



Catherine McAuley Catholic College: Koala Management Plan

FINAL REPORT

Prepared for North Construction & Building Pty Ltd

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1 Introduction

Biosis Pty Ltd was commissioned by North Construction & Building Pty Ltd (NCB) to undertake a Koala Management sub-plan (KMSP) to mitigate impacts to Koala. The KMSP forms part of the Biodiversity Management Sub-plan (BMSP) to manage the potential impacts to biodiversity during the Medowie Catholic College construction works. The BMSP is part of the Construction Environment Management Plan (CEMP). This KMSP has been prepared to address the requirements of the Minister's Development Consent, Consent Conditions for SSD 8989 (DPIE 2019) and all applicable legislation relating to the project.

1.1 Project background

The proposed development of Catherine McAuley College has been assessed under Part 4 Division 4.1 Section 89C of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) as a State Significant Development (SSD). The College will provide a childcare centre, Chapel, primary and high school. The project was assessed in accordance with the Biodiversity Assessment Method (BAM)(OEI 2017) and Biodiversity Offset Scheme (BOS) in accordance with the *Biodiversity Conservation Act 2016* (BC Act). The Secretary's Environmental Assessment Requirements (SEARs) also included requirement of the project to be assessed in accordance with the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Biodiversity Assessment Development Report (BDAR) (Biosis 2018) outlined measures to avoid and minimise impacts during the construction phase, these recommendations have also been considered as part of this KMSP.

1.2 Study area

The proposed Catherine McAuley College is located at 2 Kingfisher Close, Medowie NSW. The study area is located in the Port Stephens Local Government Area, approximately 20 kilometres north-east of the Newcastle CBD and four kilometres south of the Medowie town centre.

1.3 Development footprint

The proposed construction works are limited to the approved development footprint. Remediation works will be conducted within the study area outside of, but not limited to the development footprint and include replanting and removal of exotic species as outlined in the Vegetation Management Plan (VMP). The study area and development footprint are provided in Figure 1.

1.4 Scope of works

Works involved in the construction phase of the project are all activities involved in the demolition, construction and operation of Catherine McAuley Catholic College, as specified in the Development Consent (DPIE 2019). This includes but is not limited to:

- Removal of buildings.
- Bulk earthworks.
- Erection of buildings and other infrastructure as per development consent.

The following are excluded from the approved works:

- Building and road dilapidation surveys.
- Establishing temporary site offices (in locations other than identified by the CC).
- Installation of environmental impact mitigation measures, fencing, enabling works and minor adjustments to services or utilities.

1.5 Environmental management document system

The KMSP provided in accordance with the Conditions of Consent (CC) of the Development Consent (SSD 8989).

Construction personnel will be required to undertake works in accordance with the mitigation measures identified by this KMSP. The combination of the CEMP, sub-plans strategies and procedures identify the required environmental management actions to be implemented by North Construction and Building personnel and contractors.

The review and document control procedures for this KMSP are described in Section 6 of the BMSP.

1.6 Purpose and objectives

The purpose of this KMSP is to describe how the construction and operation of the Catherine McAuley Catholic College may impact on the Koala and to provide a plan for impact minimisation and management.

To achieve this objective, North Construction and Building will undertake the following:

- Ensure controls and procedures are implemented during construction activities to avoid, minimise or manage potential adverse impacts to fauna within and adjacent to the works.
- Ensure appropriate measures are implemented to address the relevant CC outlined in Section 2.
- Ensure measures are implemented to comply with all relevant legislation and other requirements as described in Section 2 of this FMP.

All recommendations to mitigate impacts for works contained in the EIS, endorsed BDAR and Response to Submissions have been included.

2 Environmental requirements

2.1 Relevant legislation and guidelines

The following section outlines the environmental requirements of the relevant legislation and guidelines that have been used to assist in the formulation of this KMSP.

Legislation relevant to ecological values includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act).
- *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth).
- *Biodiversity Conservation Act 2016* (BC Act).

Guidelines relevant to the project include:

- Tree Technical Specification (Port Stephens Council 2014).
- Port Stephens Comprehensive Koala Plan of Management (Port Stephens Council 2002).

