

AGL Gloucester L E Pty Ltd

Seaham Property

Potential Land Acquisition

Ecological Values Report

July 2010



Alison Hunt and Associates Pty Ltd

TERRESTRIAL



MARINE



AQUATIC

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	Background	1
1.2	Gloucester Coal Seam Gas Project	1
2	METHODS	3
2.1	Site Assessment.....	3
3	SITE ATTRIBUTES	4
3.1	Environmental Setting	4
3.2	Seaham Property.....	4
3.2.1	Vegetation	4
3.2.2	Fauna Habitat	9
3.2.3	Conservation Significance.....	9
4	OFFSETS.....	12
4.1	Green Offsets	12
4.2	Biodiversity Banking and Offsets Scheme	13
4.3	Biodiversity Offset Strategy	14
4.4	Conservation Agreements.....	15
5	CONCLUSIONS.....	16
6	REFERENCE MATERIALS	17

LIST OF FIGURES

Figure 1	Location of the Seaham Property	2
Figure 2	LHCCREMS Vegetation Communities.....	5
Figure 3	Forest Ecosystems vegetation communities.....	6
Figure 4	Broad vegetation types across the site	8
Figure 5	Specific habitat features of the Seaham property.....	11

APPENDICES

Appendix A	Threatened Species Recorded within a 10 km radius of the Seaham property
Appendix B	Photographs
Appendix C	Seaham property. Incidental fauna records.

1 INTRODUCTION

1.1 Background

Alison Hunt & Associates Pty Ltd was commissioned by AGL Gloucester LE Pty Ltd (AGL) to undertake an ecological assessment of a 160 hectare (ha) (approximate) property at 750 East Seaham Road, Seaham (Lot 20 DP815759) in order to determine its likely ecological value in the event that potential work associated with Petroleum Exploration Licence (PEL) No. 285 requires the provision of an offset package (Figure 1).

This assessment was aimed at providing an overall assessment of the ecological values of the site from a constraints and opportunities perspective, and to provide a document to be used in discussions with government agencies. The Seaham property's suitability for any specific conservation plan was not assessed in detail but rather the findings from the on-site assessment were used to provide an idea of the applicability of the site for conservation and the direction that conservation plans could take should an offsets package be required as a condition of consent.

1.2 Gloucester Coal Seam Gas Project

The Gloucester Coal Seam Gas Project is comprised of:

- Stage 1 Gas Field Development Area (GFDA) is located east of Gloucester and Stratford and covers an area of approximately 50.33 km²;
- Central Processing Facilities (CPF) is proposed to be located adjacent to an existing rail loop near the south-east corner of the GFDA; and
- Gas Transmission Pipeline (pipeline) from the CPF to Hexham and would be approximately 95km long.

The construction of this project will require the removal of some vegetation and habitat. Whilst the GFDA and CPF are largely confined to previously cleared agricultural paddocks, the gas transmission pipeline extends 95 km from Stratford to Hexham, and the removal of some vegetation will be unavoidable. Likely impacts have been substantially reduced through the use of horizontal directional drilling to avoid sensitive receptors, including major creeks and rivers and the Hexham Swamp. Consequently, the majority of the vegetation and habitat to be impacted is along roadsides, powerline easements and through agricultural paddocks. Given that the proposed pipeline is a linear structure it passes through a diverse array of vegetation types, conditions and threatened species which provides challenges when considering options for compensatory habitat.



C:\GIS\AH Ecology\1109 AGL Offsets

0 7.5 15 22.5
Kilometres

Figure 1 | Site Locality
AH Ecology

2 METHODS

2.1 Site Assessment

This study was designed to provide a constraints and opportunities assessment of the Seaham property, in order to determine site values in relation to biodiversity and conservation.

Several tasks were addressed in this assessment including:

- A review of available literature and databases to assist with the identification of site values especially in relation to threatened species, populations and endangered ecological communities;
- Field investigations were undertaken on 28 and 29 September 2009, to ascertain the current site condition and the presence or likely presence of threatened or protected species. Key sections of the site were walked and notes on vegetation boundaries, vegetation types and condition, available fauna habitat and likely habitat for threatened species were noted. Incidental records of flora and fauna were also made; and
- An assessment as to the site's applicability for conservation.

3 SITE ATTRIBUTES

3.1 Environmental Setting

The Seaham property is located within the Lower Hunter Region, approximately 40 km north of Newcastle, 2.75 km north of East Seaham and 3.5 km south of Clarence Town. Williams River is the most substantial nearby river and it is situated 0.75 km north-west of the property. Karuah River is also located 16 km to the east and a number of smaller creeks and drainage lines also occur in the area. The northern boundary of the property borders the 2,780 ha Wallaroo National Park (created in July 2007) and the eastern boundary is separated from the Wallaroo National Park by less than 500 m. Wallaroo National Park was originally declared as a Nature Reserve in 1998 as an initiative of the Department of Forestry, and in 2007 was reclassified as a national park. Its conservation qualities include its location to the Williams River, a wooded area (predominately regrowth post-forestry activities) in a largely cleared landscape and the vegetation associations within its boundaries. Seaham Swamp Nature Reserve is also situated approximately 6 km to the south-west of the property. Seaham Swamp is an important habitat for water birds many of which are migratory.

Within a 10 km radius of the site, 33 fauna and 5 flora species listed as threatened under the NSW *Threatened Species Conservation Act 1995* (TSC Act) have been recorded and these are shown in Appendix A. The majority of these species have been recorded outside the Wallaroo National Park but this may reflect survey effort, rather than actual occurrence of species or availability of habitat.

