Shire of Dandaragan: R35593 Gravel Pit, Revegetation Plan

Version 3

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SUMMARY

The Shire of Dandaragan (the Shire) needs to extend an existing gravel pit located in Section 5(1)(g) Reserve R35593 northeast of Jurien Bay, Western Australia (WA). The reserve is managed by the WA Department of Biodiversity, Conservation & Attractions and its designated purpose is "5G Reserve - Gravel Resource Management, Restoration and Conservation". The extraction of gravel from the reserve by the Shire is covered by Lease No. 176/100. A clearing permit is required as no exemption applies. The Department of Water, Environment and Regulation has asked the Shire to provide a revegetation plan to support the clearing permit application.

Shire of Dandaragan: R35593 Gravel Pit, Revegetation Plan

VERSION 3

1 INTRODUCTION AND REPORTING REQUIREMENTS

The Shire of Dandaragan (the Shire) has a lease to extract gravel from Reserve R35593 northeast of Jurien Bay, Western Australia (WA). The gravel pit is located off Cockleshell Gully Road approximately 0.8 km northwest of the junction of Gairdner Road and Cockleshell Gully Road.

The Shire proposes to extend the existing gravel pit by clearing 8.7 ha of native vegetation and extracting gravel from the cleared area.

Maia Environmental Consultancy Pty Ltd (Maia) was engaged to prepare a revegetation plan for the area to be cleared. The purpose of this plan is to describe how the Shire proposes to revegetate the area once the gravel has been extracted. A Guide to Preparing Revegetation Plans for Clearing Permits was used in preparing this plan (Department of Water and Environmental Regulation (DWER), 2018).

The Shire proposes to revegetate the area that is cleared for gravel once the gravel has been extracted. The revegetation will address the impacts of the clearing by:

- Ensuring that there is no long-term loss of vegetation from the cleared area.
- Ensuring that the vegetation that regrows in the cleared area is as similar as possible to the vegetation cleared from the area.
- Ensuring that the condition of the vegetation is no worse than the pre-clearing condition with respect to weeds and dieback.
- Ensuring that drainage in the area is managed in a way to prevent ponding of water and erosion.
- Observing the purpose of the reserve by extracting the gravel and then restoring the mined area.

The Shire's Native Vegetation Clearing Permit application is currently being assessed – CPS9303-1.

The area to be cleared (proposed impact area) and then revegetated is shown on **Map 1 (Section 13)** and DWER has the spatial data associated with the clearing area.

This revegetation plan has been prepared by Maia and the Shire of Dandaragan.

Christina Cox has developed monitoring plans and carried out monitoring programs for a number of projects since 2006. Rochelle Haycock has has carried out numerous botanical surveys in WA and has participated on and has been involved with the development of a number of monitoring plans and programs since 2008.

The Shire of Dandaragan rehabilitates and revegetates previously disturbed areas as required for various projects in the Shire.

2 BACKGROUND OF REVEGETATION SITE

The gravel pit is in a section 5(1)(g) Reserve - R35593. The reserve is vested in the National Parks and Nature Conservation Authority, the responsible agency is the Department of Biodiversity, Conservation and Attractions, and its current purpose is "Gravel Resource Management, Restoration and Conservation" (DMIRS, 2021). Its legal areas is 348.16 ha (Australian Government, 2021).

The extraction of gravel from the reserve by the Shire is covered by a lease. The latest is Lease No. 176/100, which commenced on 1 August, 2021 and expires on 31 July 2041.

The revegetation should be secure in the long-term because it is in a reserve.

Long-term rainfall data Jurien Bay Bureau of Meteorology (BoM) station are listed in **Table 1** (BoM, 2021). The average total annual rainfall for the station is 531.4 mm. The wettest months of the year are June and July and the driest are December and January.

