



# Gascoyne Food Bowl District Structure Plan

Part 1: Implementation Report  
May 2017



Department of  
Agriculture and Food



urbis

**REPORT PREPARED FOR:** Department of Agriculture & Food WA

**PROJECT TEAM:**

Town Planning – Urbis

Environmental – Land Assessment

Hydrology – Infrastructure Planning & Development

Infrastructure & Servicing – Infrastructure Planning & Development

## Endorsement Page

This Structure Plan is prepared under the provisions of the Shire of Carnarvon Town Planning Scheme No.10.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

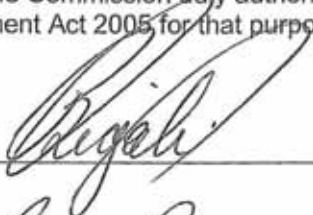
DATE: 23.05.2017

Signed for and on behalf of the Western Australian Planning Commission:



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An officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of:



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ROSA RIGALI

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23.05.2027

Date of Expiry



# Executive Summary

The Gascoyne Food Bowl Structure Plan (the 'Structure Plan') allows for the creation of new horticultural land within the Carnarvon region as contemplated under the Gascoyne Food Bowl Initiative. The Structure Plan is premised on best-practice planning principles that provides a guide to the scheme amendments required to facilitate horticultural activity and the future land use and development of the land.

The development of additional land for horticultural purposes provides opportunities to diversify and cultivate the Carnarvon horticultural industry, matched with the appropriate allocation of water resources and infrastructure. The Gascoyne Food Bowl Structure Plan will complement the surrounding horticultural operations, contribute to local employment, support local services and improve the trade and productivity of the Carnarvon horticultural industry.

The Structure Plan area covers approximately 600 hectares of largely undeveloped land and is surrounded by existing northern and southern plantations, and vacant crown land. The Structure Plan allows for the creation of approximately 22 lots (depending on market trends) over which traverses the Shire of Carnarvon's Town Planning Scheme No.10 and District Planning Scheme No.11 scheme boundaries.

A range of zonings under the aforementioned schemes currently apply to the land within the structure plan area. Separate scheme amendments are being undertaken (concurrently) to rezone the land within the boundaries of the structure plan to 'Intensive Horticulture' consistent with the existing adjacent land (northern and southern plantations).

The Structure Plan incorporates water sensitive design principles as far as possible and balances the release of water with the release of additional land. Once the Structure Plan and scheme amendments have been completed, land will be leased (in the short term) to the market, along with appropriate leasing conditions, akin to other rural/pastoral lease arrangements.

Environmental considerations and ultimately the capability of the land for horticultural purposes have been the key consideration in the identification of land for release, and are the key guiding principle with respect to the boundaries of the Structure Plan and the land subject of rezoning.

An orderly street network providing direct access to new horticultural land is outlined within the Structure Plan. The existing street network performs an integrated role with the release of land, ensuring that all new land parcels have adequate frontage to dedicated roads. Inherent to the location of any new internal roads is the protection of land from flooding.

The Structure Plan establishes a framework to deliver the appropriate infrastructure and services to the land release area, as well as appropriate guidance to ensure the development of land is consistent with orderly and proper planning, and aligned to the Department of Agriculture and Food WA (DAFWA) project scope and vision. The Structure Plan demonstrates that the area can be appropriately serviced with essential infrastructure, with the identification of roles and responsibilities for the delivery of any upgrades or extension of services identified.

As part of the preparation of the Structure Plan, the following reports, assessments and management plans have been prepared and are summarised in this report. Full copies are included in the technical appendices.

- Environmental Assessment and Management Strategy (Land Assessment).
- Local Water Management Plan (Infrastructure Planning and Development).
- Infrastructure Servicing Report (Infrastructure Planning and Development).

These reports pull together the range of comprehensive technical reporting and information undertaken to date as part of the Gascoyne Food Bowl Initiative relative to the Structure Plan to address all of the applicable planning considerations and demonstrate that the subject land is capable of supporting horticultural development in the form proposed within this Structure Plan.

Together with Part 1 (Implementation), the following Explanatory Report (Part 2) details how the Gascoyne Food Bowl Structure Plan manages all site considerations to provide a balanced, site responsive approach to the delivery of additional horticultural land to the Gascoyne region.

Table 1 below provides a summary of the key statistics and planning outcomes of the Structure Plan.

TABLE 1 – STRUCTURE PLAN SUMMARY TABLE

ITEM	DATA	STRUCTURE PLAN SECTION
Structure Plan Area	1,210 hectares	Part Two, Section 2.1
Horticultural Development Area	400 hectares	Part Two, Section 2.2
Estimate Lot Yield	22	Part 1, Section 2.2
Estimate Number of Dwellings	22	Part 1, Section 2.2

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# 1 Gascoyne Food Bowl Structure Plan

## 1.1 STRUCTURE PLAN AREA

The Gascoyne Food Bowl Structure Plan, once endorsed, will become a non-statutory document to guide future subdivision and development for the land being released as part of the Gascoyne Food Bowl Initiative.

This Structure Plan shall apply to the land contained within the inner edge of the line denoting the structure plan boundary on the Structure Plan Map as shown in **Figure 1**.

## 1.2 STRUCTURE PLAN CONTENT

This Structure Plan comprises:

- Part 1: Implementation Section
- Part 2: Explanatory Section
- Part 3: Technical Appendices

The Structure Plan should be read in conjunction with the Shire of Carnarvon Local Planning Strategy and Local Planning Scheme/s.

Part 1 of this Structure Plan is the implementation component of the Structure Plan which contains the Structure Plan map and outlines the purpose and intent of the Structure Plan.

Part 2 of this Structure Plan is the explanatory section which contains background information and explanation of the Structure Plan including design methodology, relevance and compliance with the planning framework. Part 2 also contains all supporting plans and maps.

Part 3 of this Structure Plan includes all of the relevant technical reporting which has been undertaken in support of the Structure Plan.

## 1.3 TYPE OF STRUCTURE PLAN

Structure plans follow a hierarchy being sub-regional, district, local and activity centre which are classified based on both the area covered by the structure plan and the detail contained within it. This Structure Plan is considered to be a non-statutory district level structure plan. A district structure plan is defined as a high-level, predominantly strategic, document that provides guidance on future land use and zoning and the coordination and provision of infrastructure. It is not intended that a subsequent local structure plan be prepared pursuant to this Structure Plan.

## 1.4 OPERATION

The Gascoyne Food Bowl Structure Plan comes into effect on the date in which the structure plan is approved by the Western Australian Planning Commission (WAPC). An approved structure plan is a document to which planning decision-makers are to give due regard to when making decisions on the subdivision and development of land within the structure plan area.

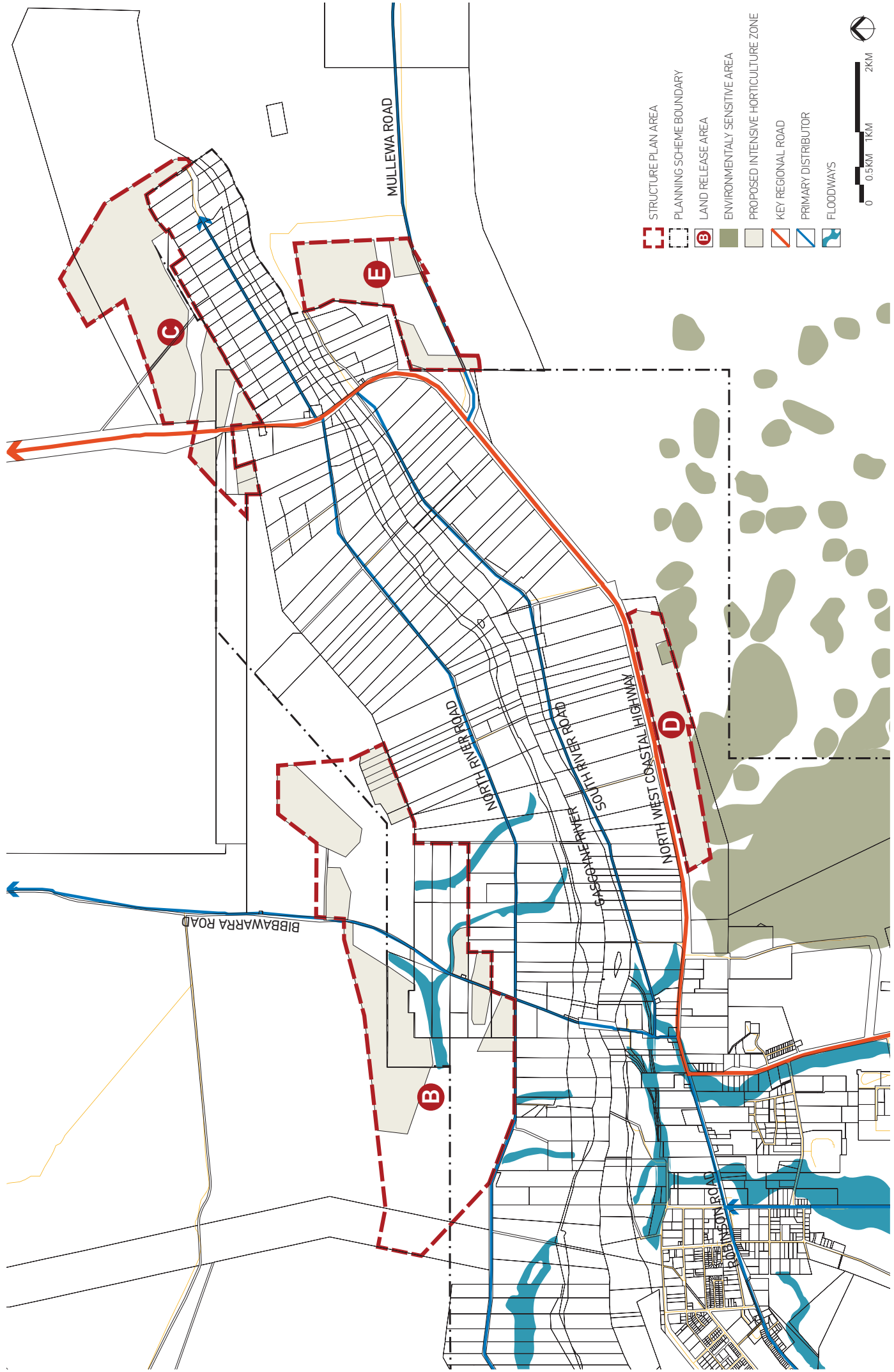
The Structure Plan does not have the force and effect of the Shire's Scheme/s, until such time as it is normalised into the Scheme. The decision-maker is to consider and apply all of the requirements of this Structure Plan (Part 1-3) when assessing applications within the Structure Plan area.

## 1.5 RELATIONSHIP WITH SCHEME

The Gascoyne Food Bowl Structure Plan shall provide the non-statutory strategic guidance to land use and development to land which has been identified for horticultural development under the Gascoyne Food Bowl Initiative.

The Structure Plan proposes new zones and provides guidance on new scheme provisions for the horticultural land being contemplated under this Structure Plan; however such provisions do not override the scheme provisions or have any statutory force and effect. Scheme amendments will be undertaken in order to implement provisions of the Structure Plan.

In the event of there being any variations or conflict between the provisions, standards or requirements of the Scheme and the provisions, standards and requirements of this structure plan, then the provisions, standards or requirements of the Scheme prevails to the extent of the inconsistency.



- STRUCTURE PLAN AREA
- PLANNING SCHEME BOUNDARY
- LAND RELEASE AREA
- ENVIRONMENTALLY SENSITIVE AREA
- PROPOSED INTENSIVE HORTICULTURE ZONE
- KEY REGIONAL ROAD
- PRIMARY DISTRIBUTOR
- FLOODWAYS



FIGURE 1 - GASCOYNE FOOD BOWL STRUCTURE PLAN

## 2 Subdivision and Development

### 2.1 LAND USE AND ZONING

Land use and development within the Structure Plan is to be consistent with the prescribed zonings as detailed on the Structure Plan Map and as defined under Town Planning Scheme No.10 and District Zoning Scheme No.11.

Land use permissibility is to be in accordance with the relevant zone and the land use permissibility of the Zoning Table under the relevant Scheme.

#### 2.1.1 Zoning

The Structure Plan proposes that land which is to be released as part of the horticultural expansion will be zoned 'Intensive Horticulture'.

The Shire of Carnarvon Town Planning Scheme No.10 definition for 'Intensive Horticulture' is as follows: *"means agricultural practices which are carried out with the aid of techniques including water reticulation to render the land capable of sustaining considerably greater number of stock, higher crop yields, or different types of crops than could be produced without the aid of those techniques."*

The key objective of this zone is to preserve and maintain land for viable horticultural and plantation activity in accordance with the Scheme, as they relate to the applicable zone. Scheme amendments have been prepared to ensure all land within the Structure Plan is zoned 'Intensive Horticulture'.

#### 2.1.2 Special Control Area

'Special Control Areas' are used within Local Planning Schemes to identify areas which require special provisions and controls. These provisions typically target a single issue or a related set of issues that often overlap in a zone or reserve. It is proposed that a 'Special Control Area' apply to all of the land within the Structure Plan to ensure that future subdivision and development is consistent with the overall objectives of the Gascoyne Food Bowl Initiative. More specifically, and as previously mentioned, the Shire's TPS10 currently allows for intensive horticultural lots to be subdivided to a minimum of 6 hectares. It is not considered consistent with draft SPP 2.5 or the overall intent of the Gascoyne Food Bowl Initiative for further subdivision to occur outside of what is proposed within the Structure Plan, without the support of the DAFWA.

As such, it is recommended that 'Special Control Areas' apply to assist in addressing the unique characteristics of the Structure Plan. This will ensure the protection of the land and it will allow for the delivery of the additional rural land which has been appropriate planned for, in accordance with draft State Planning Policy 2.5 and directives of this Structure Plan.

#### 2.1.3 Land Use Permissibility

Upon rezoning, land uses will be consistent with that currently contemplated under the Shire of Carnarvon's Town Planning Scheme No.10 Zoning Table for all land within the 'Intensive Horticulture' zone (refer, **Table 2**). Land within the boundaries of the Structure Plan which is not proposed to be Intensive Horticulture will be required to conform to the provisions of the Scheme.

As is the case with existing horticultural land, the Shire of Carnarvon will oppose any development which will result in the land being used for any other use besides for horticultural or plantation production, except those developments which may be incidental to the predominant use of the land for horticultural or plantation activity.

TABLE 2 – LAND USE PERMISSIBILITY

USE	INTENSIVE HORTICULTURE
Single House	P
Caretaker's Dwelling	IP
Home Occupation	AA
Ancillary Accommodation	AA
Seasonal Staff/Workers Accommodation	SA
Home Business	SA
Farm Stay	SA
Car Park	IP
Fuel Filling Station	IP
Office	IP
Professional Office	AA
Warehouse & Storage	SA
Hazardous Industry	SA
Wind, Solar or Tidal Energy Facility	AA
Rural Industry	SA
Public Utility	AA
Arts & Craft Studio	AA
Intensive Horticulture	P
Piggery	AA
Poultry Farm	AA
Wayside Stall	AA

The majority of the Structure Plan is located within Town Planning Scheme No.11. As it currently stands, this Scheme does not have an 'Intensive Horticulture' zone. As such, the Scheme Amendment process will require the introduction of this zone along with the permissible land uses to Table 1 of DZS11 (consistent with that of TPS10) and the modification or inclusion of any other relevant development provisions applicable to the 'Intensive Horticultural' zone, including a 'Special Control Area', as discussed above.

