CPS 6244/2 AMENDMENT APPLICATION

SUPPORTING INFORMATION

BBI RAILWAY INVESTIGATIONS

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

BBI Group Pty Ltd (BBIG), through its subsidiary company Forge Resources Swan Pty Ltd, is proposing to develop the Balla Balla Infrastructure (BBI) Project, consisting of a conveyor, railway and port facility in the Pilbara region of Western Australia (WA). The BBI Project has been planned with the intention of providing access to export markets for billions of tonnes of Pilbara iron ore.

BBIG has obtained approval under Part IV of the *Environmental Protection Act 1986* (WA) for the BBI Project via Ministerial Statement (MS) 945 for the BBI Port, and MS 1006 for the BBI railway and conveyor. The BBI railway and conveyor provides a new ore transport link (approximately 200 km in length) from the Pilbara Iron Ore Project (PIOP) to the stockyard area at the BBI Port, located midway between Port Hedland and Karratha.

1.2 PURPOSE

Since the receival of CPS 6244/2, BBI have been issued an updated Section 91 Licence (S91) under the *Land Administration Act 1997* (WA). The S91 allows geotechnical, water and other relevant investigations to occur prior to construction. The S91 has been updated to included additional areas required for project development.

The purpose of this application is to amend CPS 6244/2 to include:

- Changes to the Purpose Permit boundary to align with the recent issue of the updated S91 (Lic 00155/2014_Al 0886674);
- An extension to the expiry date through until 24 June 2022 to align with the updated S91 expiry date; and
- An extension to the period in which clearing is authorised (Condition 5) to align with the S91 expiry date.

Changes to the boundary realignment requested by this amendment application are shown in Figure 1. No changes to the total area of clearing or the nature of clearing activities has been proposed in this amendment.

A copy of S91 (Lic 00155/2014_Al 0886674) has been provided in Appendix 1.

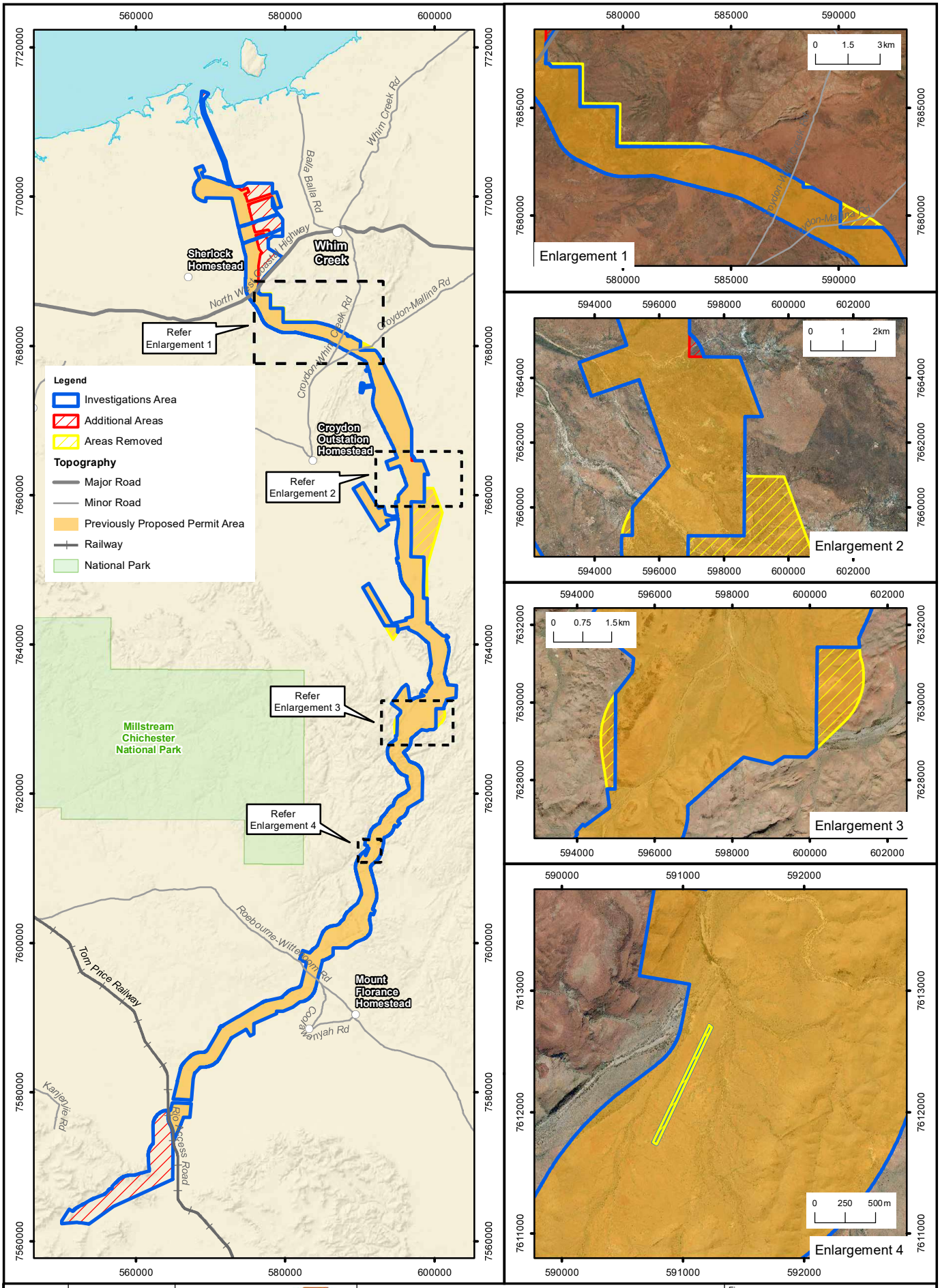


Figure 1: Proposed Purpose Permit boundary and approved (CPS 6244/2) boundary

2 INVESTIGATIONS AREA

2.1 BOUNDARY

All vegetation clearing for the BBI railway investigations are proposed to be conducted within a defined 'Investigations Area' (IA), shown within the blue border in Figure 2. The IA is aligned within the boundaries of a S91 corridor held by Forge Resources Swan Pty Ltd, as described in Section 2.2 (shown in red shading in Figure 2). The IA runs from the BBI Port in the north to west of the Cape Lambert railway line in the south. The width of the IA is generally 2 km however the width increases in some areas to include additional borrow and water target areas.

All vegetation disturbance detailed in this NVCP amendment application is proposed to occur within the IA.

This NVCP amendment application proposes that the IA is to be used as the boundary of the Purpose Permit (outlined in blue in Figure 2).

2.2 TENURE AND LAND ACCESS

All proposed vegetation disturbance addressed in this NVCP application will occur within the S91 corridor that aligns with the IA, which has been issued to Forge Resources Swan Pty Ltd, a wholly owned subsidiary of BBIG. The IA passes through several mining and exploration leases, as well as an area of Unallocated Crown Land and three pastoral leases, Sherlock, Mallina and Coolawanyah (refer to Section 4.6). The IA passes through the City of Karratha and the Shire of Ashburton Local Government areas.

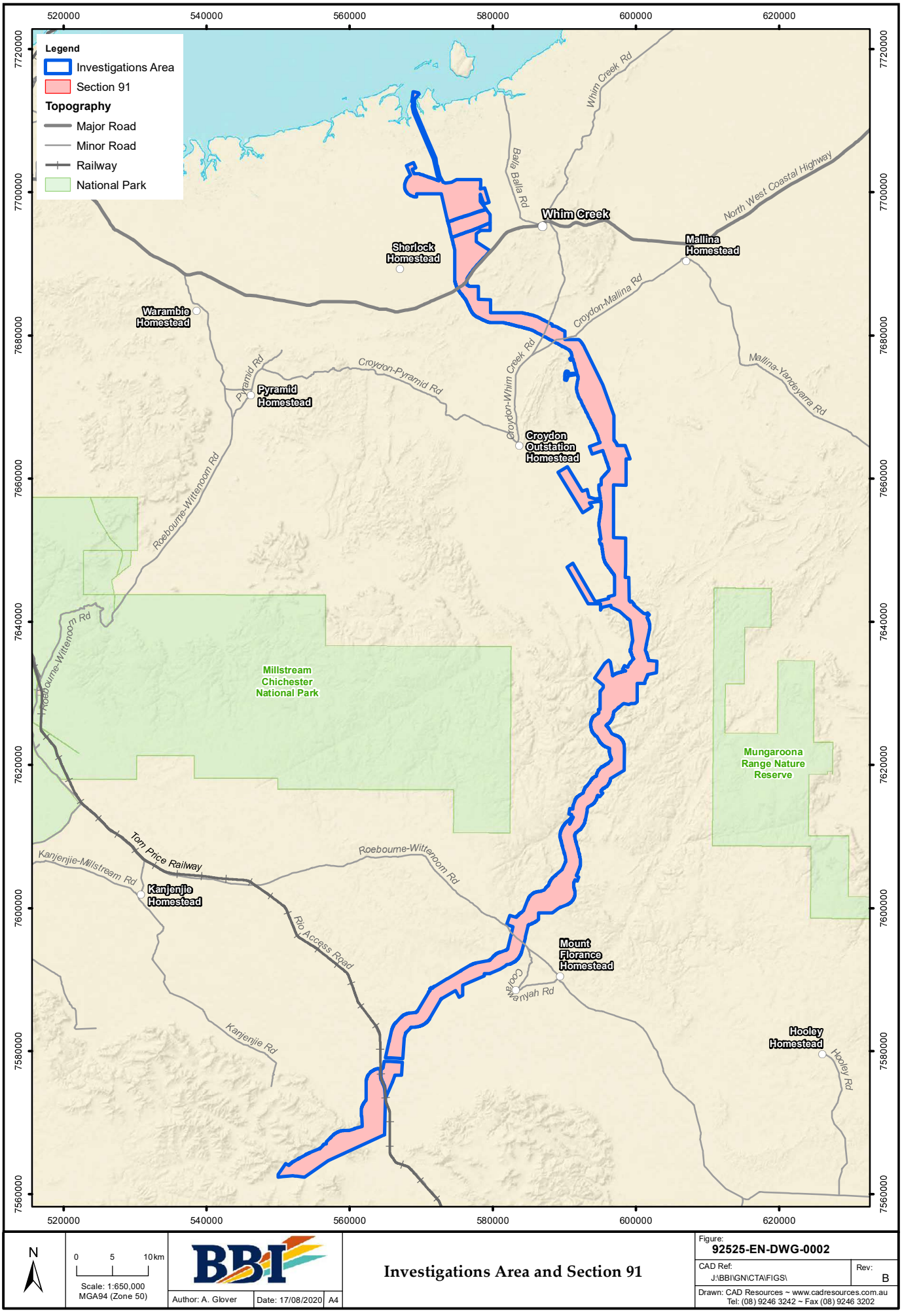


Figure 2: Investigations Area and Section 91 boundary

3 INVESTIGATION ACTIVITIES

The intent of the application for CPS 6244/2 was to seek a Purpose Permit to allow various low-impact investigations activities to occur within the IA shown in Figure 2. None of these activities have commenced and no changes to the nature of the activities is proposed in this amendment.

The activities may include:

- Geotechnical drilling;
- Test pits and other investigations;
- Water supply investigation drilling; and
- Access routes.

3.1 ESTIMATED VEGETATION DISTURBANCE REQUIREMENTS

Table 1 summarises the maximum potential vegetation disturbance requirements for each investigations activity. No changes to the areas of disturbance approved under CPS 6244/2 are proposed in this amendment.

Table 1: Summary of estimated vegetation disturbance requirements.