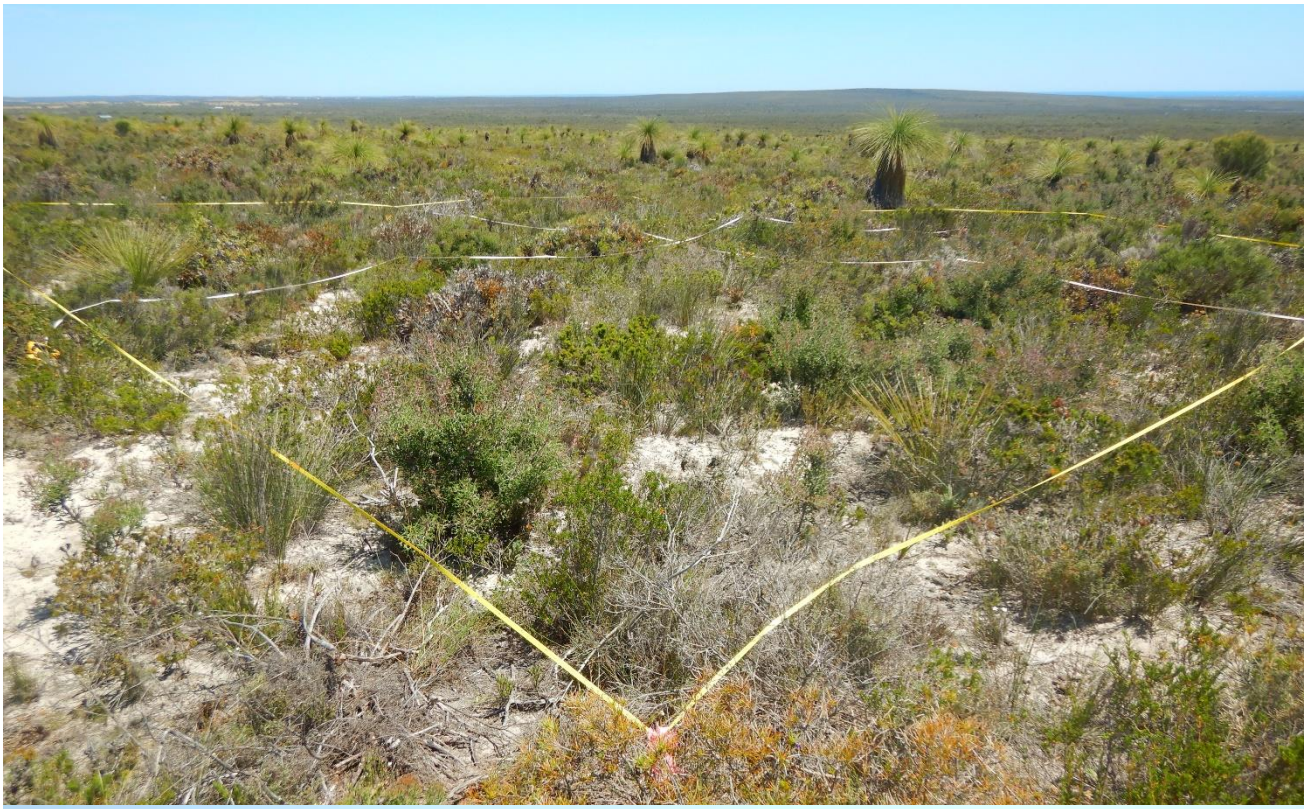
Table 1: Mean long-term (1968- 2020) monthly and annual total rainfall (mm) at Jurien Bay (BoM, 2021)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rainfall records (mm) for Jurien Bay (Station Number 9131, 1968 - 2020)													
Long-term	7.9	16.4	14.3	29.1	74.8	104.7	111.4	80.4	43.1	25.1	17.7	6.5	531.4

In October 2020 a flora and vegetation survey was carried out over an 18.38 ha section of the gravel reserve (the Survey Area, which included the 8.7 ha area to be cleared (the proposed impact area) (**Map 1, Section 13**)) (Maia and Western Wildlife, 2021). Three 10 x 10 m quadrats were assessed in the Survey Area and one vegetation type was mapped in it – Mixed Heathland; the condition of the vegetation was rated as excellent. The one vegetation type is described as: Low mixed Heathland mainly of Low mixed Heathland mainly of *Calothamnus sanguineus*, *Banksia shuttleworthiana* and *Daviesia epiphyllum* with a Sparse Shrubland of *Xanthorrhoea* sp. Lesueur (G.J. Keighery 16404) and an Open mixed Sedgeland of *Caustis dioica*, *Mesomelaena pseudostygia* and *Mesomelaena tetragona*. Sixty-eight taxa were recorded from the three quadrats assessed and 107 taxa were collected from the Survey Area (including opportunistic collections). Four live priority flora species were located - *Persoonia filiformis* (Priority (P) 3), *Persoonia rudis* (P3), *Verticordia rutilastra* (P3) and *Xanthosia tomentosa* (P4). *Synaphea lesueurensis* (P2) was also located; however, the plants were all dead. No weed species were located in the survey area.

