

APPENDIX 15

WA Offsets Template

Thornlie - Cockburn Link									
Existing environment/ Impact	Mitigation			Significant Residual Impact	Offset Calculation Methodology				
	Avoid and minimise	Rehabilitation Type	Likely Rehab Success		Type	Risk	Likely offset success	Time Lag	Offset Quantification
Clearing of 5.04 ha of Bush Forever comprised of: 0.01 ha of Bush Forever Site 246 (Canning and Southern Rivers), 4.71 ha of Bush Forever Site 388 (Jandakot Airport) and 0.32 ha of Bush Forever Site 456 (Ken Hurst Park).	<ul style="list-style-type: none"> The development envelope has been designed to avoid known populations of and direct impacts to threatened flora and native vegetation. Reduction in the extent and/or design of the development envelope in Bush Forever sites 246 and 456 (Tom Bateman Reserve) to reduce extent of vegetation clearing including a conservation category wetland No clearing of vegetation that provides a buffer to known populations of <i>Caladenia huegelii</i>. Utilisation of the existing rail reserve, which is predominantly cleared to avoid clearing extent. Establishment of a Tree Protection Zone on the southern side of the Canning River in Bush Forever Site 246 and 456 to avoid clearing mature trees. After several revisions of the development envelope: <ul style="list-style-type: none"> Complete avoidance of Banksia Woodland SCP TEC Patch 2 (northern side of the rail reserve). Complete avoidance of Banksia Woodland of 	Not applicable	Not applicable	<p>Extent</p> <p>Clearing of 5.04 ha of Bush Forever vegetation in Degraded of better condition comprised of: 0.01 ha of Bush Forever Site 246 (Canning and Southern Rivers), 4.71 ha of Bush Forever Site 388 (Jandakot Airport) and 0.32 ha of Bush Forever Site 456 (Ken Hurst Park).</p> <p>Quality</p> <p>The vegetation in Bush Forever Site 246 (Canning and Southern River) is in Degraded condition, vegetation in Bush Forever Site 388 (Jandakot Airport) is in Degraded to Very Good condition (majority is Very Good) and vegetation in Bush Forever site 456 (Ken Hurst Park) is in Degraded to Good condition (majority is Degraded).</p> <p>Conservation Significance</p> <p>Regionally significant bushland as the vegetation comprises Bush Forever.</p>	Option 1: Retrospective application of the WAPC acquired Mardella site and its reclassification as an A Class reserve (elevated from its Bush Forever status). Provision of funding to the DBCA for seven years of site management, specific to the environmental values being offset.	There is no risk associated with acquisition as the site has already been acquired. The EPA may not consider the application of the Class A classification as a suitable offset to counterbalance Bush Forever impacts. Quality/condition of Bush Forever habitat not maintained or improved or degrades over time despite rehabilitation and conservation measures.	<p><u>Can the values be defined and measured?</u> Yes - as an A Class Reserve, owned and managed by the DBCA, significant environmental surveys have been conducted onsite. These surveys will be provided to the PTA. Further, the PTA is in the process of procuring an additional site survey to assess environmental values, focusing on the environmental values and FCTs proposed to be offset.</p> <p><u>Operator experience/Evidence?</u> The DBCA already owns and manages the land and will continue to do so.</p> <p><u>What is the type of vegetation being revegetated?</u> Black Cockatoo foraging habitat and potential Black Cockatoo breeding trees, Banksia Woodlands of the SCP TEC, known TEC habitat including <i>Caladenia huegelii</i> and <i>Drakea elastica</i>.</p> <p><u>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</u> The same environmental values in Excellent condition are known to exist within the proposed offset site.</p>	No time lag - Site acquisition and classification as a Class A nature reserve has already occurred. Ecological benefit has already occurred due to Class A classification. Funding for further management activities will prolong ecological benefit.	To offset the clearing of 5.04 ha of vegetation in Bush Forever, 13.76 ha of Bush Forever will be acquired and managed for seven years. This is the quantum impact following application of the Bush Forever offset ratios based on vegetation condition. The area of offset involved is proportionate to the impact as calculated using the guidance in SPP 2.8. The application of conservation measures to an area of existing Bush Forever site (particular those that do not have existing active conservation management) is cost effective and is relevant to the impact as it involves the site that is directly affected by the Project.

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	<p>SCP TEC Patch 4 (Caladenia Grove Reserve)</p> <ul style="list-style-type: none"> Avoidance of 99.4% of Banksia Woodland of SCP TEC Patch 1 (near Karel Avenue). The impacted area is required for an infiltration basin and is unavoidable. The changes to the development envelope described above have reduced the overall impact on Banksia Woodlands TEC for the project from 2.85 ha to 2.32 ha. Refinement of the development envelope to the minimal extent necessary whilst accommodating the construction and operation of the project, allowing some degree of flexibility in detailed design. As no threatened flora will be directly impacted by the project, mitigation efforts 				<p>Land Tenure State/Unallocated Crown Land (UCL) (not currently managed for conservation)</p> <p>Time Scale <i>Permanent</i></p> <p>According to the agreed significance framework, residual impact is considered significant due to the general high conservation significance of the vegetation in Bush Forever, which supports flora and fauna, TECs/PECs and Carnaby's and Forest Red-Tailed Black Cockatoo.</p>	<p>Option 2: Acquisition of a privately owned Bush Forever site in Keysbrook for transfer from Rural Complementary to Parks and Recreation and provision of funding to DBCA for 7 years of management, management, specific to the environmental values being offset.</p>	<p>There is no risk associated with acquisition as the site has already been acquired by the WAPC. The EPA may not consider reclassification of Rural Complementary to Parks and Recreation and management as a suitable offset to counterbalance Bush Forever impacts. Site environmental values are unknown and may not be applicable to the Bush Forever impacts.</p>	<p>Can the values be defined and measured? Yes - the PTA is in the process of procuring a site survey to assess environmental values, focusing on the environmental values proposed to be offset and FCTs.</p> <p>Operator experience/Evidence? It is proposed that the DBCA manage the land, taking over from the WAPC.</p> <p>What is the type of vegetation being revegetated? The site is likely to contain Black Cockatoo foraging habitat and potential breeding trees and Banksia Woodlands of the SCP TEC. A site assessment will determine vegetation within the site.</p> <p>Is there evidence the environmental values can be re-created (evidence of demonstrated success)? A survey of the site will be conducted to assess the environmental values and applicability to the cleared Bush Forever vegetation proposed to be offset.</p>	<p>No time lag - Site acquisition has already occurred. Reclassification from Rural Complementary to Parks and Recreation is in the process of being undertaken. Ecological benefit has will be realised through classification to Parks and Recreation and management activities. Time lag is likely to range from 5 to 10 years.</p>