Activity / Item	Description	Maximum Disturbance Expected (ha)
Geotechnical investigations	43 sites adjacent to existing tracks (10 m x 10 m disturbance each), 5 other sites (20 x 20 m disturbance each)	0.7
Test pits (borrow material)	170 sites (10 m x 10 m disturbance each)	1.7
Water supply investigations	102 sites (20 m x 20 m disturbance each)	4.1
Access	172 km, 3 m wide disturbance	52
Contingency	Additional clearing allowance for unforeseen circumstances	5.0
	TOTAL	**63.5**

3.2 METHOD OF VEGETATION DISTURBANCE

Where clearing of vegetation is required, bulldozers or graders will be used. Diggers and loaders may be used around drainage lines as required.

Vegetation and topsoil will typically be stripped and stored to the side of each disturbed area. Areas with thicker vegetation may need to have the vegetation pushed into piles and mulched. For the purposes of fire hazard reduction, it is likely that a combination of mulching equipment and hand-held chain saws will be used to selectively clear vegetation.

3.3 INDICATIVE TIMELINE

BBI proposes to commence investigation activities in 2021. Investigations Activities are expected to take several months, with a target completion date in June 2022.

4 ENVIRONMENTAL CHARACTERISTICS

This section contains information about the environmental characteristics of the IA that may be relevant to this NVCP amendment. In keeping with alterations that have been made to the rail alignment during the planning period, several separate studies have been referenced to determine flora and fauna values within the IA. The boundaries of these surveys are shown in Figure 3. Ecoscape (Australia) Pty Ltd (Ecoscape) conducted flora and vegetation assessments and Phoenix Environmental Sciences Pty Ltd (Phoenix) conducted terrestrial fauna surveys in 2014 (Ecoscape, 2014; Phoenix, 2014a - c).

Phoenix also completed a supplementary flora and vegetation survey and targeted terrestrial fauna survey in 2018 (Phoenix, 2018) and an additional reconnaissance flora and vegetation survey and targeted terrestrial fauna survey in March 2020 (Phoenix, 2020). This most recent survey covered the previously unsurveyed areas in the north of the IA (which forms part of the new areas in the updated S91), and updated the conservation status of species records within the IA.

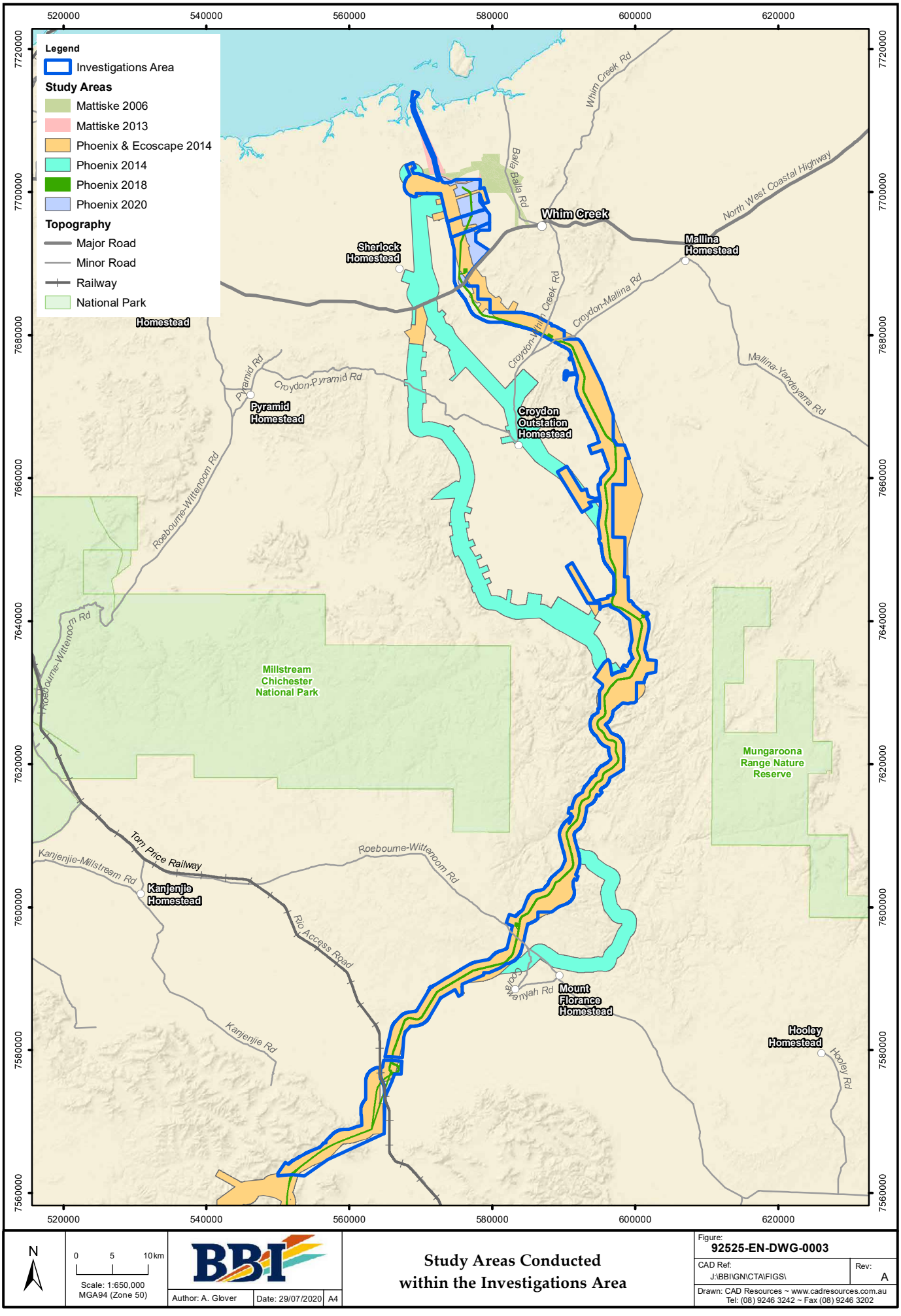


Figure 3: Study areas defined for four separate surveys conducted within the IA

4.1 LAND SYSTEMS AND SOILS

As part of the rangeland resource surveys, the then-Department of Agriculture comprehensively described and mapped the biophysical resources of the Pilbara, together with an evaluation of the condition of the soils and vegetation (from an agricultural perspective) (Van Vreeswyk *et al*. 2004). This process provides an inventory of land types, land systems and land units with particular use capabilities, habitats or conservation values were established to assist in land use planning. According to this mapping, the location of these land systems within the IA is shown in Figure 4

4.2 BIOGRAPHIC REGIONS

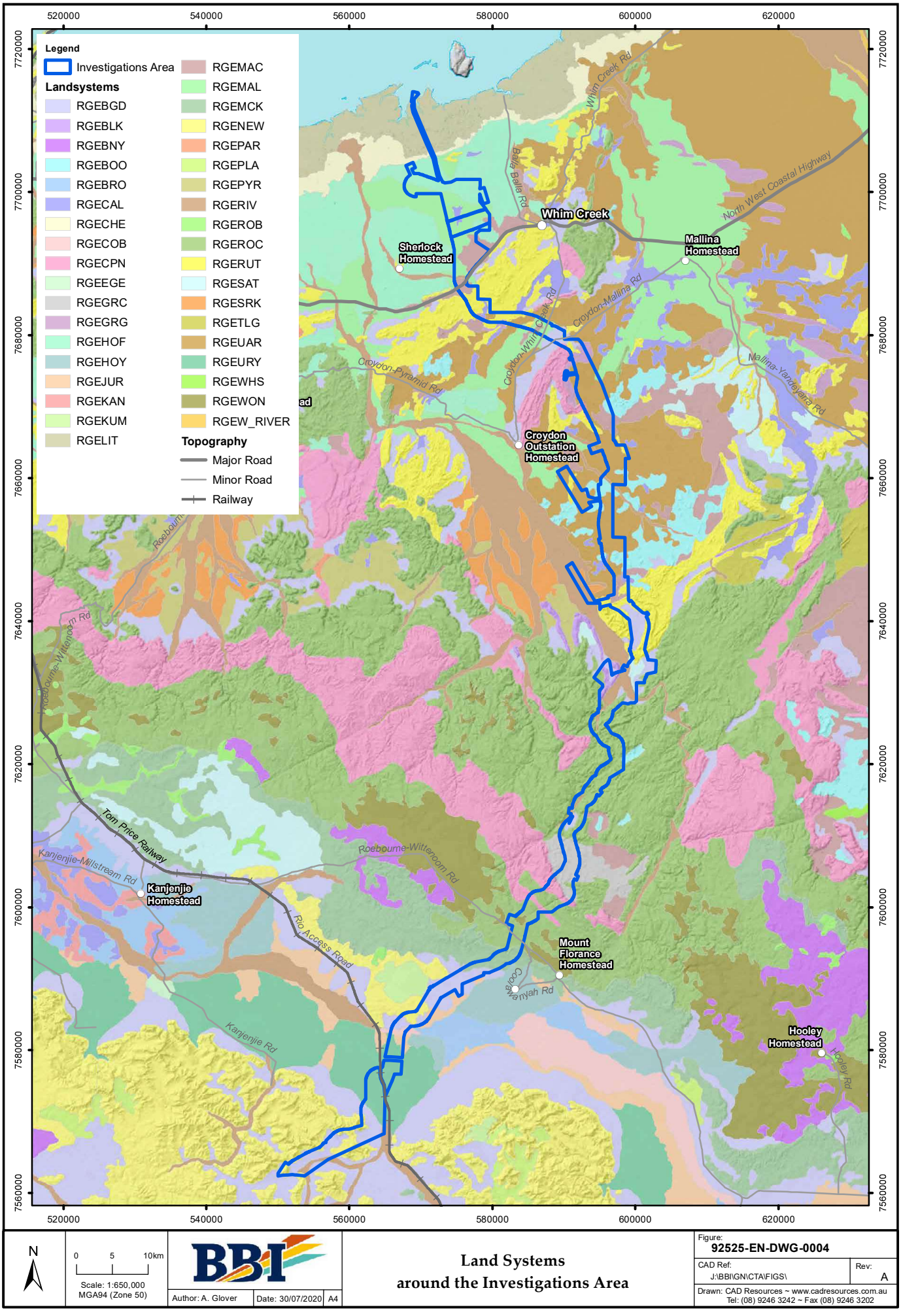
The IA is located entirely within the Pilbara Interim Biogeographical Regionalisation for Australia (IBRA) region and intersects four subregions; Chichester, Fortescue Plains and Roebourne (Thackway & Cresswell 1995) (Figure 5). These four subregions are described in the 2002 Biodiversity Audit of Western Australia's 53 Biogeographical Subregions (McKenzie *et al.* 2003).

The following three subregions were included in the CPS 6244/2 application and all subregions still form part of the amended IA:

- **Chichester** (PIL1, Kendrick & McKenzie, 2002);
- **Fortescue Plains** (PIL2, Kendrick, 2002a); and
- **Roebourne** (PIL4, Kendrick & Stanley, 2002).

The southern extension to the IA, proposed in this amendment, now intersects the Hamersley subregion which is described as follows:

- **Hamersley** (PIL3, Kendrick 2002b): Mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite). Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges. The climate is semi-desert tropical, average 300 mm rainfall, usually in summer cyclonic or thunderstorm events. Winter rain is not uncommon. Drainage into either the Fortescue to the north, the Ashburton to the south, or the Robe to the west. Subregional area is 6,215,092 ha.