An adjacent area was visited by a zoologist in early 2020 and they looked for evidence of Carnaby's Cockatoo foraging; none was found, and no Carnaby's Cockatoo were seen while the zoologist was at site (although they were seen in the surrounding area). The zoologist noted that the low heathland vegetation is low value Carnaby's Cockatoo foraging habitat that could be used by breeding birds occurring within 12 km of the gravel pit area. While carrying out the botanical survey the botanists saw kangaroos in the surrounding area but no Carnaby's Cockatoo.

Photographs taken in the Survey Area follow.



Map 2 (**Section 13**) shows the bioregion, subregion, geology, soil landscape units and pre-European vegetation in the Survey Area, which includes the proposed impact area / revegetation area.

The Survey Area is in the Geraldton Sandplains bioregion and Lesueur Sandplain subregion.

The surface geology comprises one unit – Czs, which is described as: sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand (Geoscience Australia, 2012).

The gravel pit area is on a gently inclined hillslope, and it is in the Peron Slopes landform; the soils of the Peron Slopes were mapped as the Banovich Association, which consists predominantly of lateritic gravelly soils (Burbidge, Hopper and van Leeuwen, 1990). The area is mapped as one soil landscape unit - 224Ye_2. This landscape unit is in the Yerramullah 2 Subsystem, and it is described as: plateau residuals, very gently to gently inclined hillcrest and hillslopes; pale sandy gravels, shallow gravel over duricrust, gravelly pale deep sand, pale and yellow deep sands (Australian Government, 2021).

One of Beard's vegetation system associations is mapped in the Survey Area and surrounds – 1031. It is described as: Mosaic: Shrublands; Hakea scrub-heath.

The elevation across the area rises from approximately 118 m in the west to 144 m in the east (**Figure 1**).

The revegetation area lies in the Moore-Hill Rivers basin in the Coastal catchment area and no major water course flows through it (**Figure 2**).

Figure 1: Elevation (m) (DPIRD, 2019)

Figure 2: Watercourses (Geoscience Australia, 2006)

3 CURRENT DISTURBANCES AND THREATS

Previously disturbed areas are evident in the general gravel pit area. There are areas where gravel has already been extracted; areas that have been rehabilitated; areas where topsoil has been stockpiled; and areas that are currently in use for access to, from and within the gravel pit. A track off Cockleshell Gully Road leads to the gravel pit.

Older sections of the gravel pit area were revegetated by contouring the land and then spreading stockpiled topsoil over the area. Photographs from different years and showing the progression of the rehabilitation in one section of the gravel lease are included in **Appendix 1**. Areas where vegetation was cleared pre 2008 and that have been revegetated by the Shire appear to be progressing well (**Table 6**). Compare the north-eastern section of each image in the table to see the progress of the revegetation between June 2006 and August 2018.

No weeds have been recorded in sections of the gravel lease surveyed by Maia and none were seen on the piles of soil around the gravel pit area. There was no evidence of dieback in the vegetation around the existing gravel pit. No feral animals were observed by the botanists or the zoologist while at the gravel pit and there was no evidence of grazing. The vegetation in the area assessed by the botanists is of moderate plant species richness. There is no evidence of rubbish dumping in the gravel pit area.

The vegetation of the Survey Area is rated as having high susceptibility to dieback, although no known positive *Phytophthora* species points are located within 2 km of the Survey Area; the closest is approximately 4 km to the southwest (Project Dieback, 2021).

4 REVEGETATION COMMITMENTS AND COMPLETION CRITERIA

The intent of this plan and its ultimate goal is to allow the disturbed area to be revegetated and to become a self-sustaining area of vegetation broadly representative of the original vegetation occurring in the area.

The goals of the revegetation are to:

1. Re-establish, as close as practicably possible, the original gravel pit landform post extraction of gravel. While the land will be lower (because the gravel layer will have been removed) its shape should be as similar as possible to the original landform.
2. Use the material cleared from the area pre-extraction of gravel in the rehabilitation of the area – this includes any rocks and topsoil and brush / woody debris stored / stockpiled at site.
3. Ensure that the final landform does not result in water ponding post rehabilitation.
4. Spread the topsoil and brush / woody debris that was removed pre gravel extraction when rehabilitating the area. The aim should be for the rehabilitated area/s to be as similar as possible to the original vegetation and to become self-sustaining.
5. Ensure that weed levels are as low as those in the surrounding area (by managing any weeds post rehabilitation) and that the rehabilitated area it is not disturbed post rehabilitation.