Thornlie - Cockburn Link

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	<p>are focused upon managing indirect impacts to known populations of threatened flora in proximity to the development envelope.</p> <ul style="list-style-type: none"> • A CEMP has been prepared outlining measures to manage risks to threatened flora. Including: <ul style="list-style-type: none"> ○ Provide clearing extents to the contractor in GIS format. ○ In field demarcation of Tree Protection Zones and other exclusion zones. ○ Identify all known locations of significant flora and TECs/PECs in project documentation. ○ In field demarcation of clearing extents. ○ Fencing to prevent unauthorised clearing. ○ Document and report clearing activities. ○ Clearing compliance and boundary inspections. ○ Dust control and suppression measures during construction. ○ Develop and implement weed and pathogen hygiene management 				<p>Option 3: On-ground conservation management within existing Bush Forever Site 456 to improve the condition and quality of degraded vegetation within the un-impacted areas.</p>	<p>The DBCA cannot secure funding shortfall to manage entire Bush Forever site. Condition of degraded vegetation not improved, or area of improved vegetation condition does not or is not likely to meet minimum area required to be offset, within seven years despite conservation measures.</p>	<p><u>Can the values be defined and measured?</u> Yes – vegetation values can be measured through vegetation condition inspections from on ground works during:</p> <ul style="list-style-type: none"> • Rubbish removal • Fencing installation • Fire prevention and control works • Feral animal control • Weed management • Signage installation. <p><u>Operator experience/Evidence?</u> DBCA will manage the land within their ownership.</p> <p><u>What is the type of vegetation being revegetated?</u> Vegetation types/species associated within the Bush Forever site proposed to be managed, which is likely to be one of the 4 Bush Forever sites directly impacted by the proposal so will contain the same environmental values and FCTs.</p> <p><u>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</u> DBCA is responsible for biodiversity conservation in Western Australia and routinely carries out management and restoration activities.</p>	<p>Within 10 years to achieve no net loss.</p>	

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Clearing of 2.32 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC.	<p>measures to prevent the introduction and spread of weeds and dieback.</p> <ul style="list-style-type: none"> ○ Develop and implement fire risk management procedures during construction. ○ Restrict vehicles and equipment to the development envelope. <ul style="list-style-type: none"> ● Other commitments include: <ul style="list-style-type: none"> ○ Review project dewatering requirements once detailed design has been completed to re-evaluate potential direct and indirect impacts to vegetation. ○ Position groundwater abstraction bores away from known locations of significant flora where practicable. ○ Prepare and implement a vegetation monitoring plan to detect changes in the health of significant vegetation immediately adjacent 			<p><u>Extent</u> Clearing of 2.32 ha of the Commonwealth listed Banksia Woodlands TEC</p> <p><u>Quality</u> 2.32 ha of Banksia Woodlands TEC comprised of 0.03 ha of vegetation in Very Good and 2.29 ha of vegetation in Good condition.</p> <p><u>Conservation Significance</u> High conservation significance as Banksia Woodland of SCP TEC listed as Endangered under the EPBC Act.</p> <p><u>Land Tenure</u> State</p> <p><u>Time Scale</u> Permanent</p> <p>According to the agreed significance framework, residual impact is considered significant as the loss of up to 2.32 ha of Banksia Woodlands of the SCP TEC is likely to be viewed as a significant impact to the ecological community</p>	<p>Option 1: Retrospective application of the WAPC acquired Mardella site and its reclassification as an A Class reserve (elevated from its Bush Forever status). Provision of funding to the DBCA for seven years of site management, with a focus on management of Black Cockatoo habitat and potential breeding trees.</p>	<p>There is no risk associated with acquisition as the site has already been acquired.</p> <p>Quality/condition of Bush Forever habitat not maintained or improved or degrades over time despite rehabilitation and conservation measures. Insufficient area of Banksia TEC habitat meeting essential criteria able to be practicably acquired within required timeframe.</p>	<p><u>Can the values be defined and measured?</u> Yes - as an A Class Reserve, owned and managed by the DBCA, significant environmental surveys have been conducted onsite. These surveys will be provided to the PTA. Further, the PTA is in the process of procuring an additional site survey to assess environmental values, including Banksia TEC survey and assessment.</p> <p><u>Operator experience/Evidence?</u> The DBCA already owns and manages the land and will continue to do so.</p> <p><u>What is the type of vegetation being revegetated?</u> Black Cockatoo foraging habitat and potential Black Cockatoo breeding trees, Banksia Woodlands of the SCP TEC, known TEC habitat including <i>Caladenia huegelii</i> and <i>Drakea elastica</i>.</p> <p><u>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</u> The same environmental values in Excellent condition are known to exist within the proposed offset site.</p>	<p>No time lag - Site acquisition and classification as a Class A nature reserve has already occurred. Ecological benefit has already occurred due to Class A classification. Funding for further management activities will prolong ecological benefit.</p>	<p>Total offset is up to 13 ha of Banksia TEC land acquisition and protection calculated using the DoEE offset calculator.</p> <p>The co-location of the Banksia Woodlands TEC with the Carnaby's Cockatoo offset and/or Bush Forever and/or wetlands offset is cost effective. The acquisition and/or implementation of conservation measures to protect existing high quality areas of the TEC is appropriate and the Commonwealth offset calculator used to ensure the offset is proportionate to the impact.</p>