## 2.2 LOT YIELD AND SIZE

The land which has been determined for release has been based on significant technical investigations and an understanding of the land capability. Furthermore, intensive consultation has been undertaken with the market and local producers to determine the approach for the expansion. Primarily the size of the land parcels will be driven by market demand, subject by a business case for the proposed use of the land. Notwithstanding, it is envisaged that approximately 22 lots will be released to the market (excluding prolongation lots).

Whilst the use of the lots will be heavily managed through the lease arrangements in the first instance, once the land is transferred to freehold, the conditions of lease imposed by the Department of Lands will no longer apply. In this ultimate scenario, there will no longer be the ability for the Department of Lands to control the subdivision and development of the land within the Structure Plan area.

Based on the above, the Structure Plan provides guidance to decision-makers on the consideration of any future subdivision, through the Subdivision Guide Plan (refer, **Figure 2**). It is generally considered that there are sufficient and suitably sized rural lots within WA to cater to intensive and emerging primary production and as such, further subdivision of larger rural land parcels should not be supported, in accordance with the WAPC's draft SPP 2.5. Therefore, to ensure the protection of the land within the Structure Plan area, it is recommended that once the land is transferred to freehold that no further

subdivision be supported by the Shire of Carnarvon and the WAPC, unless in accordance with draft SPP2.5 and Development Control Policy No.3.4.

As mentioned in section 6.1.2, the Shire's Town Planning Scheme No.10 contains provisions allowing for the subdivision of horticultural land to a minimum lots size of 6 hectares. Scheme Amendments will be required (and are currently being progressed) to facilitate a 'Special Control Area' for the land within the Structure Plan to ensure that decisions made on lot size and subdivision for the land within the Gascoyne Food Bowl Initiative is guided by the Structure Plan.

### 2.2.1 Prolongation Lots

A number of prolongation lots are proposed within the Structure Plan area which will extend current horticultural zoned lot boundaries with the aim of making use of current resources on adjacent existing horticultural lots. Increasing the viable size of existing properties through prolongation has been identified as a priority by DAFWA and will occur as part of the first stage of land release.

## 2.3 HORTICULTURAL SETBACKS

For the Scheme, setback requirements for development within any horticultural lot are to be in accordance with the following provisions:

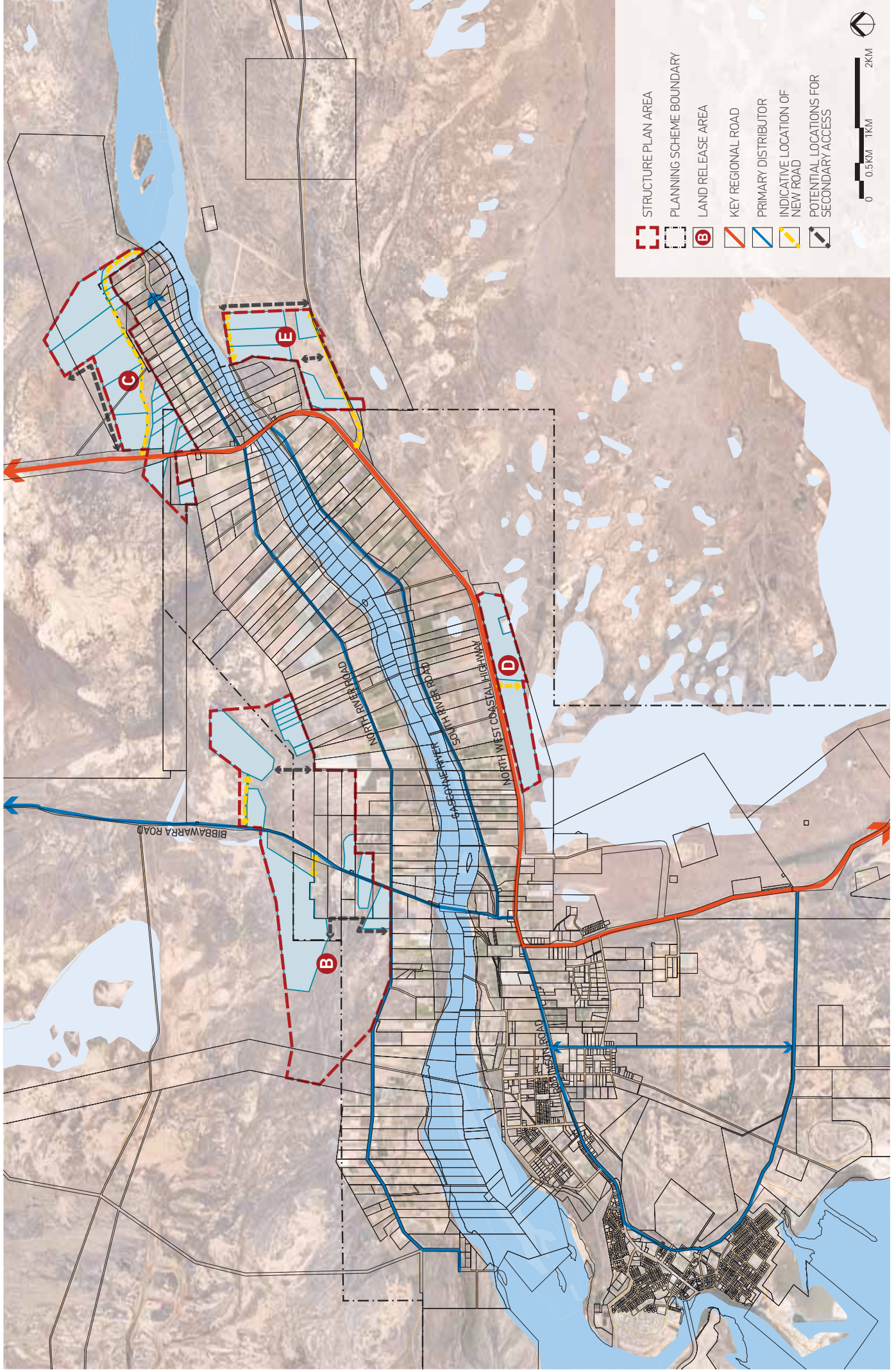
- 15 metres from the front boundary
- 7.5 metres from the side boundary
- 7.5 metres from the rear boundary

These setback requirements can be reduced where it has been demonstrated that the proposed development will not have any undue impact on the neighbouring property, access to the lot or any impact on floodways.

## 2.4 LAND USE BUFFERS

The introduction of sensitive land uses and zones within proximity to the land identified within the Structure Plan should be managed through appropriate buffers. With an average lot size of 12 hectares or greater for the land within the Structure Plan area, the land size itself will assist in creating suitable buffer distances between adjoining land uses. However, as a general guide all sensitive land uses are to be setback a minimum of 500 metres from existing and future primary production on rural land. In this regard, a single dwelling on rural land is considered a sensitive land use.

It should also be noted that there is an existing 500 metre buffer from the Brickhouse Homestead which would apply to the land within Area E.



**FIGURE 2 – SUBDIVISION GUIDE PLAN**

PA 1170 - Gascoyne Land Use Planning

DATE 01.05.2017

DWG NO 002

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## 2.5 MOVEMENT NETWORKS

The impact the proposed Structure Plan has on the transport network has been considered in the Infrastructure Report (refer, **Appendix D**), and addresses the traffic and transport considerations for the Structure Plan with respect to the need for any future upgrades or construction of access roads.

### 2.5.1 Existing Road Networks

The Infrastructure Report identifies that the existing regional and local road network has the capacity to cater to any additional traffic volumes generated by the release of additional horticultural land within the structure plan area. Essentially, no upgrades or widening will be required to the existing road network.

### 2.5.2 New Access Roads

The Infrastructure Report recognises that a number of access roads will need to be constructed prior to the use/development of land for horticultural purposes. These roads and their indicative location are demonstrated in **Figure 2** and **Appendix D**. It is proposed that these roads typically comprise of 7-9 metre seal pavement and adequate shoulder within a 20-metre reserve enabling passing of heavy vehicles, consistent with rural standards.

New accesses within Area C, D and E of the structure plan will be taken from local roads and new access roads where available. A new intersection with North West Coastal Highway that services Area C and Area D must be designed and constructed in accordance with the specifications and standards of Main Roads WA, and any proposed works within the North West Coastal Highway road reserve will require Main Roads WA approval.

Whilst it is acknowledged that these roads will primarily service local traffic, it will nevertheless be shared between multiple land owners and therefore for the purpose of maintenance such roads should be gazetted, rather than private. These access roads will be serviced via roadside table drains and will be designed to ensure no increase to upstream flood levels during major catchment wide events when floodwaters breach the banks of the Gascoyne River.

It should be noted that the proposed road network is indicative only and will be subject to detailed design and market demands.

### 2.5.3 Access for Fire Management

Given that the timing of land release to the market and the ultimate lot pattern and yield is yet to be finalised, the vehicle access arrangements in the short, medium and long term will need to ensure that all new land release areas are provided with at least two vehicular access routes at all times. Secondary vehicular access may include suitably constructed and managed emergency access ways and/or temporary access tracks until formal access roads are made available.

Subdivisions or developments will need to demonstrate how a secondary access route which connects to the surrounding public road network has been provided, either consistent with **Figure 2** or in another suitable location which meets the requirements of the Bushfire Management Plan and State Planning Policy 3.7 - Planning in Bushfire Prone Areas (WAPC).

## 2.6 WATER MANAGEMENT

The LWMS (refer, **Appendix C**) has been developed for the Structure Plan area and collates the findings from detailed predevelopment investigations that have been undertaken as part of Department of Water's flood mitigation project and groundwater allocation studies, together with the various technical investigations undertaken by the Department of Agriculture and Food WA. It is important to note that the process outlined in Better Urban Water Management (WAPC) is for urban developments, which requires a number of design issues to be addressed that are not applicable for horticultural development. The LWMS therefore addresses the key issues of Better Urban Water Management that are applicable for horticultural and rural development only.



### 2.6.1 Local Stormwater Management

Water management will focus on surface water as dictated by the hydrological conditions of the Structure Plan area. The key principle behind the stormwater management strategy for the Structure Plan area is to maintain the existing hydrology by matching pre-development flow rates leaving the site and convey (arterial) flows from upstream catchments.

A number of strategies have been incorporated into the LWMS to maintain flows and detain catchment runoff in the most effective and efficient manner. The reader is referred to **Appendix C** with respect to the detailed stormwater management strategies.

A Drainage and Nutrient Management Plan will be required as a condition of subdivision/lease to ensure internal layouts and drainage systems are designed to meet the requirements of the LWMS.

### 2.6.2 Flood Management

Flooding of the Gascoyne River and storm surge areas are influential in determining the development parameters of the Structure Plan area. Site specific detail has been provided within the Local Water Management Strategy included in **Appendix C**.

Development that is located within the floodway and considered obstructive to major river flows will not be permitted as it will increase flood levels upstream. Essentially, development in the floodway is to be avoided wherever possible. In order to ensure an appropriate level of protection remains and the operations of horticultural activity are not compromised, the Structure Plan proposes the following:

- a) No new development (i.e. filling, buildings etc.) is to be in the designated floodways as it is considered obstructive to major flows and will increase flood levels upstream;
- b) Structures at road crossings over major waterways are to be sized so that there is minimal increase in the flood levels upstream of the structure; and
- c) Onsite finished development levels (with the exception of localised pads for dwellings and sheds) within the floodplain are not to exceed existing ground levels to ensure minimal impact on upstream flood levels.

### 2.6.3 Floodplain Management

- a) For areas within the Gascoyne River floodplain (refer, **Appendix C**), a minimum habitable floor level of 0.50 metres above the adjacent 100 year ARI flood level is required to ensure adequate flood protection.
- b) For areas that are located outside of the Gascoyne River floodplain area, a minimum habitable floor level of 0.30 metres above the 100 year ARI flood level is required.

### 2.6.4 Water Allocation Management

One of the crucial elements of the Gascoyne Food Bowl Initiative is the management of water allocation and a reliable water supply. Water for the structure plan area has been allocated from Subarea B-L of the Lower Gascoyne Plan Area. Specifically, the drilling and testings undertaken by DAFWA and the Gascoyne Water Asset Mutual Cooperative Limited between 2005 and 2010 supported the allocations to the expansion. The current limitations, allocation reserves and entitlements issues are summarised in the **Table 3**.

TABLE 3 – HORTICULTURAL ENTITLEMENTS (SUBAREA B-L)

	ALLOCATIONS		ENTITLEMENTS ISSUED
	LIMITS	RESERVES	
Consumption	3.6		
- Town Centre		3.6	1.8
Horticulture	11.9		
- Water Corp		5.0	5.0
- Gascoyne Water Cooperative		3.6	2.8
- Gascoyne Food Bowl Initiative		3.3	
Total	15.5	15.5	9.6

Based on the above figures in Table 3, 3.3 GL has been reserved for the Structure Plan area. Additional studies (drilling and modelling) has been commissioned by DAFWA to assess the potential to increase the 3.3 GL allocations to 4.0 GL per annum. These investigations, separate to the Structure Plan, are expected to be finalised in December 2015.

Neither the Structure Plan nor leasing arrangements for the land release areas will control the type of crops which will be cultivated on the land, however it is expected, based on historical trends that a variety of crops will be grown which require between 0.8 GL to 1.2 GL of water per annum per 100 hectares. At this consumptive rate, an 'irrigation area' ranging between 275 hectares to 412 hectares can be released within the Structure Plan area which will meet the current allocation limit of 3.3 GL. Assuming that 10 per cent of the site will be used for dwellings, outbuildings, storage and the like, a land release of approximately 305 hectares to 458 hectares will meet the current water allocation limit.

It should also be noted that a key strategy of the Initiative is to release a number of prolongation lots. These prolongation lots will be required to source water from the existing trading scheme and will not fall within the 3.3 GL allocation limit.

Given that the land will be released on a staged basis, there will be adequate controls through the leasing arrangements and subsequent land release processes to monitor trends in water applications and the distribution and allocation of water.

## 2.7 ENVIRONMENTAL ASSESSMENT MANAGEMENT

The Structure Plan, together with the subdivision and development of land in accordance with the Scheme will ensure that the future development of the site will not significantly impact on the environmental attributes and values of the site.

It is recommended that good cultivation practice principles be adopted by all horticulturalists in accordance with the Environmental Assessment and Management Strategy in **Appendix B**.

An existing 50 metre buffer applies to the McNeill Claypan which is identified as an Environmentally Sensitive Area (ESA). It is understood that the buffer is accounted for within the mapped wetland area. Area D of the Structure Plan encroaches within the buffer however does not encroach within the wetland itself. No development should occur within the buffer area. As outlined in **Table 4** an Environmental Management Plan may be required as a condition of subdivision/lease approval, for land within Area D, and will set out an appropriate management framework to protect the Environmentally Sensitive Area.

## 2.8 BUSHFIRE MANAGEMENT

Though an overarching Bushfire Management Plan (BMP) has been prepared for the Structure Plan area (**Appendix E**), it is acknowledged that depending on the land parcel and its vegetation system, specific bushfire management strategies will need to be put in place to address the provisions of State Planning Policy 3.7 –Planning in Bushfire Prone Areas and the accompanying Guidelines for Planning in Bushfire Prone Areas. An updated BMP and/or Bushfire Attack Level Contour Map may be required at subdivision and/or development stage to demonstrate that potential bushfire risk can be managed.