3.2 Seaham Property

The Seaham Property varies from a gently undulating landscape adjacent to East Seaham Road to a steep escarpment in the south of the property. Soils appear shallow and become skeletal as the property slopes upwards. The property is currently operated as an Alpaca stud, but these activities are confined to around the house and adjacent paddocks. Photographs of the site are provided in Appendix B.

3.2.1 Vegetation

Broad scale mapping of the area undertaken as part of the Lower Hunter and Central Coast Regional Environmental Management Strategy (LHCCREMS) shows the vegetation communities across the property to consist of Hunter Valley Moist Forest, Hunter Valley Dry Rainforest and Seaham Spotted Gum Ironbark Forest (Figure 2). Forestry ecosystem mapping (NPWS 1999) shows likely vegetation communities to be dominated by South Coast Shrubby Grey Gum and Ironbark with smaller occurrences of Dry Foothills Spotted Gum, Swamp Mahogany, Smooth Barked Apple – Sydney Peppermint – Stringybark, Stringybark – Apple, Dry Heathy Blackbutt – Bloodwood and Rough-barked Apple (Figure 3).

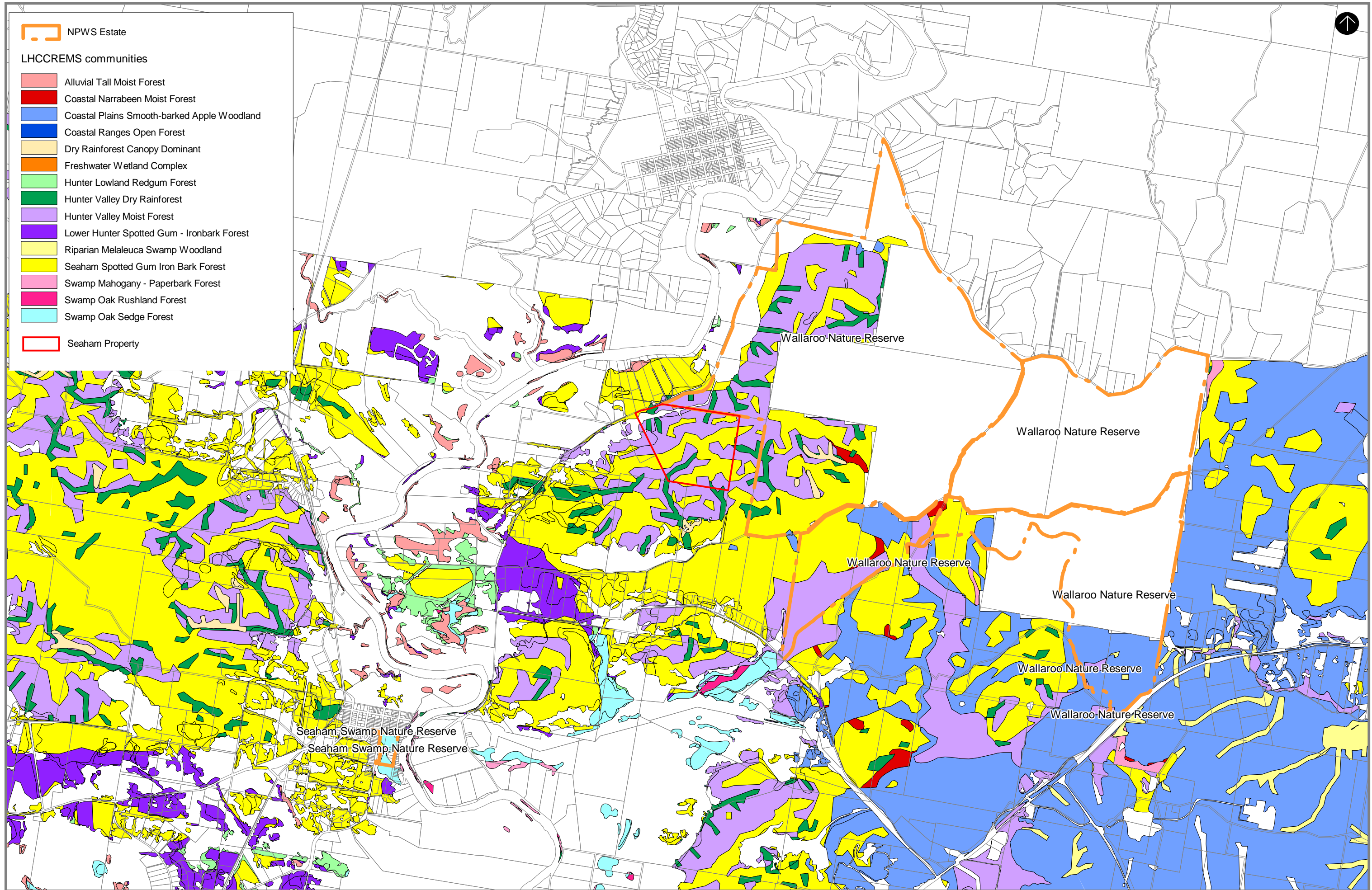


Figure 2 LHCCREMS Vegetation Communities

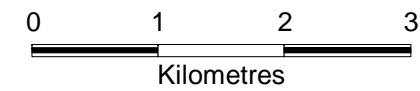
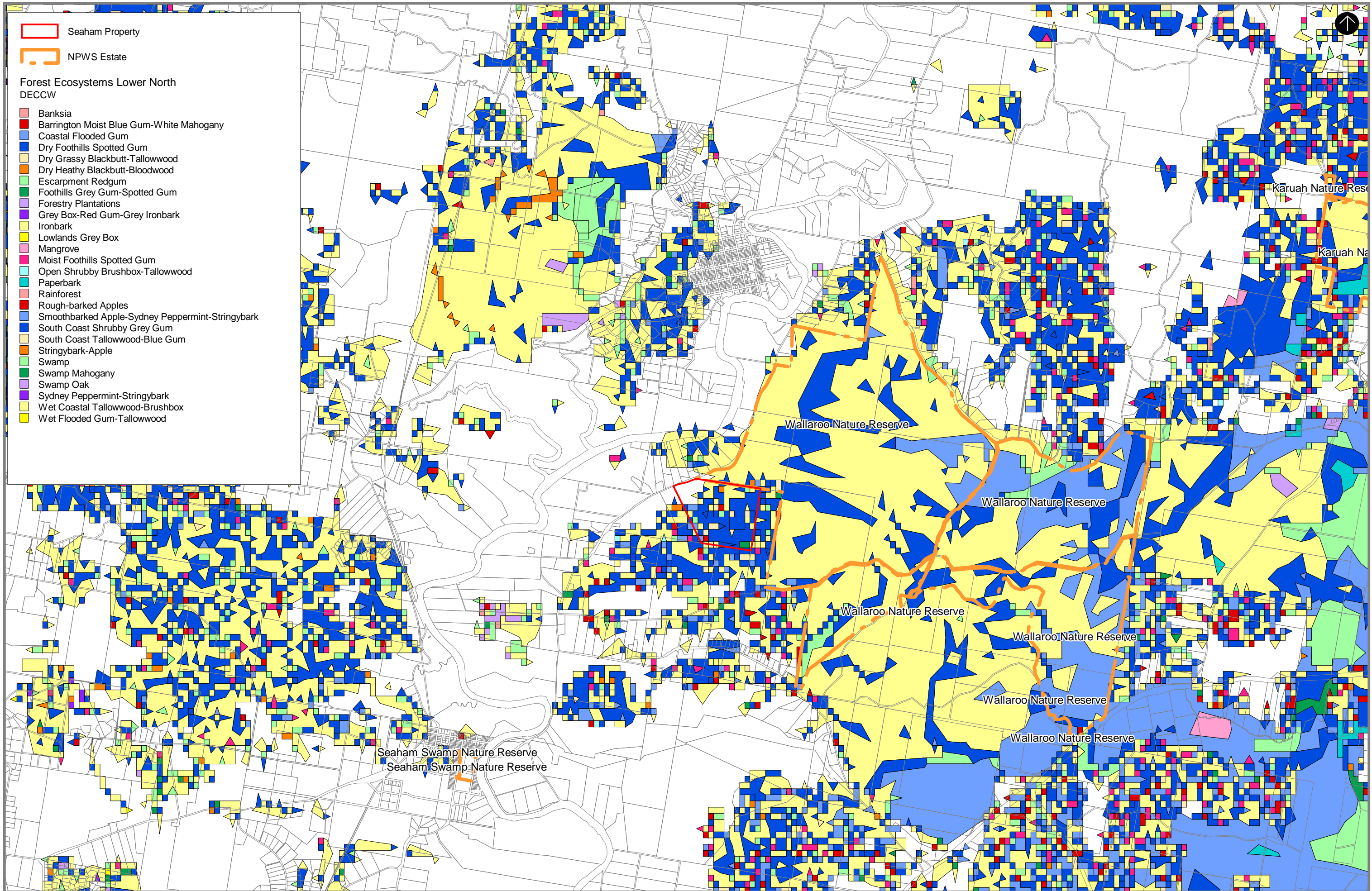


Figure 3 Forest Ecosystems vegetation communities

Northern Area

