



Persoonia pauciflora Population Management Plan

Huntlee New Town Residential Development

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Approval for Issue

Name	Signature	Date
Matt Doherty		10-1-2014

ANDERSON
ENVIRONMENT & PLANNING

ENVIRONMENT | STRATEGY | SOLUTIONS | MANAGEMENT

Our Ref: 1315EPBC APPROVAL – EPBC 2011/5898
HUNTLEE NEW TOWN RESIDENTIAL DEVELOPMENT, HUNTER VALLEY, NSW

As per Clause 12 of EPBC 2011/5898, the *Persoonia pauciflora* Population Management Plan (PPMP) herewith dated 10 January 2014 has been reviewed and endorsed by the writer in the role of *independent scientific expert*.

Yours faithfully,
ANDERSON E&P**CRAIG ANDERSON**
DIRECTOR**DATE:** 10-1-2014

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1.0 Introduction

1.1 Purpose and Scope

Huntlee Pty Ltd is required to submit for the Minister's approval a *Persoonia pauciflora* Population Management Plan (PPPMP) to support the conservation agreement of all known *P. pauciflora* plants and seed banks within the Huntlee Conservation Areas. This PPPMP has been prepared in accordance with the EPBC Conditions of Approval (EPBC 2011/5898) dated 15 October 2013 and specifically addresses Condition 11 of the project approval.

The scope of the PPPMP is to maintain and improve the Huntlee *Persoonia pauciflora* population, seed bank and habitat within Conservation Areas 1, 2 and 3, Persoonia Park, 57 Washery Road and the 150m vegetated corridor containing the Northern Population of *Persoonia pauciflora*.

1.2 Project Description

The Huntlee development area is located within the Hunter Region of NSW, approximately 55 km north-west of Newcastle and immediately south of the township of Branxton within the Cessnock and Singleton Local Government Areas (LGAs) (refer to **Figure 1**).

On 15 October 2013, project approval was granted under the *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) for the Huntlee New Town project. The key parameters of the proposal include:

- up to 5,600 dwellings in residential zones of varying sizes covering up to 612 hectares;
- employment lands totalling up to 200 hectares including a mixed use town centre with up to 1,700 residential dwellings;
- rural residential development covering up to 93 hectares to achieve up to 200 lots;
- the provision of associated infrastructure including upgrades to road, sewerage and water infrastructure and the dedication of land for education and health services, community facilities and utilities;
- dedication of 780 hectares of conservation land within Huntlee;
- dedication of Persoonia Park (17 hectares); and
- dedication of 4988 hectares of conservation land elsewhere within the Lower Hunter Region.

1.3 Objectives

The objectives of this management plan are to detail actions for the conservation management of all known *Persoonia pauciflora* plants and seed banks within the Conservation Areas and will include measures to:

- Protect and conserve *Persoonia pauciflora* in situ (including living plants and seed bank) to ensure the ongoing survival and recovery of the species, through appropriate management;
- Discourage unauthorised human access to *Persoonia pauciflora* and its habitat while still allowing access by macropods; and
- Encourage the building of community awareness and stewardship of *Persoonia pauciflora*.

The measures must be clear, measurable, auditable and time bound and include:

- Clear objectives and performance indicators;
- Costing;

- Details of monitoring and reporting to be undertaken;
- Corrective action trigger levels;
- Corrective actions;
- Measures to report to the Department;
- Responsibilities; and
- A description of how the plan will apply if the conservation areas are transferred to a third party.

1.4 Definitions

Definitions for the PPPMP have been taken from the EPBC Conditions of Approval (EPBC 2011/5898).

Commencement of the action	Means any preparatory works required to be undertaken including clearing vegetation, the erection of any onsite temporary structures and the use of heavy duty equipment for the purpose of breaking the ground for fencing, buildings or infrastructure, but excluding any works for conservation purposes, native revegetation works or the creation of conservation buffers.
Conservation Area 1	An area of land (currently owned by the proponent) immediately north of the southern portion of Hanwood, bounded on the east side by Wine Country Drive which encompasses known <i>Persoonia pauciflora</i> in this area. This area is defined in Figure 2 .
Conservation Area 2	An area of land (currently owned by the proponent) immediately south of the southern portion of Hanwood, bounded on the east by Wine Country Drive which encompasses known <i>Persoonia pauciflora</i> in this area. This area is defined in Figure 2 .
Conservation Area 3	An area of land (currently owned by the proponent) of over 400 hectares extending to the west of the southern portion of Hanwood and straddling the local government area border between Singleton and Cessnock. This area is defined in Figure 2 .
Department	The Australian Government Department responsible for the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
Independent Scientific Expert	Means a scientist with relevant qualifications and expertise who is not affiliated with the proponent or with other parties affiliate with the project of which the action is involved or a part. The expert is approved by the Minister.
Minister	The Minister administering the <i>Environment Protection and Biodiversity Conservation Act 1999</i> and includes a delegate of the Minister.
Northern Population	Means the area defined in Conditions 1 and 2 of EPBC Approval 2011/5898 being all <i>Persoonia pauciflora</i> in the area of the proposed action that is west, north or east of North Rothbury. This area is defined in Figure 2 .

Persoonia pauciflora

Means *Persoonia pauciflora* (also referred to as North Rothbury Persoonia) and known, recognised hybrids of *Persoonia pauciflora*. Where applicable this definition extends to include both living plants and the residual soil stored seed bank.

Project Area

Means the area proposed for development and any adjacent or proximate open space, remnant bushland or conservation areas that form part of the proposed action.

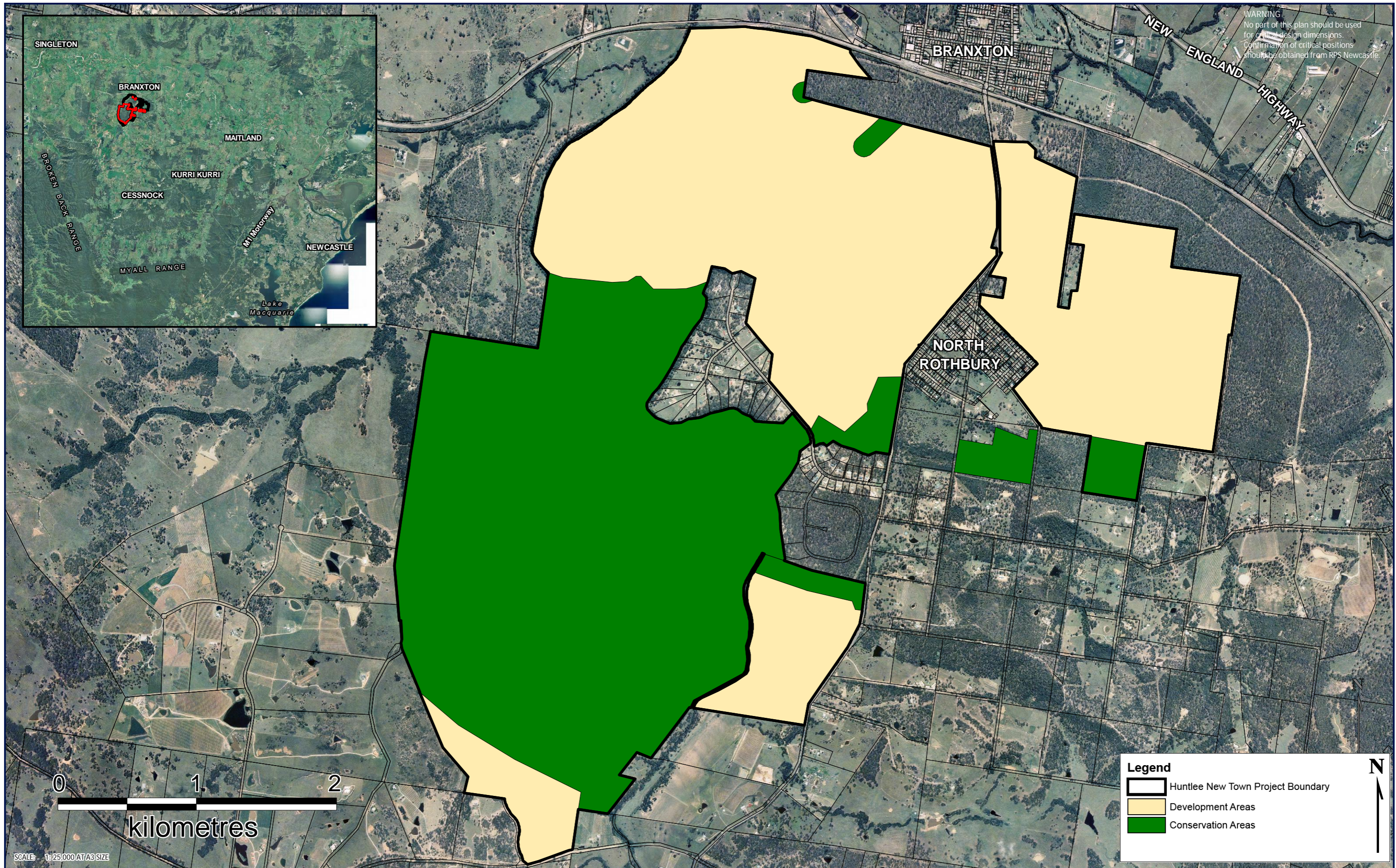


FIGURE 1 - SITE LOCALITY

LOCATION: NORTH ROTHBURY

DATUM: GDA 94
PROJECTION: MGA ZONE 56

DATE: 29/11/2013
PURPOSE: PERSOONIA PAUCIFLORA
POPULATION MANAGEMENT PLAN

LAYOUT REF: J:\JOBS\105K\105216 North Rothbury (Huntlee)
V10- Drafting\Management Plans
VERSION (PLAN BY): JS (A A3)