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	<p>the development envelope, attributable to construction works. The monitoring plan will address impacts to threatened flora, significant vegetation communities (i.e. TECs) and significant wetlands (e.g. CCWs and REWs).</p> <ul style="list-style-type: none"> ○ Conduct post-construction dieback surveys of dieback free areas. ○ On-going weed management (e.g. herbicide application) along the length of the railway reserve on a 6-monthly basis and on an annual basis along fences and structures. 				<p>on the basis that the TCL project will contribute to the reduction in area of the ecological community.</p>	<p>Option 2: Acquisition of a privately owned Bush Forever site in Keysbrook for transfer from Rural Complementary to Parks and Recreation and provision of funding to DBCA for 7 years of management, specific to the environmental values being offset.</p>	<p>There is no risk associated with acquisition as the site has already been acquired by the WPAC. Site environmental values are unknown and may not be applicable to the offset Banksia TEC impacts. Quality/condition of Banksia TEC not maintained or improved or degrades over time despite rehabilitation and conservation measures.</p>	<p><u>Can the values be defined and measured?</u> Yes - the PTA is in the process of procuring a site survey to assess environmental values, focusing on the environmental values and FCTs proposed to be offset. <u>Operator experience/Evidence?</u> It is proposed that the DBCA manage the land, taking over from the WAPC. <u>What is the type of vegetation being revegetated?</u> The site is likely to contain Black Cockatoo foraging habitat, potential Black Cockatoo breeding trees, Banksia Woodlands of the SCP TEC and wetland habitat. A site assessment will determine vegetation within the site. <u>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</u> A survey of the site will be conducted to assess the environmental values and extent and condition of Banksia of SCP TEC habitat.</p>	<p>No time lag - Site acquisition has already occurred. Reclassification from Rural Complementary to Parks and Recreation is in the process of being undertaken. Ecological benefit has will be realised through classification to Parks and Recreation and management activities. Time lag is likely to range from 5 to 10 years.</p>

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Loss of 24.59 ha of Carnaby's Black Cockatoo habitat including 17.24 ha of Forest Red-tailed and Baudin's Black Cockatoo habitat and 48 potential breeding trees (trees with DBH>500mm) which comprises seven Flooded Gum, 21 Marri and 20 Tuart trees.	<ul style="list-style-type: none"> Changes to the development envelope to avoid clearing approximately: <ul style="list-style-type: none"> 48% of Black Cockatoo foraging habitat in the survey area. 73% of potential Black Cockatoo breeding trees (avoidance of 128 trees). This was partially achieved via the commitment to establish Tree Protection Zones near the Canning River and in Bush Forever Site 456 (Tom Bateman Reserve) to avoid clearing mature trees. Minor adjustments to the development envelope in Bush Forever Site 456 (Tom Bateman reserve) have been implemented to avoid impacts to wetland habitat. Utilisation of the existing rail reserve, which is predominantly cleared to avoid clearing extent (i.e. >77% of the development envelope is comprised of cleared land or low value 			<p>Extent</p> <p>Loss of 24.59 ha of Carnaby's Black Cockatoo habitat including 17.24 ha of Forest Red-Tailed and Baudin's Black Cockatoo habitat and 48 potential breeding trees (trees with DBH>500mm) which comprises seven Flooded Gum, 21 Marri and 20 Tuart trees.</p> <p>Quality</p> <p>Clearing of 24.59 ha of foraging habitat, consisting of 21.61 ha of High quality habitat and 2.98 ha of Medium-High quality habitat.</p> <p>Conservation Significance</p> <p>High conservation significance as Carnaby's, Forest Red-Tailed and Baudin's Black Cockatoos are listed as Endangered under the <i>Biodiversity Conservation Act 2016</i>.</p> <p>Land Tenure</p>	Option 1: Retrospective application of the WAPC acquired Mardella site and its reclassification as an A Class reserve (elevated from its Bush Forever status). Provision of funding to the DBCA for seven years of site management, with a focus on management of Black Cockatoo habitat and potential breeding trees.	There is no risk associated with acquisition as the site has already been acquired. Quality/condition of Bush Forever habitat not maintained or improved or degrades over time despite rehabilitation and conservation measures. Insufficient area of Black Cockatoo habitat meeting essential criteria able to be practicably acquired within required timeframe.	<p><u>Can the values be defined and measured?</u> Yes - as an A Class Reserve, owned and managed by the DBCA, significant environmental surveys have been conducted onsite. These surveys will be provided to the PTA. Further, the PTA is in the process of procuring an additional site survey to assess environmental values, including a Black Cockatoo survey and assessment.</p> <p><u>Operator experience/Evidence?</u> The DBCA already owns and manages the land and will continue to do so.</p> <p><u>What is the type of vegetation being revegetated?</u> Black Cockatoo foraging habitat and potential Black Cockatoo breeding trees, Banksia Woodlands of the SCP TEC, known TEC habitat including <i>Caladenia huegelii</i> and <i>Drakea elastica</i>.</p> <p><u>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</u> The same environmental values in Excellent condition are known to exist within the proposed offset site.</p>	No time lag - Site acquisition and classification as a Class A nature reserve has already occurred. Ecological benefit has already occurred due to Class A classification. Funding for further management activities will prolong ecological benefit.	Total offset is up to 103 ha of Black Cockatoo land acquisition and protection calculated using the DoEE offset calculator. Acquisition and conservation of 144 potential breeding trees, this has been calculated at a 3:1 ratio. The co-location of the Banksia Woodlands TEC with the Carnaby's Cockatoo offset and/or Bush Forever and/or wetlands offset is cost effective. Further, overlap in habitat between the three Black Cockatoo species provides further value for money. The acquisition and/or implementation of conservation measures to protect existing high quality areas of the TEC is appropriate and the Commonwealth offset calculator used to ensure the offset is proportionate to the