Ground-verification confirmed that the majority of the Seaham property is dominated by Spotted Gum woodland associations with several other tree species occurring with changes in aspect, drainage, slope and underlying geology and soils and these are shown in (Figure 4). Most vegetation appears to be well established regrowth and presumably the majority of the lower area has been cleared for agriculture in the past. The northern section of the site, below the escarpment slopes, has areas that are currently cleared, mostly in the north-east around the house and sheds, and along a powerline easement that traverses the northern sections of the property.

The lower slopes of the north-west of the property are dominated by Spotted Gum / Ironbark / Grey Gum woodland. The understorey varies from intact in areas that have not been recently grazed or cleared, to bare earth / leaf litter and / or introduced grasses. Small areas of other vegetation associations occur and these are mostly associated with drainage lines although a patch of Spotted Gum / Grey Box Woodland is an exception, with this Grey Box dominated vegetation type occurring on the slopes in the west of the site.

A drainage line also in the north-west is characterised by Spotted Gum / Broad-leaved White Mahogany / River She-oak Woodland. The three remaining drainage lines are vegetated with riparian forest typical of the area. These rocky dry drainage lines have their headwaters in the escarpment sections of the property and these would flow into the Williams River during rain events. A substantial farm dam is located in one of the paddocks in the north-west of the site. It is largely devoid of fringing or emergent vegetation and is surrounded by bare earth and grazing pastures.

