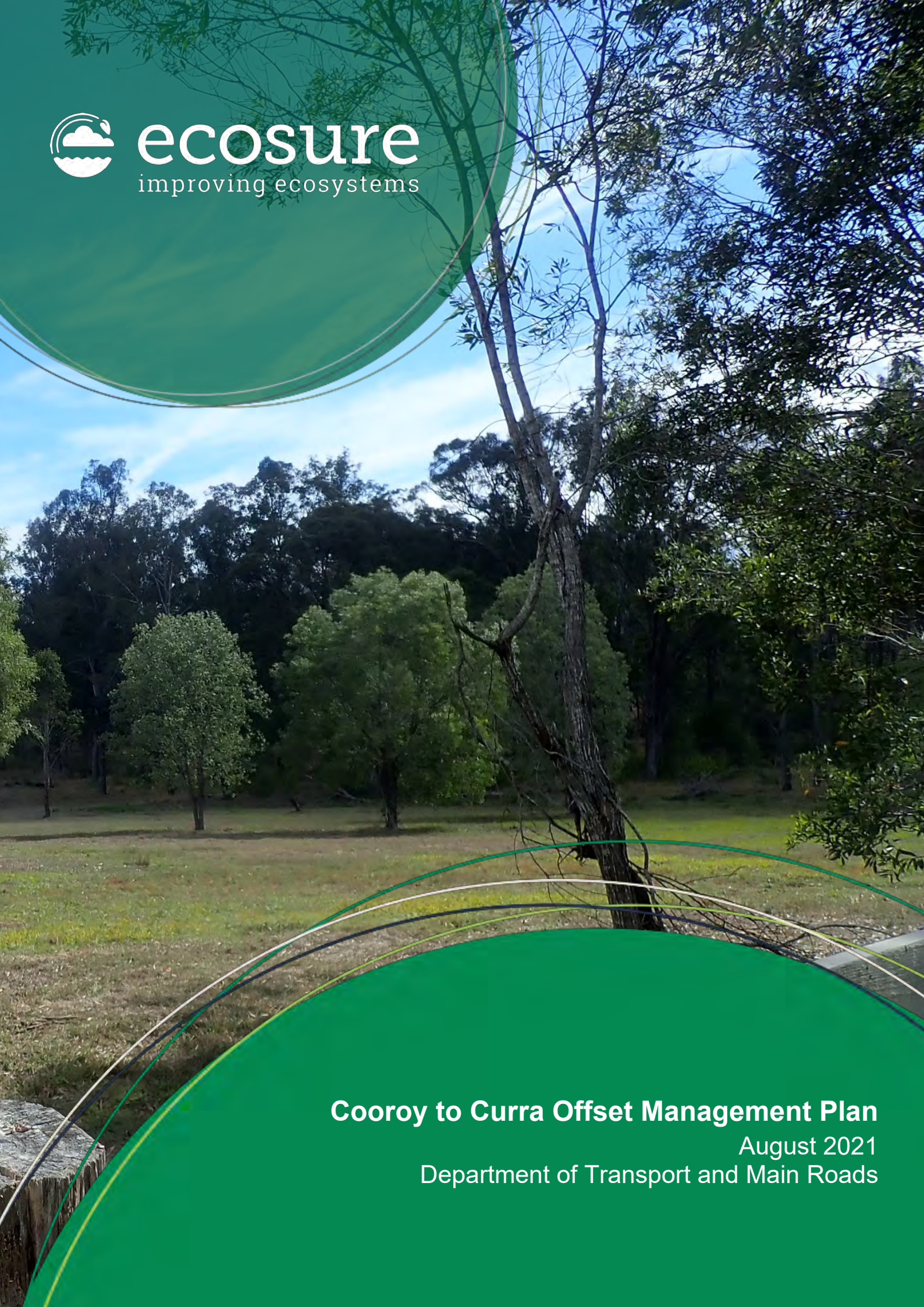

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Cooroy to Curra Offset Management Plan

August 2021

Department of Transport and Main Roads

Contents

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1 Introduction

As a part of the upgrade to the Bruce Highway Cooroy to Curra Section D, The Department of Transport and Main Roads (TMR) is required to undertake offsets relating to assisted regeneration and revegetation works. To meet the conditions of approval for the project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), TMR are required to secure and manage offsets for the impacted Matters of National Environmental Significance (MNES), specifically, koala, black-breasted button quail (BBBQ) and lowland rainforest of subtropical Australia Threatened Ecological Community (TEC). Impacts to koala and BBBQ are also legislated under the *Nature Conservation Act 1992* (NC Act). The project spans 13 different properties, which incorporates approx. 281.0 ha for the koala offset, 32.7 ha for the BBBQ offset and 2.8 ha for the TEC offset.

To achieve the requirements for this project given the varying timeframes and objectives, an Offset Management Plan (OMP) has been developed. This OMP summarises the project objectives and provides a practical approach to achieving the objectives by outlining where, when and how works should be applied.

1.1 Plan objectives

This OMP aims to guide restoration works across the site over the next 3 to 5 years. The objectives of the offsets include:

- Assisted regeneration and targeted weed control through approx. 135.0 ha of remnant / high value regrowth within the koala offset areas over 3 years. The aim of this work is to reduce the density of weeds known to impact koala movement or habitat quality. Note, the entirety of the 281.0 ha associated with the koala offset is not expected to be covered during this initial phase.
- The planting and maintenance of 7,250 koala trees across 29.0 ha. Plant selection will be based on the Regional Ecosystem (RE) and site conditions observed across the planting areas. Plants will be locally sourced and will be installed with slow release fertiliser and tree guards and further supported with regular watering and weed control for a 5 year period. The goal of the planting is to support the development of food and habitat planted trees towards Non-Juvenile Koala Habitat (NJKH) tree status.
- Assisted regeneration through approx. 28.0 ha of the natural recruitment areas within the koala offset. Regular, well timed and systematic weed control will encourage and support the development of native species through these areas for a 5 year period.
- Support the development of approx. 33.0 ha of BBBQ habitat for a 3 year period. A staged approach to weed control through these areas will be required to ensure necessary vegetation structure is retained for BBBQ. Habitat development and recovery will be supported by the planting of dry rainforest / vine scrub species if the severity of weed impacts and level of weed control required has meant recovery is slowed. An allowance for 1,500 natives species has been made for supplementary

planting if required. Similar to the koala offset, the aim of works is a 50% reduction in the density of weeds known to impact BBBQ movement or habitat quality.

- Assisted regeneration to support the recovery of native vegetation and achieve a 90% reduction in the weed density within the TEC and buffer zone (total of approx. 2.8 ha). Works will also include the planting of 750 tubestock of native, woody species to increase the species richness so that > 50 tree / shrub species are present from Appendix A of the listing Advice. Works will be for a period of 5 years.
- Assisted regeneration and site preparation works to ensure weed control (primary work and follow up) and slashing are done in a way that supports the recovery of the offset areas. Slashing will also be regularly and strategically applied to maintain access and firebreaks.
- Regular reporting of project progress. Daily Record Sheets (DRSs) will detail the activities of on ground teams each time they are on site including herbicides applied, weeds treated and areas worked. Inspection and maintenance requirements such as plant survival, observations of health and growth, insect damage, predation, additional disturbance, additional threats etc, will also be communicated through individual DRSs and monitoring forms. An annual report will also be developed for each year of the project to summarise works, document any problems experienced, how they were managed, project successes, photo monitoring, mapping and recommendations for future maintenance.

Additional offset activities are also being delivered in conjunction with the wider Cooroy to Curra program that do not form part of site restoration but are occurring within the same project area e.g. pest management, fauna monitoring, BioCondition monitoring, maintenance and management of translocated flora. Other information that we are aware of and that may influence the project, will also be documented.

1.2 Summary of team days

Table 1 provides a summary of the three person team days to be applied over the course of the project for each treatment type. Table 2 provides a summary of three person team days for each treatment type within each of the precincts. Each of the items identified in the table are further explained in Section 2.

Table 1 Three person team days to be applied each year per treatment type

Treatment type	Year 1	Year 2	Year 3	Year 4	Year 5
Koala Assisted (KA)	70	32	16	16	8
Koala Planting (KP)	32	20	16	12	12
Weed Control (WC) / Button Quail (BQ)	89	100	84	0	0
Threatened Ecological Community (TEC)	24	14	13	9	6
Total team days	**215**	**166**	**129**	**37**	**26**

Table 2 Three person team days to be applied each year per precinct and treatment type

	Year 1	Year 2	Year 3	Year 4	Year 5
Precinct North (N)					
KA	58	26	13	13	6
KP	28	18	14	10	10
WC	55	78	71	-	-
Precinct Central (C)					
WC	11	7	0	-	-
Precinct South (S)					
KA	12	5	3	3	2
KP	4	3	2	2	2
WC/BQ	23	15	13	NA	NA
TEC	24	14	13	9	6
Total team days	**215**	**166**	**129**	**37**	**26**

2 Site management plan

2.1 Site strategy

To best facilitate the delivery of works, the site has been split into precincts and zones based on offset requirements and the direction of works. It is envisaged this will assist defining objectives for individual zones while also supporting the reporting required for worked areas.

The approx. 341.0 ha site has been divided into 3 precincts, labelled North (Precinct N), Central (Precinct C) and South (Precinct S). These areas have then been further divided into zones and subzones to create smaller, more manageable and workable areas e.g. 1a, 1b, 1c, 2a, 2b etc. The numbered zones are for on ground teams so they can broadly follow the direction of works.

Within each precinct, zones have also been labelled based on the offset requirement treatment type, specifically:

- KP denotes Koala Planting
- KA denotes Koala Assisted
- KP and KA denotes a combination of Koala Planting and Koala Assisted areas
- TEC denotes Threatened Ecological Community
- BQ denotes Black Breasted Button Quail
- WC denotes Weed Control.

The aim of works in these areas is summarised in Table 3 below.

Table 3 Treatment types (incorporating Conditions and Requirements from the Lowland Rainforest and Koala / BBBQ Offset Management Plans)

Prefix	Objective	Associated Conditions and specifications	Duration	Monitoring requirements
KP	Installation and ongoing maintenance of 7,250 koala food trees across 29 ha within the koala offset. Target is 57 ha of koala food trees planted / regenerated between the KP and KA areas	**Condition 12b** – Implement ongoing koala food tree replanting program	Years 1 – 5	Monitor survival rate every 6 months for 3 years after planting. Inspection and maintenance (planting inspections) – monthly for first 6 months after planting then every three months up to one year after planting. Then every 6 months in the second and third years following planting. Trigger for remedial activities occurs if planting survival rate is < 80%
KA	Assisted regeneration through approx. 28 ha within the koala offset. Target is 57 ha of koala food trees planted / regenerated between the KP and KA areas	**Condition 12c** – Demonstrate 20% increase in koala food tree recruitment	Years 1 – 5	
TEC	Assisted regeneration to support the recovery of the TEC and achieve a 90% reduction in weeds over the 2.8 ha (as well as the surrounding buffer zone). Works will also include the planting of 750 tubestock of native, woody species to increase the species richness on site.	**Condition 13d** – commit to ecological outcomes and offset completion criteria for lowland rainforest and the timeframes in which these will be achieved. At 3 years, the increase in species richness to > 50 species present from the Listing Advice is required. Note species that are not endemic to the local area (e.g. NSW species) should be substituted to what is consistent with the local vegetation community and at least the genera of the Listing Advice for the Lowland Rainforest. At 3 years, weed infestations of invasive species have been identified and treated with the TEC. At 5 years. Extent of targeted weed infestations has been reduced with the TEC	Years 1 – 5	Monitor survival rate every 6 months for 3 years after planting. Inspection and maintenance (planting inspections) – monthly for first 6 months after planting then every three months up to one year after planting. Then every 6 months in the second and third years following planting. Trigger for remedial activities occurs if planting survival rate is < 80%

Prefix	Objective	Associated Conditions and specifications	Duration	Monitoring requirements
BQ	Assisted regeneration with a focus on weeds known to impact BBBQ movement and / or habitat quality. An allowance for the installation of 1,500 plants has also been made to assist BBBQ habitat development if required. This will be based on the severity of weed impacts, the condition of native vegetation and level of natural recruitment.	**Condition 12d i –** Demonstrate a 50% reduction in weed infestations for BBBQ areas within 3 years Within 3 years demonstrate a 50% reduction in targeted weed infestations Priority weeds for control include cat's claw creeper, Madeira vine and lantana.	Years 1 – 3	Monitor survival rate every 6 months for 3 years after planting. Inspection and maintenance (planting inspections) – monthly for first 6 months after planting then every three months up to one year after planting. Then every 6 months in the second and third years following planting. Trigger for remedial activities occurs if planting survival rate is < 80%
WC	Assisted regeneration with a focus on weeds known to impact koala movement and / or habitat quality.	**Condition 12d i –** Demonstrate a 50% reduction in weed infestations for koala offset areas within 3 years Within 3 years demonstrate a 50% reduction in targeted weed infestations Priority weeds for control include camphor laurel, cat's claw creeper, Chinese elm, climbing asparagus, lantana, Madeira vine, morning glory (*Ipomoea* spp.) and prickly pear (*Opuntia* spp.)	Years 1 – 3	

2.2 Work zones and approach

The combined offset areas total approx. 341.0 ha and the recommendations outlined in this section are specific to the Cooroy to Curra offset site. The tables below are separated into precincts and provide a short description for the zones, outlining the direction of works, activities required, the order of works as well as information on how to integrate works across the areas. Maps of each precinct and zone are provided after the relevant table. It should be noted that while the order of works contains many similar recommendations applicable to both zones, recommendations have also been detailed where a specific approach or technique is required.

