995* (NSW) (TSC Act) as well as two threatened plant species listed under the EPBC Act and TSC Act:

- *Persoonia nutans* (Nodding Geebung)
- *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea).

These impacts are anticipated to occur within the rail corridor, with the construction and operation of the rail link requiring removal of individuals and habitat of these plant species. The impacts of the SIMTA proposal on the endangered species *Persoonia nutans* are considered to be significant.

The SIMTA site itself is considered to be of limited conservation significance and ecological impacts within the SIMTA site are likely to be low.

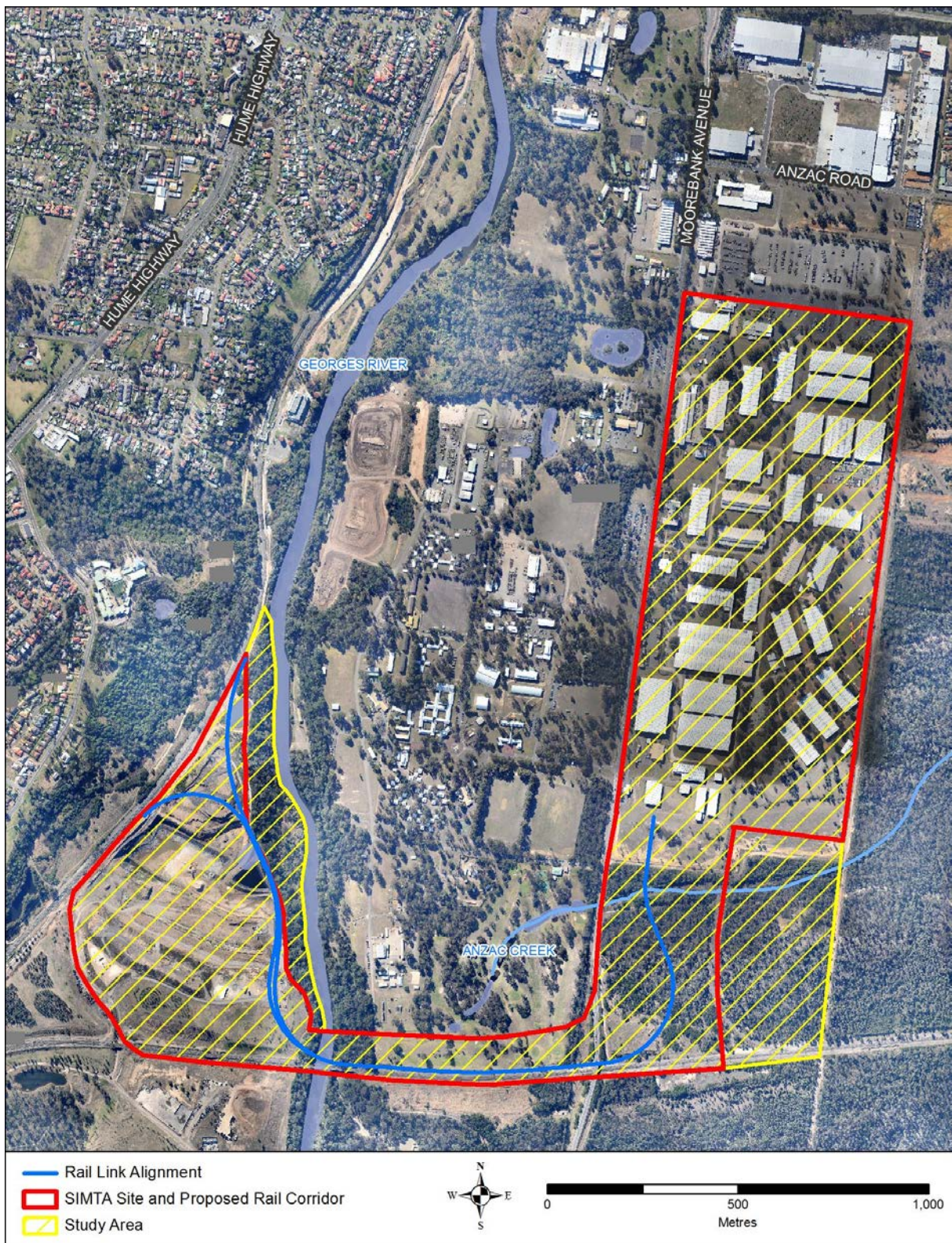


Figure 1 - SIMTA proposal and study area

1.2 Purpose of this report

The purpose of this Preliminary Biodiversity Offset Strategy is to establish a commitment to offsetting the residual significant impacts on threatened species, populations and communities resulting from the SIMTA proposal. The content of this document will provide the foundation for negotiations with the Commonwealth Department of Sustainability, Environment, Water, Populations and Communities (SEWPaC) and the NSW Office of Environment and Heritage (OEH). To this end this Preliminary Biodiversity Offset Strategy is a working document that will be developed and revised through the project approval process.

In particular, it has been prepared to address the Commonwealth EIS guidelines and DGRs for the SIMTA Proposal.

Section 3.7 of the Commonwealth EIS guidelines issued on 28th June 2012 describes the requirements for the offset strategy:

3.7 PROPOSED ENVIRONMENTAL OFFSETS

Provide a description of proposed environmental offset measures, including a proposed strategy to offset any impacts of the proposed action on matters of national environmental significance. The proposed strategy must:

- *Demonstrate how it will achieve long-term conservation outcomes; and*
- *Have regard to the scale and intensity of impact from the development on the site.*

Further guidance may be found in the department's draft Environmental Offsets Policy (or final version if released prior to the EIS being finalised) on the use of environmental offsets under the EPBC Act which is available on the department's website...

The final version of the *EPBC Act Environmental Offsets Policy* (EPBC Offsets Policy) was released in October 2012 (Commonwealth of Australia 2012) and has been used to guide the development of this Preliminary Biodiversity Offset Strategy.

The DGRs for the Concept Plan specify that the assessment of biodiversity must take into account the Principles for the Use of Biodiversity Offsets in NSW (DECCW).

OEH provided comments on the Environmental Assessment for the SIMTA proposal on 1 June 2012. In regards to biodiversity offsets, the following comment was made:

In determining offsets for unavoidable biodiversity losses, OEH concurs with the draft commitment reference to the Principles for the Use of Biodiversity Offsets in NSW (OEH 2011) but recommends any offset strategy developed be consistent with the 2011 NSW OEH Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, State Significant Development (SSD) and State Significant Infrastructure (SSI) Projects which is currently being trialled in partnership with the Department of Planning and Infrastructure (see attachment 2). Ideally a 'tier 1: improve or maintain' standard should be the biodiversity outcome with offsetting requirements calculated using the Biobanking Assessment Methodology BBAM.

1.3 Objectives of the Biodiversity Offset Strategy

The overarching objective for SIMTA's final Biodiversity Offset Strategy (to be prepared in consultation with SEWPaC and OEH) is to provide guidance for the preparation by SIMTA of a Biodiversity Offset Proposal that achieves a long-term conservation gain for the protected matters impacted by the SIMTA Proposal. The measures used to gauge success of this objective will be:

- An outcome that maintains or improves biodiversity values.
- Successfully securing the long-term (in perpetuity) protection and management of lands containing the impacted protected matters or their habitat.
- The total area of lands used to offset the biodiversity impacts shall exceed the scale of impacts of the SIMTA proposal.
- The process for setting the scope and quantum of the biodiversity offsets is transparent and justifiable on environmental, social and economic grounds.

This Preliminary Biodiversity Offset Strategy presents the framework for offsetting impacts of the SIMTA proposal on protected matters. Suitable areas of land and measures for offsetting will be identified in consultation with SEWPaC, OEH and the NSW Department of Planning and Infrastructure (DP&I).

The Preliminary Biodiversity Offset Strategy summarises the impacts on protected matters, details the mitigation measures proposed to minimise biodiversity impacts, and sets out options for offsetting residual significant impacts on threatened species, populations and communities, and a framework for delivery of these options.

1.4 Limitations

This Biodiversity Offset Strategy is preliminary in nature, and the following limitations apply:

- No potential offset sites have been identified in this strategy; a process for identification of potential offset sites is described in Section 4.2.1.1.
- As no potential offset sites have been identified, the preliminary strategy focuses on the impacts of the proposed actions, the requirements for proposed offset sites and the offset measures that may be utilised. With no proposed offset site it is not possible to use the EPBC Offsets Assessment Guide or the accompanying calculator.
- Appropriate offsets are to be determined in consultation with SEWPaC and OEH. Limited consultation on biodiversity offsetting has been undertaken with SEWPaC to date.

SIMTA is keen to refine this strategy in consultation with the SEWPaC and OEH, and would be willing to accept as a condition of approval that it submit an offset package within a designated timeframe, following both State and federal approval.

2 IMPACTS OF THE SIMTA PROPOSAL

2.1 Biodiversity impacts

The SIMTA site, approximately 83 hectares in area, will be developed into an intermodal terminal facility and warehouse/distribution facility, which will offer container storage and warehousing solutions with direct rail access to Port Botany.

The proposed rail link would connect to the SSFL approximately 500 metres south of Casula railway station and extend south then east, crossing the Georges River via a girder bridge from the south-east corner of the Glenfield Waste Disposal Centre. The rail link would then continue east within the East Hills rail corridor, before heading north into the SIMTA site.

The proposed rail link would be constructed over the following parcels of land:

- The Main Southern rail corridor containing the SSFL on the western side of the Georges River.
- The Glenfield Waste Disposal Facility on the western side of the Georges River.
- Georges River (Crown Land).
- East Hills rail corridor.
- An irregular shaped portion of land owned by RailCorp and located to the east of the intersection between Moorebank Avenue and the East Hills Railway Line.
- Land to the south of the DNSDC site owned by the Commonwealth.