Escarpment Area

A steep sandstone escarpment rises to 200 m above sea level, and approximately half of the property is located on these upper slopes. Whilst the majority of the escarpment slopes are vegetated, there are also large areas of scree and these are mostly bare. Spotted Gum also dominates the escarpment areas although in general vegetation associations differ from the lower slopes except at the south-east of the site where the escarpment slopes gently down to the south and once again Spotted Gum / Ironbark communities dominate.

The ridge of the escarpment is dominated by Spotted Gum / Smooth-barked Apple / Ironbark Forest except in a moister central area and this is characterised by Spotted Gum / Forest Red Gum / Black She-oak Forest. A small Dry Rainforest occurs along a well formed but dry drainage line. An area of Tanton / Flax-leaved Paperbark Forest dominates in a low-lying area behind the peak of the escarpment and this area merges into Spotted Gum / Ironbark vegetation types at the south-east of the property. There are two small dams which were created to provide watering points for stock when this section of the property was grazed. One of the dams has open water with fringing vegetation whilst the other is dominated with emergent vegetation.

On the escarpment areas, vegetation communities are largely intact and few weeds, apart from occasional instances along the dirt track which transects the escarpment area in an easterly direction. Weeds become more problematic on the north-east boundary where the track passes from the site into the Wallaroo National Park.

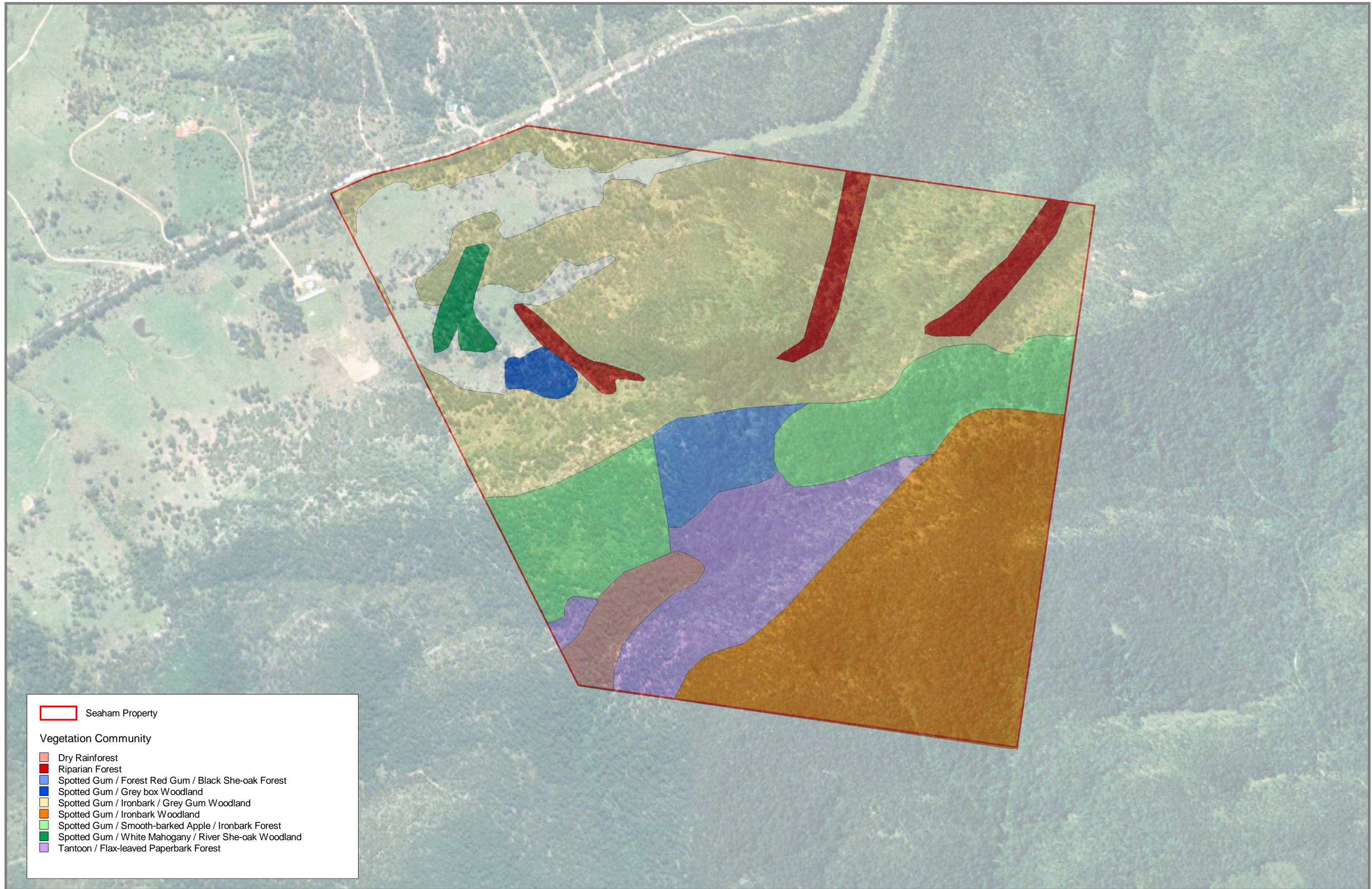


Figure 4 Broad vegetation communities across the site

3.2.2 Fauna Habitat

The property supports an array of fauna habitat, ranging from grazing land for macropods, rocky areas and scree slopes which are ideal for reptiles and some small mammals, large tracts of woodland and forest for birds, arboreal mammals and microchiropteran bats, with dams providing waterbird, amphibian and other aquatic fauna habitat. Specific habitat features of the site are shown in Figure 5. As it is contiguous with large tracts of intact vegetation in the neighbouring Wallaroo National Park, this site would provide potential habitat for species that require large home ranges (e.g. Powerful Owl and Yellow-bellied Gliders) as well as an array of species with a number of habitat requirements. On the day of assessment, incidental records of fauna included the Eastern Dwarf Tree Frog, Lace Monitor, Common Brushtail Possum, Red-necked Wallaby, European Rabbit and 28 bird species. A complete list of these is provided in Appendix C.