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Land Systems around the Investigations Area

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Figure 4: Land systems that intersect with the IA

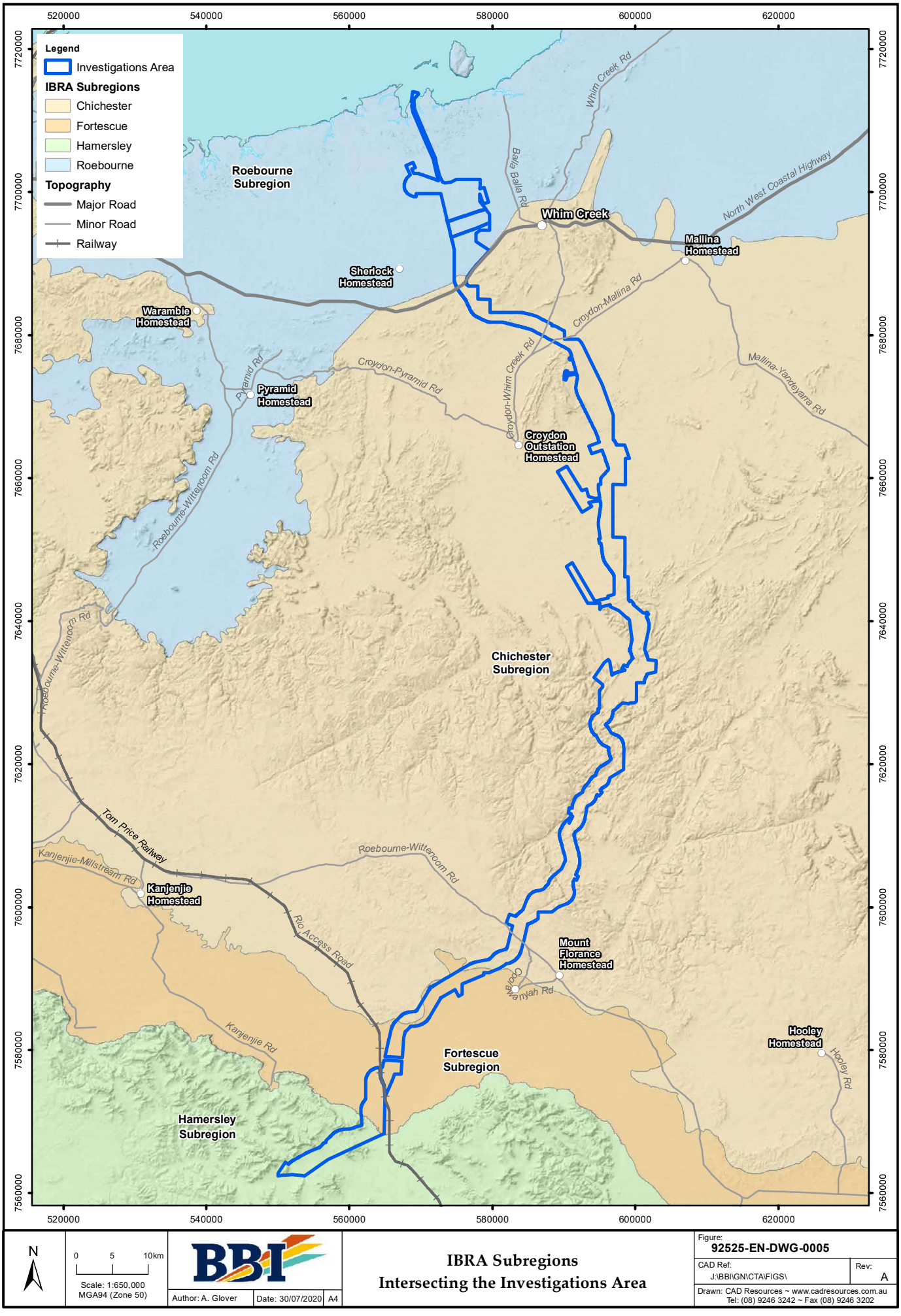


Figure 5: IBRA Regions that intersect the IA

4.3 FLORA AND VEGETATION

4.3.1 SURVEY EFFORT

Ecoscape were appointed to undertake a Level 2 flora and vegetation survey of the IA, which was conducted in 2014 (Ecoscape, 2014). The study comprised of an initial desktop recognisance assessment followed by field surveys and targeted searches for conservation significant flora. The subsequent report provided mapping and description of vegetation types and condition of flora within the IA. This survey identified 474 flora species representing 63 families and 189 genera within the IA.

A supplementary flora and vegetation survey was also completed by Phoenix in 2017 in order to define the flora and vegetation values within the IA (Phoenix, 2018). An initial desktop study of the existing survey information was conducted, including 40 km surrounding the IA boundary. Phoenix also conducted field surveys including targeted flora searches for conservation significant species. This supplementary field survey identified 221 flora species representing 36 families and 97 genera within the IA. Of these 131 were perennial, 82 annual or short lived and eight unknown (not identified to species level).

Some variation in results between the two studies is noted to likely be influenced by Phoenix (2018) being conducted post wet-season. Ecoscape conducted its field surveys in July - August whereas Phoenix surveyed during June with results that indicated higher species richness. This is likely due to a greater abundance of ephemeral species identified in the post wet-season survey.

Phoenix also completed a flora and vegetation (reconnaissance survey) of previously unsurveyed areas to the north of the corridor, which form part of the new areas under the updated S91, in 2019 (Phoenix, 2020). This survey identified 118 flora species representing 31 families and 70 genera within the IA extension.

The study areas for all surveys of the IA are identified in Figure 3.

The information in this section has been sourced the reports described above (provided in Appendix 2, 3 and 9).

4.3.2 SIGNIFICANT FLORA

The Phoenix (2018) desktop study identified 83 listed flora species as previously recorded in or near the study area (Table 3-1 in Appendix 3). These flora include one Threatened Flora species, listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act; Cth), 22 Priority 1, 15 Priority 2, 39 Priority 3 and seven Priority 4 taxa (Figure 6).

The Ecoscape (2014), Phoenix (2018) and Phoenix (2020) surveys did not identify any Threatened Flora listed under the EPBC Act or the *Biodiversity Conservation Act 2016* (BC Act; WA). Nine Priority Flora species were identified within the IA across the surveys, including two P1 flora, one P2 flora, four P3 flora and two P4 flora (Table 2 and shown in Figure 6). Significant flora within the additional areas included one record of *Rhynchosia bungarensis* (P4) within the southern extension and several records of *Heliotropium muticum* (P3) and *Oldenlandia sp.* Hamersley Station (A.A. Mitchell PRP 1479; P3) within the northern extension.

Significant flora records within the northern extension are shown in Figure 7.

Table 2: Priority Flora species recorded within the IA

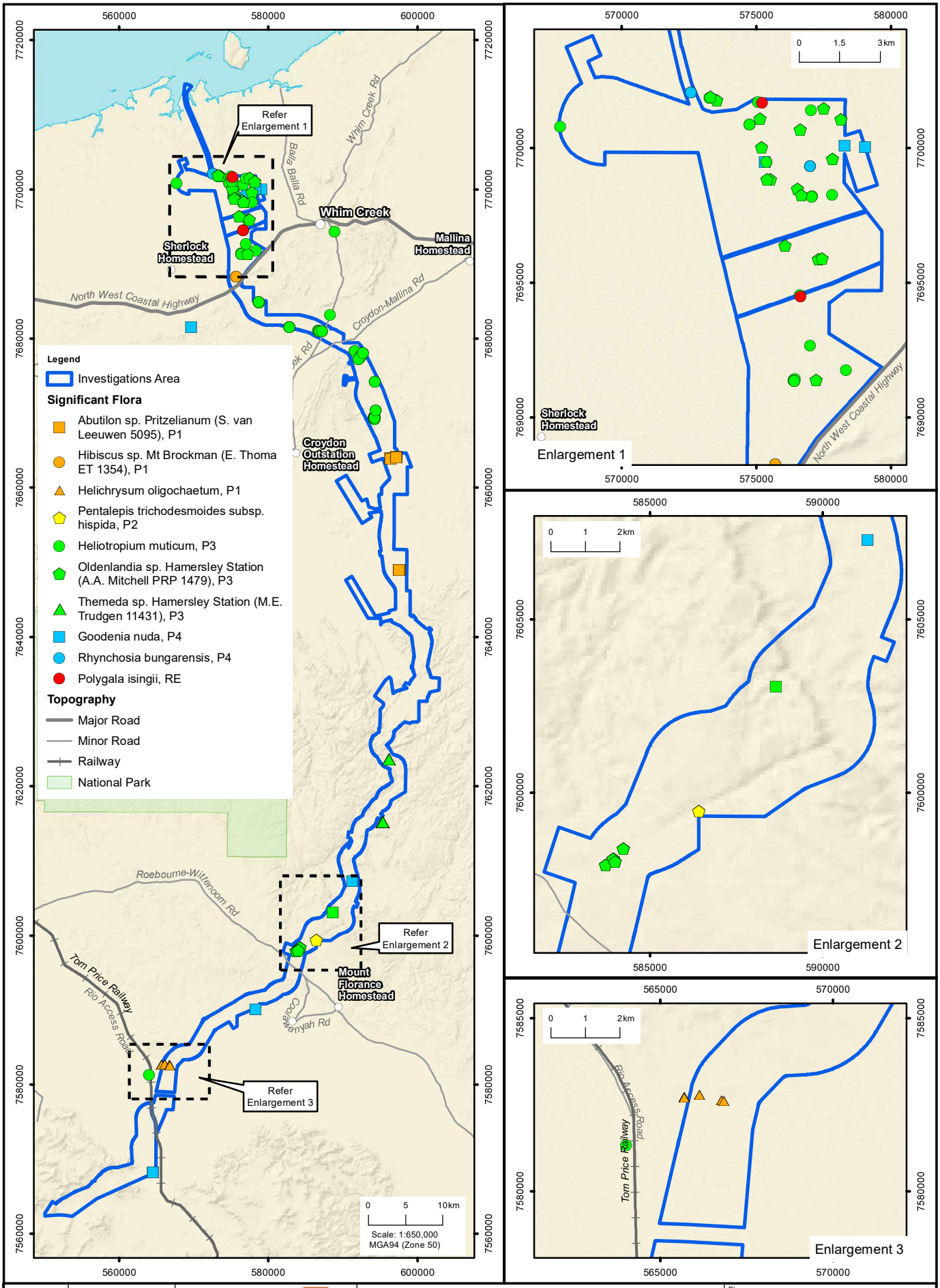
Species	Priority	Ecoscape (2014)	Phoenix (2018)	Phoenix (2020)
Helichrysum oligochaetum	1	✓		
Hibiscus sp. Mt Brockman (E. Thoma ET 1354)	1		✓	
Pentalepis trichodesmoides subsp. hispida	2	✓		
Abutilon sp. Pritzelianum (S. van Leeuwen 5095)	3	✓	✓	
Heliotropium muticum	3	✓	✓	✓
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	3	✓		✓
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	3		✓	
Goodenia nuda	4	✓	✓	
Rhynchosia bungarensis	4	✓	✓	

Other Significant Flora Species

Other significant flora species, as described in the EPA's Technical Guidance: Flora and vegetation surveys for Environmental Impact Assessment (EPA, 2016), include keystone or relictual species, those having anomalous features, range extremities, range extensions, population outliers, restricted subtaxa and hybrids, local endemics or poorly reserved species.

Undescribed (new to science) species can also be considered significant according to Guidance Statement No. 51 (e.g. EPA 2004). Additionally, Saunders et al. (1998), in the Commonwealth State of the Environment report, includes undescribed species as having significance as a biodiversity indicator.

Two records of *Polygala isingii* represent a range extension of 180 km north-west of its current know range (Phoenix, 2020; Figure 7). Although this is a significant range extension, the species is not threatened and occurs widely across WA, the Northern Territory and Queensland (Phoenix, 2020). The two records of the species occurred within *Acacia* shrublands / *Triodia* grassland units. Given the widespread range of this species and its annual lifecycle, the occurrences within the IA are not of major significance to the species as the favoured vegetation types are the most common outside the IA (Phoenix, 2020).



