Tillegra Land Use and Management Plan

Final Draft Report for Exhibition

Prepared in association with City Plan Strategy & Development and Robertson and Robertson Consulting Valuers

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Final Draft Report for Exhibition

Client: Hunter Water Corporation

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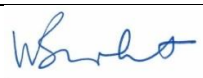
Progress Report	Vince Berkhout Technical Director	
Final Draft Strategy	Vince Berkhout Technical Director	

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1.0 Introduction

Since the 1980s, Hunter Water Corporation (HWC) acquired a number of properties totalling 6,239 hectares in the Williams River valley north of Dungog as part of its plans for the construction of the Tillegra Dam.

In 2010, following a Part 3A application to the NSW Government for the dam, the Minister for Planning decided that the dam proposal should not proceed. As a consequence of that decision, HWC is reviewing the landholdings acquired, and decided to prepare a land use strategy for those landholdings.

HWC engaged AECOM (in conjunction with City Plan Strategy and Development, and Robertson & Robertson) to prepare this Land Use and Management Plan.

The subject properties (the Study Area), located in Tillegra, Munni and Underbank, comprise around 144 lots and a range of agricultural uses including grazing, dairy, beef cattle farming. There are 29 rural dwellings of varying condition.

The context of these properties is a predominantly agricultural economy around dairy, beef, poultry and timber. In addition, there is a growing interest in the area for recreation and tourism principally based around the natural features and wilderness areas within the broader environment, including Barrington Tops National Park and World Heritage site that is located in close proximity to the Study Area.

1.1 Project objectives

The objectives of the project are:

- To identify existing and future land uses on the HWC Tillegra landholdings that are generally consistent with the intent of the Dungog Local Environmental Plan 2006 (LEP 2006), Draft Dungog Local Environmental Plan 2013 (LEP 2013) and the Hunter Special Area requirements; and
- To identify cost effective opportunities to add value to HWC's Tillegra landholdings taking into consideration any benefits for the local and regional community.

1.2 Project scope

The project brief issued by Hunter Water required the following tasks to be undertaken:

Review of Information

A review of land use information relevant to the Corporations Tillegra landholding has been conducted considering:

- Government Policies
- Environmental Planning Instruments (EPI's)
- Regional and local land use strategies
- Dwelling entitlements
- Easements
- Existing and surrounding land use
- Land use capability
- Land classification
- Environmental constraints and site characteristics
- Heritage and culture
- Infrastructure
- Capital improvements
- Indicative value of water licences

Consultation

Consultation has been conducted with a range of stakeholders including government agencies, community and tenants, including:

- Dungog Shire Council
- Government agencies – Primary Industries, NSW Fisheries, Catchment Management Authority, Office of Environment and Heritage, Office of Water, Department of Planning and Infrastructure.
- Landowners and tenants
- Other stakeholders – Dungog Business Chamber, Water Users Association, local community groups
- Karuah Local Aboriginal Land Council

SWOT Analysis

An analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT) for the Tillegra landholdings has been prepared having regard to the findings of the review of information, and following feedback from community and other stakeholders.

Value Adding Strategy

Building on the findings of the review of information and SWOT analysis, opportunities to add value to the landholdings have been identified with regard to:

- Opportunities for land portfolio diversification having consideration to demand drivers for agricultural production, rural living, biodiversity offsets, eco-tourism and the like
- Boundary adjustments
- Rationalisation of easements including access/ right of ways
- Water licences (constraints or opportunities)
- Any capital improvements that have a high potential to increase value

Under the brief, the shortlisted options identified were to be generally consistent with the existing and proposed planning provisions of Dungog Shire Council LEP. Any alternative strategies proposed must demonstrate that:

- There are good prospects to achieve the stated project objectives
- Potential benefits for the Corporation and the community significantly outweigh the anticipated costs

1.3 Approach

1.3.1 Land use opportunities identification and evaluation

The identification and evaluation of land use opportunities for the Study Area has involved consideration of the following key matters:

- Existing statutory and strategic planning framework – demonstrating consistency with existing strategies in Dungog and relevant development controls
- Site and contextual analysis – strategic analysis of key site characteristics
- SWOT analysis – addressing the key strengths, weaknesses, opportunities and constraints that the site provides
- The potential for various cost effective land use opportunities to add value to the landholdings

This Strategy presents the results of the review of background information, provides an understanding of the site characteristics and context, and assesses its potential for future land uses through a SWOT analysis.

Input from a property valuer has been obtained to analyse the land economics and feasibility issues associated with the land use opportunities to inform the Draft Land Use and Management Strategy.

The project process is illustrated in Figure 1.

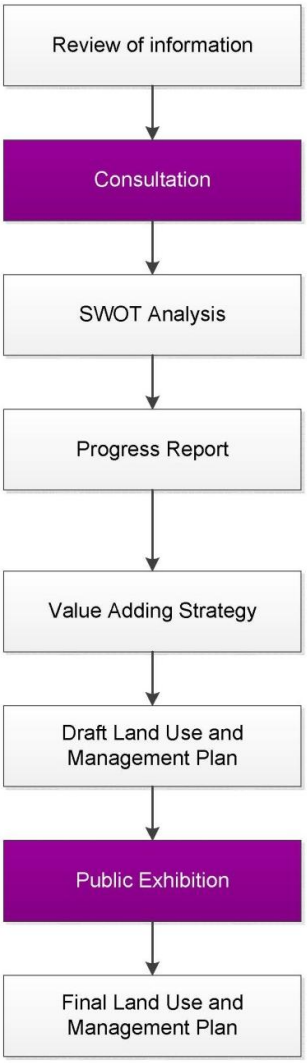


Figure 1 Land Use and Management Plan Process

1.3.2 Project objectives and assessment criteria

Each land use opportunity has been assessed against the following criteria that reflect the objectives of the study:

- Are consistent with the intent of relevant planning legislation and strategies
- Are cost effective and add value to the landholdings
- Benefit the local and regional community

1.4 Project Timing

The timeline for the project is as follows:

- Stakeholder, community and landowner workshops – February to March 2013
- Project fact sheet and questionnaire distributed – March 2013
- Community questionnaire responses – March to August 2013
- Stakeholder consultation report – April 2013
- Project progress report – June 2013
- Draft Land Use and Management Plan – July 2013
- Presentation to Hunter Water Corporation Board – August 2013
- Public exhibition – September 2013
- Community consultation feedback report – September 2013
- Final plan submitted to Hunter Water for review – September 2013
- Plan finalised by Hunter Water – October 2013

2.0 Study Area context and characteristics

2.1 Context

The Tillegra Valley is located in the Dungog Shire Council in the Hunter Region. The land acquired by HWC for the Tillegra Dam is known as the 'Study Area' and is depicted within its context in Figure 2. The Dungog Shire is located inland and to the north of Newcastle in the Hunter Region of NSW, and comprises a total area of approximately 2,265 km². The Shire's largest population centre is the township of Dungog which is about 10km from the Study Area.

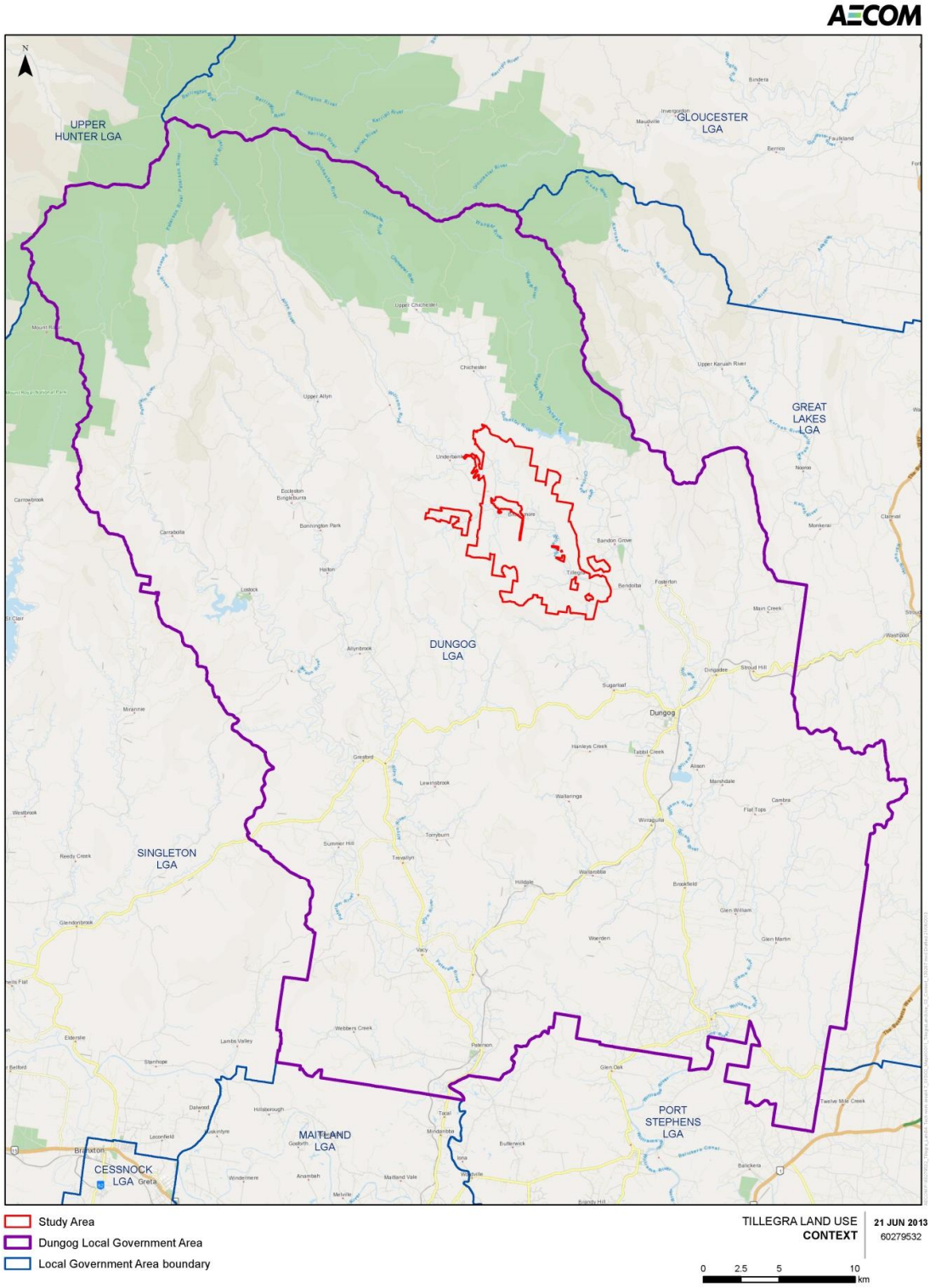
To the north of the Shire is the Barrington Tops plateau. From the mountains the Shire comprises steep and hilly country that becomes less rugged toward its southern fringe.

The landform typically consists of cleared rural land, a significant proportion of forested land, including National Parks and State Forests; and small settlements and villages. The Shire contains two main rivers, the Williams to the east and the Paterson to the west, both of which traverse the Shire in a generally north-west to south-east direction.

Some of the Shire's major industries include dairy, beef, poultry, and timber. There is also a growing tourism industry, centred mainly on recreation within the natural landscape and wilderness areas. Aside from agriculture major employers are education and training, retailing, healthcare and social administration. Small business (i.e. those employing less than four people) dominates the business community and provides the majority of local employment (Dungog Shire Council, 2008).

In recent years the quality and range of rural land and rural residential lots in the southern part of the Shire, with its proximity to Newcastle, Maitland and Raymond Terrace has been the major attractor of population growth and the dominant land development market in the Shire. Notwithstanding, the Shire has a small population of approximately 8,318 with Dungog township as the largest town (Dungog Shire Council, 2008).

Figure 2 Study Area location and context



2.2 Study Area description

The Study Area is located in the Tillegra Valley a rural area located approximately 15km from the town of Dungog within the Dungog Local Government Area. The Study Area is approximately 225km from Sydney, 80 km from Newcastle and 80 km from the Hunter Valley Wine Country.

Figure 3 depicts the Study Area which is owned by HWC. It is bounded to the north by the Barrington Tops National Park and surrounded on all other sides by agricultural land. The most direct road access is via Salisbury Road which connects the Study Area to the town of Dungog approximately 10km to the south-east. Existing roads are narrow (rural standard) and many are unsealed.

The Study Area is approximately 6,239 hectares in size with 144 lots. Figure 4depicts the lots subdivision pattern in the following area categories:

- 0 – 10 hectares (44 lots)
- 10 – 60 hectares (66 lots)
- 60 – 100 hectares (20 lots)
- 100 + hectares (14 lots)

There are approximately 32 buildings of which 29 are dwellings. The buildings are located predominantly adjacent to the road network, as illustrated at Figure 5. Many lots within the Study Area do not contain dwellings and are leased for agriculture.

The Study Area consists of predominantly cleared agricultural land used for general grazing and dairy pasture with scattered trees and some areas of remnant vegetation.

Much of the remnant vegetation, including riparian vegetation, has been heavily grazed and the understorey is greatly reduced in many areas and/or infested with weeds, particularly lantana.

Large areas of bushland are contained in reserves and State forests within 15 km to the north, north-east and east of the Study Area, including the Barrington Tops National Park, Chichester State Forest, Fosterton State Forest, Black Bulga State Conservation Area, Killarney Nature Reserve and Monkerai Nature Reserve.

The Study Area is located within the Williams River Catchment, a sub-catchment of the Hunter River catchment. The Williams River flows through the Study Area, along with four of its tributary creeks (Quart Pot Creek, Black Camp Creek, Sheep Station Creek and Native Dog Creek) and numerous smaller unnamed tributaries and drainage lines. The Chichester River joins the Williams River near Bandon Grove, approximately 3 km south-east of the Study Area. The Williams River rises on the southern slopes of the Barrington Tops and flows generally southeast and south until its confluence with the Hunter River. Approximately one third of the Williams River is contained within the Study Area, it provides 60% of the drinking water for Newcastle. The undulating terrain contains several natural springs.

2.3 Socio-economic profile

The Study Area currently holds a relatively small population. Dungog Shire has a population of approximately 8,318 persons (ABS, 2011) which has slightly declined since the population recorded in 2006 of 8,403 persons (ABS, 2006).

There are approximately 3,897 people in the labour force with 57% employed full time; 32% employed part-time and 4% unemployed (ABS, 2011).

The median age is 44 years which is well above the Sydney average of 36 years (ABS 2011). ‘Couples without children’ is the dominant family type with approximately 90% of the population born in Australia. The most common ancestries is Australian 35.4%, English 33.5%, Irish 8.8%, Scottish 7.6% and German 4.0% (ABS, 2011). The predominant age group in Dungog Shire is the 30–39 years grouping followed by the 40–49 years and 50–59 years groupings.

The Shire is projected to experience a significant increase in the proportion of its elderly population over the next two decades and a significant decline in the younger age brackets exacerbated by continued outflow of young adults and a slowing of immigration of families with children (Dungog Shire Council 2005). The economic implications of this trend are expected to adversely impact on the proportion of a population in receipt of earned income.

As a general trend, the resident population of Australia's rural communities are in decline and most rural towns have negative population growth. Over the past 10 years Dungog has maintained its population which is encouraging compared with other small towns experiencing significant population decline. The area has become attractive to people from outside the Shire seeking a 'tree change' or rural retreat and it is believed this pattern will continue into the future if economic and social trends continue to work in the Shire's favour (Dungog Land Use Strategy, 2011).

The Dungog Land Use Strategy 2011 outlined a number of opportunities that exist for the Shire that have the potential to stimulate population growth and economic development. These included:

- Tourism;
- Market for lower priced housing in the Lower Hunter;
- Market for rural residential lots given limited access to this land use type in adjoining LGAs;
- Continuation of the existing trend towards rural retreats and 'tree change'; and
- The popularity of nearby historic villages, their increased property values, expanding Lower Hunter development, and the capacity for the Shire to retain its historic charm.

2.4 Land use

2.4.1 Past land uses

The past land uses of the Study Area have been predominantly agricultural. The first agricultural activity was clearing for grazing of sheep and cattle and cropping such as wheat and corn. The head of the Williams River was established as a transhipment point for produce of farms in the Dungog area. The agricultural landscape of Dungog began to change with the rise of the dairy industry in the 1890s. From that period on, smaller farms and tenants had a more reliable source of income. As the population of rural districts increased and more people took up farming many of the larger estates were subdivided. This coincided with the boom in the timber industry and the coming of rail (which demanded sleepers) creating a long period of prosperity in the Dungog district even as the arrival of the railway in 1911 through Paterson and Dungog reduced the prosperity of the river ports of Paterson and Clarence Town (Williams Valley History 2013).

During the 1920s dairying continued to grow as an industry as cars and the railway made the delivery of milk to processing centres easier. Dungog boomed and the Chichester Dam was built.

The Tillegra Dam was first proposed in 1951 (Williams Valley History, 2013).

From the 1960s the area saw decline due to a combination of factors. Dairying began to contract and the number of families reduced and nearly all of the schools in the area closed. The creation of the Barrington Tops National Park in 1969 further reduced the timber industry and resulted in the closure of mills. The rise of the two car family and ability of people to commute to major centres outside of Dungog saw further decline in the district as it saw the shrinking of towns. Few employment opportunities influenced many young people to leave the area after the completion of their education.

The reduction in the dairying industry in the district has been furthered by deregulation in 2000 which resulted in fewer dairy farms, continuing the trend that had been occurring in the industry since the 1960s.

Today, Australian dairy farmers now operate in a deregulated industry, where international prices are the major factor in determining the price received by farmers for their milk. Australian dairy farmers receive a low price by world standards and therefore have to run very efficient production systems to remain competitive (Dairying Australia, 2013). The Study Area once held several dairy farms, however, now only a handful remain.

Improved transport (including highways) also saw people choosing to live in the area for the rural lifestyle. This was supported by smaller subdivision allowed since the 1970s, with the consequence that some agricultural land has been taken out of production for 'lifestyle' or hobby farms. This trend continues today with people moving into the district for the lifestyle and commuting to jobs in the Hunter Valley (Williams Valley History, 2013).