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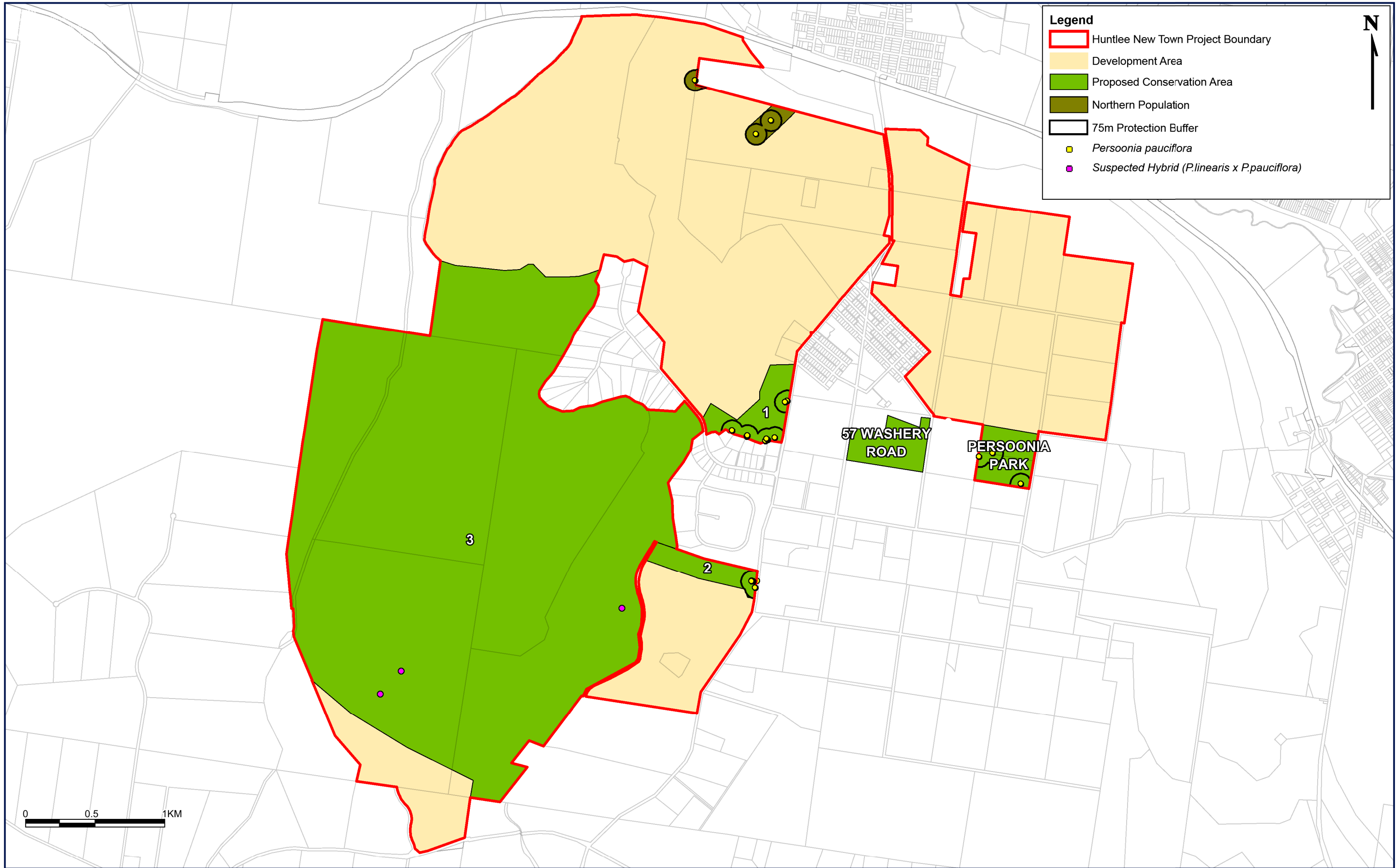


FIGURE 2 - HUNTLÉE CONSERVATION AREA DESIGN MAP

LOCATION: NORTH ROTHBURY

DATUM: DATUM
PROJECTION: MGA ZONE 56

DATE: 02/12/2013
PURPOSE: PERSOONIA PAUCIFLORA
POPULATION MANAGEMENT PLAN

LAYOUT REF: J:\085\105K\105216 North Rothbury(Huntlee)\10- Drafting\management plans
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2.0 Statutory Requirements

2.1 Relevant Legislation

Key environmental legislation generally relating to management on the Site includes:

- Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act)
- NSW Threatened Species Conservation Act 1995 (TSC Act)
- NSW Fisheries Management Act 1994 (FM Act)
- NSW Environmental Planning and Assessment Act 1979 (EP&A Act)
- NSW National Parks and Wildlife Act 1974 (NPW Act)
- NSW Noxious Weeds Act 1993 (NW Act)
- NSW Native Vegetation Act 2003 (NV Act)
- NSW Water Management Act 2000 (WM Act)

2.2 Consent Conditions

The Conditions of Approval that this management plan addresses, and what section of this document they are addressed in, are detailed below in **Table 1**. A full copy of EPBC Approval 2011/5898 is contained within **Appendix 1**.

Table 1 Conditions of Consent and Statement of Commitments

Condition	Description	Section
Condition 11		
The person taking the action must submit for the Minister's approval a <i>Persoonia pauciflora</i> Population Management Plan to support the conservation management of all known <i>Persoonia pauciflora</i> plants and seed banks within the northern population (and connecting habitat, Conservation Areas 1, 2 and 3 , Persoonia Park and the area at 57 Washery Road referred to in Condition 10. This plan must be approved by the Minister prior to commencement of the action . The plan must be implemented. The plan must include:		
a	Measures to protect and conserve <i>Persoonia pauciflora</i> in situ (including living plants and seed bank) to ensure the ongoing survival and recovery of the species, through appropriate management. These measures must be clear, measurable, auditable, and time bound.	Section 3.1
b	Measures to discourage unauthorised human access to <i>Persoonia pauciflora</i> and its habitat, while still allowing access by macropods.	Section 3.2
c	Measures to encourage the building of community awareness and stewardship of <i>Persoonia pauciflora</i> , including appropriate education programs to encourage care and protection of known plants and seed banks.	Section 3.3
d	Clear objectives and performance indicators for the measures referred to in Condition 11a, 11b and 11c.	Tables 3, 4 and 5
e	Costing of the management measures required and demonstration that these will be funded into perpetuity.	Section 2.5 and Appendix 2
f	Details of the monitoring and reporting to be undertaken to demonstrate the effectiveness of the measures referred to in Condition 11a, 11b, and 11c, including the parameters to be monitored, methods, timing, frequency and location of monitoring.	Section 4.0 (Monitoring) Section 5.0 (Reporting)
g	Specific and measurable trigger levels that will result in corrective actions being implemented to prevent the objectives referred to in Condition 11d being compromised.	Tables 3, 4 and 5

Condition	Description	Section
h	Corrective actions to be taken should the trigger levels referred to in Condition 15h be exceeded. These must be clear, measurable, auditable, and time bound.	Tables 3, 4 and 5
i	Measures to report to the Department on any exceedances of identified trigger thresholds, the implementation of corrective actions, and the outcome of these.	Section 5.0
j	The person responsible for the management actions.	Section 2.4
k	A description of how the plan will apply to any conservation areas that may subsequently be transferred to a third party for protection and management for conservation.	Section 2.5

2.3 Approvals, Licences and Permits

All works will need to be conducted in accordance with the EPBC Conditions of Approval (EPBC 2011/5898) dated 15 October 2013).

The Project Ecologist must conduct all works under the appropriate licence(s), which may include but not be limited to:

- NSW National Parks and Wildlife Service Scientific Investigation Licence.
- Animal Research Authority issued by NSW Agriculture.
- Certificate of Accreditation of a Corporation as an Animal Research Establishment issued by NSW Agriculture.
- Animal Care and Ethics Committee Certificate of Approval issued by NSW Agriculture.

Other licences, permits or approvals not identified in this PPPMP and deemed to be required through consultation or legislative changes will be obtained by Huntlee Pty Ltd or their nominated contractors during the course of the Project. The specific conditions of these licences, permits or approvals will be incorporated into the PPPMP as required.

Copies of all relevant licences, permits and approvals will be kept on-site by Huntlee Pty Ltd.

2.4 Responsibilities

Key personnel responsible for implementation of the measures set out in the PPPMP are included in **Table 2**.

Table 2 Responsibilities of Project Personnel

Title	Responsibilities	Reports to
Huntlee Pty Ltd	Ensure adequate resources are made available for the implementation of the PPPMP as well as ensuring that all staff and contractors comply with the Management Plan.	The Department
Huntlee Conservation Officer	Employed by Huntlee Pty Ltd. Responsible for the day-to-day implementation of the Management Plan and associated monitoring and reporting.	Huntlee Pty Ltd
Contractors	Contracted by Huntlee Pty Ltd. Responsible for the implementation of the PPPMP Actions and complying with the requirements within as directed by Huntlee Pty Ltd.	Huntlee Conservation Officer and Huntlee Pty Ltd

2.5 Funding and Conservation Land Governance

The PPPMP relates to conservations lands defined in **Section 1.4** as Conservation Areas 1, 2 and 3; and the objectives are equally applicable to Persoonia Park, 57 Washery Road and the Northern Population (in perpetuity or until such time that *Persoonia pauciflora* have been successfully propagated using genetic material from the Northern Population).

The EPBC Approval Conditions 11(e) and 11(k) requires consideration of funding for management measures along with conservation area governance under third party protection and management, whether this is via land dedication or via a legal instrument.

In the first instance the scope and objectives of the PPPMP should be enduring to the lands regardless of end user ownership or management, and based on legal instruments to be secured over lands to be divested as follows:

- Conservation Areas 1 and 3 / Persoonia Park – land to be transferred to the NSW Government under the terms of a Voluntary Planning Agreement (VPA). As part of the VPA, funding provisions have been made for the protection and management of the Conservation Areas to be transferred to the NSW Government as follows:
 - \$100,000 cash contribution towards the Draft National *Persoonia pauciflora* Recovery Plan paid to the NSW Minister for Planning on the 11th December 2012.
 - \$100,000 cash contribution for the preparation of a Plan of Management for the Huntlee Conservation Offset Lands, which includes Persoonia Park, paid to the NSW Minister for Planning on the 11th December 2012.
 - \$900,000 paid at \$150,000 per annum for 6 years commencing 11th December 2013 for the operation of the Plan of Management.
- Delivery of the \$341,700 funding shortfall for the National Recovery Plan – North Rothbury Persoonia *Persoonia pauciflora* outlined within table 5 of the recovery plan will be delivered through condition 19 of EPBC Approval (2011/5898).

-
- Conservation Area 2 / 57 Washery Road – to be managed under a legal instrument. Funding for the management will be subject to a separate agreement with the future third party, however and most importantly the funding provision shall allow for continued management delivered under the PPPMP and this will be secured under the terms of the legal instrument.
 - Northern Population – to be protected and managed by Huntlee Pty Ltd.

A further Huntlee Pty Ltd initiative is the creation of the ‘Persoonia Preservation Society’, for which a funding allowance of \$20,000 for the society establishment has been made by Huntlee Pty Ltd.

The funding commitments from Huntlee Pty Ltd sought under approval consents and legally binding mechanisms (e.g. VPA) provide the key financial provisions for the delivery of management measures required under the PPPMP. Furthermore the specific National Recovery Plan actions (costed in table 5 of the plan) allows both the State and Commonwealth Governments an opportunity to invest and work collaboratively with Huntlee Pty Ltd and the Huntlee Conservation Officer (funded by Huntlee Pty Ltd) to deliver the protection and management outcomes sought by the PPPMP.

Estimated costing of implementing the PPPMP management actions is presented within **Appendix 2**.

3.0 Management Actions

3.1 Protection and Conservation Actions

3.1.1 Threats

The Draft National Recovery Plan for North Rothbury Persoonia *Persoonia pauciflora* (hereafter referred to as the Recovery Plan) identifies six threat and management issues that are key to the persistence of *P. pauciflora*. These include:

- Habitat loss and fragmentation due to clearing for development;
- Accidental and unauthorised picking/clearing;
- Slashing and grazing;
- Habitat degradation;
- *Phytophthora cinnamomi*; and
- Long-term consequences of small population size.

Each of these threats is discussed in further detail below.

Habitat loss and fragmentation due to clearing for development

Weston (1999) described the habitat for this species as dry sclerophyll forest dominated by Narrow-leaved Ironbark (*Eucalyptus fibrosa*), Grey Box (*Eucalyptus moluccana*), Grey Gum (*Eucalyptus punctata*) and Spotted Gum (*Corymbia maculata*), over a grassy understorey.

The Recovery Plan indicates that the *P. pauciflora* population appears to be almost wholly located on soils derived from the Farley Formation, based on geological mapping data (Patrick 2006, in OEH 2012). The Huntlee site partly sits over the Farley geological formation along with large areas to the east of the site. Arguably, *P. pauciflora* would have had a greater distribution prior to European settlement. In this case, the underlying geology is only one factor to consider as part of the broader habitat features for this species. The geological mapping of the Farley formation occurs in three disjunct areas, with just one of these containing *P. pauciflora*. The largest area occurs west to east, from Wine Country Drive/Branxton Road to the edge of the township of Allandale. A narrow band of this parcel of the formation also runs to the north-east of Branxton. A small separate parcel of the Farley formation occurs south of Lochinvar, and a large band of this formation winds south-west to north-east from Mount View to Oakhampton. This parcel includes part of Werekata National Park. The section of the Farley formation that contains *P. pauciflora* covers an area of approximately 7 x 17 kilometres. However, only approximately 2 x 3 kilometres of this is currently known to be occupied by *P. pauciflora*.