Copies of maps illustrating the precincts and zones are also provided in Appendix 1. Appendix 2 provides an overview of restoration principles. Appendix 3 provides step by step information on how to carry out each weed control technique described in the tables below. Appendix 4 provides the rates of control including types of low toxicity herbicide suited to the control of each weed. Appendix 5 presents a species list for revegetation within the koala planting areas. Appendix 6 provides lists of species associated with the planting within the TEC. Appendix 7 contains a template to assist with recording information when taking monitoring photographs. Appendix 8 is a Daily Record Sheet that should be used by operators carrying out any restoration activity together with any observations.

2.3 Notifications

Notification requirements for access to each of the precincts have been included in the tables below.

Precinct N (northern precinct)

Zone N1 Restoration Strategy

Description

Precinct N (northern precinct) is located north of Gympie. Precinct N is the largest of the 3 precincts.

The precinct has a total area of 239.6 ha and is divided into 3 priority zones totalling 149.9 ha.

Zone N1 is approx. 48.2 ha and is separated into 7 subzones (N1a to N1g) and two treatment types, KP and KA.

Aim of Works

Prefixes to subzones are shown on the map and described in Order of Works. They include:

KP – Koala Planting

KA – Koala Assisted

Refer to Section 2.1 for the full description of treatment area aims.

Primary works in all of zone N1 are to commence in year 1.

Duration and number of 3-person team days (all of northern precinct, excluding planting days, watering and tree guard removal)

Year 1

KA = 58, KP = 28, WC = 55

Year 2

KA = 26, KP = 18, WC = 78

Year 3

Order of works

- Establish photo monitoring points prior to the commencement of any work so photos can be compared and site changes can be communicated as the site develops. Include in photos other features that are unlikely to change over the course of the next 5 years (e.g. large tree, live crooked branch etc.) to assist the same photograph (i.e. height, angle, distance) to be taken and compared as work progresses. Refer to Section 2.6.1 for additional details.
- Commence works from the main access track through N1a. From the track, works should progress in a southerly direction. Once N1a has been consolidated, works should move to the KP area in N1b. Within N1b, the small area of KA should also be incorporated into works. Works should then move to the KP areas of N1c. Through the remaining subzones (i.e. N1c to N1g), the priority for work is primary weed control through the KP areas for planting, ensuring all native plants are supported by weed control. Once these areas have undergone an initial treatment, works should then expand into the KA areas, firstly consolidating the KA area in N1c. Following this, works can commence in the KA areas of N1e. Once works have been consolidated in N1c and N1e, works should then commence in N1f and finally N1g. At all times, ongoing primary work in each zone will need to be balanced with weed control maintenance of all previously worked areas to ensure restoration is supported.
- Open areas of the KP are dominated by exotic grasses and annuals with scattered woody weeds and exotic vines. Through KA sections, woody weeds and exotic vines occur in increased densities. Many techniques will need to be simultaneously applied as the team works systematically through the area. Broadly, the techniques required during primary work will include the CSP of woody weeds < 3 m tall, the CSP of weedy vines and the spot spraying of areas following preparation.
- CSP woody weeds < 3 m such as lantana, wild tobacco, devil's fig, Easter cassia, groundsel bush, cadaghi and camphor laurel. Cut up the woody weeds into approx. 50 cm billets and leave them scattered on the ground to breakdown over time. This will assist the recovery of vegetation and the movement of teams carrying out maintenance through the area.
- While preparing KP areas, refer to specifications below in Additional Requirements for N1.
- At the same time as controlling woody weeds, control exotic vines such as corky passionfruit, Dutchman's pipe and climbing nightshade. Treat either by CSP or by hand pulling smaller plants. Where the vine is climbing into the midstory or canopy, ensure the vine is cut off above head height, leaving the vine in the canopy to fall over time. Do not pull vines down as this can negatively impact the native vegetation it is climbing on or cause workplace injuries as debris can be pulled onto the operator. After cutting the vine above head height, cut it off any native plants in the understory and treat the base. Where exotic vines are scrambling over native groundcovers, vines can be pulled aside and bundled on the ground to limit any off-target damage when spot-spraying.
- As the team systematically moves through the zone, continue to carry out primary weed control on other woody weeds and vines. All large woody weeds in the KP areas are to be controlled in the initial sweep, either by CSP or

KA = 13, KP = 14, WC = 71

Year 4

KA = 13, KP = 10, WC = NA

Year 5

KA = 6, KP = 10, WC = NA

Direction of works

Efforts should commence in N1a though N1f within the KP areas. Preparing these areas for planting is the priority in zone N1. Following this, works should expand into the surrounding KA areas. Once works have stabilised post primary and follow up weed control, works should then commence in zone N2 and once that zone has been integrated with N1, works are to progress into N3. Ongoing primary work in N1 will need to be balanced with weed control maintenance as it is essential that areas that have been worked are maintained.

Notifications and access

Access to the northern portion of the precinct is via an easement at 164 Ashfords Road. The gate is located on the left of the driveway, past the large shed. 24 hrs prior to access, the tenants at this address are to be notified by text message.

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The southern portion of the precinct is accessed via an unsealed track along Bradys Rd. Bradys Road is accessed via Old Maryborough Road. Refer to the map for access as several unsealed tracks result in dead ends.

stem injection. Through KA areas, larger woody weeds taller than approx. 3-4 m should be retained for stem injection and should be done only once all weeds in the understorey are controlled and regrowth has stabilised.

- The large mango tree in the KP area of N1c should only be stem injected when the tree is not in fruit.
- While moving across the area, rubbish is to be collected and disposed of where possible i.e. depending on accessibility and rubbish type. Where it is not possible to collect for disposal, if possible it should be piled in strategic locations so it is not spread across the site. Partially buried poly pipe within N1a is to be removed from site, as best as possible without creating significant disturbance to the area. Tyres within the planting area also require removal.
- Within KP and KA areas, many native species are germinating. To support the establishment of this natural recruitment, careful spot spraying will need to be applied. As the team works each area systematically, prepare those areas for spraying by hand pulling weeds next to native seedlings, ferns and groundcovers or by pulling / pushing weeds away from native vegetation so they are easily seen during spot-spraying activities. Small circles should be sprayed around germinating natives to assist their establishment and identifying their location for slasher / brushcutter operators. During spot spraying, germinating and reshooting woody weeds and exotic vines should be controlled along with ground layer species such as praxelis, setaria, Rhodes grass, stinking Roger, giant rat's tail grass and blue billygoat weed.
- Native vegetation is to be continually supported and expanded wherever possible including around the edges of clumps of native vegetation and individual native plants. Weeds underneath and around native vegetation are to be spot sprayed to remove competition and encourage native plant growth and expansion. Care will need to be taken to ensure that any small natives germinating are not impacted.
- Follow up weed control will need to be timely and systematic to prevent weeds from re-establishing and again outcompeting native plants. It is envisaged many of the areas will hold well following initial weed control. Over the course of the project, the majority of WC areas will only receive primary works and one follow up treatment. All works are to be recorded on a Daily Record Sheet.
- When spot spraying as a part of maintenance activities, areas may need to be prepared prior to spraying depending on the time between visits. This can be done by efficiently walking the site and pulling vines / tall exotic grasses off tree guards and bundling it on the ground for spraying and by pulling weeds away and off native vegetation and laying it on the ground for spraying. Ensure the team carrying out spot-spraying maintenance have good plant identification skills, are experienced, supported and are able to systematically work whole areas.

Additional requirements for N1

- Within KP areas, plants are to be installed in clumps across the approx. 25.4 ha. Within each clump, plants are to be installed at approx. 2.5 m centres (i.e. one plant every 6.25 m^2). The goal is to achieve a density of 250 plants / ha in each subzone:
    - N1a covers an area of 3.19 ha and requires the installation of 800 plants (RE12.9-10.17b). Note that an easement may need to be left if the powerline poles still remain on site. This is to be confirmed with the Restoration Ecologists as part of planting preparation.

Zone N1 Restoration Strategy

The middle section of the site is accessed by following the tracks through the southern portion of the precinct. Access can also be gained across the construction footprint if no other access is available and for deliveries. For access to the precinct across construction works, a CPB supervisor will need to be contacted at least 24 hrs in advance to arrange an escort. Garry Dan – 0418 796 380	o N1b has an area of 2.54 ha and requires 634 plants (RE12.3.11) o N1c has an area of 2.98 ha and requires 742 plants (RE12.9-10.17b) o N1d has an area of 2.91 ha and requires 726 plants (1.69 ha within RE12.3.11, 0.85 ha within RE12.11.5/12.11.3a and 0.37 ha within RE12.9-10.17b). Note this zone now incorporates the easement that ran between N1d and N1e in the initial planning stages. This has increased the area of the zone by 0.9 ha (N1d now has an area of 3.81 ha). o N1e has an area of 9.21 ha and requires 2,328 plants (1.43 ha within RE12.9-10.17b, 0.59 ha within RE12.3.11 and 7.19 ha within 12.11.5/12.11.3a) o N1f has an area of 4.58 ha and requires 1,145 plants (1.37 ha within RE12.11.5/12.11.3a and 1.63 ha within RE12.3.11). Note the remainder of this zone (1.58 ha) is inaccessible for a vehicle but has good recruitment of koala species (e.g. *Eucalyptus tereticornis*, *Melaleuca quinquenervia*) and will not require planting. · Clump planting is being utilised due to the relatively low density of plants specified. Installing plants in clumps in the open areas facilitates ease of planting, watering, monitoring and maintenance. As these plants establish, small pockets of intact vegetation will develop which can then be linked over time to create large areas of contiguous native vegetation, improving connectivity throughout the zone and precinct. The location of each clump needs to take this goal into account by analysing existing vegetation, where individual trees are germinating and growing and how the area is likely to develop over the next 3-5 years. · Planting areas will be slashed or brush-cut and blanket sprayed prior to revegetation. Lower lying areas should receive 2 spray treatments. Any natural recruitment on site will be sprayed around and flagged to ensure no damage occurs during slashing. Large rocks will also be sprayed around and flagged with their locations communicated to the slasher operator. · Source appropriate plants (species and numbers) based on the planting list provided in Appendix 5. Plants should be sourced from a local nursery, ideally grown from seed of local provenance, appear healthy, be sun hardened and not root-bound. · Holes for plants will be dug using 2 approaches and will vary according to the level of soil compaction. Speed spades will be utilised through alluvial areas, on the lower slopes and where relatively friable soil is present. In any areas where more compacted soil is encountered, augers will be used to dig holes prior to planting. The depth and width of the hole dug using the auger will create looser soil immediately surrounding the plant which will assist plant establishment. · Plants will be batched on site and placed in their niche within the landscape. Each plant will be installed with slow release fertiliser, water crystals, 2 by 1.2 m hardwood stakes and a 900 mm tree guard and be thoroughly watered in with a Seasol solution. Plants should be spaced at approx. 2.5 m centres. Planting is scheduled for March – May 2022. · Watering will be performed using a water trailer. A dam is located in N1f where water will be extracted for refilling the water trailer. If conditions are dry, the dam will be refilled by a local water haulage contractor.