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fauna habitat.) <ul style="list-style-type: none"> A CEMP has been prepared outlining measures to manage risks to terrestrial fauna including: <ul style="list-style-type: none"> Provide clearing extents to the contractor in GIS format. In field demarcation of Tree Protection Zones and other exclusion zones. In field demarcation of clearing extents. Fencing to prevent unauthorised clearing and exclude fauna to minimise train strike. Include fauna management requirements in site induction training. Conduct pre-clearing, fauna trapping and relocation using a qualified fauna handler at Bush Forever Site 456 and Ranford Road. Fauna spotter/handler to be present/on call 			<p>State</p> <p>Time Scale</p> <p>Permanent</p> <p>According to the agreed significance framework, residual impact is considered significant. The impacted habitat is consistent with the definition of critical habitat for all Black Cockatoo species and therefore, the impact is regarded as a significant residual impact.</p>	<p>Option 2: Acquisition of a privately owned Bush Forever site in Keysbrook for transfer from Rural Complementary to Parks and Recreation and provision of funding to DBCA for 7 years of management, specific to the environmental values being offset.</p>	<p>There is no risk associated with acquisition as the site has already been acquired by the WPAC. Site environmental values are unknown and may not be applicable to the offset Banksia TEC impacts. Quality/condition of Banksia TEC not maintained or improved or degrades over time despite rehabilitation and conservation measures.</p>	<p>Can the values be defined and measured?</p> <p>Yes - the PTA is in the process of procuring a site survey to assess environmental values, focusing on the environmental values and FCTs proposed to be offset.</p> <p>Operator experience/Evidence?</p> <p>It is proposed that the DBCA manage the land, taking over from the WAPC.</p> <p>What is the type of vegetation being revegetated?</p> <p>The site is likely to contain Black Cockatoo foraging habitat, potential Black Cockatoo breeding trees, Banksia Woodlands of the SCP TEC and wetland habitat. A site assessment will determine vegetation within the site.</p> <p>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</p> <p>A survey of the site will be conducted to assess the environmental values and extent and condition of Black Cockatoo habitat.</p>	<p>No time lag - Site acquisition has already occurred. Reclassification from Rural Complementary to Parks and Recreation is in the process of being undertaken. Ecological benefit has will be realised through classification to Parks and Recreation and management activities. Time lag is likely to range from 5 to 10 years.</p>	<p>impact.</p>

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	<ul style="list-style-type: none"> ○ during site clearing. ○ Document and report clearing activities. ○ Clearing compliance and boundary inspections. ○ Regularly inspect the development envelope for trapped fauna (in excavations or equipment) during construction works. ○ Relocation of trapped fauna. ○ Speed limits imposed during construction works. ○ Minimise duration of open excavations. ○ Fauna ramps in open trenches. ○ Dust control and suppression measures during construction. ○ Develop and implement weed and pathogen hygiene management measures to prevent the introduction and spread of weeds and dieback. ○ Develop and implement fire risk management procedures during construction. ○ Restrict vehicles and equipment to the development envelope. 				<p>Option 3: Funding Black Cockatoo research</p>	<p>Research agency unable to secure enough funding to commence the research proposal (i.e. funding from other parties.) Research results unavailable for use in future METRONET offset strategies due to delay in obtaining the data. Results do not present value for money.</p>	<p><u>Can the values be defined and measured?</u> Not applicable</p> <p><u>Operator experience/Evidence?</u> Murdoch university has proven Black Cockatoo research experience and results.</p> <p><u>What is the type of vegetation being revegetated?</u> Not applicable.</p> <p><u>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</u> Not applicable.</p>	<p>Research will be planned to commence mid-2019 and will continue for 5 years. Some results may be able to be used throughout the research period and in future planning.</p>	<p>Provision of funding to Murdoch will be no greater than 10% of the total offset proposal.</p>

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<p>4.50 ha of the following significant wetlands may be directly impacted:</p> <ul style="list-style-type: none"> CCW UFI 6911 – a small wetland (1.74 ha) containing Very Good and Degraded vegetation entirely within the development envelope at the proposed Ranford Road Station site. CCW UFI 6912 – a small CCW where a small portion (0.16 ha) of the wetland is within the southern extent of the development envelope at the Ranford Road site. REW UFI 13332 – northern portion of the wetland is 	<p>In addition to the measures listed above in relation to the avoidance and minimisation of impacts to flora and vegetation, which also apply to wetlands in this instance, the following avoidance measures apply to wetlands:</p> <ul style="list-style-type: none"> The development envelope has been redesigned from the original referred version and is now planned to: <ul style="list-style-type: none"> Avoid impacts to REW UFI 15926, including a 50 m buffer around the wetland to the west and south; and Avoid a larger area of the Canning River floodplain. Driven piles is the preferred methodology for construction of the Canning River Rail Bridge, with little to no dewatering or displacement of water require and no disruption to the flow of the Canning River. Rail bridge footings have been planned to be placed outside of the channel of the Canning River to avoid disrupting the flow of the Canning River and water 			<p>Extent</p> <p>4.50 ha of the following significant wetlands may be directly impacted:</p> <ul style="list-style-type: none"> CCW UFI 6911 – a small wetland (1.74 ha) containing Very Good and Degraded vegetation entirely within the development envelope at the proposed Ranford Road Station site. CCW UFI 6912 – a small CCW where a small portion (0.16 ha) of the wetland is within the southern extent of the development envelope at the Ranford Road site. REW UFI 13332 – northern portion of the wetland is within the development envelope (2.60 ha) and may be impacted by the construction of the Ranford Road Station site. 	<p>Option 1: Retrospective application of the WAPC acquired Mardella site and its reclassification as an A Class reserve (elevated from its Bush Forever status). Provision of funding to the DBCA for seven years of site management, specific to the environmental values being offset, including wetlands.</p>	<p>There is no risk associated with acquisition as the site has already been acquired.</p> <p>The EPA may not consider the application of the Class A classification as a suitable offset to counterbalance wetland impacts.</p> <p>Quality/condition of wetland habitat not maintained or improved or degrades over time despite rehabilitation and conservation measures.</p>	<p>Can the values be defined and measured?</p> <p>Yes - as an A Class Reserve, owned and managed by the DBCA, significant environmental surveys have been conducted onsite. These surveys will be provided to the PTA. Further, the PTA is in the process of procuring an additional site survey to assess environmental values, focusing on the environmental values, FCTs and wetland habitat proposed to be offset.</p> <p>Operator experience/Evidence?</p> <p>The DBCA already owns and manages the land and will continue to do so.</p> <p>What is the type of vegetation being revegetated?</p> <p>Black Cockatoo foraging habitat and potential Black Cockatoo breeding trees, Banksia Woodlands of the SCP TEC, known TEC habitat including <i>Caladenia huegelii</i> and <i>Drakaea elastica</i>, wetland habitat.</p> <p>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</p> <p>The same environmental values in Excellent condition are known to exist within the proposed offset site.</p>	<p>No time lag - Site acquisition and classification as a Class A nature reserve has already occurred. Ecological benefit has already occurred due to Class A classification. Funding for further management activities will prolong ecological benefit.</p>	<p>To offset the clearing of 4.50 ha of wetland habitat, 25 ha of wetland habitat will be acquired and managed for seven years calculated using the DoEE offset calculator. The area of offset involved is proportionate to the impact as calculated using the DoEE calculator.</p> <p>The application of conservation measures to an area of existing wetland habitat (particular those that do not have existing active conservation management) is cost effective and is relevant to the impact as it involves the site that is directly affected by the Project.</p>