## 2.9 INDIGENOUS HERITAGE MANAGEMENT

Based on the high-level assessment of the Indigenous heritage assets of the Structure Plan, it is unlikely that significant disturbance to Indigenous heritage values will occur as part of the release of land.

In addition, extensive consultation is being undertaken through the Native Title process, along with the undertaking of an Aboriginal heritage report and heritage survey. Notwithstanding, if it is deemed necessary an Aboriginal Heritage Management Plan may be required at the subdivision or development stage, per **Table 4**.

## 2.10 INFRASTRUCTURE & SERVICING REQUIREMENTS

This section of the report details the infrastructure and servicing requirements of the Structure Plan. **Appendix D** provides detailed information with respect to the Structure Plan's infrastructure requirements. Where information is not contained within this section please refer to the Appendix.

### 2.10.1 Irrigation Water

Irrigation water within Carnarvon is managed by the Gascoyne Water Cooperative (GWC) under the *Water Services Co-ordination Act 1995*. Irrigation water is sourced from bore fields east of the existing horticultural plantations, with the Water Corporation running the bore field on the southern side of the river and GWC running the borefield to the northern side of the river, via two separate distribution lines which are interconnected at the Nine Mile Bridge and again at the Bibbawarra Crossing.

The proposed horticultural land will be included in the GWC operating area, which will need to be extended under its current license agreement. New pipes will also need to be extended to service new land which is not part of the prolongation areas. These new installations will follow new access road alignments and will be installed prior to any use of land for horticultural purposes.

### 2.10.2 Potable Water

There is a distribution main for potable water along South River Road which links the Carnarvon Town Centre to the Brickhouse Pump Station. It is understood that there are no service connections off this main which suggests the southern plantation areas obtain its potable water at source (i.e. via tanks and self-contained treatment plants).

The northern plantation areas are not serviced by any potable water main, again suggesting that potable water is obtained at source. As there are no potable water mains in the vicinity of the proposed horticultural land, any new land released to the market will need to be self-sustaining, deriving its water from at-source.

### 2.10.3 Power Supply

The Carnarvon townsite and surrounds is serviced by Horizon Power which uses both diesel and gas to fuel generators. There is an existing overhead power network which runs along North River Road, rated at 22kV and extends along the road from Bibbawarra Road to NW Coastal Highway. Adjacent to Bibbawarra Road there is an existing 33kW power line which heads north and services part of Area B.

Extensions to the power network will be required to service those areas which are not within servicing distance.

There is limited to no high voltage power lines to NW Coastal Highway on the southern side of the Gascoyne River. Therefore, extensions to the power network would be required to service land within Area E. Similarly, the power network stops adjacent to Area C and as such any new connection is likely to require the extension of the network to the new land release areas.

### 2.10.4 Wastewater

Existing horticultural land within the Shire does not currently have access to deep sewerage. Where residences exist in these areas, wastewater is currently being disposed of via leach drain constructed within the lot. Land within the structure plan area will not be serviced by deep sewerage either immediately or into the future. Notwithstanding, the volume of wastewater which is expected to be generated on individual land parcels will be able to be disposed of on site. Landowners will be responsible for obtaining relevant approvals from the Shire of Carnarvon for the installation of a standalone waste water disposal system.

### 2.10.5 Gas

A spur line from the Dampier to Bunbury Natural Gas Pipeline (DBNGP) delivers gas to the existing Carnarvon Power Station. The buffer zone for the existing corridor is 15 metres wide with an additional 150 metre setback zone. The proposed horticultural areas are located outside of the setback zone.

There is no reticulated gas serviced provided to Carnarvon and no plans to do so in the future. Gas supply within the town is supplied by bottled gas.

### 2.10.6 Telecommunications

Telstra has advised that there are telecommunications infrastructure that are owned or controlled by Telstra in the vicinity of the structure plan area. Subject to timing of subdivision and progress by NBN Co, the site may be serviced via extension works of Telstra's infrastructure.

Mobile coverage is intermittent across the structure plan area, with Area C and Area E requiring external antenna for mobile data coverage.

## 2.11 STAGING & REQUIREMENTS FOR DELIVERY OF LAND

As part of the overall delivery of the Gascoyne Food Bowl Initiative and to facilitate in the orderly and proper release of the land, the Local Consultative Committee (LCC) (established by the Ministerial Reference Committee) recommended a three-phase strategy that recognises the inextricable link between water resources and the release of land. This approach recognises the inherent complexity of obtaining additional water allocation within the region in order to support the expansion. The LCC, three phase approach includes:

- Phase 1: Greater use of existing horticultural land matched with the utilisation of existing water allocations and water market trading.
- Phase 2: Release of adjoining land for amalgamation (prolongation) and market access through water trading and established release mechanisms.
- Phase 3: Release of unimproved land and market access through Expression of Interest (EOI), and with grower access to new water allocations through EOI.

Mores specific to the Structure Plan, land proposed to be realised to the market will be released over two stages, as outlined in **Figure 3**. The land proposed to be released as part of Stage 1 will include the least constrained land and those parcels identified for prolongation. Ultimately however, the staging and release of land will largely be driven by market demand and delivery of water resources.

All land within the Structure Plan will be leased to the market under the provisions of the *Land Administration Act 1993*. The timing of land becoming available to the public via either amalgamation (in the case of prolongation lots) or through Crown lease is dependent on the timing of Native Title clearance which effectively extinguishes Native Title over the land.

All land will be leased as a 'General lease' under Part 6 of the *Land Administrative Act 1993*. Leases will contain conditions which will need to be complied with. Eventually, all land will be transferred to freehold and assembled as a lot. The Department of Lands will carry out all investigations in relation to land and the preparation of all relevant conveyancing documentation.

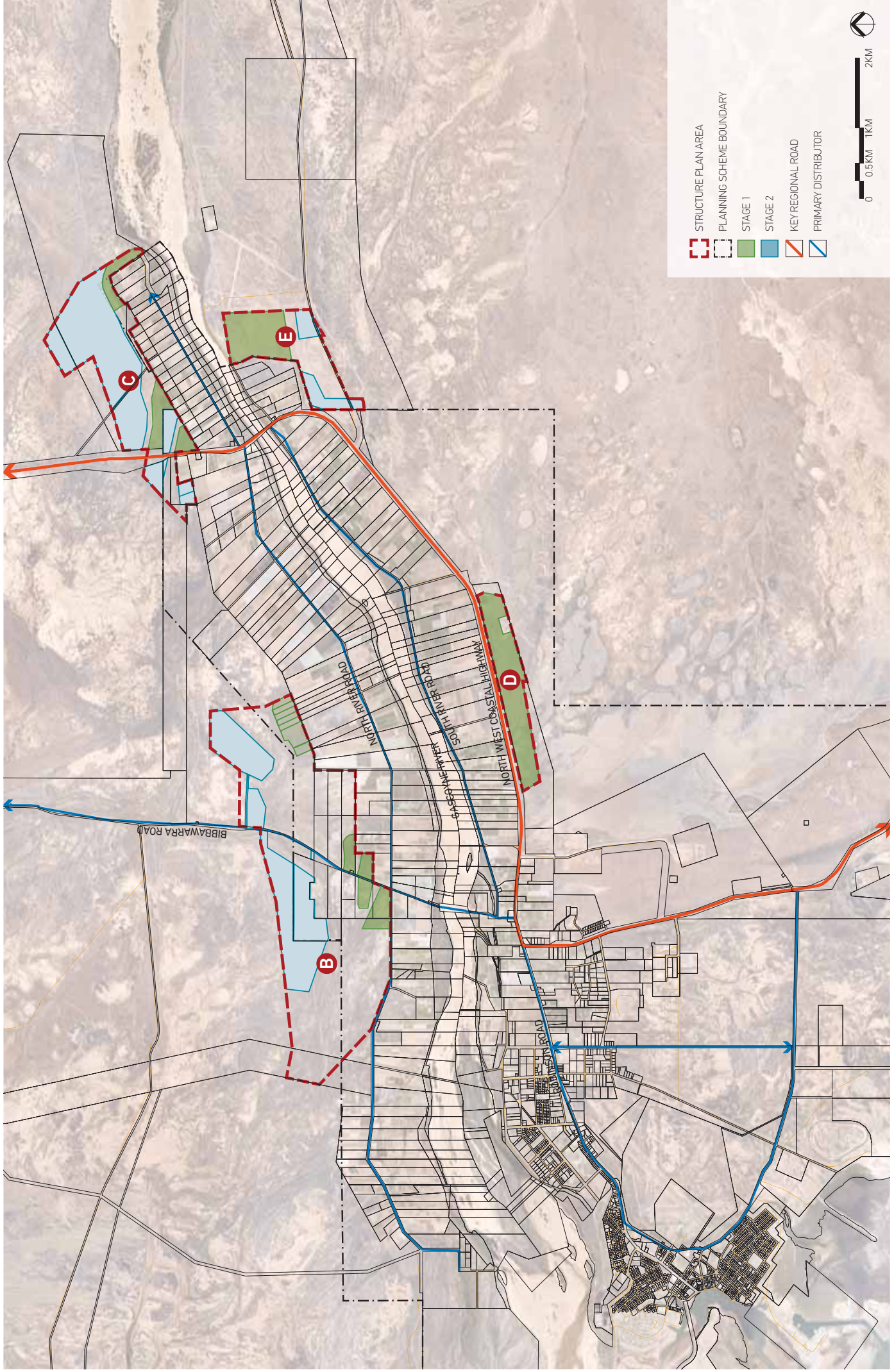
The delivery of various key infrastructure to service the new land (and ultimately new lots) will be required, including roads and drainage, irrigation water, power and communications. There are also a number of actions which will be required by the lessee (and the ultimate landowner).

**Table 4** summarises the indicative infrastructure implementation plan for future planning stages. Due to the nature of land tenure (Crown land) the delivery of the land to the market does not follow the usual process of subdivision through the Western Australian Planning Commission. Therefore, the table identifies what further actions are required to facilitate the development of the land for horticulture purposes; however, the means and timing in which these unfold will need to be determined between the various stakeholders at the more detailed planning stages.

TABLE 4 – SUBDIVISION/DEVELOPMENT REQUIREMENTS

ORGANISATION	ROLE	FUNDING
Department of Agriculture and Food WA	<ul style="list-style-type: none"> <li>i. Promote water efficiency and nutrient reduction measures at point of sale via educational brochures.</li> <li>ii. Provides advice to Department of Lands as required under the <i>Soil and Land Conservation Act 1945</i></li> </ul>	DAFWA
Department of Lands	<ul style="list-style-type: none"> <li>i. Undertakes engineering studies for the proposed access roads, power infrastructure and the irrigation mains extension works.</li> <li>ii. Design and cost estimates for the irrigation water supply to GWC standards.</li> <li>iii. Design and cost estimates for access roads and associated drainage.</li> <li>iv. Design and cost estimates for power infrastructure.</li> </ul>	Department of Lands
Developer	<ul style="list-style-type: none"> <li>i. Constructs the irrigation water supply to GWC standards.</li> <li>ii. Constructs access roads and associated drainage.</li> <li>iii. Constructs power infrastructure</li> <li>iv. Constructs communications infrastructure</li> <li>v. Undertaken a Level 2 Flora &amp; Vegetation Survey for Area D.</li> <li>vi. Undertake a Level 2 Terrestrial Fauna Survey for Area D.</li> </ul>	Department of Lands or Landowner
Shire of Carnarvon	<ul style="list-style-type: none"> <li>i. Approval of Access Road design reports and design drawings in consultation with the Department of Water and MRWA.</li> </ul>	Rates

ORGANISATION	ROLE	FUNDING
	<ul style="list-style-type: none"> <li>ii. Assumes responsibility for roads and stormwater drainage infrastructure constructed including the ongoing operations and maintenance</li> </ul>	
Horizon Power	<ul style="list-style-type: none"> <li>i. Approval of power infrastructure design.</li> <li>ii. Assumes responsibility for power infrastructure constructed including the ongoing operations and maintenance</li> </ul>	-
Gascoyne Water Cooperative	<ul style="list-style-type: none"> <li>i. Increase Operation Area to include the Expansion Area.</li> <li>ii. Assumes responsibility for irrigation infrastructure constructed including the ongoing operations, monitoring and maintenance.</li> <li>iii. Regulates applications for irrigation water from Landowners to ensure their application does not exceed their required demand (i.e. ensures equitable water use across the Expansion Area).</li> </ul>	Rates
Land Owner	<ul style="list-style-type: none"> <li>i. Preparation of any Drainage and Nutrient Management Plan required as a condition of subdivision/lease.</li> <li>ii. Responsible for meeting all requirements of building codes during the built form phase (including construction and maintenance of soakwells for onsite stormwater disposal)</li> <li>iii. Preparation of any Aboriginal Heritage Management Plans required as a condition of subdivision/lease</li> <li>iv. Preparation of any Environmental Management Plans required as a condition of subdivision/lease for any land affected by the McNeill Claypan buffer area.</li> <li>v. Preparation of a Bushfire Management Plan required as a condition of subdivision/lease, and in support of development applications.</li> </ul>	Land Owner/Leaseholder
Department of Water	<ul style="list-style-type: none"> <li>i. Approval of Drainage and Nutrient Management Plans with advice from Shire of Carnarvon.</li> <li>ii. Regulates/monitors water use provided by GWC</li> </ul>	-
Department of Environment	<ul style="list-style-type: none"> <li>i. Assess and issue permits for the clearing of vegetation.</li> </ul>	-



**FIGURE 3 - INDICATIVE STAGING PLAN**

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# Gascoyne Food Bowl District Structure Plan

Part 2: Explanatory Report  
May 2017



Department of  
Agriculture and Food



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# 1 Introduction & Purpose

The Gascoyne Food Bowl Structure Plan ('Structure Plan') is prepared on behalf of the Department of Agriculture and Food WA (DAFWA), in consultation with the Department of Lands and the Department of Regional Development. The Structure Plan forms part of the Land Development Component of the Gascoyne Food Bowl Initiative which includes the delivery of an appropriate planning framework for the facilitation of over 400 hectares of additional horticultural land within the Shire of Carnarvon.

Part 2 of the Structure Plan provides all of the necessary background information and technical reporting sought by the Department of Planning and Shire of Carnarvon during pre-lodgement discussions and meetings. The content of the Structure Plan (including the Structure Plan map) is considered to be suitable given the nature and location of the land and the intended land use. The new Planning and Development (Local Planning Schemes) Regulations 2015 and the Structure Plan Framework 2015 have been considered in the preparation of this documentation.

## 1.1 STRUCTURE PLAN OBJECTIVES

The objectives of the Gascoyne Food Bowl Structure Plan are:

- To guide the proper and orderly planning of the Gascoyne Food Bowl Land Expansion Area.
- To collaborate with key stakeholders and provide a guiding framework to assist in the release of land for horticultural purposes.
- To facilitate the release of land for horticultural development which conserves soil and land resources and mitigates the effects of erosion, salinity and flooding.
- To provide for horticultural opportunities consistent with, and complementary to the existing activity of the northern and southern plantations.
- To enable the coordinated delivery of water and services to ensure that horticultural development is able to be undertaken particularly in areas which are not subject of prolongation.
- Providing for subdivision, development and land use that will seek to protect the environmental values of the area, including the Gascoyne River, and protect where possible the water quality, soil and land capability of the area.
- Preventing further subdivision and the development of land which would be inconsistent with the intent of the land for the purposes of horticultural development.
- Ensure new subdivision and development complies with current standards of fire and flood management and protection of people, biodiversity and property.