Zone N1 Restoration Strategy

- Planting should be timed to coincide with any forecasted wetter conditions. If, however, hot / dry conditions prevail following the initial watering in on the day of planting, regular watering rotations will be required to support plant establishment with:
  - 2 watering rotations each week in the 2 weeks following planting (4 total)
  - 1 watering rotation each week for the next 6 weeks (6 total)
  - 1 watering rotation every 2 weeks for the next 6 weeks (3 total).

  The final schedule for watering will be dependent on conditions.
- During follow up weed control and watering, record any observations of stressed, unhealthy or dead plants on the DRS.
- The Planting Inspection Monitoring Form (Appendix 9) will be used to communicate the Inspection and maintenance information identified in Section 2.6.3. This form will be accessed via Fulcrum™. These quick inspections are to be performed in each zone, every month for first 6 months after planting, then every three months up to one year after planting. Inspections are then to occur every 6 months in the second and third years following planting. These observations should be used to assess survival rates and general health observations of planted stock. To keep an accurate count of any dead plants, flagging tape is to be tied to the tree guard of the dead plant during the Inspection and maintenance monitoring. This will ensure dead plants are counted only once. Should any plants then reshoot, the survival count can be adjusted and the flagging tape removed.
- Remember the priorities for the various treatment types in this zone i.e. KP and KA. Refer to Section 2.1 for details.

Zone N2 and N3 Restoration Strategy

Description

Precinct N (northern precinct) is located north of Gympie. The Precinct N is the largest of the 3 precincts.

The precinct has a total area of 239.6 ha and is divided into 3 priority zones totalling 149.9 ha.

Zone N2 is approx. 43.37 ha and has 6 sub zones (N2a to N2f). Zone N3 is approx. 56.24 ha. and is separated into 7 subzones (N1a to N1g). Zones N2 and N3 are both WC treatment types.

Aim of Works

Prefixes to subzones are shown on the map and described in Order of Works. They include:

WC – Weed Control

Refer to Section 2.1 for the full description of treatment area aims.

Primary works in zones N2 and N3 are to commence in year 2.

Duration and number of 3-person team days (all of northern precinct, excluding planting days, watering and tree guard removal)

Year 1

KA = 58, KP = 28, WC = 55

Year 2

KA = 26, KP = 18, WC = 78

Year 3

KA = 13, KP = 14, WC = 71

Year 4

KA = 13, KP = 10, WC = NA

Year 5

KA = 6, KP = 10, WC = NA

Order of works

- Establish photo monitoring points prior to the commencement of any work so photos can be compared and site changes can be communicated as the site develops. Include in photos other features that are unlikely to change over the course of the next 3 years (e.g. large tree, live crooked branch etc.) to assist the same photograph (i.e. height, angle, distance) to be taken and compared as work progresses. Refer to Section 2.6.1 for additional details. Efforts should commence in N2a though N2e. Works should expand out from the KP and KA areas. This will create larger areas of consolidated works and improve efficiencies on site as works will be focused on a specific section of the precinct each day i.e. there will be no need to move the team / vehicle between areas each day the team is on site. Following primary weed control works throughout all of N2, works should expand sequentially through N3.
- At all times, ongoing primary work through zones N2 and N3 will need to be balanced with weed control maintenance N1.
- CSP woody weeds < 3 m such lantana and camphor laurel. Cut up the woody weeds into approx. 50 cm billets and leave them scattered on the ground to breakdown over time. This will assist safely moving through the area to carry out spot spraying. Where possible, larger areas of lantana should be isolated from the surrounding native vegetation and prepared for over spraying to improve efficiencies on site and assist with providing a diversity of habitat types. Note that over-spraying is only successful when the lantana is not stressed.
- At the same time as controlling woody weeds, control exotic vines such as corky passionfruit, Dutchman's pipe and climbing nightshade. Treat either by CSP or by hand pulling smaller plants. Where the vine is climbing into the midstory or canopy, ensure the vine is cut off above head height, leaving the vine in the canopy to fall over time. Do not pull vines down as this can negatively impact the native vegetation it is climbing on or cause workplace injuries as debris can be pulled onto the operator. After cutting the vine above head height, cut it off any native plants in the understory and treat the base. Where exotic vines are scrambling over native groundcovers, vines can be pulled aside and bundled on the ground to limit any off-target damage when spot-spraying.
- Follow up weed control will need to be timely and systematic to prevent weeds from re-establishing and again outcompeting native plants. Many of the areas are likely to hold well following initial and follow up weed control. Over the course of the project, the majority of WC areas will only receive primary works and one follow up treatment. All works are to be recorded on a Daily Record Sheet including any likely 'hot spots' that may require semi-regular monitoring for regrowth.
- Native vegetation is to be continually supported and expanded wherever possible including around the edges of clumps of native vegetation and individual native plants. Weeds underneath and around native vegetation are to be spot sprayed to remove competition and

Direction of works

Efforts should commence in N2a though N2e. Works should expand out from the KP and KA areas. As such, it is not necessary to complete works in each subzone prior to commencing the next zone e.g. work fronts may exist in all subzones as works expand from the KP and KA areas.

Following primary weed control works throughout all of N2, works should expand sequentially through N3.

Ongoing primary work in N2 and N3 will need to be balanced with weed control maintenance in zone N1.

Notifications and access

Access to the northern portion of the precinct is via an easement at 164 Ashfords Road. The gate is located on the left of the driveway, past the large shed. 24 hrs prior to access, the tenants at this address are to be notified by text message.

Manuela Zehnder – 0421 205 776

The southern portion of the precinct is accessed via an unsealed track along Bradys Rd. Bradys Road is accessed via Old Maryborough Road. Refer to the map for access as several unsealed tracks result in dead ends.

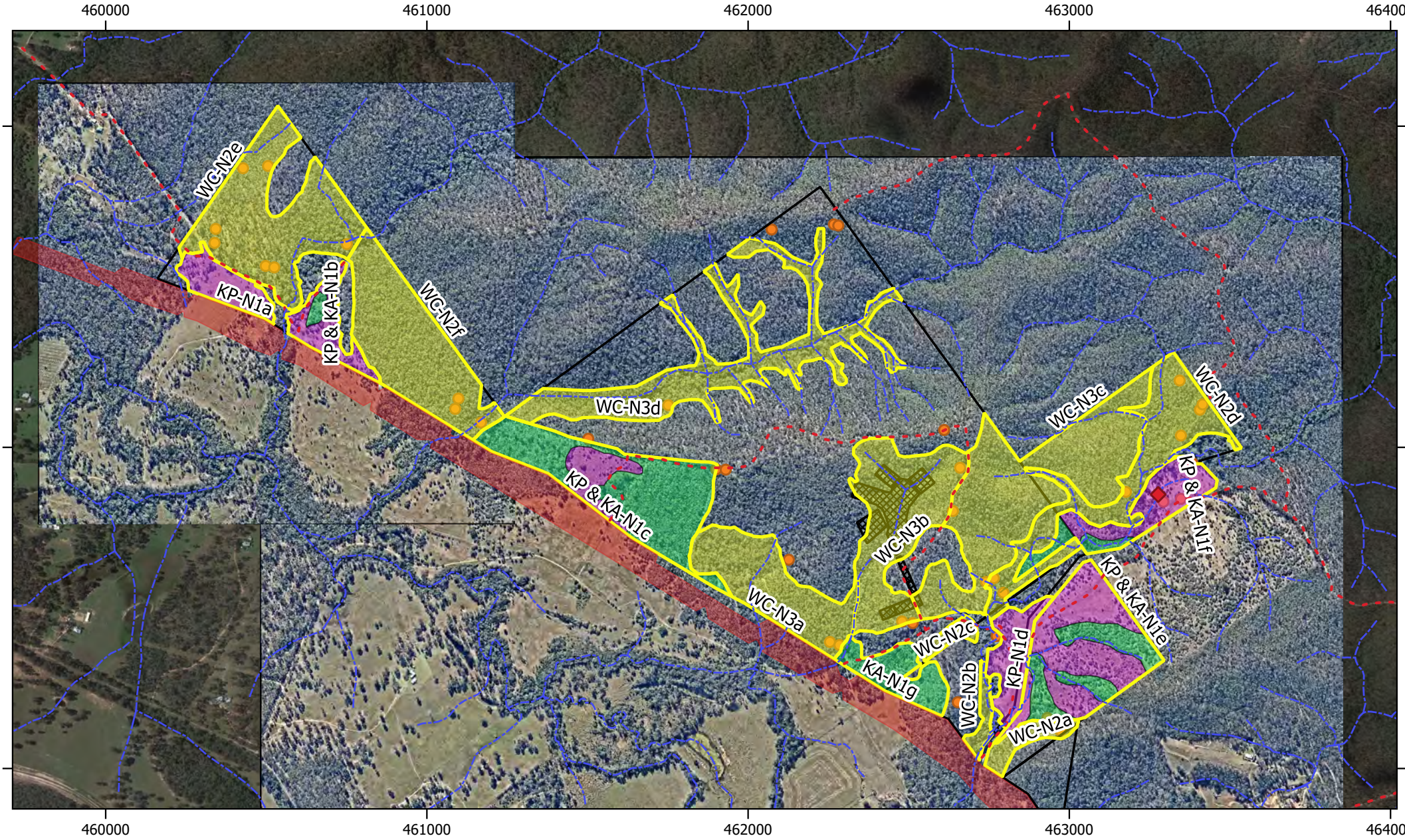
The middle section of the site is accessed by following the tracks through the southern portion of the precinct.

Access can also be gained across the construction footprint if no other access is available and for deliveries. For access to the precinct across construction works, a CPB supervisor will need to be contacted at least 24 hrs in advance in advance to arrange an escort.

Garry Dan – 0418 796 380

encourage native plant growth and expansion. Care will need to be taken to ensure that any small natives germinating are not impacted.

- There are threatened species translocation plots within zone N3b. The management of these areas is performed by others and not part of the on ground works detailed in this plan.
- Remember the priorities for the treatment type in this zone i.e. WC. As such the priority is the control of weeds that are known to restrict the movement or adversely impact available habitat of the koala across the landscape. Weed control is to occur within the priority areas through the main gullies. Refer to Section 2.1 for details.



