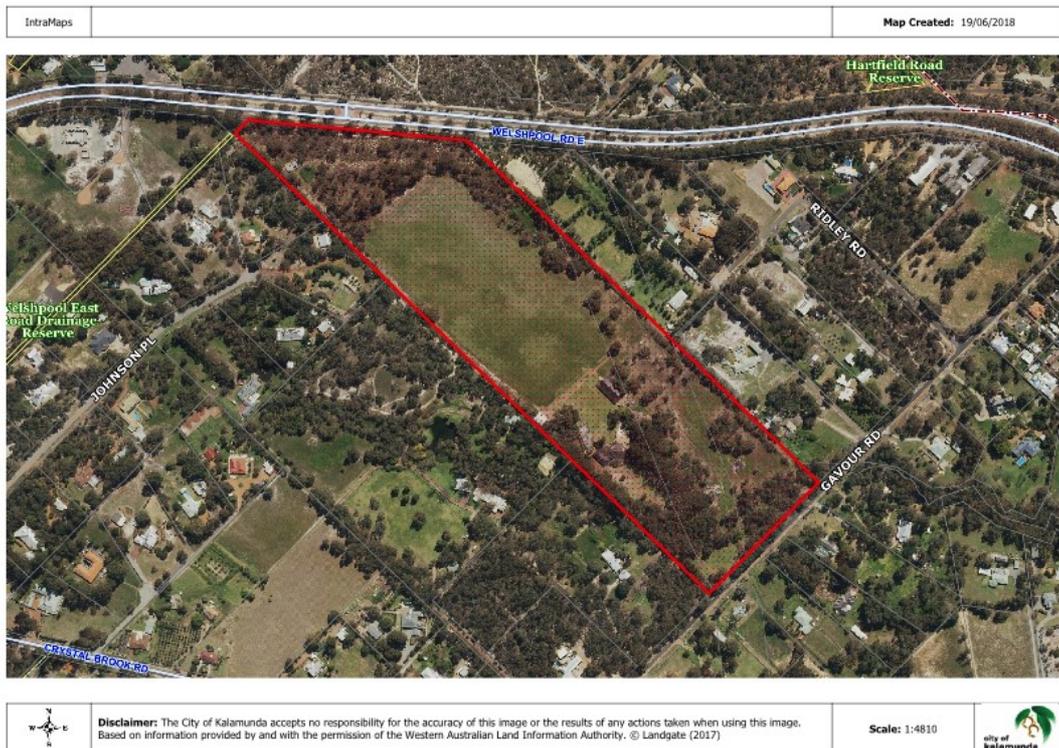


## Environmental Assessment Lot 500 GAVOUR RD WATTLE GROVE



### EXECUTIVE SUMMARY

An environmental assessment of Lot 500 is presented based on surveys of fauna, flora, soil types and the aquatic resources. Such an assessment is an integral stage of providing factual information, in context, for development applications.

The property is a flat elongated block of approximately 15 hectares, which is substantially larger than the surrounding properties. The environmental character of the block is dictated by the history and the use of the surrounding properties. Lot 500 is predominantly cleared, used as a equestrian sport facility and is surrounded by small residential holdings, most of which are parkland cleared residences including horticulture activities.

## Gavour Road - Environmental Assessment

The property is truncated by an 80m wide Western Power easement and has a major arterial road on the north- western boundary. The combination of the history and the impact of adjacent land use result in the classification of the site, including, the landform, the vegetation the faunal and the water resources, as disturbed.

To assist the process of a development application, surveys were conducted to record the current condition of the site. Few resident animals were noted, which reflects the nature of the surrounding environment especially the few and sparse vegetation types. No assemblages of vegetation or associated communities of animals were recorded in this predominately cleared Special Rural zone.

On investigation the seasonal water course was narrow, fast flowing, contained minimal habitat and was classified as moderate water quality.

These findings are consistent with the location and history of the property. No specific issues have been identified in this report that require further investigation.

The knowledge gained during this assessment process could be used to enrich the site and the local environs in both fauna and floral characteristics by directive landscape plans.

## Gavour Road - Environmental Assessment

## 1.0 INTRODUCTION

The aim of this document is to describe Lot 500 Gavour Rd Wattle Grove, from an environmental perspective. Such a description forms an integral component of development applications and can be incorporated into environmental management plans to be developed in the building application phase of development. Such a requirement has been set out in the Environmental Protection Act 1986.