The proposed rail link would be constructed within a 20 metre (variable width) easement. Prior to entry to the SIMTA site, the corridor would extend to a width of approximately 33 metres to accommodate the five lines into the site.

Loss of native vegetation, including Threatened Ecological Communities

Clearing of native vegetation is required for the SIMTA proposal. The majority of mapped vegetation to be cleared consists of planted trees on the SIMTA site, and ecological impacts within the SIMTA site are likely to be low.

A total of 1.19 hectares of native vegetation is to be cleared for the proposed rail link, consisting of four vegetation communities. All four communities fall within the definitions of threatened ecological communities under the TSC Act. No threatened ecological communities listed under the EPBC Act will be cleared.

The areas of each vegetation community that occur within the study area are listed in Table 1.

Table 1: Native vegetation to be cleared within the study area

Threatened Ecological Communities	EPBC Act Status	TSC Act Status	Area within project footprint
Castlereagh Scribbly Gum Woodland	Not listed	Vulnerable	0.76 hectares
Castlereagh Swamp Woodland	Not listed	Endangered	0.05 hectares
River-flat Eucalypt Forest	Not listed	Endangered	0.35 hectares
Freshwater Wetlands	Not listed	Endangered	0.03 hectares

The native vegetation communities to be cleared for the SIMTA proposal are primarily located within the rail corridor, in the predominantly 20 metre wide footprint for the proposed rail link. The linear clearing for the rail link and installation of fencing will result in fragmentation of the remaining vegetation in the rail corridor and increase the risk of edge effects within this vegetation.

Loss of threatened plant species and fragmentation of habitat

The construction of the rail link will also have direct impacts on populations of two threatened plant species in the rail corridor. The rail link intersects the centre of the sub-population of the endangered species *Persoonia nutans* (Nodding Geebung) mapped in the rail corridor and the western edge of the core population of the vulnerable species *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea) in the rail corridor (Figure 2, Table 2, Table 3).

Table 2: Threatened flora species to be cleared within the study area

Threatened Flora Species	EPBC Act Status	TSC Act Status	Number in study area	Number to be cleared	Percentage to be cleared
<i>Persoonia nutans</i>	Endangered	Endangered	126 individuals	17 individuals	14%
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Vulnerable	Vulnerable	4110 stems (estimated)	464 stems	11%

Table 3: Threatened flora species habitat to be cleared within the study area

Threatened Flora Species	Type of habitat	Area of habitat in study area (ha)	Area of habitat to be cleared (ha)	Percentage of habitat to be cleared
<i>Persoonia nutans</i>	Potential	19.14	0.65	3%
	Occupied	0.79	0.09	11%
	Total	19.93	0.74	4%
<i>Grevillea parviflora</i>	Potential	15.35	0.56	4%
	Occupied	4.58	0.18	4%
	Total	19.93	0.74	4%

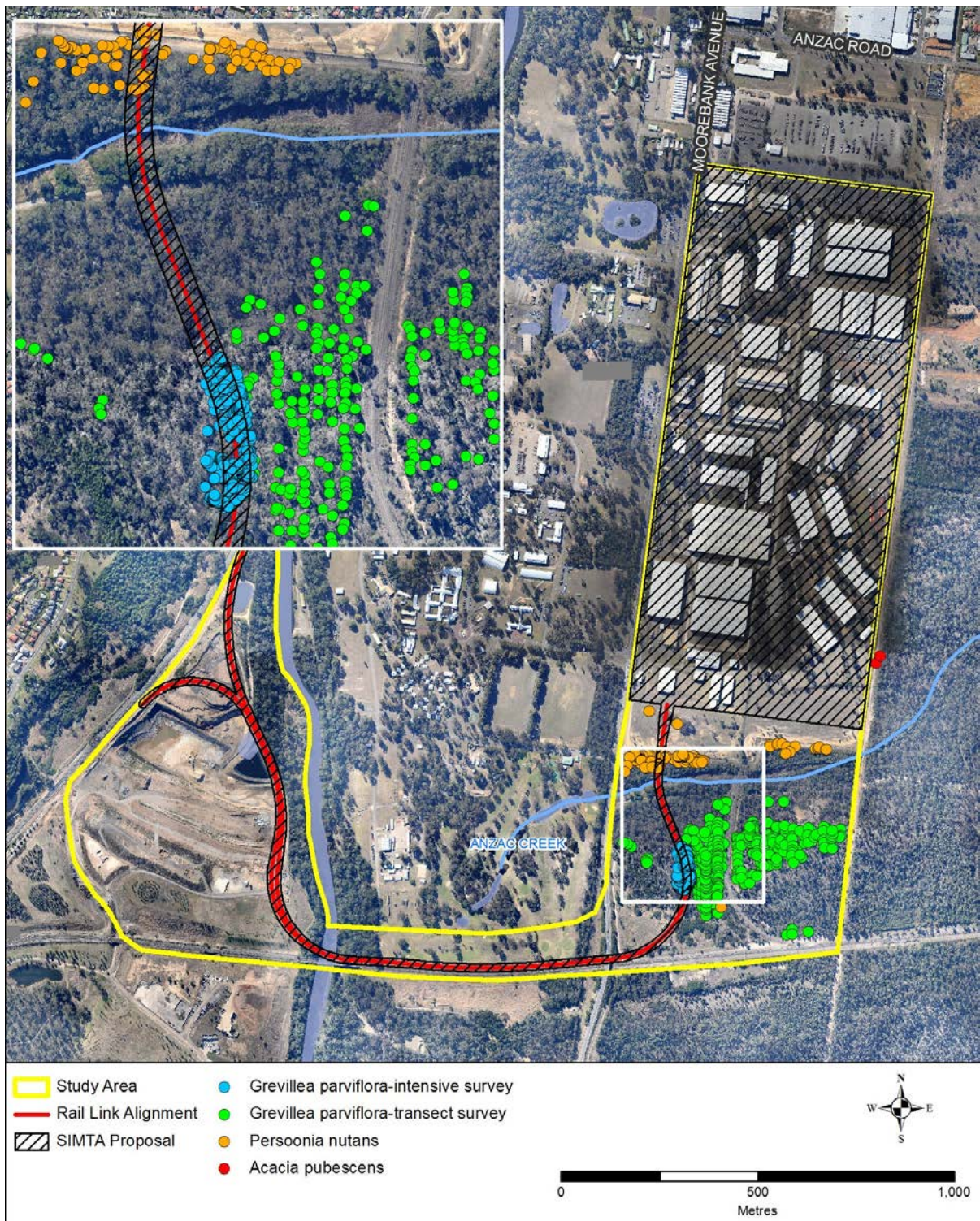


Figure 2: Threatened flora species to be cleared within the study area

Loss of fauna habitat including that of threatened and migratory species

Clearing of native vegetation for the SIMTA proposal will result in the removal of fauna habitat. The areas of each fauna habitat type in the study area that will be impacted are listed in Table 4.

The clearing of vegetation will result in the loss of specific fauna habitat components, including live trees, tree hollows, foraging resources (myrtaceous and flowering trees and shrubs), and ground layer habitats such as ground timber and well-developed leaf litter. These resources offer sheltering, foraging, nesting and roosting habitat to a variety of fauna occurring within the locality.

Table 4: Areas of fauna habitat within the project footprint

Fauna habitat type	Area to be impacted (ha)
Remnant Forest	0.07
Remnant Woodland	0.95
Riparian Habitat-Anzac Creek	0.07
Riparian Habitat-Georges River	0.39
Landscaped	82.66
Cleared and Disturbed	4.08
TOTAL	88.22

The area of habitat to be cleared does not comprise a significant area of habitat within the wider locality. Habitat features and vegetation communities that will be cleared are prevalent within the wider landscape, particularly within the Holsworthy Military Area to the south and bushland to the east of the SIMTA proposal. Habitat connectivity in the study area is currently severely restricted by significant barriers to fauna movement and is unlikely to be further fragmented as a result of the SIMTA proposal.

2.2 Impacts on Matters of National Environmental Significance

Impact assessments were undertaken for all threatened species, populations and communities that were recorded or for which habitat occurs in the study area (Hyder Consulting 2013). Impacts on Matters of National Environmental Significance known to occur in the study area are summarised below.

Acacia pubescens (Downy Wattle)

Two *Acacia pubescens* recorded to the east of the study area are separated from the SIMTA proposal by a boundary fence and powerline easement. The *A. pubescens* occur at the cleared edge of bushland and it is possible that the species occurs further east; this potential habitat will be protected from impacts by the buffer that the managed powerline easement represents. As the species occurs outside and upslope of the study area, the species is unlikely to be adversely affected by any edge effects that may result from the SIMTA proposal.

Grevillea parviflora subsp. *parviflora* (Small-flower Grevillea)

The core area of occupied habitat (not including isolated individuals in denser bushland to the west) for *Grevillea parviflora* subsp. *parviflora* within the study area occupies an area of approximately 4.58 hectares. The remainder of the approximately 19.93 hectare area of Castlereagh Scribbly Gum Woodland to the south of Anzac Creek, within which this 4.58 hectare core area of occupied habitat occurs, supports scattered individuals and also constitutes occupied habitat for this species. However, most plants were recorded in the more open, grassy areas in the east of the bushland. Approximately 0.18 hectares of core occupied habitat for *G. parviflora* subsp. *parviflora*, with a high density of stems, will be removed as a result of the proposed rail link. A total of 464 stems of *G. parviflora* subsp. *parviflora* were counted within the footprint of the 20 metre wide rail link. The area to be removed is in the western part of the core area of occupied habitat.

The proposed rail link will fragment *G. parviflora* subsp. *parviflora* habitat; a fenced gap of 35 metres will intersect areas of occupied and potential habitat to the south of Anzac Creek. Most of the population of *G. parviflora* subsp. *parviflora* recorded in the study area occurs to the east of the proposed rail link; there were only an estimated 100 stems occurring as scattered plants to the west of the rail link, compared with an estimated 2875 stems to the east of the proposed rail link.

