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# VEGETATION MANAGEMENT PLAN

## 307-321 CRANEBROOK ROAD

## CRANEBROOK

Prepared For: Maryann Bastac

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# 1. Introduction

Envirotech has been engaged by Maryann Bastac to provide a Vegetation Management Plan for the development of a residential dwelling located at 307-321 Cranebrook Rd, Cranebrook NSW (hereafter referred to as the site). The site is approximately 2.1 hectares and contains a waterway situated along the eastern boundary of the site. There is connectivity across the site through the canopy cover whilst the mid-storey is lacking throughout a large central area of the site.

A flora and fauna report prepared by Envirotech (refer to report 164614A) identified the endangered ecological community Shale Plains Woodland on site which was noted to be somewhat degraded. A population of the vulnerable species *Grevillea juniperina* subsp. *juniperina* was also found offsite (adjacent to the west boundary) during vegetation surveys. A recommendation in the flora and fauna report was that a Vegetation Management Plan (VMP) be prepared in order to advise on management of environmentally sensitive areas of the site while achieving the required Asset Protection Zones around the construction area.


Figure 1: Site Area Map (Six Maps, 2015)

### 1.1 Objectives

The objective of this report is to assess the condition of the site and to provide recommendations in order to manage the ecosystem during and after the development.

### 1.2 Scope of Work

- Site visit
    - To determine the condition and nature of site and surrounding areas.
    - Identify and name different management zones on site.
- Provide advice on limiting the negative impacts on threatened flora, fauna, and ecological communities.
- Advise on the restoration of the ecology of the site post development in a way which is suitable to the new site usage.
- Provide advice on weed management.
- Define performance criteria for current and future management of the site (including vegetation retention, replanting, and weed management).
- Describe detail of each task to be completed.

### 1.3 Legislative requirements

The report shall be prepared in accordance with:

- Environment Protection and Biodiversity Conservation Act (EPBC Act, 1999)
- Threatened Species Conservation Act (TSC Act, 1995)
- Environmental Planning & Assessment Act (1979)
    - Council Development Control Plans
- Noxious Weeds Act (1993)

# 2. Site Information

## 2.1 Zoning

The Penrith City Council has zoned the study site and immediate surrounds as RU1 – Primary Production. The objectives of RU1 zoning are:

- To encourage sustainable primary industry by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within adjoining zones.
- To protect and enhance the existing agricultural landscape character of the land.
- To ensure development is compatible with the environmental capabilities of the land and does not unreasonably increase the demand for public services or public facilities.
- To preserve and improve natural resources through appropriate land management practices.

## 2.2 Location and Extent of the Site

The site is located at 307-321 Cranebrook Road, Cranebrook and consists of 2.11 hectares of land. It is situated in the Penrith Council Area. Cranebrook Road lies to the east of the site and there is a weed infested waterway on this edge of the site parallel with the road. The property that borders the north of the site has been cleared and developed on. There is a healthy population of the threatened species *Grevillea juniperina* subsp. *juniperina* west of the site.

## 2.3 Condition of Vegetation Onsite

The condition of the vegetation varies throughout the site. A large portion of the site in the middle is lacking a mid-storey. Dense vegetation occurs around the borders of the property. According to the Cumberland_V2_2008_VISmap_3785 the ecological community onsite consists of Shale Plains Woodland (extant in 2007). A vegetation survey was conducted on 3rd December 2014 and the vegetation that was recorded during these surveys indicated that the area contained degraded Shale Plains Woodland. The flora and fauna report conducted by Envirotech stated that it is unlikely that the Endangered Ecological Community (EEC) would be detrimentally affected by the proposed development. The north edge of site itself is dense with *Backhousia myrtifolia* but also with weed species such as *Ochna serrulata* and *Cestrum parqui*.

## 2.4 Management Zones

The impacts to the EEC within the site will be moderate and it is recommended that four management zones are put in place in order to protect the vegetation that will remain on site as well as the threatened species *Grevillea juniperina* subsp. *juniperina* that exists off-site and has a high probability of existing onsite in the soil seed bank. This section will provide a description and the objectives of each of the proposed management zones. Section 4 will provide the necessary steps to be taken in order to achieve these objectives.

Proposed management zones are as follows:

### 2.4.1 Zone A: Construction Zone

The construction zone consists of an area of 57 m x 29 m in which a house, garage, and shed are to be built. This area consists of a moderate amount of native vegetation and some weed species. All trees within this area will need to be cleared for the purpose of construction (see figure 4).