Effective knowledge-based management is structured and transparent to permit a completion of the development application process. Primarily, good management practices rely on identifying and then understanding each physical, chemical and biological process, so that the cumulative impacts on the environment can be determined.

All developments have a level of impact on the existing and future environment. Knowledge-based management aims to reduce the impact to an acceptable level and even enhance the environment by ensuring projects are directed to promote care and sensitivity on both a local and regional scale.

The level of investigation is always placed into context with the environment present. The allocation of resources: time, money, emotion and opportunity cost is proportionate to the findings of the ecological investigations.

## 2.0 BACKGROUND

Aquatic Solutions, a company experienced in ecological evaluations, under the guidance of Brett O'Brien MSc BSc, was appointed by Mr. Ross Leighton to coordinate an Environmental Assessment of Lot 500 with consideration of environmental, botanical and zoological evaluations. The purpose of such an investigation is required to assist with a development application for the City of Kalamunda.

The services of Dr David Leach of Western Botanical and Dr Jenny Wilcox of Western Wildlife were contracted to assist with the assessment.

## Gavour Road - Environmental Assessment

**3.0 PROPERTY DESCRIPTION**

A narrow property is 15.1808 ha in area, orientated north-west to south east. The property extends between Gavour Road to the south-east and Welshpool Road to the north-west. The width of the property is 210.17m. At the north-western portion of the property is truncated at 50 degrees to the southern boundary and is approximately 290m wide. The longer southern boundary is 850.75m and the northern boundary is 632.76m long.

The property is flat and slopes to the west with a fall of approximately 3m over a distance of 851m. An intermittent stream known as Crystal Brook, flows across the highest portion in the south-eastern section of the property.

There is an 80m wide Western Power easement that truncates the eastern portion of the property. A main arterial road consisting of 4 lanes and a medium strip, adjoins the north-western boundary.

**4.0 HISTORY**

The property was developed as a farm and a dairy in the 1930 to 1960's. The original house and associated buildings were removed because they were located in the easement area for the high tension power line. During the period of the 1960's to the 1970's the property was used for cattle grazing and sand extraction. The property was purchased by the current owners in 1979. During the last tenure of ownership the property has been remediated and developed as a private home and as a sporting venue for polo.

**5.0 SURROUNDING ENVIRONS**

An environmental perspective needs to include both the property itself and to be placed in context with the surrounding landscape. Lot 500 is the largest of the properties in the near vicinity. Most of Gavour Road is zoned as Special Rural. The characteristics of such an area are open paddocks, grazing, parkland clearing, residential and horticulture activities.

The properties surrounding Lot 500 are smaller, usually less than 10,000m<sup>2</sup> in Johnson Place to the west, along Gavour Road to the east, Ridley Road to the north and Crystal Brook Road to the south.

## Gavour Road - Environmental Assessment

To the north of the main arterial road (Welshpool Road) there is a Bush Forever Site (2.74 ha).

## **6.0 REGIONAL PERSPECTIVE**

The south-eastern boundary of Lot 500 is situated approximately 650m west of the Darling Scarp. The landforms adjacent to Lot 500 are characterized by flat and even land. Colloquially, the area is known as "The Flats." The block is approximately 17km from the current coastline and is 25m above sea level.

The area beneath the scarp known as Wattle Grove is the result of deposition from the eroding scarp, formed due to fault line over 1,000km long that occurred over 2,500 million years ago. The soils of Lot 500 are derived from a combination of alluvial deposits from the streams flowing off the scarp, soil crept from material moving down the scarp (colluvial) and some sand deposits blown in from the marine environment. The combination of soil origin and nature of the deposition results in an even topography with more sand in the soil to the west and more clay to the east of the property.

## **7.0 ENVIRONMENTAL ASSESSMENT**

The three main components of assessing the impact on the environment are utilizing the animals as biological indicators, vegetation as a base line determinant of native or introduced species and water as a habitat or vector for pollutants.

### **7.1 FAUNA**

The fauna survey includes both a desktop and a field study, as is required in accordance with Environmental Protection Authority (EPA) Statement of Environmental Principles, Factors and Objectives (EPA 2016a), Environmental Factor Guidelines – Terrestrial Fauna (EPA 2016b), Technical Guide – Terrestrial Fauna Surveys (EPA 2016c), Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA & DEC 2010) and EPBC Act Referral Guidelines for three threatened black cockatoos: Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black-Cockatoo (DSEWPac 2012).