The population of *G. parviflora* subsp. *parviflora* in Castlereagh Scribbly Gum Woodland to the south of Anzac Creek is considered highly significant as the population size is relatively large and due to the very low occurrence of this species in the western Sydney region.

The proposed rail link will result in the removal of 464 stems from an estimated population of 4110 stems, which represents a loss of 11% of individuals. The area of core occupied habitat to be removed is approximately 0.18 hectares from the 4.68 hectares of core occupied habitat (areas of highest density) recorded in the study area, a loss of 4%. The proposed rail link intersects the western edge of the recorded population and will not fragment a large area of known habitat from other areas of known or potential habitat. As such, it is not considered likely that the SIMTA proposal constitutes a significant impact on *Grevillea parviflora* subsp. *parviflora*.

Persoonia nutans (Nodding Geebung)

The SIMTA proposal will have direct impacts on the population of *Persoonia nutans* in the study area. The construction of the rail link will require the removal of 0.09 hectares of occupied habitat supporting 17 individuals of *P. nutans* within the rail link construction footprint. An additional two individuals will be removed from the fragmented patches of Castlereagh Scribbly Gum Woodland immediately south of the SIMTA site. A total of 0.7 hectares of occupied habitat will remain in two patches of 0.27 and 0.22 hectares in the rail corridor, and another patch of 0.21 hectares to the east of the rail corridor. The remaining individuals of *P. nutans* in the rail corridor will be fragmented by a 20 metre wide fenced gap.

The proposed rail link will result in partial destruction of occupied habitat and potential habitat for *P. nutans* as well as changes to the vegetation community structure through disturbance and creation of new edges. These changes to the remaining habitat may not be entirely detrimental to this species; most *P. nutans* were found near the disturbed edge of bushland in the study area, and Robertson *et al.* (1996) suggested that the species requires disturbance to persist and is capable of surviving extreme disturbance. Nitrification of the soil substrate may occur adjacent to the construction area depending on the construction materials and methods used; this should be avoided as it would result in increased risk of weed incursions.

The population of *P. nutans* in previously disturbed Castlereagh Scribbly Gum Woodland north of Anzac Creek is considered highly significant. There are few remaining populations of *P. nutans* in the south of the species' distribution and most consist of less than 10 mature

individuals. The core population in the study area consists of 124 plants and there are an additional two plants beneath scattered trees immediately to the south of the SIMTA site.

Given the significance of the population of *P. nutans* in the study area, it is considered that the removal of 14% of recorded individuals in the population, fragmentation of the remaining plants by a 20 metre wide fenced gap, and associated edge impacts constitutes a significant impact on this endangered species.

Grey-headed Flying Fox (*Pteropus poliocephalus*)

The SIMTA proposal involves staged removal of all existing vegetation from the SIMTA site, followed by staged modification and construction of buildings and associated services. Vegetation occurring within the construction footprint of the predominantly 20 m rail link, within the rail corridor, will be removed. A tree survey has been conducted on the SIMTA site and 590 trees occurring on the site were mapped. Of those trees identified to species, at least 147 comprise known feed tree species (ABS 2001) for the Grey-headed Flying Fox are proposed to be removed. The trees proposed to be removed however do not comprise a significant area of foraging habitat within the locality for the Grey-Headed Flying Fox. Holsworthy Military Area together with smaller parks and reserves in the locality contain an abundance and diversity of potential foraging habitat for the Grey-Headed Flying-Fox. Street and garden trees in the locality offer further foraging habitat to the species.

3 AVOIDANCE AND MITIGATION OF BIODIVERSITY IMPACTS

Measures to manage the impact of the SIMTA proposal on biodiversity values have been developed as part of the environmental assessment for the project. These are outlined in Section 5 of the *SIMTA Intermodal Terminal Facility Flora and Fauna Assessment* (Hyder Consulting 2013) (Ecological assessment). Management measures for biodiversity impacts were developed following three general principles, in order of preference:

- Avoid areas of high biodiversity value wherever possible.
- Mitigate actions and safeguard values identified for retention by prescribing appropriate controls.
- Compensate for or offset the removal of biodiversity values.

A summary of the key measures relevant to avoidance and mitigation of biodiversity impacts is provided below.

3.1 Avoid

The Ecological Assessment recommended that the identified ecological values should be avoided as far as practicable. The changes to the proposal in response to identified biodiversity impacts include reduction of the rail link footprint from 35 metres in width to 20 metres in width to minimise impacts on threatened plant species.

Given the distribution of threatened plant species across the study area, impacts on threatened plant populations of *Persoonia nutans* and *Grevillea parviflora* subsp. *parviflora* will be unavoidable. Assessment of the impacts of the SIMTA proposal concluded that it will have a significant impact on *Persoonia nutans*.

3.2 Mitigate

Management measures designed to reduce impacts on biodiversity are detailed in the Ecological Assessment. In summary, measures will be implemented to mitigate:

- Soil disturbance related to site establishment, earthworks and rail construction;
- Weed establishment and invasion;
- Loss and degradation of native vegetation including threatened ecological communities (TECs);
- Threatened flora protection and management;
- Loss of fauna habitat; and
- Fauna injury/mortality.

Table 5: Mitigation measures for proposed actions

Impact	Mitigation Measure
Soil disturbance	Install appropriate drainage infrastructure (e.g. sediment basins, diversion drains), sediment and erosion controls prior to the commencement of construction.

Impact	Mitigation Measure
	<p>Clearing of vegetation is not to be undertaken during overland flow events.</p> <p>Clearly identifying sensitive areas and areas for construction and managing clearing such that clearing activities are constrained to these approved areas only.</p> <p>Locate soil or mulch stockpiles away from watercourses and key stormwater flow paths to limit potential transport of these substances into the watercourses via runoff.</p> <p>Dust suppression activities to be undertaken where appropriate.</p> <p>Stabilisation of disturbed areas, including revegetation in accordance with the Vegetation Management Plan (VMP), is to be undertaken as soon as practicable after disturbance.</p> <p>Emergency response protocols and procedures for implementation in the event of a contaminant spill or leak to be clearly articulated in the Construction Environmental Management Plan.</p> <p>Spill kits to be located to allow for timely response to uncontained spills. Site inductions are to include a briefing on the use of spill kits.</p>
Weed establishment and invasion	<p>Management of weeds in and adjacent to cleared areas will occur in accordance with a Weed Management Plan. This plan will include details relating to the monitoring, management and where necessary eradication of weeds, disposal of green waste, and vehicle/plant weed wash down protocols if required.</p> <p>Management of noxious weeds are to be undertaken in accordance with the Noxious Weeds Act 1993.</p> <p>Equipment used for treating weed infestation will be cleaned prior to moving to a new area within the project site to minimise the likelihood of transferring any plant material and soil</p> <p>Soil stripped and stockpiled from areas containing known weed infestations are to be stored separately and are not to be moved to areas free of weeds.</p>
Loss and degradation of native vegetation including TECs	<p>Clearance of native vegetation should be minimised as far as is practicable.</p> <p>Consider retention of some, or all, of the remnant scattered <i>E. sclerophylla</i> over patches of shrub and grass cover in the cleared grassland immediately south of the SIMTA site in landscaping areas.</p> <p>The extent of vegetation clearing is to be clearly identified on construction plans</p> <p>Any additional construction areas, such as site offices, construction stockpile locations and machinery/equipment laydown areas are to be located where possible within existing cleared or disturbed areas.</p> <p>Extent of clearing should be fenced with highly visible temporary fencing to ensure that clearing does not extend beyond the area necessary.</p>

Impact	Mitigation Measure
	<p>The VMP should be prepared prior to construction, detailing restoration, regeneration and rehabilitation of areas of native vegetation in study area. The VMP should also detail appropriate management for the potential habitat of threatened plant species in the study area, including monitoring during and after construction works to ensure impacts are minimised.</p> <p>As soon as possible rehabilitation will commence where possible. Management of land disturbed as a result of construction works will occur in accordance with a VMP.</p>
Threatened flora protection and management	Detailed mitigation measures for threatened flora species are listed in Table 6 below.
Loss of fauna habitat	<p>Fauna microhabitat such as logs should be removed from areas to be cleared and relocated to suitable nearby bushland areas in the presence of an ecologist.</p> <p>Consider the installation of nest boxes in woodland vegetation in the rail corridor that may offer alternative nesting habitat to hollow-dependent species recorded in the study area.</p> <p>High visibility plastic fencing is to be installed to clearly define the limits of the works area as to not further encroach on fauna habitat.</p>
Fauna injury/ mortality	<p>Undertake a pre-start up check for sheltering native fauna of all infrastructure, plant and equipment and/or during relocation of stored construction materials</p> <p>Undertake a two-stage approach to clearing:</p> <ul style="list-style-type: none"> ▪ Remove non-hollow bearing trees at least 48 hours before habitat trees are removed. ▪ Hollow bearing trees are to be knocked with an excavator bucket or other machinery to encourage fauna to evacuate the tree immediately prior to felling. ▪ Felled trees must be left for a short period of time on the ground to give any fauna trapped in the trees an opportunity to escape before further processing of the trees. ▪ Felled hollow bearing trees must be inspected by the Project Ecologist as soon as possible (not longer than 2 hours after felling). <p>Site inductions are to include a briefing regarding the local fauna of the site and identification of protocols to be undertaken if fauna are encountered</p> <p>If any pits/trenches are to remain open overnight, they are to be securely covered, if possible. Alternatively, fauna ramps (logs or wooden planks) are to be installed to provide an escape for trapped fauna.</p>

Threatened flora protection and management

Construction of the proposed rail link will require removal of individuals of threatened plant species and will result in fragmentation of existing populations and disturbance of habitat. A Threatened Species Management Plan would be prepared and implemented for the *P. nutans*

and *G. parviflora* subsp. *parviflora* populations within the rail corridor that would be affected by the rail link. Specific management measures are required to ensure that impacts on these species are mitigated as far as is practicable.