### 2.4.2 Zone B: Asset Protection Zone

An area between the construction zone and the proposed bushland zone that is to remain needs to be established in order to protect property and inhabitants from bushfire. The threat of bushfire can be dependent on the type of vegetation, and the direction and extent of the slope.

Vegetation is to be cleared within the asset protection zone to achieve adequate fuel reduction. The midstorey vegetation is to be removed and selective removal of canopy trees is to be undertaken to achieve a permissible canopy cover densities. The inner protection area should consist of canopy cover of no more than 15% and the outer protection area should have a canopy cover of more than 30%.
The removal of weeds within the APZ is the first step to reduce fuel and ensure the safety of property and its inhabitants. It is important that low hanging branches are removed from trees near the building envelope. No branches or trees are to overhang or be within 2 m of the building. Species with ribbon bark are not recommended to be planted or retained in close proximity to the house as these pose a fire risk. Generally eucalypts, melaleucas and leptospermums (the tea trees) should be avoided when replanting as they contain a high content of flammable oils. Using granite or gravel as mulch on plants that are in close proximity to the house can also reduce fire risk.

Species that should be selectively retained if possible are *Eucalyptus crebra, E. eugenioides,* and *E. fibrosa*. This will assist in maintaining the integrity of the Shale Plains Woodland onsite. The Asset Protection Zone is to be prepared in accordance with both Appendix 5 of *Planning for Bushfire Protection 2006* and the *RFS Document Standards for Asset Protection Zones*.

The establishment and ongoing maintenance in perpetuity is the sole responsibility of the property owner. Maintenance of the APZ is to be undertaken annually (minimum requirement) preferably prior to the commencement of the fire season (September).