## Gavour Road - Environmental Assessment

A Level 1 vertebrate fauna survey with a targeted Carnaby's Black-Cockatoo habitat survey was undertaken. The survey was conducted with reference to the following documents:

- Statement of environmental principles, factors and objectives (Environmental Protection Authority (EPA) 2016a)
- Environmental factor guideline – terrestrial fauna (EPA 2016b)
- Technical guidance – terrestrial fauna surveys (EPA 2016c)
- Technical Guide: terrestrial vertebrate fauna surveys for environmental impact assessment (EPA and DEC 2010)
- EPBC Act Referral Guidelines for three threatened black cockatoos: Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black-Cockatoo (DSEWPac 2012).

The fauna survey included a search of available literature and databases (a desk-top study), and a brief site visit. The data collected in the field serve to put the desk-top study into context, as well as allowing for the identification of fauna habitats and likely fauna assemblages of the site.

As detailed in Appendix 1, including a map of sites where different species or species presence were noted. The site is characteristic of most of the land in the area, being residential lots with medium to high intensive use as Special Rural land. Such land use does not permit a rich faunal presence and the possibility of a diverse faunal assemblage of ecological significance.

Based on the area of the different habitat types the majority of the property is open grass, with the remainder being cleared open woodland or parkland cleared with minimal or no understory. The presence of roads on the eastern and western boundaries, plus adjoining properties, further restricts the ability of the property to provide moderately suitable habitat for many species. Suitable high quality habitat does not exist.

The food types, shelter required for protection from predators and ability to move and forage are all either absent or inadequate to support most species. Organisms that fly can make minor use of the habitat structure provided by larger trees (diameter of >0.5m) present on the site. Adjoining properties have a more substantial presence of vegetation to attract birds.

## Gavour Road - Environmental Assessment

The aquatic habitat on the eastern boundary of the property is characterized by open, denuded and a simple channel for seasonal stream flow. Similarly, to the rest of the property, the creek zone does not provide the basic resources of shelter, food or breeding sites for many organisms. There is no riparian vegetation to assist in providing a range of foods or shelter.



**Map 1. Sightings of animals or the presence of animals on Lot 500. See Appendix 1 for details.**

### 7.1.1 Summary of Fauna Survey.

The structure of the community determines the faunal assemblage. The property has the usual range of species that are capable of inhabiting sparse and introduced vegetation. Lot 500 is mostly utilized by a few species (27 observed) that fly into and out of the property, making use of the trees present.

The presence of Cockatoos and some signs of Quendas (bandicoots) was noted. There were no signs of roosting cockatoos and more suitable vegetation exists in the area.

## Gavour Road - Environmental Assessment

The aquatic resource is of moderate quality, is intermittent, fast flowing and lacks riparian shelter. Therefore, the basic requirement for a community of aquatic organisms is not available.

## 7.2 FLORA

Similar to the preceding Fauna Survey, both the desktop and field studies provided the basis for assessment. The desktop study indicates that before settlement of Europeans, several functioning and stable vegetation communities existed. Some evidence of these assemblages exist in isolated and protected pockets within the vicinity of Lot 500. Predominantly they were *Banksia attenuata* woodlands. The polygons of potential occurrence of species is indicated in Appendix 2.

No *Banksia attenuata* or any other species threatened or priority species listed were identified on Lot 500.

A map of the property identifies the different vegetation zones.



\* Areas not mapped as vegetation (Condition Completely Degraded)

**Map 2. Vegetative Map - Depicts the vegetation types based on aerial photography and field surveys. See Appendix 2 for details.**

1 *Banksia menziesii* open woodland

## Gavour Road - Environmental Assessment

- 2 Allocasuarina fraseriana open woodland
- 3 Corymbia calophylla sparse woodland
- 4 Corymbia calophylla open woodland
- 5 Corymbia calophylla open woodland
- 6 Mixed Corymbia citriodora open
- 7 Corymbia calophylla woodland
- 8 Mixed native and exotic plantings

The investigation of the vegetation present indicate that all of the property is parkland cleared or grass. Over 50% of the area is turf and all but the most western portion of the property is introduced and degraded vegetation.

The small areas inhabited by a few native species Categories 1 to 4 in the Vegetation Map are located in a narrow strip along the main arterial road. They comprise approximately 8% of the property on the map, but this area includes the spaces between the few plants present and therefore the area “covered” is much smaller.