Mitigation measures are proposed to minimise the potential impacts on *P. nutans* as a result of the SIMTA proposal, in accordance with the measures identified in the *P. nutans* Recovery Plan (DEC 2006) (Table 6).

Table 6: Specific mitigation measures for *Persoonia nutans*

Impact	Mitigation Measure
Removal of individuals of threatened plant species	Investigate options for translocation of individuals removed from the project footprint.
	Collection of seed or other genetic material from individuals to be removed, and propagation of tube stock to be replanted in retained areas of habitat.
Removal of potential habitat for threatened plant species	Retain topsoil and seed bank from the occupied habitat area of <i>P. nutans</i> and reapply to disturbed areas once construction is complete. Ensure that stockpiling of topsoil is managed to maintain the viability of the seedbank.
Disturbance of threatened species habitat during construction	Fencing of areas of habitat to be retained should be undertaken and individuals of the threatened plant species should be clearly marked.
	Site inductions for construction staff are to include a briefing on the presence of threatened species and their habitat in and adjacent to the project footprint, its significance and locations and extents of no-go zones.
Fragmentation of habitat and edge effects	Detailed design of the rail link will minimise impacts on hydrology and maximise terrestrial connectivity beneath the proposed rail link during operation of the SIMTA proposal.
	Cleared edges supporting threatened species habitat to be managed with the habitat requirements of the species considered as a priority.
	Weeds should be removed by hand in areas of threatened species habitat.
	Given the specific disturbance regimes required by <i>Persoonia nutans</i> , the use of fire or other disturbance mechanisms as a long-term management tool should be considered, in consultation with OEH and DSEWPC.
	The fencing around the bushland on site should be maintained to restrict public access and prevent trampling and rubbish dumping in areas of habitat.
	All wastes generated during construction to be handled in accordance with a Waste Management Plan and no dumping of rubbish permitted on site.
Fire management	In consultation with Defence, develop a land management plan such that an interval of at least 7 to 10 years between fires is maintained within the area of occupied habitat for <i>P. nutans</i> .

Mitigation measures are proposed to minimise the potential impacts on *G. parviflora* subsp. *parviflora* as a result of the SIMTA proposal (Table 7).

Table 7: Specific mitigation measures for *Grevillea parviflora* subsp. *parviflora*

Impact	Mitigation Measure
Removal of individuals of threatened plant species	Investigate options for translocation of individuals removed from the project footprint.
	Collection of seed or other genetic material from individuals to be removed, and propagation of tube stock to be replanted in retained areas of habitat.
Removal of potential habitat for threatened plant species	Topsoil within the areas identified as habitat for <i>G. parviflora</i> subsp. <i>parviflora</i> will be stripped and stored on site for reapplication at those areas identified as <i>G. parviflora</i> subsp. <i>parviflora</i> habitat once works are complete. Topsoil from these areas will be managed to maintain the viability of the seedbank and <i>G. parviflora</i> subsp. <i>parviflora</i> suckers.
Disturbance of threatened species habitat during construction	Fencing of areas of habitat to be retained should be undertaken and individuals of the threatened plant species should be clearly marked.
	Site inductions for construction staff are to include a briefing on the presence of threatened species and their habitat in and adjacent to the project footprint, its significance and locations and extents of no-go zones.
Fragmentation of habitat and edge effects	Detailed design of the rail link will minimise impacts on hydrology and maximise terrestrial connectivity beneath the proposed rail link during operation of the SIMTA proposal.
	Cleared edges supporting threatened species habitat to be managed with the habitat requirements of the species considered as a priority.
	Weeds should be removed by hand in areas of threatened species habitat.
	A Soil and Water Management Plan should be developed for construction of project in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> Edition 4 (Landcom 2004). The Soil and Water Management Plan will be developed to minimise changes in hydrology and increases in soil nutrients in adjoining areas; particularly in the vicinity of habitat area of <i>G. parviflora</i> subsp. <i>parviflora</i> .
	A Weed Control and Restoration Plan will be developed to manage land disturbed by construction of the SIMTA proposal. The management plan will contain provisions for the identification and management of <i>Imperata cylindrica</i> (Blady Grass) and <i>Kunzea ambigua</i> (Tick Bush) within areas identified as habitat for <i>G. parviflora</i> subsp. <i>parviflora</i> .
	The fencing around the bushland on site should be maintained to restrict public access and prevent trampling and rubbish dumping in areas of habitat.
	All wastes generated during construction to be handled in accordance with a Waste Management Plan and no dumping of rubbish permitted on site.

4 OFFSETTING BIODIVERSITY IMPACTS

4.1 Policy framework

4.1.1 EPBC Act Environmental Offsets Policy

Offsets are to be determined having reference to the EPBC Offsets Policy. Under the EPBC Offsets Policy, environmental offsets are measures that compensate for the residual adverse impacts of an action. Offsets should counterbalance the impacts that remain after avoidance and mitigation measures have been implemented. For assessments under the EPBC Act, offsets are only required if residual impacts are significant. The only Matter of National Environmental Significance that is considered to be subject to residual significant impacts as a result of the SIMTA proposal is *Persoonia nutans*.

An offsets package is defined in the EPBC Offsets Policy as a suite of actions that a proponent undertakes in order to compensate for the residual significant impact of a project. An offsets package can comprise of a combination of direct offset and other compensatory measures.

Direct offsets are actions that deliver a measurable conservation gain for an impacted protected matter. Conservation gains may be achieved by:

- Improving existing habitat for the protected matter;
- Creating new habitat for the protected matter;
- Reducing threats to the protected matter;
- Increasing values of a heritage place; and/or
- Averting the loss of a protected matter or its habitat that are under threat.

Other compensatory measures are actions that do not directly offset the impacts on the protected matter, but are anticipated to lead to benefits for the impacted protected matter. Other compensatory measures may include funding for suitable research or education programs.

Under the EPBC Offsets Policy, a minimum of 90 per cent of the offset requirements for any given impact must be met through direct offsets.

The EPBC Offsets Policy is guided by ten overarching principles to be applied when determining the suitability of offsets. Suitable offsets must:

1. Deliver an overall conservation outcome that improves or maintains the viability of the protected matter.
2. Be built around direct offsets but may include other compensatory measures.
3. Be in proportion to the level of statutory protection that applies to the protected matter.
4. Be of a size and scale proportionate to the residual impacts on the protected matter.
5. Effectively account for and manage the risks of the offset not succeeding.
6. Be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs.
7. Be efficient, effective, timely, transparent, scientifically robust and reasonable.
8. Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

In assessing the suitability of an offset, government decision-making will be:

9. Informed by scientifically robust information and incorporate the precautionary principle in the absence of scientific certainty.
10. Conducted in a consistent and transparent manner.

These offset principles have been applied in the development of this Preliminary Biodiversity Offset Strategy and each principle is discussed and addressed in Section 4.2.2.

The EPBC Offsets Policy is accompanied by an Offsets Assessment Guide, including an offset calculator in the form of a balance sheet. This guide was designed for departmental use but can be used by proponents to consider offset requirements.

4.1.2 OEH Principles for the use of Biodiversity Offsets

Offsets are to be determined with reference to the Principles for the Use of Biodiversity Offsets in NSW (OEH 2011a). The principles provide a useful framework for considering environmental impacts and developing offset proposals, but they do not apply where legislation defines requirements for biodiversity offsets.

The OEH principles are listed below and are broadly similar to the EBC Act offset principles requirements.

1. Impacts must be avoided first by using prevention and mitigation measures.
2. All regulatory requirements must be met.
3. Offsets must never reward ongoing poor performance.
4. Offsets will complement other government programs.
5. Offsets must be underpinned by sound ecological principles.
6. Offsets should aim to result in a net improvement in biodiversity over time.
7. Offsets must be enduring – they must offset the impact of the development for the period that the impact occurs.
8. Offsets should be agreed prior to the impact occurring.
9. Offsets must be quantifiable – the impacts and benefits must be reliably estimated.
10. Offsets must be targeted.
11. Offsets must be located appropriately.
12. Offsets must be supplementary.
13. Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract.

4.1.3 NSW OEH Interim Policy on assessing and offsetting biodiversity impacts of Part 3A, State significant development (SSD) and State significant infrastructure (SSI) projects

OEH have developed an interim policy (OEH 2011b) for the assessment and offset of biodiversity impacts for proposals that are assessed by DP&I under the Part 3A, SSD or SSI provisions of the EP&A Act and are not being considered as part of the Biobanking Scheme.

The interim policy acknowledges that proposals assessed as SSD do not have to meet the “improve or maintain” standard required under the Biobanking Scheme. Nevertheless, the policy does adopt the use of the Biobanking assessment methodology (BBAM) for the purpose of quantifying and categorising biodiversity values and impacts, and to establish, for benchmarking purposes, the offsets that would be required if the proposal was required to meet the “improve or maintain” standard,

The policy provides a structured approach to determining how proposals may, in lieu of meeting the “improve or maintain” standard, meet one of two alternative standards: “no net loss” or “mitigated net loss”.

Figure 3 illustrates how the BBAM is applied under the interim policy.