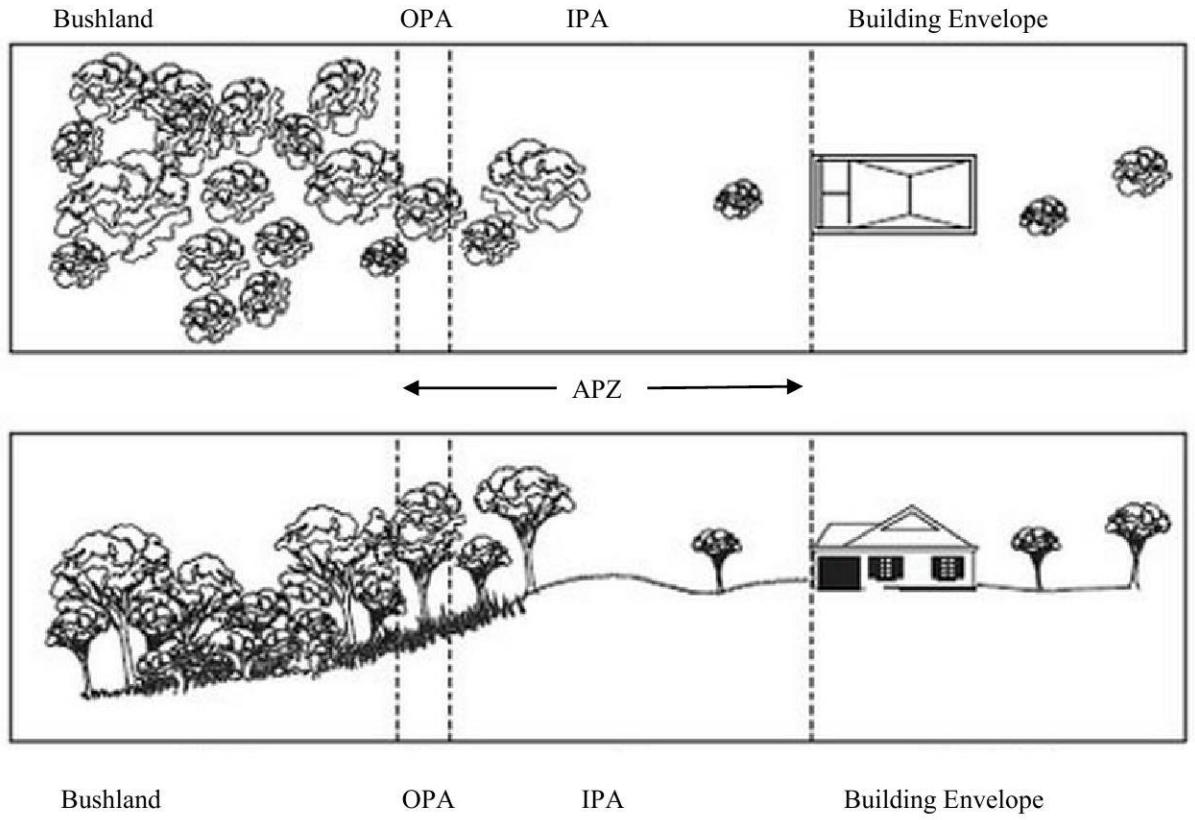


Figure 2 : Example of an Inner Protection Zone and an Outer Protection Zone (RFS).

### 2.4.3 Zone C: Bushland Zone

The areas of bushland from the centre of the site to the southernmost area of the site should be retained (see figure 4) in its current form. The centre of the site is currently quite sparse in vegetation and gradually increases in density towards the south. Weed species should be removed from this area ensuring best practice bush-regeneration is implemented. The native species should be left to recover and regenerate. It is probable that some threatened species occur in the soil seed bank (particularly *Grevillea juniperina* subsp. *juniperina*) and this will give these species the opportunity to germinate and flourish. The protection of this area will also encourage regeneration of the threatened ecological community on site. Many individuals of the vulnerable species *Grevillea juniperina* subsp. *juniperina* were discovered on the neighbouring property to the west of the study site.

All native flora species outside of the building envelope and APZ are to be retained and protected.

### 2.4.4 Zone D: Threatened Species Buffer

*Grevillea juniperina* subsp. *juniperina* is a shrub in the Proteaceae family. It only occurs in Western Sydney and is listed as Vulnerable by the NSW Government under the TSC Act (1995). Threats to its survival include clearing for urban and industrial development, weed invasion, trampling, and damage caused by vehicles.

Figure 3: *Grevillea juniperina* subsp. *juniperina*

As can be seen in the map below (figure 4) ten individuals of *Grevillea juniperina* subsp. *juniperina* were discovered on the neighbouring property, two of which are very close to the property boundary. It is more than likely that this species exists in the soil seed bank on site and under appropriate environmental conditions they will germinate. Therefore it is important that the area on site closest to these plants is protected from processes which may threaten the germination and survival of individual plants.

Envirotech advises that approximately 20 m from the western boundary along the whole length of the property (3000 $m^2$) should be classed as a threatened species buffer. This area should be protected and all weed species should be removed in accordance with best practice bush-regeneration. Under no circumstances should vehicles be allowed into this area. No native species should be removed from this area.


Figure 4: The green hatched area represents the threatened species buffer. Green stars are individuals of *Grevillea juniperina* subsp. *juniperina* that were recorded during a vegetation survey.

### 2.4.5 Zone E: Riparian Zone

The riparian zone stretches across the eastern boundary of the site parallel to Cranebrook Road. It has several weed species growing along its banks including *Ochna serrulata* (Micky Mouse Bush) and *Prunus laurocerasus* (Cherry Laurel). These should be removed in accordance with best practice bush-regeneration techniques to ensure bank stability and prevent erosion and sedimentation of the river banks. Some native water plants such as *Typha domingensis* (Bull Rush or Narrow-leaved Cumbungi) are present within the waterway. These should be retained as they may provide habitat for frogs as well as stabilising the banks of the waterway. All involved parties should ensure that the waterway is protected from run-off related to construction.

# 3. Aims of the Vegetation Management Plan

The overall aim of this Vegetation Management Plan is to mitigate the impact of development on native vegetation, including rare and endangered species and communities.

This will be achieved by:

- Undertaking the establishment of the Asset Protection Zone with due regard to the sensitivity of the site while complying with the requirements detailed within *Planning for Bushfire Protection 2006* and *Standards for Asset Protection Zones*.
- Conservation or selection of appropriate landscape species and on site tree management;
- Limiting impacts on threatened, endangered, vulnerable or a locally significant flora and fauna species or ecological communities by their conservation, provision of adequate native vegetation buffers and ameliorative measures;
- Ensuring erosion and sedimentation are controlled before, during, and after construction;
- Retaining and restoring vegetation and trees within mapped or otherwise identified protected areas;
- Removal of noxious and environmental weeds in a manner that is environmentally sustainable.