In accordance with the relevant legislation, Development Consent has been granted by the Minister and includes conditions of consent to be implemented prior to commencement of construction. The preparation of this KMSP as part of the CEMP satisfies relevant consent conditions, comments from the Response to Submissions, and recommendations outlined by the EIS and BDAR.

Conditions of Consent relevant to this plan are outlined in Table 1 below.

Table 1 Conditions of consent relating to the Koala Management Sub-plan

CC No.	Condition	Condition requirements	KMSP reference
Construction			
C10	Management plans required under this consent must be prepared in accordance with relevant guidelines and include	a) Detailed baseline data	1.1
		b) Details of: <ul style="list-style-type: none"> i. The relevant statutory requirements (including any relevant approval, licence or lease conditions) ii. Any relevant limits or performance measures and criteria; and iii. The specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; 	3 and 7.1 Section 7
		c) A description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria.	Section 5

CC No.	Condition	Condition requirements	KMSP reference
		d) A program to monitor and report on the <ul style="list-style-type: none"> i. Impacts and environmental performance of the development. ii. Effectiveness of the management measures set out pursuant to paragraph (c) above. 	Section 6
		e) A contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.	Section 7.2
		f) a program to investigate and implement ways to improve the environmental performance of the development over time.	See SIMP
		g) a protocol for managing and reporting any: <ul style="list-style-type: none"> i. incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); ii. compliant; iii. failure to comply with statutory requirements. 	See FMP and BSMP
		h) A protocol for periodic review/update of the plan and as updates in response to incidents or matters of non-compliance.	In accordance with SIMP and CEMP
C12	Prior to the commencement of construction, the Applicant must submit a Construction Environment Management Plan (CEMP) to the satisfaction of Planning Secretary. The CEMP must include, but not be limited to, the following:	g) Koala Management Sub Plan (see condition C19)	Provision of this sub-plan.
C20	The Koala Management Sub-plan must address, but not be limited to, the following:	a) The KMSP must be prepared by a suitably qualified person and submitted to the Planning Secretary for approval prior to the commencement of construction works on site;	
		b) Identify habitat corridors, of adequate dimensions to provide an adequate Koala habitat corridor supported by a Koala specialist;	Section 3.3
		c) Include details of structures to eliminate barriers to movement (presented by fenced, roads, drainage culverts or pits and the like) for koalas and other native fauna likely to use the site or habitat corridor;	Section 4.1

CC No.	Condition	Condition requirements	KMSP reference
		d) Include details of koala feed tree offsets in accordance with the Port Stephens Tree Technical Specification 2014.	Section 6
		e) include all recommendations to mitigate impacts for works contained in the EIS and the endorsed BDAR and the management and mitigation measures in EIS and Response to Submissions;	Section 5
		f) include details monitoring, management and maintenance procedures for Koala habitat corridors;	Section 7
		g) include measures to communicate to the construction workforce the presence of Koala habitat and that are to be retained and protected; and	Section 5
		h) Include other measures to minimise the risk of harm to koalas.	Section 5 Section 8
Occupation			
E31	Prior to the issue of an Occupation Certificate, Koala feed tree offsets must be provided in accordance with the Port Stephens Tree Technical Specifications 2014.	Prior to the issue of an Occupation Certificate Koala feed tree offsets must be implemented.	Section 6 for details on feed tree offsets.

3 Existing environment

3.1 Permits and licences

During tree clearing and construction works, fauna handling and any resultant relocation of fauna should be undertaken by an appropriately qualified and experienced ecologist and in accordance with a Scientific Licence issued by the Office of Environment and Heritage under the *National Parks and Wildlife Act 1974* and approval from the NSW Animal Care and Ethics Committee. .

3.2 Desktop review

The desktop review consisted of background research and review of available databases and key documents relevant to the works, including:

- Development Consent Application number SSD 8989, Minister for Planning 2019.
- Catherine McAuley Catholic College, Medowie BDAR. Report for Webber Architects (Biosis 2018).
- Catherine McAuley Catholic College, Medowie, VMP for Webber Architects (Biosis 2018).
- Tree Technical Specification (Port Stephens Council 2014).
- Port Stephens Comprehensive Koala Plan of Management (Port Stephens Council 2002).
- Medowie Planning Strategy (Port Stephens Council 2016).