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within the development envelope (2.60 ha) and may be impacted by the construction of the Ranford Road Station site.	<p>quality issues.</p> <ul style="list-style-type: none"> No mobile or permanent (>12 months) fuel storage tanks or chemicals/dangerous good storage will be sited in significant wetlands, the UWPCA or well head protection zone. Laydown area adjacent to Canning River adjusted to be outside of the floodway and flood fringe. Design options for the Ranford Road Station will be reviewed and refined, potentially reduce impacts to UFI 6912 and UFI 13332. WSUD principles and considerations have been incorporated into the conceptual drainage designs for the TCL project. PTA will implement the following restrictions on activities within the floodway to meet the DWER requirements and ensure no obstruction to major flows of the Canning River during flood events: 			<p>Quality</p> <ul style="list-style-type: none"> CCW UFI 6911 – vegetation is in Good (1.31 ha), Good-Degraded (0.12 ha), Degraded- Completely Degraded (0.01 ha) and Cleared (0.03 ha) condition. CCW UFI 6912 – vegetation is in Very Good (0.07 ha) and Degraded (0.09 ha) condition. REW UFI 13332 – vegetation is in Very Good (1.34 ha), Good (0.66 ha), Degraded (0.50 ha) and Cleared (0.10 ha) condition. <p>Conservation Significance Conservation Category and Resource Enhancement wetlands are considered significant.</p> <p>Land Tenure</p>	Option 2: Acquisition of a privately owned Bush Forever site in Keysbrook for transfer from Rural Complementary to Parks and Recreation and provision of funding to DBCA for 7 years of management, management, specific to the environmental values being offset.	There is no risk associated with acquisition as the site has already been acquired by the WPAC. The EPA may not consider reclassification of Rural Complementary to Parks and Recreation and management as a suitable offset to counterbalance Bush Forever impacts. Site environmental values are unknown and may not be applicable to the Bush Forever impacts.	<p>Can the values be defined and measured? Yes - the PTA is in the process of procuring a site survey to assess environmental values, focusing on the environmental values, FCTs and wetlands proposed to be offset.</p> <p>Operator experience/Evidence? It is proposed that the DBCA manage the land, taking over from the WAPC.</p> <p>What is the type of vegetation being revegetated? The site is likely to contain Black Cockatoo foraging habitat and potential breeding trees and Banksia Woodlands of the SCP TEC. A site assessment will determine vegetation within the site.</p> <p>Is there evidence the environmental values can be re-created (evidence of demonstrated success)? A survey of the site will be conducted to assess the environmental values and applicability to the wetland vegetation and habitat proposed to be offset.</p>	No time lag - Site acquisition has already occurred. Reclassification from Rural Complementary to Parks and Recreation is in the process of being undertaken. Ecological benefit has will be realised through classification to Parks and Recreation and management activities. Time lag is likely to range from 5 to 10 years.	

Thornlie - Cockburn Link

Existing environment/ Impact	Mitigation			Significant Residual Impact	Offset Calculation Methodology				
	Avoid and minimise	Rehabilitation Type	Likely Rehab Success		Type	Risk	Likely offset success	Time Lag	Offset Quantification
	<ul style="list-style-type: none"> No new permanent buildings constructed in the floodway. No filling within the floodway. Mobile fuel storage tanks will not be sited in the floodway as it may not be possible to obtain 2m separation distance to groundwater. No permanent (>12 months) fuel storage tanks sited in the floodway. No storage of chemicals or dangerous goods, even if appropriately banded, in the floodway. No stockpiles of potentially contaminated soil to be sited in the floodway. Construction and laydown area location outside of the floodway and flood fringe. The new Canning River Bridge footings/pillars will be placed adjacent to existing footings/pillars and therefore will not narrow the river course or restrict flow beyond the current situation. Based on the above restrictions and proposed placement of footings/pillars, the risk of obstructing flows during major flood events is considered low, and therefore no significant impacts to the hydrological 			<p>State/Unallocated Crown Land (UCL) (not currently managed for conservation)</p> <p>Time Scale Permanent</p> <p>According to the agreed significance framework, residual impact is considered significant due to the general high conservation significance of Conservation Category and Resource Enhancement wetlands.</p>	<p>Option 3: On-ground conservation management within existing Bush Forever Site 456 to improve the condition and quality of wetland habitat.</p>	<p>The DBCA cannot secure funding shortfall to manage entire Bush Forever site. Condition of wetland habitat not improved, or area of improved wetland habitat does not or is not likely to meet minimum area required to be offset, within seven years despite conservation measures.</p>	<p><u>Can the values be defined and measured?</u> Yes – vegetation and wetland values can be measured through vegetation condition inspections from on ground works during: • Rubbish removal • Fencing installation • Fire prevention and control works • Feral animal control • Weed management • Signage installation. <u>Operator experience/Evidence?</u> DBCA will manage the land within their ownership. <u>What is the type of vegetation being revegetated?</u> Vegetation types/species associated with wetland habitat is proposed to be managed, which is likely to be one of the 4 Bush Forever sites directly impacted by the proposal so will contain the same environmental values and FCTs. <u>Is there evidence the environmental values can be re-created (evidence of demonstrated success)?</u> DBCA is responsible for biodiversity conservation in Western Australia and routinely carries out management and restoration activities.</p>	<p>Within 10 years to achieve no net loss.</p>	