### 3.1 Performance Criteria

The following table lists the aims of the Vegetation Management Plan and the performance criteria in which the task should be achieved.

Table 1: Tasks and performance criteria of the vegetation management plan

| Tasks | Performance Criteria | Reference Section |
|---|---|---|
| Selective retention of habitat trees | Written statement by a qualified ecologist, in accordance with the Guidelines of the RFS, to be submitted to Council | 4.1 |
| Staged removal of vegetation | In accordance with vegetation management plan and certified by botanist. | 4.2 |
| Maintenance of canopy vegetation cover to satisfy RFS requirements | Ongoing clearing and maintenance of cleared mid-storey vegetation and management of groundcovers for an asset protection zone. | 4.4 |
| Erosion and sediment controls to be put in place prior to vegetation removal | In line with blue book recommendations for sediment controls. | 4.5 |
| Establishing a threatened species protection zone | Fifty metre flagging zone, erected before construction begins and maintained during construction phase. | 4.3 |
| Choosing locally endemic flora species which have a low oil/high moisture content. | Follow guidelines within RFS documents | 4.6 |
| Encouraging the growth of native grass species such as *Microlaena*. | The percentage of native vs exotic species following the construction of the APZ and the dwelling. | 4.6 |
| Installation of artificial hollows | Inspection by ecologist pre and post clearance to state compliance. | 4.7 |
| All exotic flora species within the IPA must be removed | Removal of weed species, in line with the state of the vegetation community prior to clearing and construction. | 4.8 |
| Increasing resilience of surrounding vegetation communities following vegetation clearing | Minimise weed species and removal of all noxious weeds. | 4.8 |

# 4. Defining the Project Tasks

## 4.1 Selective retention of habitat trees

The first stage of this task will require an arborist/ ecologist to mark out habitat trees (trees with hollows), so that they can be preserved and protected as clearing is undertaken. In addition to habitat trees, there needs to be selective retention of a variety of tree species of various ages.

**Responsibility:** Arborist/ Ecologist

## 4.2 Staged removal of vegetation

Approximately 6200 $m^2$ is to be cleared of selected vegetation and maintained to the requirements of an asset protection zone. Vegetation is to be removed as a staged process, in consideration of fauna needing to emigrate from the site due to habitat loss. The steps involved to minimise displacement are as follows.

### 4.2.1 Survey and Development Layout

It is anticipated that the first stage of clearing will be for survey purposes and will commence immediately upon approval. It will require surveyors to 'peg out' the proposed development incorporating zone boundaries. It will also require an arborist/ licenced ecologist to mark out habitat trees so that they can be preserved and protected as clearing is undertaken.

### 4.2.2 Removal of vegetation

Recommendations for vegetation removal are as follows:

Habitat Tree Clearing Procedure

Any hollow bearing tree requiring removal is to be dismantled by arborists in the presence of a suitably qualified ecologist. Any fauna identified as utilising the felled hollows will be relocated to nearby adjacent habitat.

Any limbs containing hollows are to be relocated within adjacent habitat areas to partly offset impacts.

Equipment To Be Utilised

Large trees are to be cleared by an arborist using chainsaws and tree climbing equipment or cherry picker equipment (if deemed appropriate) so as to minimise the impact on surrounding vegetation to be retained.

Medium to small trees and shrubs will be cleared using a 20-25 tonne excavator (or similar equipment) to push trees over and to stockpile cleared vegetation. Branches and trunks shall be wood-chipped or mulched while the stumps will be disposed of or recycled at the local waste disposal area. Only native mulch material will be stock-piled and retained for use in landscaping, erosion and weed control.

Inspections

Inspections of the site by an ecologist/arborist will be undertaken prior to and during the clearing operations to ensure that trees and bushland identified for retention are adequately marked and that other appropriate clearing and protection procedures are being maintained.

### 4.3 Establishing a Threatened Species Protection Zone

Before construction begins, the area that is twenty metres from the western boundary along the length of site should be marked out by flagging tape or equivalent so that those involved in construction activities know not to encroach on the protected area. No native plants should be removed from this area and the soils should not be disturbed.

**Responsibility**: Owner/builder

### 4.4 Maintaining an Adequate Asset Protection Zone

To accommodate for the establishment of an appropriate IPA the site will require some clearing from the north side of the building to the edge of the property (the neighbouring property is already cleared). On the east and south sides of the building envelope the IPA is 22 m and the OPA is 10 m. To the west the IPA is 15 m and the OPA is 10 m.