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Records of Conservation Significant Flora

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Figure 6: Significant flora species

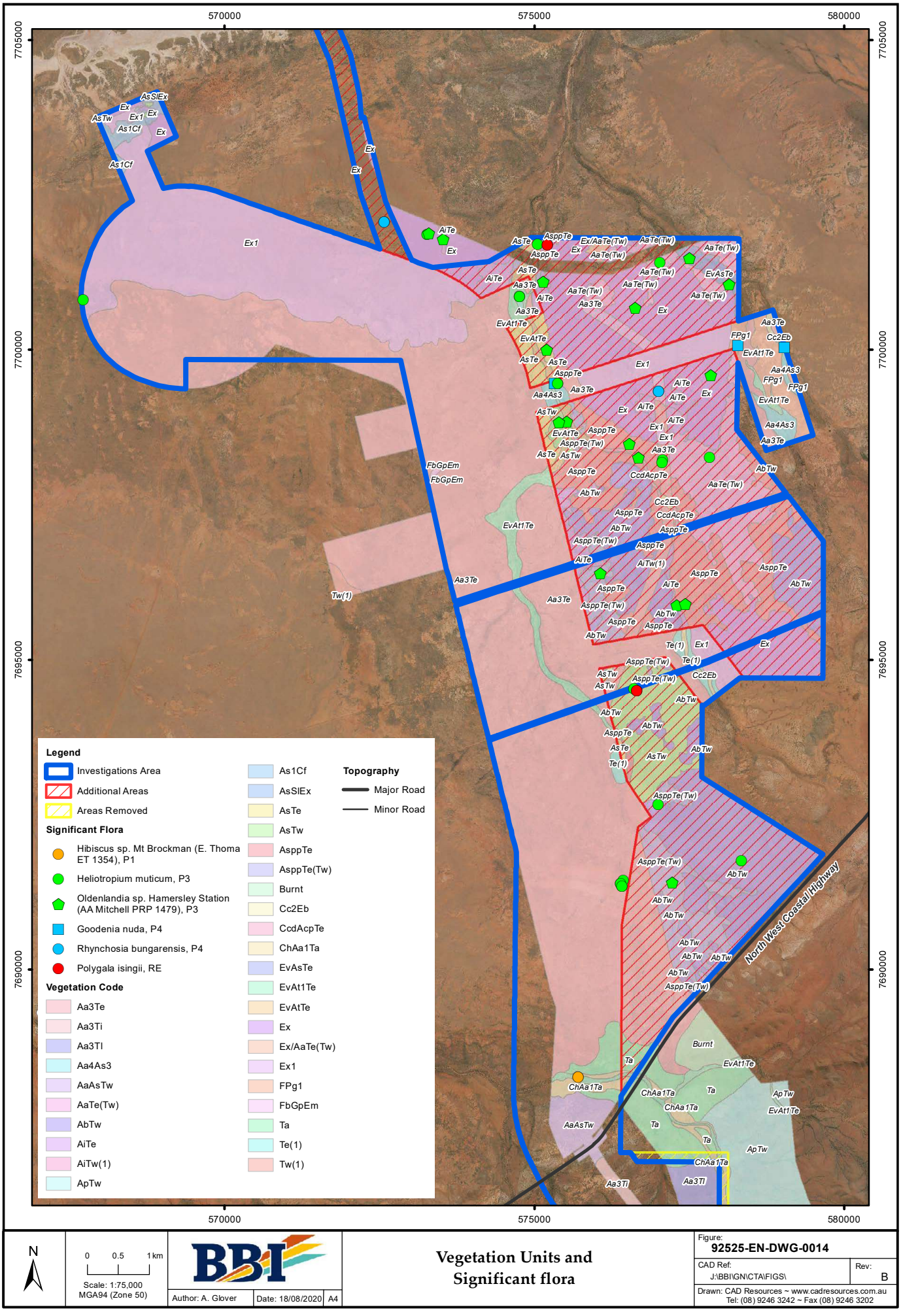

Figure 7: Significant flora records within the northern extension

4.3.3 Introduced Flora Species

Introduced species (weeds) are commonly recorded, particularly in disturbed areas including those targeted for grazing by stock. Plants are regarded as introduced if they are listed as 'alien' on FloraBase (WAH 1998-2014). FloraBase (WAH 1998-2014) lists 112 introduced species as having been collected within the Pilbara bioregion, 49 within the Chichester (PIL1) subregion, 31 within the Fortescue Plains (PIL2) subregion, 61 within the Hamersley (PIL3) subregion, 70 within the Roebourne (PIL4) subregion, 47 within the Shire of Roebourne and 78 within the Shire of Ashburton.

Phoenix (2018 & 2020) noted that most of the vegetation within the IA was observed to be free of introduced flora and recorded no weeds of national significance. Eight introduced species were however, recorded during the surveys:

- *Flaveria trinervia*;
- *Cenchrus ciliaris*;
- *Aerva javanica*;
- *Portulaca Pilosa;*
- *Setaria verticillate*;
- *Vachellia farnesiana*;
- *Malvastrum americanum;* and
- *Trianthema portulacastrum*.

4.3.4 Vegetation Associations

Twelve pre-European vegetation associations intersect with the IA (DAFWA, 2012). Their pre-European and current extents are listed in Table 3 (Government of WA, 2013) and shown on Figure 8. The total extent of the Pilbara bioregion is 17,808,657 ha.

All of the vegetation associations have more than 97% of their Pre-European extent remaining.

Table 3: Pre-European vegetation associations within the IA

Vegetation Association	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
93	3,042,114	3,038,472	99.88
173	1,752,521	1,747,678	99.72
175	507,860	507,467	99.92
569	59,338	59,338	100.00
587	580,729	580,697	99.99
589	728,768	724,696	99.44
607	120,789	120,600	99.84
626	117,724	117,198	99.55
641	18,328	18,328	100.00
644	27,200	27,069	99.52
647	195,860	191,711	97.88
649	40,364	40,178	99.54

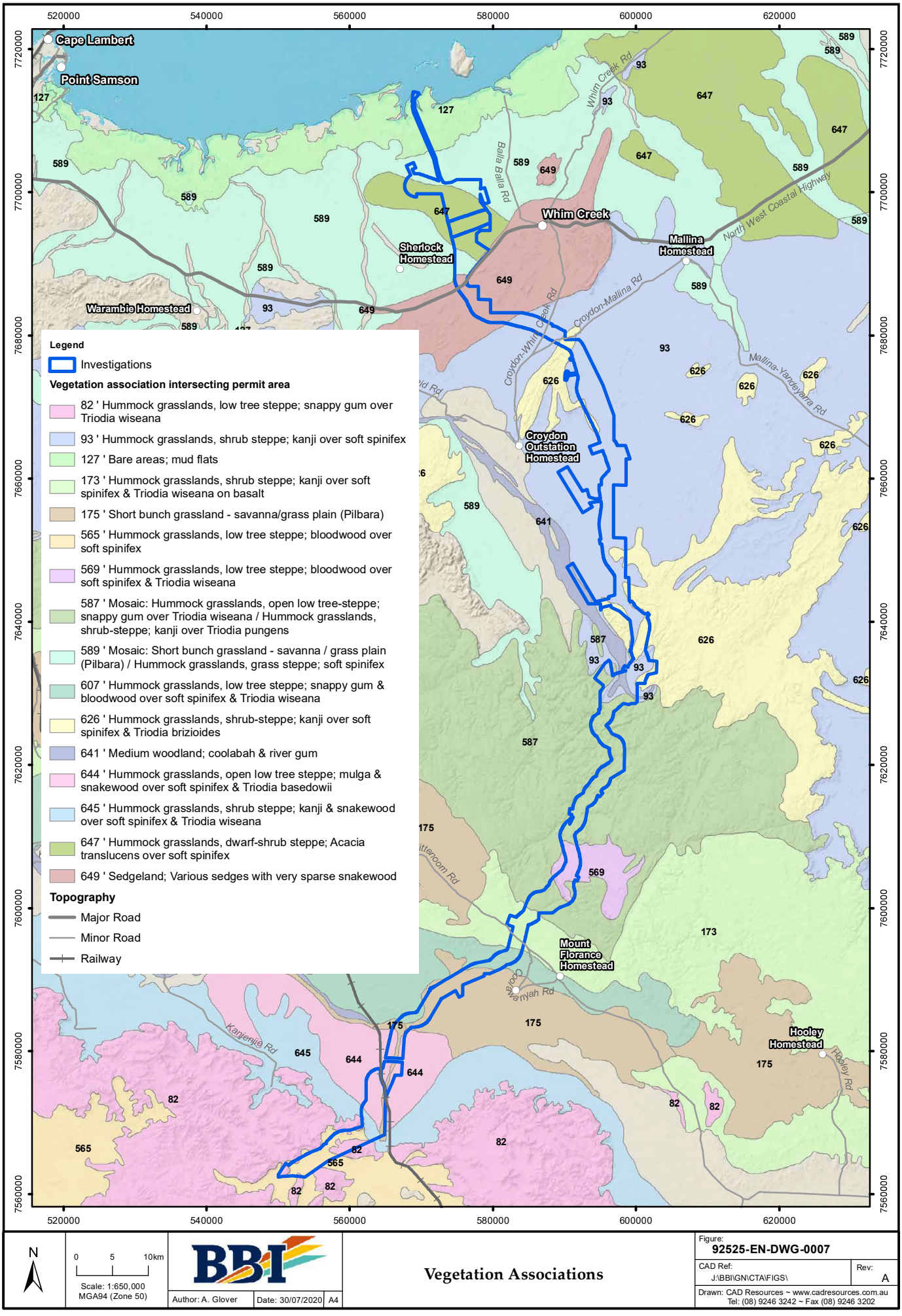

Figure 8: Vegetation associations intersecting the IA

4.3.5 VEGETATION UNITS

Ecoscape (2014) mapped 58 vegetation types within the IA. Little evidence of human impacts were observed with 90.64% of vegetation assessed as being in excellent condition. Those areas assessed as being in less than excellent condition were predominately affected by cattle grazing and weed invasion. This study was limited by some small areas that had recently been burnt and also notes that seasonality may have limited the species richness at the time.

A detailed list of the identified vegetation types and their extent is provided in Table 6 of Appendix 2.

Phoenix (2018) mapped a total of 15 vegetation types in the previously unsurveyed portion of the study area. The vegetation types comprised eight open to sparse woodlands, seven open to sparse shrublands over hummock and/or tussock grasslands, and one tussock grassland. Woodlands were dominated by *Eucalyptus victrix* or *Corymbia hamersleyana* with occasional *Eucalyptus leucophloia* over shrublands of *Grevillea* and *Acacia* species. Shrublands were dominated by mixed *Acacia* species over hummock grasslands of *Triodia* species. The tussock grasslands were dominated by *Eragrostis xerophila*, *Sorghum timorense* and *Chrysopogon fallax*. The condition of the vegetation across the previously unmapped portion of the IA ranged from excellent to very good condition with 94.79% recorded as being in excellent condition according to the EPA's Environmental Factor Guideline: Flora and vegetation (2016).

The Phoenix (2020) study of the northern extension area mapped 31 vegetation types. They comprised *Acacia* shrublands over *Triodia* hummock grasslands on plains, low hills and outcrops, and drainages. Three defined drainage types were present, with broad drainages/plains surrounding them. Drainages were characterised by the presence of *Eucalyptus* and *Corymbia* species. The plains and drainage plains were characterised by *Acacia* shrublands/*Triodia* hummock grasslands except for the gilgaied plains of the Horseflat Land System of the Roebourne Plains which are open grasslands dominated by *Eragrostis xerophila* with *Acacia spp*. sometimes present. The Horseflat Land System is also represented in a mosaic unit incorporating *Acacia/Triodia* vegetation.

A series of maps combining the extent of the detailed vegetation type mapping within the IA is provided in Appendix 4.

4.3.6 THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES

No Commonwealth or State-listed Threatened Ecological Communities (TECs) were identified within the IA. Two Priority Ecological Communities (PECs) were identified within the IA; vegetation that represent the P1-P3 'Four plant assemblages of the Wona Land System' PEC and the P3 'Horseflat Land System of the Roebourne Plains' PEC (Figure 9). Both were identified by Ecoscape (2014) and were confirmed by Phoenix (2018), which also extended the mapped area for the 'Horseflat Land System of the Roebourne Plains' PEC.