5 REFERENCE SITE FLORISTIC DATA COLLECTION

Reference site floristic data was collated from information collected at three 10 x 10 m quadrats assessed in the Survey Area. Stem counts data was collected from three quadrats assessed in 2019 in the same vegetation type in the area directly adjacent to the 2020 Survey Area.

The species list collated from the three quadrats assessed in 2020 is included as **Table 7**, **Appendix 2**.

6 TARGETS AND COMPLETION CRITERIA

Quadrat data collected from the Survey Area and adjacent vegetation were used to generate completion targets and criteria for the revegetation areas.

The framework for the completion criteria for the project is presented in **Table 2** and the targets and completion criteria for the revegetation area are outlined in **Table 3**. Completion criteria were developed using DWER 2018 and the data collected at the reference sites and adjacent vegetation.

Species richness, species cover, and plant density data are consistent with the SMART (specific, measurable, achievable, relevant, time-bound) principles. However, no long-term monitoring has been carried out in the vegetation in the area to determine what the system could achieve over five years post revegetation, which is a relatively short time span.

Table 2: Completion Targets and Criteria - DWER, 2018

Criterion		Measure	Units
A	Species richness	i. Total species richness (site)	Species count
		ii. Quadrat species richness (average across all quadrats)	Species count
		iii. Tree species richness	Species count
		iv. Shrub species richness	Species count
B	Species density	i. Tree density (for each dominant species)	Stems / ha
		ii. Shrub density	Stems / ha (large shrubs) or count/quadrat (small shrubs)
C	Herbs, sedges, grasses		Count and / or percentage cover per quadrat
D	Weed cover	i. Minor, non-competitive species	Percentage cover or count
		ii. Major competitive weeds	Percentage cover or count
E	Bare ground		Percentage

Table 3: Completion Targets and Criteria – Revegetation Areas

Criterion	Baseline Floristic Data	Completion Targets	Completion Criteria
A (i)	Site species richness is 68 (there were no weed species).	Minimum of 60% of native species returned, based on reference sites.	Forty-one species based on a minimum of 60% of native species returned.
A (ii)	Species richness at the three 10 m x 10 m reference site quadrats was 32, 38 and 41 with an average of 37.	Minimum of 60% of native species returned, based on reference sites.	A minimum of 22 native species should be recorded from revegetation area sites.
A (iii)	One dominant tree-like species was recorded in the quadrats - *Xanthorrhoea* sp. Lesueur.	Return dominant tree species present at reference sites.	*Xanthorrhoea* sp. Lesueur should be recorded in the revegetation area sites.
A (iv)	Shrub species richness is 44.	Minimum of 60% of native species returned, based on reference sites.	The revegetation area sites need to have a minimum of 26 shrub species.
B (i)	The common tree-like monocot species is *Xanthorrhoea* sp. Lesueur (383 stems/ha).	Minimum of 60% of stems/ha for dominant tree species returned, based on reference sites.	The revegetation area needs a minimum of 230 *Xanthorrhoea* sp. Lesueur stems/ha.
B (ii)	Counts from the three reference site quadrats assessed, resulted in 3,416 stems / ha of the dominant shrub genera (*Melaleuca*, *Isopogon*, *Allocasuarina* and *Banksia*).	Minimum of 60% of stems/ha counted for dominant shrub genera returned, based on reference sites.	The revegetation area needs a minimum of a combined 2,050 stems / ha for *Melaleuca Isopogon Allocasuarina* and *Banksia* species.
C	Average percentage cover at the reference sites is 1% for herbs and 4% for sedges. The average cover for all herbs and sedges is 5%. No grasses were recorded in the reference sites.	Minimum of the overall average of 2% for total herb and sedges percentage cover returned based on reference sites.	The revegetation area needs a minimum of 2% cover for herbs and sedges.

Criterion	Baseline Floristic Data	Completion Targets	Completion Criteria
D (i)	No weed species were recorded in the quadrats.	Weed cover should be no greater than that at the reference sites.	The revegetation sites should have 0% weed cover.
D (iii)	No declared weeds are present.	Managed as required by the Biosecurity and Agriculture Management Regulations 2013.	No declared weeds.
E	The bare ground average for the reference sites is 50%.	No more than 10% greater than in the reference sites.	Revegetation site average bare ground is to be no more than 60%, based on the average for the quadrats.

7 SPECIES LIST COMPILATION AND REVEGETATION TECHNIQUES

Table 7 (Appendix 2) lists the 68 species recorded at the quadrats assessed in 2020.