## 1.2 STRUCTURE PLAN PURPOSE

The implementation of the Gascoyne Food Bowl project (expansion areas) will transform the Carnarvon horticultural area into an opportunity area for increased horticultural investment and activity, establishing a new context around which the area will develop and evolve into the future. The key purpose of this Structure Plan is to provide a strategic framework to guide the rezoning, subdivision and development of the identified expansion areas. Furthermore, the Structure Plan aims to provide an appropriate level of detail on how the area will be developed, to guide various approval agencies and horticulturalist when considering future subdivision and development through the provision of appropriate planning, assessment, coordination and implementation.

### 1.3 PROJECT BACKGROUND

The significant growth in the Carnarvon horticultural industry over the past 10 years has seen the value of its production double. In recognition of this growth and through the Royalties for Regions program, the State Government established the Gascoyne Food Bowl Initiative (Initiative) in 2008 to support the continual expansion and diversification of the industry. The project sees the collaboration of the Department of Agriculture and Food WA, Department of Regional Development, Department of Lands, Department of Water and the Gascoyne Development Commission.

The key initial components of delivering the Gascoyne Food Bowl Initiative have been the technical investigation and identification of suitable land to be developed and utilised for horticultural purposes, matched with the sourcing and identification of additional water of a quality and quantity able to support the expansion of the industry. Initially, broad areas for investigation were identified, referred to as 'Areas A, B, C, D and E'. These areas were extensively investigated in terms of their environmental and flooding constraints, and their overall capability for horticultural development.

Whilst water sourcing and drilling was progressing, various technical studies were also undertaken to initiate and support the commencement of the land development component of the project. Technical investigations included soil and erosion risk analysis, consideration of flood and flowlines, and the assessment of vegetation and environmentally sensitive areas, to determine the potential of the broad horticultural areas identified (Areas A-E). This involved the commissioning of various technical environmental/water studies, which resulted in the identification of over 400 hectares of relatively unconstrained land suitable for horticultural development (refer, **Figure 4**).

Along with the capability of the land (risk to flooding and salinity and the availability to water), the individual land parcels which have been identified for release to the market have also been based on ensuring the delivery of land parcels which will cater to future primary production and are not used for rural living. On this basis, the following key considerations were given to the selection of land:

- The type of enterprises being sought within the market.
- The avoidance of environmentally significant areas.
- Provision of land which is able to be used for production and cater to a dwelling, shed, other outbuildings and infrastructure (with the exception of the prolongation lots).
- Contributing to the variety and mix of rural land to the market.

As a result, specific and refined land parcels within Areas A-E have been identified as being suitable for horticultural activity (rezoning), with the remaining portions of these areas being excluded due to constraints.

It is important to note that as part of this process, it was determined that land within Area A was not suitable for immediate expansion primarily due to the lands environmental and accessibility constraints. As a result, this area does not form part of the Structure Plan and will require further investigation should it be considered for horticultural expansion into the future. Therefore, only areas B-E form part of this Structure Plan.

The Structure Plan makes provision for adequately sized land for the purposes of primary agriculture and horticultural development to meet the market demands. With the proposed Scheme amendments, the Scheme will subsequently provide adequate control to protect and retain land for such purposes and that land is not further subdivided into smaller, ad hoc rural lots. In this regard, the Scheme provides the required provisions and controls to ensure that future decision making with respect to subdivision and development is consistent with the overall intent of the Gascoyne Food Bowl Initiative. The land release component of the project is being guided by the Structure Plan.

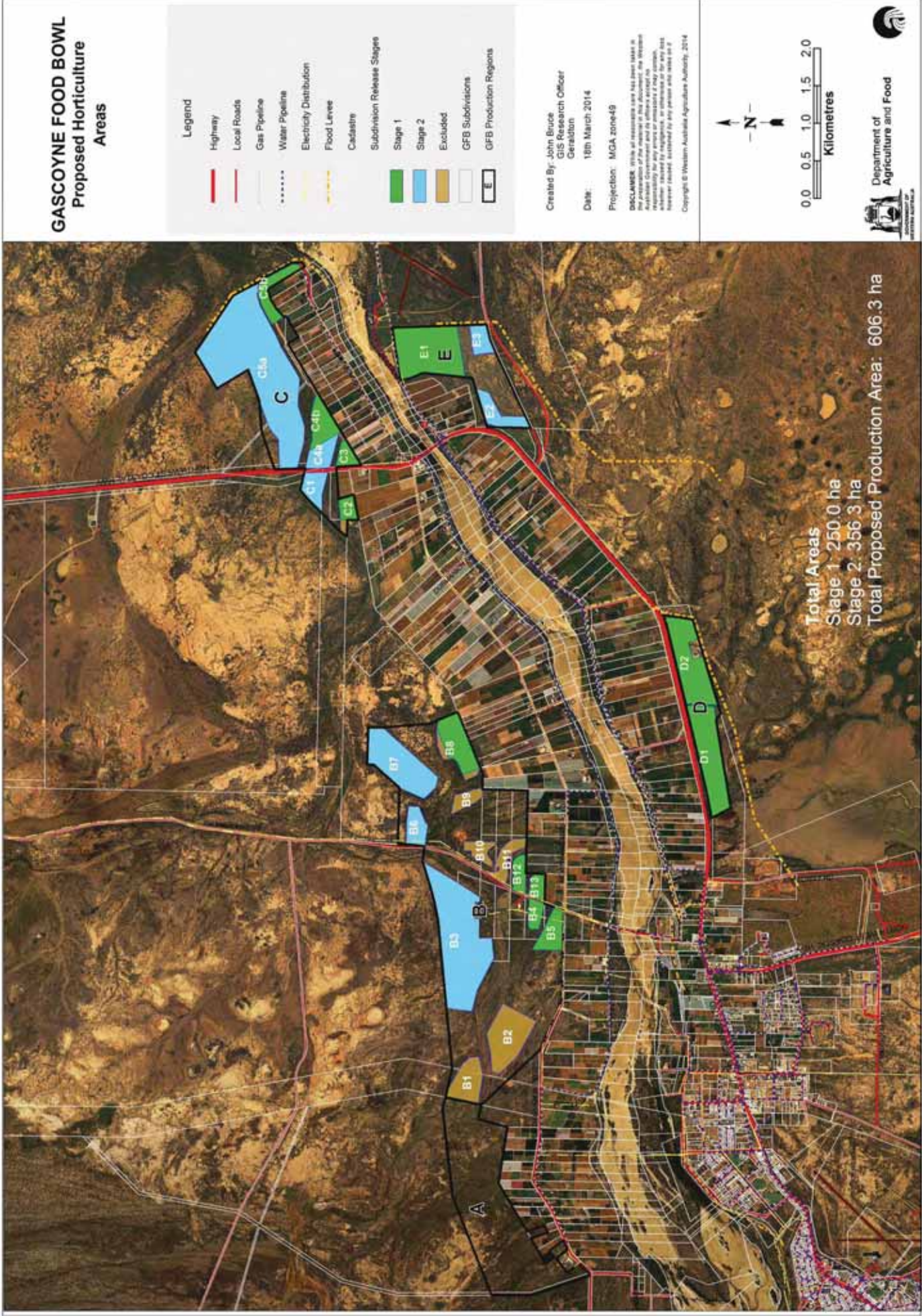


FIGURE 4 – GASCOYNE FOOD BOWL INITIATIVE LAND EXPANSION AREAS

## 2 Land Description

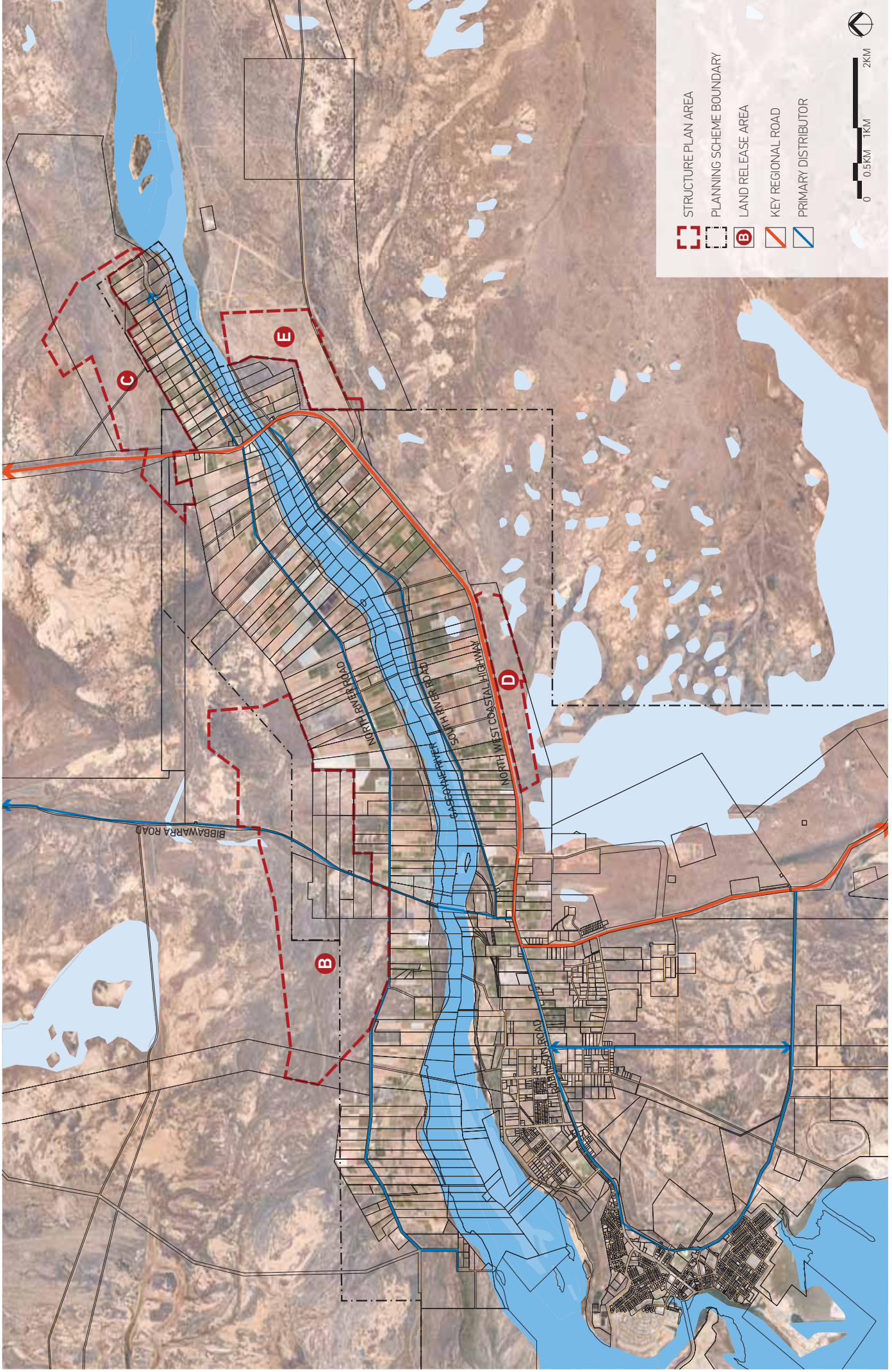
### 2.1 STRUCTURE PLAN AREA

The Structure Plan consists of large landholdings in fragmented zonings/reserves, with a total of 28 land parcels, located wholly or partially within the Structure Plan boundary. The Structure Plan covers an area exceeding 600 hectares, with the actual land proposed to be released approximately 400 hectares.

The Structure Plan boundary encompasses all of the land located within Areas B-E, as identified through prior detailed reporting. The technical reports accompanying this Structure Plan aim to bring together previous reporting and assessments to inform the overall delivery of the planning framework. The Structure Plan goes into further detail to identify those specific land areas which will require rezoning under the relevant local planning scheme, to the 'Intensive Horticulture' zone.

In this regard, it should be noted that not all of the land within the Structure Plan will be rezoned or available for horticulture and released to the market. By way of example, areas of flood way will be unavailable for development. In discussion with the Department of Lands, Department of Planning and the Shire of Carnarvon, it has been determined that the Structure Plan boundary will apply to the broad land areas as identified by DAFWA as part of the earlier stages of the Initiative (Areas B-E in their entirety). The scheme amendments undertaken to rezone the land to Intensive Horticulture and the application of a 'Special Control Area' will be utilised to limit/guide the more specific location of horticultural land use, as required.

The land contained within the Gascoyne Food Bowl Structure Plan is shown in the aerial plan included in **Figure 5**.



**FIGURE 5 - AERIAL PLAN**

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## 2.2 LAND OWNERSHIP

The Structure Plan covers an area exceeding 600 hectares, with approximately 400 hectares of land proposed to be released for horticultural development. The Structure Plan area includes all land parcels, roads, and reserves contained within the area identified at **Figure 6**.

A full list of all lots subject of this structure plan is detailed in **Table 5**.

TABLE 5 – LEGAL DESCRIPTION & LAND TENURE

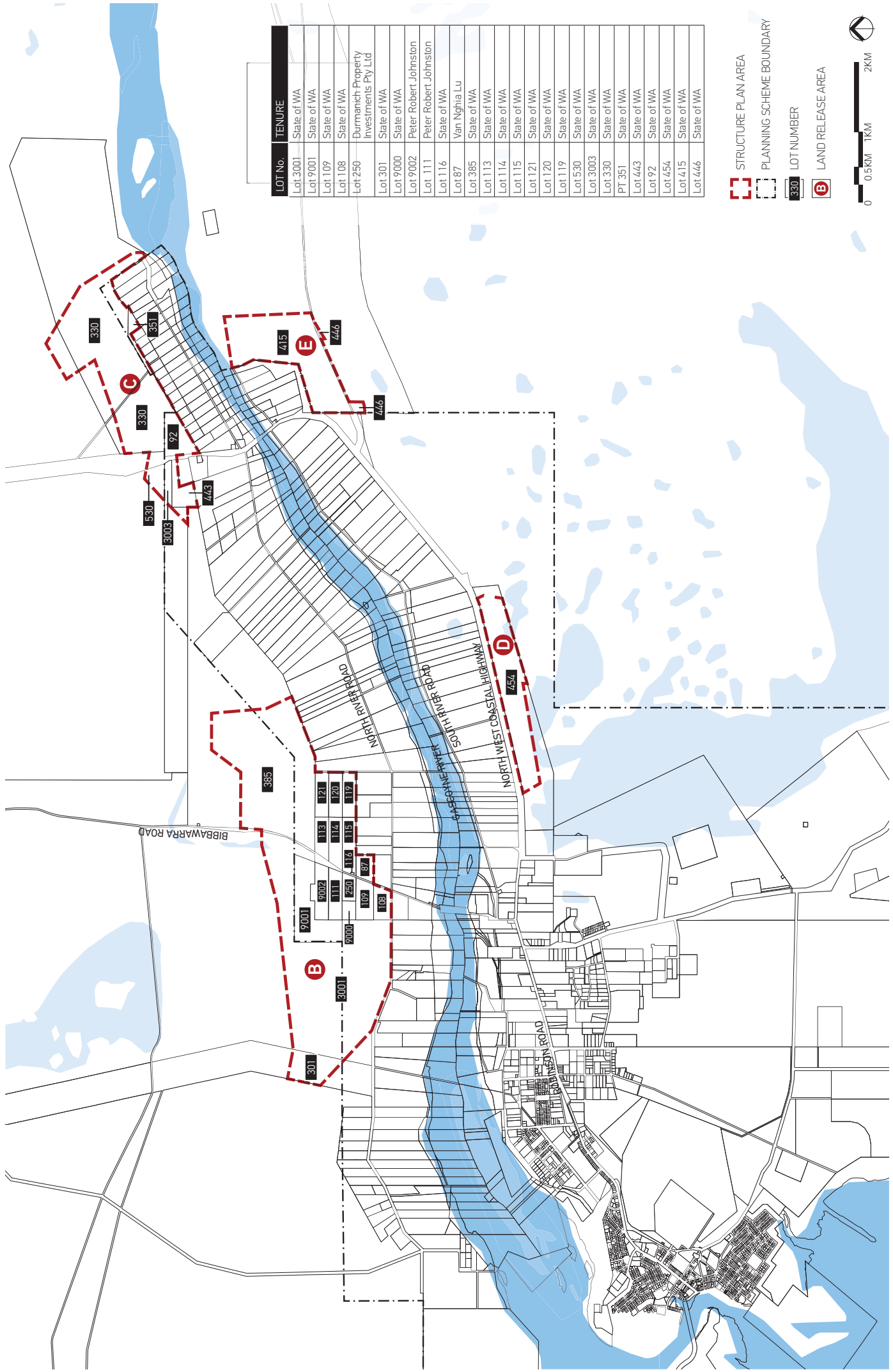
HORTICULTURAL AREA	LOT NUMBER	PLAN NUMBER	TENURE	ZONING
Area B	Lot 3001	P 50853	State of WA	Rural
	Lot 9001	P 67938	State of WA	Private Clubs & Institutions
	Lot 109	P 202367	State of WA	Public Purposes
	Lot 108	P 202367	State of WA	Public Purposes
	Lot 250	P 67938	Durmanich Property Investments Pty Ltd	Private Clubs & Institutions
	Lot 301	P 43053	State of WA	Community Purposes
	Lot 9000	P 67938	State of WA	Private Clubs & Institutions
	Lot 9002	P 67938	Peter Robert Johnston	Private Clubs & Institutions
	Lot 111	P 202367	Peter Robert Johnston	Private Clubs & Institutions
	Lot 116	P 202367	State of WA	Intensive Horticulture
	Lot 87	P 202367	Van Nghia Lu	Intensive Horticulture
	Lot 385	P 193585	State of WA	Rural
	Lot 113	P 20237	State of WA	Intensive Horticulture
	Lot 114	P 202367	State of WA	Intensive Horticulture