Figure 3 Study Area

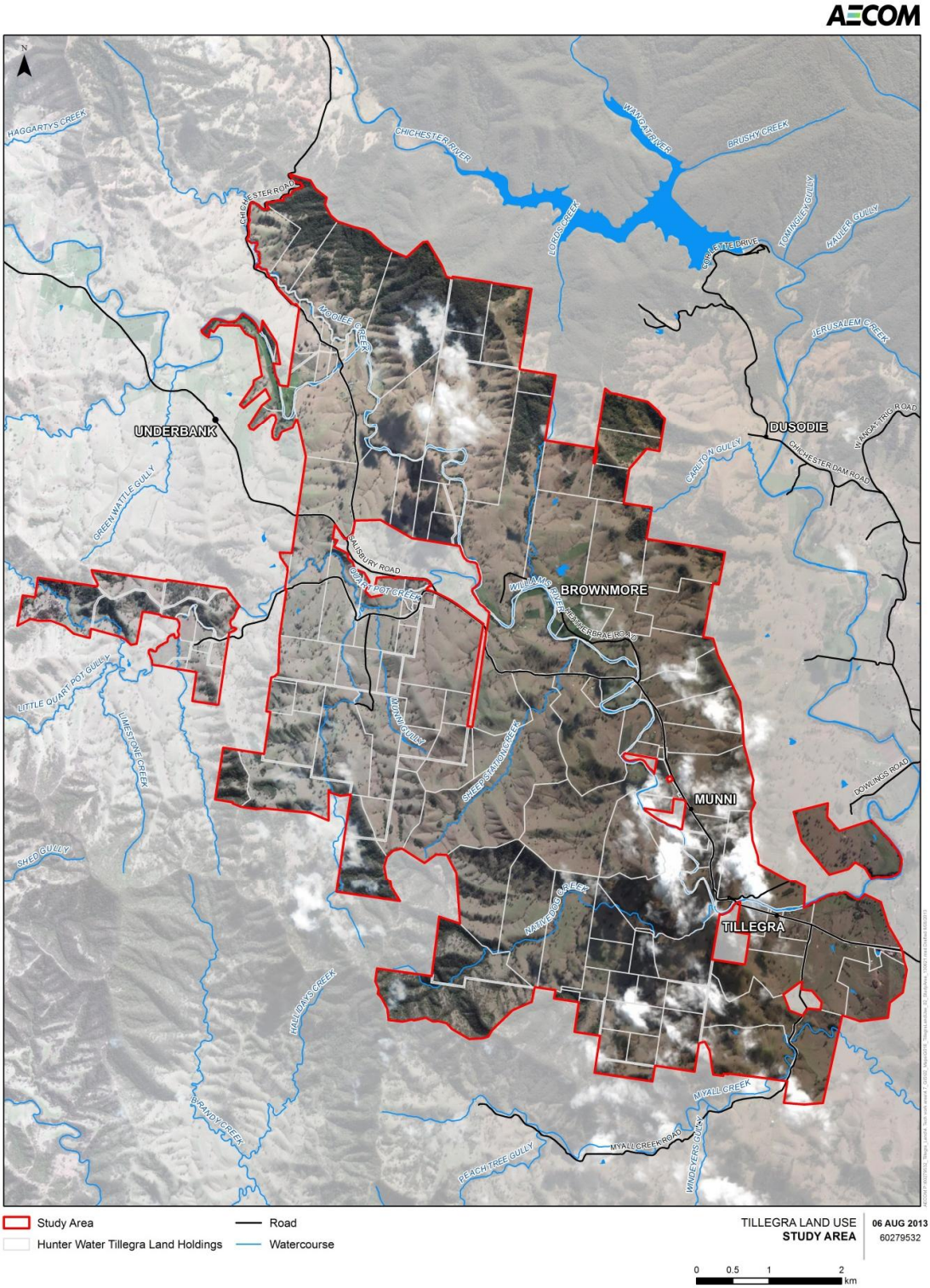
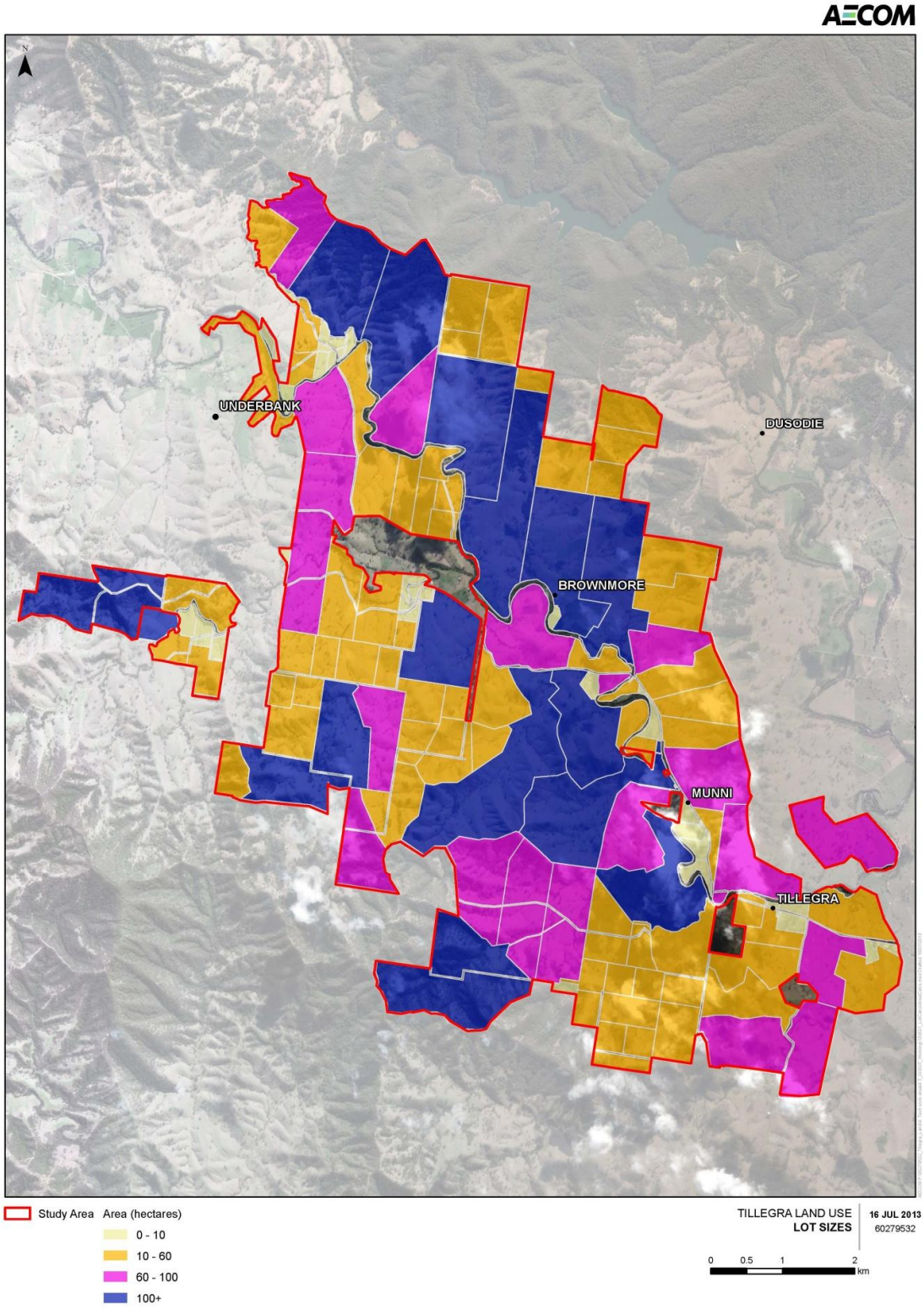


Figure 4 Lot sizes



2.4.2 Land capability

The land is not considered to be prime agricultural land. The best soils are located near the Williams River. Figure 5 depicts the existing land capability and use. The land is predominantly suitable for 'Grazing with no Cultivation' (shown in teal) with some areas along the Williams River suitable for 'Grazing with Occasional Cultivation' (shown in light brown).

No land within the Study Area is suitable for 'Regular Cultivation' (dark brown). Most of the Study Area is suitable for 'Grazing with no cultivation'. Land on the floodplain of the Williams River is suitable for 'Grazing with occasional cultivation'. Other portions of the site are shown as 'Other' (beige) indicating that these areas are generally not suitable for agriculture - they are predominantly the steep, hilly and/or vegetated areas.

Figure 5 also depicts the locations of the 32 identified buildings, 29 of which are dwellings.

2.5 Climate and weather

The two closest Bureau of Meteorology stations are Chichester Dam (elevation 194 m AHD) and Lostock Dam (elevation 200 m AHD).

Distinct seasonal patterns in rainfall are apparent with the wetter months occurring from December through to March at both sites. This is reflected in both average monthly rainfall totals and the mean number of rain days. The difference between maximum and minimum temperatures does not vary overly from month to month but is greatest in summer months.

Annual rainfall varies across the catchment with about 650 mm/year in Scone (in the Upper Hunter) and over 1,100 mm/year at Williamtown (in the Lower Hunter). Rainfall peaks between January and March and the variability of rainfall from year to year is high.

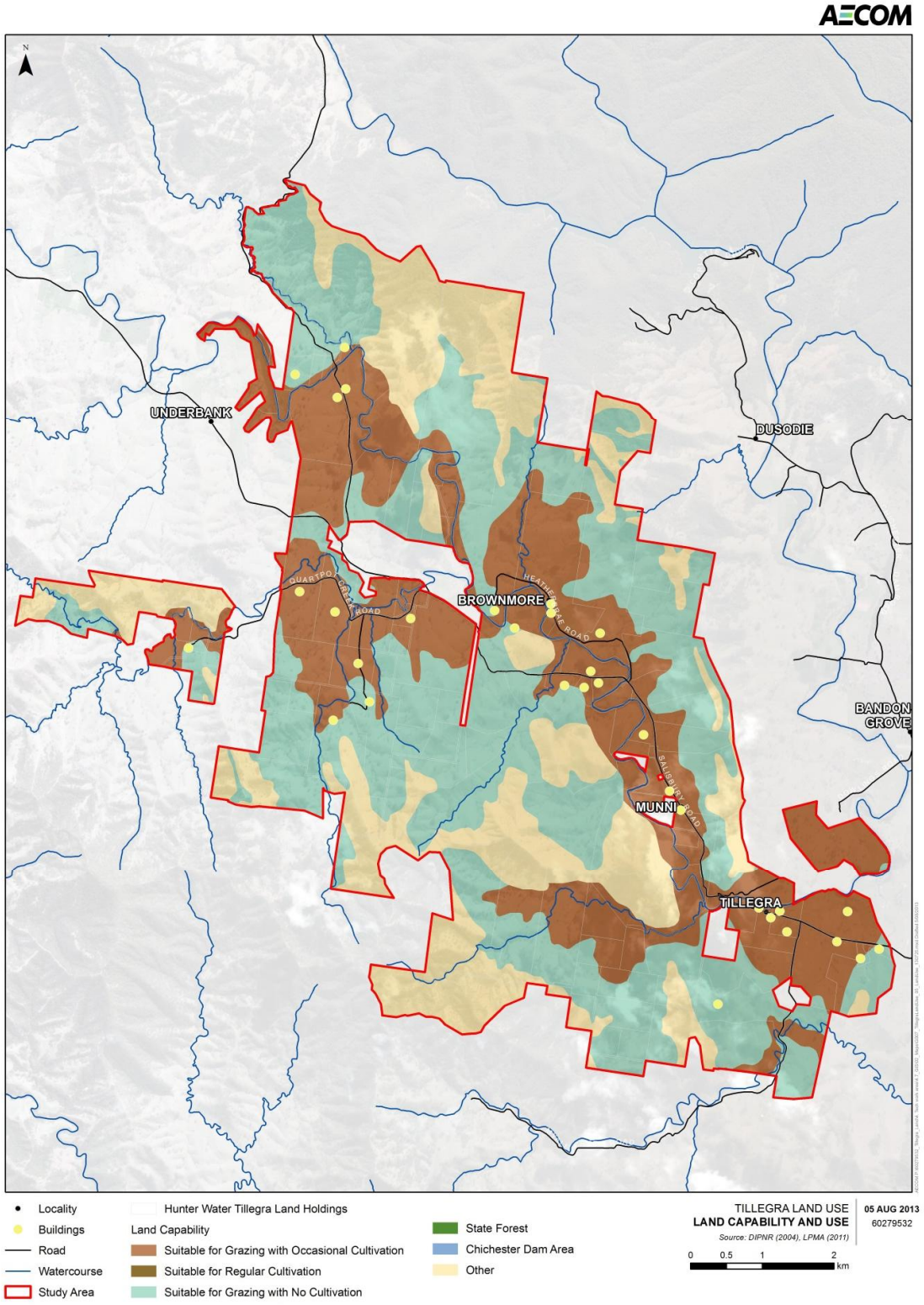
2.5.1 Flooding

It is known that the Williams River is subject to flooding events, however, no flooding data is available for the Study Area.

2.5.2 Bushfire

The Study Area contains bushfire prone land. The vegetated areas have a greater bush fire risk.

Figure 5 Existing land capability and buildings



2.6 Ecology

2.6.1 Introduction

A desktop ecological assessment was conducted by AECOM as part of this project. It included database searches and a review of existing information and literature of the Study Area. It does not include any field surveys.

Threatened species, populations and ecological communities considered in this assessment are those identified in the schedules of the *Threatened Species Conservation Act 1995* (TSC Act), the *Fisheries Management Act 1994* (FM Act) and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) as threatened (extinct, critically endangered, endangered or vulnerable).

Searches of the NSW Office of Environment and Heritage (OEH) *Atlas of NSW Wildlife* (BioNet) and the EPBC Act *Protected Matters Search Tool* were conducted to identify threatened flora or fauna species, populations and ecological communities listed under the TSC Act or EPBC Act that have been recorded or predicted to occur within a 10 km radius of the Study Area since 1980 (from a point at the centre of the Study Area[1]).

A literature review of publicly available documents and information (and of that provided by Hunter Water) was undertaken. Information obtained by consultation with Dungog Shire Council, relevant government agencies, and other stakeholders was also considered.

The documents reviewed included (but not limited to):

- Tillegra Dam Planning and Environmental Assessment (Aurecon, 2009), including the Terrestrial Ecology Working Paper (Ecotone Ecological Consultants, 2009) and the Aquatic Ecology Assessment (The Ecology Lab, 2008);
- Tillegra Dam Preliminary Environmental Assessment (Connell Wagner, 2007); and
- Vegetation mapping (OEH 2013).

2.6.2 Study Area description

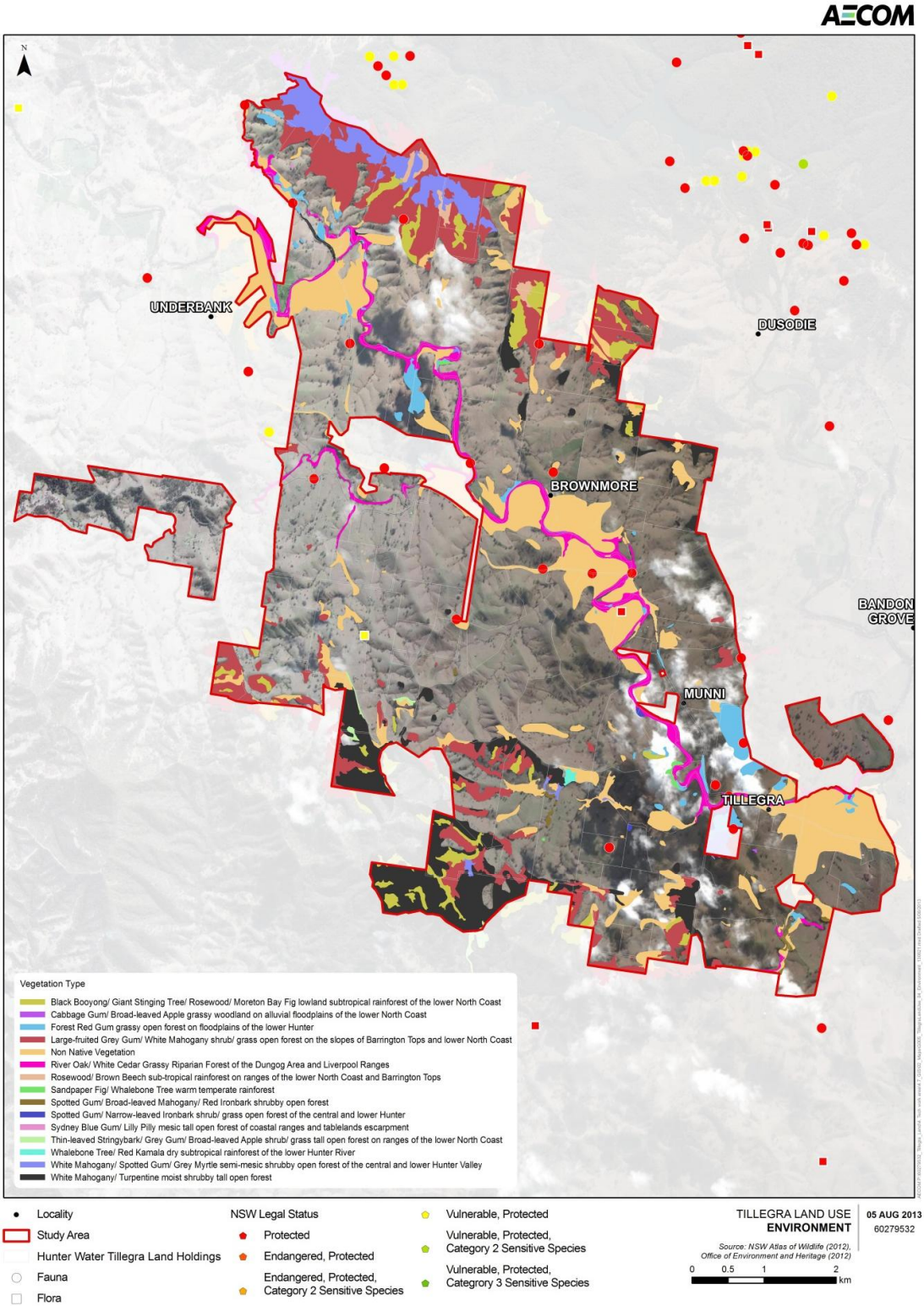
The Study Area falls within the North Coast Bioregion, which occupies around 7% of NSW landforms (DECC 2004). This bioregion covers northern NSW from the shoreline to the Great Escarpment. The climate in the region is temperate with warm summers and cold winters. Annual rainfall totals approximately 1,300mm, with the wetter months occurring from December through to March. The Study Area is situated within a rural landscape consisting predominantly of cleared general grazing and dairy pasture with scattered trees and some areas of remnant vegetation and steep and rolling hills. Much of the remnant vegetation (including riparian vegetation) has been heavily grazed and the understorey is greatly reduced in many areas and/or infested with weeds (particularly lantana).

Large areas of bushland are contained in reserves and State forests nearby. As a result of the undulating terrain and presence of natural springs, those areas of remnant vegetation that do occur within the Study Area contain a range of habitats including riparian zones, areas of rainforest and drier sclerophyll forest. Remnant native vegetation is limited mainly to riparian zones, and on the steeper slopes and ridges (mainly in the north and south-west of the Study Area (Figure 6). The Tillegra Travelling Stock Reserve (TSR), although not encompassed by the proposed land use strategy, is fully contained within the Study Area, and represents the best quality native vegetation in the area (Ecotone, 2009).

The Study Area is located within the Williams River catchment, a sub-catchment of the Hunter River catchment. The Williams River flows through the Study Area, along with four of its tributary creeks (Quart Pot Creek, Black Camp Creek, Sheep Station Creek and Native Dog Creek) and numerous smaller unnamed tributaries and drainage lines. The Chichester River joins the Williams River near Bandon Grove, approximately 3 km south-east of the Study Area. The Williams River rises on the southern slopes of the Barrington Tops and flows generally southeast and south until its confluence with the Hunter River.

[1] The approximate coordinates of the selected point used for the database searches are as follow: -32.2905S and 151.6639E.

Figure 6 Environment



2.6.3 Flora

The OEH BioNet search revealed a total of 540 flora species in the search area (10km radius around a point at the centre of the Study Area), including 440 native species and 100 exotic species (OEH, 2013).

Flora field surveys of the Study Area were conducted by Ecotone Ecological Consultants as part of the Tillegra Dam EA (Ecotone, 2009). These surveys confirmed the high diversity of species in the area and recorded and identified a total of 315 flora species from 100 families, including 21 ferns, 220 dicotyledons and 73 monocotyledons. Of the total species recorded, 78 species of exotic flora were identified, representing approximately 25% of the total species.

The OEH BioNet search revealed a total of 228 fauna species in the search area (10km radius around a point at the centre of the Study Area), including 214 native species and 14 exotic species (OEH, 2013).

The Tillegra Travelling Stock Reserve (TSR), although not encompassed within the Study Area is fully contained within the Study Area, and represents the best quality native vegetation in the area (Ecotone, 2009).

2.6.4 Fauna

Terrestrial fauna field surveys conducted by Ecotone during the EA process (2009) positively identified 157 fauna species within the Study Area, comprising 95 bird, 32 mammal, 16 frog and 14 reptile species. A further five species of insectivorous bat were given a probable identification and two species given a tentative (possible) identification based on ultrasonic call analysis. Six of the recorded species were introduced pests including the Black rat, Brown hare, Common myna, Feral dog, House mouse and Rabbit.

Aquatic fauna field surveys undertaken by The Ecology Lab during the EA process (2008) identified 85 different taxa of aquatic macro-invertebrates and six species of fish in the Williams River in and around the Study Area.

2.6.5 Environmental Constraints

The constraints of the Study Area in terms of ecological values include:

- The vegetation of the Study Area is important in that it includes three endangered ecological communities (EECs), provides habitat for documented threatened fauna species and has potential habitat for threatened flora species and rare non-listed flora species. Accordingly, development in the areas where these EECs, fauna and / flora occur is potentially constrained. Any strategy or land use option that has the potential to impact on listed ecological assets would require detailed impact assessments to be conducted and relevant approvals to be obtained. The key threat to the EEC is the clearing, degradation and fragmentation of the remnants for agriculture, forestry, infrastructure and residential development.
- In context of the key fauna (including the migratory species) the key actions for the management of these species are to prevent habitat loss and fragmentation, enhance habitat features, promote connectivity in the environment, management of the wetland and riparian areas and promote the recruitment of native plants.
- Other areas offer ecological values for inclusion in in reserves or alternatively be managed for multiple use in such a way which conserves their ecological value.
- There exist across the site patches of complementary habitat value, buffer areas and connecting areas. Whilst being constrained geographically these areas still retain important ecological value and are worthy of retention ideally through a program of planned sympathetic land use.
- In contrast the development of the area surrounding the site by the proliferation of small / medium rural holders has in some cases created an increase in the fragmentation of the habitat value and increased the risk of spread of weed and vertebrate pest species. The proximity of the site to commercial and industrial centres of the Newcastle, Dungog and Gloucester innately creates pressure on the biodiversity value of the site and inversely the ecological value of the area provide constraints to growth from these areas.

2.7 Indigenous and non-indigenous heritage

A number of heritage items and Aboriginal archaeological sites exist with the Study Area. A search of relevant heritage databases was undertaken on 18 April 2013. No items of World, National, Commonwealth or State heritage were identified within the Study Area, although it was noted that these heritage values were found to the north of the Study Area in the Barrington Tops National Park.

One item, Munni House, is identified on Hunter Water's s170 heritage register (#3630112). This has previously been identified as an important item of local significance, having also been listed on the Dungog Local Environment Plan (2006) and Hunter Regional Environmental Plan (1989). One additional item, Underbank House (I141) is listed on the Dungog LEP as occurring adjacent to the Study Area.