Seed and/or tube stock/seedlings currently listed on WA seed/plant suppliers' web sites is indicated in **Table 7**. Only 24 of the 68 native species located at the reference sites (excluding those where the subspecies or variety is not available) are currently listed in seed/plant supplier catalogues. It is unlikely that the seed / seedlings will be of local provenance and therefore, if required to be sown over the area, seed would need to be collected from the gravel lease and surrounds.

The Shire has achieved good seed germination results using the regeneration method previously (i.e., spreading the topsoil and brush / woody debris over revegetation areas), and it proposes to continue using this regeneration method for future revegetation areas. However, should monitoring show that the regeneration method is not effective, and targets and compliance criteria are not being met, the Shire will liaise with Department of Biodiversity, Conservation and Attractions (DBCA) re seed collection and seed sowing / seedling planting to achieve relevant targets and compliance.

8 SITE PREPARATION

When clearing vegetation from the gravel area the Shire will push the vegetation to the edges where it will be stockpiled. Topsoil will also be pushed to the edges of the gravel extraction area and stockpiled. Once the gravel has been extracted, the area will be graded, contoured and ripped. The stockpiled topsoil will be spread over the area followed by the previously cleared vegetation. These areas will not be driven over post revegetation. As no weeds have been recorded in the areas surveyed to date, no weed treatment should be needed; however, if monitoring shows that weeds are growing in the revegetation areas they will be treated appropriately (steam treatment or herbicide).

9 MAINTENANCE AND CONTINGENCY MEASURES

The revegetation areas will be monitored in spring of the second year and each spring over the following years until the completion targets and criteria have been met. The results of the monitoring will indicate whether additional seed needs to be sown over the area or seedlings planted.

As the revegetation areas are in a dieback-free area, the Shire will take appropriate dieback prevention management measures e.g., all machinery, plant and equipment to be free of soil and vegetative material when moving into and out of the gravel lease, and no work to be carried out in the gravel lease during wet conditions.

Fencing will not be required as the revegetation area sits within the gravel lease, it is not open to the public and there is a fence along both sides of Cockleshell Gully Road.

10 SCHEDULE AND BUDGET

A schedule of actions (including the timeline), the responsible persons for the different actions, the budget and approximate costing for each action is outlined in **Table 4**.

11 MONITORING AND ANALYSIS

The revegetated areas will be monitored in spring (October) two years post revegetation and then in spring for three years or until the completion criteria have been met. Monitoring requirements are listed in **Table 5**.

As the completion criteria and targets data presented in **Table 3** were derived from data collected at quadrats, they will also be established and assessed in the revegetation areas. The same data will be collected from these quadrats as from reference site quadrats. Species composition, density and cover data for the revegetation areas will be collated and compared with the data collected from the reference site. Targets will be shown on charts in the report so that the current condition of the revegetation areas compared with relevant targets can be visualised. The general health of tree and shrub seedlings will be recorded at each quadrat.

Photo monitoring points will be established in the revegetation areas and photographs will be taken when monitoring is carried out. Photographs will be taken from selected photo monitoring points set up in each revegetation area and also at each quadrat established in the revegetation areas.

The Shire will engage botanical consultants to carry out a spring assessment (in previously revegetated areas adjacent to current disturbance areas) for conservation significant species that have been recorded in the surrounding area. This should indicate the potential for their germination and growth in areas to be revegetated in the future. The Shire will liaise with the DBCA in Jurien Bay re the results of the assessment, and, if no conservation significant species are located in previously revegetated areas the Shire will discuss their re-establishment with the DBCA e.g., the collection of seed from conservation significant flora species in the surrounding area, seed pre-treatment and seed sowing or seedling planting to work towards returning commonly occurring conservation significant flora species to the revegetated areas.