3.2.3 Conservation Significance

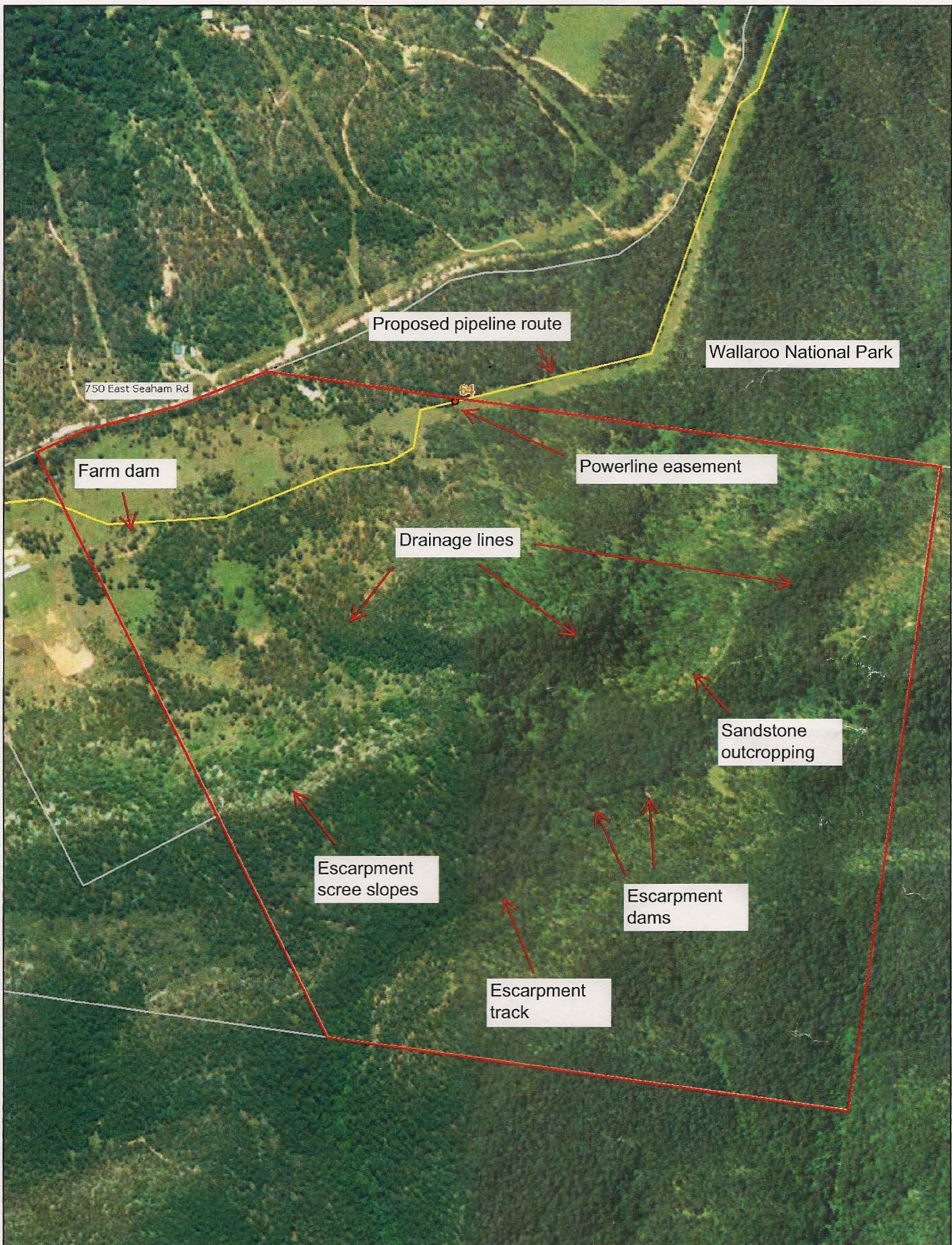
The conservation significance of a property is largely dependent on whether it contains:

- Intact vegetation types;
- An array of vegetation types;
- An array of fauna and or fauna habitat;
- Is contiguous with larger tracts of vegetation;
- Provides a corridor to enhance movement through a landscape; and
- Communities, populations and or species listed as threatened under State and Commonwealth vegetation.

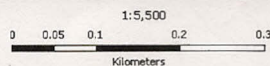
Although this property has largely been cleared in the past it now contains around nine vegetation associations mostly comprised of approximately 20 year old regrowth. These associations are largely weed-free, especially on the escarpment area, and mostly intact. The site is well connected and well placed within the landscape. It is adjacent to the Wallaroo National Park and is nearby to the Williams River with Karuah River 16 km to the east. There is the potential that this property may contain areas of the endangered ecological community (EEC) *Lower Hunter Spotted Gum - Ironbark Forest in the Sydney Basin Bioregion* although this would need to be confirmed with more detailed vegetation assessment and further consultation with Department of Environment, Climate Change and Water (DECCW) regarding the outcomes of vegetation mapping currently being undertaken in the area (Lawrence Penman, NPWS, pers. com.). The site has the potential to support an array of fauna as the property has a number of fauna habitats conducive to a relatively wide range of fauna, especially given that it is adjacent to a national park.