The RFS suggests the following points are considered when deciding how to remove or control vegetation in and APZ.

Raking or manual removal of fine fuels

Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of a fire. Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

Mowing or grazing of grass

Grass needs to be kept short and, where possible, green.

Removal or pruning of trees, shrubs and understorey

The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation. Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.

**Responsibility**: Bush regenerator/Arborist

### 4.5 Erosion and Sediment Controls

Erosion and sediment control measures are to be implemented across the Development Area prior to clearing and until disturbed areas are rehabilitated. Of particular importance is the protection of the riparian zone as it is highly susceptible to the effects of erosion. The following recommendations are provided:

- Coordinated work practices aimed at minimising land disturbance;

- Wherever reasonably practical, vegetation should be mulched and used onsite to cover bare soils.
- Exposed soil surfaces should also be rapidly revegetated using soil stabilising vegetation.
- Ensure that earthworks are avoided during wet weather, or when the soil is saturated.
- Ensure that appropriate sediment control measures are put in place prior to construction. These need to be located downslope of any soil stockpiles, or earthworks and may include:
    - Filter fence or composite sediment fence for clayey soils
    - Woven sediment fence for washed sand
    - Sediment basin wherever possible.
- Regular monitoring of erosion and stormwater control devices and identification, rehabilitation and revegetation of eroded or potential erosion areas.
- It is recommended that an Erosion and Sediment Control Plan (ESCP) be prepared.

**Responsibility**: Earthworks contractor/bushland regenerator

### 4.6 Choosing Locally Native Flora Species

If the applicant desires a garden area on the site it is recommended that all species planted are native if not locally indigenous. It is important that no noxious or environmental weeds which could spread into the bushland are planted.

Avoid planting lawn species such as Buffalo Grass and Couch as these are invasive to bushland areas. Native ground cover and grass species such as *Microlaena stipoides* or other species that naturally occur in Shale Plains Woodland are highly recommended if a lawn is deemed necessary.

**Responsibility:** Landscaper, applicant, bush regenerator

### 4.7 Installation of artificial hollows

It is recommended that artificial nest boxes are installed in nearby adjacent habitat PRIOR to vegetation removal if hollow bearing trees are removed. These will need to amount to the number of hollows removed during clearing, and be of similar dimensions to those being removed (different fauna species require different hollows for breeding and roosting).

**Responsibility:** Ecologist

### 4.8 Weed Management

All noxious and environmental weeds are to be managed continuously across the entire site, in accordance with the Noxious Weeds Act 1993. If any weeds are to be removed during the course of building works they are to be moved offsite to an appropriate facility. Mitigation measures must be put in place to prevent the spread of weeds due to soil disturbance during excavation.

Management of weeds onsite are to be conducted at 2 month intervals for the first year after consent, and then at 6 month intervals for the second year. Follow up visits are recommended once during the year within the 3-5th year following development, to control weed outbreaks.

All maintenance visits are to be undertaken by the applicant at no cost to council or any other authorities.

**Responsibility**: Bushland regenerator/applicant

# 5. Monitoring and Reporting Methods

Monitoring and reporting the progress and success should be provided on a 6-12 monthly basis for a minimum 2 year period (or as otherwise specified). Council will monitor the satisfactory completion of specified targets in the VMP at mandatory critical stage inspections and/or at other nominated times, including prior to the issue of the Occupation Certificate.

Reports will address the progress, performance criteria and any problems encountered in the plans implementation AND/OR a series of photographs, taken from established reference points.

# 6. Links to other Documents

This vegetation management plan is not intended as a stand-alone document and should be read alongside the accompanying flora and fauna report and bushfire report. These are attempts to lessen the environmental impacts of the proposed development and to ensure that it complies with the Penrith Local Environment Plan 2010, the Threatened Species Conservation Act 1995, the Water Management Act 2000, and Planning for Bushfire Protection 2006.