No PECs have been recorded within the southern extension of the IA. The additional areas within the northern extension have increased the previously mapped areas of the P3 'Horseflat Land System of the Roebourne Plains' PEC by 778 ha within the IA (Figure 9; Phoenix, 2020).

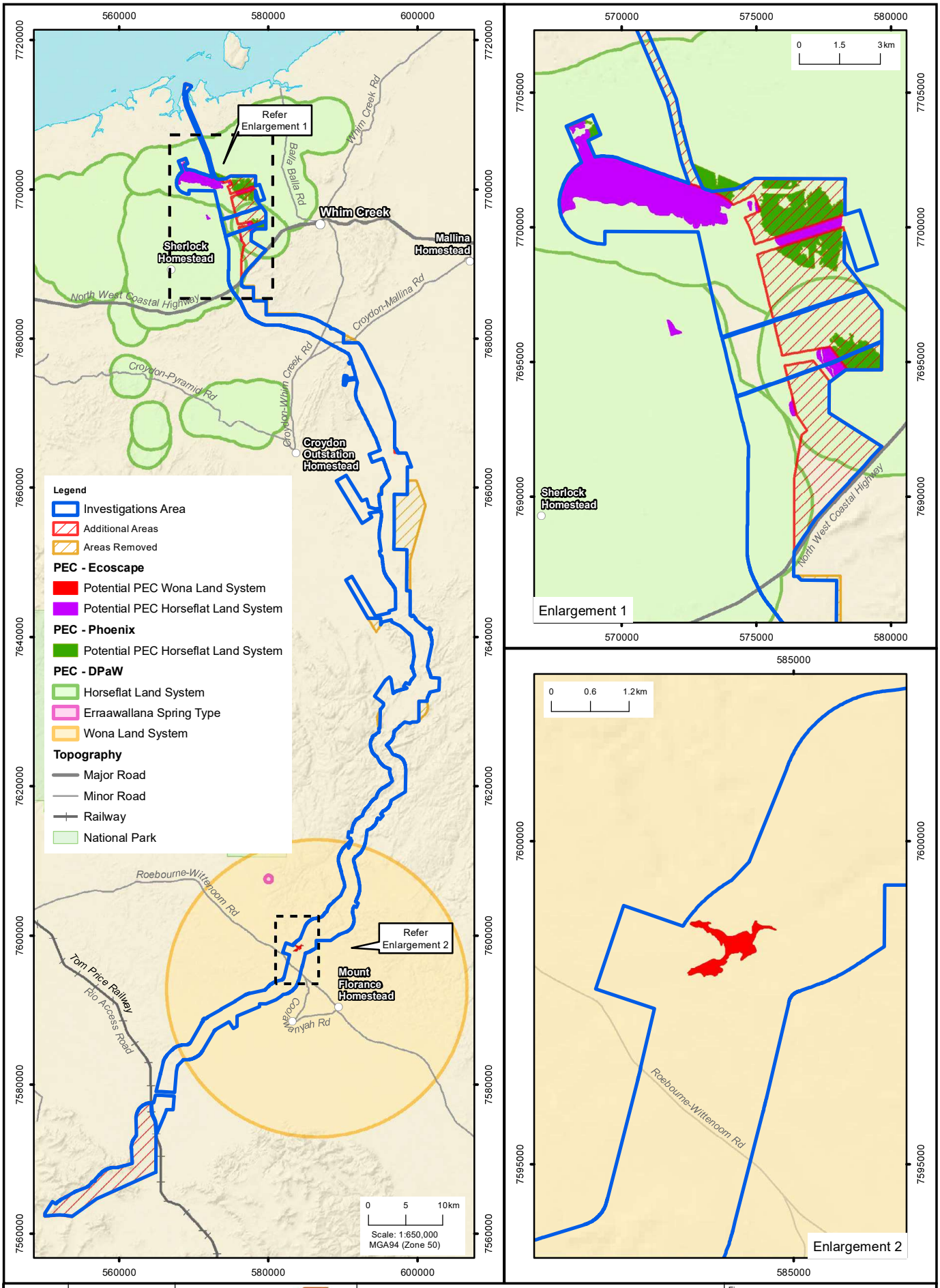

Figure 9: PECs recorded within the IA

The 'Four plant assemblages of the Wona Land System' PEC is located in the vicinity of Mt Florence homestead, and a total of 39.0 ha has been mapped within the IA (Figure 9). The 500 m administrative buffer also extends into the IA. The PEC is described as:

> A system of basalt upland gilgai plains with tussock grasslands occurs throughout the Chichester Range in the Chichester-Millstream National Park, Mungaroona Range Nature Reserve and adjacent pastoral leases. There are a series of community types identified within the Wona Land System gilgai plains that are considered susceptible to known threats such as grazing or have constituent rare/restricted species, as follows:
>
> - P1 Cracking clays of the Chichester and Mungaroona Range. This grassless plain of stony gibber community occurs on the tablelands with very little vegetative cover during the dry season, however during the wet a suite of ephemerals/annuals and short-lived perennials emerge, many of which are poorly known and range-end taxa;
> - P1 Annual Sorghum grasslands on self mulching clays. This community appears very rare and restricted to the Pannawonica-Robe valley end of Chichester Range;
> - P3(iii) Mitchell grass plains (*Astrebla spp*.) on gilgai; and
> - P3(iii) Mitchell grass and Roebourne Plain grass (*Eragrostis xerophila*) plain on gilgai (typical type, heavily grazed).

The P3 'Horseflat Land System of the Roebourne Plains' PEC is mapped as occurring a large portion of the northern section of the IA, covering an area of 1,983 ha (Figure 9). The PEC is described as:

> Extensive, weakly gilgaied clay plains dominated by tussock grasslands on mostly alluvial non-gilgaied, red clay loams or heavy clay loams. Perennial tussock grasses include *Eragrostis xerophila* (Roebourne Plains grass) and other *Eragrostis spp., Eriachne spp*. and *Dichanthium spp*. The community also supports a suite of annual grasses including *Sorghum spp*. and rare *Astrebla spp*. The community extends from Cape Preston to Balla Balla surrounding the towns of Karratha and Roebourne. This community incorporates Unit 3 (Gilgai plains), Unit 5 (Alluvial Plains) with some Unit 7 (Drainage Depressions) described in Van Vreeswyk et al. (2004).

One other PEC was identified as occurring within the 40 km search area but outside the IA; P1 'Brockman Iron cracking clay communities of the Hamersley Range' occurs approximately 17 km to the south and therefore well outside of the IA. The PEC is described as:

> Rare tussock grassland dominated by *Astrebla lappacea* in the Hamersley Range, on the Newman land system. Tussock grassland on cracking clays-derived in valley floors, depositional floors. This is a rare community and the landform is rare. Known from near West Angeles, Newman, Tom Price and boundary of Hamersley and Brockman Stations.

4.3.7 ECOSYSTEMS AT RISK

'Ecosystems at Risk' were identified by regional ecologists and others as part of the Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002 (Department of Conservation and Land Management, 2002), however they do not have any formal legislative protection.

'Ecosystems at Risk' identified from the Chichester subregion (PIL1) of the Pilbara (Kendrick & McKenzie, 2002) that may occur in or near the study area include the vulnerable 'Cracking clay communities of the Chichester Range and Mungaroona Range' (now a PEC).

'Ecosystems at Risk' identified from the Fortescue Plains subregion (PIL2) of the Pilbara (Kendrick, 2002) that may occur in or near the study area include 'Perennial grassland communities in the Fortescue Valley' (no status given).

'Ecosystems at Risk' identified from the Hamersley subregion (PIL3) of the Pilbara bioregion (Kendrick, 2002a) that may occur in or near the study area include:

- The vulnerable 'Grove/inter-grove mulga, eastern Hamersley Range' ecosystem;
- The vulnerable 'Valley floor mulga' ecosystem; and
- The vulnerable 'All major ephemeral water courses'.

No 'Ecosystems at Risk' were identified from the Roebourne subregion (Kendrick & Stanley, 2002) that may occur in or near the study area (other than those now considered to represent a PEC).

Note: the above listed 'Ecosystems at Risk' do not include ecosystems currently listed as TECs or PECs.

4.4 FAUNA

4.4.1 SURVEY EFFORT

Phoenix (2018) conducted field surveys, including targeted fauna searches for conservation significant species during 2017, in order to define terrestrial fauna values within the IA (Figure 3). The initial desktop study included records from a fauna gap analysis, a Level 1 and Short Range Endemic (SRE) fauna survey and a targeted significant fauna survey all conducted by Phoenix in 2014 (Phoenix, 2014a - c). To supplement these previous records and identify potential records in previously unsurveyed areas, Phoenix (2018) also conducted new database searches that included substantial buffer zones.

The Phoenix (2020) report included fauna surveys of the additional area to the north of the IA. This survey included:

- Habitat assessment;
- Active diurnal and nocturnal searches;
- Night Parrot audio recorder surveys;
- Bat echolocation recordings; and
- Camera trapping.

The information in this section has been sourced from Phoenix (2018; Appendix 3) and Phoenix (2020; Appendix 9) with reference to Phoenix (2014a - c).

4.4.2 GENERAL FAUNA HABITAT

Three broad habitat types were differentiated within the original 2 km wide rail corridor investigated by Phoenix (2014b). Of these, plains and plateaus represent the most common type, covering about two thirds of the area. Slopes along hills, mesas and rocky outcrops represent about a quarter of the survey corridor and rivers cover about one tenth.

Phoenix (2020) also identified three broad habitat types within the northern extension of the IA however, defined them in slightly different terms. Of these, sparse grassy shrublands and

grasslands represent the majority (96%) of the northern extension and are the equivalent to the previously defined plains and plateaus. Within the remaining 4%, some minor drainage lines (equivalent to rivers) make up a small portion running north, south and three areas of small rocky outcrops occur intermittently.

Detailed mapping of fauna habitats is provided in Appendix 5.

4.4.3 Significant Fauna

Recent NatureMap and EPBC protected matters searches identified that eleven mammals, seven birds and two reptiles of conservation significance have the potential to occur within 20 km of the IA. These are listed in Table 4.

Table 4: Significant fauna species potentially occurring within the IA

Species	Listing under BC Act	Listing under EPBC Act
Mammals		
Dasyurus hallucatus (Northern Quoll)	Endangered	Endangered
Petrogale lateralis (Black-footed Rock-wallaby)	Endangered	Endangered
Macroderma gigas (Ghost Bat)	Vulnerable	Vulnerable
Macrotis lagotis (Greater Bilby)	Vulnerable	Vulnerable
Rhinonicteris aurantia - Pilbara form (Pilbara Leaf-nosed Bat)	Vulnerable	Vulnerable
Hydromys chrysogaster (Water-rat, Rakali)	Priority 4	
Lagorchestes conspicillatus subsp. leichardti (Spectacled Hare-wallaby (mainland))	Priority 4	
Leggadina lakedownensis (Northern Short-tailed Mouse)	Priority 4	
Pseudomys chapmani (Western Pebble-mound Mouse)	Priority 4	
Dasycercus blythi (Brush-tailed Mulgara)	Priority 4	
Ozimops cobourgianus (Northern Coastal Free-tailed Bat	Priority 1	
Birds		
Calidris ferruginea (Curlew Sandpiper)	Critically Endangered	Critically Endangered
Calidris tenuirostris (Great Knot)	Critically Endangered	Critically Endangered
Numenius madagascariensis (Eastern Curlew)	Critically Endangered	Critically Endangered
Pezoporus occidentalis (Night Parrot)	Critically Endangered	Endangered
Rostratula australis (Australian Painted Snipe)	Endangered	Endangered
Falco hypoleucos (Grey Falcon)	Vulnerable	
Falco peregrinus (Peregrine Falcon)	Specially protected fauna	
Reptiles		
Liasis olivaceus subsp. barroni (Pilbara Olive Python)	Vulnerable	Vulnerable
Notoscincus butleri (lined soil-crevice skink (Dampier))	Priority 4	

Of the above, five species were recorded during the Phoenix (2014b, 2018 and 2020) surveys (Figure 10 and Figure 11):

- *Dasyurus hallucatus* (Northern Quoll); and
- *Liasis olivaceus barroni* (Pilbara Olive Python).
- *Pseudomys chapmani* (Western Pebble-mound Mouse);
- *Dasycercus blythi* (Brush-tailed Mulgara); and
- *Ozimops cobourgianus* (Northern Coastal Free-tailed Bat).