Table 4: Schedule of Actions and Budget

Stage	Actions	Timing	Responsibility	Year 1	Year 2	Year 3	Year 4 and beyond	Cost
Completion criteria	Reference site survey and development of completion criteria	Completed	Shire of Dandaragan and consultants					
Site preparation	Dieback hygiene plan	-	Shire of Dandaragan	-	-	-	-	$1,000
	Onsite clearing	Autumn	Shire of Dandaragan		X			$10,000
	Ripping	Autumn	Shire of Dandaragan		X			$10,000
	Weed control	Autumn	Shire of Dandaragan	X	X	As required		$1,000
Vegetation establishment	Seed collection and seed management	Spring / summer	Seed / tube stock/seedling supplier		X	Only if required; depends on the success of germination from soil seedbank		TBC
	Place seedling orders with nursery	Summer	Shire of Dandaragan		X	Only if required; depends on the success of germination from soil seedbank		TBC
	Plant seedings and carry out direct seeding	May–July	Shire of Dandaragan		X	Only if required; depends on the success of germination from soil seedbank		TBC
Monitoring	Vegetation monitoring against completion criteria	Spring	Botanical consultant		X	Until completion criteria have been met and maintained for two years (within the timeframe of the clearing permit).		$7,500
	Weed monitoring	Spring	Botanical consultant		X	Ongoing annually until completion criteria met and maintained for two years (or as required in the clearing permit)		
	Dieback monitoring	-	If dieback susceptible species appear to be dying for no evident reason	-	-	-		

Stage	Actions	Timing	Responsibility	Year 1	Year 2	Year 3	Year 4 and beyond	Cost
Maintenance and Contingency	Weed control	After winter rains	Shire of Dandaragan		X	If required; no weeds currently in the area		TBC
	Remedial planting and sowing	May to July	Shire of Dandaragan			X	As indicated by monitoring	TBC
	Dieback treatment	-	As and if required	-	-			TBC
Reporting	Revegetation plan	Completed		X				$3,000
	Annual progress report	June 30 each year	Shire of Dandaragan with input from botanical consultants. To include data collected and report including data analysis, results, discussion. Mapping and GIS shapefiles to be included with annual report.		X	Ongoing annually until completion criteria met and maintained for two years (or as required in the clearing permit). Monitoring results will not be included until two years after revegetation carried out.		TBC

Note: TBC = to be confirmed.

Table 5: Monitoring Requirements

Scale	Monitoring type	Output	Frequency	Duration
Quadrat-level	Quadrat floristics	Floristic survey data, analysis (suited to the size of site and scale of revegetation), discussion, list of coordinates and site map with quadrats	Annual	First assessment in spring two years after revegetation has been carried out. For three years (in spring) or until completion criteria have been met (within the timeframe of the clearing permit) and maintained for two years.
	Vegetation structure	Data, analysis and discussion	Annual	
	Photopoint monitoring	Photographs, coordinates, map showing photo monitoring point location	Annual	
Site-level	Photopoint monitoring	Photographs, coordinates, map showing photo monitoring point location	Annual	
	Vegetation condition	Data and map	Annual	
	Tree and shrub density	Numbers per hectare	Annual	
	Diversity	Site species list	Annual	
	Weed monitoring and mapping	Data and map	Annual	
	Disease monitoring and mapping	If required	If required	