Precinct N work zones

Department of Transport and Main Roads

Cooroy to Curra Offset

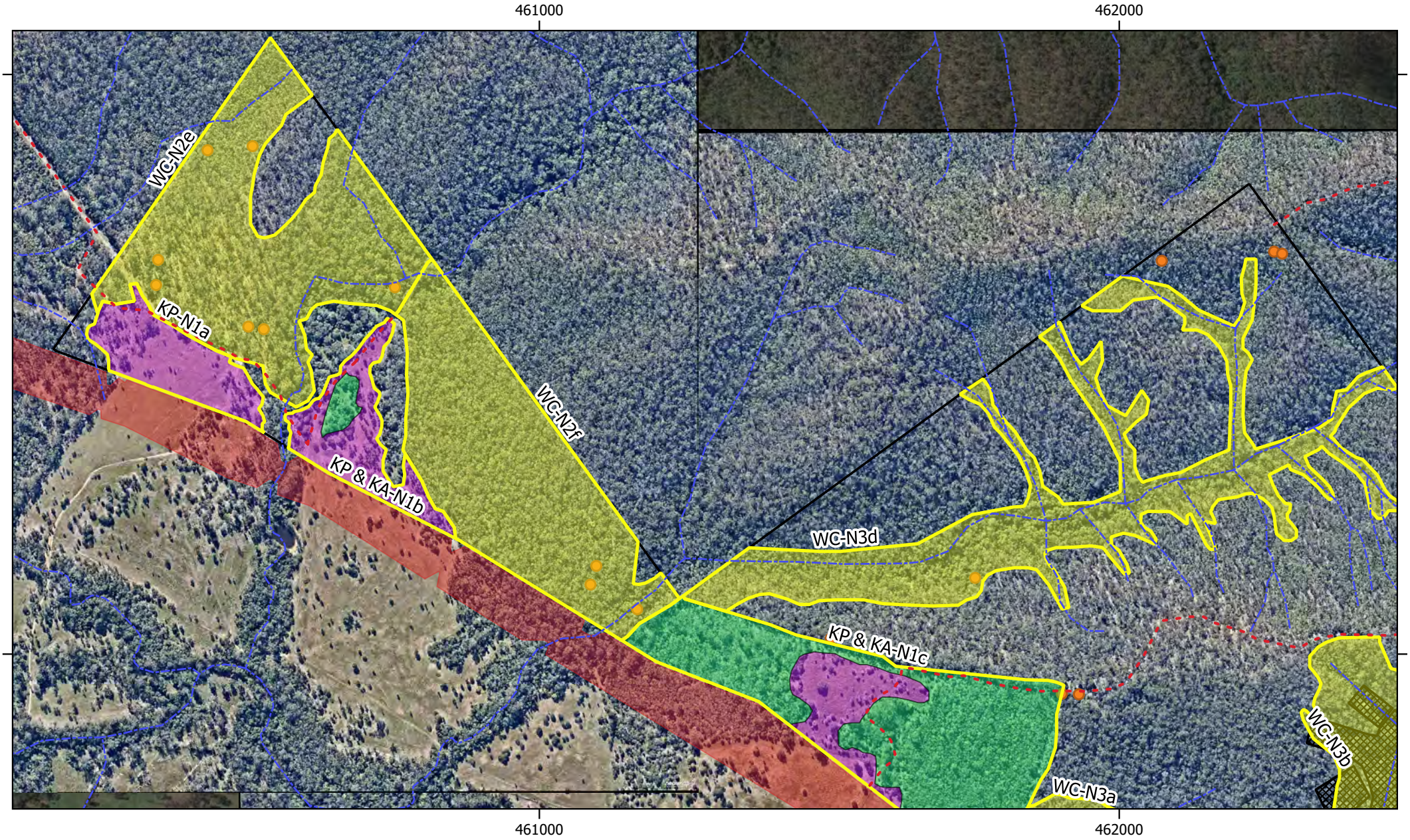
Offset area
Zone boundary
Weed Control area
Koala Assisted area
Koala Planting area
Track
Water course
Dam
External survey point
Construction footprint
Translocation plot managed by others

ecosure
improving ecosystems

Job number: PR6322
Date: 02/12/2021

0 100 200 300 400 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct N work zones - northwest portion

Department of Transport and Main Roads

Cooroy to Curra Offset

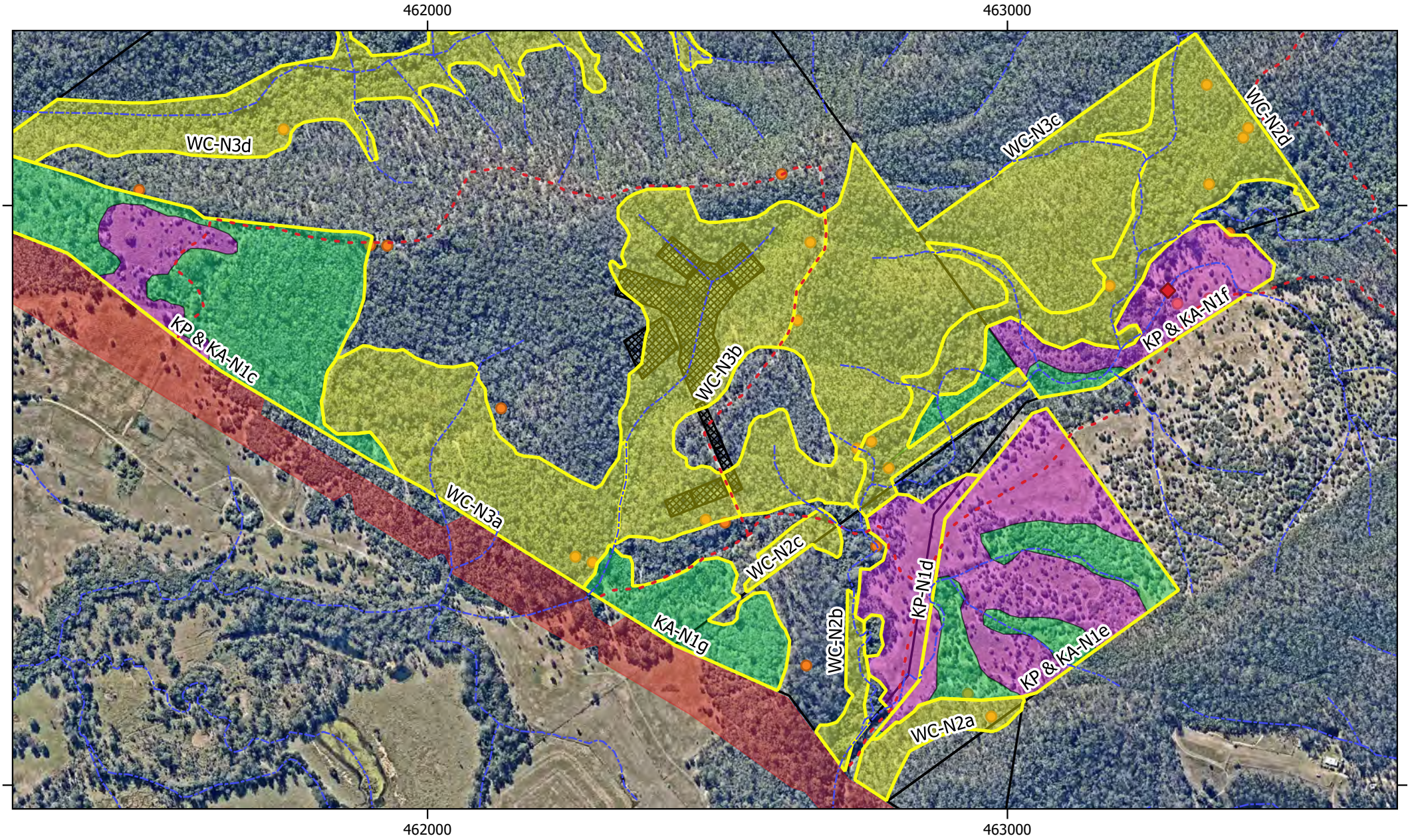
- Offset area
- Zone boundary
- Weed Control area
- Koala Assisted area
- Koala Planting area
- Track
- Water course
- Dam
- External survey point
- Construction footprint
- Translocation plot managed by others

ecosure
improving ecosystems

Job number: PR6322
Date: 02/12/2021

0 50 100 150 200 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct N work zones - southeast portion

Department of Transport and Main Roads

Cooroy to Curra Offset

- Offset area
- Zone boundary
- Weed Control area
- Koala Assisted area
- Koala Planting area
- Track
- Water course
- Dam
- External survey point
- Construction footprint
- Translocation plot managed by others

ecosure
improving ecosystems

Job number: PR6322
Date: 02/12/2021

0 50 100 150 200 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre

Precinct C (central precinct)

Zone C1 and C2 Restoration Strategy

Description

Precinct C (central precinct) is located in Gympie and is owned by Gympie Regional Council. A railway line runs through the middle of the precinct.

The precinct has a total area of 45.62 ha and is divided into 2 priority zones. Zone C1 is approx. 3.52 ha and is south of the railway line. It can be accessed from Banks Pocket Road. Zone C2 is on the northern side of the railway tracks and is split into 2 subzones. Zone C2a is approx. 3.27 ha and zone C2b is approx. 0.64 ha. Zone 2 can be accessed from a 4WD track at the end of Belvedere Road.

Both zones C1 and C2a contain remnant vegetation of the Of Concern RE 12.3.11.

Only one treatment type, WC, occurs in the zone.

Aim of works

Prefixes to subzones are shown on the map. These include:

WC – Weed Control

Refer to Section 2.1 for the full description of treatment area aims.

Primary works in all zones to commence in year 1.

Duration and number of 3-person team days (all of central precinct)

Year 1

WC = 11

Year 2

WC = 7

Year 3

WC = 0

- Establish photo monitoring points prior to the commencement of any work so photos can be compared and site changes can be communicated as the site develops. Include in photos other features that are unlikely to change over the course of the next 3 years (e.g. large tree, edge of a track, live crooked branch etc.) to assist the same photograph (i.e. height, angle, distance) to be taken and compared as work progresses. Refer to Section 2.6.1 for additional details.
- Commence works on the southwestern edge of zone C1 and systematically work through to the northeast, following the main gully and staying within the priority area.
- Control exotic vines such as cat's claw creeper, corky passionfruit and climbing asparagus.
- Mature cat's claw creeper should first be cut at waist height and then peeled off the base of the tree before treating the base via CSP. The gap created between the cuts will assist managing the maintenance program (i.e. operators can see when cat's claw has re-shot and is climbing back up the tree). Less mature cat's claw vines, along with corky passionfruit, should be cut off native vegetation and either CSP or where sufficient leaf remains, laid on the ground to be sprayed.
- Large climbing asparagus should be cut at head height, cut off native vegetation in the midstorey and the bases treated using the cut, gouge and paint technique. Smaller vines should be cut off native vegetation and laid on the ground to be sprayed.
- CSP woody weeds < 3 m such giant devil's fig, Easter cassia, small-leaved privet, camphor laurel, umbrella tree and lantana. Cut up the woody weeds into approx. 50 cm billets and leave them scattered on the ground to breakdown over time. This will assist safely moving through the area to carry out spraying activities which in the first instance (i.e. primary spray) will consist of the control ground layer weeds such as Singapore daisy, garden escapes, as well as other exotic seedlings, vines and herbaceous weeds.
- Control ochna using a variation to the CSP technique. Excavate about 2-4 cm of soil from immediately around the base of the plant. Lightly scrape the bark and paint / apply the herbicide mix (See Appendix 4 for the rate of control). Cut off the stem at approx. ground level and paint again with herbicide. Any large ochna (i.e. > 2 m with a thicker base) can be stem injected.
- As the team systematically moves through the area, continue to carry out primary weed control on other woody weeds and vines. At the same time, prepare areas for spraying by pulling / pushing weeds away from native vegetation including seedlings so they are easily seen and not impacted during spraying.
- Weeds >3 m such as umbrella tree and camphor laurel are to be stem injected. Stem injection should only be performed once an area has begun to stabilise i.e. not during primary weed control works and only once there is sufficient evidence that natural recruitment will occur. For umbrella tree, care must be taken to ensure the trees are not in flower when stem injection occurs as anecdotal evidence suggests accumulation of herbicide in the nectar affects fauna such as lorikeets.
- Once primary works have been complete in zone C1, monitor for any regrowth of weeds and for any changes in the area, particularly in lower lying or moist areas. Works should then commence from the southwestern

Direction of works

Weed control for this project should commence in zone C1 at the southwestern edge of the site with teams working systematically following the main gully within the priority area of works. When primary works have been completed in zone C1, works should commence in the southwest corner of C2a, again following the main gully within the priority area. Works should then commence on the western edge of zone C2b only when primary works have been consolidated in zone C2a.

Notifications and access

Zone C1 is accessed via Banks Pocket Road.

Zone C2 is accessed via a 4WD track at the end of Belvedere Road.