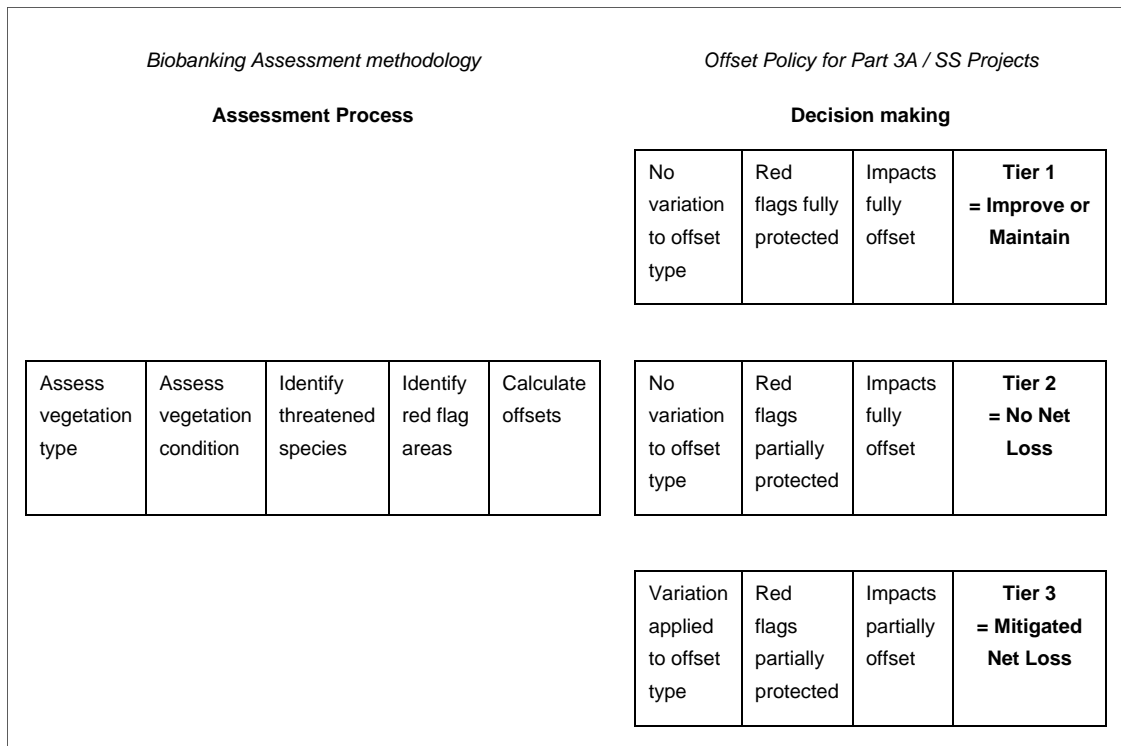


Figure 3: Application of the Biobanking Assessment Methodology to Part 3A and State Significant projects (from OEH 2011).

The policy states that where it is not possible due to resourcing constraints to apply the BBAM, offsets are to be negotiated on a case by case basis and in accordance with OEH’s offsetting principles (as described in section 4.1.2 above). The interim policy is not relevant to offsets that have been calculated without applying the BBAM.

The BBAM has not been used to date to assess the impacts and offsets for the SIMTA proposal; surveys were undertaken in accordance with the Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities, as stipulated by the Concept Plan DGRs (MP 10_0193). Field surveys for the flora and fauna assessment were undertaken in May 2011 and May 2012, prior to receipt of the interim policy with OEH comments in June 2012, therefore the BBAM methodology was not utilised.

The proposed offset strategy has therefore been considered with reference to the OEH offsetting principles (addressed in Section 4.2.2.1 of this strategy).

4.1.4 *Persoonia nutans* Recovery Plan

A recovery plan has been prepared for *Persoonia nutans* (DEC 2006). This constitutes the National and NSW State Recovery Plan for the species. The overall objective of the recovery plan is “to ensure the continued and long-term survival of *P. nutans* in the wild by promoting the in situ conservation of the species across its natural range”.

This plan consists of six specific recovery objectives, each of which has a set of associated recovery actions and performance criteria (Table 8).

Table 8: Recovery objectives and associated actions for *Persoonia nutans* (DEC 2006)

Recovery Objective	Actions	Relevant to this offset strategy?
1. To minimise the loss and fragmentation of <i>P. nutans</i> habitat using land-use planning mechanisms.	1.1: Councils and the Department of Planning will ensure that all relevant Environmental Planning Instruments (prepared under Part 3 of the EP&A Act) are prepared, or reviewed, with reference to this recovery plan and any future advice from the Department of Environment and Conservation regarding the species.	No
	1.2: All relevant consent and determining authorities (under Part 4 & 5 of the EP&A Act) will assess developments and activities with reference to this recovery plan, environmental impact assessment guidelines and any future advice from the Department of Environment and Conservation regarding the species.	Yes
	1.3: The Department of Environment and Conservation will reconsider the need for a recommendation of critical habitat by the final year of implementation of this plan.	No
2. To identify and minimise the operation of threats at sites where <i>P. nutans</i> occurs.	2.1: The Department of Environment and Conservation (DEC) will prepare site management statements for populations located on DEC estate.	No
	2.2: The Department of Environment and Conservation will implement any necessary threat abatement measures in accordance with the site management statements prepared under Action 2.1.	No
	2.3: The Department of Environment and Conservation to ensure any Plan of Management or Fire Management Plan for DEC estate supporting <i>P. nutans</i> provides for the species' conservation.	No

Recovery Objective	Actions	Relevant to this offset strategy?	
	2.4: Councils will incorporate site specific threat abatement measures for <i>P. nutans</i> into Plans of Management for community land.	No	
	2.5: Councils will implement threat abatement measures in accordance with the site specific recommendations incorporated into the Plan of Management prepared under Action 2.4.	No	
	2.6: Other public authorities that manage land that supports <i>P. nutans</i> will prepare a site management statement(s) in consultation with the Department of Environment and Conservation, for <i>P. nutans</i> habitat under their management.	No	
	2.7: Other public authorities (as identified in action 2.6) will implement any necessary and feasible threat abatement measures within the habitat of <i>P. nutans</i> to mitigate against habitat degradation related to unrestricted access, and frequent fire, in accordance with the site management statements prepared under Action 2.6.	No	
	2.8: The Department of Environment and Conservation will liaise with the Commonwealth Defence Department to facilitate the implementation of threat abatement measures at sites within Holsworthy Military Area.	Yes	
	2.9: The Department of Environment and Conservation will encourage and assist private landholders in the preparation of site management statements for sites located on freehold land.	Yes	
	2.10: The Department of Environment and Conservation will encourage landholders in the implementation of threat abatement measures on freehold land in accordance with the site management statements prepared under Action 2.8.	No	
	2.11: The Department of Environment and Conservation will liaise with the Rural Fire Service and relevant Bush Fire Management Committees to ensure that the fire requirements of <i>P. nutans</i> are taken into consideration when relevant Bush Fire Risk Management Plans are drafted and reviewed.	No	
	2.12: Department of Environment and Conservation) and the NSW Rural Fire Service will review the mitigative conditions for <i>P. nutans</i> on the Threatened Species Hazard Reduction List of the Bush Fire Environmental Assessment Code.	No	
	3. Develop and implement a survey and monitoring program that will provide information on the extent and viability of <i>P. nutans</i> .	3.1: The Department of Environment and Conservation will design and facilitate a long-term monitoring program that will enable long-term monitoring of the viability of selected populations and in particular will provide insight into the lower and upper thresholds of inter-fire intervals for <i>P. nutans</i> .	Yes
		3.2: The Department of Environment and Conservation to facilitate surveys of potential habitat on public lands and to promote community involvement in the surveys.	No

Recovery Objective	Actions	Relevant to this offset strategy?
4. To provide public authorities with information that assists in conserving the species.	4.1: The Department of Environment and Conservation will coordinate the prompt distribution of site records through the Atlas of NSW Wildlife.	No
	4.2: The Department of Environment and Conservation will update the profile and environmental impact assessment guidelines for the species to incorporate information acquired during the implementation of this recovery plan.	No
	4.3: Councils and the Department of Planning and Infrastructure (DP&I) will inform the Department of Environment and Conservation (DEC) of decisions (made under the EP&A Act 1979) that may affect <i>P. nutans</i> .	No
5. To raise awareness of the species and involve the community in the recovery program.	5.1: The Department of Environment and Conservation will distribute information on the progress of the recovery program to raise awareness of the recovery program and encourage community involvement in its implementation.	No
	5.2: The Department of Environment and Conservation will raise awareness of, and encourage community involvement in, the recovery program.	Yes - indirectly
6. To promote research questions that will assist future management decisions.	6.1: The Department of Environment and Conservation to promote potential research projects as identified in this recovery plan.	Yes - indirectly

Most of the recovery objectives and actions concern the NSW Department of Environment and Conservation (now OEH) and other government agencies' commitments and are not directly relevant to actions by proponents. The proposed offset measures in this Strategy are to be consistent with the objectives of the Recovery Plan.

4.2 Biodiversity Offset Strategy

There are two key types of information utilised in planning an offset proposal – determining what types of activities would be appropriate as offsets for a given impact, and determining the specific size and scope of an offsets package. In order to determine these requirements, consideration of specific matters at the proposed impact site and the proposed offset site must be undertaken. Matters to be considered at the impact site are addressed in Table 9.

Table 9: Matters to be considered at the impact site

Matters to be considered at the impact site	Consideration of SIMTA proposal
Presence and conservation status of protected matters likely to be impacted by the proposed action	<p>Two threatened species in the study area are likely to be impacted by the proposed action:</p> <ul style="list-style-type: none"> ▪ <i>Persoonia nutans</i> (Nodding Geebung) – Endangered ▪ <i>Grevillea parviflora</i> subsp. <i>parviflora</i> (Small-flowered Grevillea) – Vulnerable <p>The impacts of the proposed action on <i>Persoonia nutans</i> are considered to be significant.</p>
Specific attributes of the protected matter being impacted at a site, for example: the type of threatened species or ecological community habitat, the quality of habitat, population attributes such as recruitment or mortality, landscape attributes such as habitat connectivity, or heritage values	<p><i>Persoonia nutans</i> was recorded in Castlereagh Scribbly Gum Woodland north of Anzac Creek, in the rail corridor lands. Most <i>P. nutans</i> were found near the disturbed edge of bushland in the study area. A targeted search for this species recorded 126 individual plants, of which 110 occurred within the rail corridor. There were two distinct sub-populations in the study area, separated by an approximately 170 metre gap. Plants ranged from 20 cm to about 1.8 metres in height, and many individuals were observed to be flowering and/or fruiting.</p> <p>The population of <i>P. nutans</i> in the study area is considered to be significant as it is the largest population recorded in the south of the species' range, and one of only 15 known populations with over 50 mature individuals.</p>
Scale and nature of the impacts of the proposed action – including direct and indirect impacts	<p>The proposed action will have the following impacts on <i>P. nutans</i>:</p> <ul style="list-style-type: none"> ▪ removal of 17 individuals ▪ removal of 0.09 ha of occupied habitat ▪ removal of 0.65 ha of potential habitat ▪ fragmentation of remaining population
Duration of the impact (not of the action).	The residual impacts will be permanent.