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12 REFERENCES

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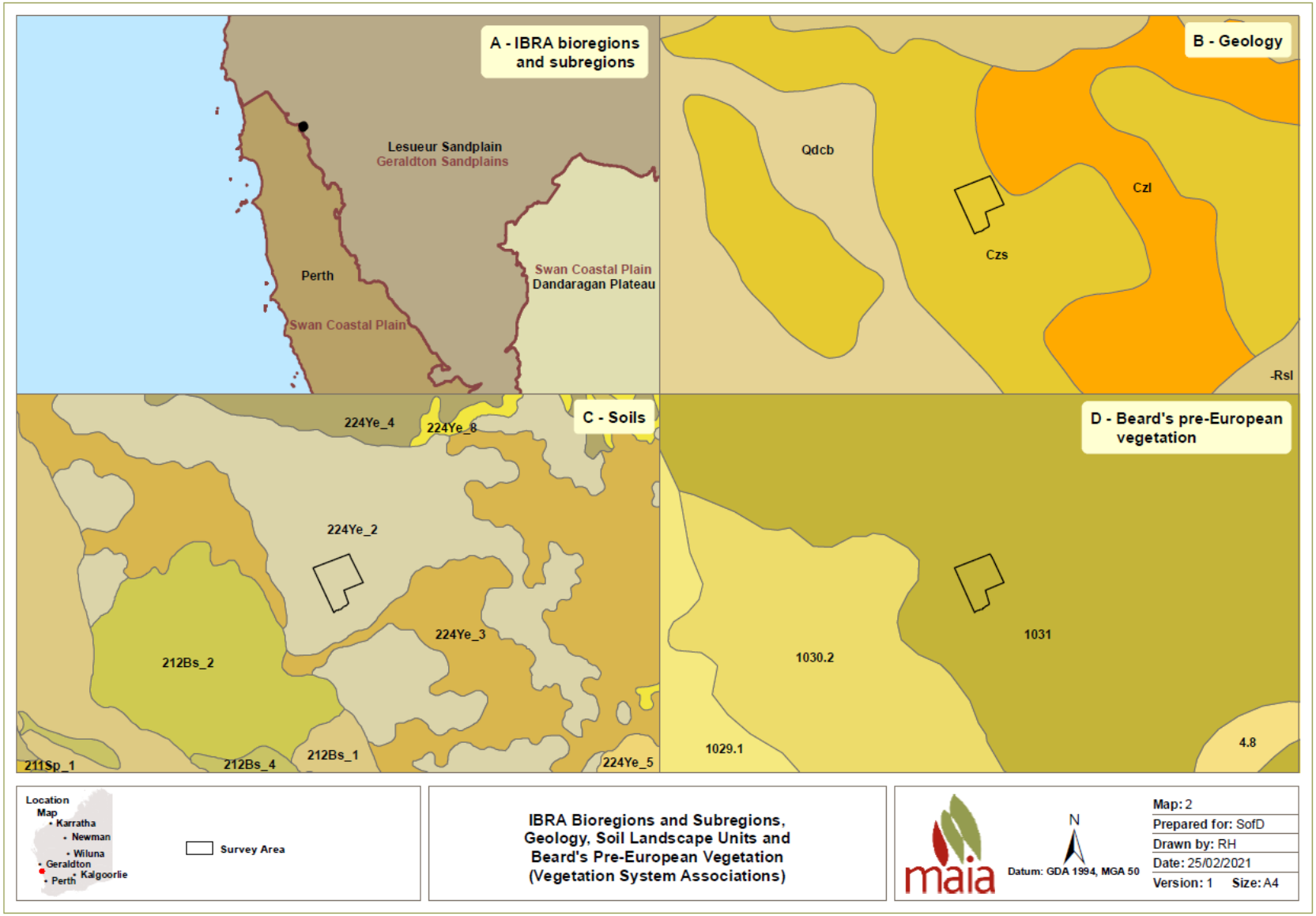
13 MAPS

Map 1: The Survey and Proposed Impact Area

Map 2: IBRA Bioregions and Subregions, Geology, Soil Landscape Units and Beard's Pre-European Vegetation (System Associations)



APPENDIX 1: PAST REVEGETATION – AERIAL PHOTOGRAPHS

Table 6: Past clearing and revegetation in Reserve 35593

Google Earth Imagery of Gravel Extraction Area June 2006 to August 2018
 **Google Earth Imagery, June 2006**
 **Google Earth Imagery, March 2011 (a fire appears to have affected large sections of the surrounding area)**