To date, only two detailed assessments of heritage values have been conducted within the Tillegra region. These were conducted as part of heritage assessments undertaken for the Tillegra Dam environmental assessment. The remaining studies have either been located outside of the Study Area or are regional studies which broadly review the heritage for a particular region of NSW.

No registered Aboriginal archaeological sites are currently recorded on the NSW Aboriginal Heritage Information Management System (AHIMS) within 5km of the Study Area. However, eight Aboriginal archaeological sites have been identified during sub-surface testing as part of the EIS for Tillegra Dam (Hardy 2008). These sites are yet to be registered in AHIMS. Consultation with the Karuah Local Aboriginal Land Council for this project indicated that they would prefer that sensitive indigenous sites were not registered in AHIMS due to cultural reasons.

2.8 Topography and landscape character

The landscape character of the Dungog to Barrington Tops locality varies from extensive cleared agricultural land to the forested land on more elevated and steeper country. The locality ranges in elevation from 10 metres AHD at Seaham Weir to over 1,500 metres AHD at Barrington Tops. The natural vegetation cover for the locality would have once been predominantly woodland and temperate rainforest of various densities. However, many of the woodland and forest areas have been cleared since European settlement commenced in the early 1800s.

The Study Area consists of a series of valleys and rolling hills. The elevation, ridge lines and valleys are shown on Figure 7. The Study Area includes a basin with the Williams River flowing from the north-west to south-east. A predominant ridge line containing most of the remnant vegetation with high points up to 489m forms a scenic backdrop. A ridge line to the south with scattered vegetation and high points of up to 409m forms the southern view boundary.

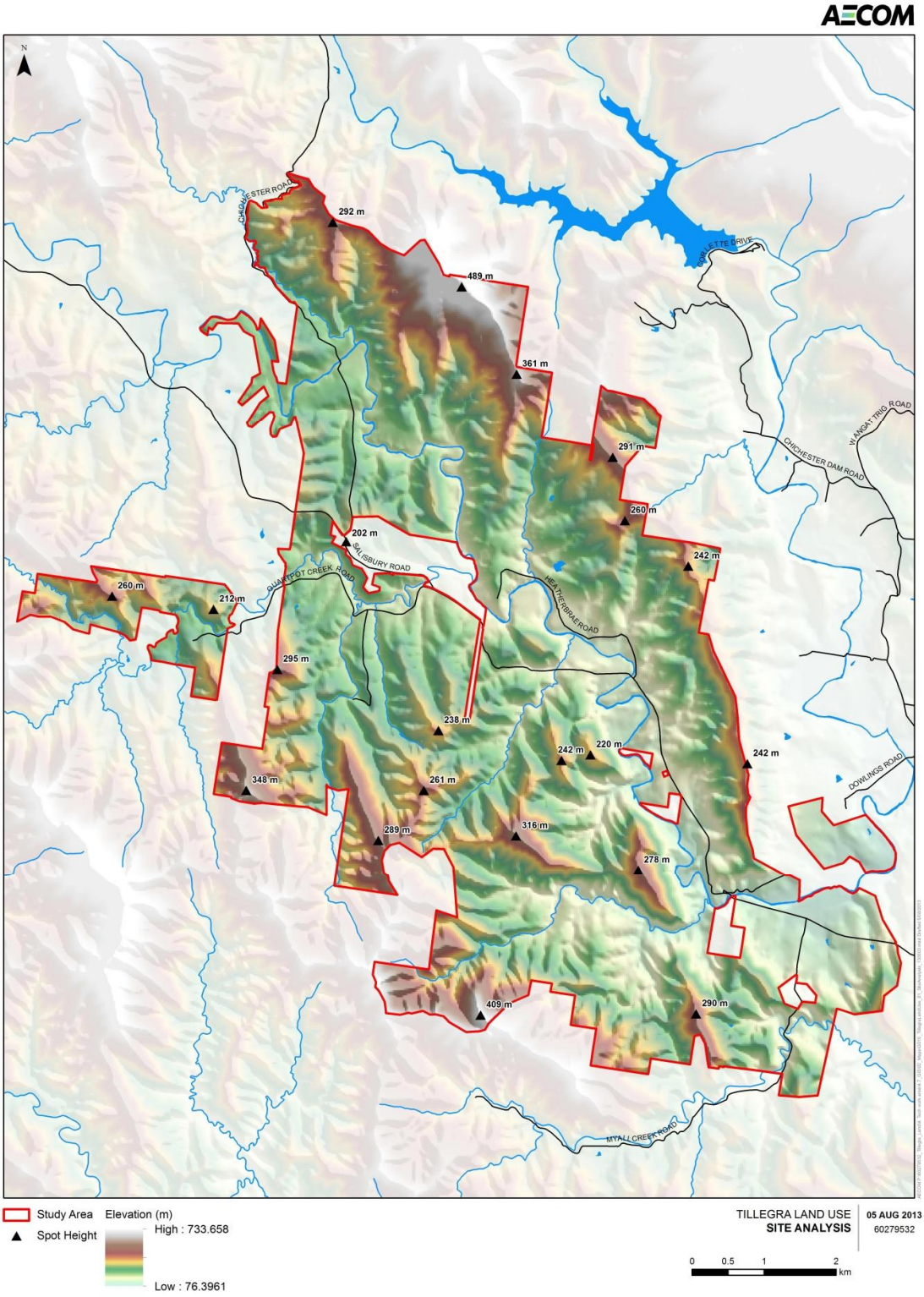
There is a visual contrast between the cleared agricultural land and remnant woodland vegetation. Barrington Tops National Park, which is approximately 10 kilometres to the north of the proposed Tillegra Dam site, has been listed as a World Heritage Area and provides a backdrop to views looking north from the Study Area (Tillegra Dam Environmental Assessment, Aurecon 2009).

The Study Area consists of undulating spur and valley formations, with the Williams and Chichester Rivers cutting through the landscape. The rivers are subdued visual features compared to the steep slopes and ridges that form the catchment divides. The predominant landform elements through the Project area include:

- The Williams River and its connecting tributaries and drainage channels;
- The low lying floodplains and gently sloping valley floor; and
- Surrounding steeper and elevated slopes and ridgelines.

Within the Study Area, the Williams River flows through mostly rural properties meaning that the river is not highly visible from public areas, except for areas where Salisbury Road is near or over the river such as at Tillegra Bridge. The Williams River is bordered by riparian vegetation which provides partial or full screening of the river from public areas. There are a number of tributaries that lead into the Williams River of where the lower reaches, these include Moolee Creek, Sheep Station Creek, Quart Pot Creek, Black Camp Creek, Taylors Creek and Native Dog Creek.

Figure 7 Site analysis



Some of the scenic views and elements of the landscape character of the Tillegra land are illustrated on Figure 8 to Figure 12.

Figure 8 Looking north on Chichester Road

Figure 9 Looking west from property on the western edge of the Study Area

Figure 10 Looking south from high point on Salisbury Road

Figure 11 Looking north west from a high point in the south east corner of the Study Area

Figure 12 Looking west north west from a high point in the south east corner of the Study Area

2.9 Soils

Figure 5 illustrates the capacity of the land. It shows that the highest value land is near the Williams River where the soils are richer and more suitable for cultivation. The Williams River is suffering from erosion, as are other parts of the Study Area, particularly the steep slopes where trees have been cleared.

Soils associated with the underlying meta-sedimentary rock sequences are generally less than one metre in depth across the landscape. Topsoils include pale brown sandy silts overlaying gravel, sand silts and clay (Department of Commerce 2009). There are, however, a variety of soil landscape types present including alluvial, colluvial, erosional and stagnant alluvial (Henderson 2000). Overall, soils in the Study Area are generally susceptible to localised occurrences of:

- Sheet and gully erosion
- Acidity (and associated aluminium toxicity)
- High run-on
- Sodicity
- Mass movement

Erosion hazard is generally moderate to very high across the Study Area. Gully erosion is evident along drainage lines, exacerbated by grazing of livestock, and sheet erosion is common on cleared slopes. Due to the seasonality of erosive rainfall in the Dungog area, adequate ground cover is essential (particularly on steeper slopes) to avoid high rates of soil erosion during high intensity summer storms (Henderson, 2000).

A review of acid sulphate soil risk maps (Department of Natural Resources, 2006) indicated no known occurrence of acid sulphate materials in the Study Area, therefore, the risk of acid sulphate occurrence in the Study Area is considered to be low.

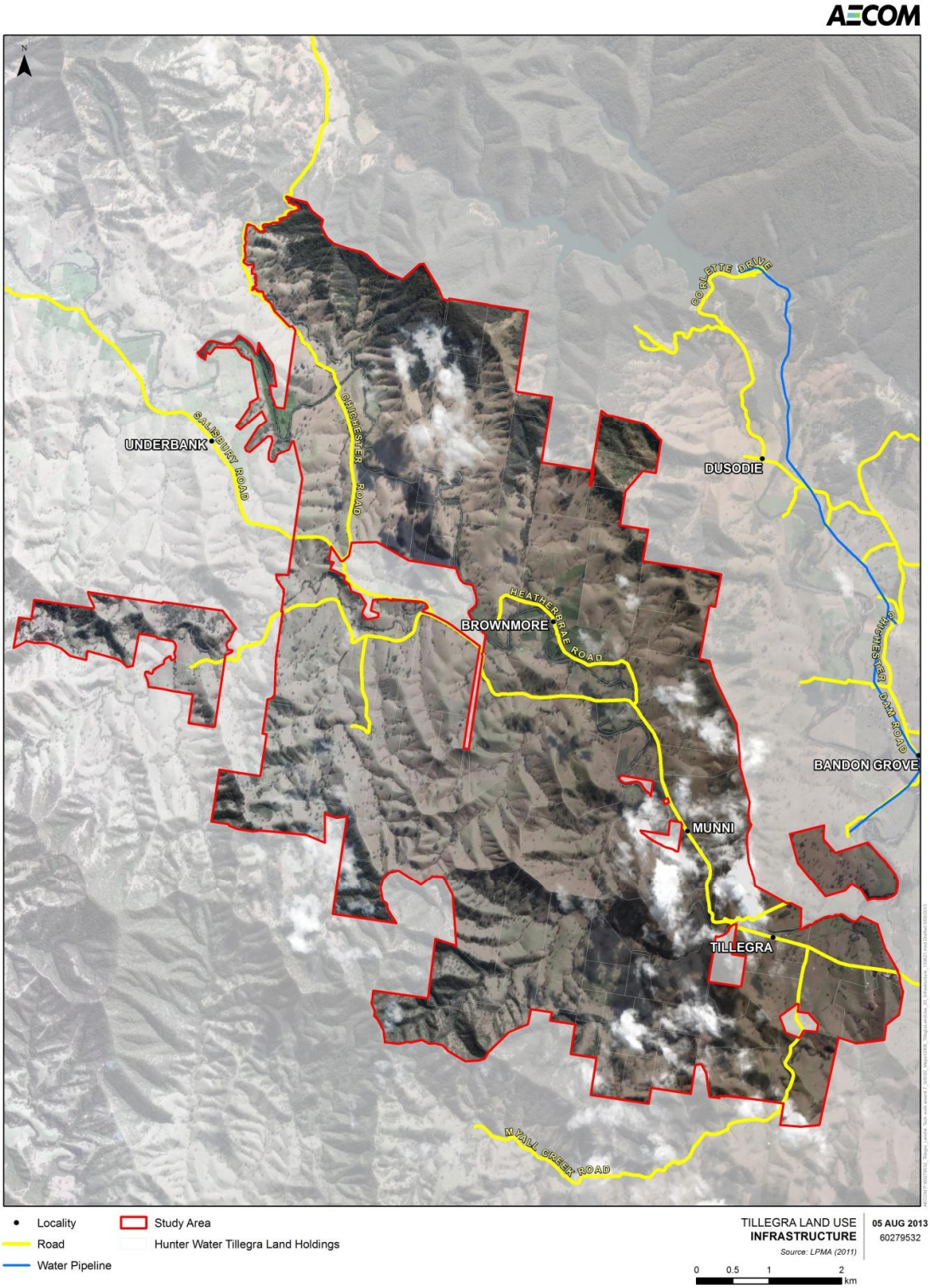
2.10 Infrastructure

Figure 13 indicates the existing infrastructure within and near the Study Area. Infrastructure is limited to local roads, many unsealed. There is a water pipeline from Chichester Dam to Grahamstown Dam running to the east of the Study Area. There are no high voltage power lines within the Study Area.

The existing roads within the Study Area are in fair to reasonable condition for their current two-way rural road function. However, the narrow, sometimes winding, nature of some sections of various roads is not ideal for larger vehicles and sight distance limitations in some areas are of concern from a road safety perspective.

A recent study by Dungog Shire Council (2008) identified that in general, access within the Shire is deficient in terms of all major indicators of asset condition. Most roads are excessively rough, narrow and have inadequate shoulder width. Additionally, they have significant pavement defects such as cracking, potholes, rutting, shoulder drop off and failed patches. They also lack any reasonable level of overtaking opportunities. These findings were confirmed by a road safety audit undertaken as part of the environmental assessment for the Tillegra Dam (Aurecon 2009).

Figure 13 Infrastructure



2.11 Community and stakeholder consultation

Community and stakeholder engagement has been conducted with government agencies, community groups, landowners and the public to obtain input into the development of this Land Use and Management Plan.

Due to the previous history of the site and the high profile nature of HWC's involvement in the area, there was a reasonable level of awareness among both stakeholders and the community of the existence of the landholdings, their location and of the former proposal for a dam.

Consultation undertaken to date for the project has involved meeting with government agencies, community groups, Dungog Shire Council and landowners, to gather information about the issues that stakeholders would like to see addressed in the Land Use and Management Plan.

Separate meetings have been held with Dungog Shire Council, the Metropolitan Water Directorate (currently preparing the Lower Hunter Water Strategy) and the Karuah Local Aboriginal Land Council. Three workshops were held:

- Government agency workshop (14 February 2013)
- Community groups and local stakeholder workshop (7 March 2013)
- Landowner workshop (21 March 2013)

All three workshops followed a similar format, and included presentations from HWC and AECOM on the history and current status of Hunter Water's ownership, the features of the land, and the regional and local context. This was followed by discussion where the participants were asked to prioritise issues and share ideas on land uses they thought would be appropriate for the land.

The output from the first workshop, with government agencies and Council, largely focused on the broader impacts and context of the landholdings within the Lower Hunter region, including impacts on water quality and the environment. Representatives in the community group workshop were mainly concerned with local economic impacts and the opportunity to retain agriculture as the predominant land use for the site. Landowners were mostly interested in improving the value of the land, its ongoing maintenance and improvement and how this could be paid for.

In discussions with Dungog Shire Council, concerns were raised over the timing of the preparation and release of the plan, as Council is due to commence preparation of its own Rural Land Use Strategy for the entire shire in the second quarter of this year. The other main concern raised by Council was the need to stimulate economic growth and jobs in the local area.

In addition to the workshops and meetings, AECOM also distributed a fact sheet about the project to all property owners in the Dungog Shire. The fact sheet invites people to complete a questionnaire (available on Hunter Water's website) on the issues and priorities they would like to see addressed in the Land Use and Management Plan. Findings from the questionnaire will be considered in the preparation of the draft plan, and reported on in AECOM's final report to Hunter Water in September 2013.

A community survey has been made available on the HWC website at:

http://www.hunterwater.com.au/About-Us/Latest-News/2013/Residents-Urged-to-Have-Their-Say-on-Tillegra-Properties.aspx

Throughout the consultation for the project, media coverage of the project and the government's intentions for the site, has generated interest from stakeholders, and at times has caused some concern, as stakeholders from all sides are keen to see the issue of the land ownership and use resolved. The certainty of the future of the landholdings is seen by some groups as key to improving not only its value, but also the economic stability of the district.

2.12 SWOT Analysis

A SWOT Analysis (Strengths, Weaknesses, Opportunities and Threats) has been conducted for the Study Area based on the results of the site analysis, review of planning framework and initial community and stakeholder consultation. Table 1 provides a summary of the results.

2.12.1 Strengths

The Study Area has several strengths, primarily based around its scenic rural landscape qualities. It offers several attractive characteristics that provide the conditions for certain potential future land uses. The landscape character consists of picturesque rolling hills and valleys with ridges providing sweeping views of distant vegetated ridge lines and valley bowls. Much of the land has been cleared for agricultural purposes with some ridge lines and sloped valleys conserving remnant vegetation.

The historic charm of the nearby Dungog township is a strength with several nearby cultural assets attracting people to the area. These include the Barrington Tops National Park which receives over 100,000 visitors per year, the Dungog Independent Film Festival, Wests Cycle Classic and the recent Mumford and Sons Folk Music Festival. These cultural features and events are unique to Dungog and provide the potential for catalyst activities and events within the Study Area that build on this cultural identity. The community spirit and strong sense of local identity is considered to be a strength attracting people to Dungog township and surrounds.

Draft LEP 2013 is fairly flexible in terms of permissible land uses. It does not pose any significant limitations on activities and is considered a strength.

Water is a key asset of the Dungog LGA with the Williams River Catchment providing 60% of Newcastle's drinking water needs. One third of the Williams River is located within the Study Area. The Tillegra Valley has a unique point of difference in the region as a 'clean air and fresh water' bowl. It is protected from extractive and polluting industries with good rainfall located on the Williams River.

The Study Area is a 75 minute drive from Newcastle and 3 and a half hour drive from Sydney providing opportunities for the transport of produce and goods to these markets. Its location also enables people from Sydney and Newcastle to easily make weekend trips or to own hobby farms and properties taking advantage of the rural lifestyle and rural charms of the area.

A holding of over 6,000ha is rare and could be of great value to certain investors for potential land uses that require substantial land and a remote location from residential populations.

2.12.2 Weaknesses

Access is a key constraint to the future use of the Study Area. Many roads are narrow and unsealed with limited opportunities for passing reducing access for buses in higher traffic volumes. Several lots within the Study Area do not have direct road frontage or access to suitable easements.

Since the 1960s the agricultural industries in the area have been in decline with few new industries opening up. The feasibility of agriculture within the existing structure on 60ha lots is uncertain due to the high cost of buying a property. Anecdotal information states that farms which are able to make a profit in the area have been in families for generations. Currently, it is considered unfeasible for a new purchaser to buy a farm and invest in agriculture (community workshop engagement results).

Using the land for continued agricultural use is strongly desired by the community (community workshop results). New agricultural practices that use land efficiently (permaculture) or large scale agribusiness structures are being invested for their potential to overcome these constraints.

The Dungog LGA has a low population that is in decline. There are few employment opportunities to retain young people and to grow the economy. This provides a constraint to future uses as local markets are restricted.

The Study Area is impacted by soil erosion issues, pest and weed infestation and steep terrain in some places. These issues provide land management practices that are costly to HWC.

There are no natural resources, prevailing winds or high solar access present to generate any potential natural resources-based land uses and associated revenue.

The uncertainty of the Tillegra Dam proposal over the past few years has created concern within the local community. Uncertainty of future land use has been a cause for community concern and believed by the community to have resulted in a lack of economic investment in the area and on the land.

2.12.3 Opportunities

There are several opportunities that the Study Area provides for the future use of the HWC landholdings. These are discussed in further detail in Section 4.0.

The Study Area receives good although highly variable rainfall and has soil around the floodplain of the Williams River which is suitable for cultivation and may have the potential to be enriched for food production.

Land capability analysis has shown that most of the land is only suitable for grazing and some cropping.

The potential for soil enrichment could be considered to increase its potential for food production.

There is an opportunity to build an identity for the Study Area to market it as an organic sanctuary servicing the growing demand for organic, locally produced food for the Newcastle and Sydney markets. This could set Tillegra and the Dungog district apart as a centre for organic farming, with the potential to use this identity for branding and marketing purposes.

There are several opportunities in regards to drinking water protection and the maintenance or improvement of water quality by revegetating and managing the Williams River riparian corridor.

Revegetating the riverbank and linking existing remnant vegetation along ridge lines and connecting to the Barrington Tops National Park is another opportunity for recreation benefits, which may have the potential to earn carbon offsets, and credits for BioBanking.

Conserving heritage items, habitat and developing carbon farming projects also supports the opportunity of developing parts of the Study Area for tourism.

The scenic rural landscape and proximity to Newcastle and Sydney populations provide the opportunity for ecotourism. The Study Area has a lot of space for multiple facilities including resorts, day spas, farms stays, bed and breakfast, camping grounds and holiday cabins.

2.12.4 Threats

Potential threats that may impact the Study Area include natural occurrences, economic and land market uncertainties and community opposition.

Natural threats that could influence the recommendation of future land uses include drought, flooding, bushfire, soil erosion and pest and weed infestation. No flooding data has been mapped for this study, however, the Williams River floodplain experience flooding events.

Vegetated areas (along the Williams River and on ridge lines) are more susceptible to bushfire risk, however this risk is considered to be manageable through rural bushfire risk management practices and assessment.