The *P. pauciflora* plants within the Huntlee Study Area have been recorded within four areas, namely the Northern Population, within Persoonia Park, within Conservation Area 1 and Conservation Area 2. The populations within the proposed Persoonia Park and Conservation Areas 1 and 2 are within consolidated areas of vegetation to be conserved in perpetuity. Tentative habitat connectivity between these two sites exists through private lands (generally north of Tuckers Lane). The proposal will not cause fragmentation between these two sites to a greater degree than that which already exists considering the land disturbance history of the area.

Three plants exist within the proposed Town Centre. Two plants will be protected by a minimum 75 metre buffer, and a third within a riparian corridor. The immediate habitat area for these plants is likely to become more fragmented as a result of development, hence the creation of buffers around these plants. The four *P.*

pauciflora plants to the south of Hanwood Estate occur in an area of proposed open space with connectivity maintained to the west via an open space corridor and to the north through privately owned lands with known *P. pauciflora* individuals and habitat.

The proposed Huntlee development will see 12 *P. pauciflora* plants conserved and protected in perpetuity within dedicated conservation areas, with the remaining seven plants within Huntlee controlled lands to be retained within vegetated buffers.

The proposed on-site offset design has prioritised protection of the main areas of threatened species and their habitats. Dedicated on-site offset areas comprise the areas described as Conservation Areas 1, 2, and 3, 57 Washery Road, and Persoonia Park. The total combined area of the sites is approximately 823.9 hectares. The purpose of Conservation Area 2, the northern population buffers, and 57 Washery Road is to provide connectivity between known individuals and contiguous patches of remnant vegetation.

In addition, as part of the Huntlee Conservation Management Plan (RPS 2013), habitat quality and extent will be improved through the proposed revegetation and rehabilitation program. This proposed revegetation will facilitate the movement of the identified likely key dispersal vectors; frugivorous birds, macropods and possums. For more specific details regarding revegetation works refer to the Huntlee Conservation Management Plan (RPS 2013).

Accidental and Unauthorised Picking/Clearing and Slashing and Grazing

Through the long term protection of the conservation areas through legally binding agreements, and the resulting restrictions that will apply, no agricultural activities including grazing and slashing will occur within the conservation lands. To ensure this remains the case, and to ensure no unauthorised access that may result in accidental and unauthorised picking / clearing of *P. pauciflora* individuals occurs, the Conservation Areas will be fenced around the entirety of their perimeters. The fencing methods applied will be appropriate for the deterrence of humans and livestock from the Conservation Areas. A monitoring and maintenance program will ensure that this remains the case (see **Section 4**).

In addition no individuals of *P. pauciflora* present within the Conservation Areas will be marked with high visibility flagging or similar visible markings that may allow a person that would otherwise be unlikely to be able to identify *P. pauciflora* to be able to identify individual plants.

Habitat degradation

The most likely impacts resulting in *P. pauciflora* habitat degradation are activities such as grazing by domestic stock and the associated trampling, introduction and maintenance of pasture grasses and landscapes areas (including use of fertilizers), road maintenance, trampling and damage due to unrestricted access, weed invasion, dumping of rubbish and garden waste, slashing, mowing, and inappropriate weed control (OEH 2012). An additional factor that has been identified as having a negative impact upon *P. pauciflora* and ecosystems as a whole is inappropriate fire regimes.

The unauthorised access management measures will reduce the likelihood of the majority of potential impacts occurring. The impacts that require active management, that is weed management and the exclusion of grazing from the conservation areas, are addressed within the Huntlee Conservation Management Plan (RPS 2013).

Phytophthora cinnamomi

P. pauciflora may be potentially threatened by *Phytophthora cinnamomi*. However, this disease is mostly associated with high rainfall areas and is not known from the region. The proposed action is therefore not expected to introduce disease that may cause the species to decline. The unauthorised access management

program will go a long way to reduce the potential for *Phytophthora* to become established by reducing the vectors that could bring the disease onto the site. Ongoing monitoring for *Phytophthora* will enable infections to be detected and mitigation / control measures to be implemented.

Unless *Phytophthora* is recorded on the Conservation Areas, the Conservation Areas should be considered to be free from these pathogens and control measures should concentrate on preventing the pathogens from being brought on to the Conservation Areas from external sources.

Baseline

An initial baseline assessment will be conducted over the Conservation Areas to determine if these pathogens are present and if so to what extent. This information will then be used to determine what controls are necessary and where they should be applied. If neither pathogen is recorded then general hygiene protocols will apply to all of the Conservation Areas.

Field kits are readily available to test for the presence of *Phytophthora*. Stratified sample sites situated within access tracks and roads and key access points across the Conservation Areas will be assessed and the locations of positive *Phytophthora* records will be mapped so that pathogen infection zones can be mapped and controls implemented. All records and potentially occurring records identified by staff and contractors are to be reported to the Huntlee Conservation Officer.

All records of plant pathogens will then be verified by the Huntlee Conservation Officer before any controls are implemented.

Controls

The general pathogen hygiene control protocol that will apply to all persons entering the conservation lands will involve a few simple actions. Those actions include vehicle and equipment hygiene and spraying of potentially infected equipment and clothing with a disinfectant or diluted Methylated spirits before being allowed onto the Conservation Areas. If any pathogen infections are recorded then strict controls regarding vehicle and equipment hygiene will be implemented for anybody accessing and leaving these infection areas.

Controls for working within infestation areas will include supervised mandatory vehicle, clothing and equipment disinfection before accessing other areas of the conservation lands.

See **Appendix 3** for regarding detailed pathogen management protocol.

Long-term consequences of small population size

Theoretically, the species is at risk of inbreeding depression (OEH 2012). As it is unknown whether *P. pauciflora* is an obligate outcrosser or if it is able to self-pollinate, connectivity between known individuals and populations needs to be maintained. This will be achieved through the establishment of the conservation zones and the improvement in the quality of the vegetation within those areas where required. The details as to how this will be achieved are outlined within the Huntlee Conservation Management Plan (RPS 2013). The other way to combat the potential impact of limited population size is to increase the numbers of individuals with a broader genetic base. Due to the potential longevity of the *P. pauciflora* soil seedbank the genetic diversity of the species may potentially reside within this seedbank. Patrick (2006) surmised that periods of high rainfall may have triggered germination of *P. pauciflora* resulting in the increased number of individual seedlings recorded in April 2000 and that fire or disturbance may also trigger germination.

In addition to the maintenance of all known *Persoonia* individuals within conservation areas, three actions are proposed to preserve the genetic diversity of this species. These actions will potentially result in the

increase of the numbers of individual *Persoonia pauciflora*, an increase in the germination rate of the soil seed bank, and the preservation of the species genetic diversity.

Seed collection

Seed collection will be undertaken for inclusion into the National Seed Bank coordinated by the Australian National Botanic Gardens or the Australian Seedbank Partnership programs with short term seed collections used for ongoing germination and the long term seed collection used to safeguard this species against total loss in the wild. This will be coordinated with the receiving seed bank by the Huntlee Conservation Officer and will be conducted by a person experienced in seed collection and who has the appropriate licences.

The in situ germination augmentation trial

The in situ germination augmentation trial will include, but not be restricted to, a variety of treatments including supplementary watering to replicate conditions that Patrick (2006) identified as potentially resulting in the elevated germination rates recorded in April 2000, application of 'Smoke Water' to replicate fire triggers, and different levels of disturbance, all of which are known or suspected germination triggers. These treatments will be applied to the soil in the known locations that *P. pauciflora* has been recorded from but where the individual has senesced and no longer occurs. This trial will be developed and implemented by the Huntlee Conservation Officer.

Persoonia pauciflora Propagation Trial

The *Persoonia pauciflora* Propagation Trial will involve the propagation of *P. pauciflora* using the most appropriate propagation methods for this species. Particular attention will be given to sourcing propagules from the Northern Population to preserve the genetic diversity of these individuals in accordance with **Condition 3** of the EPBC Conditions of Approval (EPBC 2011/5898). The Huntlee Conservation Officer will be responsible for the development and implementation of the propagation trial. The trial will draw upon experience gained by an initial trial conducted by the Mount Annan Botanical Gardens which indicated a relatively moderate success rate for the germination of *P. pauciflora* from seed, with propagated individuals to be planted in suitable habitat throughout the Huntlee Conservation Areas.

3.1.2 Action Table

In accordance with Condition 11(g) and (h) of the EPBC Approval, **Table 3** addresses the required actions, timing, responsibilities and triggers for threat control management.

Table 3 Action Table

Action	Details	Criteria	Timing	Triggers	Corrective Actions
Protection and conservation of <i>Persoonia pauciflora</i>		Huntlee Conservation Areas protected by a legal instrument	In accordance with EPBC Approval (2011/5898) Conditions commencement of the action	Action commences before approval of PPPMP	Cease all action until approval granted
	Control of unauthorised picking / removal, slashing, grazing	No individual <i>P. pauciflora</i> are picked, cleared, or grazed by livestock	Ongoing	Individual <i>P. pauciflora</i> are picked, cleared, or grazed by livestock	Ensure deterrence fencing is adequate, in serviceable condition and repair / upgrade as necessary
		No livestock access the conservation areas	Ongoing	Livestock observed within Conservation Areas	Ensure fencing is adequate and in serviceable condition, repair / upgrade where necessary Ensure all livestock were removed during agistment cancellation
	Habitat restoration and maintenance	Habitat value of the known and potential habitat is not negatively impacted upon	Ongoing	Negative trends in habitat health determined through annual habitat health monitoring	Investigate possible reasons for decline in habitat health and develop and implement controls accordingly
	<i>Phytophthora</i> Management	Pathogen hygiene protocol is implemented	Within 12 months of commencement of the action	Contractors, staff or visitors access the Conservation Areas without having completed induction and been provided with Pathogen Hygiene Protocols	Cease all activities on the Conservation Areas until induction and hygiene protocol implemented

Action	Details	Criteria	Timing	Triggers	Corrective Actions
	Long term management of consequences of small population size	Development and implementation of seed collection program, <i>P. pauciflora</i> propagation trial, and the in situ seedbank germination augmentation trial	At Huntlee Pty Ltd and Huntlee Conservation Officer discretion	Chosen measures developed and implemented	N/A

3.2 Unauthorised Access Management

To ensure that unauthorised human access to existing habitat of *P. pauciflora* does not occur a boundary fencing program will be implemented. The type of perimeter fencing used needs to consider durability, integrity, potential impacts to wildlife, and aesthetics. In regards to durability and integrity, metal fencing is the most suitable material to use.

A key consideration is that the potentially key dispersal agent for *P. pauciflora* are macropods, therefore the methods used to exclude humans need to include measures that will allow macropods to move freely between the Conservation Areas and surrounding vegetation.

A variety of fence types are proposed for the conservation lands to discourage unauthorised entry, with the inclusion of modifications to allow for the movement of macropods. For Conservation Area 2, Conservation Area 3, the northern population and 57 Washery Road conventional rural type fencing with signage will be adequate. For Persoonia Park a 1.2 metre high powder coated aluminium fence type or similar is suggested along the interface with the residential development, and for the largest concentration of *P. pauciflora* within Conservation Area 1 a 2.1 metre high chain link type fence or similar is proposed.

The key risks to wildlife from fencing are entanglement in loose mesh style fencing and injuries resulting from collisions with, and getting hung up in, barbed wire. As such the use of barbed wire should be prohibited. The appropriate types of fences and their proposed locations are detailed in **Figure 3**.