The Phoenix (2018) targeted fauna surveys did not directly confirm *Macrotis lagotis* (Greater Bilby) however, additional suitable habitat was mapped and a single defunct Bilby burrow was recorded from a plot site in this area.

Potential habitat was identified for the following seven species of conservation significance during the field surveys:

- *Macrotis lagotis* (Greater Bilby);
- *Notorcyctes caurinus* (Northern Marsupial Mole);
- *Dasycercus* sp. – most likely *D. blythi* (Mulgara);
- *Anilios ganei* – formerly Ramphotyphlops (Ganes Blind Snake);
- *Leggadina lakedownensis* (Short-tailed Mouse, Karekanga);
- *Falco hypoleucos* (Grey Falcon); and
- *Falco peregrinus* (Peregrine Falcon).

All identified habitats were well represented outside the study area. A small area of sandy dune habitat surrounded by low sandplain in the central section of the study area appears to be less well represented and may provide suitable habitat for Northern Marsupial Mole, Greater Bilby and Mulgara (Phoenix, 2014b).

During the Phoenix (2020) survey no suitable nesting habitat (mature ring-forming spinifex >50 cm) was observed for *Pezoporus occidentalis* (Night Parrot) and audio recorders placed in areas of the largest and densest spinifex available failed to detect any Night Parrot calls.

Conservation significant fauna habitats and fauna records, from the surveys, are shown in Figure 9. The southern extension includes additional *Liasis olivaceus barroni* (Pilbara Olive Python) habitat previously mapped by Phoenix (2014b).

The methodologies of habitat mapping used in the Phoenix (2020) surveys vary from previous studies and have therefore been identified separately. Figure 11 shows the *Dasyurus hallucatus* (Northern Quoll) habitat mapped within the northern extension during the Phoenix (2020) survey.

Detailed mapping of conservation significant fauna and fauna habitats are shown in Appendix 5.

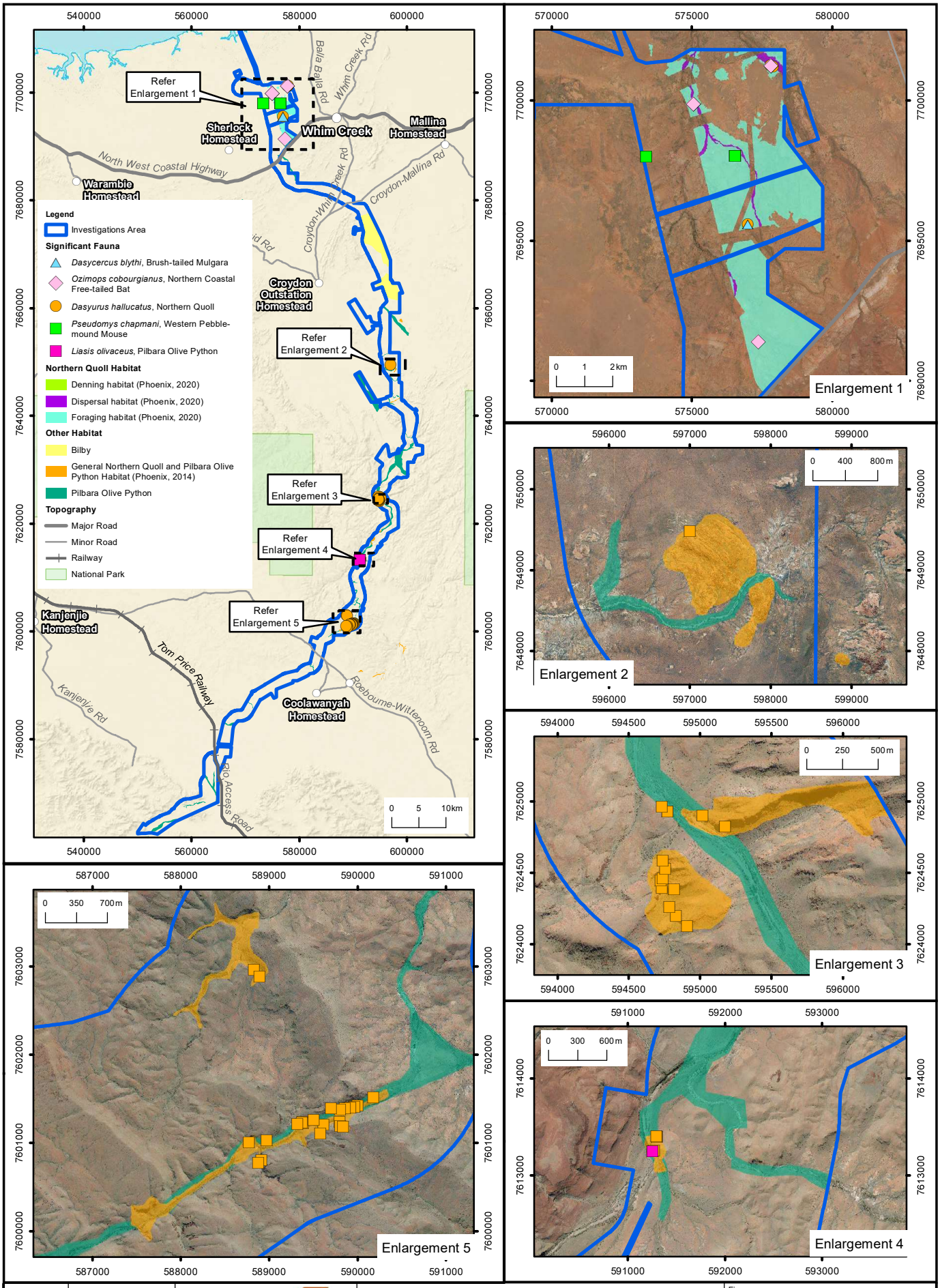

Figure 10: Conservation significant fauna and habitat within the IA.

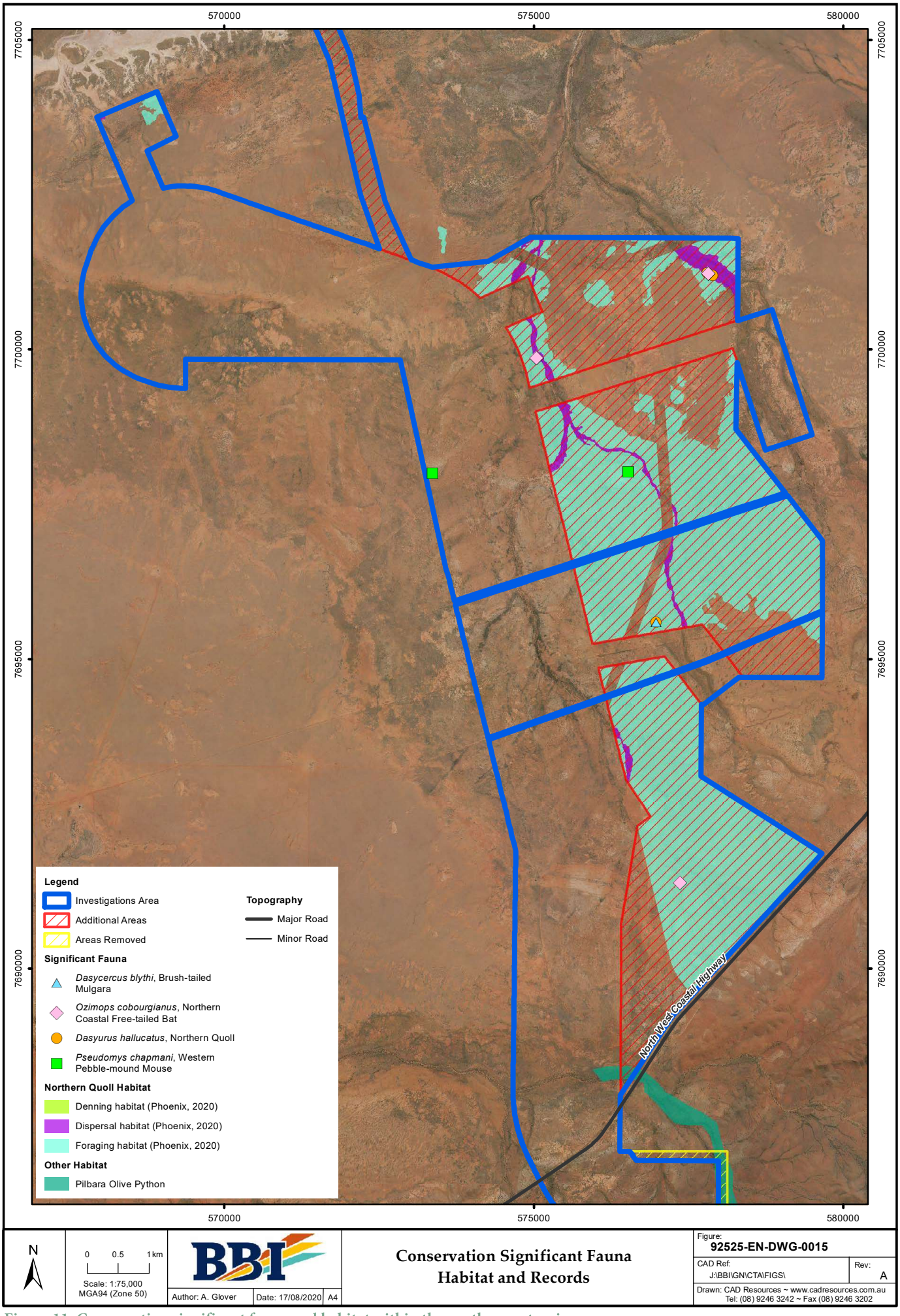

Figure 11: Conservation significant fauna and habitat within the northern extension

4.5 SURFACE WATER DRAINAGE

The northern portion of the IA is associated with the Sherlock River, crossing the river and corresponding with its floodplain and tributaries. Near the centre of the IA the alignment crosses the Fortescue River. The southern portion of the IA is associated with Weelumurra Creek and its tributaries that flow into the Fortescue River.

4.6 CURRENT LAND USE

Mining is a significant land use in the area. The IA passes through several mining and exploration leases (Figure 12).

The IA passes through an area of Unallocated Crown Land and three pastoral leases, Sherlock, Mallina and Coolawanyah (Figure 13).