Soil erosion and pest and weed infestation is an issue that HWC is addressing within the Study Ares through Land Management Plans. The maintenance costs are understood to be high considering the size of the landholdings and infestation of weeds particularly along the Williams River.

Several economic uncertainties apply to the Study Area. These include the decline of dairying in the area and the agricultural sector generally in Australia. Selling the land for agricultural uses in its current condition and subdivision pattern may not be compatible for market demands. A property valuer has assessed the economic potential of the land for agricultural uses.

The opportunity for BioBanking is threatened by the suitability and quality and relatively limited amount of the remnant vegetation that remains. Pockets of vegetated areas remain that are often not connected restricted the value of their potential for BioBanking without substantial investment in revegetation, and pest and weed control.

The opportunity for carbon sequestration through carbon farming initiatives has good potential, however, it is threatened by the uncertainty of National policy and the carbon price.

Land uses that impact on the scenic values and character of the place or are non-agricultural could encourage community opposition. The community desires that the land is preserved for agricultural use, or uses that protect its rural, scenic qualities.

2.12.5 Summary

Table 1 provides a summary of the key strengths, weaknesses, opportunities and threats that apply to the Study Area. The analysis has been arranged according to cultural, environmental, social and economic considerations.

Table 1 SWOT Analysis Summary

SWOT Analysis	Cultural	Environmental	Social	Economic
Strengths				
	- Scenic landscape character, sweeping views of valleys and ridge lines, rural charm - Clean country living point of difference - Rural lifestyle in close proximity to Dungog township - Dungog provides historic charm and cultural activities - Barrington Tops National Park, Dungog Independent Film Festival, Wests Cycle Classic, Mumford and Sons Folk Music Festival attract visitors	- High rainfall - Williams River Catchment provides 60% of the drinking water for Newcastle, substantial landholding along 1/3 of Williams River - Proximity to Barrington Tops National Park - Remnant vegetation - Fresh air free of mining and industrial uses - Lack of natural resources protect the land from the impacts of extractive industries, this is a point of difference from the impacts that the Hunter Valley experience	- Strong community spirit and ties and sense of local identity within Dungog and surrounds, notwithstanding the small population	- Proximity to Newcastle, Hunter Valley, Mudgee to commute to jobs - Proximity to Sydney for transporting goods - Such land holding is rare, substantial holding to accommodate multiple activities and uses - Water licences are available for agricultural use - Draft LEP 2013 is open in terms of permissibility of uses
Weaknesses				
	- Heritage items may create provide constraints to potential future uses	- Pest and weed infestation - Poor soil quality, erosion - Steep slopes - Low solar access - Low wind - Lack of remnant vegetation - Some lots do not have adequate access and easements - Stakeholder concern for potential for future land uses to impact on water quality	- Low population in decline - Few employment opportunities to retain young people - Ageing population - Uncertainty of future use of the land has caused community concern	- Lack of infrastructure, poor quality roads in need of upgrade - Agricultural industry in the area is in decline with few new industries emerging - Existing lots sizes may not be appropriate for agricultural market demands - Lack of employment and economic diversity, lack of workers - High cost of maintaining

SWOT Analysis	Cultural	Environmental	Social	Economic
				properties from weed and pest infestation - Uncertainty of the dam has slowed the confidence for economic investment in the area - Lack of mineral resources limits economic opportunities through a more diversified economy - Water licences available from the Williams River may not be sufficient to create any meaningful benefit to the agricultural economy
Opportunities				
	- Scenic landscapes provide opportunity to attract 'tree changers', tourists, - Heritage items present tourism opportunities (Munni House, Quartpot Creek Cemetery, Barrington Tops National Park)	- Organic farming for food production (including permaculture) as the Study Area is free from impacts of mining or industry) taking advantage of high rainfall, location and proximity to Sydney market - A high proportion of land is suitable to grow trees for carbon sequestration - Improve soil quality - Improve and protect water quality through revegetation of the Williams River - Conserve remnant vegetation and endangered ecological communities for BioBanking	- Provide local employment through the development of new activities and investment in the Study Area	- Ecotourism could trade off popular national parks and forests, heritage values of the Study Area and district through resorts, bed and breakfast, farm stays, camping grounds etc
Threats				
		- Drought, bushfire and flooding - Soil erosion	- Community opposition to land uses that impact on the scenic qualities and rural character or	- Lots may be economically for agriculture - Putting numerous lots on the

SWOT Analysis	Cultural	Environmental	Social	Economic
			that are non-agricultural - Community concern over loss of value to land due to perceived minimal maintenance and management of the land since abandonment of the Tillegra Dam proposal in 2010 - Community uncertainty over future of the Study Area may discourage people from returning to the land, or new people from investing in the land - The sale of the land is seen by certain groups in the community as essential to overcome security, this could conflict with other land use options in the long term	market at once will flood the market - The unstable carbon price is a potential threat to the long term success of carbon sequestration - 60ha rural lots may not be sufficient to ensure viability of agriculture - Lack of a robust local economy may threaten the economic sustainability of any new venture - Market uncertainty around value of the land - Investment in improvement of land may not be returned on sale or change of use

3.0 Legislative and policy framework

To plan for potential land use opportunities for the Study Area it is valuable to understand the various regulations and strategic policies and studies that apply.

The relevant legislation, plans, policies and environmental planning instruments have been reviewed. Their requirements have been considered in the development of this plan.

3.1 Legislation and plans governing the catchment

3.1.1 Hunter Water Act 1991

The *Hunter Water Act 1991* defines the functions and rules applying to the Hunter Water Corporation. Division 8 refers to catchment areas and other special areas. These areas are identified for their importance in order to ensure that water within a Special Area (as specified in the Hunter Water Regulation 2010) is not polluted.

3.1.2 Hunter Water Regulation 2010

The *Hunter Water Regulation 2010* replaces the *Hunter Water (General) Regulation 2005* and the *Hunter Water (Special Areas) Regulation 2003*, which were repealed on 1 September 2010. Williams River Catchment is defined as a Special Area under Part 2 of the Regulation.

The intent of the Regulation is to make provision for healthy catchments and thus reduce the pollution risk to water captured by the catchment.

The Regulation also specifies legislation for pollution, plumbing and drainage work within the Special Area.

3.1.3 Hunter Water Catchment Management Plan 2011

The Hunter Water Catchment Management Plan provides a long term water quality improvement plan for the drinking water catchments and water sources of the Lower Hunter. The Lower Hunter Regional Strategy predicts that an additional 160,000 people will reside in the Hunter by 2031. The Department of Planning has identified that most housing will principally be developed on 'greenfield' sites, some within drinking water catchments. It is recognised that increasing development and land use pressures in the catchment of source waters causes a decline in raw water quality and a resultant increase in risk to the security of drinking water.

Eight principles have been used to guide the management of catchments:

- Identify and prioritise hazards to water quality;
- Have effective legislation that is embedded into local planning instruments to govern land use;
- Work with stakeholders in the management of the total water cycle, rather than focusing solely on service components such as water delivery and stormwater;
- Monitor high risk areas for pathogens in the water catchment;
- Foster research in national and local catchments;
- Perform proactive surveillance of each catchment with simple templates so that catchment condition information can be recorded and shared; and
- Engage the community.

Hunter Water's catchments are approximately 65% privately owned. It follows that land users have arguably the greatest ability to make a difference to water quality in catchments. They have begun to implement methods to inform and engage the community and will develop a Catchment Communication Plan with help from catchment stakeholders.

The Williams River is identified as having good overall water quality. In particular there are good levels of turbidity, algae and pathogens, moderate levels of salinity and low nutrient levels. The Williams is highly influenced by climatic conditions and is consequently highly variable in flow and water quality.

3.1.4 Hunter - Central Rivers Catchment Action Plan 2007

The Catchment Action Plan (CAP) for the Hunter-Central Rivers provides a coordinated plan for all natural resource work in the region. By outlining the most important natural resource issues in the whole region, the CAP

can guide rehabilitation effort where it is most needed. The CAP includes guiding principles that outline how natural resource management should occur in the Hunter-Central Rivers region. Guiding principles include those related to land use planning, environmental trading schemes, and offset schemes. The plan emphasises the opportunity to earn environmental credits, carbon credits and biodiversity offsets.

3.1.5 Hunter - Central Rivers Catchment Action Plan 2013-2023

The 2013-2023 Hunter - Central Rivers Catchment Action Plan is an updated catchment plan providing the strategic direction for the region. The following catchment goals have been established:

- Governance and planning
- Knowledge and research
- Empowerment and community capacity
- Land and soil
- Freshwater
- Biodiversity
- Air
- Estuary and marine
- Community wellbeing
- Economic prosperity

Key strategies that are relevant to the Study are contained in the following table. They have been considered in the development of this Study.

Hunter Central Rivers Catchment Action Plan 2013-2023 relevant strategies
Consider and assess cumulative and long term impacts on natural resources and ecosystem services in decision making and land use planning
Natural resource and environmental needs are effectively incorporated into planning processes
Achieve effective collaboration, cooperation and information sharing
Improve compliance with and effectiveness of regulation and approvals
Plan for adaptation and mitigation of climate change
Increase and diversify investment for natural resource management
Strategic land use planning builds community wellbeing within the limits of nature
Prevent and minimise soil loss and degradation
Minimise contamination of soil and sediment
Increase soil carbon
Improve soil health through land management
Minimise impacts of salinity and acid sulphate soils
Understand and reduce the impact of climate change on soils
Protect and improve habitat connectivity, quality and condition
Increase native habitat in strategic locations
Prevent and reduce threats to biodiversity
Protect and manage estuarine and marine habitats and connectivity
Maintain cultural and social values and uses of estuaries and the marine environment
Facilitate cultural connection

Hunter Central Rivers Catchment Action Plan 2013-2023 relevant strategies
Manage weeds and invasive species to reduce their impact on productivity
Support local production and diversification

3.2 Environmental Planning Instruments

The environmental planning instruments that are relevant to the Study Area have been reviewed to highlight their implications.

3.2.1 State Environmental Planning Policy (Rural Lands) 2008

The State Environmental Planning Policy (Rural Lands) 2008 (Rural Lands SEPP) guides the protection and orderly economic use and development of rural land. The rural planning principles relate to the protection of potential and existing productive and sustainable economic activities, and recognition of social, cultural and economic benefits and importance of rural land, and the protection of natural resources.

Principles for the subdivision of rural land include minimisation of rural land fragmentation, and land use conflicts, and planning for future supply of rural residential land.

3.2.2 Williams River Catchment Regional Environmental Plan 1997

The Williams River Catchment Regional Environmental Plan 1997 (WRC REP 1997) relates to the Williams River Catchment that the Study Area is within:

The objectives of this Plan include promoting the:

- Sustainable use of land, water, vegetation and other natural resources in the Williams River catchment; and
- The protection and improvement of the environmental quality of the catchment.

Under WRC REP 1997, *"the Council must not grant consent to the carrying out of development on land covered by this plan unless the Council is of the opinion that the carrying out of the development will not have a significant adverse effect on the water quality of any watercourse".*

3.2.3 Dungog Local Environmental Plan 2006

Dungog Local Environmental Plan 2006 (LEP 2006) currently applies to the Study Area. The Study Area is wholly contained within zone Rural 1(a).

Permissible land uses under zone Rural 1(a) are:

Permitted with consent	Permitted without consent	Prohibited
Advertisements, Bed and breakfast, Camp or caravan sites, Community facilities, Demolition, Dual occupancies, Dwelling-houses, Farm gate sales, Farm-stays, Forestry, Home business, Institutions, Intensive agriculture, Kiosks, Leisure areas, Mines, Recreation areas, Recreation facilities, Restaurants, Rural worker's dwellings, Tourist facilities, Utility installations , Veterinary establishments	Agriculture	Commercial premises, Employment Multiple dwellings, Shops

LEP 2006 will be repealed by *Draft Dungog Local Environmental Plan 2013* (LEP 2013) when it is finalised. Dungog Shire Council have advised that this is expected to occur around the end of 2013.

3.2.4 Draft Dungog Local Environmental Plan 2013

Zoning

The Study Area is zoned RU1 Primary Production under Draft LEP 2013. One lot adjacent to the Study Area is zoned E3 Environmental Management. The zoning is depicted at Figure 14.

RU1 Primary Production

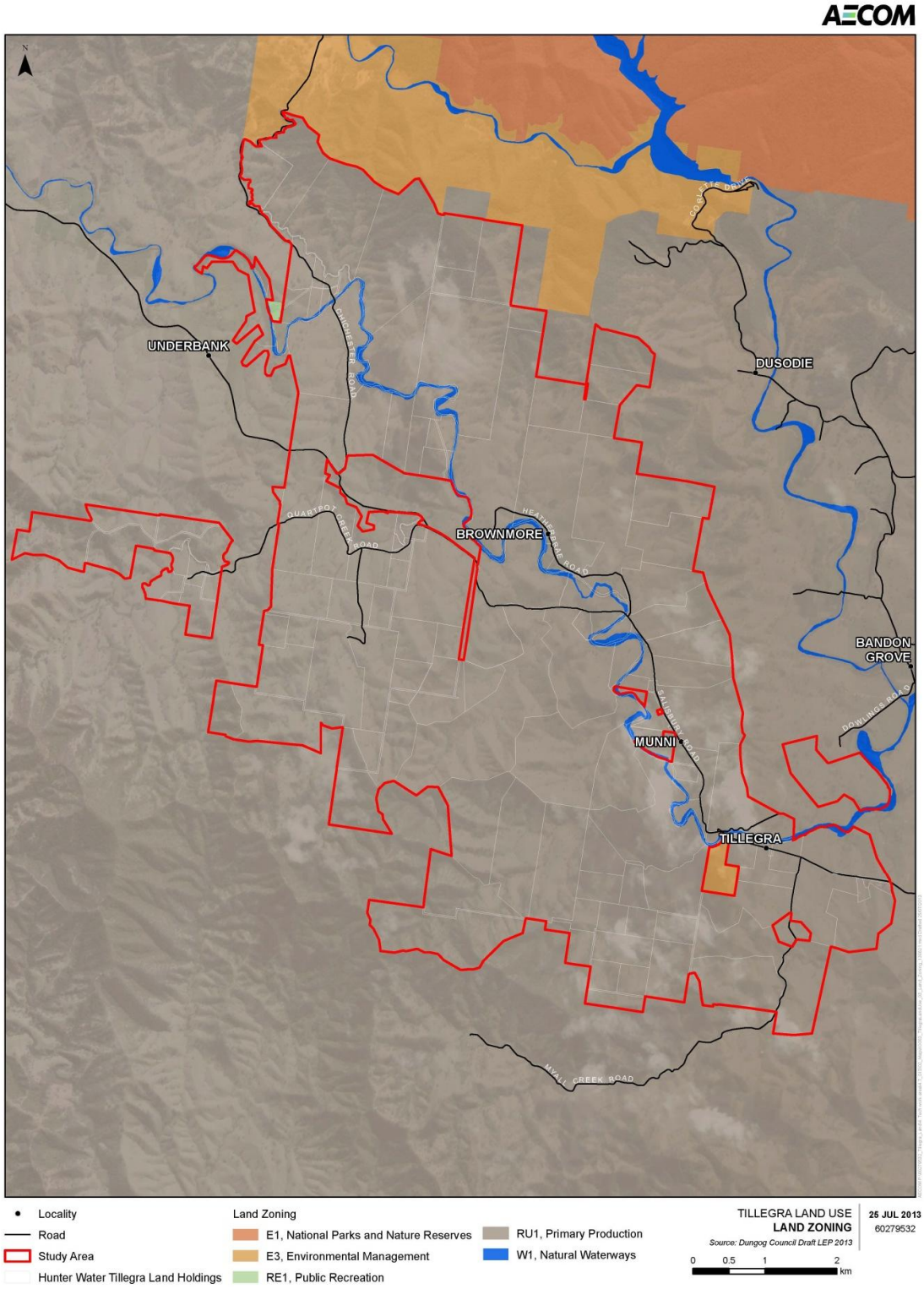
Permitted with consent	Permitted without consent	Prohibited
Airstrips; Animal boarding or training establishments; Aquaculture; Boat launching ramps; Boat building and repair facilities; Boat sheds; Camping grounds; Car parks; Caravan parks; Cellar door premises; Cemeteries; Charter and tourism boating facilities; Community facilities; Correctional centres; Crematoria; Dual occupancies; Dwelling houses; Eco-tourist facilities; Educational establishments; Environmental facilities; Extractive industries; Farm buildings; Flood mitigation works; Function centres; Freight transport facilities; Group homes; Health services facilities; Helipads; Heliports; Highway service centres; Home-based child care; Home businesses; Home industries; Industrial training facilities; Information and education facilities; Intensive livestock agriculture Intensive plant agriculture; Jetties; Kiosks; Landscaping and garden supplies; Marinas; Open cut mining; Moorings; Places of public worship; Plant nurseries; Recreation areas; Recreation facilities (outdoor); Research stations; Restaurants or cafes; Rural Industries; Rural supplies; Rural worker's dwellings; Signage; Timber yards; Tourist and visitor accommodation; Transport depots; Truck depots; Veterinary hospitals; Water recreation structures.	Environmental protection works; Extensive agriculture; Forestry; Home occupations; Horticulture; Markets; Roadside stalls; Roads.	Any development not specified as permitted with or without consent.

Any development not specified as permissible with consent or permissible without consent is prohibited.

E3 Environmental Management

Permitted with consent	Permitted without consent	Prohibited
Bed and breakfast accommodation; Boat launching ramps; Camping grounds; Caravan parks; Dwelling houses; Eco-tourist facilities; Emergency services facilities; Environmental facilities; Environmental protection works; Extensive agriculture; Farm buildings; Farm stay accommodation; Home based childcare; Information and education facilities; Mooring pens; Moorings; Recreation areas; Research stations; Roads; Sewerage systems; Water supply systems; Water recreation structures.	Home occupations.	Industries; Multi dwelling housing; Residential flat buildings; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres

Figure 14 Draft Dungog LEP 2013 zoning



Clause 6.6 Riparian land and waterways (local)

The Williams River watercourse is identified as Riparian Land on the Riparian Lands and Watercourses Map. Clause 6.6 applies with the objective of protecting and maintaining:

- Water quality;
- Maintaining the stability of the bed and banks of the watercourse;
- Aquatic and riparian habitats; and
- Ecological processes within watercourses and riparian areas.

Any development applications proposed on land where this clause applies, the consent authority must consider the impact to water quality, flows, habitats and ecosystems of the watercourse, bank stability, free passage of fish and any future rehabilitation of the riparian area.

Clause 7 Williams River catchment (local)

The objective of this clause is to protect and improve the environmental quality of the Williams River Catchment. The majority of the Study Area is contained within the Williams River Catchment Area on the Williams River Catchment Map (Draft DLEP 2013). *Development consent must not be granted on land to which this clause applies unless the consent authority has considered:*

a) whether the development:

i) promotes the sustainable use of land, water, vegetation and other natural resources within the Williams River Catchment,

ii) promotes the protection and improvement of the environmental quality of the catchment,

iii) (will have any significant adverse impacts on water quality of the Williams River Catchment, and

b) the Williams River Catchment Regional Planning Strategy.

The Williams River Catchment Regional Planning Strategy means the document published by the Department of Planning and Infrastructure on 1997.

3.2.5 Dwelling entitlements

Provisions exist in both DLEP 2006 and Draft DLEP 2013 that allow dwellings on land holdings smaller than 60 hectares, under certain circumstances. These provisions were designed to allow dwellings on smaller allotments than the minimum where multiple contiguous lots are under the same ownership, and where the lots were legally created before 1 July 2003 (and on that date were part of a holding of lots under the same ownership). These provisions sought not to penalize owners who had legally approved subdivisions from erecting a dwelling.

For simplicity the following should be used as a guide:

- Where lots are greater than 60 hectares each lot has 1 dwelling entitlement – since they meet the minimum lot size;
- If individual lots are sized at a multiple of 60 hectares (e.g. 120ha or 180 ha) then these lots could be subdivided to 60 hectares with a dwelling entitlement on each – since they meet the minimum lot size; and
- Where lots are less than 60 hectares, the total area of the holding under HWC ownership should be divided by 60 hectares to determine the total number of dwellings that the combined area has capacity to accommodate in accordance with the planning framework.

Dungog LEP 2006 (DLEP 2006)

Under the current Dungog LEP 2006 (DLEP 2006) dwelling houses can only be erected on properties of less than 60 hectares in area if:

- The land is, or is part of, an ‘established holding’ of lots that had the same owner on 1 July 2003 and an area of over 60 hectares; AND
- The development would not result in a residential density of greater than 1 dwelling per 60 hectares across the area of the established holding.

Accordingly, if the land was part of a consolidated holding of 60 hectares or over that existed on 1 July 2003, it could be put to the market as having capacity for a dwelling house/s at the minimum density of 1 dwelling per 60 hectares. In simple terms, it could be assumed that if a 35 hectare lot is adjacent to a 25 hectare lot were under the same ownership in 2003, the land could be marketed for sale as a consolidated holding with capacity for 1 dwelling under DLEP 2006. However, some analysis of the current density of dwellings existing on the whole holding (as it existed in 2003) would be necessary to establish the provision of a dwelling on that land would not cause the density of dwellings across the entire 2003 'established holding' to exceed 1 dwelling per 60 hectares.