3.2.1 Rural Fencing

The entire perimeter of Conservation Area 2, Conservation Area 3, the northern population and 57 Washery Road will need to be fenced. Generally fencing has been established and as such an audit will be required to determine if they are in a serviceable condition and what maintenance requirements exist (e.g replacing, upgrading or ongoing maintenance / monitoring). The wire used should be single strand high tensile wire to ensure that the fencing does not cause injuries to wildlife and retains its ability to exclude cattle - a three to five strand single strand wire fence or similar will be sufficient for these purposes. Wherever an existing fenceline is in a serviceable condition, it will be retained, and if barbed wire has been used the top and bottom run should be replaced with high tensile single strand wire.

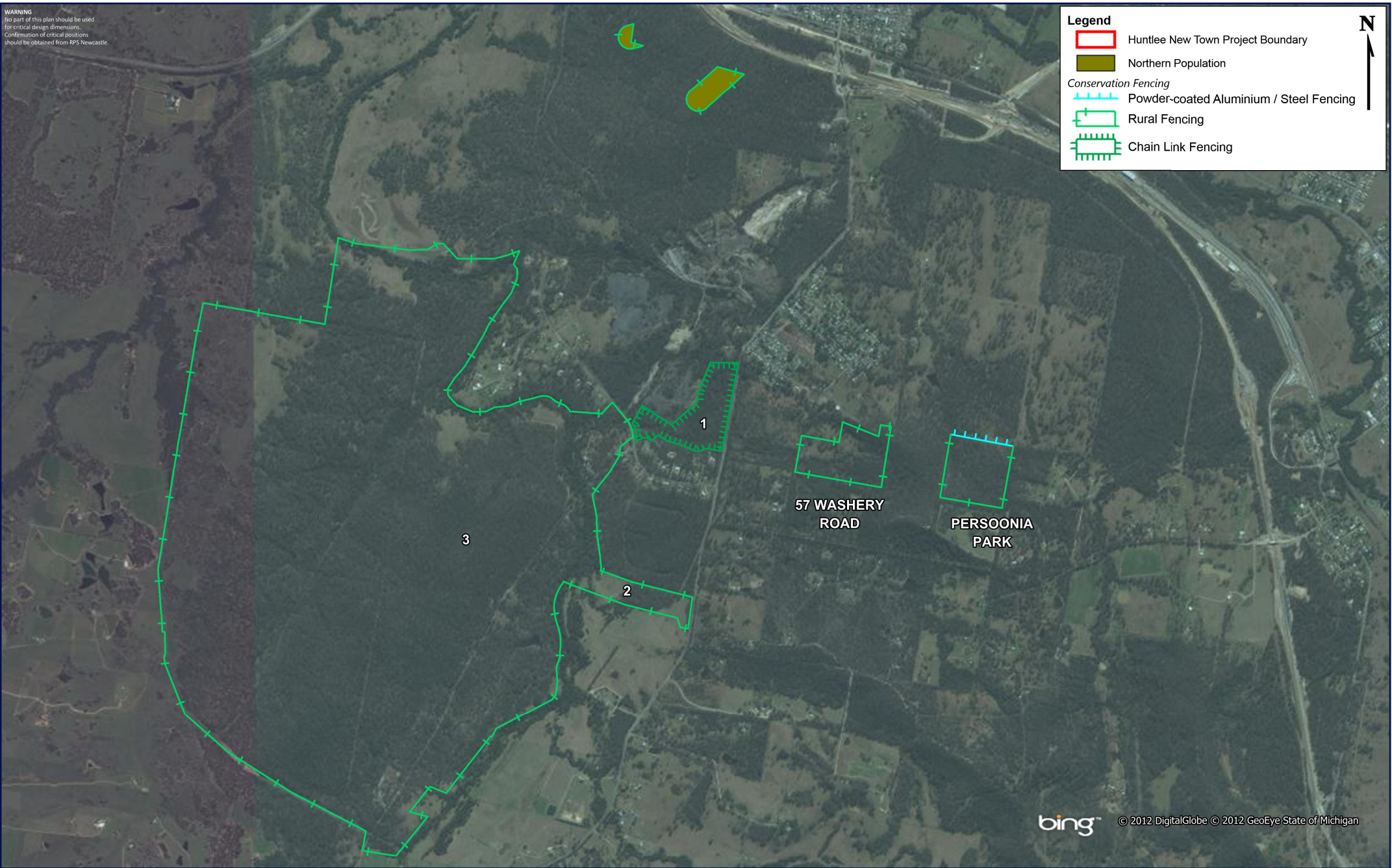
To ensure that unauthorised personnel are aware that they are not permitted to enter the Conservation Areas, signage should be installed at regular intervals along the fenceline. All access points will need to be locked and larger access point signage installed. All signage will be installed in accordance with **Section 3.2.5**.

3.2.2 Persoonia Park Fencing

As Persoonia Park will be adjacent to residential areas there is a higher likelihood of unauthorised entry. As such, different considerations are required when determining what style of fencing will be required. Steel or aluminium powder coated type or similar fencing will be required along this residential interface as it is the most appropriate for unauthorised access control as it is durable, and is less obtrusive than chain link fencing. The remainder of the boundary should be fenced with rural fencing as described above. Initially prior to development occurring on the Persoonia Park interface, the interface area shall be fenced with rural type fencing until such time that development occurs.

A number of access points at key locations will be required for access to undertake management actions. Signage will also need to be installed to ensure people are aware of their obligations regarding access to the site and the need for restricting their access.

WARNING
 No part of this plan should be used
 for critical design dimensions.
 Confirmation of critical positions
 should be obtained from RPS Newcastle.



Legend

- Huntlee New Town Project Boundary
- Northern Population
- Conservation Fencing**
- Powder-coated Aluminium / Steel Fencing
- Rural Fencing
- Chain Link Fencing



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FIGURE 2 - HUNTLEE CONSERVATION AREA DESIGN MAP

LOCATION: NORTH ROTHBURY

DATUM: DATUM
 PROJECTION: MGA ZONE 56

DATE: 2/12/2013
 PURPOSE: PERSOONIA PAUCIFLORA POPULATION MANAGEMENT PLAN

LAYOUT REF: J:\JOBS\105K\105216 North Rothbury(Huntlee)\10- Drafting\management plans
 VERSION (PLAN BY): MD PH JS (A-A3)

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3.2.3 Conservation Area 1 fencing

Of all the Conservation Areas, Conservation Area 1 contains the highest concentrations of *Persoonia pauciflora*. This Conservation Area is bounded by Hanwood Road to the west, Wine Country Drive to the east, rural residential lots to the south, and proposed residential lots to the north. As such 2100 mm high chain link fencing will be required along all boundaries with an urban interface, and to limit the potential impacts to wildlife barbed wire is not to be used. Due to its imperviousness the chain link fence will require the installation of wildlife thoroughfares. The designs of which are detailed below in **Section 3.2.4**. Signage will also be required at all access points and at regular intervals along the boundary, the details of which are provided in **Section 3.2.5**.

Initially prior to development occurring on the Conservation 1 interface, the existing boundary fencing shall be maintained and the future interface area generally to the north / north-west shall be fenced with rural type fencing until such time that development occurs in the area.

3.2.4 Wildlife Thoroughfares

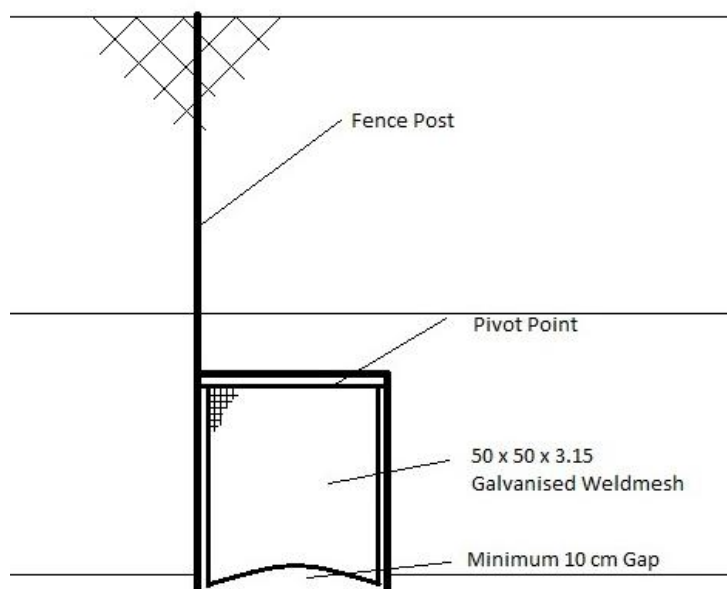
The exclusion of unauthorised persons from Conservation Area 1 will also inadvertently exclude macropods (an important species for dispersal of seeds of the Critically Endangered *P. pauciflora*) and other terrestrial fauna, and as such wildlife thoroughfares will need to be installed.

There are a number of methods for creating wildlife thoroughfares but not all will achieve the goal of deterring people. The swing gate design developed in Western Australia and described in the Victorian Department of Sustainability and Environment Flora and Fauna Notes *Problems Caused by Kangaroos and Wallabies* (FF0019 ISSN 1440-2246) is the most suitable design as it is of a size that would exclude all but the most persistent people and can easily be incorporated into the chain mesh fenceline.

Swing gates are a 500 x 450 rectangle hinged at the top with an arc on the bottom to enable macropods to identify the gate as a possible entry point. The rectangle should have a durable mesh welded to it that should be able to be seen through more easily than the surrounding fence wire to enable macropods to identify the gate as a potential thoroughfare (see **Figure 4**).

An ecologist should inspect the proposed location of the fenceline to identify any potential movement corridors. These corridors should then be recorded and a swing gate installed in that exact location. If no obvious thoroughfares are recorded swing gates should be installed every 100-200 metres.

Figure 4 Swing Gate Design



3.2.5 Signage

To ensure that individuals are aware of the need for exclusion and the consequences of accessing the Conservation Areas without authorisation, clear information will be provided via the education program and information signage. Specific signage will also need to be added to the fence lines themselves and will include 'Conservation Area authorised access only', or similar, signs installed around the perimeter. To ensure that people's privacy is not impinged upon as a result of wildlife thoroughfare and unauthorised access surveillance camera notices should also be erected. These signs will also serve a dual purpose and act as a deterrent to unauthorised access. These details could be incorporated into the Conservation Area signs. Signage does not need to be confrontational and should emphasise the positive aspects of the Conservation Areas.

An example of the boundary fence signs that would be required can be seen in **Figure 5**.

Figure 5 Example of Conservation Fenceline Signage



3.2.6 Site Access Records

In order to monitor who is accessing the conservation lands, when, and what their activities are, a register shall be maintained with details on name, company, date, time in and out, location, and activities undertaken recorded. This will be available at a central location so that if anybody notifies that they have seen people within the Conservation Areas then details on who is authorised on the site and what their activities are can be clarified.

All details regarding the unauthorised access deterrence program will be included in the Annual Monitoring Report and will include details of:

- notifications regarding unauthorised access to the conservation areas;
- confirmed unauthorised access including:
 - » Nature of unauthorised access;
 - » Outcomes of investigation; and
 - » Corrective actions implemented.

3.2.7 Fence and Thoroughfare Monitoring

Monitoring points should be established adjacent to a representative number of the swing gate sites to establish if they are being utilised and if they are to estimate the number of macropods doing so. Monitoring would involve the temporary installation of infrared motion sensitive cameras which are designed to detect motion and take photographs when a sensor is triggered by movement.