HORTICULTURAL AREA	LOT NUMBER	PLAN NUMBER	TENURE	ZONING
	Lot 115	P 202367	State of WA	Intensive Horticulture
	Lot 121	P 202367	State of WA	Intensive Horticulture
	Lot 120	P 202367	State of WA	Intensive Horticulture
	Lot 119	P 202367	State of WA	Intensive Horticulture
Area C	Lot 530	P 70848	State of WA	Rural
	Lot 3003	P 50853	State of WA	Rural
	Lot 330	P 75102	State of WA	Rural
	PT 351	P 75101	State of WA	Public Purpose/Rural
	Lot 443	P 189564	State of WA	Intensive Horticulture
	Lot 92	P 202373	State of WA	Public Purpose
Area D	Lot 454	P 218099	State of WA	Rural
Area E	Lot 415	P 220782	State of WA	Rural
	Lot 446	P 54526	State of WA	Rural

**2.2.1 Land Tenure Process**

As part of the land expansion process, land tenure will need to change from Unallocated or Vacant Crown Land and Pastoral lease tenure into a Section 79 lease (General Lease). Therefore, the land within the Structure Plan area will initially be leased to the market as per Part 6 of the *Land Administration Act 1997* which provides the Minister with the ability to grant a lease of any Crown land for such purposes. It is envisaged that the leases will contain conditions which control the use and development of the land, along with options to renew or purchase the lands as freehold after a stipulated period of time. The land within the Structure Plan area will not be transferred to freehold until the planning and management of the land has been undertaken in accordance with the Structure Plan.

It is understood that the Department of Lands is currently proceeding with tenure change and Native Title negotiations. It should be noted that the land tenure process required to release the land to the market does not impact on the Structure Plan or its ability to be approved.



LOT No.	TENURE
Lot 3001	State of WA
Lot 9001	State of WA
Lot 109	State of WA
Lot 108	State of WA
Lot 250	Durmanich Property Investments Pty Ltd
Lot 301	State of WA
Lot 9000	State of WA
Lot 9002	Peter Robert Johnston
Lot 111	Peter Robert Johnston
Lot 116	State of WA
Lot 87	Van Nghia Lu
Lot 385	State of WA
Lot 113	State of WA
Lot 114	State of WA
Lot 115	State of WA
Lot 121	State of WA
Lot 120	State of WA
Lot 119	State of WA
Lot 530	State of WA
Lot 3003	State of WA
Lot 330	State of WA
PT 351	State of WA
Lot 443	State of WA
Lot 92	State of WA
Lot 454	State of WA
Lot 415	State of WA
Lot 446	State of WA

STRUCTURE PLAN AREA  
 PLANNING SCHEME BOUNDARY  
 LOT NUMBER  
 LAND RELEASE AREA  
 0 0.5KM 1KM 2KM

**FIGURE 6 - LAND OWNERSHIP**

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## 2.3 STATE & REGIONAL CONTEXT

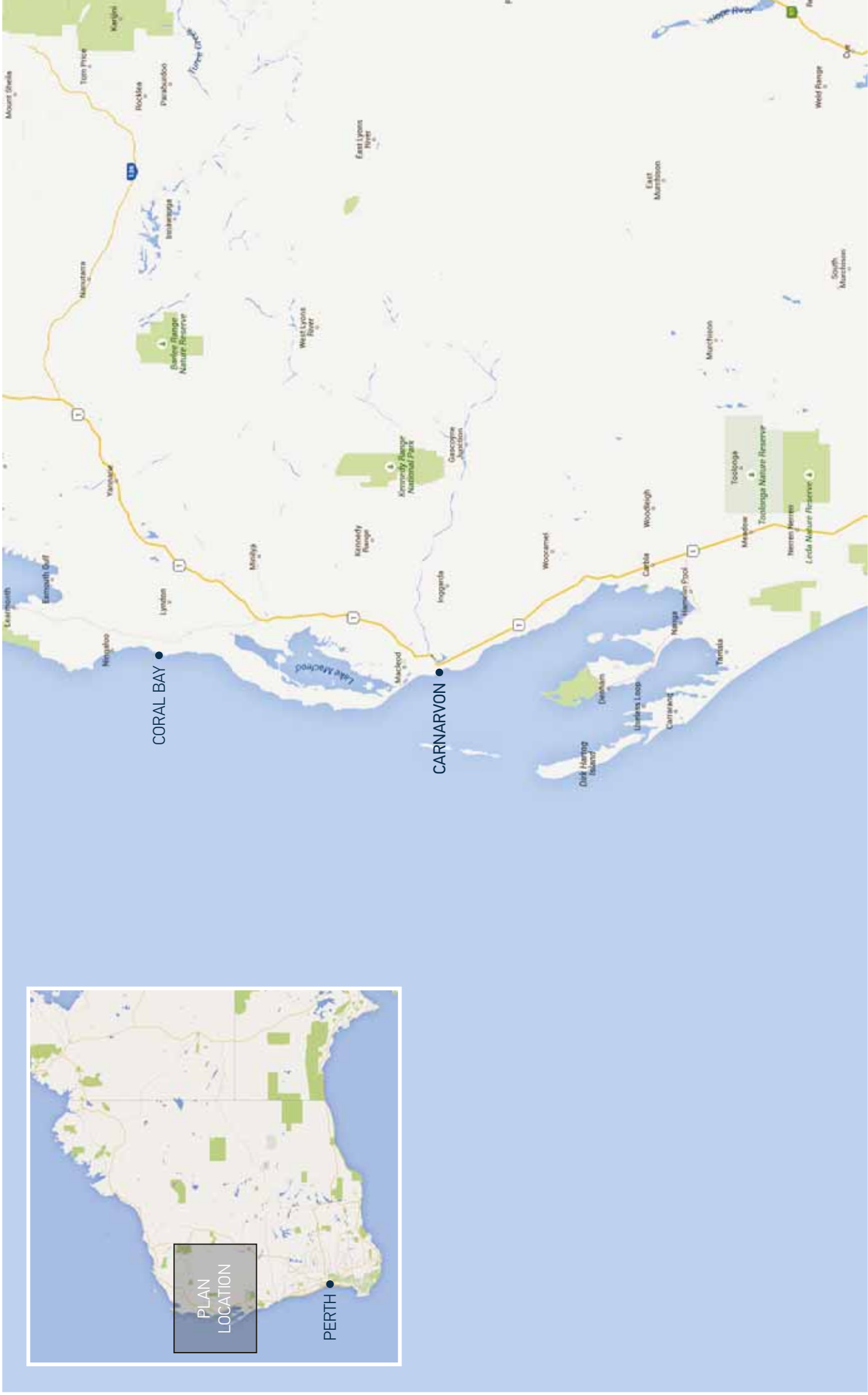
The Structure Plan area is situated in the Shire of Carnarvon, which spans an area of approximately 46,500 square kilometres of Western Australia's north-west coast. The Shire occupies approximately 450 kilometres of coastline and extends inland approximately 200 kilometres, covering sedimentary basin land known as the Carnarvon Basin.

The Shire is located within the Gascoyne Region, bordered by the Shire of Exmouth to the north, Shire of Upper Gascoyne to the east and Shire of Shark Bay to the south (refer, **Figure 7**).

Carnarvon is the Gascoyne Region's major centre, and provides higher order shopping, office and administrative functions to outer-lying townships such as Coral Bay, as well as surrounding agricultural areas. Carnarvon has a lesser tourism focus/reliance than other centres in the Region such as Shark Bay and Exmouth.

Carnarvon's horticultural areas predominantly service Western Australia. There is limited export interstate and even more limited overseas export. Carnarvon provides Perth and southern regions with the significant majority of its counter-season produce.

Transport of this produce is primarily based on road freight. Indeed, freight and road access to the town from Perth and elsewhere is to a high standard, via the North West Coastal Highway. While Carnarvon has a safe recreational harbour, it does not have a major port. The local airport provides for regular small aircraft access to Perth. It is generally not utilised for direct freight distribution.



**FIGURE 7 - REGIONAL CONTEXT**

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## 2.4 LOCAL CONTEXT

The Structure Plan area commences approximately 12 kilometres northeast of the town of Carnarvon, and extends approximately 12 kilometres further to the east.

At the time of the 2011 Census, the Shire of Carnarvon had a population of 5,797. The majority of the town's population is located within the Carnarvon townsite with the remainder generally within pastoral landholdings lying outside of the urban areas. Several population forecasts have been conducted over recent years with some significant differences in the future scenarios for the Shire. Importantly however, the population projections that have been undertaken by various agencies all reflect the extrapolation of historic growth. Based on a business as usual scenario identified in the Shire's draft Local Planning Strategy, population is expected to grow to 6,682 people by 2030.

The actual future population growth will be influenced by a number of events such as mining activity, industrial growth, completion of major infrastructure projects such as roads, and importantly, the impacts of the Gascoyne Food Bowl project.

Liaison with the Shire of Carnarvon indicates a significant seasonal fluctuation in Carnarvon's population. For example, during southern winter months, a large transient population is attracted to Carnarvon's warmer climate. In addition, during harvest a large number of transient workers are attracted to Carnarvon's horticultural areas for temporary employment as pickers etc. As a result, there is associated demand for transient workers' accommodation.

The current horticultural areas are generally located up to 12 kilometres to the east of the Carnarvon townsite, and straddle the Gascoyne River. As such, the horticulture areas spread in a linear pattern east-west. Within this overall land use pattern, the cadastral layout is generally north south – either side of North River Road and south of South River Road. The expansion areas reflect the historic spatial pattern of the northern and southern plantations of Carnarvon.

## 2.5 EXISTING HORTICULTURAL LAND USE

Horticultural and agricultural development along the banks of the lower Gascoyne River has been undertaken since the early 1900's. Horticultural activity in Carnarvon capitalises on the locality's comparative advantages of soil, climate and the absence of pests and disease. The existing Carnarvon Horticultural District covers some 2,000 hectares in area with up to 1,200 hectares under intensive horticultural use at any one time.

There are over 150 horticultural operations within the Shire. Approximately 350 hectares are devoted to bananas, 570 hectares to vegetables (tomatoes, beans, capsicums and asparagus) and 100 hectares to fruit trees (paw paw, mangoes, citrus, stone fruit and avocados). The total value of the industry is considered to exceed \$71M (DAFWA).

Agriculture (horticulture and pastoral operations) is an extremely important industry sector for Carnarvon, representing almost 50 per cent of all businesses in the town and as of 2011, over half of all employment related to agriculture (*Australian Bananas Growers Council Inc.*). Australian Bureau of Statistics information confirms the significance of agriculture to Carnarvon, generating approximately 2,000 direct jobs. Further, by way of example, the proportion of persons employed as labourers (including hand packers and general farm hands) is (at 20%) twice that of Perth (ABS, 2011).

Previous studies have identified a range of opportunities for the horticultural sector in Carnarvon, including:

- Expanding Carnarvon horticulture, through the release of undeveloped land and additional water.
- Applying value-adding processes to local horticulture.
- Developing existing and emerging export markets, particularly in populous neighbouring Asian countries.

- Developing horticulture as an alternative industry for pastoral properties in the region, including growing melons, grapes and cattle feed.
- Establishing research and development facilities.

The above opportunities reinforce the sustained strength of the horticulture industry in Carnarvon – that the industry has the capacity to support further expansion into high-capability areas, to expand local employment/business growth, and to service established demand for fresh produce and new market opportunities.

## 3 Planning Framework

Land use planning and development within the Shire of Carnarvon is currently governed by two planning schemes (the Schemes) being Town Planning Scheme No.10 (TPS 10) and District Zoning Scheme No.11 (DZS 11). Town Planning Scheme No.10 relates to the Carnarvon townsite and surrounds while District Zoning Scheme No.11 relates to the balance of the Shire, including Coral Bay. The horticultural expansion area is affected by the two Schemes.

### 3.1 EXISTING ZONING

A number of different zonings and reservations under the two Schemes apply to the land within the Structure Plan area (refer, **Figure 8**). In summary, the zones and reservations applicable to the land under TPS10 and DZS11 are:

- Rural
- Private Clubs & Institutions
- Public Purposes
- Community Purposes
- Intensive Horticulture

The most appropriate zone to apply to future horticultural land within the Structure Plan is considered to be the Intensive Horticulture zone within which horticulture is a 'P' use. Due to the existing status of zoning/reservation of the land, this Structure Plan has been prepared to guide the future rezoning and relevant subdivision/development provisions. As such, the Structure Plan identifies those land parcels which are proposed to be rezoned to Intensive Horticulture under the corresponding Scheme.

### 3.2 TOWN PLANNING SCHEME NO.10

TPS10 currently has an 'Intensive Horticulture' zone which applies to existing land within the northern and southern plantations.

'Intensive Horticulture', as a land use is defined as follows under TPS10:

*"means agricultural practices which are carried out with the aid of techniques including water reticulation to render the land capable of sustaining considerably greater number of stock, higher crop yields, or different types of crops than could be provided without the aid of those techniques."*

'Intensive Horticulture' is a 'P' (permitted) use under TPS10. A 'P' use means;

*"that the use is permitted provided it complies with the relevant standards and requirements laid down in the Scheme and all conditions (if any) imposed by the Local Government in granting planning consent."*

#### 3.2.1 TPS10 Development Provisions

Under TPS 10, development within the 'Intensive Horticulture' zone is required to be setback in accordance with the following provisions:

- 15 metres from the front boundary
- 7.5 metres from the side boundary
- 7.5 metres from the rear boundary

Site coverage, landscaping and car parking are development requirements which are to be determined upon application for development approval.