Additionally, rural workers dwellings could be provided, with consent (i.e. a DA), if:

- It can be established that there is a long term need for employment of rural workers with accommodation on-site; and
- The workers dwelling is located on the same lot as a dwelling house (Clause 37).

Dwelling houses are permissible with development consent (i.e. require a DA) within the Rural 1(a) Zone, but only if the site satisfies any one of the criteria set out in Clause 27 (Buildings), which are summarised below:

- A lot of at least 60 hectares created by the subdivision of an established holding of at least 120 hectares, which immediately after the subdivision contained no more than a single dwelling house (i.e. pursuant to DLEP 2006 Clause 28(4)(b)).
- A vacant holding nominated in Schedule 1 of that LEP (does not appear to apply to any land at the site).
- The land comprises an 'established holding' and does not accommodate an existing dwelling.
- The subject lot/s is part of 'established holding' and the proposal is for less than 1 dwelling per 60 hectares on that holding.

An 'established holding' means contiguous lots (or adjacent lots divided by road/rail) that had a total area of at least 60 hectares and a single owner on 1 July 2003, regardless of current ownership.

Relevant Draft (exhibited) provisions: Dungog LEP 2013 (Draft DLEP 2013)

Under Clause 4.2A of Draft Dungog LEP 2013 (DELP 2013), a dwelling house can only be erected on properties of less than **60 hectares** if either:

- It will replace an existing lawfully erected dwelling house on the land; OR
- The lot is created before the plan is commenced, and the dwelling house was permissible immediately before commencement, OR
- DLEP 2006 sets out that relevant permissibility framework for dwelling houses - This essentially means that the current provisions of the DLEP 2006, described above, can continue to apply to existing lots that will be included in the RU1 Zone of the DLEP 2013 when that plan comes into force.
- The land is an 'existing holding', which is defined under Draft DLEP 2013 as adjoining land (including lots divided by road/rail/river) that had single owner on 1 July 2003 and had a single owner at the time of lodging a development application for a dwelling house.

There is currently no minimum holding area included in the Draft DLEP 2013, meaning that, if gazetted in its current form, the LEP would permit the development of dwelling houses on property holdings that have been in existence since 2003 regardless of their size (and regardless of if the 2003 holding has been broken into smaller separated portions, each comprising several adjoining lots with the same owner).

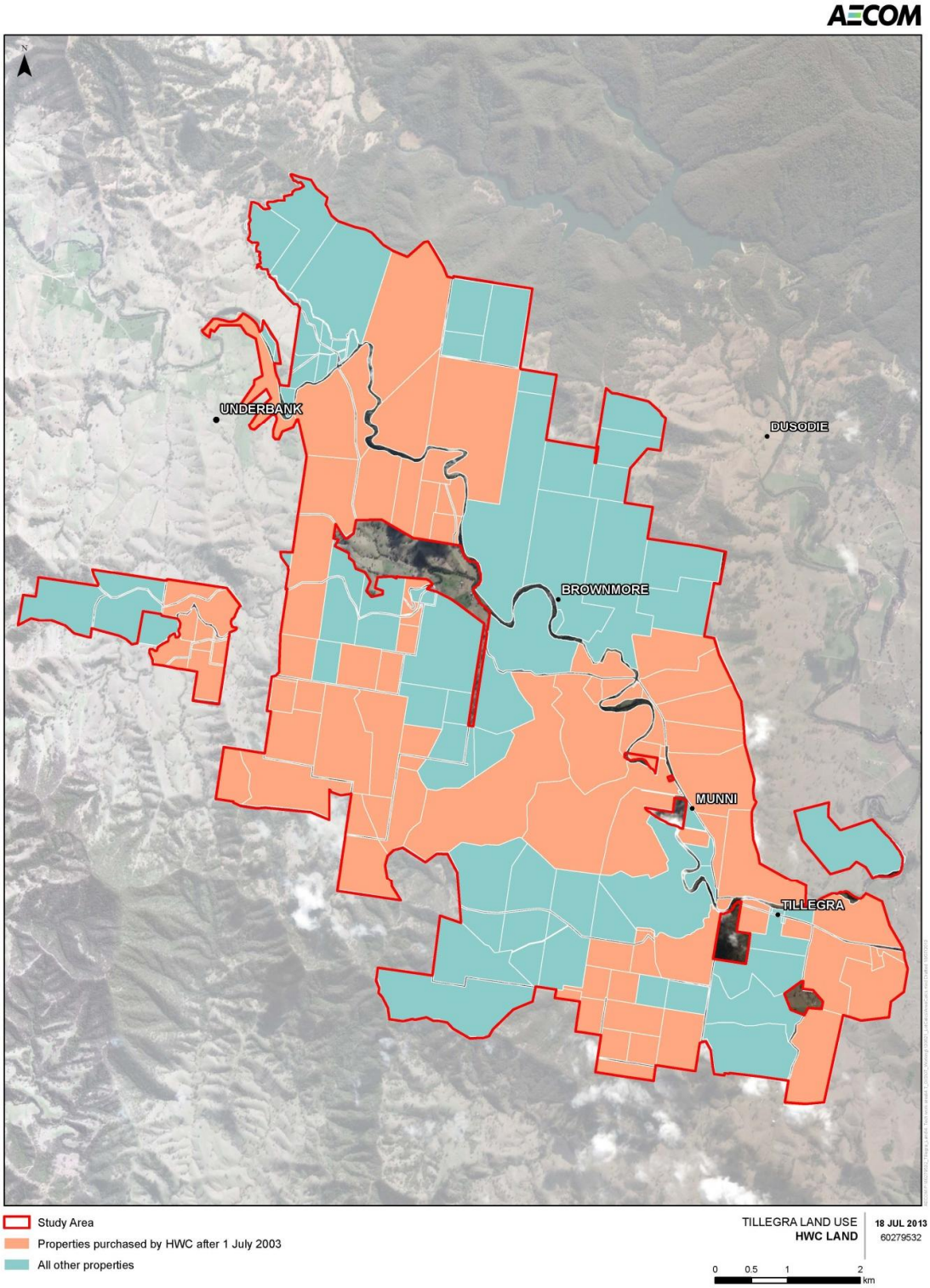
This is a departure from the approach to residential densities in rural areas in DLEP 2006.

Landholdings purchased by Hunter Water prior to 1 July 2003 are indicated in blue on Figure 15.

3.2.6 Dungog Development Control Plan No. 1

Dungog Development Control Plan No. 1 (DCP No. 1) outlines development controls that would need to be considered when applying for a Development Application within the Study Area.

Figure 15 Land purchased by Hunter Water after 1 July 2003



3.3 Planning Policies

3.3.1 Hunter Regional Plan 2012- 2022

The Hunter Regional Plan describes the strategic approach for the Region to achieve the Vision for the Hunter for *"the continuing growth of a vibrant and sustainable regional economy in a carbon constrained future."* The plan outlines strategies for the short, medium and long term. The plan identified the following immediate priorities for the Hunter Region which are:

- Infrastructure to improve productivity and efficiency;
- Grow the Hunter's economy;
- Comprehensive and cohesive long-term planning;
- Investment in education, skills and workforce development;
- Build knowledge skills and innovation capabilities; and
- Enriching the natural and built environment to create liveable places.

3.3.2 Lower Hunter Regional Strategy 2007

The Lower Hunter Regional Strategy 2007 sets directions for housing, the economy and the environment for the Lower Hunter region. The following challenges have been identified in the Strategy and are of relevance this plan.

Regional population and housing challenges are to:

- Provide sufficient land and development opportunities to provide housing for the future growth of the population; and
- Provide housing choice and affordability in the right locations reflecting changes in population and associated reduction in household occupancy rates.

The economic challenges for the Region are to:

- Maximise the economic opportunities associated with the Region's competitive advantages, in particular its economic infrastructure and specialised centres;
- Maintain or improve the employment self sufficiency of the region; and
- Ensure activity within the Lower Hunter complements rather than competes with the economies and communities of adjoining regions.

The key environmental challenges for the Region are to accommodate significant population growth whilst:

- Protecting and managing the biodiversity and conservation values of the key green corridors of the Region;
- Maintaining or improving the biodiversity value of the Region; and
- Protecting the rural character and viable agricultural lands of the Region.

The NSW Government is currently developing a new 20 year strategic plan for the Lower Hunter region. The new regional plan will draw on the State-wide objectives of *NSW2021: A plan to make NSW number one. NSW2021* aims to drive economic growth in regional NSW, invest in critical infrastructure and build liveable centres.

The new Strategy will guide future planning and investment decisions covering housing; economic development and jobs, open space, and the transport to connect homes, jobs, education and recreation facilities.

Key statistics for the lower hunter region include the following:

- The Lower Hunter population has grown by 22,500 people between 2008-2013;
- The projected population is 670,000 by 2031, compared to a population of 540,000 in 2011;
- 24% of the population will be over the age of 65;
- 11,000 new dwellings were constructed between 2008-2013;
- 35,000 lots were rezoned for residential development between 2008-2013; and
- 25% of new residential development was located in new release areas.

- 3% employment growth since 2003, compared with 2% for NSW over the same period.

This strategy emphasises the economic challenges that the region is facing and the need to maintain or improve employment self sufficiency of the region, whilst ensuring that future uses complement and do not compete with nearby economies and local communities.

3.3.3 Dungog Local Government Area Situation Analysis 2008

This Situation Analysis was prepared for Dungog Shire Council (DSC) to provide background information to support the preparation of the Dungog Land Use Strategy 2010 and to support the comprehensive Draft LEP 2013 for Dungog. The document provides a demographic profile, economic, social and environmental analysis, and reflects this information in key land use planning issues and concerns.

The following provides a list of key principles to be considered:

- Promoting economic development, and increasing local employment opportunities, while protecting the natural resource base.
- Encouraging urban population growth.
- Providing adequate industrial and commercial land.
- Protecting agricultural land and viability (including consideration of minimum subdivision size).
- Providing infrastructure (e.g. water, sewer, roads, telecommunications, and public transport) to residents and local business.
- Facilitating tourism development as an economic opportunity.
- Land availability and demand pressures on the southern fringe of the LGA, especially around Paterson and Clarence Town.
- Providing, improving, and maintaining urban infrastructure, specifically; urban water supply; sewer; and road networks, while also considering urban sustainability.
- Providing for infill development (including mixed densities).
- Maintaining village and town centre integrity.
- Providing for an increase in rural lifestyle demand while maintaining agricultural viability.
- Providing adequate, accessible, and appropriate aged care facilities and housing.
- Providing opportunities for appropriate rural small holding subdivision, taking into account service provision (e.g. water, sewer); environmental values (e.g. groundwater, surface water runoff); and the need to protect viable agricultural land.
- Recognising environmental values, constraints, and protection requirements including:
    - Catchment health, rural water quality and availability;
    - Heritage issues (including indigenous and natural);
    - Scenic and cultural landscapes;
    - Natural hazards;
    - Land capability (including salinity); and
    - Biodiversity and natural ecosystems.

The findings of this analysis provide several land use opportunities to consider including: tourism, economic development, protection of agriculture, increase in rural lifestyle living opportunities whilst maintaining agricultural viability, rural small holdings and protection of environmental values.

3.3.4 Dungog Land Use Strategy 2010

The Dungog Land Use Strategy was prepared for Dungog Shire Council to provide a framework to guide land use related decisions affecting the Dungog Local Government Area (LGA) through to the year 2031. The intention of the Strategy is to provide Council with a clear land use framework for strategically directing growth and change into the future.

The Strategy does not support the Tillegra District as an appropriate location for substantial increase in future population but supports continuation of the existing land use (primary agriculture) with increased emphasis on an emerging tourism industry, as identified in the Situation Analysis.

Relevant recommendations include:

- Council should initiate discussions with the National Parks and Wildlife Service, State Forests and Hunter Water with regard to the preparation, development and implementation of a management strategy and action plan for the southern part of the Barrington Ranges that integrates visitor facilities and connectivity.
- The following developments should also be considered within a tourist zone:
    - Primitive/informal bush camping, bunk house/school group accommodation, powered and unpowered camping and vans sites, on site vans and cabins;
    - Bushwalking and cycling tracks, picnic areas (including tables) and playgrounds, shelters, sheds and seating;
    - Recreational sporting facilities such as tennis, golf or valley ball areas;
    - amenity blocks, camp kitchens, disabled facilities, laundry facilities, car parking; and
    - higher end accommodation and facilities including but not limited too; resort style, retreat style and conference style accommodation.

Tourism has been identified as an opportunity for economic development in Dungog.

3.3.5 Dungog Shire Council Community Strategic Plan 2012-2030

The Dungog Community Strategic Plan 2012-2030 identifies the community's main priorities and aspirations for the future. It provides strategies to achieve outcomes related to those priorities and aspirations. The following strategies have been identified as most relevant to this plan:

Local economy:

- Ensure that economic growth and expansion across the shire is supported by improvement of local public and private infrastructure;
- Ensure that appropriate public and private sector agencies and business work co-operatively to strengthen and expand the shire's economic base;
- Promote the shire as a good location for the establishment of innovative, small scale, sustainable businesses;
- Develop a unique brand and identity for the shire to promote local economic growth and development; and
- Identify and develop local tourism opportunities.

Rural and urban development:

- Ensure that there is adequate land supply to accommodate future expected population growth;
- Maintain a long term planning approach that caters for diversity and choice in rural and village living; and
- Ensure that our land use planning for the Shire acknowledges the importance of our rural character and agricultural activities.

3.4 Section 117 Directions

The Minister for Planning, under section 117(2) of the *Environmental Planning and Assessment Act 1979* issues directions that planning authorities must follow when preparing planning proposals for new LEPs. The following Directions are relevant to the Study Area.

- Direction No 1.2 Rural zones - Agricultural production value of rural land is to be protected. Rural zones should facilitate the orderly and economic development for rural and related purposes;
- Direction No 2.1 Environmental protection zones - Environmentally sensitive areas should be protected and conserved;

- Direction No 3.2 Caravan Parks and Manufactured Home Estates - a variety of housing types, caravan parks and manufactured home estates should be provided;
- Direction No 3.3 Home Occupations - the carrying out of low-impact small businesses in dwelling houses should be encouraged;
- Direction No 3.4 Integrating Land Use and Transport - urban structures, building forms, land use locations, development designs, subdivision and street layouts should improve access to housing, jobs and services by walking, cycling and public transport;
- Direction No 4.3 Flood Prone Land - development of flood prone land should be consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005. The provisions of an LEP on flood prone land should commensurate with flood hazard and includes consideration of the potential flood impacts both on and off the subject land; and
- Direction No 4.4 Planning for Bushfire Protection - the development of incompatible land uses in bush fire prone areas should be discouraged.

3.5 Conclusions

The planning framework sets the objectives and existing intentions for the future use of the Study Area. The review of the applicable planning legislation and strategies has found that:

- A new Draft LEP for Dungog was in preparation at the time of writing and will be made as Dungog Local Environmental Plan 2013 (expected late 2013).
- The Study Area is predominantly rural area with the appropriate rural planning objectives concerning with preserving agricultural land and to deter land fragmentation.
- There are broad land uses permissible in the rural zone that presently presents little constraint to development opportunities, subject to relevant environmental controls.
- Planning controls emphasise primary production opportunities, with objectives to maintain rural landscape amenity and environmental quality.
- There are specific controls and strategies related to maintaining and enhancing the quality of water in the Williams River.
- Several strategies for the catchment identify the opportunity to revegetate and protect vegetated areas for biodiversity, carbon and environment credits and offsets.
- The Draft LEP 2013 includes proposed controls for dwelling entitlements that generally allow for one dwelling per 60 hectares, however, they allow for flexibility based on existing dwellings and subdivision patterns.
- The background land use studies recommend that appropriate future land uses for the Study Area would be primary agriculture with an opportunity to facilitate tourism as an economic opportunity.
- Dungog Shire is seeking to strengthen and diversify its economic base, provide for an increase in rural lifestyle demand whilst maintaining agricultural viability and infrastructure.

4.0 Discussion and evaluation of land use opportunities

The consultation process, assessment of site characteristics and the SWOT analysis outlined in the previous sections identified several land use opportunities that may be suitable for the Study Area.

This Section presents a discussion of the potential land use opportunities grouped into the following themes:

- Environment and heritage
- Agriculture
- Natural resource extraction/ renewable energy infrastructure
- Tourism and recreation
- Rural residential living

The purpose of this discussion is to provide a basis for the valuation of the potential costs and benefits of these opportunities. This Section is concluded by an assessment of the proposed opportunities against the project objectives and the results of the land valuation. The objectives are to identify potential opportunities that:

- Consistency with the intent of relevant planning legislation and strategies;
- Cost effectiveness and ability to add value to the landholdings; and
- Potential to benefit the local and regional community.

4.1 Environment and heritage

A landholding of the scale owned by HWC in Tillegra provides a number of environment and heritage opportunities to that have the capacity to add environmental value to the land by conserving and rehabilitating it for carbon sequestration, BioBanking, riparian revegetation along the Williams River to maintain or improve water quality, and the scenic protection of historic features and the rural landscape.

The potential for these uses is discussed below.

4.1.1 Carbon sequestration

An analysis of the potential use of the landholdings for carbon sequestration (or carbon farming) has been conducted. The following is a summary.

Three types of carbon farming initiatives have been identified by Australian Government programs;

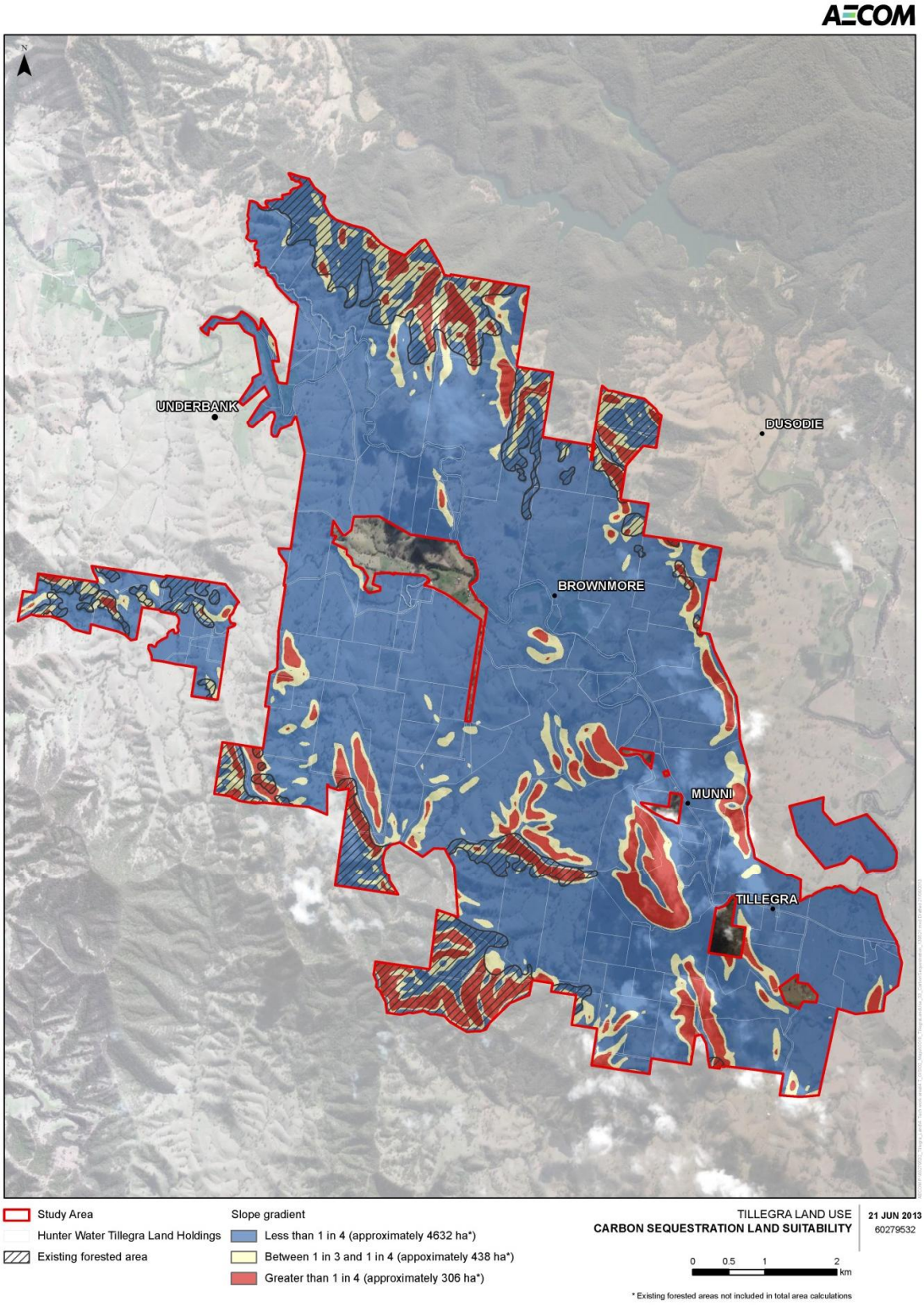
1. Environmental plantings – involving the revegetation of cleared land with indigenous species;
2. Human-induced regeneration of a permanent even-aged native forest - undertaking activities that will lead to the natural regeneration of forests; and
3. Reforestation and afforestation - Establishing forests on cleared land that may include non-indigenous species.