Of the five threatened flora species recorded within 10 km of the site (Appendix A), the property provides potential habitat for Slaty Red Gum, Small-flower Grevillea, Tall Knotweed and Black-eyed Susan. Thirty three fauna species have been recorded within a 10 km radius and there are records for Koala, Little Bentwing-bat, Eastern Bentwing-bat, Powerful Owl, Spotted-tailed Quoll, Grey-crowned Babbler and Glossy Black-cockatoo on or near to the property. There is potential habitat available for another 16 species, and these include Bush Stone-Curlew, Eastern Pygmy-possum, Brown

Treecreeper, Eastern False Pipistrelle, Golden-tipped Bat, Swift Parrot, Eastern Freetail-bat, Southern Myotis, Barking Owl, Yellow-bellied Glider, Squirrel Glider, Brush-tailed Phascogale, Grey-headed Flying-fox, Speckled Warbler, Greater Broad-nosed Bat and Regent Honeyeater.



Revision E; DRAFT
 Created 29 July 2009
 Author Upstream Gas



Map Grid of Australia, Zone 56
 Geocentric Datum of Australia 1994

Gloucester Coal Seam Gas Project

Figure 5 Specific habitat features of the Seaham property

4 OFFSETS

4.1 Green Offsets

Whilst losses of biodiversity should be avoided where possible, complete loss is sometimes unavoidable and consequently, 'offsets' can be provided as compensatory habitat. Conservation of biodiversity on privately owned lands with secure tenure can provide a valuable adjunct to conservation of biodiversity in protected areas such as national parks and reserves, as State funds and resources to purchase and manage such areas is limited.

The EPA (2002) provides guidelines for the operation and implementation of 'green offsets' as a trade-off for biodiversity losses as a consequence of development. The Green Offsets concept paper defines:

A green offset is an action taken outside a development site (but near to it) that reduces pollution or environmental impacts. The developers either take the action themselves or pay for others to do it on their behalf.

A green offset scheme ensures that there is a net environmental improvement as a result of development. Any additional environmental impact that is generated by a development is offset by action taken off-site that reduces a greater amount of environmental impact, so the net effect of development is positive.

The principles of green offsets as outlined by the concept paper are:

- Environmental impacts must be avoided first by using all cost-effective prevention and mitigation measures. Offsets are then only used to address remaining environmental impacts;
- All standard regulatory requirements must still be met;
- Offsets must never reward ongoing poor environmental performance;
- Offsets will complement other government programs; and
- Offsets must result in a net environmental improvement.

Offsets should be:

- Enduring – they must offset the impact of the development for the period that the impact occurs;
- Quantifiable – the impacts and benefits must be reliably estimated;
- Targeted – they must offset the impacts on a 'like for like or better' basis;
- Located appropriately – they must offset the impact in the same area;
- Supplementary – beyond existing requirements and not already being funded under another scheme; and

- Enforceable – through development consent conditions, licence conditions, covenants or a contract.

The EPA (2002) provides examples of offset actions for native vegetation clearing and these include:

- Fencing off an area of bushland to exclude sheep for most of the year;
- Encouraging bushland to regenerate by controlling weeds;
- Planting or regenerating locally indigenous trees, shrubs and grasses in order to link isolated patches of bush;
- Planting trees on previously cleared land; and
- Entering into a conservation agreement, property agreement or covenant to protect vegetation including areas of vegetation in the conservation reserve system.

There are several legal mechanisms by which green offsets can be provided and some which are likely to be applicable to this project are discussed below:

4.2 Biodiversity Banking and Offsets Scheme

Biodiversity Banking and Offsets Scheme (Biobanking Scheme) was established in order to give landowners a financial incentive to protect biodiversity on their properties. This scheme favours properties that contain endangered ecological communities, endangered populations and / or threatened species. However, the biobank site does not need to be pristine as ongoing management actions to improve the condition of the site are required to be undertaken. Reporting and management costs would be funded through the Total Fund Deposit on a yearly basis at an agreed rate.

Once a biobank site has been established and the owner granted biodiversity credits, these can then be sold to a developer who may be required to purchase them to offset the impact of their development. The benefit for the developer is that once they have purchased the credits they no longer have a responsibility to manage or monitor the land. If the Seaham property was purchased by AGL and set up as a Biobanking site, then AGL would be both the 'owner' of the biobank site and 'developer' meaning that AGL would have ongoing responsibilities associated with Biobanking management of the site. However, undertaking the agreed management actions for the site could be out-sourced, although the ultimate responsibility for overseeing these management actions would once again remain with AGL in perpetuity.

The credits created by each biobank site will vary, as each site has different vegetation types, conditions and threatened species and the credits required to be purchased to offset an impact will also vary depending on vegetation types, conditions and threatened species across the development area. Given that the proposed pipeline is a linear structure that passes through a diverse array of vegetation types of varying condition and adjacent to or through habitat for a range of threatened species, it is unlikely that the Seaham property could provide all of the ecosystem and species credits required to be purchased to offset the impacts should Biobanking be pursued. At best this property would possibly account for some of the credits required (predominately species credits) and it is likely

that other credits would need to be sourced from other landowners that have lodged an expression of interest on the Biobank website.