In addition, Clause 6.9 of TPS10 outlines provisions relating to development within a floodway. The Shire has the ability to refuse an application if the development is considered to being exposed to risk of flooding. The Shire's Scheme maps delineate the floodway, however it is noted that this has not been updated since flood mitigation works were undertaken in 2014. The Structure Plan map also depicts the floodway (as detailed in the Scheme map) as it applies to the land proposed for the horticultural expansion areas. In addition, flood protection and management requirements are described in section 6 of this report. These requirements provide further control over the use and development of land affected by flood.

Policy Statement 1 (in TPS 10), states that the Local Government will not recommend approval to any subdivision proposal for lots smaller in area than 6ha, and in such other cases will only recommend approval where it can be convinced that the proposed subdivision will enhance rather than detract from the viability of the lots for Intensive Horticultural purposes and where a water supply service is assured. It is proposed that this policy does not apply to the Structure Plan.

Consistent with draft SPP 2.5, it is important that the lot sizes which are proposed within the Structure Plan are maintained and land is not further subdivided to ensure that the land is adequate in catering to horticultural production. It is understood that it is the Shire's intent to remove this provision from their new Scheme, however in the meantime, it is recommended that a 'Special Control Area' be introduced for the Structure Plan to ensure that no ad hoc subdivision occurs at the time when the land is transferred from leasehold to freehold. The implementation of the above is outlined in Part 1.

### 3.3 DISTRICT ZONING SCHEME NO.11

Currently the 'Intensive Horticultural' zone is not included within District Zoning Scheme No.11. As such there are no relevant provisions of the Scheme applicable to the Structure Plan. As a result, the amendment to DZS11 will not only propose to rezone the relevant landholdings to 'Intensive Horticulture', but will also propose the inclusion of new provisions to the Scheme to correspond with those of TPS10 (as they relate to the Intensive Horticulture zone). This is discussed further in section 3.4 below.

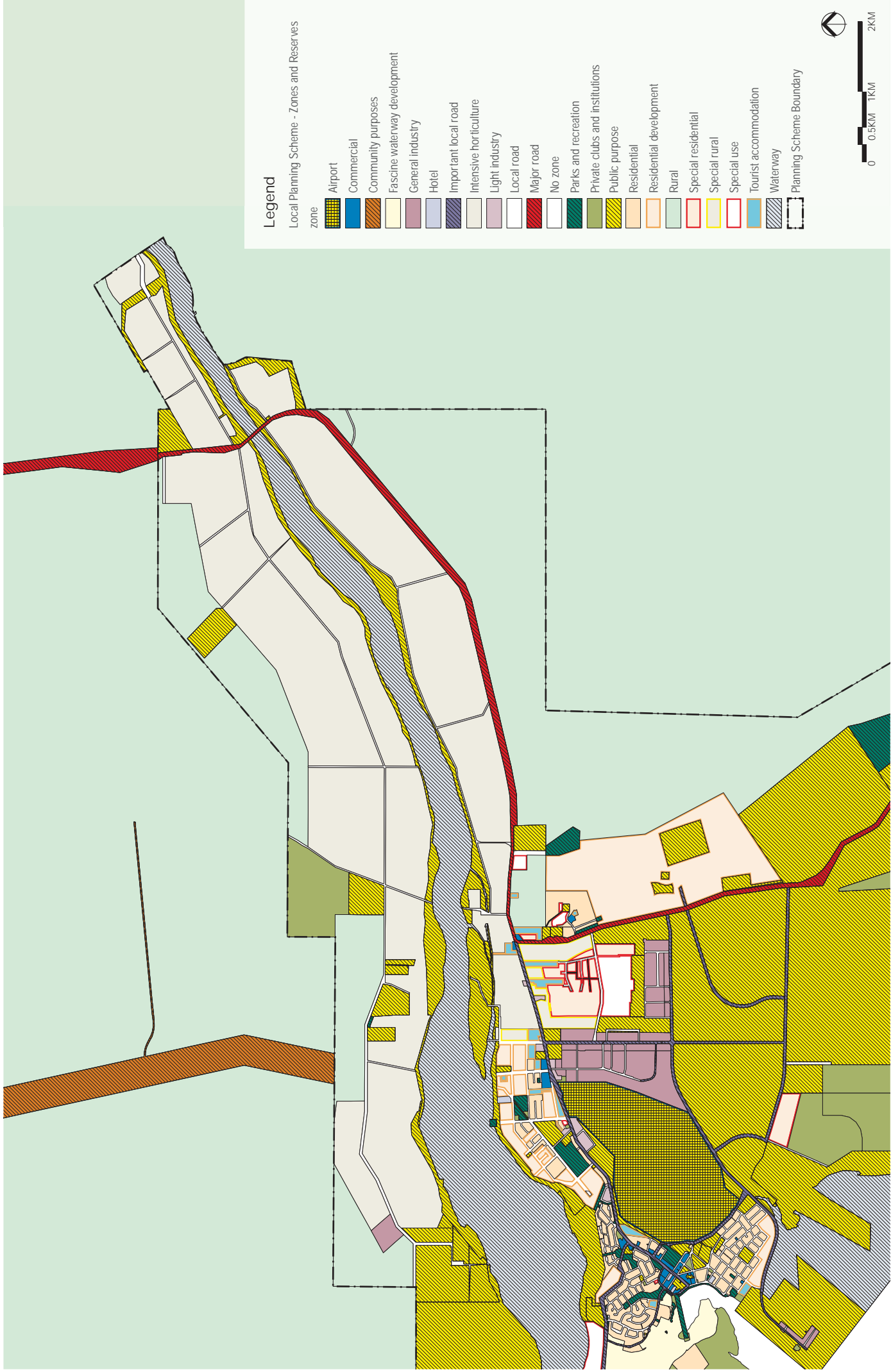
### 3.4 SCHEME AMENDMENTS REQUIRED

As a result of the number of different zonings applicable to the Structure Plan area, scheme amendments are required to the two Schemes to ensure that land which will be released to the market is appropriately zoned 'Intensive Horticulture', consistent with the zoning of the existing northern and southern plantations.

As detailed above, no 'Intensive Horticultural' zone exists under DZS11 due to the historical rural and pastoral use of land within this Scheme area. This results in the need to introduce the 'Intensive Horticulture' zone (and associated land use and development controls) into DZS 11 as part of the Scheme amendment process, consistent with that of TPS10.

The Structure Plan provides the basis for the amendments in terms of the required zoning, provisions and details. The two Scheme amendments have been prepared within the context of the recommendations of this Structure Plan and are proposed to be undertaken parallel to the structure planning process. Agreement has been provided by the Department of Planning and the Shire of Carnarvon to initiate and progress with these amendments prior to the approval of the Structure Plan.

The Shire of Carnarvon is currently reviewing its Schemes with a view to prepare a consolidated Local Planning Scheme No.13 (LPS13) for the whole of the Shire. The timing of delivery of this Scheme is unknown, however it is acknowledged that the lodgement of the proposed Scheme Amendments will occur prior to LPS13 coming into effect. It is important that the proposed Scheme Amendments be initiated and assessed separately to the Scheme review as the timing of the review is likely to exceed the Initiatives timelines.



**FIGURE 8 - LOCAL PLANNING SCHEME ZONING PLAN**

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### 3.5 RELEVANT STRATEGIES, POLICIES & PLANNING FRAMEWORKS

The following strategies, policies and planning documents are considered to be the most relevant and applicable to the Structure Plan:

- The **Gascoyne Regional Planning and Infrastructure Framework (GRPIF)** provides a regional context for land use planning in the Gascoyne, outlining major issues, priority actions and infrastructure projects. The framework acknowledges the Carnarvon horticultural industry as being resilient, despite being vulnerable to adverse climatic events. The Carnarvon horticultural district largely supplies the local domestic market at present. The GRPIF acknowledges that the Region's proximity to Asia makes it well positioned to develop existing and emerging export markets. The Gascoyne Food Bowl initiative is recognised within this document as having a fundamental role in expanding the industry into the future. The GRPIF recognizes that the industry's role into the future will be diversified with many pastoralists/horticulturalists producing melons, table grapes, corn and cattle feed crops etc., with the aim of expanding their economic base. The proposed District Structure Plan will assist the release of additional land for horticultural purposes, consistent with the priorities of the GRPIF.
- The **Gascoyne Regional Development Plan 2010-2020 (GRDP)** acknowledges the opportunity to promote Carnarvon and the horticultural industry as a source of labour to the wider regional area. The proposed land expansion will assist in generating additional employment opportunities in the long-term, however it is recognised that a majority of these employment opportunities are reliant on season.
- **State Planning Strategy 2050** identifies future opportunities for the expansion of agriculture within the 'Central Sector' within which Carnarvon sits, with specific reference made to the potential for significant increase to Carnarvon's cultivated district. It is our view that the release of additional horticultural land recognises and supports the broader efforts for economic development within the Central Sector and in particular, within the Shire of Carnarvon. The proposed District Structure Plan and subsequent Local Planning Scheme Amendments will result in the required planning mechanisms being in place to facilitate subdivision and development of the additional horticultural land which will in turn increase the local horticultural industry activity, having flow on economic effects.
- The **Rural Planning Guidelines** were specifically developed to provide guidance in using and interpreting **State Planning Policy 2.5 – Land Use Planning in Rural Areas (SPP 2.5)** and **Development Control Policy 3.4 – Subdivision of Rural Land DC 3.4**. The Guidelines are for the most part influential on the preparation of local planning strategies and local planning schemes in terms of providing guidance on how to plan for land uses within rural and horticultural zoned land. SPP 2.5 has recently been reviewed with a draft currently out for public comment. The policy acknowledges that there is sufficient supply of suitably sized and located rural land to cater for intensive and emerging primary production land uses. As a result, the creation of new rural lots through ad hoc, unplanned subdivision is inconsistent with, or contrary to the objectives of the policy. The Structure Plan will protect the use of the land for rural purposes (rather than rural living) and provides guidance on the subdivision of the Crown land consistent with this policy. Any further subdivision will not be supported in accordance with the overall objectives of SPP 2.5 and DC 3.4.

It is also recognised in SPP 2.5 that local planning strategies and schemes should identify rural land appropriately, with primary agricultural land being identified accordingly within these strategic planning instruments. It is understood that the Shire of Carnarvon is currently progressing with their Local Planning Strategy and Local Planning Scheme review. It is understood that rural land will be identified in these documents accordingly.



- The **Planning and Development (Local Planning Schemes) Regulations 2015** amend and replace the *Town Planning Regulations 1967* and the existing Model Scheme Text provisions, to introduce a suite of deemed provisions which will apply to all local governments across WA. These Regulations set out the requirements primarily for local planning scheme's and local planning strategies. Of particular are the new timeframes set out under the Regulations for the consideration Scheme Amendments and Structure Plans. The Shire's new Local Planning Scheme No.13 must accord with the updated Model Scheme Text provisions.
- Pursuant to the Regulations (above), the WAPC has prepared the **Structure Plan Framework 2015** which constitutes the manner and form in which a structure plan is to be prepared. The subject Structure Plan has been prepared in accordance with this framework.
- The purpose of **State Planning Policy 2.7 – Public Drinking Water Source** is to protect and manage Public Drinking Water Source Areas (PDWSA) across WA and ensure they are reasonably protected under local planning strategies and subsequent planning frameworks. There is one proclaimed PDWSA in the Shire of Carnarvon but the proposed expansion areas are distant from this PDWSA and its buffer.
- **State Planning Policy 3.4 – Natural Hazards and Disasters** aims to guide the assessment of subdivision and development in areas which may be affected by natural disasters. In this case, the key issue relating to the expansion areas is exposure to flooding due to portions of the subject land being located within the floodway and floodplain. The Structure Plan has due regard to SPP 3.4 and provides an appropriate planning response to the subdivision/development of land within the context of flood, which will be addressed fully by the Local Planning Schemes.
- **State Planning Policy 3.7 – Planning in Bushfire Prone Areas** and accompanying *Guidelines for Planning in Bushfire Prone Areas* direct how land use should address bushfire risk management in Western Australia. It applies to all higher order strategic planning documents, strategic planning proposals, subdivision and development applications located in designated bushfire prone areas. As the Structure Plan area is within a bushfire prone area, the policy has been addressed through the preparation of a Bushfire Management Plan (**Appendix E**).
- The Shire of Carnarvon's draft **Local Planning Strategy** identifies the land within the Gascoyne Food Bowl Initiative as being an area for further investigation. In accordance with the WAPC guidelines, Investigation Areas means; "*an area identified in a strategic plan that presents development and growth opportunities, however requires further investigations to resolve identified constraints including infrastructure servicing*". The Structure Plan provides the further technical investigation and reporting and recommendations required to facilitate the rezoning of the land to Intensive Horticulture.

The above demonstrates that due consideration has been given to the relevant planning documents as part of the preparation of this Structure Plan. The Structure Plan is considered to be consistent with the above planning framework and their specific recommendations.

## 4 Site Conditions

This section of the Structure Plan provides a summary of the site conditions and opportunities and constraints relative to the Structure Plan area (refer, **Figure 10**). Further detail and technical information is included within **Appendix A-E** which should be read in conjunction with this section.

### 4.1 BIODIVERSITY AND NATURAL AREA ASSETS

**Appendix B** provides detailed information with respect to the Structure Plan's biodiversity and natural assets. Where information is not contained within this section please refer to the Appendix.

#### 4.1.1 Vegetation Complexes

The following key vegetation qualities directly relate to the Structure Plan:

- a) The area is located within the Interim Biogeographic Region of Australia (IBRA) in Western Australia and is located on the northern and southern floodplain of the Gascoyne River, fringing the existing land used for horticultural production.
- b) The structure plan incorporates three pre-European Vegetation Systems including:
  - Gascoyne marshes: Bare areas; claypans;
  - Gascoyne marshes: Bare areas; drift sand; and
  - Gascoyne marshes: Mosaic: Shrublands; Acacia scelosperma sparse scrub/ succulent steppe; Saltbush and Bluebush.
- c) Based on a level 1 survey undertaken for the site, no Threatened or Priority Flora species were recorded within the Study Area during the field surveys undertaken as part of the land identification process. In addition, vegetation within the study area was not indicative of a particularly high level of biological diversity.
- d) The McNeill Claypan, on the eastern side of Brown range and extending into parts of Area D of the land investigated for horticulture expansion, is however recognised as an Environmentally Sensitive Area (DPAW) (refer, section 4.1.2).

In light of the above key considerations, the proposed Structure Plan is not considered to have any detrimental impact on the vegetation systems of the area.

#### 4.1.2 Environmentally Sensitive Areas

The McNeill Claypan, on the eastern side of Brown Range extends into part of structure plan Area D and is designated under the *Environmental Protection Act 1986* as an Environmentally Sensitive Area (ESAs).

The McNeill Claypan occupies an area of approximately 2,800 hectares of land south of Area D, characterised by low lying land, covered in rushes and inundated by water after rainfall. The ESA is described as having a healthy birdlife, being a breeding ground for the Australian Painted Snipe. A species identified as 'rare or likely to become extinct' in Western Australia under the *Wildlife Conservation Act 1950* and 'vulnerable' under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Environmental assessment determined that the mapped ESA boundary currently encompasses a 50-metre buffer from the edge of the wetland. It will be important that development does not unduly impact on the wetland and its environmental qualities through appropriate management, as outlined in section 6.