The few species present in Categories 1 to 4, occupy an area too small to create an assemblage or representative sample of any community structure. The species type, species number, structure of the array of plants result in them being isolated native plants. The surrounding land use being parkland cleared, essential firebreaks, adjoining 4 lane road and narrow band of native species is indicative of the last 70 years of land use. This land use has also resulted in the spread of the dieback fungus *Phytophthora innamomic* which is most likely the cause of the observed death of most of the susceptible native plants in the area.

#### 7.21. Summary of Flora Survey

The history of land use and soil types (see later section 9.0) dictate the species and distribution of plants. The vegetation present follow east/west delineations. All of the vegetation on the property, as determined by area, is either grass, introduced species or parkland cleared. All of the vegetation is degraded from intense use, including being infected by the dieback fungus.

There is some remnant species of vegetation in a narrow band along the road on the western boundary. No threatened, endangered or priority species were identified.

## Gavour Road - Environmental Assessment

The investigation into the flora of Lot 500 (Appendix 1) identified areas that had been slashed in order to comply with the Bushfire Act and the requirements of the City of Kalamunda as a mandatory bushfire mitigation requirements. As an ongoing requirement these relatively small areas will be maintained in their current (slashed) state. This is considered an appropriate and responsible fire mitigation strategy.

## 8.0 WATER

Both the surface water and underground supplies are present on the property. Crystal Brook is the winter stream that flows through the highest and southern portion of the property. The climate of the area is long dry summers and cool wet winters, therefore the hydrological characteristics will predominantly be influenced by rainfall.

### 8.1 Surface water

In practical terms, the surface water flows through in a channel of just over 200m of the property. The creek known as Crystal Brook is approximately 5 km long and on the site moves rapidly (>3m/sec) having just flowed down the 180m high scarp on the way to a swamp to the west of the property. In this swamp or soak area, the water filters through to Yule Brook approximately 2km to the west.

Water quality is moderate with slightly elevated salinity (300 to 500us/cm) and moderately high nitrogen levels (0.5 to 1.5 mg/l). Other parameters of pH, suspended solids, phosphorus and dissolved oxygen are acceptable for water from a catchment with land use of residential, high density residential, agriculture, horticulture and light industry.

Water quality would most likely improve during the season from the initial flows usually in June to the end of the season in October.

Aquatic fauna surveys revealed minimal organisms inhabiting the water and riparian zones. The combination of seasonal water availability, fast flowing water, narrow channel, minimal shelter and clay rich edges does not provide for suitable habitat for most organisms.

## Gavour Road - Environmental Assessment

There are no aquatic species put at risk by any proposed development in or associated with the creek.

## 8.2 Underground water supplies

The more sandy northern portion of the property did not have any ground water present to the depth of 4m. There is a shallow perched water table at approximately 1.1 to 1.6m in the southern portion of the property. This perched water is most likely just sitting on lenses of clay because the local bores in the area have standing water approximately 20m below ground level.

## 9.0 SOILS

There are three general soil types on the property, which are often reflected in the vegetation distribution because the soil type impacts on both fertility and water holding ability of the soil.

Soils associated with the eastern portion of the property except adjacent to the seasonal creek consist of clayey/sand topsoil to 0.2m overlying gravelly sandy/clay to 2m. These soils are formed on the slope (colluvial) in association with deposition of material derived from the creek (alluvial).

Adjacent to the creek and formed by more recent activity is the alluvial clays associated with flooding of the creek.

Soils in the northern quarter consist of medium to fine sand with organics to approximately 0.75m overlying medium fine yellow sand to a depth of 4m – typical of the Bassendean sand complex.

## 10.0 ENVIRONMENTAL MANAGEMENT

Effective management includes incorporating the knowledge of the environment into the design and to implement action plans. The value of knowledge is to assist managers to place all variables into a realistic context of the site, the area, the region and the investment required commensurate with each step in the evaluation process.

Gavour Road - Environmental Assessment

This assessment of the existing fauna, flora and water resources of the site indicated that the site is typical of the area of intensive to semi-intensive rural pursuits.

No animals or plants of ecological significance were noted. Similarly, no issues relating to the seasonal creek or subterranean water resources were identified.

# Appendix 1

## Fauna Survey

# Appendix 2 Flora Survey