A formal and informal monitoring program as well as feedback / information provided by the general public will be used to monitor for unauthorised persons accessing the Conservation Areas. This

program will be used to determine whether or not macropods are freely moving in and out of the Conservation Areas. Results of this monitoring will be used to determine the need for upgrades / modifications to any elements of the fence design as well as the need for maintenance works.

3.2.8 Unauthorised Access Deterrence Action Table

In accordance with Condition 11(g) and (h) of the EPBC Approval, **Table 4** addresses the required actions, timing, responsibilities and triggers for fencing management.

Table 4 Unauthorised Access Deterrence Action Table

Action	Details	Completion Criteria	Timing	Responsibility	Trigger	Corrective Action
Unauthorised persons are discouraged from accessing the Conservation Areas	Fencing program implemented for boundaries of all Conservation Areas	All fences are installed in accordance with Section 3.2	Within 12 months of commencement of the action (Note: <i>Persoonia</i> Park and Conservation Area 1 interim fencing per Section 3.2.2 & 3.2.3)	Huntlee Pty Ltd	Fence installation has not been commenced within 12 months	Huntlee Pty Ltd will immediately engage a fencing contractor to commence the fencing program within 6 months
		The fences are adequate for the exclusion of unauthorised persons, vehicles and livestock	Within 24 months following the commencement of the action	Huntlee Pty Ltd	If unauthorised persons are observed or reported as being observed within the Conservation Areas	Establish the validity of the sighting or signs of unauthorised access; Inspect the fenceline, gates, and wildlife thoroughfares to ensure they have not been intentionally damaged to access the Conservation Areas or as a result of tree or branch fall; If repairs are required ensure they are carried out as soon as possible; Ensure that the fenceline, wildlife thoroughfares and gates are adequate to exclude unauthorised access and modify if required; and If unauthorised access occurs repeatedly then initiate a surveillance camera program to detect offenders.
		Fences are in a serviceable condition that ensures that they will function as they were intended	Ongoing	Huntlee Pty Ltd Huntlee Conservation Officer	Fenceline is not in serviceable condition	A fencing contractor will be engaged to undertake repairs immediately

Action	Details	Completion Criteria	Timing	Responsibility	Trigger	Corrective Action
Macropod thoroughfares	Install Macropod thoroughfares at key locations	Macropods are freely entering and leaving the Conservation Areas	Ongoing	Huntlee Pty Ltd Huntlee Conservation Officer	Thoroughfare monitoring establishes that macropod gates are ineffective	Determine why the gates are not being utilised and modify gates accordingly

3.3 Community Engagement Program

3.3.1 Objectives

The key objective of the community awareness program is to engage with the community to encourage them to care for and protect known individuals of *P. pauciflora* and their habitat.

One way to ensure that *P. pauciflora* and its' habitat is conserved is to create a sense of 'ownership' within the people that currently, and those that will live, with this species by implementing a program that results in the local community identifying *P. pauciflora* as a key element to their communities identity.

3.3.2 Actions

To engage the community a number of actions are proposed. Actions will include an initial fact sheet mail out, the establishment of a micro-website for *P. pauciflora*, and permanent information signage installed at key points within the Huntlee Lands (e.g. Persoonia Park) detailing the species ecology, status, the need for conserving this species, etc. A community interaction program will also be initiated and will be delivered by the Huntlee Conservation Officer who will also be the point of contact for the community in all matters regarding *Persoonia pauciflora*.

3.3.2.1 [Fact Sheet](#)

A fact sheet on *P. pauciflora* should be developed and should be separate from any marketing brochures. This fact sheet has multiple applications and therefore the content should be suitable for a wide audience. The fact sheet should contain:

- Ecological information of the species;
- Range and numbers remaining;
- Key threats;
- The status of this species (state and federal listing);
- Why we need to preserve what remains; and
- What Huntlee is doing to assist with the preservation of the species. This section should include:
 - » Details on the locations of the conservation lands;
 - » A general breakdown of the management actions proposed, and how those actions may benefit the community i.e. pest and weed control;
 - » An explanation of how this will affect neighbouring properties. There potentially will be some misconceptions regarding the site harbouring pest animal species and posing a bushfire risk and the pamphlet should address the most likely concerns; and
 - » Provide details on where additional information can be sourced and contact details of an appropriate person to deal with community feedback / concerns.
- Contact details for the nominated community contact (Huntlee Conservation Officer) and directions as to how to access the *P. pauciflora* microsite.
- Should not provide locations of individual *P. pauciflora*.

Each household would be provided with this fact sheet as part of their information pack upon purchase of their property. The fact sheet should also be sent out to the general community and specifically to any properties or communities adjacent to the Huntlee Conservation Lands. In addition the fact sheet should be

included as part of the site induction process and be available for distribution to interested parties including school students, community and interest groups.

3.3.2.2 [Persoonia pauciflora Microsite](#)

It is suggested that a dedicated micro-website be linked to the Huntlee website that houses all of the relevant information regarding *P. pauciflora* and the Huntlee Conservation Areas for stakeholders and community members at all levels – residents, schools, etc.

Information on the site would include everything within the fact sheet but is not limited to:

- General ecological information on *P. pauciflora*;
- Details of the conservation lands;
- Progress reports and notifications;
- Q&As;
- Links to other information including OEH, Royal Botanic Gardens, and **Department** species profiles;
- Community feedback page; and
- Contact information.

A regular program of updating the website should be implemented. Updates will occur at the end of each quarter.

3.3.2.3 [Information Signage](#)

Signs can be used for a variety of purposes and are a sustained long term action. Signs should be installed in strategic locations where people are most likely to come in contact with interfaces of the Huntlee Conservation Lands or natural areas.

Two forms of signage are proposed, namely a small number of large information signs, and smaller signage at regular intervals around the boundary of the conservation lands. The larger information signage should include a summary of information within the fact sheet with an abundance of maps and photos. The boundary signage will be in accordance with **Section 3.2.5**.

3.3.2.4 [Community interaction program](#)

Engaging the community is most effectively achieved through a human interface. The most suitable candidate for the interface and development and delivery of a community interaction program is the Huntlee Conservation Officer. Therefore their role should include a community engagement responsibility. The program should include:

- The development of a power point presentation that can be delivered to school groups or community groups;
- Provisions for the Huntlee Conservation Officer to act as a dedicated community contact for all matters regarding *P. pauciflora* and the Huntlee Conservation Lands; and
- The development and distribution (via the microsite, email or post out) of a bi-annual community update including but not limited to:
 - » Progress of Conservation Management Plan actions;
 - » Construction program progress;
 - » Additional information that may have become available since the last community update; and
 - » Information regarding any non-conformances.

3.3.3 Success Criteria

In accordance with Conditions 11(g) and (h) of the EPBC Approval, **Table 5** addresses the required actions, timing, responsibilities and triggers for the implementation of the Huntlee Community Engagement Program.

Table 5 Community Engagement Program Action Timetable

Action	Criteria	Timing	Responsibilities	Triggers	Corrective Action
Fact Sheet	Fact sheet developed	Within 3 months of Commencement of Action	Huntlee Pty Ltd	Fact Sheet not developed within nominated timeframe	Fact Sheet developed within one month of original due date
Microsite	Microsite developed and hosted	Within 6 months of Commencement of Action	Huntlee Pty Ltd	Microsite not developed and hosted within nominated timeframe	Microsite developed and hosted within one month of original due date
Signage	Information signage installed	During construction and landscaping adjacent to Persoonia Park and other nominated frequently used public space	Huntlee Pty Ltd	Information signage not installed within nominated timeframe	Information signage installed within one month of original due date
Interaction Program	Presentation developed and regular progress reports provided to the community	Presentation developed within 6 months of Commencement of Action Progress reports provided at key milestones	Huntlee Pty Ltd Huntlee Conservation Officer	Presentation and Progress Reports not installed or distributed within nominated timeframes	Presentation developed within one month of original due date Timetable for key milestones developed and made available to community and any delays to key milestones, and therefore status report, communicated to the community

3.3.4 Evaluation

A range of methods will be designed to achieve continuous improvement, when it comes to community education.

It is proposed that regular discussion and feedback on the performance of the community education strategy, including its implementation and strategies, will be undertaken through monthly project meetings. These meetings will provide an opportunity for regular informal review of all communications.

It is proposed that there be a formal assessment of the implementation of the community education plan at key project milestones. The results of the formal assessment will be used to review and refine the plan as required. The assessment will rely on project team discussions and individual evaluations of key communication activities, and a log / diary of all community interactions including:

- The feedback, number of complaints or positive comments about information materials and communications;
- The level and nature of any media coverage;
- The number of requests for meetings or presentations;
- The range of views presented during meetings, presentations or briefings; and
- The level of satisfaction of communication activities, indicated by a formal feedback evaluation form distributed to households.

It is also expected that the annual survey would be used as an evaluation tool for the communication education program and that information gathered at this time will be fed back into the program to enhance interaction tools and activities.

4.0 Monitoring

Population monitoring will need to be conducted yearly with known locations of individuals inspected and details on plant health, reproductive status (flowering, fruiting, etc), and seed germination. A census of *P. pauciflora* will be conducted every five years to determine if new individuals have become established. Any opportunistic sightings made in the process of management actions and other monitoring programs will be reported to the Huntlee Conservation Officer for inclusion into the annual population monitoring program.

Habitat assessments will be conducted in conjunction with additional annual monitoring programs and will include vegetation monitoring and habitat health monitoring. Monitoring for Macropod thoroughfares usage will utilise camera traps.

4.1 Flora Surveys

Flora monitoring plots will consist of 20 x 20 metre quadrats. Quadrat points should be marked with a steel star-picket and located with a GPS to ensure consistent replication of monitoring.

All species recorded will be identified as far as practicable to species and subspecies level (where relevant). When a plant could not be identified accurately in the field, a single sample will be collected, together with notes on habitat, form, percent coverage and height. These samples will be identified in the office (according to nomenclature in Harden [1992 – 2002]) or sent to the Royal Botanical Gardens for identification.

The following parameters will be collected within each 20 x 20 metre permanent monitoring quadrat:

- Flora species diversity;
 - » Total number of flora species.
 - » Number and percent of native flora species.
 - » Number and percent of introduced flora species.
- Flora species abundance (Modified Braun-Blanquet 1-6);
- Dominant species and vegetation height in metres of each vegetation layer; and
- Presence of dieback.

For revegetation monitoring, additional parameters to be monitored will include the number of stems per plot, and once trees reach a sufficient height the total basal area measured at breast height.

Weed identification and monitoring will be undertaken in association with these works.

4.2 Camera Traps

Camera traps can be used to monitor a wide variety of fauna species, specifically pest animals, accurately and efficiently. Camera traps are used as a tool to conduct surveys or record general observations as they provide better results than standard surveys, such as live trapping (Paull et al 2011). Detection rate is one of the simplest methods of measuring animals that are photographed at camera trap sets (Kays et al 2009), which provides a general index of abundance, and is recorded as:

- Detection Rate = Total number of events of a species/deployment time.

If each camera trap is queried separately, a probability of detection per-site can be derived by calculating the detection of each species by each camera each day (Kays et al 2009).

Camera trapping will include:

- Four trap nights per fauna census plot; and
- The use of both carnivore and omnivore baits.