Gympie Regional Council to be notified prior to each visit. An email is to be sent in the week prior to works to Glen Fensom and Estelle Cummings: glen.fensom@gympie.qld.gov.au

estelle.cummings@gympie.qld.gov.au

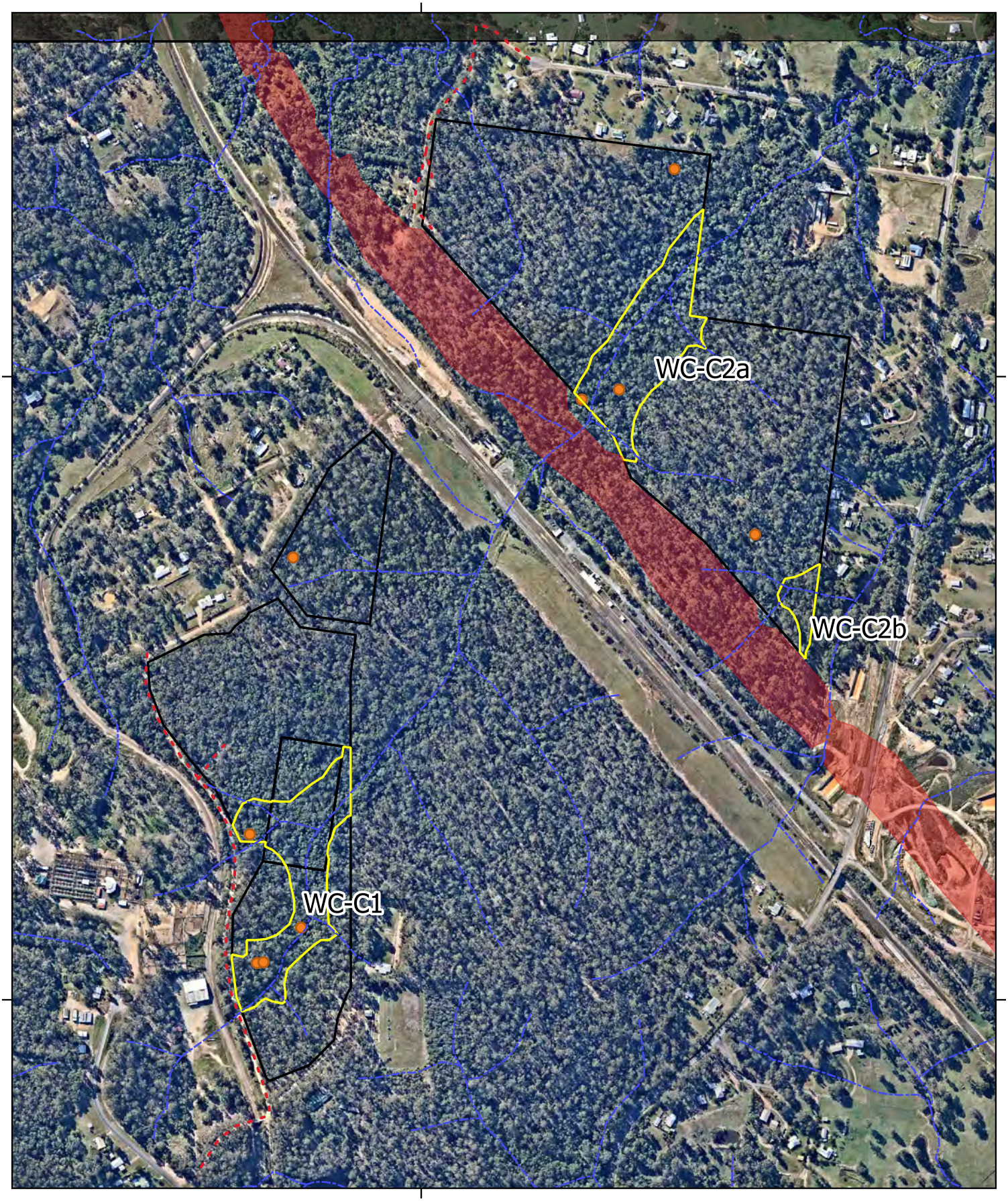
The email will identify which lot/s will be worked on what date. See below for zone / lot correlation.

Zone C1 – 1MPH5670, 2MPH14193, 1MPH23904 and 763MCH5342

Zone C2 (a and b) – 19SP299683

boundary of zone C2a following the same methods. Once zone C2a has stabilised, works should commence from the western boundary of zone C2b.

- Follow up weed control will need to be timely and systematic to prevent weeds from re-establishing and again outcompeting native plants. Many of the areas are likely to hold well following initial weed control though any wetter areas or those areas along the edge will require more regular monitoring / control. Over the course of the project, the majority of WC and BQ areas will only receive primary works and one follow up treatment. All works are to be recorded on a Daily Record Sheet.
- Rubbish appears to be regularly dumped at the site. The collection and responsible disposal of rubbish will need to be done. It can be piled into areas for collection before being transported to the tip. Take photos of rubbish piles, note them on the DRSs and keep any receipts of trailer hire and tip fees for reimbursement by TMR.
- Take annual photographs from established photo points, ensuring a copy of the initial photo is used to line up the shots as close as possible. Monitoring should also occur after significant events (e.g. high rainfall, destructive storms) to assess the zones response to the disturbance and any additional action / maintenance that may be required. Photos are to be included in the annual report.
- Remember the priorities for the treatment type in this zone i.e. WC. As such the priority is the control of weeds that are known to restrict the movement or adversely impact available habitat of the koala across the landscape. Weed control is to occur within the priority areas through the main gullies. Refer to Section 2.1 for details.



Precinct C work zones

Department of Transport and Main Roads

Cooroy to Curra Offset

Zone boundary
Water course
Offset area
External survey point
Track
Construction footprint

ecosure
improving ecosystems

Job number: PR6322
Date: 12/08/2021

0 50 100 150 200 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre

Precinct S (southern precinct)

Zone S1 Restoration Strategy

Description

Precinct S (southern precinct) is located south of Gympie. Highway upgrade construction works separate zone S3 from zones S1 and S2.

The precinct covers a total area of 56.1 ha and is divided into 3 priority zones totalling 37.6 ha.

Zone S1 is approx. 16.7 ha and is separated into 7 subzones (S1a to S1g) and three treatment types including BQ, KA and TEC.

Aim of Works

Prefixes to subzones are shown on the map with specific requirements included in Additional Requirements for S1. They include:

KA – Koala Assisted areas

TEC – Threatened Ecological Community

BQ – Black Breasted Button Quail

Refer to Section 2.1 for the full description of treatment area aims.

Primary works are scheduled for all but one of the subzones in year 1. S1h primary works are scheduled for year 2.

It is worth noting that some overlap does occur between BQ and WC areas, as well as BQ and TEC areas, however in an effort to simplify the OMP, the highest priority objectives for these areas have been applied.

Order of works

- Establish photo monitoring points prior to the commencement of any work so photos can be compared and site changes can be communicated as the site develops. Include in photos other features that are unlikely to change over the course of the next 5 years (e.g. large tree, live crooked branch, up and down the gully etc.) to assist the same photograph (i.e. height, angle, distance) to be taken and compared as work progresses. Refer to Section 2.6.1 for additional details.
- Commence works along the track to access the southwest corner of S1a. Works should then progress in a north easterly direction through the zone. This area is to be worked first to facilitate natural recruitment through the koala offset area as soon as possible. Works should then progress through S1b, and following this, into S1c (the TEC), and so on. At all times, ongoing primary work will need to be balanced with weed control maintenance through all previously worked areas.
- There are many weeds impacting the ground layer, midstorey and canopy of this zone and a range of techniques will need to be simultaneously applied as the team works systematically through the area. Broadly, the techniques required during primary work will include the CSP of woody weeds < 3 m tall, the CSP of weedy vines, variations to the CSP technique described below for ochna and cat's claw creeper, and spot spraying of areas following preparation.
- CSP woody weeds < 3 m such as lantana, wild tobacco, Easter cassia and camphor laurel. Cut up the woody weeds into approx. 50 cm billets and leave them scattered on the ground to breakdown over time. This will assist movement through the area. Through large areas of lantana, assessment will need to be made to determine if treatment will impact habitat and protection for the BBBQ. Refer Additional requirements for S1 below for further details.
- Control ochna using a variation to the CSP technique. Excavate about 2-4 cm of soil from immediately around the base of the plant. Lightly scrape the bark and paint / apply the herbicide mix (See Appendix 4 for the rate of control). Cut off the stem at approx. ground level and paint again with herbicide. Any large ochna (i.e. > 2 m with a thicker base) can be stem injected.
- Mature cat's claw creeper should first be cut at waist height and then peeled off the base of the tree before treating the base via CSP. The gap created between the cuts will assist managing the maintenance program (i.e. operators can see when cat's claw has re-shot and is climbing back up the tree). Less mature cat's claw vines, should be cut off native vegetation and either CSP or where sufficient leaf remains, laid on the ground to be sprayed.
- At the same time as controlling cat's claw creeper and woody weeds, control other exotic vines such as corky passionfruit, Dutchman's pipe and climbing nightshade. Treat either by CSP or by hand pulling smaller plants. Where the vine is climbing into the midstory or canopy, ensure the vine is cut off above head height, leaving the vine in the canopy to fall over time. Do not pull vines down as this can negatively impact the native vegetation it is

Zone S1 Restoration Strategy

Duration and number of 3-person team days (all of southern precinct, excluding planting days, watering and tree guard removal)

Year 1

KA = 12, KP = 4, BQ / WC = 23, TEC = 24

Year 2

KA = 5, KP = 3, BQ / WC = 15, TEC = 14

Year 3

KA = 3, KP = 2, BQ / WC = 13, TEC = 13

Year 4

KA = 3, KP = 2, BQ / WC = NA, TEC = 9

Year 5

KA = 2, KP = 2, BQ / WC = NA, TEC = 6

Direction of works

Efforts should commence along the track to access the southwest corner of S1a. Works should then progress through S1a in a north easterly direction. Once works have stabilised following primary and follow up weed control, works should then commence in S1b. Ongoing primary work in S1b will need to be balanced with weed control maintenance of S1a as it is essential that areas that have been worked are maintained. Once works have stabilised in S1b, works should commence in S1c while maintaining S1a and S1b. Works should progress in this manner through all zones ensuring all worked zones are integrated before starting a new zone.

Notifications and access

Access is the via the shared driveway at 95 Woondum Road.

climbing on or cause workplace injuries as debris can be pulled onto the operator. After cutting the vine above head height, cut it off any native plants in the understory and treat the base.

- Climbing asparagus can be crowned out if smaller vines are encountered. Hang the rhizome off the ground to avoid it re-shooting though leaves and stems can be cut up and left on the ground. Where larger vines are occurring, the base of the plant is to be treated by cut, gouge and paint i.e. cutting off the stems and gouging into the rhizome and painting with herbicide. As with all the vines on this site, severed stems can be cut up and left scattered on the ground to break down over time. Where exotic vines are scrambling over native groundcovers, vines can be pulled aside and bundled to limit any off-target damage when spot-spraying.
- As the team systematically moves through the area, continue to carry out primary weed control on other woody weeds and vines. Larger woody weeds taller than approx. 3-4 m should be retained for stem injection and should be done only once all weeds in the understorey are controlled and regrowth has stabilised. As the team works each area, prepare those areas for spraying by hand pulling weeds next to native seedlings, ferns and groundcovers or by pulling / pushing weeds away from native vegetation so they are easily seen during spot-spraying activities. In addition to germinating and reshooting woody weeds and exotic vines, species such as praxelis, stinking Roger, giant rat's tail grass, coral berry, blue billygoat weed, crofton weed and mistflower should be controlled during spot spraying.
- Spot spraying rates, as part of both primary and follow up works, will need to take into account the suite of weed species to be treated. Herbicide rates will need to be assessed through each area due to the presence of cat's claw creeper in many areas. Spot spraying cat's claw creeper with stronger rates than specified in Appendix 4 will results in leaf burn and ineffective control.
- Native vegetation is to be continually supported and expanded wherever possible including around the edges of clumps of native vegetation and individual native plants. Weeds underneath and around native vegetation are to be spot sprayed to remove competition and encourage native plant growth and expansion. Care will need to be taken to ensure that any small natives germinating are not impacted.
- Follow up weed control will need to be timely and systematic to prevent weeds from re-establishing and again outcompeting native plants. Many of the areas will hold well following initial weed control however areas containing cat's claw creeper will require more regular maintenance. All works are to be recorded on a Daily Record Sheet.
- When spot spraying as a part of maintenance activities, areas may need to be prepared prior to spraying depending on the time between visits. This can be done by efficiently walking the site and pulling vines such as cat's claw off trees and bundling it on the ground for spraying and by pulling weeds away and off native vegetation and laying them on the ground for spraying. Ensure the team carrying out spot-spraying maintenance have good plant identification skills, are experienced (e.g. can make sound decisions on where to retain certain weeds e.g. exotic grasses on the toe of the creekbank to assist stability in the short term) and are able to systematically work whole areas.