3.3 Koala Habitat and Corridors

An existing movement corridor (Key Corridor 1) is identified in the Medowie Planning Strategy (Port Stephens Council 2016) to the west of the subject land in vegetation to be retained Figure 1. The corridor incorporates connective patches of preferred Koala habitat in the Medowie area and provides north-south movement for fauna, in particular Koala, within the locality.

The function of this corridor as connective habitat for Koala within the area is supported by habitat mapping within the Port Stephens Comprehensive Koala Plan of Management (CKPoM) which indicated vegetation to the west of the subject site contains primary Koala habitat. The result of the field investigation undertaken for the Biodiversity Development Assessment Report (BDAR, Biosis 2018) confirm the recent use of this habitat by Koala.

The Medowie Planning Strategy (Port Stephens Council 2016) outlines five key principals guiding land use planning and sustainable growth for the area over the next 20 years. The fifth key principal is *Key Koala habitat and corridors are improved or maintained*. Koala habitat corridors will not be directly impacted by the proposed works as the development is situated across land which has been previously cleared. Habitat to the west of the development includes Primary Koala habitat (Port Stephens Council 2002) forming part of Key Corridor 1 (Figure 2). Areas to the west of the subject site currently in low condition include the area mapped as PCT 1718 which do not meet the criteria for listing as the Swamp Sclerophyll EEC (see figure 2 of the VMSP). This area will be allowed to regenerate naturally, improving the connectivity and function of the north-south movement provided by Key Corridor 1.

4 Impacts

Koala habitat to be removed by the proposed development has been offset in accordance with the Biodiversity Offset Scheme (BOS), the retirement of all offset credits is required prior to commencement of the project.

Potential residual Impacts to Koala arising from the proposed development are outlined below, associated mitigation measures are provided in Table 2.

4.1 Barriers to movement

Fencing and large volumes of traffic can create a barrier to movement for fauna, in particular Koala. Fencing of the subject site will be of a design to prevent Koala from entering the construction area and reduce the potential for injury and mortality of individuals to occur. Fencing specifications are provided in Table 2. Fencing the perimeter of the subject site will not prevent the Koala from accessing the movement corridor to the west. Similarly fencing of the school during operation will not create a barrier to movement for the Koala as the movement corridor to the west will not be affected. Mitigation measures outlined in Table 2 reduce the potential for this impact.

4.2 Construction movement and traffic

Construction movement and traffic may impact Koala through collisions causing injury or mortality. Construction movement and traffic will be limited to existing roads, and excluded from vegetation to be retained in no-go areas. Koala are capable of moving large distances over open ground, however, the risk of vehicle strike will increase with increased traffic. Appropriate traffic controls outlined within the SIMP will reduce this risk. Appropriate fencing will exclude the Koala from the construction area. Mitigation measures to prevent this impact are outlined in Table 2.

4.3 Habitat loss

Removal of Koala habitat has been assessed against relevant legislation through the production of a Biodiversity Development Assessment Report (BDAR). Koala habitat to be removed is required to be offset. In addition, habitat loss will also be offset in accordance with the Port Stephens Tree Technical Specification, and involves the planting of Koala feed trees at a specified ratio. Given the small area of habitat to be removed, and the nature of the operation phase a significant effect was considered unlikely by the BDAR.

5 Mitigation measures

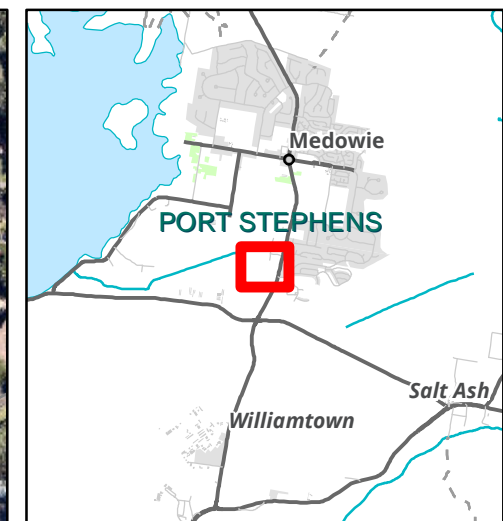
Mitigation measures and performance criteria for each identified impact are detailed in Table 2 below.