## 4.2 GEOLOGY, LANDFORM & SOILS

**Appendix B** provides detailed information with respect to the Structure Plan's geological conditions. Where information is not contained within this section please refer to the Appendix.

### 4.2.1 Topography

The Structure Plan area encompasses land adjacent, or in close proximity to existing plantations on levees of the Gascoyne River near Carnarvon. Topography is predominately flat and characterised as low relief land (ranging between 0-16m AHD), with gentle undulating sand plains. Of particular note, the contours show that the floodplain gently slopes away from the primary channel of the Gascoyne River.

### 4.2.2 Soils and Geology

The soils within the structure plan area are developed from alluvial sediments which have been deposited on terraces that extend approximately 1 kilometre on either side of the river. As outlined within **Appendix B**, the alluvial soils or Gascoyne soils can be broadly categorized as light, medium and heavy textured soils. Gascoyne light soils (Gl) have a sand to sandy loam soil texture throughout the soil profile; Gascoyne medium (Gm) have loam to clay loam and Gascoyne heavy (Gh) soils have silty clay to light – medium clay soil textures.

Soil surveys have concluded that the most un-improved alluvial soils contain salts within the soil profile (Coburn soils). Generally, Coburn soils are not conducive to horticultural development. It is acknowledged however that whilst salinity can be constraining in terms of horticultural production, current irrigation technology and management strategies can assist growers in addressing salinity risk.

Furthermore, most recent electromagnetic surveys (EM surveys) of the Structure Plan area (refer to detail in **Appendix B**) depict those areas which have the lowest- highest risk of salinity. DAFWA are mindful of the need to ensure that horticulture production levels are not limited by soil salinity; accordingly, areas with the highest level of salinity have been excluded from consideration for future horticultural development.

## 4.3 HYDROLOGICAL CONDITIONS

**Appendix C** provides detailed information with respect to the Structure Plan's hydrological conditions. Where information is not contained within this section please refer to the Appendix.

### 4.3.1 Surface Water

One of the key physical features of the Structure Plan area is the Gascoyne River which flows through the site. Other existing waterways and drains within the vicinity of the Structure Plan area include Burnt Gully and several smaller creeks and agricultural drains that traverse the site.

The Gascoyne River flows west into the Indian Ocean and is located centrally in the Structure Plan area. The Lyons River is the main tributary of the Gascoyne River and generally has saline flow. It joins the Gascoyne River near Gascoyne Junction, approximately 176 kilometres upstream of the river mouth. Flows of the Gascoyne River are generally directed in a westerly direction and away from the main channel when floodwaters breach the river banks. The Gascoyne River is episodic with significant flows resulting from heavy rainfall received inland. Recent major flow events have occurred in 2010 and again in 2011. The frequency of long 'no-flow' periods is generally increasing (refer, **Appendix C**).

The surface and groundwater systems within the Structure Plan area are closely linked. The high conductivity of the riverbed sands allows for rapid recharge of the aquifer during periods of surface water flow. As surface flows continue to recharge the river sands, vertical leakage occurs in the underlying older alluvium.

It has been identified within the LWMS that management of surface water is a necessary development requirement to reduce the risk of inundation within the Structure Plan area. The approach to the management of surface water is outlined in Part 1 (section 2.6) of this report.

### 4.3.2 Flooding

The Gascoyne River has experienced flooding in the past, with the 2010 flood being regarded as the most severe flood to take place along this river. As more seasonal changes occur it will become increasingly important to ensure that suitable actions are taken to reduce the impacts of potential flooding.

The extent of flooding post flood mitigation work shows a general reduction in flood levels in the horticultural district. This has enabled DAFWA to investigate and identify suitable expansion areas, though in some cases more detailed flood management interrogation and response may still be desirable (refer, Part 1 section 2.6.)

The completion of the flood mitigation work in 2014 has generally benefitted the horticultural areas by lowering the extent and the severity of flooding. The land determined within the Structure Plan area for expansion has been specifically chosen due to the reduced exposure to flooding, based on flood modelling which has taken into consideration the new levees.

The Structure Plan aims to protect the existing floodway from development. The land use framework of the Structure Plan defines the '100 Year ARI Extent of Flooding', as prepared by the Department of Water (DoW) and reflected in the Shire's Scheme. It should be noted that the extent of the floodways is based on the pre-flood mitigation works scenario (prior to construction of the flood levees in the area). Therefore, it is expected that the floodways, particularly in the Kingsford area, will reduce in width. The Department of Water intends to revisit the floodway mapping following the next major event.

### 4.3.3 Groundwater

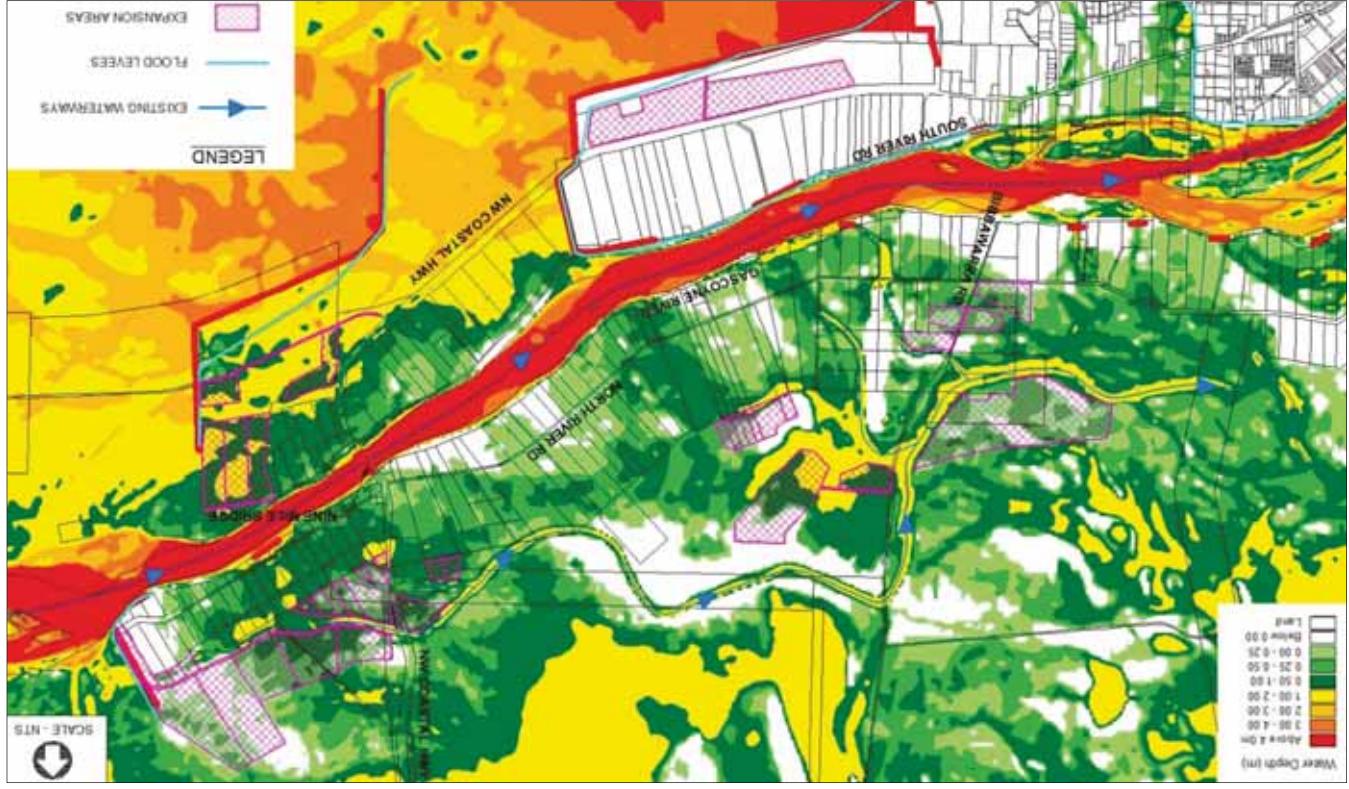
The Structure Plan area is located within the Lower Gascoyne Plan Area which covers 1,187km<sup>2</sup>. This system comprises of the following:

- Birdrong confined aquifer
- Lower Gascoyne Alluvial aquifer
- The Surficial aquifer

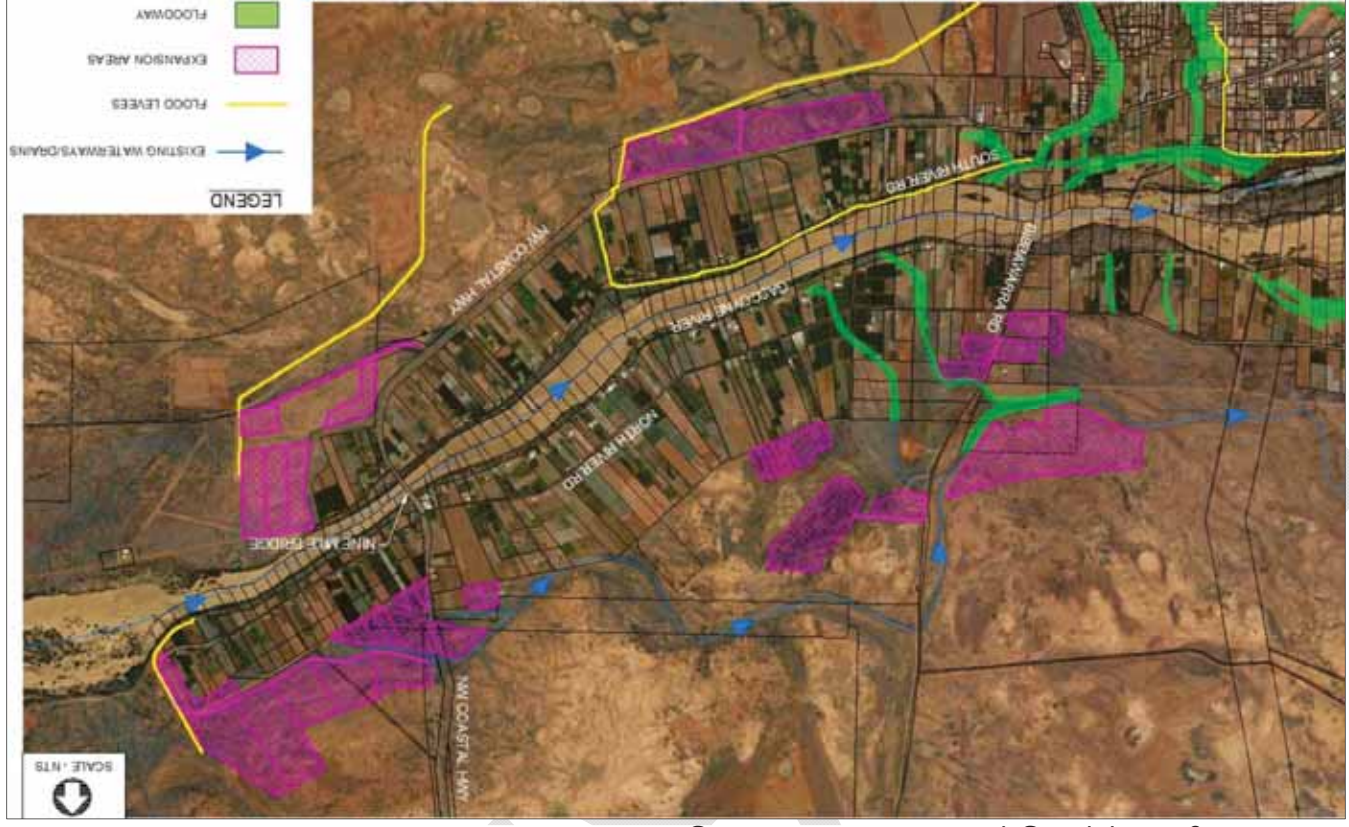
The Birdrong aquifer has minimal interaction with the unconfined aquifers in the Lower Gascoyne Plan area. The DoW currently assigns all confined or artesian groundwater to the Birdrong groundwater resource. It is managed through the Carnarvon Artesian Basin Water Management Plan (DoW 2007).

Groundwater modelling undertaken by DoW indicates that groundwater levels typically fluctuate between 1.5 metres to 2.5 metres adjacent to the Structure Plan area. The depth to maximum groundwater level across the Structure Plan area is generally greater than 4.0 metres with the exception of some localised low lying areas in Area B, where the depth to maximum groundwater level is 2.5 – 3.0 metres. On this basis, it is highly unlikely that development of the Structure Plan area will intercept exiting groundwater (via drains and subsoil drains). Consequently, strategies to manage the impact from drainage infrastructure on groundwater flows and groundwater levels are not required for the Structure Plan area.

Further detail of the groundwater management strategy is outlined in Part 1 section 2.6 of this report.



Floodplain Mapping - Post Flood Mitigation Works (Source: DOW, 2014)



Floodway Mapping prior to Flood Mitigation Works (Source: DOW, 2014)

## FIGURE 9 - FLOOD MAPPING

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## 4.4 HERITAGE

### 4.5.1 Indigenous Heritage

Indigenous land use agreements and Native Title are a key consideration in the planning for the structure plan area. The Gnulli (WC 1997/028) Native Title determination application covers the most of the Shire of Carnarvon including existing and proposed horticultural areas. The representative for the applications and their determination is the Yamatji Maripa Aboriginal Corporation (YMAC).

In addition to Native Title, there are over 200 Aboriginal heritage sites within the Shire of Carnarvon as assessed by the Department of Aboriginal Affairs. These sites are protected in Western Australia through the following overlapping state and federal legislation:

- *Aboriginal Heritage Act 1972 (WA)*
- *Australian Heritage Commission Act 1975 (Commonwealth)*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth); and*
- *Native Title Act 1993 (Commonwealth)*

The Structure Plan area is not within the boundary of any sites under the *Aboriginal Heritage Act 1972 (AHA)*, as currently mapped on the Register of Aboriginal Sites. There are two places however where a decision under section 5 of the AHA is yet to be made in the vicinity of the expansion areas. These sites are:

- DAA 18625 Carnarvon – Mullewa Road 1
- DAA 28380 Carnarvon 002

Notwithstanding the above, the Department of Aboriginal Affairs (DAA) has advised that there are sites within the general locality which whilst are not on the Register, are still afforded protection under the AHA. Whilst some anthropological surveying has been undertaken as part of the Native Title process, it is noted that not all of the Structure Plan area has been surveyed as this generally falls outside the role of the District Structure Plan. There is the potential that as areas are cleared or earthworks undertaken as part of any future development, cultural material may be uncovered. In this case, an Aboriginal Heritage Management Plan may be required at the subdivision or development stage as noted in Part 1.

The management of Indigenous heritage is further outlined in section 2.9 of this report.

### 4.5.2 Non-Indigenous Heritage

A desktop search of the State Heritage office database indicates that there are a number of registered heritage sites within proximity of the Structure Plan boundaries, including:

- Inggarda Aboriginal Mission – 281 Bibbawarra Road Carnarvon
- Stock Route Well – Nichol Bay Flat
- Gascoyne River Bridge – North-West Coastal Highway
- Brickhouse Station Homestead
- Gascoyne Research Station – South River Road corner Research Road, Carnarvon

None of the above heritage sites are located within the expansion areas.

It is understood that the Shire is currently undergoing a review of its Municipal Heritage Inventory which will be finalised as part of the overall Scheme review.