Table 2: Gantt chart showing recommended management of the site before, during, and after construction.

| **Task** | **Time Frame** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Before Construction** | **During Construction** | **2 Months** | **4 Months** | **6 Months** | **1 Year** | **1.5 Years** | **2 Years** | **3 Years** | **4 Years** | **5 Years** |
| Mark out trees to be retained | | | | | | | | | | | |
| Construction of artificial hollows and nest boxes to replace removed trees | | | | | | | | | | | |
| Mark out barrier to protect threatened species 20 m from western boundary | | | | | | | | | | | |
| Prepare erosion and sediment control plan | | | | | | | | | | | |
| Insertion of sediment fences/basins | | | | | | | | | | | |
| Relocate any fauna species found in trees to be removed | | | | | | | | | | | |
| Removal of selected species in development area/IPA | | | | | | | | | | | |
| Monitor sediment control | | | | | | | | | | | |
| Weed Management | | | | | | | | | | | |

# 7. Site Maps

Figures 2 and 3 provide a spatial representation of the zones outlined in section 1.4, and the habitat features recorded onsite during the flora and fauna assessment.

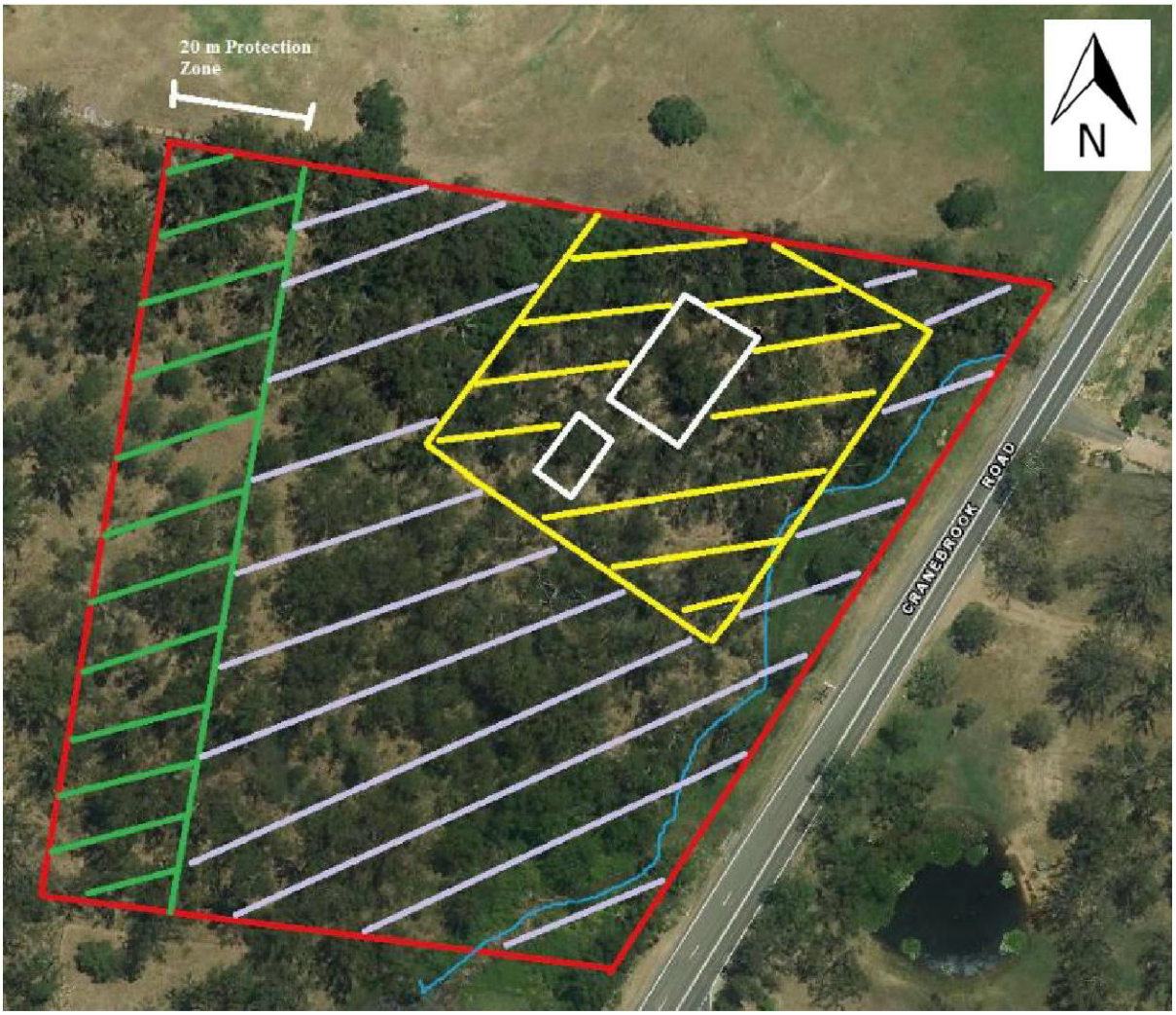


Figure 5: Aerial map showing proposed zoning of site (not to scale, refer to bushfire report for specific dimensions).