Table 2 Impacts, mitigation measures and performance criteria

Task	Impact	Action	Performance criteria
Site establishment			
Fencing of construction area	Prevent Koala gaining access to the construction site.	<p>Fencing of the impact footprint is required to exclude Koala movement in to the construction area. Fencing is to be erected following ecologist pre-clearance survey to determine the presence of Koala or threatened species inside the construction footprint.</p> <p>Ideal Koala exclusion fencing would include:</p> <ul style="list-style-type: none"> • A minimum height of 2 metres. • a 900 mm strip of hard plastic, colour bond sheeting or equivalent exclusion materials lining the upper outside of the perimeter fence, with the top edge of the sheeting at least 1.5 metres from the ground. • The gap between the bottom of the fence and the ground should be less than 200 mm to prevent Koala entering. • Fencing should be at least 3 m away from trees or sturdy shrubs from which a koala could jump to the top of the fence. If this is not feasible trees can be temporarily excluded from use by koala, using a smooth metal tree guard. • Fencing must not prevent any Koala from exiting the construction area. • Upon completion of construction and rehabilitation works, Koala exclusion fencing and any tree guards should be removed. 	<ul style="list-style-type: none"> • Fence installed as per specifications. • Compliance reported in pre-clearance survey report as per FMP.
Vegetation clearing	Clearing of habitat / damage to threatened fauna	<ul style="list-style-type: none"> • Pre-clearance survey will be conducted in accordance with the FMP to determine presence of threatened species and habitats. • Pre-clearance survey will include determining the exact number and species of Koala feed trees to be offset in accordance with <i>Port Stephens Tree Technical Specifications 2014</i>. 	<ul style="list-style-type: none"> • Compliance reported in pre-clearance survey report as per FMP.
Construction works			
Koala Habitat	Encroachment of habitat to be retained	<ul style="list-style-type: none"> • Inductions and toolbox talks are to include identification of no-go zones as containing important habitat for the Koala. 	<ul style="list-style-type: none"> • Included in inductions and toolbox talks.
Koala Management	Injury/mortality from vehicle and mechanical	<ul style="list-style-type: none"> • Contractors to be inducted in sensitive environment matters including the appropriate action in the event a Koala is found within the construction site. 	<ul style="list-style-type: none"> • Included in contractor inductions.

Task	Impact	Action	Performance criteria
	movement	<ul style="list-style-type: none"> In the unlikely event a Koala gains access to the construction area, work should stop immediately, and action taken in accordance with the Threatened species procedure outlined in the FMP. If a Koala is found and is suspected to be injured, the nearest wildlife carer and/or veterinarian should be contacted immediately. <p>Road and construction site speed limits should be adhered to in order to prevent potential collision with Koala.</p>	<ul style="list-style-type: none"> Koala encountered should be reported to the Environment Manager.
Construction activities	Noise and Light Dust and Vibration	<ul style="list-style-type: none"> Construction activity is limited to daylight hours, indicated in the SIMP, this will prevent excessive noise and light occurring during nocturnal hours. Any security lighting required should be pointed inward at the site to prevent light spill and be limited to the minimum required. Construction noise mitigation measures includes utilising machinery for the duration required only, not leaving machinery idling unnecessarily and using noise dampening methods where possible. Dust will be limited through use of suppressant methods outlined in the SIMP. Vibration impacts will be limited using best-practice methods and are outlined in the SIMP. 	<ul style="list-style-type: none"> Included in SIMP
Operation			
Fencing	Koala Movement corridors. Injury/mortality of fauna.	<ul style="list-style-type: none"> Fencing of the school should be of a nature that enables Koala to safely pass through the school grounds (Appendix 1). Fencing should be of a fauna-friendly design to prevent injury to fauna, including Grey-headed Flying-fox (Appendix 1). Movement corridors to the west of the subject site are unlikely to be impeded by the development as movement corridors will be maintained and improved by Koala feed tree offsets to the west of the Subject site. Monitoring and actions detailed in Section 7 detail actions to ensure the establishment of Koala feed tree offsets. 	<ul style="list-style-type: none"> Adaptive management as per Section 7.
Lighting	Edge effects to retained vegetation	<ul style="list-style-type: none"> Lighting should be pointed inward to the completed development to prevent light spill. Lighting should be limited to the minimum required for security lighting at night, or where required for special events. 	<ul style="list-style-type: none"> Lighting design incorporates environmental sensitivities.
Traffic	Injury/mortality of Koala	<p>Additional traffic is expected at peak school drop-off and pickup times as a result of operation.</p> <ul style="list-style-type: none"> School zone speed limits in-place to protect children will also help protect the Koala if individuals attempt to cross the road. Koala crossing signs may be erected outside the school to remind drivers to watch for fauna and to slow down. 	<ul style="list-style-type: none"> School zones in place during the operational phase.