4.3 Habitat Health Assessment

Habitat health assessments will be conducted and will involve the utilisation of the habitat analysis techniques described in Bayley and Brouwer (2004). This program will be conducted in conjunction with monitoring programs associated with the Huntlee *Persoonia pauciflora* Population Management Plan (RPS 2013). Recorded habitat attributes include:

- Physical features including:
 - » Topographic position;
 - » Slope;
 - » Aspect;
 - » Structure;
 - » Patch size;
 - » Patch shape;
 - » Width if linear;
 - » Connectivity;
 - » Linear type;
 - » Geology;
 - » Soil colour and texture; and
 - » Surface water bodies within 100 m.
- Plant diversity and health including:
 - » Exposed soil;
 - » Lichen;
 - » Litter;
 - » Herbs / forbs;
 - » Grasses;
 - » Grassland condition;
 - » Grassland height;
 - » Grassland species diversity;
 - » Dieback;
 - » Mistletoe;
 - » Litter tree base;
 - » DBH ranges and percentage cover;
 - » Shrub species;
 - » Shrub layer species diversity;
 - » Canopy species;
- » Canopy layer species diversity;
- » Canopy layer structural diversity;
- » Patch health;
- » Canopy description;
- » Understory description; and
- » Tree species percentage (%) cover.
- Habitat value including:
 - » Rock on rock;
 - » Overhangs / caves;
 - » Mistletoe;
 - » Terrestrial and Arboreal termite mounds;
 - » Hollow; structure, size classes, number, status and relative abundance;
 - » Number of habitat trees;
 - » Scratches on smooth tree trunks; and
 - » Loose tree bark.
- Level of disturbance including:
 - » Fire;
 - » Number of cut stumps;
 - » Presence of grazing and if so by what animal species;
 - » Presence of erosion and if so what type;
 - » Dumping;
 - » Weed cover abundance; and
 - » Dominant weed species.

The above variables have been analysed by using a habitat typology assessment developed by RPS.

4.4 Monitoring Locations

Monitoring locations will be established during the first round of annual monitoring by a consultant in consultation with the Huntlee Conservation Officer. The location of weed control and revegetation monitoring will be established in line with the progress of those programs.

4.5 Survey Data

All survey data collected for the project must be collected and recorded so as to conform to a reasonable standard such that it can be readily used by a third party or to data standards notified from time to time by the **Department** in accordance with Condition 22 of the EPBC Approval (2011/5898)

4.5.1.1 Timing and Frequency

For details regarding the application of each monitoring method and the timing for each monitoring event refer to **Table 6**.

Table 6 Monitoring Timetable

Monitoring Method	Purpose	Location	Frequency
Flora Quadrats	Habitat Health Monitoring	Formalised monitoring points	Annual
	Pathogen Monitoring		
Camera Traps	Macropod Thoroughfare Monitoring	Macropod Thoroughfares	4 sites per year for 4 nights
	Unauthorised Access Monitoring	Areas identified as likely points of unauthorised entry	As required
Habitat Assessment	Habitat Condition Monitoring	Formalised monitoring points	Annual
Visual Inspection	Pathogen Infections	Vegetation throughout Conservation Areas	Quarterly / opportunistically
	Fenceline Integrity Monitoring	Boundary Fencelines	Quarterly / opportunistically
	Unauthorised Access Monitoring	Boundary Fencelines Known locations of <i>P. pauciflora</i>	Quarterly / opportunistically

4.5.1.2 Duration

Monitoring will be conducted from commencement of the action for the life of the Action or until the **Minister** is satisfied that the condition has been addressed.

5.0 Reporting

Reporting will occur under two circumstances. If any individuals of *P. pauciflora* are removed either intentionally or accidentally the **Department** will be notified immediately. An Annual Monitoring Report (AMR) will be provided to the **Department** 12 months following commencement of the Action.

The annual report is a summary of everything that has occurred on the site in the past 12 months. The AMR shall include but not be limited to:

- A summary of all monitoring results including:
 - » Fence line monitoring program;
 - » Pathogen protocol compliance audits; and
 - » Community engagement formal feedback forms.
- Any recommendations made based on monitoring results;
- Any actions implemented as a result of the monitoring program;
- If and when any trigger levels were exceeded;
- if required, details of any corrective actions implemented;
- what management actions were completed in the past 12 months with details on:
 - » numbers;
 - » areas;
 - » time; and
 - » cost.

In accordance with the EPBC Approval (2011/5898) any non-compliance is to be notified to the **Department** in writing within two days of becoming aware of non-compliance.

5.1 Revisions

All reviews and revisions will be conducted in accordance with Conditions 26, 27, and 28 of the EPBC Conditions of Approval (EPBC 2011/5898)

If the person taking action wishes to carry out any activity otherwise than in accordance with the plans, as specified in the conditions, the person taking action must submit to the Department for the Minister's written approval a revised version of that plan. The varied activity shall not commence until the Minister has approved the revised plan in writing. The Minister will not approve a revised plan, unless the revised plan would result in an equivalent or improved environmental outcome. If the Minister approves the revised plan, that plan must be implemented in place of the plan originally approved.

If the Minister believes that it is necessary or convenient for the better protection of listed threatened species and communities or listed migratory species to do so, the Minister may request that the person taking the action make specified revisions to the relevant management plan specified in the conditions and submit the revised plan for the Minister's written approval. The person taking the action must comply with any such request. The revised approved plan must be implemented. Unless the Minister has approved the revised plan then the person taking the action must continue to implement the originally approved plan, as specified in the Conditions.

If, at any time after 5 years from the date of this approval, the person taking the action has not substantially commenced the action, then the person taking the action must not substantially commence the action without the written agreement of the Minister.

6.0 References

- Carignan, V. & Villard, M. (2002). Selecting indicator species to monitor ecological integrity: a review. *Environmental Monitoring and Assessment* 78: 45-61.
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Appendix 1

EPBC Approval 2011/5898



Australian Government
Department of the Environment

Approval

Huntlee New Town Residential Development, Hunter Valley, NSW (EPBC 2011/5898)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

person to whom the approval is granted	Huntlee Pty Limited
proponent's ACN (if applicable)	143 744 745
proposed action	To develop a new urban settlement known as Huntlee, to be located adjacent to the villages of North Rothbury and Branxton in the Hunter Valley, NSW (see EPBC Act referral 2012/5898).

DECISION to approve:

Approval decision

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	Approve
Listed migratory species (sections 20 & 20A)	Approve

conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

This approval has effect until 01 January 2038

Decision-maker

name and position The Hon Greg Hunt MP
Minister for the Environment

Signature

date of decision

15/10/2013

Conditions attached to the approval (EPBC 2011/5898)

Maintenance of existing populations of *Persoonia pauciflora* in-situ

1. The person taking the action must protect and manage the **northern population** of *Persoonia pauciflora* establishing a 75 metre buffer of existing native vegetation (limited to the **project area**) around each plant prior to **commencement of the action**.
2. All plants within the **northern population** must be connected by a native vegetation corridor, to be of a minimum width of 150 metres, to each other and to allow connection to conservation areas and/or native vegetation outside of the **project area** (so as to allow for macropod access) prior to **commencement of the action**.
3. The **northern population** and vegetation referred to in Conditions 1 and 2 must be maintained (to protect and conserve both plants and seed bank) in perpetuity or until such time as *Persoonia pauciflora* from the **northern population** have been scientifically verified by an **independent scientific expert** approved by the **Minister**, to have been successfully propagated and surviving in the wild (consistent with the EPBC Act Policy Statement: *Translocation of Listed Threatened Species – Assessment under Chapter 4 of the EPBC Act*) and as defined in these conditions.
4. The person taking the action must arrange for the protection and conservation management of all *Persoonia pauciflora* (including living plants and the in-soil seed bank of known dead or pre-existing plants) in **Conservation Areas 1, 2 and 3** in perpetuity prior to **commencement of the action**.
5. **Conservation Areas 1, 2 and 3** must be protected by a legal instrument under relevant nature conservation legislation on the title of the land. Arrangements to implement this instrument must be approved by the **Department**, in writing, prior to **commencement of the action**. This instrument must:
 - a. provide for the protection of the land in perpetuity;
 - b. prevent any future development activities, including mining and mineral extraction; and
 - c. ensure the active management of the land.
6. All *Persoonia pauciflora* within **Conservation Areas 1, 2 and 3** must be a minimum of 75 metres from the development at the start of the **commencement of the action**.
7. **Conservation Area 2** must be contiguous with **Conservation Area 3** to the west. It must be a minimum of 150 metres wide (north to south).
8. All cleared areas within **Conservation Areas 1, 2 and 3** must be revegetated to Central Hunter Ironbark - Spotted Gum - Grey box forest vegetation type (NSW) (to act as a buffer to the *Persoonia pauciflora*). The revegetated areas must be maintained for conservation purposes.
9. The person taking the action must arrange for the in-perpetuity protection and conservation management of the *Persoonia pauciflora* in Persoonia Park (as identified in the **preliminary documentation**) through an appropriate legal instrument on the title of the land. Arrangements to implement this instrument must be approved by the **Department**, in writing, prior to **commencement of the action**. The northern boundary of Persoonia Park must be designed so that all *Persoonia pauciflora* within Persoonia Park are a minimum of 75 metres away from the northern boundary.

10. The person taking the action must protect by a legal instrument under relevant nature conservation legislation on the title, an area of at least 16.9 hectares at 57 Washery Road (being Lot 47 DP 755211). Arrangements to implement this instrument must be approved by the **Department**, in writing, prior to **commencement of the action**. The legal instrument must:
 - a. provide for the protection of the land in perpetuity;
 - b. prevent any future development activities, including mining and mineral extraction; and
 - c. ensure the active management of the land.
11. The person taking the action must submit for the **Minister's approval** a *Persoonia pauciflora* Population Management Plan to support the conservation management of all known *Persoonia pauciflora* plants and seed banks within the **northern population** (and connecting habitat), **Conservation Areas 1, 2 and 3**, Persoonia Park and the area at 57 Washery Road referred to in Condition 10. This plan must be approved by the **Minister** prior to **commencement of the action**. The plan must be implemented. The plan must include:
 - a. measures to protect and conserve *Persoonia pauciflora* in situ (including living plants and seed bank) to ensure the ongoing survival and recovery of the species, through appropriate management. These measures must be clear, measurable, auditable and time bound;
 - b. measures to discourage unauthorised human access to *Persoonia pauciflora* and its habitat, while still allowing access by macropods;
 - c. measures to encourage the building of community awareness and stewardship of *Persoonia pauciflora*, including appropriate education programs to encourage care and protection of known plants and seed banks.
 - d. clear objectives and performance indicators for the measures referred to in Condition 11a, 11b and 11c;
 - e. costing of the management measures required and demonstration that these will be funded in perpetuity;
 - f. details of the monitoring and reporting to be undertaken to demonstrate the effectiveness of the measures referred to in Condition 11a, 11b and 11c, including the parameters to be monitored, methods, timing, frequency and location of monitoring;
 - g. specific and measurable trigger levels that will result in corrective actions being implemented to prevent the objectives referred to in Condition 11d being compromised;
 - h. corrective actions to be taken should the trigger levels referred to in Condition 11g be exceeded. These must be clear, measurable, auditable and time bound;
 - i. measures to report to the **Department** on any exceedances of identified trigger thresholds, the implementation of corrective actions, and the outcome of these;
 - j. the person responsible for the management actions; and

- k. a description of how the plan will apply to any conservation areas that may subsequently be transferred to a third party for protection and management for conservation.
12. The *Persoonia pauciflora* Population Management Plan must be reviewed by an **independent scientific expert** approved by the **Department** prior to submission.
13. Prior to and within six months of **commencement of the action** the person taking the action must undertake pre-clearance surveys to identify any *Persoonia pauciflora* plants (dead or alive) that are not currently documented and advise the **Department** in writing of any new plants or seed banks that are discovered.
14. The person taking the action must implement measures, consistent with those referred to in Condition 1 and, where applicable, 11a, to be put in place to protect and manage any new plants or seed banks identified as a result of implementing Condition 13.