## 4.5 TRANSPORT & FREIGHT

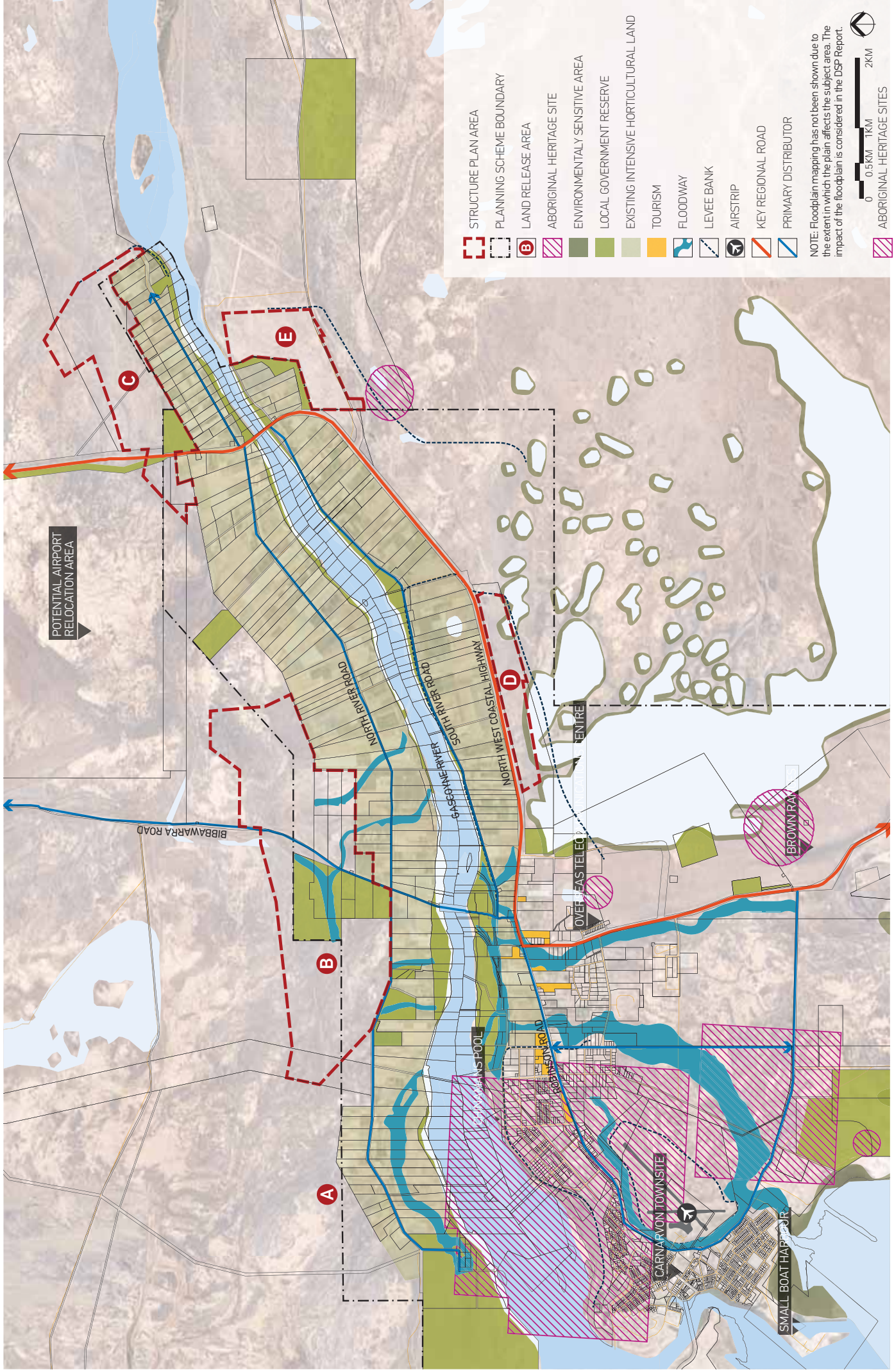
North West Coastal Highway is the major state access and freight distributor route servicing the northwest. The Highway provides access to the Carnarvon Horticultural District from Perth and Geraldton in the south, and Karratha and Port Headland in the north. The primary local access network for the Carnarvon horticultural district consists of the Bibbawarra Road, the North River Road and the South River Road. All of these primary access network roads are linked to the Highway, which is sealed and designed to allow high speed travel. Existing transport networks are identified in **Appendix D**.

The North West Coastal Highway is constructed as a regional rural highway with a typical 7 to 9 metre sealed carriageway. Intersections are controlled by give way or stop signs with a posted speed limit of 110kph provided along most of its length.

The proposed horticultural expansion areas will require the construction of new access roads to limit the number of traffic ingress and egress points. The proposed horticultural expansion areas can generally be serviced through the construction of dedicated service roads. Based on previous consultation with Main Roads WA, **Appendix D** notes the following:

- The easement to the west of the Highway on the north side of the river has been revoked, meaning that the pavement has been completely removed (West Area C).
- McGlades Road can potentially be looped to allow for prolongation of existing plantations & new plantations further north (Area C).
- A service road running parallel to the Highway in Area D may not be necessary if it only services only two lots. It may be possible to provide common access instead.

Based on the above, an indicative road network plan has been prepared (included in **Appendix D**) to demonstrate the preferred location for internal road networks required to service individual lots. This provides decision-makers with the required direction in making future decisions on subdivision and development. The implementation of the above is detailed further in Part 1.



**FIGURE 10 - CONTEXT AND CONSTRAINTS**



## 5 Land Capability

The purpose of this section of the report is to provide the detailed information with respect to the capability of the land for horticultural purposes. A great deal of technical study and investigation has been undertaken as part of the earlier stages of the Gascoyne Food Bowl Initiative to determine the capability of the investigation areas (refer, **Figure 4** of Areas B- E). Those areas which have been identified as being least constrained (generally shown as fair-high perennial horticultural capability) are considered potentially suitable for rezoning to Intensive Horticulture under the Shire's Schemes, which will facilitate the development of the land for such purposes.

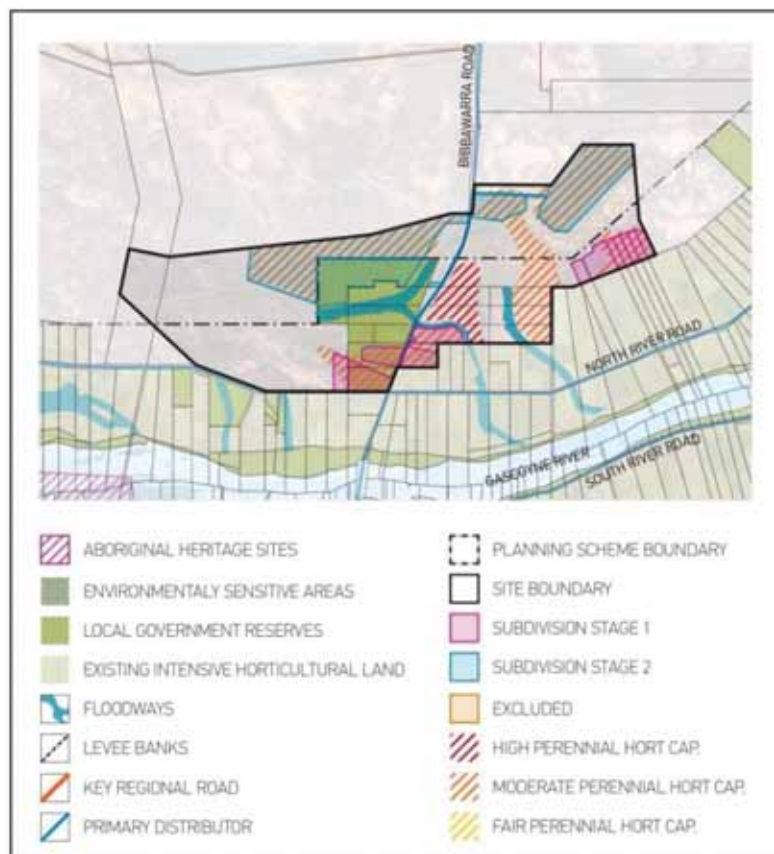
A synthesis of the land capability and salinity information along with other planning and environmental considerations, including flood susceptibility and 'environmentally sensitive areas' has resulted in the delineation of the more specific horticulture areas, which are proposed to be rezoned.

### 5.1 AREA B

Mapping at **Figure 11** demonstrates Area B's dissection by a major drainage line and associated floodway lines and channels. Several potential horticultural areas have been identified as moderate to high capability.

There are a number of parcels of land which have been excluded from release to the market due to their sand or loamy sand textures and due to having a low water holding capacity. Area B is well connected to the existing transport network with the majority of release areas having direct access to either North River Road or Bibbawarra Road. Stage 1 areas identified on **Figure 11** largely reflect those areas flagged as prolongation areas to existing horticulture lots along North River Road.

FIGURE 11 – AREA B LAND CAPABILITY

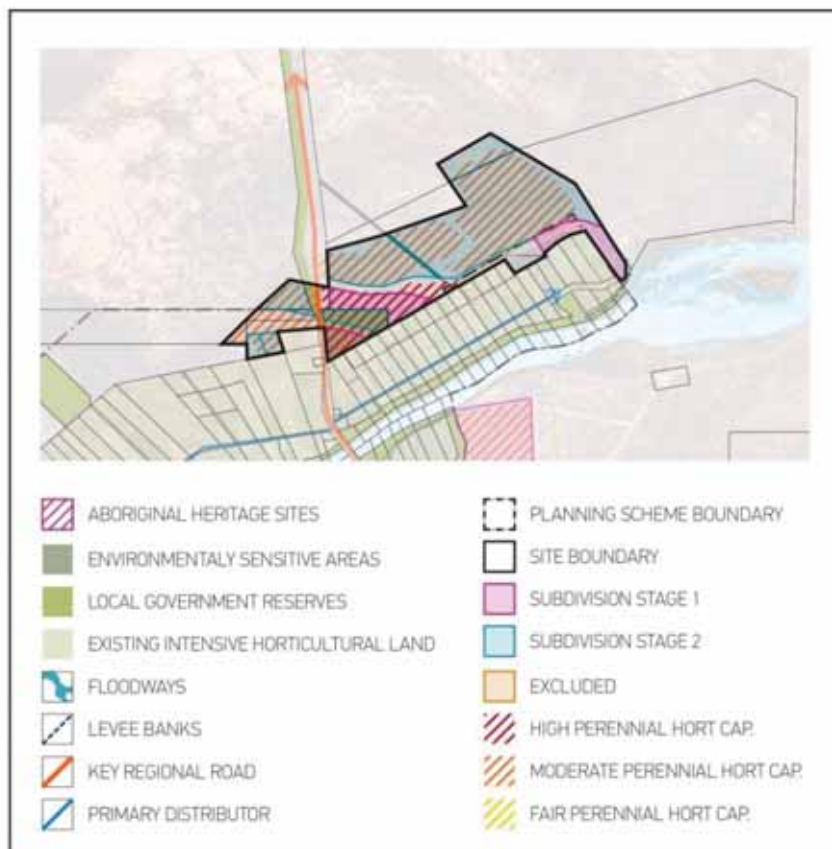


## 5.2 AREA C

Area C (refer, **Figure 12**) contains the north-western most land proposed to be expanded. This area contains light to medium texture Gascoyne soils which can be utilised for both expansion and prolongation.

The largest identified block within this area contains a major flow line however the recent McGlades Road levee will reduce overland flow and reduce flood height and velocity to the majority of Area C. This area benefits from having direct access from North-West Coastal Highway and McGlades Road. Internal access roads would be required should the larger blocks be subdivided into the future. Land identified as Stage 1 release relates to land identified for prolongation.

FIGURE 12 – AREA C LAND CAPABILITY



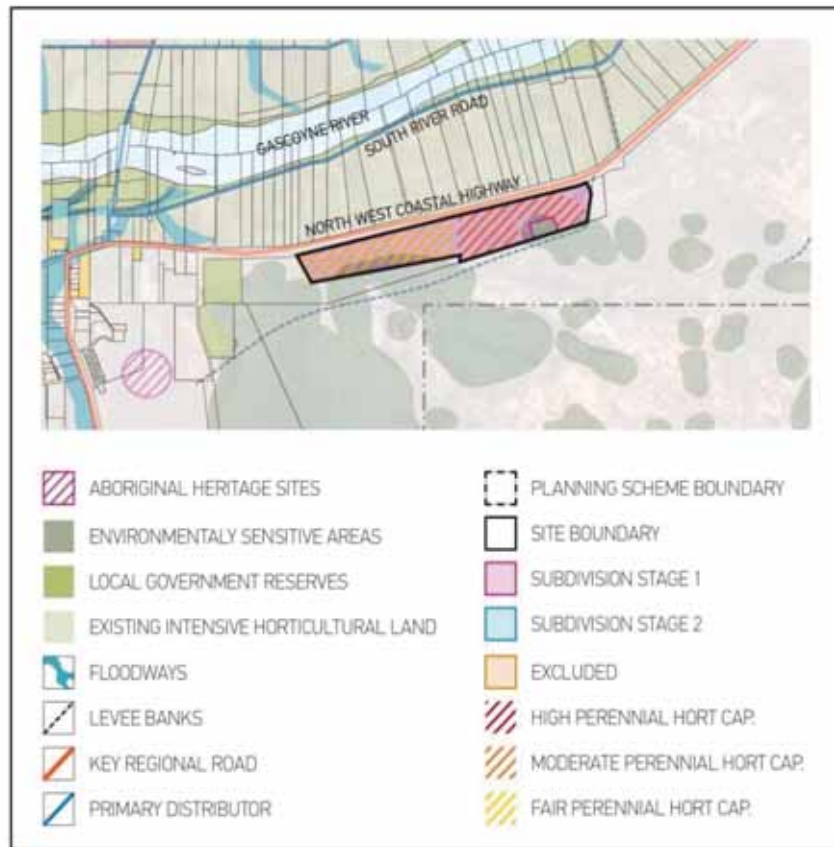
## 5.3 AREA D

Area D is located to the south of the Gascoyne River, adjacent to the established southern plantations. The area benefits from direct access from North West Coastal Highway. This location is also extremely well situated to the passing tourist trade.

The soils within Area D (refer, **Figure 13**) are identified as having moderate horticultural capability due to the moderately saline soils. It has been recognised however that salinity levels could be reduced through leaching and melioration with gypsum. Those areas with extremely high levels of salinity have been excluded from this area. The mapping also identifies the environmentally sensitive area associated with the McNeill Claypan located directly to the south of the expansion area.

Area D is adjacent to the flood levee which wraps around the land to the eastern and southern boundary however, these areas contain burrow pits and flow lines that would require fill and land grading to divert flow west to the drainage channel adjacent to Giles Road.

FIGURE 13 – AREA D LAND CAPABILITY



## 5.4 AREA E

Area E (refer, **Figure 14**) contains three potential expansion blocks between Lawson Street and the Gascoyne Junction Road.

The flood levees to the east and southern edge of the expansion area boundary should reduce the areas exposure to flood.

The largest block identified contains light to medium textured Gascoyne soils and has been identified as having a high perennial horticultural capability. It is noted that land grading would be required to fill and level a minor flow line and depression area within this block.

The remaining portion of Area E contains medium textured Gascoyne soils that have slight to moderate saline subsoils. It has been identified by DAFWA that these soils could be improved by amelioration with gypsum.

FIGURE 14 – AREA E LAND CAPABILITY



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