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Banksia Woodlands TEC
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	Yes	2.32 ha of impact to Banksia Woodlands of the Swan Coastal Plain TEC	Area	2.32	Hectares	2.32 ha of impact to Banksia Woodlands of the SCP TEC comprised of 0.03 ha of vegetation in Very Good and 2.29 ha of vegetation in Good condition.
			Quality	6	Scale 0-10	
			Total quantum of impact	1.39	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species</i>						
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																										
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source										
<i>Ecological Communities</i>																										
Area of community	Yes	1.39	Adjusted hectares	11.52 ha of land acquisition and maintenance	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	11.52	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%	Raw gain	1.15	Confidence in result (%)	90%	Adjusted gain	1.04	Net present value (adjusted hectares)	0.82	1.39	100.01%	Yes			
					Future area without offset (adjusted hectares)	9.8	Future area with offset (adjusted hectares)	10.9																		
					Time until ecological benefit	10	Start quality (scale of 0-10)	8	Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	8	Raw gain	1.00	Confidence in result (%)	85%	Adjusted gain	0.85	Net present value (adjusted hectares)	0.75						
<i>Threatened species habitat</i>																										
Area of habitat	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset		Raw gain		Confidence in result (%)		Adjusted gain		Net present value (adjusted hectares)							
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																		
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)		Raw gain		Confidence in result (%)		Adjusted gain		Net present value (adjusted hectares)							
<i>Threatened species</i>																										
Number of features e.g. Nest hollows, habitat trees	No																									
Condition of habitat Change in habitat condition, but no change in extent	No																									
Birth rate e.g. Change in nest success	No																									
Mortality rate e.g. Change in number of road kills per year	No																									
Number of individuals e.g. Individual plants/animals	No																									

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
					Birth rate	0	
Mortality rate	0			Yes	\$0.00		\$0.00
Number of individuals	0			Yes	\$0.00		\$0.00
Number of features	0			Yes	\$0.00		\$0.00
Condition of habitat	0			Yes	\$0.00		\$0.00
Area of habitat	0			Yes	\$0.00		\$0.00
Area of community	1.392	1.39	100.01%	Yes	\$0.00	N/A	\$0.00
					\$0.00	\$0.00	\$0.00

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Matter of National Environmental Significance	
Name	Banksia Woodlands TEC
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source	
<i>Ecological communities</i>						
Area of community	Yes	2.32 ha of impact to Banksia Woodlands of the Swan Coastal Plain TEC	Area	2.32	Hectares	2.32 ha of impact to Banksia Woodlands of the SCP TEC comprised of 0.03 ha of vegetation in Very Good and 2.29 ha of vegetation in Good condition.
			Quality	6	Scale 0-10	
			Total quantum of impact	1.39	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species</i>						
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																							
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source							
<i>Ecological Communities</i>																							
Area of community	Yes	1.39	Adjusted hectares	11.52 ha of land acquisition and maintenance	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	10.89	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%	Raw gain	1.09	Confidence in result (%)	90%	Adjusted gain	0.98	Net present value (adjusted hectares)	0.77			
					Future area without offset (adjusted hectares)	9.3	Future area with offset (adjusted hectares)	10.3															
					Time until ecological benefit	10	Start quality (scale of 0-10)	9	Future quality without offset (scale of 0-10)	8	Future quality with offset (scale of 0-10)	9	Raw gain	1.00	Confidence in result (%)	85%	Adjusted gain	0.85	Net present value (adjusted hectares)	0.75			
<i>Threatened species habitat</i>																							
Area of habitat	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset		Raw gain		Confidence in result (%)		Adjusted gain		Net present value (adjusted hectares)				
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0															
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)												
<i>Threatened species</i>																							
Number of features e.g. Nest hollows, habitat trees	No																						
Condition of habitat Change in habitat condition, but no change in extent	No																						
Birth rate e.g. Change in nest success	No																						
Mortality rate e.g. Change in number of road kills per year	No																						
Number of individuals e.g. Individual plants/animals	No																						

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	0				\$0.00		\$0.00
Area of community	1.392	1.39	100.09%	Yes	\$0.00	N/A	\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
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Matter of National Environmental Significance	
Name	Carnaby's Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
<i>Ecological communities</i>					
Area of community	No		Area		
			Quality		
			Total quantum of impact	0.00	
<i>Threatened species habitat</i>					
Area of habitat	Yes	24.59 ha of Carnaby's Black Cockatoo foraging habitat	Area	24.59	Hectares
			Quality	8	Scale 0-10
			Total quantum of impact	19.67	Adjusted hectares
24.59 ha of Carnaby's Black Cockatoo foraging habitat consisting of 21.61 ha of High quality habitat and 2.98 ha of Medium High quality habitat					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
Number of features e.g. Nest hollows, habitat trees	Yes	48 potential breeding trees	48	Count	
Condition of habitat Change in habitat condition, but no change in extent	No				
<i>Threatened species</i>					
Birth rate e.g. Change in nest success	No				
Mortality rate e.g. Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator																										
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source										
<i>Ecological Communities</i>																										
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																		
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																		
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																		
<i>Threatened species habitat</i>																										
Area of habitat	Yes	19.67	Adjusted hectares	Acquisition and maintenance of 138.5 ha of Carnaby's Black Cockatoo Habitat (90% of impact offset, 10% balance research)	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	138.5	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%	Raw gain	13.85	Confidence in result (%)	90%	Adjusted gain	12.47	Net present value	9.82	% of impact offset	17.72	90.07%	Yes		
					Future area without offset (adjusted hectares)	117.7	Future area with offset (adjusted hectares)	131.6																		
					Time until ecological benefit	10	Start quality (scale of 0-10)	9	Future quality without offset (scale of 0-10)	8	Future quality with offset (scale of 0-10)	9	Raw gain	1.00	Confidence in result (%)	85%	Adjusted gain	0.85	Net present value	0.75						
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source										
Number of features e.g. Nest hollows, habitat trees	Yes	48	Count	144 trees (3:1 ratio)	5	0	0	144	144	90%	129.60	122.10	254.37%	Yes												
Condition of habitat Change in habitat condition, but no change in extent	No																									
<i>Threatened species</i>																										
Birth rate e.g. Change in nest success	No																									
Mortality rate e.g. Change in number of road kills per year	No																									
Number of individuals e.g. Individual plants/animals	No																									