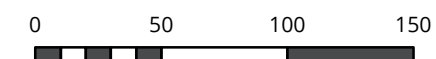
Task	Impact	Action	Performance criteria
		<ul style="list-style-type: none">Increased traffic will occur only during peak school times and is unlikely to significantly impact Koala crossing of Medowie Road.	



Legend

- Study area
- Subject site

Figure 1 Study area



Metres
Scale: 1:3,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56



Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30449
Date: 01 August 2019,
Checked by: SNA, Drawn by: AEDM, Last edited by: amurray
Location: P:\30400s\30449\Mapping\30449_FMP_F1_StudyArea



Legend

- Subject site
- HydroLine (Biosis 2018)
- Koala habitat to be removed
- Koala habitat retained
- Habitat connectivity

Figure 2 Koala habitat mapping

0 50 100 150

Metres

Scale: 1:3,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56



Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30449
Date: 06 August 2019,
Checked by: SNA, Drawn by: AEDM, Last edited by: amurray
Location: P:\30400s\30449\Mapping\30449_KMP_F2_KoalaManagement

6 Koala feed tree offsets

Koala Feed trees removed by the proposed works are required to be offset in accordance with Port Stephens Tree Technical Specification. Trees removed within the subject site are to be offset in accordance with the ratio provided in Table 3 below.

Table 3 Koala feed tree offset ratio

Diameter at Breast Height (DBH) of tree removed	Replacement ratio (loss: gain)
<100 mm	1:6
100-300	1:8
>300 mm	1:10

Replacement Koala Feed trees are to be:

- Of the same species as feed trees removed.
- Sourced from local provenance seed stock.
- Planted in a cluster and, where possible, in the vicinity of retained feed trees.
- Protected, nurtured and maintained until the trees have reached a mature size of 5 metres – at the cost of the applicant.
- Any replacement trees that die before maturity must be replaced by the applicant at their cost.

A total of 483 trees are to be planted in accordance with the Landscape Management Plan (LMP), these will include the Koala feed tree offset plantings. Suitable locations for re-plantings are indicated in the LMSP, trees will be incorporated into the landscape design within the development area.

7 Monitoring and reporting

7.1 Baseline data

Data collected as part of the Biodiversity Development Assessment Report (BDAR) indicates Koala activity within the subject land as low, with activity levels assessed through application of a modified Spot Assessment Technique (SAT) as less than 30%. Koala activity within the surrounding study area was considered to be high given the sighting of a Koala during survey, indirect evidence such as scratch marks on trees and activity level >30% indicated by SAT results in this area.

All Koala sightings within the construction area will be reported to the environment manager, If a Koala is sighted within the construction area, works should ceased in accordance with mitigation measures outlined in Table 2. Fencing will exclude Koala from the construction footprint and further monitoring of activity is therefore not necessary.

The Landscape management Plan will provide details for monitoring and maintenance measures to manage revegetation, this will include monitoring of Koala feed tree offsets until offset plantings reach a height of 5 metres.