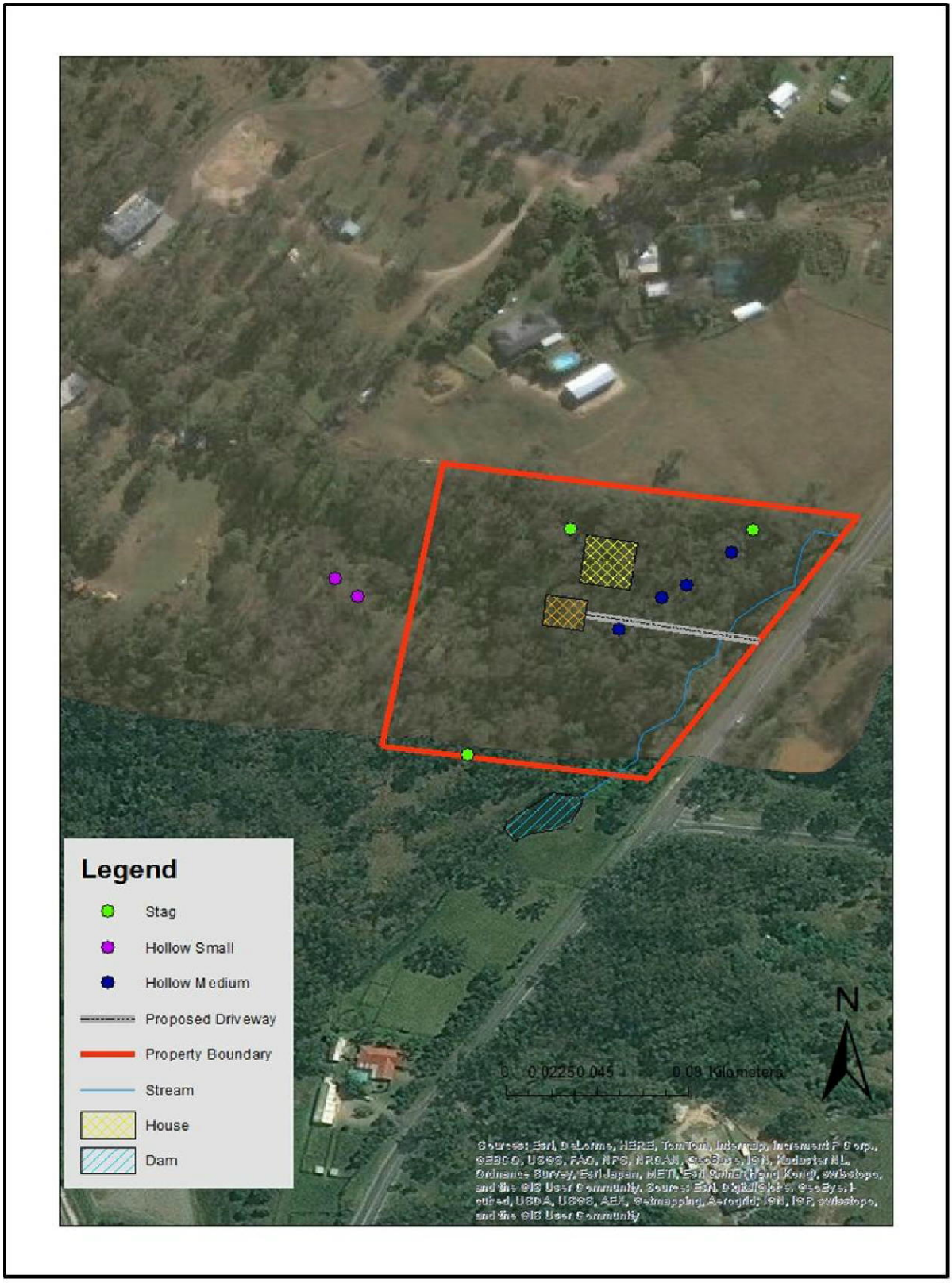


Figure 6: Aerial map showing faunal use of the site.

# 8. References

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