Management of conservation areas, edge effects, open space and indirect impacts to conservation values

15. The person taking the action must submit a detailed Huntlee Conservation Management Plan to the **Minister** for approval prior to **commencement of the action**. This plan must be approved by the **Minister** prior to **commencement of the action**. The approved plan must be implemented. The Plan must include, but not be limited to, the following requirements:
 - a. restoration and revegetation measures to be implemented in **Conservation areas 1, 2 and 3**, as relating to Condition 8.
 - b. measures to maintain and improve the quality and condition of habitat values in all conservation areas (including **Conservation Areas 1, 2 and 3**), open space and remnant bushland in the project area that support other matters of national environmental significance (other than *Persoonia pauciflora*), including Swift Parrot (*Lathamus discolor*), Regent Honeyeater (*Anthochaera phrygia*), Grey-headed Flying-fox (*Pteropus poliocephalus*) and Slaty Red Gum (*Eucalyptus glaucina*).
 - c. measures to prevent, mitigate and manage all direct and indirect impacts to the natural habitat values to all conservation areas (including **Conservation Areas 1, 2 and 3**), open space and remnant bushland within the project area resulting from the action, including but not limited to measures to avoid, suppress and control the spread of weeds, plant pathogens, invasive species, commercial grazing, domestic pets, unauthorised vehicles, and erosion and sedimentation control;
 - d. measures to prevent changes to hydrological regimes arising from the action that may negatively affect native vegetation;
 - e. any measures that support *Persoonia pauciflora* that are in addition to those included under Condition 11;
 - f. the design of **Conservation Areas 1, 2 and 3**;
 - g. measures in referred to in condition 15a, 15b and 15c must be clear, measurable, auditable and time bound;
 - h. clear objectives and performance indicators for the measures referred to in Condition 15a, 15b and 15c;

- i. details of the monitoring to be undertaken to demonstrate the effectiveness of the measures referred to in Condition 15a;
- j. details of the parameters to be monitored, methods, timing, frequency and location of monitoring;
- k. specific and measurable trigger levels that will result in corrective actions being implemented to prevent the objectives referred to in Condition 15e being compromised;
- l. corrective actions to be taken should the trigger levels referred to in Condition 15h be exceeded. These must be clear, measurable, auditable, and specific timing;
- m. measures to report to the **Department** on any exceedances of identified trigger thresholds, the implementation of corrective actions, and the outcome of these;
- n. the person responsible for the management actions; and
- o. a description of how the plan will apply to any conservation areas that may subsequently be transferred to a third party for protection and management for conservation.

16. The Huntlee Conservation Management Plan must be reviewed by an **independent scientific expert** approved by the **Department** prior to submission.

Funding of a Huntlee Conservation Officer

17. The person taking the action must arrange for and commit to the funding of a Huntlee Conservation Officer, to be employed for no less than 22.5 hours per week for a period of at least 10 years. The person to be employed in this position must possess relevant qualifications and expertise. A plan setting out contractual arrangements for the funding of the role, relevant employment arrangements (including start date) and a duty statement for the position must be provided to the **Minister** prior to the **commencement of the action**. This plan must be approved by the **Minister** prior to **commencement of the action**. The approved plan must be implemented.

18. The roles of the position must include:

- a. coordination and implementation of Condition 11c;
- b. coordination and implementation of actions to support the protection and conservation of *Persoonia pauciflora* consistent with the plans referred to in Conditions 11 and 15; and
- c. contribution to actions that are consistent with the *National Recovery Plan North Rothbury Persoonia* (*Persoonia pauciflora*).

Offsets – *Persoonia pauciflora* (recovery actions)

19. To compensate for the loss of habitat for the *Persoonia pauciflora* and the remaining residual impacts to the species as a result of the action, the person taking the action must provide \$341,700 directly to the NSW Office of Environment and Heritage (or appropriate agency or organisation responsible for implementation of the *National Recovery Plan North Rothbury Persoonia* (*Persoonia pauciflora*)) and approved by the **Minister**) prior to **commencement of the action** to fund activities that are consistent with the recovery actions identified in the *National Recovery Plan North Rothbury Persoonia* (*Persoonia pauciflora*).

Offsets – other matters of national environmental significance

20. The person taking the action must dedicate or ensure the transfer of, for the purposes of dedication, the 5791 hectares of conservation offset lands described in the preliminary documentation to National Park (or arrange for and demonstrably commit to an equivalent other arrangement of in-perpetuity protection and management of these offset lands that is consistent with the **Department's** EPBC Act offsets policy). The area of land contained within this 5791 hectares must include appropriate areas of offset lands for each of the following matters of national environmental significance: Swift Parrot (*Lathamus discolor*) and Regent Honeyeater (*Anthochaera phrygia*), the vulnerable Grey-headed Flying-fox (*Pteropus poliocephalus*) and Slaty Red Gum (*Eucalyptus glaucina*).
21. Any land referred to at Condition 20 that is not dedicated to National Park or with an alternative level of protection in perpetuity agreed to by the **Department** must be protected by a legal instrument under relevant nature conservation legislation on the title of the land. Arrangements to implement this instrument must be approved by the **Department**, in writing, prior to **commencement of the action**. The instrument must:
 - a. provide for the protection of the land in perpetuity;
 - b. prevent any future development activities, including mining and mineral extraction; and
 - c. ensure the active management of the land.

Reporting and auditing

22. All survey data collected for the project must be collected and recorded so as to conform to a reasonable standard such that it can be readily used by a third party or to data standards notified from time to time by the **Department**. When requested by the **Department**, the proponent must provide to the **Department** all species and ecological survey data and related survey information from ecological surveys undertaken for matters of national environmental significance. This survey data must be provided within 30 business days of request, or in a timeframe agreed to by the **Department** in writing. The **Department** may use the survey data for other purposes.
23. Within 14 days after the commencement of construction, the person taking the action must advise the **Department** in writing of the actual date of **commencement of the action**.
24. Within three months of every 12 month anniversary of the **commencement of the action**, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published. The person taking the action must also notify any non-compliance with this approval to the **Department** in writing within two business days of becoming aware of the non-compliance.
25. Upon the direction of the **Minister**, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.

Revisions

26. If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans, as specified in the conditions, the person taking the action must submit to the **Department** for the **Minister's** written approval a revised version of that plan. The varied activity shall not commence until the **Minister** has approved the revised plan in writing. The **Minister** will not approve a revised plan, unless the revised plan would result in an equivalent or improved environmental outcome. If the **Minister** approves the revised plan that plan must be implemented in place of the plan originally approved.
27. If the **Minister** believes that it is necessary or convenient for the better protection of listed threatened species and communities or listed migratory species to do so, the **Minister** may request that the person taking the action make specified revisions to the relevant management plan specified in the conditions and submit the revised plan for the **Minister's** written approval. The person taking the action must comply with any such request. The revised approved plan must be implemented. Unless the **Minister** has approved the revised plan then the person taking the action must continue to implement the originally approved plan, as specified in the conditions.
28. If, at any time after 5 years from the date of this approval, the person taking the action has not substantially commenced the action, then the person taking the action must not substantially commence the action without the written agreement of the **Minister**.

Publication of plans

29. The person taking the action must maintain accurate records substantiating all activities and outcomes associated with or relevant to the above conditions of approval, including measures taken to implement the management plans required by this approval, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.
30. Unless otherwise agreed to in writing by the **Minister**, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved.

Definitions

commencement of the action – means any preparatory works required to be undertaken including clearing vegetation, the erection of any onsite temporary structures and the use of heavy duty equipment for the purpose of breaking the ground for fencing, buildings or infrastructure, but excluding any works for conservation purposes, native revegetation works or the creation of conservation buffers.

Conservation Area 1 – an area of land (currently owned by the proponent) immediately north of the southern portion of Hanwood, bounded on the east side by Wine Country Drive which encompasses known *Persoonia Pauciflora* in this area (as identified on the map at Annexure 1 to these Conditions).

Conservation Area 2 – an area of land (currently owned by the proponent) immediately south of the southern portion of Hanwood, bounded on the east side by Wine Country Drive which encompasses known *Persoonia Pauciflora* in this area (as identified on the map at Annexure 1 to these Conditions).

Conservation Area 3 – an area of land (currently owned by the proponent) of over 400 hectares extending to the west of the southern portion of Hanwood and straddling the local government area border between Singleton and Cessnock (as identified on the map at Annexure 1 to these Conditions).

Department – the Australian Government Department responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

independent scientific expert – means a scientist with relevant qualifications and expertise who is not affiliated with the proponent or with other parties affiliated with the project of which the action is involved or a part.

Minister – the Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the Minister.

northern population – means all *Persoonia Pauciflora* in the area of the proposed action that is west, north or east of North Rothbury.

Persoonia pauciflora – means *Persoonia Pauciflora* (also referred to as North Rothbury *Persoonia*) and known, recognised hybrids of *Persoonia Pauciflora*. Where applicable this definition extends to include both living plants and the residual soil stored seed bank.

preliminary documentation – means the preliminary documentation submitted by the proponent to the **Department** in October 2012 as part of the EPBC Act assessment process.

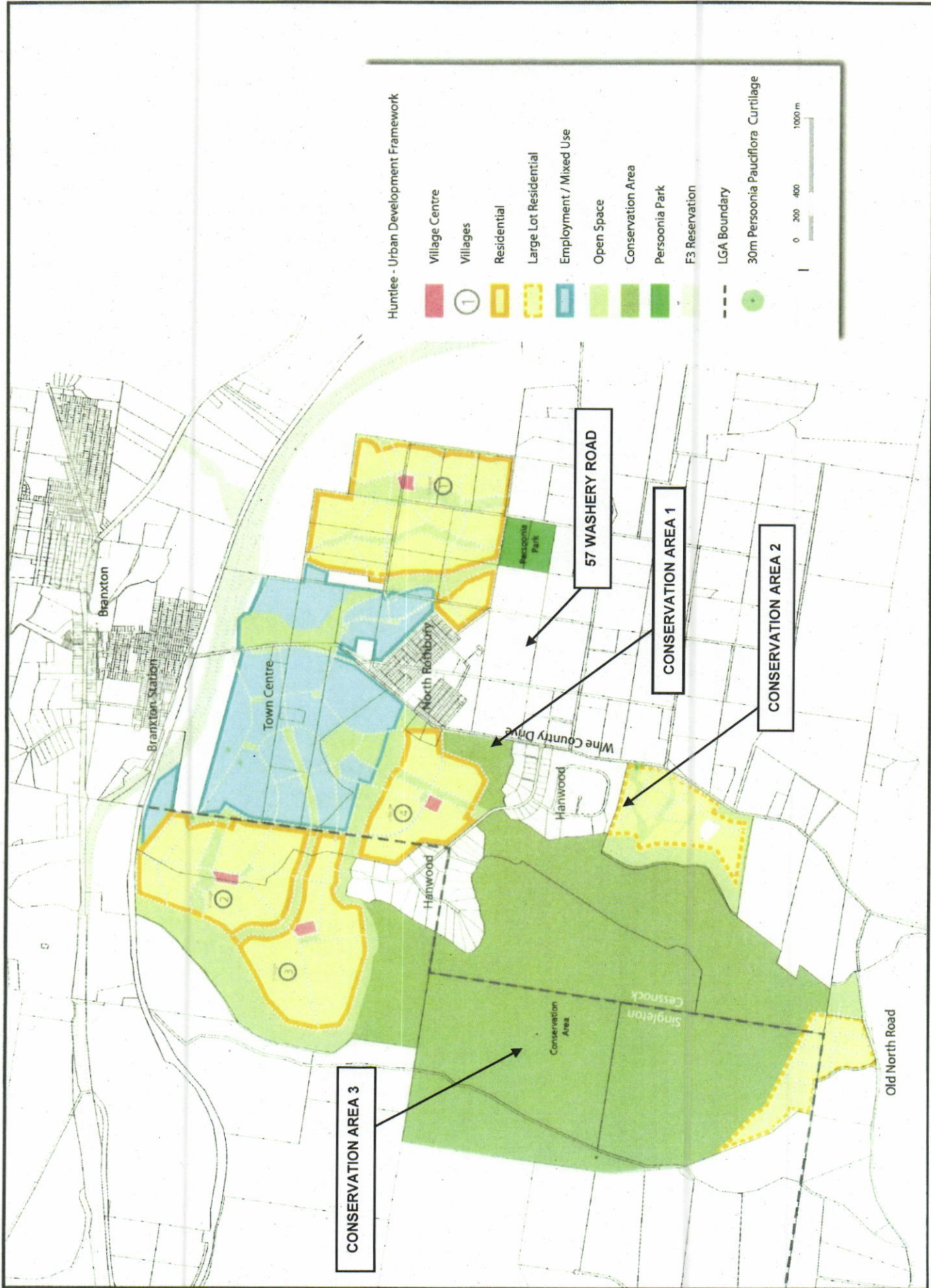
project area – means the area proposed for development and any adjacent or proximate open space, remnant bushland or conservation areas that form part of the proposed action.