Of these three programs 1 and 2 - environmental plantings, and human-induced regeneration of a permanent even-aged native forest have been found to be suitable for the Study Area, and are discussed below. Program 3 - Reforestation and afforestation - can only be planted on land receiving more than 600 mm annual rainfall, where those plantings address dry land salinity. The Tillegra area is not affected by dry land salinity, therefore, this program has not been assessed.

It is understood that HWC has a program of acquiring carbon credits for its capital works. A carbon farming initiative within the Study Area could contribute to this.

Figure 16 demonstrates the slope of the land and suitability of the site for carbon sequestration. Tree planting on a slope of 1 and 3 or below is considered to be suitable as shown in blue and yellow on the map.

Figure 16 Carbon sequestration land suitability



4.1.2 Hunter Water tree planting for carbon offsets

Hunter Water's Tree Planting for Carbon Offsets program is one of a number of projects to ensure that the carbon emissions from Lower Hunter Recycled Water Initiative are fully offset.

Hunter Water has been planting around 300,000 trees and shrubs, to be maintained for 12 months until fully established. Plantings will occur on 160ha of land owned by Hunter Water and located at Grahamstown Dam, Chichester Dam, and Irrawang Swamp.

Revegetation consists of native trees which are suitable for the local habitat – including Spotted Gum, White Stringybark and Broad-leaved Paperbark.

The program will offset more than 80% of the 80,000 tonnes of carbon emissions that will be produced by the water recycling initiative over a 20 year period.

The program is fully funded by a grant through the Australian Government's Water for the Future Initiative.

At the time of writing the program was nearing completion (HWC, 2013).

4.1.3 BioBanking

The NSW BioBanking Scheme commenced in July 2008. The framework for the scheme was established under Part 7A of the *Threatened Species Conservation Act 1995*. The aim of the BioBanking scheme is to conserve threatened animals, plants and ecosystems by addressing habitat and degradation.

Under the scheme, landowners are able to generate biodiversity credits by agreeing to carry out a set of management actions which, over time, are expected to improve biodiversity values. Most land in NSW containing native vegetation or threatened species, populations, ecological communities or their habitat can potentially become BioBank sites. Exceptions and ineligible classes of land are defined in clause 11 of the BioBanking Regulation (DECCW, 2009).

As none of the land located within the Study Area is listed under clause 11 of the regulation, and as the area contains listed threatened ecological communities and threatened species and/or their potential habitat, there is the potential for establishing BioBanking. Areas of degraded woodland could also be eligible provided that revegetation and /or management actions to improve the quality of habitat are implemented.

The following benefits may result from establishing BioBank sites:

- Conserve the site's biodiversity values into the future;
- Generate a profit from the proceeds of selling the biodiversity credits (credits can be sold and funds used for the management of the site);
- Use the BioBank site credits to offset the loss of vegetation arising from other potential Hunter Water developments; and
- Exemption from paying land tax on the proportion of the lands designated as BioBank sites.

The suitability of the vegetation /lands as BioBank sites and the amount of credits generated would need to be assessed by an accredited assessor, and a BioBank agreement signed with the NSW Office of Environment and Heritage. Due to the small amounts of EECs within the Study Areas the opportunity for BioBanking whilst present, would be limited to small pockets throughout the Study Area.

4.1.4 Williams River riparian rehabilitation and water quality improvement

There is an opportunity for HWC to improve water quality and maintain drinking water security through the rehabilitation of the Williams River within the Study Area. The Study Area contains one third of the Williams River, with its Catchment providing approximately 60% of Newcastle's drinking water needs. The revegetation of the Williams River riparian corridor would have a positive contribution to water quality, would provide biodiversity benefits and could have the potential to contribute to a carbon sequestration initiative.

Riparian vegetation can offer flood risk benefits, particularly on downstream floodplains by providing bank stabilisation (Sharpe, 2013). The riparian corridor is defined as 30m either side of the top of the bank.

Rehabilitation of the river would need to be managed through planning controls, easements and/or covenants with the future land owners. It would be implemented by HWC on land they own as part of the identified riparian corridor or by a Conservation Covenant on land they may sell to a purchaser. Revegetation would be financed by HWC.

Planning controls under the existing and Draft Dungog LEPs provide principles and controls to maintain the water quality of the Williams River.

Revegetation would require financial investment by HWC, however, there is potential for State or Federal funding and grants to assist with implementation including the *Biodiversity Fund* and *Community Environment Grants (Caring for our Country).* If the revegetation is proposed as part of a carbon sequestration initiative grants under *Carbon Farming Futures* also have the potential to apply.

Revegetation risks

Ongoing Management: If the planting method was to be finishing the project after the 12 months there is a risk that the fenced corridors could become substantially colonised by problematic weeds. On similar projects undertaken by Greening Australia in the Sydney Basin where on-going management was removed 2 years after planting, many of the trees have survived, but the areas also have dense understorey infestations of woody weeds that have become a significant management issue. Provision should be made for an on-going management regime.

Steep slopes and natural regeneration: The success of natural regeneration for steep sloped areas not suitable for mechanical preparation and planting would depend on factors such as:

- Proximity of existing eucalypts to provide seed drop for regeneration, and
- Weed pressures on the area, which as discussed above, could out-compete any native regeneration process.

The use of bush regeneration techniques where areas have a good native suite of species, e.g. native grassland could be a cost effective approach in these steeper areas.

Alternative / Approach to plantings (direct seeding)

An ecological restoration approach that aims to create a dominant native plant association to all areas within the fence line could provide a more sustainable long-term outcome. This would include decreasing on-going management costs over time as the community was able to withstand weed colonisation pressures, compared to potentially higher, 'flatter' on-going management costs over time for the proposed approach due to the on-going need to contain colonisation of problematic weeds.

Seeding has good potential to be undertaken successfully when undertaken using the suitable and experienced contractor. HWC has already experienced direct seeding project failing. In many cases this can be traced to use of contractors with insufficient experience, and tender cost pressures which result in the use of poorer quality or insufficient quantities of seeds.

HWC may wish to consider trialling a direct seeding approach using a recognised leading contractor in the field to provide the greatest opportunity for success, providing the capacity to critically assess the effectiveness of the approach before applying it to the whole riparian corridor.

Conservation covenants/ Conservation agreements

Conservation covenants (CCs) could be used to enable the revegetation of the Williams River riparian corridor. A conservation covenant is a voluntary agreement made between a landholder and an authorised body (such as a local council or a government agency) that aims to protect and enhance the natural, cultural and/or scientific values of certain land. The owner continues to own, use and live on the land while the natural values of an area are conserved by the landholder.

Features of conservation covenants are:

- The covenant is usually registered on the title of the land and binds all future owners. This ensures that the land is always protected, even if the property changes hands;
- Covenants may cover all or just part of a property, therefore landholders are able to select which significant natural or cultural values are to be protected;
- Covenants do not prevent all uses of an area; they ensure that future uses of the land are compatible with the conservation of the land's natural and/or cultural values;
- The landholder may be eligible for tax benefits if the covenant reduces the value of their land; and
- Covenants agreed through approved programs can be eligible for taxation concessions.

- Generally, landholders incur no costs when establishing a Conservation Covenant. Most programs cover the legal costs involved in entering into a CC, and the registration on land title is free in most states. Depending on the CC Scheme Provider, landholders may be entitled to a number of other benefits.

Conservation Agreements are similar to conservation covenants and are administered under Division 12 of the *National Parks and Wildlife Act 1974* (NPW Act 1974). Conservation Agreements are voluntary agreements between landholders and the Minister for the Environment. They are administered by the NSW Office of Environment and Heritage (OEH) and established under the NPW Act 1974 and provide permanent protection for the special features of the subject land.

Conservation agreements may be entered into for areas containing scenery, natural environments or natural phenomena worthy of preservation. They can also be entered into for the study, preservation, protection, care or propagation of fauna or native plants or other flora.

Key features of Conservation Agreements are:

- Landholders may be eligible for rate relief and tax deductions if the value of the property is shown to decrease when a Conservation Agreement has been signed;
- Provide permanent protection for the conservation values of the subject land and is binding on all subsequent owners; and
- Agreement is registered on the title of the land, and terms and conditions are binding on all subsequent owners of the land.

Responsibilities of land owners include:

- Must not carry out any activities or developments that could adversely affect conservation values;
- Must not subdivide or permit the subdivision of the conservation area;
- Must manage the conservation area to protect and promote species, populations and ecological communities protected under the *Threatened Species Conservation Act 1995;* and
- Must incorporate the terms of the Conservation Agreement into any lease or license issued over the conservation area.

Conservation covenants would be the most appropriate mechanism to enable rehabilitation and revegetation of a riparian corridor along the Williams River. Advice from the land valuer Robertson and Robertson (2013) found that that application of a Conservation Covenant over land to facilitate the revegetation of the riparian corridor is unlikely to decrease the land value if access to water licences, vehicle crossings and river access for swimming and other recreational activities are maintained. The riparian corridor would however, be fenced off from stock.

4.1.5 Indigenous and non-indigenous heritage interpretation

There is an opportunity to preserve (either in situ or collecting) indigenous heritage items that may be found along the Williams River during revegetation. Consultation with the Karuah Local Aboriginal Council indicated that they would not like exact sites of sensitive items to be made public. They also indicated that any artefacts found during the rehabilitation of the Williams River are most likely to be extracted and kept for educational and cultural purposes. There could be an opportunity to display and interpret any found artefacts within an educational or ecotourism facility within the Study Area or district. This could add value for the community by providing cultural information about the original custodians of the land.

Munni House is only non-indigenous heritage item located within the Study Area. It holds unique historic and architectural value that could make it attractive to be redeveloped for several uses including tourist, agricultural, educational or lifestyle.

4.1.6 Vegetation/ biodiversity corridors

The Great Eastern Ranges Initiative (GERI) is a strategic response to mitigate the potential impacts of climate change, invasive species, land clearing and other environmental changes on biodiversity and water quality.

The initiative is based on increasing the connectivity of conservation values across the area encompassed by the Great Eastern Ranges, which includes the Study Area.

The key principle of the initiative is to create stepping stones between areas of protected native vegetation along the length of the Great Eastern Ranges corridor (GERI 2009). The GERI has been established through the

coordinated work of landholders, industry groups, traditional owners, governments and Non-Government Organisations to rehabilitate native vegetation.

There is an opportunity to preserve and/or create stepping stone habitats by retaining and protecting existing vegetation or defining green corridors for revegetation within the Study Area connecting to adjacent land.

4.2 Agriculture

The Study Area is currently used for predominantly agricultural purposes. This includes the raising of beef cattle and dairying that occupies the alluvial plains and gently inclined slopes. The potential for the use of the Study Area for a variety of agricultural purposes is discussed below.

The land capability analysis has shown that the land is mostly suitable for 'grazing with no cultivation' and 'grazing with occasional cultivation'. Only land within the immediate Williams River floodplain is 'suitable for regular cultivation' (refer to Figure 5).

Properties with high productive potential are of particular value for agricultural use. However, low current productivity does not mean that further subdivision is necessarily appropriate. Larger landholdings are necessary for the sustainable productive use of typically moderate to low productivity grazing lands typical of the Study Area. The total landholding may not comprise of a single parcel of land in the same locality (DPI, 2006).

Low current productivity may be improved by appropriate soil and pasture management. When farmland prices are high, the most cost effective means to increase returns is to improve soil fertility. However, the capacity to sustainably improve pastures is limited by such factors as the risk of erosion or nutrient run off, the need to protect biodiversity and the relative difference between costs and benefits (DPI, 2006).

4.2.1 Dairying

The Dungog area once held many dairy farms and now only a few remain. Since the 1960s dairying has been declining which has been furthered by the deregulation of the dairying industry in 2000. Australian dairy farmers receive a low price for milk by world standards and therefore have to run efficient production systems to remain competitive (Dairying Australia, 2013). The Dairy Australia Situation and Outlook, (May 2013) provides the following update of the industry:

- The 2012/13 season has proved a difficult one for many dairy farmers, as falling farm gate prices, higher input costs and unfavourable seasonal conditions combine to challenge the profitability of farm businesses. While many farmers realise the opportunities offered in growing international dairy markets, short-term oscillations in returns and profitability have strained finances and are challenging confidence.
- Variable seasonal conditions in south-eastern Australia, combined with reduced farm gate margins, means there has been little incentive to expand production. Cash flow challenges were brought sharply into focus as many farm businesses struggled to manage milk-to-feed price ratios and variable weather reduced home-grown fodder yields. In some cases falling land prices and higher debt loadings pushed businesses beyond prearranged credit limits and into relying on extended payment terms from suppliers.
- Confidence as measured in this year's National Dairy Farmer Survey (NDFS) has taken a significant step backwards. Challenging production conditions, rising input costs and a persistent focus on the supermarket milk price war have undermined confidence - particularly in northern milk production regions. Significant variation remains in confidence around the nation as farmers adjust to milk pricing and market dynamics.
- The two major supermarkets have announced new sourcing strategies intended to increase farm gate price transparency and improve public relations associated with milk price discounting. Long-term contracts between Coles and east coast cooperatives and a direct sourcing trial for Woolworths suggest a changing landscape for suppliers.
- In drinking milk-focused regions, the balancing act between fresh supply and demand continues as processors adjust their intake requirements and pricing to meet the demands of a highly competitive retail marketplace. While the long-term contracts in place are positive for dairy farmers, those farmers falling outside of new agreements have concerns about the impact of this pricing structure on smaller operations in particular.

Statistics from Dairy Australia identify the number of dairy farms operating nationally has reduced from 22,300 in 1982 to about 6,770 in 2012. This decline of about 70% nationally is surpassed in New South Wales where the

decline is about 78% over the same period. Dairy Australia estimate about 778 dairy farms exist in New South Wales as at June 2012.

The average dairy farm in New South Wales is 269 ha comprising 232 dairy cows according to data from the Department of Agriculture Fisheries and Forestry (*ABARES*) in 2011-12. The rate of return on these farm businesses is forecasted at 1.1%, excluding capital appreciation for the 2012–13 financial year. The average dairy farm business will incur a loss of about $11,100 for the same period (*ABARES*).

According to the 2005-6 Agricultural Census prepared by Industry and Investment New South Wales, Milk Production comprised 31.9% of the total value of agricultural commodities produced in the Local Government Area of Dungog. Milk Production is second only to Livestock Slaughtering in the Dungog Local Government Area.

The establishment of new dairy farms within the Study Area is considered to be unlikely due to its significant decline in the region since the 1960s and constraints within the outlook of the industry.

4.2.2 Beef cattle

The Study Area is an established location for beef cattle grazing. Beef cattle farming is the most predominant farm use within the Study Area and the adjoining rural localities. Dungog is recognised as a beef cattle production area. Figure 5 in Section 3 indicates that the whole Study Area is suitable for grazing beef cattle.

According to the 2005-06 Agricultural Census prepared by Industry and Investment New South Wales, Livestock Slaughtering accounted for 62.7% of the total value of agricultural commodities produced in the Dungog Local Government Area.

Most beef cattle holdings in the Hunter and mid north coast region tend to be of a relatively modest size. Contributing factors include the extended period of rural subdivision, the high cost of the land and the popularity of cattle for owners of small, rural lifestyle lots (DPI, 2006).

DPI has outlined the disadvantages that affect small scale beef enterprises:

- The higher unit cost of buying relatively small quantities of items such as fertiliser, drenches, farm equipment and yards;
- Increased costs per head for small scale pasture improvement, cattle management and mustering operations;
- Limited ability to negotiate prices, or to access profitable cattle markets;
- Reduced eligibility for taxation offsets and primary producer assistance;
- Limited capacity to adapt to changing market requirements, or climates, or to cover the cost of rising overheads; and
- Higher levels of dependency on off-farm income and the associated lack of available time and focus on pastures and cattle enterprise.

There exists a stark contrast in the sustainability of Australian cattle operations with the top 25% of cattle producers generating an average 7.5% return on investment (excluding capital appreciation) and the lowest 25%,with significantly smaller scale enterprises on average generating a loss of around $66,000/pa with a return of minus 7.5%. The bottom 25% of beef enterprises also had a cattle death rate twice that of the top grouping of producers indicating poorer, less sustainable management practices (DPI, 2006).

Stocking rates

In the Hunter, a minimum number of 40 breeding cows is recognised as the minimum number to cover costs of a grazing operation (DPI, 2006).

Native pastures in the Hunter Region require relatively large holdings for sustainable cattle grazing operations. A property of at least 150 ha is required to sustain a minimum number of 40 breeding cows. Land sizes of 40 ha could only sustain 11 breeding units (cow and follower) and produce less than 9 weaner calves for sale each year. Productivity at this low level is unlikely to cover basic operating costs (DPI, 2006).

In relation to the Study Area, the land valuation found no documented evidence in relation to carrying capacity and viable farm sizes. Robertson and Robertson (2013) have made enquiries with leading local land agents on the subject in order to obtain anecdotal evidence.

Robertson and Robertson (2013) advise that stocking rates vary significantly within the Tillegra district and are dependent upon the quality of the pasture occupied. The low levels of pasture improvement undertaken in the Study Area over recent years will also impact capacity. Anecdotal evidence is as follows.

- Open Grazing and River Flats: 1 breeding unit per 2 ha
- Steeper Slopes More Rugged Land: 1 breeding unit per 4 ha

There is considerable variation of the land required for commercial beef farming which is dependent on the location, slope and quality of the land. Based the anecdotal evidence, 40 ha of open grazing and river flats could support approximately 20 breeding units. However, given current beef prices about 100 breeding units are required to cover operational costs and break even. This would require 200 ha of open grazing and river flat land.

There is an opportunity to release some packages of land located on the river flats to encourage the sale of land for potentially economically viable beef cattle.

Lifestyle farmers

Beef cattle farming is also a popular pursuit with non-commercial, lifestyle purchasers or hobby farmers. Compared to some other agricultural uses, beef cattle production is less maintenance-intensive and able to be sustained where infrequent property attendance or visitation is part of the ownership model.

Anecdotal evidence indicates that many existing farmers in the Dungog district have a secondary income that they rely on as existing agricultural practices in the area are not efficient enough to make a profit.

Robertson and Robertson (2013) found a number of the sales considered in their market evidence are used for beef cattle production, however, the commercial returns from that use are considered for the most part, secondary or hobby incomes for the landowners.

Lot sizes for beef cattle farming

Many of the lots within the Study Area are under 60ha. Draft LEP 2013 requires a minimum lot size of 60ha. There is an opportunity to consider amalgamating smaller properties within the Study Area to provide the opportunity for potential small scale farmers who may purchase properties to improve the capacity and hence profitability of their agricultural practices. As discussed above, releasing amalgamated lots on the high quality agricultural land near the river would be released first.

Pasture improvement and strategies to increase profitability

The Study Area currently consists of lots of about 60 ha which are considered to be small scale cattle farms. As discussed above, it is difficult for beef enterprises to be capable of covering direct operating costs and maintaining a resource base to buy into the Study Area. There are several options that could improve the profitability and sustainability of cattle enterprises that are particularly relevant where land prices are high (DPI, 2006):

- Increased productivity from better management of pastures and herds;
- Increased returns per head by producing cattle for higher value markets, or by direct sale to retailers;
- Increased operating efficiency and reduced unit costs through economies of scale (larger herds), smarter purchasing and professional management;
- Running the enterprise over more than one holding and using the complementary features of each property to reduce risks such as feed shortages and increase productivity;
- Leasing rather than buying farmland and equipment;
- Using increased land prices over time to realise returns on the capital invested in buying land, rather than unrealistically relying on cattle sales, or reducing future productive options through subdivision; and
- Diversifying. Timber sales traditionally provided an important source of supplementary income for cattle properties in the Hunter region. Other options include managing other properties, contract farm work, ecotourism, value added farm enterprises and income from work not related to farming.

With good pasture, grazing and livestock management the sustainable carrying capacity of beef properties can usually be lifted above historically reported rates in certain places. Denser pasture cover can also provide environmental benefits via reduced run off and erosion. Ensuring positive economic returns from pasture improvement, however, requires additional livestock management and marketing. The cost per hectare is also

highly dependent on the scale of works undertaken. Significant pasture improvement is unlikely to be economically justified for many smaller holdings (<60ha) (DPI, 2006).

However, with decreasing property size pasture improvement and maintained increased productivity may consequently be inappropriate for small rural lifestyle properties, especially those with other production constraints such as poor soils or limited growing seasons.