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	48	122.10	254.37%	Yes	\$0.00	N/A	\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	19.672	17.72	90.07%	Yes	\$0.00	#DIV/0!	#DIV/0!
Area of community	0				\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!

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Matter of National Environmental Significance	
Name	Carnaby's Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	24.59 ha of Carnaby's Black Cockatoo foraging habitat	Area	24.59	Hectares	24.59 ha of Carnaby's Black Cockatoo foraging habitat consisting of 21.61 ha of High quality habitat and 2.98 ha of Medium High quality habitat.
			Quality	8	Scale 0-10	
			Total quantum of impact	19.67	Adjusted hectares	
<i>Threatened species</i>						
Number of features e.g. Nest hollows, habitat trees	Yes	48 potential breeding trees	48		Count	
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																												
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source												
<i>Ecological Communities</i>																												
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																				
					Time until ecological benefit	Start quality (scale of 0-10)	Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																		
							Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)																			
<i>Threatened species habitat</i>																												
Area of habitat	Yes	19.67	Adjusted hectares	Acquisition and maintenance of 146.8 ha of Carnaby's Black Cockatoo Habitat (90% of impact offset, 10% balance research)	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	146.8	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%	Raw gain	14.68	Confidence in result (%)	90%	Adjusted gain	13.21	Net present value	10.41	% of impact offset	17.74	90.18%	Yes				
					Time until ecological benefit	10	Start quality (scale of 0-10)	8	Future area without offset (adjusted hectares)	124.8	Future area with offset (adjusted hectares)	139.5	Raw gain	1.00	Confidence in result (%)	85%	Adjusted gain	0.85	Net present value	0.75								
									Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	8																
<i>Threatened species</i>																												
Number of features e.g. Nest hollows, habitat trees	Yes	48	Count	144 trees (3:1 ratio)	5	0	0	144	144	90%	129.60	122.10	254.37%	Yes														
Condition of habitat Change in habitat condition, but no change in extent	No																											
Birth rate e.g. Change in nest success	No																											
Mortality rate e.g. Change in number of road kills per year	No																											
Number of individuals e.g. Individual plants/animals	No																											

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
					Birth rate	0	
Mortality rate	0			Yes	\$0.00		\$0.00
Number of individuals	0			Yes	\$0.00		\$0.00
Number of features	48	122.10	254.37%	Yes	\$0.00	N/A	\$0.00
Condition of habitat	0			Yes	\$0.00		\$0.00
Area of habitat	19.672	17.74	90.18%	Yes	\$0.00	#DIV/0!	#DIV/0!
Area of community	0			Yes	\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!

Offsets Assessment Guide

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2 October 2012

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Matter of National Environmental Significance	
Name	Forest Red-Tail Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	17.24 ha of Black Cockatoo foraging habitat	Area	17.24	Hectares	Subset of 24.59 ha of Carnaby's Black Cockatoo foraging habitat consisting of 21.61 ha of High quality habitat and 2.98 ha of Medium-High quality habitat
			Quality	8	Scale 0-10	
			Total quantum of impact	13.79	Adjusted hectares	
<i>Threatened species</i>						
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																					
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																					
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																					
<i>Threatened species habitat</i>																													
Area of habitat	Yes	13.79	Adjusted hectares	Acquisition and maintenance of 97.1 ha of Forest Red-Tail Black Cockatoo Habitat (90% of impact offset, 5% balance research)	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	97.1	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%	Raw gain	9.71	Confidence in result (%)	90%	Adjusted gain	8.74	Net present value	6.88	% of impact offset	12.42	90.07%	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source	
					Future area without offset (adjusted hectares)	82.5	Future area with offset (adjusted hectares)	92.2																					
					Time until ecological benefit	10	Start quality (scale of 0-10)	9	Future quality without offset (scale of 0-10)	8	Future quality with offset (scale of 0-10)	9	Raw gain	1.00	Confidence in result (%)	85%	Adjusted gain	0.85	Net present value	0.75									
<i>Threatened species</i>																													
Number of features e.g. Nest hollows, habitat trees	No																												
Condition of habitat Change in habitat condition, but no change in extent	No																												
Birth rate e.g. Change in nest success	No																												
Mortality rate e.g. Change in number of road kills per year	No																												
Number of individuals e.g. Individual plants/animals	No																												

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	13.792	12.42	90.07%	Yes	\$0.00	#DIV/0!	#DIV/0!
Area of community	0				\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!