Matters to be considered at a proposed offset site, as identified in the EPBC Offsets Policy (p15) include:

- The extent to which the proposed offset actions correlate to, and adequately compensate for, the impacts on the attributes for the protected matter.
- The conservation gain to be achieved by the offset. This may be through positive management activities that improve the viability of the protected matter or averting the future loss, degradation or damage of the protected matter.

- The current land tenure of the offset and the proposed method of securing and managing the offset for the life of the impact.
- The time it will take to achieve the proposed conservation gain.
- The level of certainty that the proposed offset will be successful. In the case of uncertainty, such as using a previously untested conservation technique, a greater variety and/or quantity of offsets may be required to minimise risk.
- The suitability of the location of the offset site. In most cases this will be as close to the impact site as possible. However, if it can be shown that a greater conservation benefit for the impacted protected matter can be achieved by providing an offset further away, then this will be considered.

4.2.1 Proposed Offset Measures

This Biodiversity Offset Strategy proposes three measures for consideration. These are:

- Offset Measure A Secure additional native vegetation protected through an appropriate legal instrument that ensures the land is managed for conservation. Additional vegetation to be acquired should have similar biodiversity values to those being impacted by the SIMTA proposal. In particular the threatened species subject to residual significant impacts in the study area, *Persoonia nutans*, or its habitat, must be present on any offset site.
- Offset Measure B Retirement of an appropriate number and class of biodiversity credits under the NSW Biobanking scheme.
- Offset Measure C Investment in research and/or education programs related to related to the impacted protected matters (limited to 10% of the total offset requirement).

Offset Measure A is SIMTA's first priority to achieve the objectives of the Biodiversity Offset Strategy. Offset Measures B and C would only be considered after further consultation with SEWPaC, OEH and DP&I.

4.2.1.1 Offset Measure A - Direct Offset: Acquisition and Conservation of Compensatory Habitat

Direct offsets must deliver a tangible and measurable on-ground conservation gain. Securing of land supporting existing unprotected habitat, and protection of this land with an appropriate legal mechanism would provide an appropriate offset for the impacts of the SIMTA proposal and would be consistent with the principles of the EPBC Act Offsets Policy and the OEH Offset Principles. Any proposed offset site must include potential habitat for *Persoonia nutans*, as this species is subject to residual significant impacts as a result of the SIMTA proposal.

The proposed action will have the following impacts on *P. nutans*:

- Removal of 17 individuals.
- Removal of 0.09 ha of occupied habitat.
- Removal of 0.65 ha of potential habitat.

Any proposed offset site must at minimum have an equivalent area (0.74 ha - total of occupied plus potential habitat) of habitat for *P. nutans*. A conservation gain for *P. nutans* may be delivered through protecting existing populations of species by acquisition and conservation of

land; improving the quality of habitat within and adjoining existing populations of the species, and/or creating new similar habitat for the species through re-vegetation works.

Priorities for the location of the offset site would be as follows:

1. Within 10 kilometres of the project study area.
2. Within the south of the species' range (i.e. south from Villawood and Kemps Creek populations).
3. Within the species' known range.

Potential habitat for *Persoonia nutans* is defined as land with the following attributes (DEC 2006):

- **Soil type:** confined to aeolian and alluvial sediments and found primarily on the Agnes Banks and Berkshire Park soil landscapes.
- **Vegetation type:** occurs within a range of different vegetation communities: Agnes Banks Woodland, Castlereagh Scribbly Gum Woodland, Cooks River Castlereagh Ironbark Forest, Shale Gravel Transition Forest and Shale Sandstone Transition Forest. The majority of individuals (99%) occur within Agnes Banks Woodland and Castlereagh Scribbly Gum Woodland

Based on these habitat requirements, the following areas of potential habitat have been mapped using the soil landscape mapping by Bannerman and Hazelton (1990) and the vegetation mapping by NPWS 2002/Tozer 2003 and DECCW (2009)(Figure 4, Table 10)

Table 10: Areas of potential habitat for *P. nutans* within priority areas

Priority	Location	Area of <i>P. nutans</i> habitat (hectares)
1.	Within 10 kilometres of the project study area	896 ha
2.	Within the southern part of the species' range	970 ha
3.	Within the species' known range	7823 ha

Only 12% of the mapped potential habitat for *P. nutans* occurs in the south of the species' range, and the majority of this southern habitat appears to be located in the Holsworthy Military Area within and adjacent to the project study area.

In order to identify potential offset sites that meet the specified criteria, spatial analysis will be undertaken using a range of data, including vegetation mapping, species records, habitat values, site condition, landscape connectivity, and land tenure.

Should a potential offset site be identified, condition and habitat assessment of the proposed offset lands would be undertaken to ensure the potential offset land consists of appropriate vegetation type/habitat and is of adequate condition. This assessment would be undertaken by suitably qualified ecologists and the report prepared would be included in the Offset Proposal.

It is recognised that the availability and suitability of land for inclusion in the offset package will be uncertain until the detailed investigation of suitable sites and finalisation of negotiations with landholders occurs.

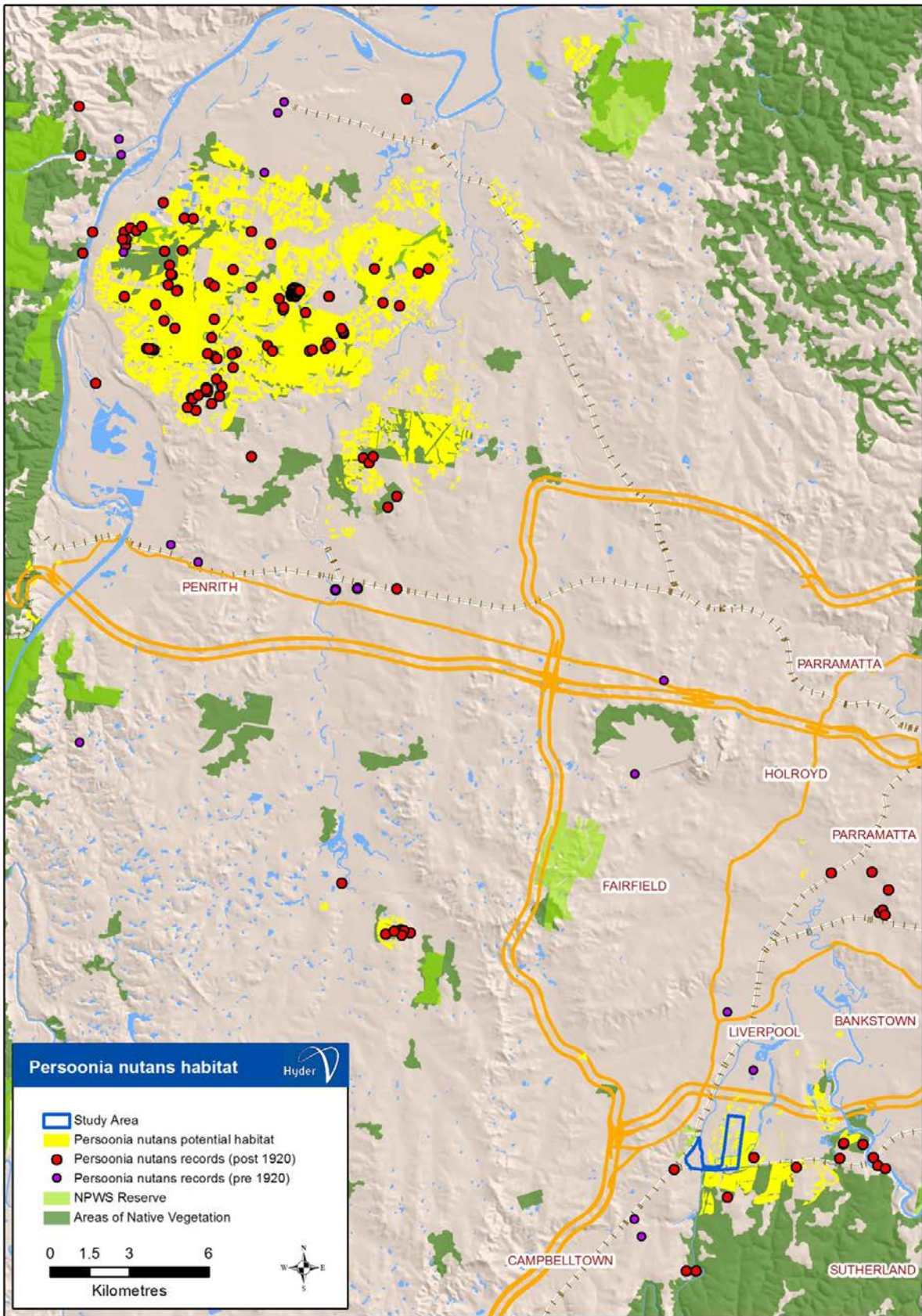


Figure 4. Potential habitat for *P. nutans*

4.2.1.2 Offset Measure B – Direct Offset: Retirement of Biobanking Credits

The BioBanking scheme was established under Part 7A of the *NSW Threatened Species Conservation Act 1995* (TSC Act). BioBanking is a market-based scheme that enables 'biodiversity credits' to be generated by landowners who commit to enhance and protect biodiversity values on their land through a biobanking agreement. These credits can then be sold, generating funds for the management of the site. Credits can be used to offset the impacts on biodiversity values that are likely to occur as a result of development.