4.2.3 Large scale agribusiness

A potential land use option could be to package and dispose of large components of site in smaller number of transactions to be used by large scale national or international agri-business. The demand for available land for food production is becoming more valuable as there is a growing recognition of food security as a global issue.

There has been no large-scale agribusiness uses entering the rural market in Dungog in the last five years.

A risk associated with the selling of the site in its entirety to a large scale international organisation could be constrained by limited rural road infrastructure and the distance to ports for shipping. This option would also result in loss of control of land to overseas interests and a diminished food security to the district and community. The limitations of the water licences could also potentially not be adequate to support the water demands of large scale agri-business.

4.2.4 Small scale farms

There is anecdotal evidence that there is a growing market for 'tree-changers' wishing to invest in small scale farms. Initial constraints outlined by DPI, 2006 note that there is:

- A lack of market depth of "tree changers" to generate adequate land sales; and
- A lack of economic viability of traditional agricultural method and land sizes.

Organic beef production is gaining interest and may provide alternative marketing options. However, its suitability is limited by the high risk of bacterial diseases and internal parasites in high rainfall areas, and the relatively low growth rates of native pastures and low phosphate soils. The additional effort required to control weeds and maintain feed quality may also be unsuitable for smaller scale properties where the owners spend considerable time off-farm (DPI, 2006).

There are several organic farms in the area including the 45 hectare Fosterton Farm on the Williams River, downstream of the Study Area near Dungog. It produces biodynamic sourdough flour and bread, biodynamic beef, lucerne and grass hay, produces chickens for eggs, fruit and nut trees, vegetables and honey. It also has an eco-farm stay. It was purchased in 2002 after operating as a dairy for approximately 140 years. The farm has taken advantage of the good river soil on the flat, rising to clay/shale ridges and steeper hill country. The farm fronts the Williams River which provides access to permanent clean water and fishing for bass and mullet. The farm has been gradually increasing the biodiversity to encourage the overall health of the soil, plants, birds and animals. This has involved extensive tree belt planting, sowing diverse pasture species and employing nature organic and biodynamic methods of farm fertilisation and weed/pest control (Fosterton Farm, 2013).

Establishing organic/biodynamic farms within the Study Area is an opportunity that was widely supported by the community engaged in consultation. Organic farming in the area is supported by the access to fresh air and water within transportable distances of Newcastle and Sydney. The opportunity to release lots on waterfront land could be particularly attractive to a purchaser wishing to set up an organic farm.

4.2.5 Commercial timber farming

Dungog has a history of commercial timber farming based on old growth forests. This industry has declined due to the extraction of most of the available timber. Investigating the potential for commercial timber farming by HWC has the potential to provide a commercial return. Types of timber farming that could be valuable include furniture timber, almonds, olive trees for example.

It could be investigated whether land dedicated for carbon sequestration could include species of trees suitable for harvesting and sale to return a profit to HWC after the relevant time frame for carbon sequestration has occurred. The tree species chosen for the revegetation could also provide a valuable resource (for example furniture timber) subject to maturation rates.

Figure 17 Dairy cows within the Study Area

4.3 Natural resource extraction/ renewable energy/ infrastructure

4.3.1 Mineral resources

The potential for natural resources to add value to the Study Area was investigated. It was found that there are no known natural resources such as coal seam gas or other valuable minerals that can be extracted from the land. A review of the source maps from the Department of Primary Industries (DPI, 2013) revealed that there is no coal or coal seam gas reserves within the Study Area.

There are also no petroleum basins which are a source of liquefied natural gas (LNG).

4.3.2 Energy - solar farms

The Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education manages the Large-scale Renewable Energy Target. It creates a financial incentive to promote the establishment, deployment and growth of renewable energy such as solar farms. The creation of solar farms supports national and state objectives around renewable energy targets.

An assessment of water and land requirements and costs to establish different types of solar farms are outlined below (AECOM, 2010).

Annual water requirements:

- Mono-crystalline PV: 140L/ MWp[2]
- Thin film PV: 0.435 ML/ MWp
- Solar trough: 0.74 ML/ MWp

Land requirements

- Monocrystalline PV: 1.04 ha/ MW
- Thin film PV: 3.3 ha/ MW
- Solar trough: 2.4 ha/ MW

[2] Megawatt-peak (solar panel/array installed power rating at standard test conditions)

- Solar tower: 3.5 ha/ MW
- Hybrid: 2.4 ha/ MW

Costs

Costs are variable depending on technology used. Connection to the electricity network is an important cost consideration in respect of the distance to the grid.

Suitability of the Study Area

The Study Area presents a number of constraints for solar farms set out below, as a result of which it is not considered to be a feasible use of the land:

- On average, Dungog Shire has lower annual sunlight than areas such as the high sunlight areas of Moree, Dubbo, Tamworth and Broken Hill, making it a less feasible area for solar farms;
- Pool of potential investors is unknown and uncertainty of market interest;
- Adequacy of water licences to meet demand for water (only 600-700ML available for entire Study Area); and
- Distance of the site from the power grid creating higher connection costs.

As a consequence no further consideration is given to solar farms.

4.3.3 Energy - wind farms

The Australian Government's Large-scale Renewable Energy Target also creates a financial incentive to promote the establishment, deployment and growth of wind farms.

Installing wind farms on the Study Area could contribute sales of electricity to the grid and the sale of Large-scale Generation Certification (LGCs). There is the potential for State or Federal funding to assist with implementation.

However, based on the NSW Wind Farms map approved under Part 4 of the EP&A Act (Windlabs, 2012) it was found that the Study Area is not identified as a high wind speed area and therefore potential for wind power is considered limited. In addition to this constraint, the pool of potential investors is unknown as is the market interest in wind farms. The distance from the power grid would increase connection costs and the presence of wind turbines could produce unacceptable visual impact. As a consequence of these constraints, no further consideration is given to this wind farms.

4.3.4 Telecommunications facilities

The opportunity also exists to locate large scale telecommunications facilities on the land given its relatively low intensity of activity. Telecommunications infrastructure could include radio or television towers, mobile phone infrastructure, subject to the scale of the infrastructure, and assessment of its visual impact.

4.4 Tourism and recreation

There are several opportunities to increase tourism and recreational activities within the Study Area, including building on existing cultural and recreational events. Tourism has been identified as a land use opportunity as it takes advantage of the rural landscape character, nearby National Parks and State Forests and historic sites.

The Tillegra Valley is about 3.5 hours from Sydney and 75 minutes from Newcastle, offering the potential for weekends away, farm stays and retreats. The scenic landscape and picturesque valleys have the potential to attract visitors for retreats, spas, resorts, farms stays, bed and breakfasts, bushwalking, cycling and numerous other outdoor activities.

4.4.1 Resorts and tourist accommodation

The Barrington Tops National Park hosts over 100,000 visitors each year and is a well-known world heritage site. People travel to Dungog to visit it and nearby country towns and villages. The Study Area is in close proximity to the National Park and could provide Ecotourism resorts trading off the features of the local area.

Several farm stays already exist in the area which trade off the organic and rural lifestyle and scenic qualities of the area such as the Fosterton organic farm discussed previously.

There is adequate land for a resort to buy land to build an eco-resort and spa. Tourist uses can vary greatly in scale from farm stays to large resorts.

Robertson and Robertson (2013) found that features such as views, access and privacy are of significant importance and outweigh features such as suitability for grazing and the potential for cultivation. In many instances, tourist uses lifestyle farms (hobby farms) complement one another given the commonality of drivers in value in the two markets. It is not uncommon for tourist uses to occupy lower quality agricultural land reducing the land cost component of what can be a significant total development cost.

4.4.2 Public recreation facilities on the Williams River

Rehabilitation of the Williams River could include allowing public access to the foreshore for public recreation and picnicking to allow appreciation of the scenic qualities of the landscape. Currently, the river is used for occasional canoeing the swimming by locals. Providing access to the river for recreation could provide more activities for tourists and visitors and create additional reasons for people to visit. The costs to establish and maintain the picnicking area could be a constraint as Dungog Shire Council has expressed concern over lack of funds to maintain picnicking facilities. Other sources of funding would have to be secured.

4.4.3 Walking, cycling and recreational tracks

There is an opportunity to provide walking tracks linking the Barrington Tops National Park to the key scenic and historic features of the Study Area including the Williams River, remnant vegetation and ridge top views. These walking paths could be implemented along with revegetation and protection of a network of green corridors to enhance the ecological and scenic value and experience of the area. Walking tracks could be provided through the creation of an easement and a low maintenance path. Weeds would have to be managed.

There is land available to also provide for mountain biking tracks and a touring car track to provide a variety of recreational opportunities within the area to support tourist uses.

4.4.4 Cultural facilities and events

Dungog township is establishing a reputation for its historic charm and active Main Street. Cultural activities such as Folk Music Festivals and the Dungog Independent Film Festival are contributing to Dungog's attractiveness as a destination for music and cultural events.

The Wests Cycle Classic passes through Dungog and several other small towns in the area. This annual fundraiser brings people into the area to support participants. Providing accommodation and encouraging additional sporting events and activities could increase the visibility of Dungog and the Tillegra Valley as a weekend and holiday destination.

Figure 18 Mumford and Sons Folk Music Festival, Dungog Showground 2012

4.5 Rural residential living

Retaining the capacity for sustainable primary production and creating further smallholdings and residential opportunities has been recommended by the Dungog Land Use Strategy and Situation Analysis (WorleyParsons, 2009).

The Dungog Land Use Strategy does not support the Tillegra District as an appropriate location for a substantial increase in future population. It supports the continuation of the existing land use (primary production/ agriculture) with increased emphasis on an emerging tourism industry as identified in the Situation Analysis (WorleyParsons, 2009).

Subdivision and closer settlement of residential populations can result in landscape changes, loss of rural character, cumulative impacts on biodiversity and catchment values, the loss of farm forestry potential and the potential for land use conflict (DPI, 2006). Retaining the capacity for sustainable grazing can also help retain other productive land use options, and protect environmental and landscape values.

The community consultation raised concern over subdividing the land for rural residential purposes as the community preferred to maintain the agricultural character of the area.

4.6 Land use opportunities evaluation

This report has identified several land use opportunities that are considered appropriate to complement the site characteristics and planning framework. The property valuer assessment conducted by Robertson and Robertson (2013) has been conducted to provide input into the viability of the identified land use opportunities. The opportunities that have been assessed against the project objectives to identify the recommended future land uses to be considered realistic and viable for the Study Area.

4.6.1 Land valuation assessment

Robertson and Robertson Consulting Valuers prepared an assessment of the land value of the Study Area referring to the following brief:

The brief for the property valuer included the following tasks:

(a) Estimate the en globo value of the land as a single holding

(b) Identify the highest and best use for the Study Area;

(c) Identify the minimum viable property size and estimated values (in dollars per hectare) for a range of agricultural and resort/ tourism uses;

(d) Identify the potential value implications (if any) from the possible fencing of vegetation areas on properties and applying a conservation covenant to protect revegetation of the Williams River; and

(e) Comment on potential property improvements that could add value to the subject land.

En globo valuation

The en globo value of the land as a single holding has been provided to HWC for their information.

Highest and best use

Robertson and Robertson (2013) have provided advice that the highest and best use for the land is the sale of individual groups of titles to purchasers seeking to use the land for non-commercial or lifestyle purposes on a weekend or part-time basis. Their advice provides the following supporting information:

- Whilst some of the land may be purchased by buyers with slightly different motivation, they consider the “sweet spot” in the current market to be this lifestyle or retreat use;
- This type of purchaser is not uncommon in the Dungog area and most other rural markets between one and three hours north of Sydney or Newcastle CBDs. Typically these buyers are not seeking to make a commercial return on any activities undertaken on the land, though some form of agricultural activity, such as beef farming, are uses which appeal to this market;
- Purchasers in this market seek land with a scenic quality, ideally comprising cleared and arable land suitable for grazing, some timbered hillside of varying grade and special features such as a river or creek to provide

for some recreational activities. Preferred access is via bitumen sealed roads though good gravel roads are not a significant deterrent;

- In relation to improvements, older style farm cottages tend to appeal the most. Vacant land however is not considered undesirable as it provides for creative opportunities for part-time accommodation;
- In very general terms, these buyers are mature persons with comfortable incomes and surplus cash flow, usually approaching a retirement or semi-retirement age; and
- The relative strength of this market has waned in recent years as a result of a number of factors including changes to taxation legislation introduced in 2009-10 This legislation restricted tax losses made on farms (non-commercial losses) to be applied to other income earned at a personal level where earnings were greater than $250,000.

Viable property sizes for identified uses

The minimum viable land sizes for the following land uses were identified by Robertson and Robertson (2013):

- Large scale agribusiness – 480ha +;
- Dairying – limited viability for this market within the Study Area;
- Beef cattle – the land requirements to stock 100 breeding units varies considerably depending on the slope and quality of the land; and
- Tourism – land required can vary greatly from farm stays to large resorts on land with supporting agricultural uses.

Williams River Revegetation

Robertson and Robertson (2013) provided advice on the impact of revegetating the riparian zone of the 70m wide of the centre line of the Williams River. This process will include fencing the revegetation from stock but retaining gated access to vehicles and pedestrians to access the river for recreation, water use and established vehicle crossings.

This advice did not include any assumptions about ongoing costs or maintenance that would be put upon future land owners as a result and for the purposes of this advice, they have assumed them not to be financially onerous on the landowners.

The complexity of this issue, however, would be found in the detail of the wording of the instrument and the application to each site on a case-by-case basis. Accordingly, they are only able to generalise as to the impact on value this instrument may have. There may always be specific circumstances where the general rule is not appropriate.

It is upon these considerations that they believe there to be little or no impact on the value of the land by the imposition of the proposed fenced riparian corridor. They do not believe that the gross realisable values of the subject lands would be materially affected by the imposition of these arrangements.

Potential property improvements

Robertson and Robertson (2013) do not consider there to be any readily identifiable value add opportunities relating to the en globo or in-one-line value considering works on the subject land in the Study Area.

Value add opportunities may exist if individual or smaller groups of titles are being disposed of in the market. An example of this is basic pasture improvement at the time of sale (as discussed previously in this report). Non-commercial or lifestyle buyers are driven by lands' scenic attractiveness and the lack of maintenance in recent times means aesthetic presentation could be improved. These and other prospects, however, would need to be assessed on a case-by-case basis.

Viable land uses

The land valuation assessment found that the following land use opportunities were considered viable:

- Non-commercial or lifestyle purposes agricultural/ part-time;
- Beef cattle farming on lots of at least 200ha on river flats and open grazing land;
- Large scale agri-business; and

- Tourism.

Protection and revegetation of the land should not take away from the value of the land.

The land valuation results have been taken into account in the evaluation of the various land use opportunities.

4.6.2 Assessment framework and analysis

The potential land use opportunities discussed have been assessed against the following outcomes:

- Are consistent with the intent of relevant planning legislation and strategies;
- Are cost effective and add value to the landholdings; and
- Benefit the local and regional community.

Table 2 is an assessment of the potential land use opportunities for the Study Area considered for further investigation.

Table 2 Assessment of potential land use opportunities

Land use opportunity	Consistent with planning framework	Cost Effective	Benefit to the community
Environment and heritage			
Carbon sequestration	Yes	If direct seeding methodology used, funding could be secured	Community benefit through improved environmental outcomes
Biobanking and biodiversity conservation	Yes	If funding secured	Community benefit through improved environmental outcomes
Williams River revegetation	Yes	Investment is considered to deliver considerable water quality improvements, funding could be secured	Community benefit through improved environmental outcomes and improved water quality for broader regional community
Green corridors	Yes	Investment is considered to deliver considerable biodiversity values and could contribute to a carbon sequestration initiative, funding could be secured	Community benefit through improved environmental outcomes
Heritage interpretation strategy/ bushwalking track	Yes	The main cost would relate to preparing signage, funding could be secured	Community benefit through improved environmental, historic and educational outcomes
Agriculture			
Beef cattle farming	Yes	If lots are over 100ha and located on good quality agricultural land (near the Williams River)	Maintaining agricultural uses are supported by the community
Dairying	Yes	No longer viable in current market conditions	Maintaining agricultural uses are supported by the community
Agri-business	Yes	Land use is possible however, a property used for this use would have a	Agricultural uses are supported, however international or corporate

Land use opportunity	Consistent with planning framework	Cost Effective	Benefit to the community
		value less than the highest and best use identified	buyer has the potential to not be accepted by the community
Non-commercial or lifestyle purposes agricultural/small scale	Yes	Identified as highest and best use	Maintaining agricultural uses are supported by the community
Commercial timber farming	Yes	Potential to provide economic return to HWC	Timber farming is historic to Dungog and likely to gain community support
Resources and infrastructure			
Wind power	If environmental impact justified, however site characteristics do no support this use	NA	NA
Solar power	If environmental impact justified, however site characteristics do no support this use	NA	NA
Mineral resource extraction	If environmental impact justified, however site characteristics do no support this use	NA	NA
Telecommunications	If environmental impact justified	Land would be sold at value to communications delivery agency	Potential to improve telecommunications
Tourism and recreation			
Resorts and boutique accommodation	Yes	Assessed to have similar value to the highest and best use identified	Supports the development of the local economy for tourism
Farm stays/ bed and breakfast	Yes	Assessed to have similar value to the highest and best use identified	Supports the development of the local economy for tourism
Bushwalking tracks/ green corridors, scenic views and heritage interpretation	Yes	Establishment of a bushwalking track with signage and maintenance is likely to be minimal	Supports the development of the local economy for tourism by providing activities and attraction, supports appreciation of scenic character
Public recreation areas on Williams River	Yes	Large financial investment without ongoing maintenance funding	Supports the development of the local economy for tourism
Rural residential			
Rural residential living	No	NA	NA

4.6.3 Summary of results

Assessment of the land use opportunities has led to the following recommendations, summarised in Table 3.

Table 3 Summary of appropriate land use opportunities for the Study Area

Land use theme	Viable land uses recommended
Environment and heritage	Carbon sequestration (carbon farming)
	Williams River riparian revegetation
	Revegetating Green corridors to increase biodiversity and environmental values
	Heritage interpretation strategy along possible bushwalking track identified
Agriculture	Non-commercial or lifestyle purposes agricultural/small scale
	Large-scale agriculture
	Beef cattle farming
	Commercial timber farming
Tourism and recreation	Resort or tourism accommodation
	Farms stays/ accommodation in tandem with agricultural production
	Bushwalking tracks associated with green corridors, scenic views and heritage interpretation

Of the opportunities discussed, a number of uses have been ruled out from further analysis due to apparent clear constraints to their implementation, or due to planning policy considerations. Uses that have been ruled out include the following:

- Mineral resource extraction – on the grounds that the Study Area is not underlain by mineral resources (such as coal, coal seam gas, or other valuable minerals;
- Solar power, and wind power – the Study Area is not mapped as having suitable conditions for solar or wind power generation;
- Dairying – no longer considered viable in current market conditions;
- Public recreation areas on the Williams River – the cost and establishment is considered to be prohibitive and lacks an ongoing funding base for maintenance; and
- Rural-residential living – the preferred location for rural-residential living comprising subdivisions of around two hectare parcels is in close proximity to established towns and villages. This is to minimise the potential fragmentation of productive rural land, and to avoid pressures from owners for the extension of town utilities.

4.6.4 Risk assessment

The following risk assessment has been conducted on the recommended opportunities summaries in Table 4.

Table 4 Risk Assessment Matrix

Land use opportunity	Risk	Rating (Low, Medium, High)
Carbon sequestration (carbon farming)	- Financial risk – tree seeding or planning failure or lack of rainfall - Financial risk – political change to carbon pricing and policy over the long term	Low - Medium
Williams River riparian revegetation	- Environmental risk– fencing off riparian corridor without adequate weed control measures could see increase in feed infestation - Financial risk – investment of seeding revegetation methodology without experienced contractor could fail	Low-Medium
Revegetating Green corridors to increase biodiversity and environmental values	- Financial risk – investment of seeding revegetation methodology without experienced contractor could fail - If plantings/seeding were to be used for carbon sequestration and fenced from stock weed infestation could increase	Low - Medium
Non-commercial or lifestyle purposes /small scale farming	- No identified risks	Low
Large-scale agriculture	- Financial risk - could return a lower land value compared with the highest and best use - Community risk – international investor or large scale privatisation may not be accepted by the community	Medium
Beef cattle farming	- Financial risk – to dispose of all land for this purpose would take many years - Financial risk – leasing land long term could result in a lack of soil or investment pasture improvement reducing the attractiveness of the land for sale	Low - Medium
Commercial timber farming	- Financial risk – failure of tree planting could result of loss of financial investment - Environmental risk – intensive farming of since species trees does not produce the environmental and biodiversity value of ecological revegetation approaches	Medium
Resort or ecotourism accommodation	- Financial risk – to dispose of all land for this purpose would take many years - Financial risk – leasing land long term could result in a lack of soil or investment pasture improvement reducing the attractiveness of the land for sale	Low - Medium
Farms stays/ accommodation in tandem with agricultural production	- Financial risk – to dispose of all land for this purpose would take many years - Financial risk – leasing land long term could result in a lack investment in soil/pasture improvement reducing the attractiveness of the land for sale	Low - Medium
Bushwalking tracks associated with green corridors/ heritage interpretation	- No identified risks	Low

5.0 Land Use Strategy and Management Plan Recommendations

5.1 Introduction

The recommended land use opportunities identified for the Study Area discussed in Section 4 include the following summarised in Table 5, and explored in further detail below.