Zone S1 Restoration Strategy

The tenants at 95 Woondum Road need to be notified before accessing all areas of S1. A text message is to be sent to Zane (0428 800 835) and Danielle (0449 602 148) before 4 pm the day before works are scheduled.	**Additional requirements for S1** · While performing the primary control of lantana through BQ areas, assessments will need to be made by on ground teams on the retention and management of BBBQ habitat. These assessments will only need to be made where large areas of lantana occur OR where no other suitable habitat is present in the immediate surroundings. Where there is evidence of BBBQ activity e.g. feeding scrape / platelets, lantana should be treated by CSP and the frames replaced and left in situ to retain some habitat value. This approach should also be considered where no evidence of BBBQ activity is observed. In situations where native species exist but are being smothered by lantana, all lantana will be treated using the CSP technique and some frames retained for habitat value. Where large areas of lantana occur i.e. > 100 m^2, a staged approach to the treatment needs to be taken by only controlling some of the weed. This will create a mosaic pattern of both alive and dead lantana which can then be expanded over time. The over-spraying control method for lantana can also be used where there is no evidence of BBBQ activity as this will improve efficiencies on site. Before over-spraying, ensure any isolated native species are cleared around and the edges of the lantana are cut back from the more intact vegetation. This approach also assists retaining lantana frames for habitat. Frames can then be broken down over time as native species germinate and start to fill the gaps created by lantana control. · Within BQ areas, an allowance has been made for up to 1,500 plants (total within all BQ areas) to be installed should large areas of weeds remain devoid of natural recruitment. If supplementary planting is required in specific areas, species should align with the RE mapping and enhance the habitat for BBBQ (i.e. be species that that retain lower branches for habitat) and be planted in a way that assists the closure of vegetation as BBBQ are vulnerable to predators such as foxes and cats. An indicative species list is provided in Appendix 5. Indicative species to be planted include *Alchornea illicifolia*, *Alectryon tomentosus, Alyxia ruscifolia, Aphananthe philippinensis, Breynia oblongifolia, Capparis arborea*, *Cryptocarya laevigata, Pittosporum multiflorum and Streblus brunonianus.* Check with the Ecosure Restoration Ecologists for tips on planting for BBBQ based on specific areas. If planting is required, the Planting Inspection Monitoring Form (Appendix 9) will be used to communicate the Inspection and maintenance information identified in Section 2.6.3. · To improve the diversity of the TEC, 750 plants are to be installed in year 2 of the project. As this planting is aimed at increasing the diversity of native species present throughout the area, a final planting list will need to be compiled following works through the subzone to determine how many additional species are required. As noted in Section 2, >50 species should be present from the Listing Advice (Table 7 in Appendix 6). The planting list is to be built by first recording all species on site via observations and then comparing that list with the Listing Advice to create the final list. The list of species recorded on site (as part of baseline surveys) is provided in Appendix 6. A list of species associated with the TEC is also provided in Appendix 6. It should be noted that not all species in the Listing Advice are endemic to the local area and NSW species should be substituted with those suited to the local Regional Ecosystem. There are several open areas that may be suitable for planting (i.e. adjacent to the main gully that runs through the TEC). All plants are to be installed with slow release fertiliser, water crystals, 2 hardwood stakes and a tree guard to protect them from herbivory and be thoroughly watered in with a Seasol solution. Plants are to be spaced at 1 – 2 m centres (1.8 m tends to be the optimal spacing for reconstructing rainforest). During follow up weed control and watering rotations, record any observations of unhealthy or dead plants on the DRS.

Zone S1 Restoration Strategy

- This planting is scheduled for year 2 of the project, once weed growth has stabilised. This will provide the opportunity for additional native species to be recorded on site by the on ground team especially as native plants are uncovered during weed control. The list of species observed (so far) on site is provided in Appendix 6. The level of natural recruitment through the zone will also determine the final planting requirements. It should be noted that while recovery of many native species is expected, it will likely take longer than 1 year due to the density of weed, especially cat's claw creeper.
- The Planting Inspection Monitoring Form (Appendix 9) is to be used to communicate the Inspection and Maintenance information identified in Section 2.6.3. This form is to be accessed via Fulcrum™. These quick inspections will be performed in each zone monthly for first 6 months after planting, then every three months up to one year after planting. Inspections will then occur every 6 months in the second and third years following planting. These observations should be used to assess survival and general health observations of planted stock. To keep an accurate count of any dead plants, flagging tape is to be tied to the tree guard of the dead plant during the Inspection and maintenance monitoring. This will ensure dead plants are counted only once. Should any plants then reshoot, the survival count can be adjusted and the flagging tape removed.
- While moving across the area, the team is to identify and note the location of any rubbish within the zone. Depending on accessibility, rubbish i.e. sheet metal, wire, glass etc. is to be collected and disposed of off-site. Where it is not possible to collect rubbish for disposal due to access restrictions, rubbish will be piled in strategic locations so it is not spread across the site.
- There are threatened species translocation plots near zone S1e. The management of these areas is performed by others and not part of the on ground works detailed in this plan.
- Remember the priorities for the various treatment types in this zone i.e. BQ, KA and TEC. Refer to Section 2.1 for details.

Zone S2 Restoration Strategy

Description

Precinct S (southern precinct) is located south of Gympie. Highway upgrade construction works separate zone S3 from zones S1 and S2.

The precinct has a total area of 56.1 ha and is divided into 3 priority zones totalling 37.6 ha.

Zone S2 is approx. 8.22 ha and is separated into 3 subzones (S2a, S2b and S2c) and three treatment types including KP, KA and WC.

Aim of Works

Prefixes to subzones are shown on the map and described in Order of Works. They include:

KP – Koala Planting

KA – Koala Assisted

WC – Weed Control

Refer to Section 2.1 for the full description of treatment area aims.

Primary works in all zones are to commence in year 1.

Duration and number of 3-person team days (all of southern precinct, excluding planting days, watering and tree guard removal)

Year 1

KA = 12, KP = 4, BQ / WC = 23, TEC = 24

Year 2

KA = 5, KP = 3, BQ / WC = 15, TEC = 14

Year 3

KA = 3, KP = 2, BQ / WC = 13, TEC = 13

Order of works

- Establish photo monitoring points prior to the commencement of any work so photos can be compared and site changes can be communicated as the site develops. Include in photos additional features that are unlikely to change over the course of the next 5 years (e.g. large tree, live crooked branch etc.) to assist the same photograph (i.e. height, angle, distance) to be taken and compared as work progresses. Refer to Section 2.6.1 for additional details.
- Commence works from the main access track through the KP area of S2a. From the track, works should progress in a northwest direction through the KP area. Once the KP area in S2a has been consolidated, works should move to the KP area in S2b. The priority for works in S2 is primary weed control through the KP areas for planting. Once these areas have received an initial treatment, works should expand into the KA areas, firstly consolidating the smaller KA area in S2b. Following this, works can then progress to the KA areas of S2a. Consolidate works in S2a and S2b, before commencing in S2c from the southern boundary. At all times, ongoing primary work will need to be balanced with weed control maintenance of all previously worked areas.
- There are many weeds impacting the ground layer, midstorey and canopy of this zone and many techniques will need to be simultaneously applied as the team works systematically through the area. Broadly, the techniques required during primary work will include the CSP of woody weeds < 3 m tall, the CSP of weedy vines, variations to the CSP technique described below for ochna and cat's claw creeper and spot spraying of areas following preparation.
- CSP woody weeds < 3 m such as lantana, wild tobacco, devil's fig, Brazilian cherry, Easter cassia and camphor laurel. Cut up the woody weeds into approx. 50 cm billets and leave them scattered on the ground to breakdown over time. This will assist movement through the area during spot-spraying and maintenance. See Appendix 4 for suitable herbicides and rates of control for different weed species.
- While preparing KP areas, refer to specifications below in Additional Requirements for S2
- Control ochna using a variation to the CSP technique. Excavate about 2-4 cm of soil from immediately around the base of the plant. Lightly scrape the bark and paint / apply the herbicide mix. Cut off the stem at approx. ground level and paint again with herbicide. Any large ochna (i.e. > 2 m with a thicker base) can be stem injected.
- Mature cat's claw creeper should first be cut at waist height and then peeled off the base of the tree before treating the base via CSP. The gap created between the cuts will assist managing the maintenance program (i.e. operators can see when cat's claw has re-shot and is climbing back up the tree). Less mature cat's claw vines, should be cut off native vegetation and either CSP or where sufficient leaf remains, laid on the ground to be sprayed.
- At the same time as controlling cat's claw creeper and woody weeds, control other exotic vines such as corky passionfruit, Dutchman's pipe and climbing nightshade. Treat either by CSP or by hand pulling smaller plants. Where the vine is climbing into the midstory or canopy, ensure the vine is cut off above head height, leaving the vine in the canopy to fall over time. Do not pull vines down as this can negatively impact the native vegetation it is climbing on or cause workplace injuries as debris can be pulled onto the operator. After cutting the vine above head height, cut it off any native plants in the understory and treat the base. Where exotic vines are scrambling

Year 4

KA = 3, KP = 2, BQ / WC = NA, TEC = 9

Year 5

KA = 2, KP = 2, BQ / WC = NA, TEC = 6

Direction of works

Efforts should commence in S2a and S2b in the KP areas. Preparing these areas for planting is the priority in zone S2 to ensure the site is prepared for planting between March – May. Following this, works should expand into the surrounding KA areas. Once works have stabilised following primary and follow up weed control, works should then commence in S2c. Ongoing primary work in S2c will need to be balanced with weed control maintenance of S2a and S2b as it is essential that areas that have been worked are maintained.

Notifications for access

Access is the via the shared driveway at 95 Woondum Road.
The tenants at 95 Woondum Road need to be notified before accessing all areas of S1.
A text message is to be sent to Zane (0428 800 835) and Danielle (0449 602 148) before 4 pm the day before works are scheduled.

over native groundcovers, vines can be pulled aside and bundled to limit any off-target damage when spot-spraying.

- As the team systematically move through the zone, continue to carry out primary weed control on other woody weeds and vines. All large woody weeds in the KP areas are to be controlled in the initial sweep, either by CSP or stem injection. Through KA areas, larger woody weeds taller than approx. 3-4 m should be retained for stem injection and should be done only once all weeds in the understorey are controlled and regrowth has stabilised. As the team works each area, prepare those areas for spraying by hand pulling weeds next to native seedlings, ferns and groundcovers or by pulling / pushing weeds away from native vegetation so they are easily seen during spot-spraying activities. In addition to germinating and reshooting woody weeds and exotic vines, species such as praxelis, stinking Roger, giant rat's tail grass, coral berry, blue billygoat weed, crofton weed and mistflower should be controlled during spot spraying.
- Spot spraying rates, as part of both primary and follow up works, will need to take into account the suite of weed species to be treated. Herbicide rates will need to be assessed through each area due to the presence of cat's claw creeper in many areas. Spot spraying cat's claw creeper with stronger rates than specified in Appendix 4 will results in leaf burn and ineffective control.
- Native vegetation is to be continually supported and expanded wherever possible including underneath and around the edges of clumps of native vegetation and individual native plants. Weeds underneath and around native vegetation are to be spot sprayed to remove competition and encourage native plant growth and expansion. Care will need to be taken to ensure that any small natives germinating are not impacted.
- Follow up weed control will need to be timely and systematic to prevent weeds from re-establishing and again outcompeting native plants. Over the course of the project, the majority of WC and BQ areas will only receive primary works and one follow up treatment so systematic and well-timed control is essential. All works are to be recorded on a Daily Record Sheet.
- When spot spraying as a part of maintenance activities, areas may need to be prepared prior to spraying depending on the time between visits. This can be done by efficiently walking the site and pulling vines such as cat's claw off trees and bundling it on the ground for spraying and by pulling weeds away and off native vegetation and laying it on the ground for spraying. Ensure the team carrying out spot-spraying maintenance have good plant identification skills and are experienced in making sound decisions on where and when to retain weeds in the shorter term (e.g. retaining exotic grasses in overflow areas below dams). Ensure teams systematically work whole areas.