Offsets Assessment Guide

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Matter of National Environmental Significance	
Name	Forest Red-Tail Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	17.24 ha of Black Cockatoo foraging habitat	Area	17.24	Hectares	Subset of 24.59 ha of Carnaby's Black Cockatoo foraging habitat consisting of 21.61 ha of High quality habitat and 2.98 ha of Medium-High quality habitat
			Quality	8	Scale 0-10	
			Total quantum of impact	13.79	Adjusted hectares	
<i>Threatened species</i>						
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																					
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																					
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																					
<i>Threatened species habitat</i>																													
Area of habitat	Yes	13.79	Adjusted hectares	Acquisition and maintenance of 102.8 ha of Forest Red-Tail Black Cockatoo Habitat (90% of impact offset, 5% balance research)	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	102.8	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%	Raw gain	10.28	Confidence in result (%)	90%	Adjusted gain	9.25	Net present value	7.29	% of impact offset	12.42	90.07%	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source	
					Future area without offset (adjusted hectares)	87.4	Future area with offset (adjusted hectares)	97.7																					
					Time until ecological benefit	10	Start quality (scale of 0-10)	8	Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	8	Raw gain	1.00	Confidence in result (%)	85%	Adjusted gain	0.85	Net present value	0.75									
<i>Threatened species</i>																													
Number of features e.g. Nest hollows, habitat trees	No																												
Condition of habitat Change in habitat condition, but no change in extent	No																												
Birth rate e.g. Change in nest success	No																												
Mortality rate e.g. Change in number of road kills per year	No																												
Number of individuals e.g. Individual plants/animals	No																												

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	13.792	12.42	90.07%	Yes	\$0.00	#DIV/0!	#DIV/0!
Area of community	0				\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Wetlands
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	Yes	4.2 3ha of wetland habitat	Area	4.5	Hectares	4.50 ha of CCW and REW wetlands which includes Cleared vegetation or better located at the Ranford Road Station site in Bush Forever Site 388. These wetlands are a CCW and REW.
			Quality	7	Scale 0-10	
			Total quantum of impact	3.15	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																			
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
<i>Ecological Communities</i>																			
Area of community	Yes	3.15	Adjusted hectares	4.23 ha of wetland habitat	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	26.07	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%	2.61	90%	2.35	1.85	3.15	100.01%	Yes
					Future area without offset (adjusted hectares)	22.2	Future area with offset (adjusted hectares)	24.8											
					Time until ecological benefit	10	Start quality (scale of 0-10)	8	Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	8	1.00	85%	0.85	0.75			
<i>Threatened species habitat</i>																			
Area of habitat	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset								
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0											
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)								
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
Number of features e.g. Nest hollows, habitat trees	No																		
Condition of habitat Change in habitat condition, but no change in extent	No																		
<i>Threatened species</i>																			
Birth rate e.g. Change in nest success	No																		
Mortality rate e.g. Change in number of road kills per year	No																		
Number of individuals e.g. Individual plants/animals	No																		

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
					Birth rate	0	
Mortality rate	0				\$0.00	\$0.00	
Number of individuals	0				\$0.00	\$0.00	
Number of features	0				\$0.00	\$0.00	
Condition of habitat	0				\$0.00	\$0.00	
Area of habitat	0				\$0.00	\$0.00	
Area of community	3.15	3.15	100.01%	Yes	\$0.00	N/A	\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

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2 October 2012

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Matter of National Environmental Significance	
Name	Wetlands
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	Yes	4.50 ha of wetland habitat	Area	4.5	Hectares	4.50 ha of CCW and REW wetlands which includes Cleared vegetation or better located at the Ranford Road Station site in Bush Forever Site 388. These wetlands are a CCW and REW.
			Quality	7	Scale 0-10	
			Total quantum of impact	3.15	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																			
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
<i>Ecological Communities</i>																			
Area of community	Yes	3.15	Adjusted hectares	4.50 ha of wetland habitat	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	27.69	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%							
					Future area without offset (adjusted hectares)	23.5	Future area with offset (adjusted hectares)	26.3											
					Time until ecological benefit	10	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	7	1.00	85%	0.85	0.75	3.15	100.00%	Yes
<i>Threatened species habitat</i>																			
Area of habitat	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset								
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0											
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)								
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
Number of features e.g. Nest hollows, habitat trees	No																		
Condition of habitat Change in habitat condition, but no change in extent	No																		
<i>Threatened species</i>																			
Birth rate e.g. Change in nest success	No																		
Mortality rate e.g. Change in number of road kills per year	No																		
Number of individuals e.g. Individual plants/animals	No																		

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	0				\$0.00		\$0.00
Area of community	3.15	3.15	100.00%	Yes	\$0.00	#DIV/0!	#DIV/0!
					\$0.00	#DIV/0!	#DIV/0!

Vegetation condition	Extent in the development envelope within BF Site 245 Ken Hurst Park			Area subject to offset based on offset ratio (ha)
	Area (ha)	Conservation significance	Offset ratio	
Degraded to Completely Degraded	0.76	Low	-	-
Cleared	3.36	None	-	-
Total	4.12		-	-

Vegetation condition	Extent in the development envelope within Canning and Southern Rivers BF Site 246				Area subject to offset based on offset ratio (ha)	
	Area (ha)	Conservation significance	Portion outside rail reserve (ha)	Offset ratio		
Degraded	Regionally significant bushland	0.04	Medium	0.01	1:01	0.01
Degraded to Completely Degraded		11.47	Low		-	-
Cleared		2.02	None		-	-
Total		13.53	-	0.01		0.01

Vegetation condition	Extent in the development envelope within Jandakot Airport BF Site 388				Area subject to offset based on offset ratio (ha)	
	Area (ha)	Conservation significance	Portion outside rail reserve (ha)	Offset ratio		
Very Good	Regionally significant bushland	1.49	High	4	1.5:1	6.00
Good		3.07				
Good to Degraded		0.16	Medium	0.04	1:01	0.04
Degraded		0.67		0.67		0.67
TOTAL		5.39	-	4.71	-	6.71
Degraded to Completely Degraded		0.01	Low	-	-	-
Cleared		0.56	None	-	-	-
Total		5.96	-	4.71	-	13.42

Vegetation condition	Extent in the development envelope within Nicholson Rd Bushland BF Site 456				Area subject to offset based on offset ratio (ha)	
	Area (ha)	Conservation significance	Portion outside rail reserve (ha)	Offset ratio		
Good	Regionally significant bushland	0.01	High	0.01	1.5:1	0.02
Good to Degraded		0.06	Medium	0.06	1:01	0.31
Degraded		0.25		0.25		
TOTAL		0.32	-	0.32	-	0.33
Degraded to Completely Degraded		5.16	Low	-	-	-
Cleared		0.36	None	-	-	-
Total		5.84	-	0.32	-	0.33

TOTAL 13.76