Table 5 Summary of appropriate land use opportunities for the Study Area

Land use theme	Viable land uses recommended
Environment and heritage	Carbon sequestration (carbon farming)
	Williams River riparian revegetation
	Revegetating Green corridors to increase biodiversity and environmental values
	Heritage interpretation strategy along possible bushwalking track identified
Agriculture	Non-commercial or lifestyle purposes agricultural/small scale
	Large-scale agriculture
	Beef cattle farming
	Commercial timber farming
Tourism and recreation	Resort or tourism accommodation
	Farms stays/ accommodation in tandem with agricultural production
	Bushwalking tracks associated with green corridors, scenic views and heritage interpretation

5.2 Environment and heritage

5.2.1 Carbon sequestration (carbon farming)

This has the potential to provide off-sets against the carbon produced by HWCs capital works program, following an initial investment period for revegetation. Any additional offsets generated could be sold on the open market. Funding assistance is available through the Australian Government's *Carbon Farming Futures* for this initiative. The land capable of being used for carbon farming (slopes less than 1 in 3) is illustrated on Figure 19.

5.2.2 Williams River riparian rehabilitation with a conservation covenant

This initiative proposes to rehabilitate the Williams River Riparian corridor to improve water quality values. There is not expected to be any diminution in land value with revegetation, fencing and covenant in place (Robertson and Robertson, 2013). Funding from Government could be sought to assist with financing including the *Habitat Action Grant* and *Biodiversity Fund*. The Williams River riparian corridor revegetation option is illustrated on Figure 19.

5.2.3 Green corridors

This opportunity involves the revegetation of approximately 410ha that could also be staged over time contingent on the land disposal program. Funding could be sought from Government to assist with implementation. The areas that could be the subject of green corridors with the potential bushwalking track and heritage interpretation strategy are illustrated on Figure 19.

5.2.4 Heritage interpretation

A heritage interpretation strategy could be provided as part of the bushwalking track and implemented as part of the Williams River riparian rehabilitation. The main costs would relate to the preparation of information signage. Government funding under heritage programs could be sought for this opportunity. The heritage interpretation strategy could be implemented as part of the potential bushwalking track illustrated on Figure 19.

5.2.5 Potential environmental funding sources

Community Environment Grants (Caring for our Country)

Grants of between $5000 and $50,000 are available to help community groups and organisations to contribute to sustainable management of the environment. Investment under the following strategic objectives are prioritised:

- Maintenance of ecosystem services, including ecological and cultural values, now and into the future;
- Protection of our conservation estate; and
- Enhanced capacity of Indigenous communities to conserve and protect natural resources.

Conserving and maintaining vegetation under this grant would provide a positive contribution to the conservation, biodiversity and management of land within the Study Area with the help of Government funding. To be eligible for this grant the formation of a community based organisation or trust is required.

Target Area Grants (Caring for our Country)

Target Area Grants funds projects across Australia that are aimed at improving biodiversity and implementing sustainable farm practices to achieve national targets.

To be eligible for the grant, land must be wholly located within one of the identified target areas. The Study Area is not within a target area. However, there is an application process for land outside target areas for initiatives that comply with the principles.

Biodiversity Fund (Caring for our Country)

The Biodiversity Fund supports the establishment of native vegetation or better management of existing native vegetation for carbon and biodiversity benefits.

- For funding <$2 million, applicants need to complete a Full Application; and
- For funding >$2 million, applicants need to complete an Expression of Interest (EOI) form. If the EOI is successful, the applicant will be able to proceed to Full Application.

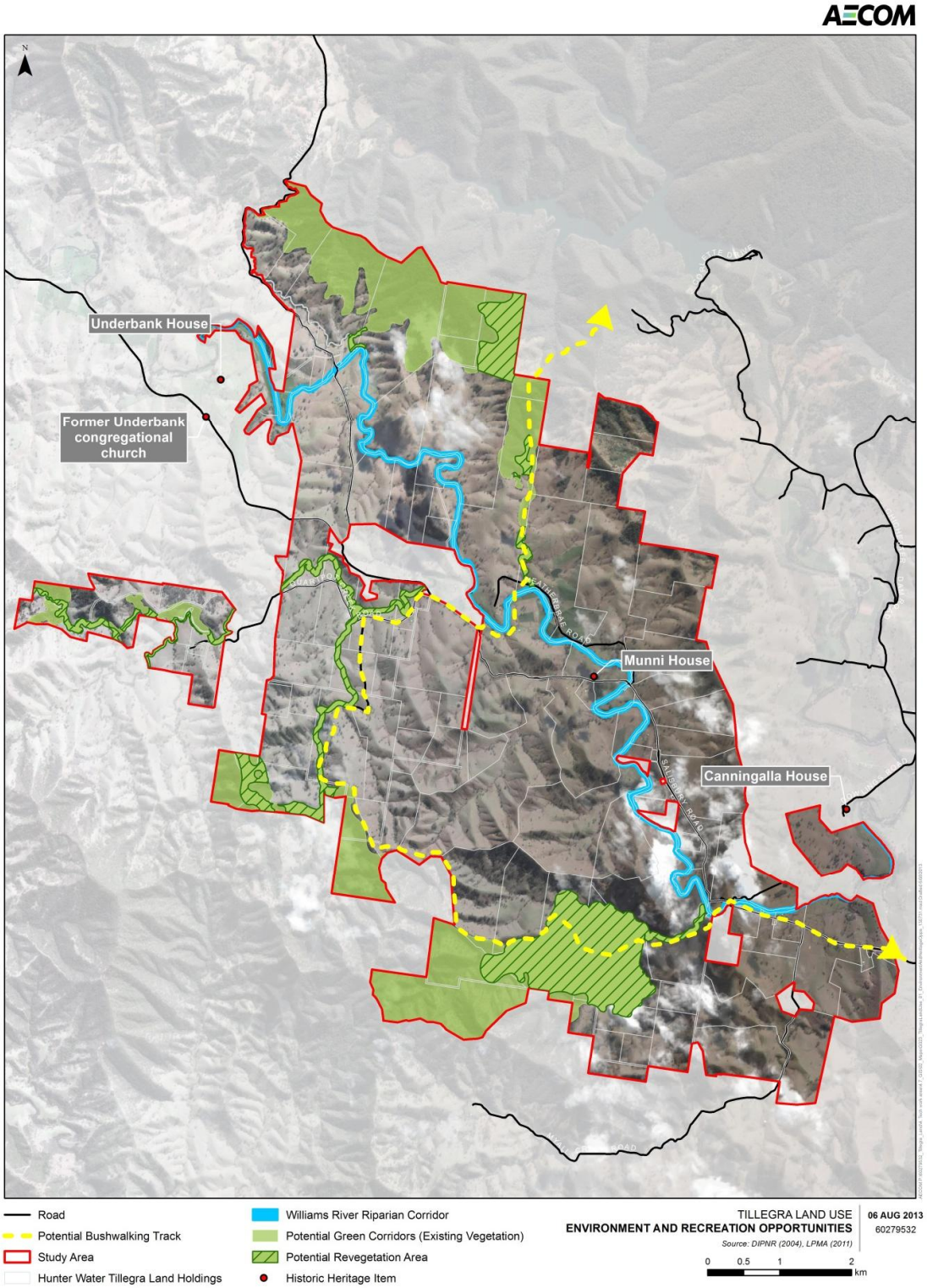
To be eligible, projects must be:

- 100% within an identified Target Area;
- Linked to the themes of the Biodiversity Fund; and
- Be a Carbon Farming Initiative (CFI) – related project operating within, or planning to operate within, an approved methodology.

Applying for funding under the Biodiversity Fund could support the establishment of CFI within the Study Area. The Biodiversity Fund is particularly interested in larger scale projects spanning different land uses and tenures. A future project application for the Biodiversity Fund could be established under the CFI or be linked to the themes of the Biodiversity Fund. There is a risk that land may only be accepted as part of a CFI.

The Federal government is investing around $94 million over the next six years. Funding will be provided for projects seeking a minimum grant amount of $500,000. The grant could be application to the creation of the proposed green corridor, the Williams River riparian revegetation and broader carbon farming within the Study Area if these plantings also accredited as a carbon farming initiative.

Figure 19 Environment and recreation opportunities



Habitat Action Grant

Twenty five projects were funded in the 2012-2013 Habitat Action Grants. These grants totalling almost $525,000 will assist recreational anglers, local Councils, environmental and community groups and private landholders to enhance and rehabilitate degraded recreational fish habitat through a range of on-ground works. Rehabilitation of fish habitat provides long-term sustainable benefits for native fish stocks and in turn provide substantial benefits for NSW recreational fishers who will enjoy more healthy productive fisheries. Improvements in fish habitat will also provide more opportunities for rural and regional communities to promote local tourism. Rehabilitation of riparian lands has been outlined by DPI – Fisheries and Aquaculture as being a good method to improve fish habitat as fish and other aquatic species prefer waterbodies with healthy, endemic riparian vegetation.

The DPI website outlines that angling clubs, individuals, community groups, local councils and organisations interested in rehabilitating fish habitats in freshwater and saltwater areas throughout NSW can apply for grants.

Funding applications require the completion of the habitat-specific Funding Application form and must relate to the enhancement of recreational fishing through the improvement of fish habitat. Applicants may apply for a small grant (maximum $1,000 excluding GST) or a large grant (maximum $40,000 excluding GST). Successful projects are usually funded for one year and announced towards the end of the year.

Carbon Farming Futures

Under the Australian Government's plan for securing a Clean Energy Future, the Carbon Farming Futures program will provide $429 million to ensure that advances in land management technologies and techniques for emissions reduction and adaptation will lead to enhanced productivity and sustainable land use under a changing climate. These advances will allow farmers and other landholders to benefit from the economic opportunities of the Carbon Farming Initiative (CFI) while assisting Australia in achieving its long term emission reduction targets.

The program is part of a set of land sector measures (the Land Sector Package) under the Government's Clean Energy Future Plan. The plan's $1.7 billion Land Sector Package is about creating new opportunities for land managers to enhance productivity, gain economic benefits and help the environment by reducing greenhouse gas emissions.

The Department of Agriculture, Fisheries and Forestry is responsible for delivering the components of the Carbon Farming Futures program ($429 million over six years) which include:

- **Filling the Research Gap** ($201 million over six years) to fund research into new technologies and practices for land managers to reduce emissions and store soil carbon. National survey to identify common practice. Commences in 2011/12;
- **Converting research into methodologies** ($20 million over six years) to convert research into estimation methodologies for use in the CFI. Commences in 2012/13;
- **Action on the Ground** ($99 million over six years) to assist industry and farming groups test and apply research outcomes in real farming situations;
- **Refundable Tax Offset** (RTO) ($44 million over three years) to provide 15% RTOs for new eligible conservation tillage equipment installed between 1 July 2012 and 30 June 2015; and
- **Extension and Outreach** ($64 million over six years) to provide technical information and support to farmers, land managers and their key influencers to assist them to participate in land sector emissions management activities and the CFI.

5.3 Agriculture

5.3.1 Small-scale farms and non-commercial lifestyle farms

Robertson and Robertson (2013) have advised that the highest and best use is small scale farms for non-commercial or lifestyle purposes on a weekend or part time basis. Some buyers could, however, wish to acquire properties for commercial small scale farming. It would be imperative to ensure that lots packaged up and put to the market should have a dwelling entitlement that is, they should have a minimum lot size of at least 60 ha.

5.3.2 Large-scale agribusiness

This option remains as a potential use, with the size of property dictated by market response. Robertson and Robertson (2013) advise that there are few precedents for large scale agri-businesses in the Dungog area, however, they exist elsewhere in the Hunter Valley. This is shown to be of lesser value than the highest and best use identified earlier, however, could provide an attractive opportunity to HWC is their wished to dispose of the land quickly.

5.3.3 Beef cattle farming

Advice from Robertson and Robertson (2013) indicates that the minimum farm size for viable beef cattle farming ranges from 150ha for 40 breeding units (DP&I, 2006) to 80ha for 40 breeding units (anecdotal local land valuer evidence). Current beef prices demonstrate that about 100 breeding units are required to cover operational costs and to break even. Therefore, a ready market is understood to exist for “weekender” farmers who would use their property as a secondary income.

5.4 Tourism and recreation

5.4.1 Resorts and other tourist accommodation

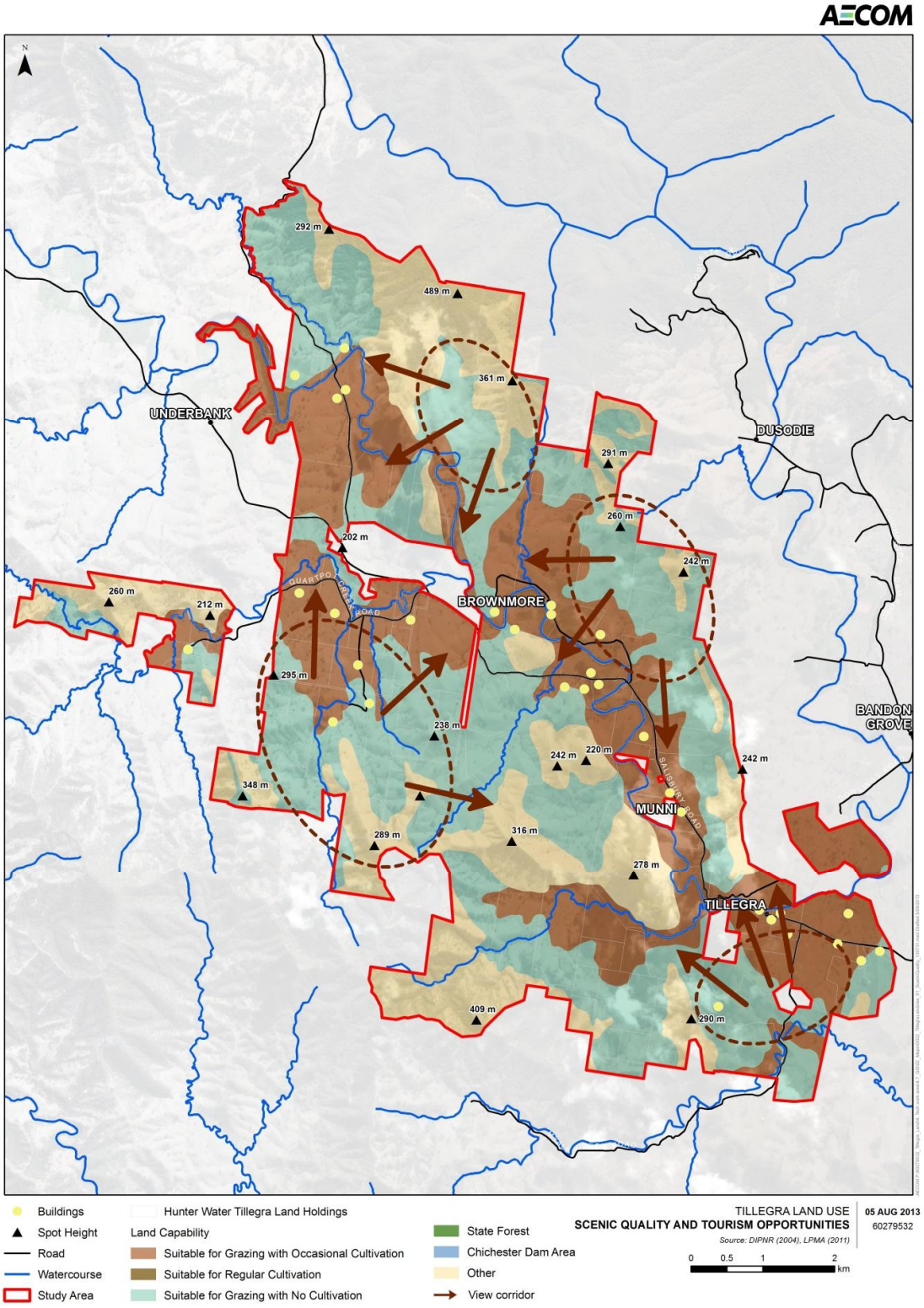
Advice from Robertson and Robertson (2013) indicate that the size of properties used for viable resorts and tourist accommodation varies significantly, ranging from less than 10 ha in size to several hundred ha. The study has identified a number of locations within the Study Area that appear to have good scenic and landscape attributes that could be suitable for tourism uses.

Land within the Study Area has been identified as having special scenic and landscape values and could be suitable for resorts or tourist accommodation. Areas with scenic views located on comparatively lesser value agricultural land have been identified on Figure 20 as potential areas to locate tourist resorts and other accommodation as they do not need to utilise the higher quality agricultural land. However, as discussed previously all land in the Study Area is considered suitable for tourism uses from a market and capability perspective.

5.4.2 Walking tracks associated with green corridors

The Williams River riparian corridor could be connected with walking tracks to Chichester Dam and the Barrington Tops National Park and other natural areas in the hinterland of the Study Area. The vegetation corridors would increase the ecological value of the land by connecting existing remnant vegetation and creating biodiversity corridors. Funding could be pursued through Government programs mentioned above aimed at achieving improved biodiversity outcomes including *Caring for our Country*. Figure 19 illustrates these elements.

Figure 20 Scenic quality and tourism opportunities



5.5 Value add improvements

Improvements to the landholdings to add value which could be implemented to add value include:

- Reconciliation of property boundaries in selected areas to address accessibility restrictions (mainly resulting from an absence of appropriate easements), or new easements/right-of-way negotiated to address access difficulties for specific details of recommendations); and
- Individual or small groups of titles are being disposed of in the market. This could include pasture improvement at the time of sale.

Reconciliation of property boundaries is recommended in specific areas identified by HWC in the course of this Plan, and some locations where new easements of rights-of-way should be negotiated.

Any improvements to track access or river crossings should be addressed on a case-by-case basis having regard to the disposal strategy to be identified by HWC, and likely return on investment at the time of disposal.

5.6 Suggested staging

The landholdings within the Study Area have enough agricultural land to provide a supply for many years. Therefore intermediate land use opportunities will need to be considered to approach land use in the interim.

Given that the highest and best use has been found to be small lot farming for lifestyle or weekend use, the following strategy is recommended to make best use of the land over time:

Short term

- Due to the potentially long disposal period to achieve the highest returns from the land, HWC should continue its program of weed, pest and fencing management under lease arrangements, and could investigate other suitable pasture improvement measures aimed at maintaining the quality of the land and enhancing its attractiveness to buyers.
- Another short-term action should be to establish rights-of-carriageway or easements, or amalgamate suitable properties to resolve existing access issues, and to provide larger lots for more commercially viable agricultural uses.
- Lots with higher value land capability described as ‘Suitable for Grazing with Occasional Cultivation’ (shown on Figure 5) should be considered for initial sale. Land near the Williams River is considered most marketable due to the attraction of the river frontage and amenity, and potential access to water licences. Some lots of at least 200ha could be put to market to test the market in terms of interest in larger scale agricultural ventures. The remainder should be at least 60ha to enable dwelling entitlements.
- Areas with scenic values have been identified for tourist accommodation. These areas have are shown outside the higher value agricultural lands to make that land available for potential agricultural use. These could be put to market in the short-term to gauge market interest in such pursuits. The preference would be to attract tourist facilities to these areas, however, the whole of the Study Area is considered suitable for tourist facilities and accommodation.
- Carbon sequestration, by way of a carbon farming initiative could be investigated in more detail in the short-term. Carbon farming has the potential to deliver returns in the medium to long term. Beginning with the Williams River riparian revegetation and establishment of the Green Corridors additional carbon farming initiatives could be established on steeper slopes and areas of lower value agricultural land in the interim to provide a return to HWC. The investment in planting could be offset by seeking funding grants.

Medium term

- Revegetation of the Williams River riparian corridor to improve water quality for the drinking water catchment is a realistic opportunity that is considered an efficient investment for the implications that it has for water quality, and biodiversity outcomes. Conservation covenants could be developed to protect the revegetation areas. HWC could consider using the revegetation to form part of a carbon farming initiative with the potential to be built upon in future stages. HWC could apply for funding grants to reduce investment costs.
- To support the proposed land uses the bushwalking track with heritage interpretation could be implemented in the medium term incorporated within the green corridors. The green corridors would increase the biodiversity value of the land and provide the opportunity for carbon sequestration.

Long term

- If determined feasible in the short term carbon sequestration, by way a carbon farming initiative could be a suitable long term use for the land that has a lower agricultural capability and may not be as attractive for sale.
- An alternative to creating carbon farming initiatives within the Study Area could be to investigate the potential for HWC to plant higher value commercial timber varieties that would be suitable for furniture making. This investment could provide a shorter economic return if required.

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