Additional requirements for S2

- Within KP areas, plants are to be installed in clumps across the approx. 2.1 ha to align with the pre-clear RE12.11.3. To achieve a density of 250 plants / ha, a further 776 plants (across 2.05 ha) are to installed in S2a and 31 plants (across 0.13 ha) in S2b. Note this is an extra 250 plants than required for this area as plants initially scheduled for S1a will also be installed in this area. Within each clump, plants are to be installed at approx. 2.5 m centres (i.e. one plant every 6.25 m^2). Clump planting is being utilised due to the relatively low density of plants specified per hectare. Installing plants in clumps facilitates ease of planting, watering, monitoring and

maintenance. It also assists with creating competition between trees so they grow taller and quicker together. As the trees establish, small pockets of intact vegetation will develop which can then be linked over time by applying assisted regeneration techniques to create large areas of contiguous native vegetation, improving connectivity throughout the area.

- Planting areas will be slashed or brush-cut and sprayed prior to revegetation i.e. as per the design of each clump. Lower lying areas should receive 2 spray treatments. Any natural recruitment on site is to be protected and sprayed around. Apply flagging tape prior to slashing activities to ensure no damage occurs during slashing. Large rocks are also to be sprayed around and flagged with their locations communicated to the slasher operator.
- Source appropriate plants (species and numbers) based on the planting list provided in Appendix 5. Plants should be sourced from a local nursery, ideally grown from seed of local provenance, appear healthy, be sun hardened and not root-bound.
- Holes for plants will be dug using 2 techniques. Speed spades will be utilised through alluvial areas, lower slopes and where relatively friable soil is present. In any areas where more compacted soil is encountered, augers will be used to dig holes prior to planting. The depth and width of the hole dug using the auger will create looser soil immediately surrounding the plant which will assist plant establishment.
- Plants will be batched on site and placed in their niche within the landscape. Each plant is to be installed with slow release fertiliser, water crystals, 2 by 1.2 m hardwood stakes and a 900 mm tree guard and be thoroughly watered in with a Seasol solution. Plants should be spaced at approx. 2.5 m centres. Planting is scheduled between March – May 2022.
- Watering will be performed using a water trailer, with water extracted from the dams on site. If conditions are dry, the dam will be refilled by a local water haulage contractor.
- Planting should be timed to coincide with any forecasted wetter conditions. If, however, hot / dry conditions prevail following the initial watering in on the day of planting, regular watering rotations will be required to support plant establishment with:
    - 2 watering rotations each week in the 2 weeks following planting (4 total)
    - 1 watering rotation each week for the next 6 weeks (6 total)
    - 1 watering rotation every 2 weeks for the next 6 weeks (3 total).

  The final schedule for watering will be dependent on conditions.
- During follow up weed control and regular watering, record any observations of stressed, unhealthy or dead plants on the DRS.
- The Planting Inspection Monitoring Form (Appendix 9) is to be used to communicate the inspection and maintenance information identified in Section 2.6.3. This form is to be accessed via Fulcrum™. These quick inspections will be performed in each zone monthly for first 6 months after planting then every three months up to one year after planting. Inspections will then occur every 6 months in the second and third years following planting. These observations should be used to assess survival and general health observations of planted stock. To keep an accurate count of any dead plants, flagging tape is to be tied to the tree guard of the dead plant during the

Zone S2 Restoration Strategy

	Inspection and maintenance monitoring. This will ensure dead plants are counted only once. Should any plants then reshoot, the survival count can be adjusted and the flagging tape removed. · There are threatened species translocation plots near zone S2a. The management of these areas is performed by others and not part of the on ground works detailed in this plan. · Remember the priorities for the various treatment types in this zone i.e. KP, KA and WC. Refer to Section 2.1 for details.

Zone S3 Restoration Strategy

Description

Precinct S (southern precinct) is located south of Gympie. Highway upgrade construction works separate zone S3 from zones S1 and S2.

The precinct has a total area of 56.1 ha and is divided into 3 priority zones totalling 37.6 ha.

Zone S3 is approx. 12.01 ha and is separated into 3 subzones (S3a, S3b and S3c). They include two treatment types KP and BQ.

Aim of Works

Prefixes to subzones are shown on the map and described in Order of Works. They include:

KP – Koala Planting

BQ – Button Quail

Refer to Section 2.1 for the full description of treatment area aims.

Primary works in S3a and S3b are to commence in year 1, with works in S3c to commence in year 2.

It is worth noting that some overlap does occur between BQ and WC areas, however in an effort to simplify the OMP, the highest priority objectives for these areas have been applied.

Duration and number of 3-person team days (all of southern precinct, excluding planting days, watering and tree guard removal)

Year 1

KA = 12, KP = 4, BQ / WC = 23, TEC = 24

Year 2

Order of works

- Establish photo monitoring points prior to the commencement of any work so photos can be compared and site changes can be communicated as the site develops. Include in photos other features that are unlikely to change over the course of the next 3 years (e.g. large tree, live crooked branch, gully etc.) to assist the same photograph (i.e. height, angle, distance) to be taken and compared as work progresses. Refer to Section 2.6.1 for additional details.
- Commence works from along the edge of Keefton Road through S2a. This small area will require several plants to be installed along the front edge associated with the KP. Works should expand along the northern boundary of S3b towards the northeast corner and then south along the eastern boundary where quality habitat for the BBBQ exists and platelets have been recorded. Works should then be expanded in the same manner through the rest of the subzone until the gully separating S3b and S3c is reached. S3a and S3b should continue to be maintained while works expand into S3c in year 2.
- While preparing KP areas, refer to specifications below in Additional Requirements for S3.
- There are many weeds impacting the ground layer, midstorey and canopy of this zone and many techniques will need to be simultaneously applied as the team works systematically through the area. Broadly, the techniques required during primary work will include the CSP of woody weeds < 3 m tall, the CSP of weedy vines, variations to the CSP technique described below for ochna and cat's claw creeper, over-spraying of lantana where possible to retain habitat and spot spraying of areas following preparation.
- CSP woody weeds < 3 m such as lantana, smooth senna, wild tobacco, devil's fig, Easter cassia and camphor laurel. Cut up the woody weeds into approx. 50 cm billets and leave them scattered on the ground to breakdown over time. This will assist movement through the area. Through large areas of lantana, assessment will need to be made to determine if treatment will impact habitat and the protection of the BBBQ. Refer Additional Requirements for S3 below for further details.
- Control ochna using a variation to the CSP technique. Excavate about 2-4 cm of soil from immediately around the base of the plant. Lightly scrape the bark and paint / apply the herbicide mix. Cut off the stem at approx. ground level and paint again with herbicide. Any large ochna (i.e. > 2 m with a thicker base) can be stem injected.
- Mature cat's claw creeper should first be cut at waist height and then peeled off the base of the tree before treating the base via CSP. The gap created between the cuts will assist managing the maintenance program (i.e. operators can see when cat's claw has re-shot and is climbing back up the tree). Less mature cat's claw vines, should be cut off native vegetation and either CSP or where sufficient leaf remains, laid on the ground to be sprayed.
- At the same time as controlling cat's claw creeper and woody weeds, control other exotic vines such as corky passionfruit, Dutchman's pipe and climbing nightshade. Treat either by CSP or by hand pulling smaller plants. Where the vine is climbing into the midstory or canopy, ensure the vine is cut off above head height, leaving the vine in the canopy to fall over time. Do not pull vines down as this can negatively impact the native vegetation it is climbing on or cause workplace injuries as debris can be pulled onto the operator. After cutting the vine above head height, cut it off any native plants in the understory and treat the base.

Zone S3 Restoration Strategy

KA = 5, KP = 3, BQ / WC = 15, TEC = 14

Year 3

KA = 3, KP = 2, BQ / WC = 13, TEC = 13

Year 4

KA = 3, KP = 2, BQ / WC = NA, TEC = 9

Year 5

KA = 2, KP = 2, BQ / WC = NA, TEC = 6

Direction of works

Efforts should commence in S3a to prepare the area for planting. Following this, works should expand into S3b and then into S3c in year 2. Ongoing primary work will need to be balanced with weed control maintenance of previously worked areas.

Notifications and access

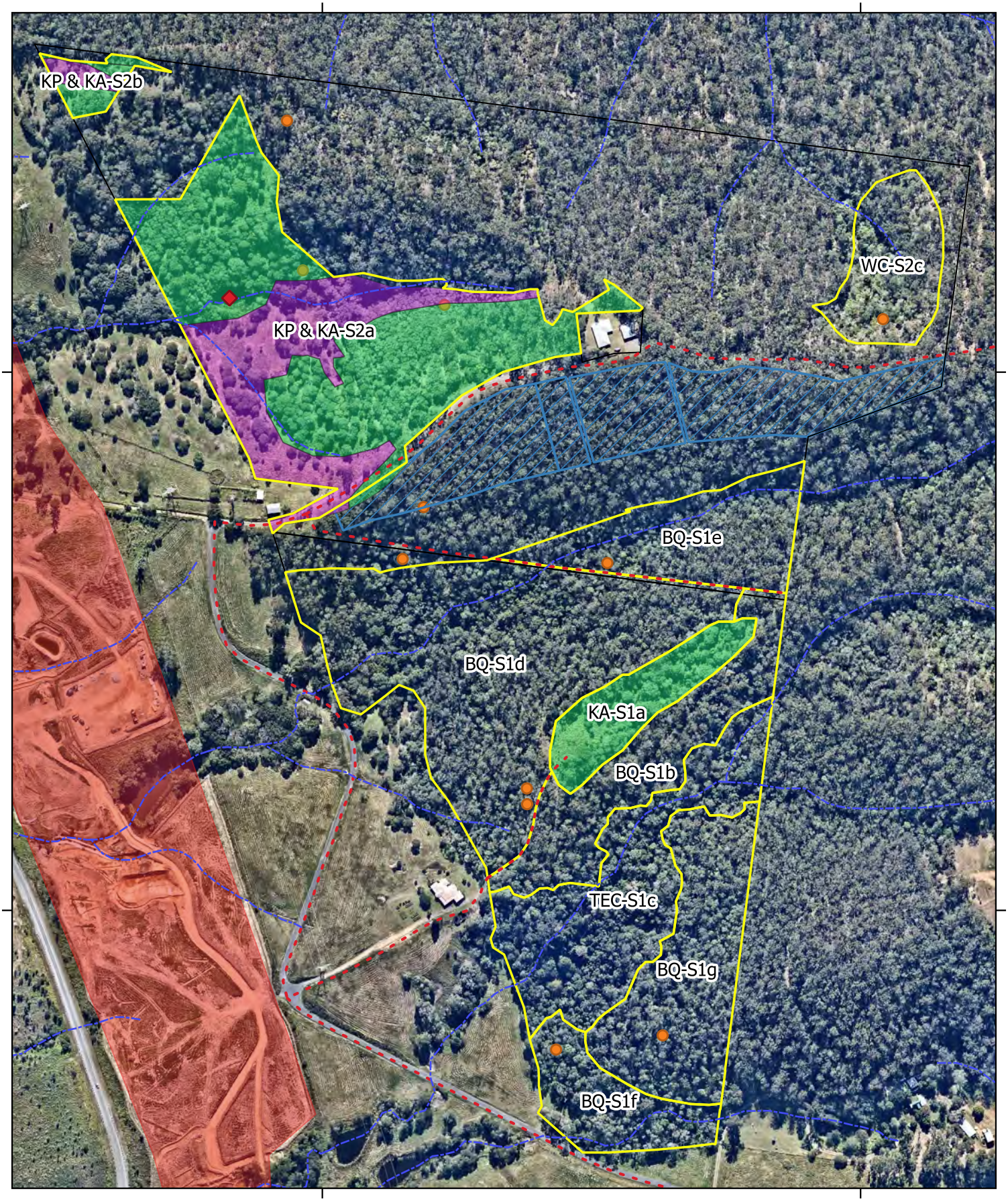
Access is via Keefton Road. 24 hours prior to access, Darren Beatson (0417 788 375) from Beilby Holdings is to be notified so safe parking and access to the site can be organised.