7.2 Unexpected impacts

Unexpected impacts should be evaluated on a case by case basis should they be identified. This may include increased Koala mortality from traffic on Medowie Road, should this occur consultation with the project ecologist should be undertake to develop additional strategies or measures. All koala sightings are to be reported to the site environment officer.

Unexpected impacts may require assessment by an ecologist in accordance with the BC Act and EPBC Act. Appendix 1 of the FMP outlines steps to be undertaken in the event of unexpected threatened species occurrence.

8 Adaptive management

Although mitigation measures provided by the Biodiversity Management Sub-plan, Fauna Management Plan and herein aim to mitigate and manage impacts to Biodiversity, an adaptive management approach should be undertaken.

The cycle of 'do, monitor, evaluate and respond' is the foundation of adaptive management and is widely applied to terrestrial and aquatic ecosystem management (Kingsford et al. 2011). Monitoring results will be reviewed and actions revised from time to time where documented improved knowledge of ecosystem management becomes available or where on-ground evidence supports a change in management trajectory.

Adaptive management for this site primarily relates to maintenance and improvement of vegetation extent and health to achieve a net gain in condition and exclusion of Koala during the construction phase based on the following activities and related monitoring results:

- Management of vegetation retained including active rehabilitation of riparian corridors and passive improvement of areas to the west of the subject site.
- Fire management protocols adapted to planned and unplanned fire.
- Regular inspections of exclusion fencing during construction to identify any breach.

Adaptive management requires an agreed monitoring, evaluation, reporting and improvement cycle (MERI). As the various management plans and strategies for the site contain a range of objectives, activities and monitoring programs, a framework for MERI is provided below and will be further developed with the site manager:

- Monitoring – activities and programs outlined in this plan and others to measure biodiversity condition and achievement of objectives.
- Evaluation – collation of results by the site manager (or their agents) and assessment of trajectory towards desired objectives.
- Reporting – internal and external reporting cycles that document results, general observations and suggest changes or maintenance of the status quo.
- Improvement – the actual changes to management, and attendant monitoring programs, to ensure they remain relevant as conditions change or management challenges arise.

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Appendices

Appendix 1 Fencing design

8.1 Fauna exclusion fencing

Exclusion fencing specifications are provided in Table 2 and can contain any materials so long as Koala will be safely excluded from the construction area.

WIRES have information on fauna friendly fence designs on their website and in the brochure provided below. These materials are intended as a guide, materials may be substituted where appropriate to incorporate the fauna friendly design.

An example of fencing designed to exclude Koala are provided below.

Koala exclusion fencing



Image sourced online from Fencescape at: <https://fencescape.com.au/wp-content/uploads/2012/04/Koala-Security-Fence1.jpg> 6 August 2019



Imaged sourced online from Sunset fencing at: <https://sunsetfencing.com.au/wp-content/uploads/2018/10/bZVSAhpw.jpeg> 6 August 2019.

8.2 Fauna friendly fencing

Fauna friendly fencing allows for a variety of fauna to safely move through or over the fence. Providing a minimum of at least 200 millimetres between the ground and the bottom of the fence allows the Koala to move underneath the fence.

Fences may also facilitate easy climbing by Koalas, these may include sturdy chain mesh fencing, solid style timber fencing with timber posts on both sides or open post and rail or post and wire fencing (Port Stephens Council 2002). Koala movement over fences can also be facilitated by providing shrubs or overlapping trees on either side of the fence to form a bridge (Port Stephens Council 2019). The use of barbed wire should be avoided as this may cause injury to Koala and other fauna, including Grey-headed Flying-fox which occurs in the area.

Examples of fauna-friendly fencing are provided below.

Fauna friendly fencing



Image sourced online from Fencescape at: <https://fencescape.com.au/wp-content/uploads/2013/12/Chainwire-Fencing-mowing-strip.jpg> 6 August 2019



Image sourced online from Redland City Council *Wildlife-friendly fencing* accessed online at: https://www.redland.qld.gov.au/info/20287/wildlife-friendly_backyard/643/wildlife-friendly_fencing 6 August 2019