To deliver this option, the proponent would engage an accredited BioBanking Assessor to undertake a BioBanking assessment of the rail corridor to determine the credit values required for the impacts in the study area. The availability of the appropriate number and class of biodiversity credits required would also be investigated. At the date of this report, there were no species credits for *Persoonia nutans* or *Grevillea parviflora* subsp. *parviflora* listed on the BioBanking public register (www.environment.nsw.gov.au/bimsprapp/BiobankingPR.aspx).

The EPBC Offsets Policy acknowledges that offsets may be determined and delivered through market-based schemes, such as the NSW biobanking scheme, but recommends that proponents engage with SEWPaC early in the assessment process to ensure that the offsets delivered through such a scheme will satisfy the requirements of the EPBC Offsets Policy.

Offset Measure B would only be investigated if Offset Measure A was not feasible or appropriate and after consultation with SEWPaC.

4.2.1.3 Offset Measure C – Other Compensatory Measures: Research and/or Education Programs

To deliver Offset Measure C, SIMTA would work with SEWPaC, OEH and other relevant government agencies and stakeholders to identify some key projects aimed at research and management of *P. nutans* that would lead to future opportunities for improving biodiversity outcomes.

As per the guidelines for suitable research and education programs in the EPBC Offsets Policy, any research proposed must be targeted towards key research or education programs identified in the relevant Commonwealth approved recovery plan. The recovery plan for *P. nutans* (DEC 2006) identified three knowledge gaps that should be priorities for research:

- Impact of fire frequency on population persistence – what are the lower and upper thresholds of fire intervals for *P. nutans*?
- Current status, distribution and abundance of the species
- Impact of habitat fragmentation on the long-term viability of populations.

Additional compensatory measures that may be considered include development and implementation of Community Conservation Programs focusing on restoration of *P. nutans* habitat. Consultation with SEWPaC, OEH, Liverpool Council and any existing community bushcare groups in the locality would be undertaken if considering a Community Conservation Program as an offset.

A suitable research or education program must improve the viability of the impacted protected matter, be undertaken in a transparent, scientifically robust and timely manner by a suitably qualified individual or organization, and consider best practice research approaches.

The amount of investment in this option will depend on outcomes of the other options above, but would be limited to a maximum 10% of the total offset requirement, unless it can be demonstrated that a greater benefit to the protected matter is likely to be achieved through increasing the proportion of other compensatory measures.

4.2.2 Offset Principles

Suitable offsets can be determined through application of the principles in the EPBC Offsets Policy and the OEH Principles for the use of Biodiversity Offsets.

4.2.2.1 EPBC Offset Principles

1. Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter.

This Strategy aims to directly contribute to the ongoing viability of *Persoonia nutans* in south-western Sydney by delivering a conservation outcome that improves or maintains viability of this species compared to the status quo (i.e. if neither the action nor the offset were to take place).

The proposed offset is to be tailored specifically to the attributes of *P. nutans* that are to be impacted, in order to deliver a conservation gain. Given that the proposed action will result in removal of individuals and habitat of the species, then an appropriate offset could include one or more of the following:

- protecting existing populations of species by acquisition and conservation of land;
- improving the quality of habitat within and adjoining existing populations of the species, and/or
- creating new similar habitat for the species through re-vegetation works.

The EPBC Offsets Policy identified that trading offsets across different protected matters is not considered as a suitable offset. Accordingly, the proposed offset for the SIMTA proposal will be directly targeted to conservation of *P. nutans*.

Any direct offset will meet, as a minimum, the quality of the habitat at the impact site. If a proposed offset site has a lower habitat quality than that of the impact site, the offset will be managed and resourced over a defined period of time so that its habitat quality is improved to meet the quality of habitat originally impacted.

2. Suitable offsets must be built around direct offsets but may include other compensatory measures.

Offsets must be built around direct offsets, which should form a minimum of 90 per cent of the total offset requirement.

Direct offsets are SIMTA's first priority to achieve the objectives of this Strategy, and the objective is for direct offsets to form 100 per cent of the offset requirement. Deviation from the 90 per cent direct offset requirement may be considered if it can be demonstrated that a greater benefit to the protected matter is likely to be achieved through increasing the proportion of other compensatory measures in an offsets package. This will be determined following consultation with SEWPaC and OEH.

An offset should address key priority actions outlined for the impacted protected matter in any approved recovery plans, threat abatement plan, conservation advice, ecological character description or approved Commonwealth management plan. Higher priority actions are preferred to lower priority actions. This Strategy aims to be consistent with the key priority actions in the *Persoonia nutans* Recovery Plan (DEC 2006), as discussed in Section 4.1.2.

Tenure for direct offsets

The securing of existing unprotected habitat as an offset only provides a conservation gain if that habitat was under some level of threat of being destroyed or degraded, and as a result of offsetting will instead be protected in an enduring way and actively managed to maintain or improve the viability of the protected matter. The tenure of the offset should be secured for at

least the same duration as the impact on the protected matter arising from the action, not necessarily the action itself.

As the impacts of the SIMTA proposal on *P. nutans* are expected to be permanent (i.e. removal of individuals), it is intended that any direct offset will have permanent and secure protection.

Key principles applicable to offsets on private lands include:

- should be legally secured for conservation purposes for at least the duration of the impact;
- the securing scheme should actively monitor for compliance, with covenant requirements enforced; and
- any change in legal status should require Ministerial or statutory approval.

3. Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.

Due to the higher risk involved with protected matters of greater conservation status, the offsets required for those protected matters with higher conservation status must be greater than those with a lower status.

Persoonia nutans is an Endangered species under the EPBC Act and TSC Act. The conservation status of *P. nutans* will be taken into account when determining the offset ratios required.

4. Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.

Offsets must be proportionate to the size and scale of the residual impacts arising from the action so as to deliver a conservation gain that adequately compensates for the impacted matter.

The size and scale of an offset required for each impact is determined by taking account of a number of different considerations that are discussed in the EPBC Offsets Policy, as listed in Table 11.

Table 11: Consideration of size and scale impacts

Size and scale impacts - guidelines	Size and scale impacts – SIMTA proposal
Level of statutory protection that applies to the protected matter	<i>Persoonia nutans</i> is listed as an Endangered species under the EPBC Act.
Specific attributes of the protected matter, or its habitat, being impacted	The proposed action will have the following impacts on <i>P. nutans</i> : <ul style="list-style-type: none"> ▪ removal of 17 individuals ▪ removal of 0.09 ha of occupied habitat ▪ removal of 0.65 ha of potential habitat
Quality or importance of the attributes being impacted with regard to the protected matter's ongoing viability	The population of <i>P. nutans</i> in the study area is considered to be significant as it is the largest population recorded in the south of the species' range, and one of only 15 known populations with over 50 mature individuals.

Size and scale impacts - guidelines	Size and scale impacts – SIMTA proposal
Permanent or temporary nature of the residual impacts	The residual impacts will be permanent.
Level of threat (risk of loss) that a proposed offset site is under	To be determined through development and implementation of proposed offset measures.
Time it will take an offset to yield a conservation gain for the protected matter	To be determined through development and implementation of proposed offset measures.
Risk of the conservation gain not being realised.	To be determined through development and implementation of proposed offset measures.

5. Suitable offsets must effectively account for and manage the risks of the offset not succeeding.

The use of offsets as a compensatory measure through the assessment and approval process involves two levels of risk:

1. That the impact on the protected matter will be too great and that an offset will not be able to compensate for the impact.

This risk is addressed through the assessment process. It is considered that a suitable offset will compensate for the loss of individuals and habitat for *P. nutans* from the study area.

2. Whether individual offsets are likely to be successful in compensating for the residual impacts of a particular action over a period of time.

This risk is to be considered in determining a suitable offset and will influence the scale of the offset required. Direct offsets are considered to present a lower risk than other compensatory measures, as they are more likely to result in a conservation gain for a protected matter.

A risk based approach incorporating the precautionary principle is taken when determining whether offsets are a suitable option. Risk is taken into account when considering the questions in Table 12.

Table 12: Risks taken into account when considering offsets

Issue	Response
What is the residual impact?	<p>The residual impacts on <i>Persoonia nutans</i> are:</p> <ul style="list-style-type: none"> ▪ removal of 17 individuals ▪ removal of 0.09 ha of occupied habitat ▪ removal of 0.65 ha of potential habitat

Issue	Response
What type of offset should be provided?	<p>A direct offset should be provided by securing additional native vegetation supporting individuals and/or habitat for <i>P. nutans</i> and protecting it through an appropriate legal instrument that ensures the land is managed for conservation.</p> <p>An appropriate direct offset could include one or more of the following:</p> <ul style="list-style-type: none"> ▪ protecting existing populations of the species; ▪ improving the quality of habitat within and adjoining existing populations of the species, and/or ▪ creating new similar habitat for the species through re-vegetation works
What size should the proposed offset be?	The offset should provide, at minimum, an equivalent area of habitat to that removed (0.74 ha) and preferably a greater area.
Where should the proposed offset be located?	The offset should be located within the known range of <i>Persoonia nutans</i> .

There is also the risk that offsets may result in perverse outcomes, either for the environment as a whole or for other aspects of the community, for instance social and economic factors. To avoid these outcomes, analysis of the possible perverse outcomes will form part of the decision making process in deciding the suitability of an offset package.

6. Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs.

Offsets must deliver a conservation gain for the impacted protected matter, and that conservation gain must be new, or additional to what is already required by a duty of care or to any environmental planning laws at any level of government. SIMTA notes that the EPBC Offsets Policy provides that this does not preclude the recognition of State or Territory offsets that may be suitable as offsets under the EPBC Act for the same action. SIMTA will consult with the NSW DP&I and OEH in an attempt to align its offset under the EPBC Act and State legislation to the extent that it compensates for the residual impact to protected matters.