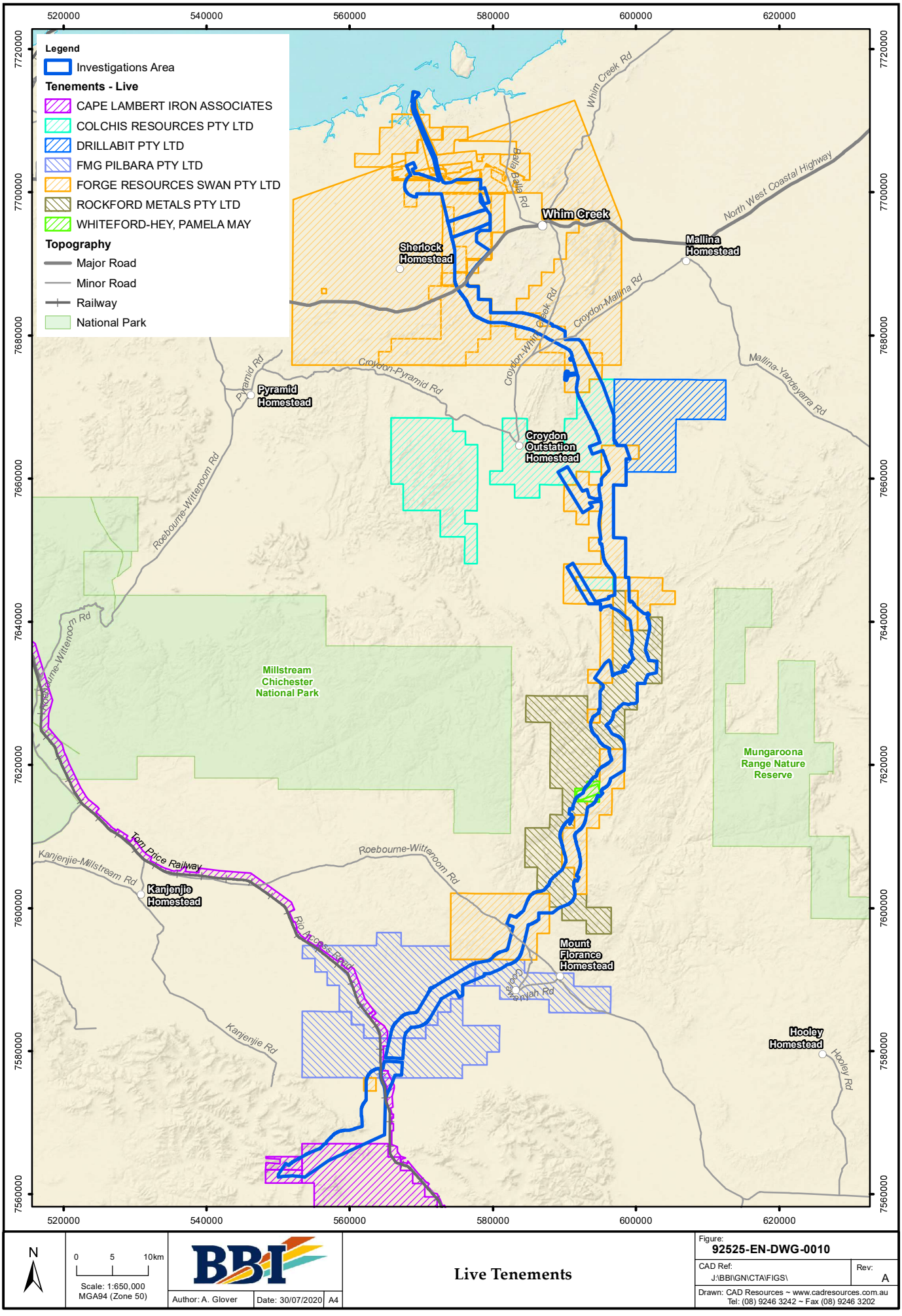

Figure 12: Tenements that intersect with the IA

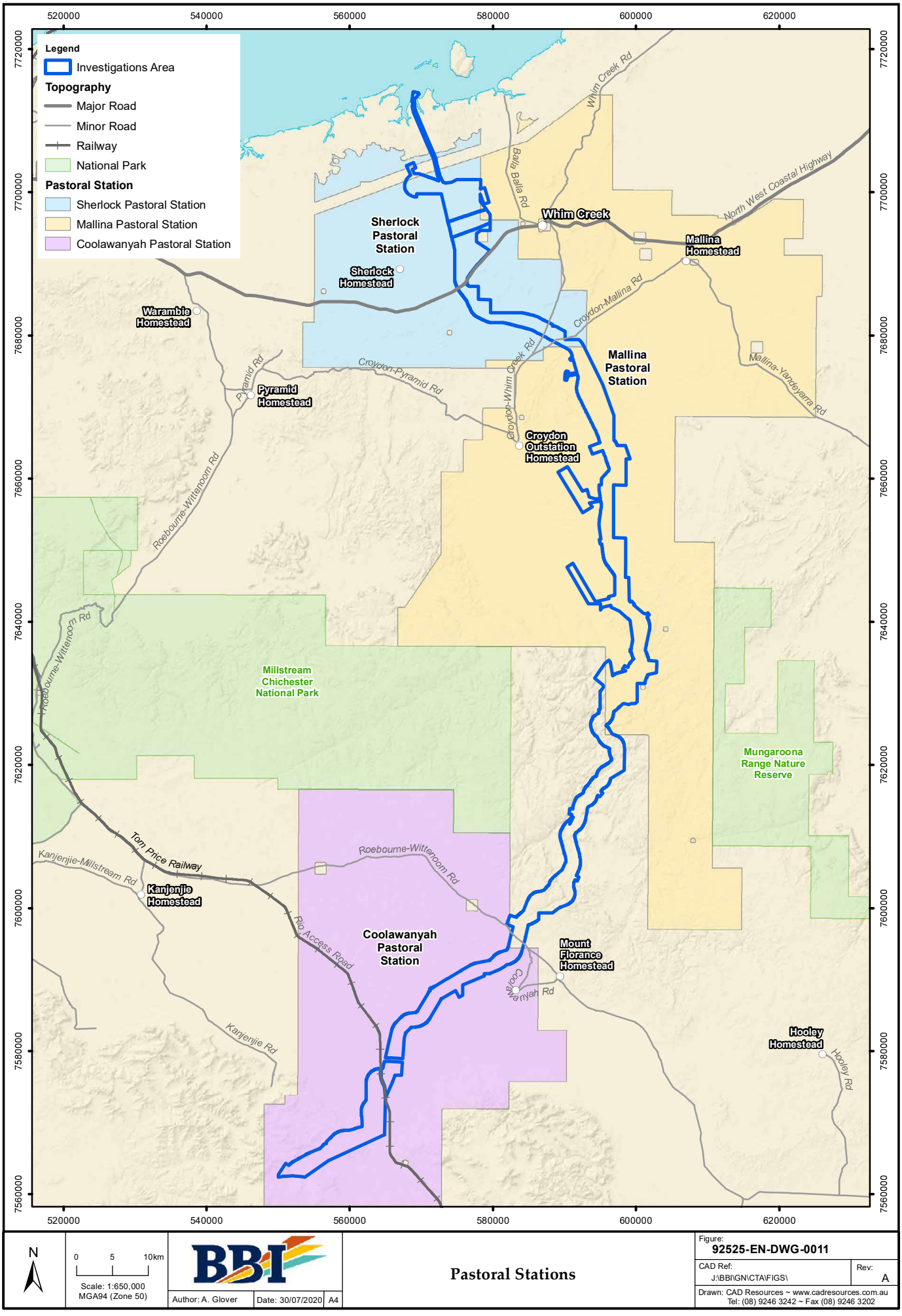

Figure 13: Pastoral Leases that intersect with the IA

5 STAKEHOLDER CONSULTATION

BBI have consulted, and continue to consult with several stakeholders during the planning stage for the BBI Project, including:

- Department of Jobs, Tourism, Science and Innovation;
- Department of Agriculture, Water and Environment (Cth);
- Department of Transport;
- Department of Water and Environmental Regulation;
- Pilbara Ports Authority;
- Registered Native Title holders;
- Pastoral leaseholders;
- Local government authorities; and
- Mining leaseholders.

6 ASSESSMENT OF CLEARING AGAINST THE TEN CLEARING PRINCIPLES

The proposed vegetation disturbance has been assessed against the ten clearing principles described within A Guide to the Assessment of Applications to Clear Native Vegetation (DEC, 2014). The following sections of this document assess the Investigations Activities against these ten clearing principles (Table 5).

Where applicable, the results of the Ecoscape and Phoenix studies described in Section 4 have been used in the assessment.

Table 5: Assessment of proposed vegetation disturbance against the ten clearing principles

Relevant information	Assessment of potential impacts	Proposed control measures	Outcome - Assessment of variance with clearing principle
1. Native vegetation should not be cleared if it comprises a high level of biological diversity			
No Threatened Flora have been recorded within the IA. Priority Flora have been recorded (Figure 6). Significant flora within the additional areas included one record of *Rhynchosia bungarensis* (P4) within the southern extension and several records of *Heliotropium muticum* (P3) and *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479; P3) within the northern extension (Figure 7). The IA does not intersect with any recorded TECs. Two PECs were identified as occurring within the IA however, the other two identified within the 40 km search area buffer occur well south of the IA and are not known to occur within the IA (DPaW Species & Communities Branch, 2014). Three broad fauna habitats exist within the IA; plains and plateaus represent the most common type, covering about two thirds of the IA. Slopes along hills, mesas and rocky outcrops represent about a quarter of the IA and rivers cover about one tenth. These habitats extend well outside of the IA. The IA contains areas of habitat for conservation significant fauna (Northern Quoll, Greater Bilby and Pilbara Olive Python; Figure 10).	The majority of the IA represents vegetation within a broad uncleared landscape, however given the length of the IA there are some portions that intersect with areas of potentially higher biological diversity, such as PECs, creeklines and rocky slopes. Priority Flora records are expected to be able to be completely avoided (refer to control measures), and vegetation clearing within the boundaries of the recorded PECs will be minimised. The Investigations Activities are being conducted to inform the detailed design of the BBI Project railway. The BBI Project railway will be designed to avoid areas of difficult terrain where possible, therefore some areas of potential unique or restricted habitat such as rocky outcrops, caves, steep rocky slopes and gorges etc. will generally not need to be investigated. The Investigations Activities have been planned in such a way that they will minimise the potential impacts to native vegetation. Any disturbance of native vegetation will be incidental (i.e. damage from vehicles) and occur over a narrow area (several metres) or in defined spaced-out locations (drilling or test pit areas). The requirement for access tracks has been minimised by the proposed use of 4WD or truck-mounted drill rigs and the use of existing tracks which are mapped via aerial surveys. The proposed Investigations Activities are of low impact and therefore clearing within any areas of higher biological diversity would be limited to narrow access tracks and small geotechnical investigation areas. This clearing is unlikely to significantly impact the level of biological diversity within these areas.	• Known Priority Flora locations have been logged in BBI's GIS database and this database will be used to ensure Investigations Activities are targeted to avoid these locations • PEC boundaries and significant fauna habitat have also been logged in BBI's GIS database and this database will be used to ensure Investigations Activities are targeted to minimise clearing within these locations • The requirement for track clearing will be assessed to determine if access can be provided by driving over with 4WD or truck mounted rig • Existing tracks will be used wherever practicable • Low impact 4WD or truck-mounted drill rigs are to be used	Small portions of the proposed vegetation clearing may be at variance with this principle.
2. Native vegetation should not be cleared if it comprises the whole, or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA			
Three broad habitats exist within the IA; plains and plateaus represent the most common type, covering about two thirds of the IA. Slopes along hills, mesas and rocky outcrops represent about a quarter of the IA and rivers cover about one tenth. These habitats extend well outside of the IA. Based on surveys conducted by Phoenix, the IA may contain some areas of conservation significant fauna habitat. The IA contains areas of confirmed habitat for conservation significant fauna (Northern Quoll, Greater Bilby and Pilbara Olive Python; Figure 10). Seven species of conservation significance were identified as having potential habitat within the IA. The southern extension includes additional *Liasis olivaceus barroni* (Pilbara Olive Python) habitat previously mapped by Phoenix (2014b). Within the northern extension, additional Northern Quoll habitat was mapped by Phoenix (2020).	The majority of the IA represents vegetation within a broad uncleared landscape, however given the length of the IA there are some portions that intersect with areas of identified significant fauna habitat. Vegetation clearing within the boundaries of the identified significant fauna habitat will be minimised (refer to control measures). The Investigations Activities are being conducted to inform the detailed design of the BBI Project railway. The BBI Project railway will be designed to avoid areas of difficult terrain where possible, therefore some areas of potential unique or restricted habitat such as rocky outcrops, caves, steep rocky slopes and gorges etc. will generally not need to be investigated. The Investigations Activities have been planned in such a way that they will minimise the potential impacts to fauna habitat. Any disturbance of habitat will be incidental (i.e. damage from vehicles) and occur over a narrow area (several metres) or in defined spaced-out locations (drilling or test pit areas). The requirement for access tracks has been minimised by the proposed use of 4WD or truck-mounted drill rigs and the use of existing tracks which are mapped via aerial surveys. The proposed Investigations Activities are of low impact and therefore clearing within any areas of significant fauna habitat would be limited to narrow access tracks and small geotechnical investigation areas. The disturbance will therefore not result in the loss of the whole, or a significant part of a significant fauna habitat. In addition, the required native vegetation disturbance is unlikely to prevent access to an area necessary for maintaining a significant fauna habitat. No barriers to fauna movement, surface water or other natural processes will be installed for the duration of the Investigations Activities.	• Implement measures described above • Any fauna injuries or fatalities will be reported to the BBI environment team • Speed limits will be applied to vehicles travelling through significant fauna habitat areas	Small portions of the proposed vegetation clearing may be at variance with this principle.