4.3 Biodiversity Offset Strategy

Conditions of Consent may include a requirement to develop a Biodiversity Offset Strategy to provide compensation for unavoidable impacts. Such a strategy aims to achieve a neutral or net beneficial biodiversity outcome for the region as a result of a project. DECCW (2010) lists 13 guiding principles for developing biodiversity offsets and these are:

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

These guidelines may typically be achieved in a number of ways including securing remnant native vegetation protection through covenants, or other equivalent legal mechanisms, strategic revegetation for threatened species and communities and / or investment in management research relating to rehabilitation and protection of threatened communities or threatened species. Whilst credits could be bought under the Biobanking Scheme as a part of an offset strategy, compensatory habitat can be provided by other legal mechanisms, such as a Conservation Agreement. Although the Seaham property is unlikely to provide all of the credits which could be required under the Biobank Scheme, it could nonetheless potentially comprise a substantial component of a Biodiversity Offset Strategy, should one be required. It is likely that other inputs would also be required, perhaps in the form of revegetation and management of vegetation types which may be impacted by the pipeline but which do not occur on the Seaham property.

4.4 Conservation Agreements

The requirement to provide compensatory habitat could be provided by securing the Seaham property under a permanent conservation agreement with the Minister for DECCW under the NSW *National Parks and Wildlife Act 1974*. Conservation agreements are used to permanently protect land for its overall biodiversity value, unlike a Biobanking agreement which is focussed on protecting endangered ecological communities and threatened species and their habitat. An agreement is registered on the title of the land, runs with the land, and therefore binds future owners of the land. Agreements operate in perpetuity, unless the agreement specifies otherwise, or it is terminated with the consent of all parties. The Minister can also unilaterally terminate an agreement if it is no longer effective. These agreements are legally enforceable and statutory authorities cannot develop land covered by a conservation agreement without the Environment Minister's agreement. The conservation agreement is entered on a public register.

5 CONCLUSIONS

The conservation traits of the adjacent Wallaroo National Park include its location to the Williams River, a wooded area (predominately regrowth post-forestry activities) in a largely cleared landscape and the vegetation associations within its boundaries.

The majority of the 160 ha Seaham property shares these values. The Seaham property has approximately nine vegetation associations, many of which are intact especially on the escarpment, and a range of fauna habitat including exposed rocks and scree slopes, woodland areas, dams and drainage channels over a range of elevations. Seven species of threatened fauna have been recorded close to the site and there is potential habitat for another 19 fauna species and 4 plant species. The site is well placed within the landscape to link the Williams River with sections of Wallaroo National Park and provides stepping stone links between the Seaham Swamp Nature Reserve, and Karuah Nature Reserve and Karuah River in a much depleted landscape.

Placing this property under secure tenure as a privately owned conservation area would effectively expand the Wallaroo National Park by approximately 150 ha. It would also have the benefit of providing a buffer to the park on the northern and eastern boundaries. However, it is unlikely to provide additional vegetation or habitat types already conserved within the Wallaroo National Park. Consequently, rather than providing additional assets it would expand on the resources already available in the area.

The potential for AGL to enter into a biobanking agreement using the Seaham property as a biobank site to offset biodiversity losses associated with the Gloucester Coal Seam Gas Project is likely to be limited. Ecosystem and species credits would not necessarily be an adequate match for those required, due to the array of vegetation types and habitats traversed by the proposed pipeline. The property may be more effectively used as compensatory habitat as a part of a Biodiversity Offset Strategy which may be required as a condition of consent.

6 REFERENCE MATERIALS

AECOM 2009 **Gloucester Coal Seam Gas Project. Ecological Assessment. Gloucester to Hexham.** Report prepared for AGL, Gloucester NSW.

Alison Hunt and Associates Pty Ltd 2009 **Gloucester Coal Seam Gas Project. Addendum Ecological Assessment. Gloucester to Hexham Amended Sections.** Prepared for AECOM, Pymble.

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DECC 2005 **Threatened Species Profiles.** Department of Environment and Climate Change, Hurstville. <http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>

DECCW 2009 **Threatened Species Database Records.** Department of Environment and Conservation, Hurstville. Accessed 15 September 2009.

DECCW 2009 **Guide to Establishing a Biobank Site.** Department of Environment and Climate Change and Water, Hurstville.

DECCW 2010 **Principles for the Use of Biodiversity Offsets in NSW.** Department of Environment and Climate Change and Water, Hurstville.
<http://www.environment.nsw.gov.au/biocertification/offsets.htm>

Environmental Protection Authority 2002 **Green Offsets for Sustainable Development. Concept Paper.** Environmental Protection Authority, Sydney

NPWS 1999 **Forest Ecosystem Classification and Mapping of the Upper and Lower North East Comprehensive Regional Assessment (CRA) regions.** CRA Unit, Northern Zone National Parks and Wildlife Service.

Pizzey G & Knight F 2001 **The Field Guide to the Birds of Australia.** Harper Collins Publishers Pty Ltd, Sydney.

Robinson L 2003 **Field Guide to the Native Plants of Sydney.** Kangaroo Press, Pymble.