This requirement prohibits the use of a piece of land that has already been conserved, or is unable to be developed due to zoning laws, as an offset for a proposed action. However, if the proposed offset is for further activities that achieve additional conservation gain on the same piece of land, then those additional activities may be eligible for use as offsets.

SIMTA's first priority is to secure additional *P. nutans* habitat through acquisition of land not currently under a conservation zoning land use tenure. If this cannot be achieved, other options will be discussed with SEWPaC.

7. Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable.

Table 13: Consideration of offset requirements

Offset requirement	Response
<p>Efficient and effective:</p> <ul style="list-style-type: none"> - maintains or improves the viability of a protected matter through the sound allocation of resources. - Alignment of offset requirements between Commonwealth and State 	<p>The proposed offset should satisfy both NSW and Commonwealth requirements for offsets, as <i>P. nutans</i> is the only threatened entity in the study area that will be significantly impacted by the proposed action.</p>
<p>Timely:</p> <ul style="list-style-type: none"> - implemented either before, or at the same point in time as, the impact arising from the action. 	<p>SIMTA will commit to the submission of an offset package within an agreed interval of time from approval. This timeframe would need to account for all Commonwealth and State approvals pending for the SIMTA proposal.</p>
<p>Transparent and scientifically robust:</p> <ul style="list-style-type: none"> - sufficiently analyses and documents the benefit to a protected matter's ecological function or values – ie desktop modelling of offset benefits and conducting relevant field work as appropriate. 	<p>Any proposed offset site would be assessed using desktop spatial analysis to determine likely presence of habitat requirements, followed by fieldwork to confirm the suitability of habitat.</p>

8. Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

Offsets must be delivered within appropriate and transparent governance arrangements. Proponents, or their contractors, must report on the success of the offsets so that conditions of approval can be varied if the offsets are not delivering the desired outcome.

Offset proposals will need to include clearly articulated measures of success that are linked to the purpose of the offsets and provide clear benchmarks about their success or failure. Annual reports will be required by SEWPaC and, where possible, will be made publicly available.

Offsets for the SIMTA proposal will only be chosen if they are suitable for ongoing management for conservation through an appropriate legal instrument. Additionally, offsets will be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes. Details of monitoring and auditing will be included in the Biodiversity Offset Proposal.

4.2.2.1 OEH Offset Principles

1. Impacts must be avoided first by using prevention and mitigation measures.

The construction footprint incorporating the rail link footprint and construction access requirements was reduced from 35 metres in width to 20 metres in width for the majority of the rail link to minimise impacts on threatened plant species. Given the distribution of threatened plant species across the study area, impacts on threatened plant populations of *Persoonia nutans* and *Grevillea parviflora* will be unavoidable.

Management measures designed to reduce impacts on biodiversity are detailed in the Ecological Assessment and in Table 5 of this Strategy. Specific mitigation measures for the threatened plant populations that will be impacted are provided in Tables 6 and 7 of this Strategy.

2. All regulatory requirements must be met.

This Biodiversity Offset Strategy is being prepared to address biodiversity impacts and satisfy the EIS guidelines and DGRs for the SIMTA Proposal. This Biodiversity Offset Strategy is not being used concurrently to satisfy another assessment or approval under other legislation.

3. Offsets must never reward ongoing poor performance.

Land for offsets will be chosen based on the criteria outlined in Section 4.2, and any land found to address these criteria would not be deliberately degraded in order to increase the value from the offset.

Any direct offset will meet, as a minimum, the quality of the habitat at the impact site. If a proposed offset site has a lower habitat quality than that of the impact site, the offset will be managed and resourced over a defined period of time so that its habitat quality is improved to meet the quality of habitat originally impacted. As such, any deliberate degradation of the proposed offset site would be counter-productive for the proponent.

4. Offsets will complement other government programs.

SIMTA will consult with OEH to ensure offsets complement existing conservation areas and are of sufficient quality and are managed appropriately to ensure the offsets are secured in perpetuity.

The NSW Biodiversity Strategy and relevant local and regional conservation plans will be consulted when identifying and assessing potential offset options.

5. Offsets must be underpinned by sound ecological principles.

Any proposed offset site would be assessed using desktop spatial analysis to determine likely presence of habitat requirements, followed by fieldwork to confirm the suitability of habitat. Assessment of the proposed offset site would include consideration of structure, function and compositional elements of biodiversity and the conservation status of ecological communities, but would be focused on establishing the presence of *P. nutans* or its habitat.

6. Offsets should aim to result in a net improvement in biodiversity over time.

Any proposed offset site must at minimum have an equivalent area of habitat for *P. nutans* to the area being impacted by the SIMTA Proposal. A conservation gain for *P. nutans* may be delivered through protecting existing populations of species by acquisition and conservation of land; improving the quality of habitat within and adjoining existing populations of the species, and/or creating new similar habitat for the species through re-vegetation works.

Any direct offset will meet, as a minimum, the quality of the habitat at the impact site. If a proposed offset site has a lower habitat quality than that of the impact site, the offset will be managed and resourced over a defined period of time so that its habitat quality is improved to meet the quality of habitat originally impacted.

7. Offsets must be enduring – they must offset the impact of the development for the period that the impact occurs.

As the impacts of the SIMTA proposal on *P. nutans* are expected to be permanent (i.e. removal of individuals), it is intended that any direct offset will have permanent and secure protection.

8. Offsets should be agreed prior to the impact occurring.

SIMTA will commit to the submission of an offset package within an agreed interval of time from approval. This timeframe would need to account for all Commonwealth and State approvals, pending for the SIMTA proposal.

9. Offsets must be quantifiable – the impacts and benefits must be reliably estimated.

Offsets for the SIMTA proposal will only be chosen if they are suitable for ongoing management for conservation through an appropriate legal instrument. Additionally, offsets will be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes. Details of monitoring and auditing will be included in the Biodiversity Offset Proposal.

10. Offsets must be targeted.

The proposed offset will be directly targeted to conservation of *P. nutans*, which would be subject to significant impacts from the SIMTA proposal. The proposed offset is to be tailored specifically to the attributes of *P. nutans* that are to be impacted, in order to deliver a conservation gain. Given that the proposed action will result in removal of individuals and habitat of the species, then an appropriate offset could include one or a combination of the following:

- protecting existing populations of species by acquisition and conservation of land;
- improving the quality of habitat within and adjoining existing populations of the species, and/or; and
- creating similar habitat for the species through re-vegetation works.

Any direct offset will meet, as a minimum, the quality of the habitat at the impact site. If a proposed offset site has a lower habitat quality than that of the impact site, the offset will be managed and resourced over a defined period of time so that its habitat quality is improved to meet the quality of habitat originally impacted.

11. Offsets must be located appropriately.

The location of offsets will be driven by the habitat requirements of *P. nutans*. The species occurs on aeolian and alluvial sediments and its distribution is restricted to the Cumberland Plain. Areas of potential habitat have been mapped using the soil landscape and vegetation mapping and are shown in Figure 4 of this strategy.

Priorities for the location of the offset site would be as follows:

1. Within 10 kilometres of the project study area.
2. Within the south of the species' range (i.e. south from Villawood and Kemps Creek populations).
3. Within the species' known range.

12. Offsets must be supplementary.

SIMTA's first priority is to secure additional *P. nutans* habitat through acquisition of land not currently under a conservation zoning land use tenure. If this cannot be achieved, other options will be discussed with OEH.

13. Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract.

Offsets will only be chosen if they are suitable for ongoing management for conservation through an appropriate legal instrument. Additionally, offsets will be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes. Details of monitoring and auditing will be included in the Biodiversity Offset Proposal.

5 CONCLUSION

This Preliminary Biodiversity Offset Strategy summarises the impacts of the SIMTA proposal on protected matters, details the mitigation measures proposed to minimise biodiversity impacts, and sets out options for offsetting residual significant impacts on threatened species and a framework for delivery of these options (in consultation with SEWPaC and OEH).

The SIMTA proposal will have direct impacts on threatened ecological communities listed under the TSC Act as well as two threatened plant species listed under the EPBC Act and TSC Act, *Persoonia nutans* (Nodding Geebung) and *Grevillea parviflora* subsp. *parviflora* (Small-flower Grevillea). The impacts of the SIMTA proposal on the endangered species *Persoonia nutans* are considered to be significant.

The aim of the Biodiversity Offset Strategy is to achieve a long-term conservation gain for the protected matters subject to residual significant impacts as a result of the SIMTA Proposal. The Preliminary Biodiversity Offset Strategy is guided by the EPBC Offsets Policy, the OEH Offset Principles and the recovery objectives and actions in the approved Recovery Plan for *Persoonia nutans*.

The Strategy proposes three measures for consideration.

Two of the measures propose direct offsets:

- Offset Measure A: Secure additional native vegetation protected through an appropriate legal instrument that ensures the land is managed for conservation. *Persoonia nutans*, or its habitat, must be present on any offset site.
- Offset Measure B: Retirement of an appropriate number and class of biodiversity credits under the NSW Biobanking scheme.

The third offset measure is comprised of other compensatory measures, which may only comprise 10% of the maximum offset requirement:

- Offset Measure C: Investment in research and/or education programs related to related to the impacted protected matters.

Offset Measure A is SIMTA's first priority to achieve the objectives of the Biodiversity Offset Strategy. Offset Measures B and C would only be considered after further consultation with SEWPaC, OEH and DP&I.

This Preliminary Biodiversity Offset Strategy presents the framework for offsetting impacts of the SIMTA proposal on protected matters. Suitable areas of land and measures for offsetting will be identified and further developed in consultation with SEWPaC, OEH and DP&I. This Strategy will be developed and revised through the project approval process.

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