Relevant information	Assessment of potential impacts	Proposed control measures	Outcome - Assessment of variance with clearing principle
3. Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora			
No Threatened Flora have been recorded within the IA. Priority Flora have however been recorded (Figure 6). Two Priority Flora species were recorded in the Phoenix (2020) survey within the northern extension.	No Threatened Flora will be cleared as part of the Investigations Activities. Any disturbance of native vegetation will occur over a narrow area (several metres) or in defined spaced-out locations (drilling pads or test pit locations). Priority flora records are expected to be able to be completely avoided (refer to control measures). Given that recorded Priority Flora will be avoided during the Investigations Activities, no activities are expected to impact the continued existence of rare flora.	Implement measures described above.	The proposed vegetation clearing is not expected to be at variance with this principle.
4. Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a Threatened Ecological Community			
The IA does not intersect with any recorded TECs.	Not applicable	Not applicable	The proposed vegetation clearing is not at variance with this principle.
5. Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared			
The IA is located in the Central Pilbara region, which has not been extensively cleared. The surrounding area is largely uncleared with disturbance limited to that caused by local mining and pastoral activity. All vegetation associations have more than 97% of their pre-European extent remaining.	The vegetation associations within the IA represent widespread communities that are well represented at regional level with more than 97% of their pre-European extent remaining.	Implement measures described above.	Vegetation disturbance is not expected to be at variance with this principle.
6. Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland			
The northern portion of the IA is associated with the Sherlock River, crossing the river and corresponding with its floodplain and tributaries. Near the centre of the IA the alignment crosses the Fortescue River. The southern portion of the IA is associated with Weelumurra Creek and its tributaries that flow into the Fortescue River. No significant wetlands are contained within or are in close proximity to the IA.	Some geotechnical investigations are required within the boundaries of surface water systems, to inform the design of the bridges and culvert crossings for the BBIP railway. The proposed Investigations Activities within the watercourse boundaries are of low impact and any impacts to water flow, quality or surrounding vegetation is expected to be minor or non-existent. It is unlikely that native vegetation that is growing in, or in association with, an environment associated with a watercourse or wetland will be disturbed to a level that would significantly affect the quality or flow of a watercourse.	• Implement measures described above • Watercourse boundaries will be logged in BBI's GIS database and this database will be used to ensure Investigations Activities are targeted to minimise clearing within these locations • Creek crossing will follow existing topography - no causeways or other barriers to surface water flow will be constructed within creeklines • Hydrocarbons will not be stored within the boundary of any creekline during drilling activities • Drilling will target the dry season to reduce flooding risks	Small portions of the proposed vegetation clearing may be at variance with this principle.
7. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation			
The IA is located in the Central Pilbara region, which has not been extensively cleared. The surrounding area is largely uncleared with disturbance limited to that caused by local mining and pastoral activity.	Vegetation disturbance has the potential to result in erosion impacts, including direct erosion and excess sediment transport to waterways. Any disturbance however will be of low impact, relatively short-term, with minimal ongoing impacts, which will ensure that erosion is minimised. There is minimal risk of appreciable land degradation associated with the proposed native vegetation disturbance.	• Implement measures described above • The Investigation Areas will be inspected after significant rainfall events for erosion impacts and measures will be taken to prevent further erosion	The proposed vegetation clearing is not expected to be at variance with this principle.
8. Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area			
The IA passes between two conservation estates, the Millstream Chichester National Park and the Mungaroona Range Nature Reserve. No conservation areas will be directly impacted as the boundary of the IA is 7 km from the Millstream Chichester National Park and 7.8 km from the Mungaroona Range Nature Reserve.	Given the low impact of the proposed Investigations Activities there are no indirect impacts expected.	Not applicable.	The proposed vegetation clearing is not at variance with this principle.
9. Native vegetation should not be cleared if the clearing is likely to cause deterioration in the quality of surface or underground water			
The northern portion of the IA is associated with the Sherlock River, crossing the river and corresponding with its floodplain and tributaries. Near the centre of the IA the alignment crosses the Fortescue River. The southern portion of the IA is associated with Weelumurra Creek and its tributaries that flow into the Fortescue River. No significant wetlands are contained within or are in close proximity to the IA. The southern section of the IA passes through the Millstream Water Reserve.	Potential impacts to surface or groundwater quality as a result of the Investigations Activities include sediment loss from disturbed areas and minor hydrocarbon spills. Some geotechnical investigations are required within the boundaries of surface water systems, to inform the design of the bridges and culvert crossings for the BBI Project railway. The proposed Investigations Activities within the watercourse boundaries are of low impact and any sediment impacts is expected to be minor or non-existent.	• Implement measures described above • Fuel is not proposed to be stored on site in large quantities • Any spills will be controlled, contained and cleaned up using spill kits that will be available for the duration of the Investigations Activities. Contaminated soil will be collected and disposed of at a licenced facility	The proposed vegetation clearing is not expected to be at variance with this principle.

Relevant information	Assessment of potential impacts	Proposed control measures	Outcome - Assessment of variance with clearing principle
	It is unlikely that native vegetation that is growing in, or in association with, an environment associated with a watercourse or wetland will be disturbed to a level that would significantly affect the quality of a watercourse.		
10. Native vegetation should not be cleared if the clearing is likely to cause, or exacerbate, the incidence or intensity of flooding			
The Pilbara is subject to regular high-intensity rainfall events, generally associated with cyclones. Flooding of watercourses is often the result of these rainfall events. The northern portion of the IA passes through the Sherlock River floodplain. Near the centre of the IA the alignment passes through the Fortescue River floodplain and the southern portion of the IA is associated with Weelumurra Creek and its tributaries that flow into the Fortescue River.	The proposed Investigations Activities within the watercourse floodplains will not result in any barriers to water flow, as the 4WD or truck-mounted drill rigs will drive on existing tracks or develop simple tracks at current ground level. Drilling will not require significant earthworks (such as raised pads etc.) or bunding. The proposed native vegetation disturbance will not cause, or exacerbate, the incidence or intensity of flooding.	Implement measures described above.	The proposed vegetation clearing is not expected to be at variance with this principle.

7 SUMMARY AND CONCLUSIONS

The purpose of this application is to propose amendments to CPS 6244/2 to include:

- Changes to the Purpose Permit boundary to align with the recent issue of the updated S91 (Lic 00155/2014_Al 0886674);
- An extension to the expiry date through until 24 June 2022 to align with the updated S91 expiry date; and
- An extension to the period in which clearing is authorised (Condition 5) to align with the S91 expiry date.

No changes to the total area of clearing or the nature of clearing activities has been proposed in this amendment.

Changes to the alignment of the Permit Area proposed in this amendment have included additional areas of the P3 'Horseflat Land System of the Roebourne Plains' PEC and *Dasyurus hallucatus* (Northern Quoll) habitat within the northern extension and additional *Liasis olivaceus* subsp. *barroni* (Pilbara Olive Python) habitat within the southern extension. Three species of conservation significant flora were recorded within the additional areas.

This NVCP application assessed the proposed vegetation disturbance against the ten clearing principles described within A Guide to the Assessment of Applications to Clear Native Vegetation (DER, 2014). As described in Section 6 and summarised in Table 5, only small portions of the proposed Investigations Activities may be at variance with clearing principles due to the following key points:

- Minimal vegetation clearing is proposed. Where possible, clearing will be avoided as vehicles may be able to drive over vegetation to access areas that are not connected by existing tracks. Drilling and test pits will target areas with little to no vegetation and can potentially occur with little to no disturbance to surrounding vegetation;
- BBIG has up-to-date flora and fauna survey information, which will allow significant flora, vegetation or fauna habitat to be avoided or minimised when planning target locations for drilling or test pits. Broad areas of significant vegetation or fauna habitat may need to be traversed by vehicles, but any disturbance to vegetation will be minor;
- The IA does not contain any of the following features:
    - TECs;
    - Threatened Flora;
    - Remnant vegetation that has been extensively cleared;
    - Wetlands;
    - Areas of degraded land; or
    - Conservation estates.

The following points were also considered in the assessment in Section 6 and summarised in Table 5:

- Two PEC's intersect the IA;
- The IA contains some areas of conservation significant fauna habitat;
- The IA crosses several watercourses and associated floodplains;

- The Investigations Activities will generally not be focused on distinct fauna habitat such as rocky outcrops, caves, steep rocky slopes etc. as these areas will be avoided by the railway;
- The Investigations Activities have been planned to minimise environmental impacts, including the following:
    - 4WD or truck-mounted drill rigs will be used. Where possible these will utilise existing tracks or drive over existing land, which minimises the requirement for clearing for access tracks;
    - Mapping of existing tracks have been obtained and will be used wherever practicable;
    - Environmental surveys have been completed to identify areas of environmental significance; and
    - The mapping of significant environmental features such as conservation significant flora, vegetation and fauna habitat, which allows these areas to be avoided wherever practicable.

8 GLOSSARY

Term	Meaning
BAM Act	*Biodiversity and Agriculture Management Act 2007* (WA)
BBIG	Balla Balla Infrastructure Group
BC Act	*Biodiversity Conservation Act 2016* (WA)
DAFWA	Department of Agriculture and Food
DBCA	Department of Biodiversity Conservation and Attractions
DER	Department of Environment Regulation (formerly Department of Environment and Conservation)
DPaW	Department of Parks and Wildlife (now Parks and Wildlife Service consolidated under DBCA)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now Department of Agriculture, Water and the Environment)
Ecoscape	Ecoscape (Australia) Pty Ltd
EP Act	*Environmental Protection Act 1986* (WA)
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
FMG	Fortescue Metals Group Ltd
BBI	Balla Balla Infrastructure Group Ltd
IA	Investigations Area, as defined in Section 2
IBRA	Interim Biogeographical Regionalisation for Australia
NVCP	Native Vegetation Clearing Permit
Phoenix	Phoenix Environmental Sciences Pty Ltd
PEC	Priority Ecological Community
SRE	Short Range Endemic species
TEC	Threatened Ecological Community

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10 APPENDICES

Appendix 1: Section 91 Licence (Lic 00155/2014_Al 0886674)

Appendix 2: Ecoscape Rail Corridor Flora and Vegetation Assessment (Ecoscape, 2014)

Appendix 3: Phoenix Flora, Vegetation and Terrestrial Fauna Survey (Phoenix, 2018)

Appendix 4: Detailed vegetation units mapped within the IA

Appendix 5: Detailed fauna and habitat mapped within the IA

Appendix 6: Phoenix Terrestrial fauna gap analysis (Phoenix, 2014a)

Appendix 7: Phoenix Terrestrial fauna surveys (Phoenix, 2014b)

Appendix 8: Phoenix Addendum to terrestrial fauna surveys (Phoenix, 2014c)

Appendix 9: Phoenix flora, vegetation and terrestrial fauna survey (Phoenix, 2020)