Google Earth Imagery of Gravel Extraction Area June 2006 to August 2018

Google Earth Imagery, October 2013

Google Earth Imagery, October 2015

Google Earth Imagery of Gravel Extraction Area June 2006 to August 2018

Google Earth Imagery, August 2018

APPENDIX 2: SPECIES LIST

Table 7: Species list for the three quadrats assessed in the Survey Area

Family	Taxa	Herb, Shrub or Sedge	Seed available?
Apiaceae	*Xanthosia tomentosa* (P4)	Herb	
Asparagaceae	*Thysanotus patersonii*	Herb	SS
Asparagaceae	*Thysanotus thyrsoideus*	Herb	
Casuarinaceae	*Allocasuarina humilis*	Shrub	Nin, SS, GHEMS
Casuarinaceae	*Allocasuarina microstachya*	Shrub	Nin
Cyperaceae	*Caustis dioica*	Sedge	
Cyperaceae	*Lepidosperma pubisquameum*	Sedge	
Cyperaceae	*Mesomelaena pseudostygia*	Sedge	
Cyperaceae	*Mesomelaena tetragona*	Sedge	Nin, SS
Cyperaceae	*Schoenus brevisetis*	Sedge	
Cyperaceae	*Schoenus* sp.	Sedge	Nin
Dasypogonaceae	*Calectasia narragara*	Herb	
Dilleniaceae	*Hibbertia robur*	Shrub	
Dilleniaceae	*Hibbertia striata*	Shrub	
Ecdeiocoleaceae	*Georgeantha hexandra*	Sedge	
Ericaceae	*Lysinema pentapetalum*	Shrub	
Fabaceae	*Acacia auronitens*	Shrub	Nin
Fabaceae	*Acacia sphacelata* subsp. *verticillata*	Shrub	Nin
Fabaceae	*Cristonia biloba*	Shrub	
Fabaceae	*Daviesia epiphyllum*	Shrub	
Fabaceae	*Daviesia incrassata* subsp. *incrassata*	Shrub	Nin (not the subsp.)
Fabaceae	*Daviesia nudiflora*	Shrub	Nin, SS, GHEMS
Fabaceae	*Daviesia pedunculata*	Shrub	
Fabaceae	*Gastrolobium plicatum*	Shrub	
Goodeniaceae	*Dampiera spicigera*	Shrub	
Goodeniaceae	*Goodenia coerulea*	Shrub	
Goodeniaceae	*Scaevola canescens*	Shrub	
Haemodoraceae	*Anigozanthos humilis* subsp. *humilis*	Herb	Nin (no subsp.), SS (no subsp.), GHEMS (no subsp.)
Haemodoraceae	*Conostylis canteriata*	Herb	
Haemodoraceae	*Conostylis setigera* subsp. *setigera*	Herb	
Haemodoraceae	*Conostylis teretifolia* subsp. *teretifolia*	Herb	
Haemodoraceae	*Haemodorum venosum*	Herb	
Hemerocallidaceae	*Tricoryne tenella*	Herb	
Lauraceae	*Cassytha* sp.	Herb	Nin, SS, GHEMS
Loganiaceae	*Orianthera spermacocea*	Herb	
Myrtaceae	*Babingtonia grandiflora*	Shrub	
Myrtaceae	*Calothamnus sanguineus*	Shrub	Nin, SS, GHEMS
Myrtaceae	*Darwinia sanguinea*	Shrub	
Myrtaceae	*Eremaea violacea* subsp. *raphiophylla*	Shrub	Nin (no subsp.), SS (no subsp.), GHEMS (no subsp.)

Family	Taxa	Herb, Shrub or Sedge	Seed available?
Myrtaceae	*Melaleuca platycalyx*	Shrub	Nin
Myrtaceae	*Melaleuca trichophylla*	Shrub	Nin, SS, GHEMS
Myrtaceae	*Melaleuca zonalis*	Shrub	
Myrtaceae	*Verticordia densiflora* var. *densiflora*	Shrub	Nin, SS (no var.), GHEMS (no var.)
Myrtaceae	*Verticordia pennigera*	Shrub	Nin
Myrtaceae	*Verticordia picta*	Shrub	Nin, SS
Polygalaceae	*Comesperma confertum*	Shrub	
Proteaceae	*Banksia armata* var. *armata*	Shrub	SS (no var.)
Proteaceae	*Banksia dallanneyi* subsp. *dallanneyi* var. *dallanneyi*	Shrub	SS
Proteaceae	*Banksia micrantha*	Shrub	
Proteaceae	*Banksia sclerophylla*	Shrub	
Proteaceae	*Banksia shuttleworthiana*	Shrub	SS
Proteaceae	*Banksia tridentata*	Shrub	
Proteaceae	*Conospermum boreale* subsp. *ascendens*	Shrub	
Proteaceae	*Hakea conchifolia*	Shrub	SS
Proteaceae	*Hakea flabellifolia*	Shrub	Nin, SS
Proteaceae	*Hakea incrassata*	Shrub	Nin, SS
Proteaceae	*Hakea neospathulata*	Shrub	Nin
Proteaceae	*Hakea prostrata*	Shrub	Nin, SS, GHEMS
Proteaceae	*Isopogon dubius*	Shrub	Nin, SS, GHEMS
Proteaceae	*Persoonia filiformis* (P3)	Shrub	
Proteaceae	*Petrophile brevifolia* subsp. *brevifolia*	Shrub	Nin (no subsp.)
Proteaceae	*Petrophile macrostachya*	Shrub	Nin, GHEMS
Restionaceae	*Desmocladus lateriticus*	Sedge	
Stylidiaceae	*Stylidium cygnorum*	Herb	
Stylidiaceae	*Stylidium diuroides* subsp. *paucifoliatum*	Herb	
Stylidiaceae	*Stylidium repens*	Herb	
Thymelaeaceae	*Pimelea sulphurea*	Shrub	SS
Xanthorrhoeaceae	*Xanthorrhoea* sp. Lesueur (G.J. Keighery 16404)	Tree	

Note: P3 & P4 = Priority 3 and Priority 4 species, sp. = species, subsp. = subspecies, var. = variety. Nin = nindethana australian seeds; GHEMS = ghems; SS = Seed Shed.

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