successful propagation – means the individual plants involved being of measurable value to the long term conservation of the listed entity, with this value likely to be retained for 50 or 100 years without management input, that is, plants are established with very low risk that this value will diminish without active management (for the purposes of clarity, this meaning can be taken to include, but not be limited to, plants being self-sustaining in the wild, propagating from seed over successive generations). If further definition is required to implement the conditions it should be defined in a way that is consistent with the **Department's** EPBC Act policy statement: *Translocation of Listed Threatened Species – Assessment under Chapter 4 of the EPBC Act*.

Attached to these Conditions:

Annexure 1: Huntlee Project Area, identifying conservation areas for *Persoonia pauciflora*.

Annexure 1: Huntlee Project Area, identifying conservation areas for *Personia pauciflora* (map reproduced from Preliminary Documentation, October 2012, Figure 1-2: Huntlee Development Concept)



Appendix 2

Estimated Cost of Management Measures

Reference	Action	Yr 1	Yr 2	Yr 3	Yr 3	Yr 5	Yr 6	Yr 7	Yr 8-14	Yr 15-20	Yr 21-25	Total
Section 3.1	Phytophthora Management Program	\$500	\$50	\$50	\$50	\$50	\$50	\$50	\$50/ year	\$50/ year	\$50/ year	\$1,700
	Seed Collection In Situ Germination Trial Propagation Trial	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	Nil	Nil	Nil	Nil	Nil	\$50,000
	Wildlife Thoroughfares	\$2,500	\$2,500	\$50	\$50	\$50	\$50	\$50	\$50/ year	\$50/ year	\$50/ year	\$6,150
Section 3.2	Conservation Area 1 <ul style="list-style-type: none"> ▪ monitor & maintain existing fencing ▪ install interim rural fencing on northern & north-west boundary. (\$20LM¹ x 900m - approx) ▪ install chain link type fencing (\$60LM¹ x 2.3km) 	\$1000 \$18,000 (Supply and install Interim rural fence)	\$1000	\$1000	\$1000	\$1000	\$1000	\$1000	\$1,000/year	\$1000/year \$138,000 (supply and install chain link fence)	\$1,000/year	\$181,000
	Conservation Area 2 <ul style="list-style-type: none"> ▪ monitor & maintain fencing 	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500/ year	\$500/ year	\$500/ year	\$12,500
	Conservation Area 3 <ul style="list-style-type: none"> ▪ monitor & maintain fencing 	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000/year	\$3,000/year	\$3,000/year	\$75,000
	Persoonia Park <ul style="list-style-type: none"> ▪ monitor & maintain rural fencing ▪ install northern interface fencing (\$225LM¹ x 400m) 	\$1000	\$1000	\$1000	\$1000	\$1000	\$1000 \$45,000	\$1000 \$45,000	\$1,000/year	\$1,000/year	\$1,000/year	\$115,000
	57 Washery Road <ul style="list-style-type: none"> ▪ monitor & maintain fencing 	\$1000	\$1000	\$1000	\$1000	\$1000	\$1000	\$1000	\$1,000/year	\$1,000/year	\$1,000/year	\$25,000
Section 3.3	Community Engagement	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000/year	\$3,000/year	\$3,000/year	\$75,000
Section 4.0	Monitoring ²	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000/year	\$8,000/year	\$8,000/year	\$200,000
TOTAL												\$741,350

1 – This cost provision is for supply and install.

2 – This cost provision assumes external contractor will be used to complete these works.

Appendix 3

Pathogen Control Protocols

Phytophthora Management Program

As introduced plant pathogens, it must be assumed that Phytophthora (*Phytophthora cinnamomi*) is not present in bushland unless there is evidence to the contrary. These uninfected bushland sites need to be protected, as there are no known methods to eradicate or prevent the autonomous spread of Phytophthora from sites once they have become infested.

Disease mitigation options in bushland include hygiene protocols, the application of phosphonate, restriction of access to uninfected areas, the provision of educational resources, effective communication between land managers and land users.

Soil or mud on footwear, clothing, vehicles, tyres, equipment and tools, provides the ideal medium to spread plant pathogens. Hygiene protocols seek to limit the human assisted spread of plant pathogens.

Purpose

The purpose of this document is to ensure the plant pathogen Phytophthora does not become established in the Huntlee Conservation Lands which would pose a risk to *Persoonia pauciflora* and its habitat. To achieve this, this document provides a list of actions to prevent the introduction and spread of Phytophthora which will be distributed to contractors and staff entering and / or working within the Huntlee Conservation Lands.

This document will apply to any contractors accessing or working within the conservation lands. How this program will be applied will be dependent on the frequency of access, where the contractor or employee accesses the site from, and where within the conservation lands they access; for example known locations of *P. pauciflora*.

Identification

Phytophthora (*Phytophthora cinnamomi*)



Phytophthora species can invade the roots and crowns of woody trees but foliar symptoms may not become evident for months or even years. Leaves become pale green, wilted and fall readily. Shoots die back from

the tips so that eventually the tree is reduced to a bare framework of dying branches. Death of the tree may take from a few months to several years.

Feeder roots are black, decayed and few in number. As infected roots lose the ability to exclude salts, leaf margins in affected trees develop brown, necrotic symptoms typical of salt burn. Under severe waterlogging rapid decline of trees may occur. The leaves wilt and die, leaving a canopy of brown, dead leaves. A weeping stem canker may occur on the lower trunk

Zoospores (motile asexual spores) are important for the rapid spread of the pathogen. This occurs when free water is present in the soil or on aerial plant surfaces. *Phytophthora cinnamomi* is mostly soil-borne and can survive in infected roots under adverse conditions for several years. Infection is usually confined to the roots and lower trunk (DAFF 2013).

Disease/death of susceptible plant species - some plants are more susceptible to *Phytophthora* than others and these can be used as "indicator" species to detect the possible presence of *Phytophthora*. One of the most susceptible species is *Xanthorrhoea* (Greening Australia).

Resources

Recommended disinfectant products include:

- Non corrosive disinfectants include Coolacide®, Phytoclean® or Biogram® for cleaning footwear, tools, tyres, machinery and other items in contact with soil.
- **70% Methylated spirits in spray bottle for personal use.**
- Sodium Hypochlorite 1% is very effective but can damage clothing and degrades rapidly in light.

Recommended hygiene equipment includes:

- **Spray bottles**
- Large tubs for dipping footwear and tools
- **Scraper or coarse brush to remove mud.**

All persons accessing the Huntlee Conservation Areas are to ensure compliance with this process. The items marked in bold above will be made available to contractors who do not have their own kit.

Hygiene Protocols

Provide hygiene protocols to all new workers, contractors and volunteers during the site induction.

General vehicle, equipment, and clothing hygiene will apply in all cases with vehicles with a build-up mud, soil, and plant material. Huntlee Conservation Officer to determine which additional protocols will apply in each case.

A map of all known pathogen infection sites will be provided to all persons accessing the Conservation Areas and signage installed at access points to these areas identifying them as pathogen infection sites.

The below actions are developed from the *Phytophthora cinnamomi* within the Sydney Metropolitan Catchment Management Authority Area (Suddaby and Liew, 2008).

To prevent introduction of Phytophthora:

- Assume the area you are entering is free of plant pathogens unless otherwise tested and understand that your activities have the potential to introduce pathogens.
- **To avoid introducing infection, before entering un-infested sites remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant until runoff is clear.**
- Plan works so they begin in non- infested sites and then move on to infested areas.
- Do not import plants unless they are from nurseries accredited with Nursery Industry Accreditation Scheme (NIASA).
- Restrict movement of people, vehicles and equipment. It may be necessary to quarantine areas, either permanently or temporarily (for example when the soil is moist).
- Where possible avoid working in wet conditions. Restrict activities to times when dry soil conditions exist (generally from November – March). Postpone activities in wet weather.
- Travel only on designated roads and tracks. Avoid entering surrounding bushland.
- Use mulch sourced from disease free native trees and taken from at least one meter above ground level.
- Never import soil or gravel unless it is certified to be free of plant pathogens by a plant disease diagnostic laboratory.
- Restrict access in high value areas, particularly if autonomous spread is unlikely to occur.

To avoid spread of phytophthora from areas of infestation:

- To avoid spreading Plant Pathogens, when leaving infested sites remove excess soil and mud and then spray boots, tools, gloves and small equipment with methylated spirits or disinfectant until runoff is clear.
- On infested revegetation sites, plant species known to be resistant to Phytophthora.
- All vegetative materials stored on site must be in a bunded and then removed from a site and taken to landfill.
- Do not drive or park vehicles or trailers off established tracks.
- Use vehicle wash down stations when available.
- Ensure effluent from wash down stations does not drain into bushland.
- Use coloured tape to label tools when working in infested sites. Remove tape once tools have been cleaned.
- Where ever possible avoid work on a site if the soil is saturated and mud is likely to adhere to footwear and tools.
- Avoid unnecessary soil disturbance.

Responsibilities

It is the responsibility of Huntlee Pty Ltd to ensure all staff and contractors accessing the site understand their obligations regarding the Phytophthora Management Program.

It is the responsibility of the contractor to ensure all their staff are aware of their obligations regarding the Phytophthora Management Program and that all their staff abide by it.

It will be the responsibility of Huntlee Conservation Officer to periodically audit contractors and staff regarding compliance with the Phytophthora Management Program.

Reporting

Contractors are responsible for reporting any signs of infection by Phytophthora to the Huntlee Conservation Officer for verification.

To whom this document has been provided to, the audits undertaken, details of any non-conformance and occurrences of known infections will be provided in the Annual Monitoring Report.

References

Department of Agriculture, Fisheries, Forestry (DAFF), (2013). Phytophthora Root Rot (Fact Sheet).

<http://www.daff.qld.gov.au/plants/fruit-and-vegetables/a-z-list-of-horticultural-diseases-and-disorders/phytophthora-root-rot> Accessed on line on 1/12/2013

Suddaby, T., and Liew, E. (2003), *Phytophthora cinnamomi within the Sydney Metropolitan Catchment Management Authority Area*. Botanic Gardens Trust, Royal botanic gardens, Sydney.