APPENDIX A

THREATENED SPECIES RECORDED WITHIN A 10 KM RADIUS OF THE SEAHAM PROPERTY

SCIENTIFIC NAME	COMMON NAME	STATUS
FLORA		
<i>Tetradlea juncea</i>	Black-eyed Susan	V
<i>Angophora inopinata</i>	Charmhaven Apple	V
<i>Eucalyptus glauca</i>	Slaty Red Gum	V
<i>Persicaria elatior</i>	Tall Knotweed	V
<i>Grevillea parviflora subsp. parviflora</i>	Small-flower Grevillea	V
FAUNA		
<i>Litoria aurea</i>	Green and Golden Bell Frog	E1
<i>Anseranas semipalmata</i>	Magpie Goose	V
<i>Botaurus poiciloptilus</i>	Australasian Bittern	V
<i>Ixobrychus flavicollis</i>	Black Bittern	V
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1
<i>Irediparra gallinacea</i>	Comb-crested Jacana	V
<i>Burhinus grallarius</i>	Bush Stone-curlew	E1
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V
<i>Glossopsitta pusilla</i>	Little Lorikeet	V
<i>Lathamus discolor</i>	Swift Parrot	E1
<i>Neophema pulchella</i>	Turquoise Parrot	V
<i>Ninox connivens</i>	Barking Owl	V
<i>Ninox strenua</i>	Powerful Owl	V
<i>Tyto capensis</i>	Grass Owl	V
<i>Climacteris picumnus</i>	Brown Treecreeper	V
<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	V
<i>Xanthomyza phrygia</i>	Regent Honeyeater	E1
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V
<i>Phascolarctos cinereus</i>	Koala	V
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V
<i>Petaurus australis</i>	Yellow-bellied Glider	V
<i>Petaurus norfolcensis</i>	Squirrel Glider	V
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V
<i>Kerivoula papuensis</i>	Golden-tipped Bat	V
<i>Miniopterus australis</i>	Little Bentwing-bat	V
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V
<i>Myotis macropus</i>	Southern Myotis	V
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V
DECCW Threatened Species Database Records. Accessed 15 September 2009.		
Status = Threatened species listed under the NSW TSC Act 1995		

APPENDIX B

PHOTOGRAPHS



Typical Spotted Gum / Ironbark /
Grey Gum Woodland



Farm dam in north-west of the
property



Typical drainage line vegetation



Tantoon / Flax-leaved Paperbark Forest on escarpment



Scree slopes of escarpment face



Track that transects the escarpment area

APPENDIX C

SEAHAM PROPERTY INCIDENTAL FAUNA RECORDS

September 2009

Key

A - indicates species listed under the Commonwealth EPBC Act 1999.

B - indicates species listed under the NSW TSC Act 1995.

F - migratory Family listed under the Commonwealth EPBC Act 1999.

A	B	Common Name	Family / Scientific Name	Method of Detection
		MAMMALS		
			Phalangeridae	
		Common Brushtail Possum	<i>Trichosurus vulpecula</i>	Scat
			Macropodidae	
		Red-necked Wallaby	<i>Macropus rufogriseus</i>	Observed
		BIRDS		
F			Anatidae	
		Pacific Black Duck	<i>Anas superciliosa</i>	Observed
F			Charadriidae	
		Masked Lapwing	<i>Vanellus miles</i>	Observed / heard
F			Accipitridae	
		Wedge-tailed Eagle	<i>Aquila audax</i>	Observed
			Columbidae	
		Wonga Pigeon	<i>Leucosarcia melanoleuca</i>	Observed
			Psittacidae	
		Australian King Parrot	<i>Alisterus scapularis</i>	Observed / heard
			Cuculidae	
		Fan-tailed Cuckoo	<i>Cuculus flabelliformis</i>	Heard
			Halcyonidae	
		Laughing Kookaburra	<i>Dacelo naxaeguineae</i>	Observed / heard
			Climacteridae	
		White-throated Treecreeper	<i>Cormobates leucophaeus</i>	Observed / heard
			Maluridae	
		Superb Fairy-wren	<i>Malurus cyaneus</i>	Observed / heard
			Pardalotidae	
		Spotted Pardalote	<i>Pardalotus punctatus</i>	Heard
			Acanthizidae	
		White-throated Gerygone	<i>Gerygone olivacea</i>	Heard
			Meliphagidae	
		Noisy Friarbird	<i>Philemon corniculatus</i>	Heard
		Noisy Miner	<i>Manorina melanocephala</i>	Observed / heard
		Lewin's Honeyeater	<i>Meliphaga lewinii</i>	Heard
		Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	Observed / heard
		Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	Observed / heard
			Orthonychidae	
		Eastern Whipbird	<i>Psophodes olivaceus</i>	Heard
			Pachycephalidae	
		Grey Shrike-thrush	<i>Colluricincla harmonica</i>	Observed / heard
		Rufous Whistler	<i>Pachycephala rufiventris</i>	
			Dicruridae	
		Willie Wagtail	<i>Rhipidura leucophrys</i>	Observed / heard
		Flycatcher	<i>Myiagra sp.</i>	Observed / heard
		Magpie Lark	<i>Grallina cyanoleuca</i>	Heard

A	B	Common Name	Family / Scientific Name	Method of Detection
			Oriolidae	
		Olive-backed Oriole	<i>Oriolus sagittatus</i>	
			Campephagidae	
		Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	
			Artamidae	
		Pied Butcherbird	<i>Cracticus nigrogularis</i>	Observed / heard
		Australian Magpie	<i>Gymnorhina tibicen</i>	Observed
		Pied Currawong	<i>Strepera graculina</i>	Observed / heard
			Corvidae	
		Australian Raven	<i>Corvus coronoides</i>	Observed / heard
		REPTILES		
			Varanidae	
		Lace Monitor	<i>Varanus varius</i>	Observed
		AMPHIBIANS		
			Hylidae	
		Eastern Dwarf Tree Frog	<i>Litoria fallax</i>	Observed / heard



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