- Climbing asparagus can be crowned out if smaller vines are encountered and spot-spraying if a seedling. Hang the rhizome off the ground to avoid it re-shooting though leaves and stems can be cut up and left on the ground. Where larger vines are occurring, the base of the plant is to be treated by cut, gouge and paint i.e. cutting off the stems and gouging into the rhizome and painting with herbicide. As with all the vines on this site, severed stems can be cut up and left scattered on the ground to break down over time. Where exotic vines are scrambling over native groundcovers, vines can be pulled aside and bundled to limit any off-target damage when spot-spraying.
- As the team systematically moves through the area, continue to carry out primary weed control on other woody weeds and vines. Larger woody weeds taller than approx. 3-4 m should be retained for stem injection and in more open areas, should be done only once all weeds in the understorey are controlled and regrowth has stabilised. As the team works each area, prepare those areas for spraying by hand pulling weeds next to native seedlings, ferns and groundcovers or by pulling / pushing weeds away from native vegetation so they are easily seen during spot-spraying activities. In addition to germinating and reshooting woody weeds and exotic vines, species such as praxelis, coral berry, ground asparagus, blue billygoat weed, crofton weed and mistflower should be controlled by spot spraying.
- Native vegetation is to be continually supported and expanded wherever possible including around the edges of clumps of native vegetation and the site. Weeds underneath and around native vegetation are to be spot sprayed to remove competition and encourage native plant growth and expansion. Care will need to be taken to ensure that any small natives germinating are not impacted.
- Follow up weed control will need to be timely and systematic to prevent weeds from re-establishing and again outcompeting native plants. This is particularly important in areas where cat's claw creeper and coral berry occur as well as areas that are more open such as edges. Over the course of the project, the majority of WC and BQ areas will only receive primary works and one follow up treatment. All works are to be recorded on a Daily Record Sheet.
- When spot spraying as a part of maintenance activities, areas may need to be prepared prior to spraying depending on the time between visits. This can be done by efficiently walking the site and pulling vines such as cat's claw off trees and bundling it on the ground for spraying and by pulling weeds away and off native vegetation and laying it on the ground for spraying. Ensure the team carrying out spot-spraying maintenance have good plant identification skills, are experienced and can make sound decisions on where and when to retain exotic grasses (e.g. in certain overflow areas below culverts and through the gully in the short term to prevent erosion and silt entering the site) and are able to systematically work whole areas.

Additional requirements for S2

- The KP area adjacent to Keefton is approx. 0.27 ha. To achieve a density of 250 plants / ha, 68 plants are to be installed. Plants are to be installed through the open section between the edge of the existing canopy and Keefton Road. This area will need to be brush-cut and sprayed prior to planting. If sufficient natural recruitment is found throughout this area during initial works, it is likely this planting will not be required and plants can be installed in other KP areas.

- If planting is required, source appropriate plants (species and numbers) based on the planting list provided in Appendix 5. Plants should be sourced from a local nursery, ideally grown from seed of local provenance, appear healthy, be sun hardened and not root-bound. Holes will be dug using a combination of speed spades and augers, depending on the quality of the soil encountered. Each plant is to be installed with slow release fertiliser, water crystals, 2 by 1.2 m hardwood stakes and a 900 mm tree guard and be thoroughly watered in with a Seasol solution. Plants should be spaced at approx. 2.5 m centres. Planting is scheduled for March – May 2022. Watering will be performed using a water trailer. During follow up weed control and watering rotations, record any observations of unhealthy or dead plants on the DRS. If planting is required, the Planting Inspection Monitoring Form (Appendix 9) will be used to communicate the Inspection and maintenance information identified in Section 2.6.3.
- While performing the primary control of lantana through BQ areas, assessments will need to be made by on ground teams to determine how each area is worked to ensure the protection of the BBBQ. These assessments will only need to be made where large areas of lantana occur OR where no other suitable habitat is present in the immediate surrounding. Where there is evidence of BBBQ activity e.g. feeding scrape / platelets, lantana should be treated by CSP and the frames reinstated and left in situ. This approach should also be considered in areas where no evidence of BBBQ activity is observed. In situations where native species exist but are being smothered by lantana, all lantana will be treated using the CSP technique and some frames retained for habitat value. Where large areas of lantana occur i.e. >100 m^2, a staged approach to the treatment will be taken by only controlling some area of the weed. This will create a mosaic pattern of both live and dead lantana which can then be expanded on over time. The over-spraying control method for lantana can also be used where there is no evidence of BBBQ activity to improve efficiencies. Before over-spraying, ensure any isolated native species are cleared around and the edges of the lantana are cut back from the more intact vegetation. Lantana has to be actively growing (i.e. not stressed) with a good coverage of herbicide applied to ensure successful control. This method of control also retains the lantana frames for habitat. Frames can then be broken down over time as native species germinate and fill the gaps created by lantana control. Ensure vines are controlled as these can take advantage of the trellis created which is likely to prevent further of recovery of a diversity of native vegetation.
- Within BQ areas, an allowance has been made to install a further 1,500 plants (total across all BQ areas). These plants will be installed should large areas of weed devoid of natural recruitment be encountered and where no recovery is occurring. If supplementary planting is required in specific areas, species should align with the RE mapping and enhance the habitat for BBBQ (i.e. contain native plant species that contains lower branches) and be planted in a way that closes vegetation as BBBQ are vulnerable to predators such as foxes and cats. Indicative species to be planted include *Alchornea illicifolia*, *Alectryon tomentosus, Alyxia ruscifolia, Aphananthe philippinensis, Breynia oblongifolia, Capparis arborea*, *Cryptocarya laevigata, Pittosporum multiflorum and Streblus brunonianus.* Check with the Ecosure Restoration Ecologists for tips on planting for BBBQ based on specific areas. If planting is required, the Planting Inspection Monitoring Form (Appendix 9) will be used to communicate the Inspection and maintenance information identified in Section 2.6.3.
- Remember the priorities for the various treatment types in this zone i.e. KP and BQ. Refer to Section 2.1 for details.



Precinct S work zones 1 and 2

Department of Transport and Main Roads

Cooroy to Curra Offset

- Zone boundary
- Offset area
- Koala Assisted area
- Koala Planting area
- Water course
- Track
- Dam
- External survey point
- Construction footprint
- Translocation plot managed by others

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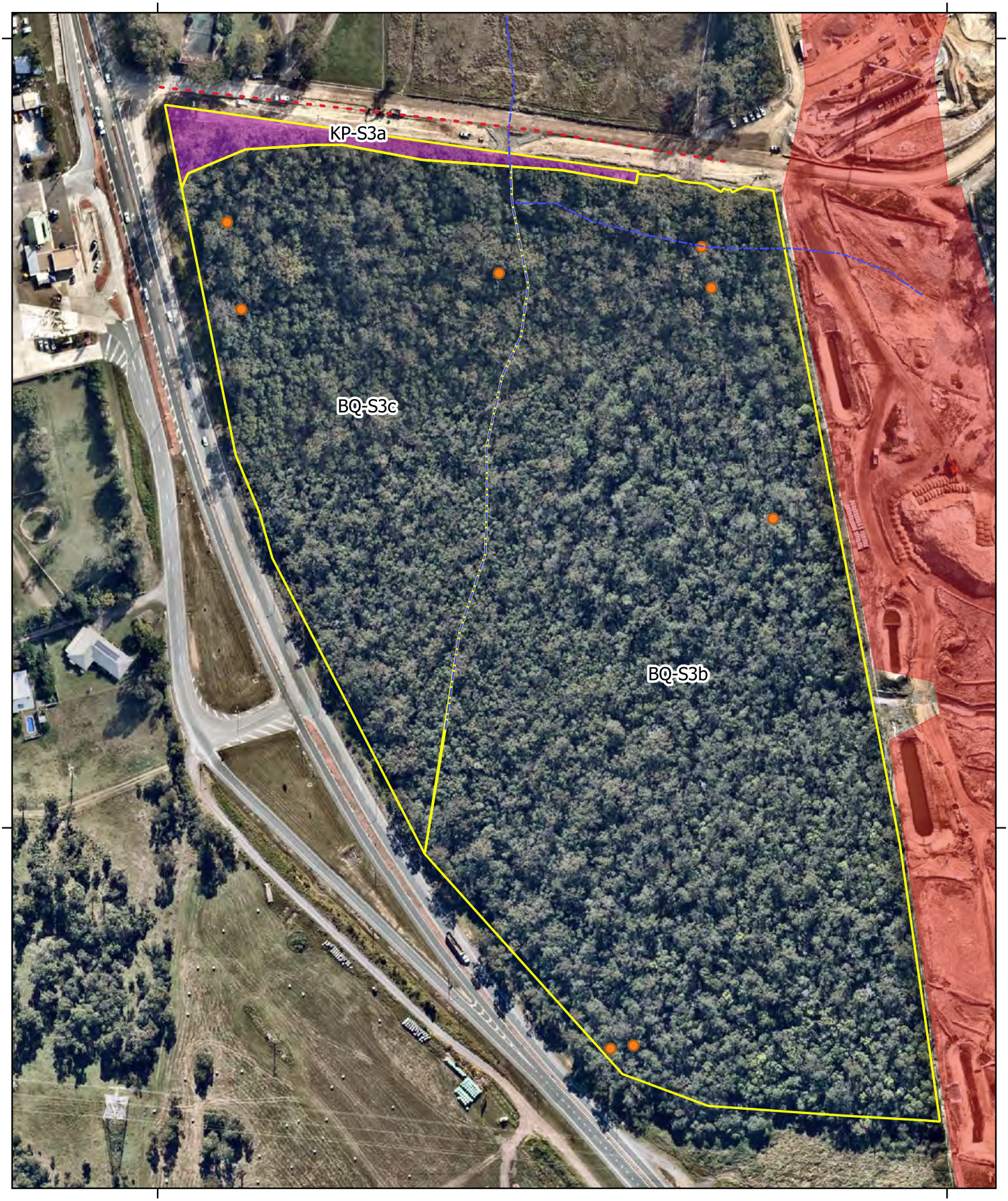
Job number: PR6322
Date: 02/12/2021

0 25 50 75 100 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct S work zone 3

Department of Transport and Main Roads

Cooroy to Curra Offset

Zone boundary
Track
Koala Planting area
External survey point
Water course
Construction footprint

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Job number: PR6322
Date: 02/12/2021

0 20 40 60 80 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre

2.4 Maintenance

Following primary weed control, it is estimated areas of the site will require ongoing weed control maintenance for a 5 – 10 year period, particularly in areas where dense cat's claw creeper is present. Follow up weed control is essential to control weeds that have been missed or are already re-shooting. Maintenance requirements are often demanding post primary and follow up weed control due to the disturbance caused by that activity but efforts will decrease over time especially once native plants fill the available spaces and the weed seedbank begins to decrease.

Given the objectives of the varying treatment types and the duration this OMP covers, not all areas will be incorporated into weed control maintenance. Areas of the WC treatment are likely to respond well to follow up weed control and are unlikely to require treatment again in the short term (i.e. within the 3 year period of works for these areas). Within the TEC, BQ, KA and KP areas however, weed control maintenance will be essential to achieve the offset objectives.

Maintenance through the TEC, BQ, KA and KP areas will need to be applied according to the following points:

- Weed control maintenance will be required in a timely and systematic way to prevent weeds re-establishing and competing with the germination and development of native vegetation. It should be noted that regular weed control applied accurately and systematically during the first 3 – 5 years will significantly reduce weed control requirements (and resources) post year 5, particularly as regular weed control will deplete the existing weed seed bank and energy of underground cat's claw tubers, present in the soil.
- Continue to support native vegetation once primary and follow up weed control has been completed by controlling underneath and around native plants to 1 - 2 m beyond drip lines. This is best done via spot spraying (see Appendix 3) as it reduces ongoing disturbance to the soil. This will support the development of regenerating plants, and as the driplines of natives become linked, the consolidation of whole areas will occur, further encouraging native recruitment and reducing weed growth. This approach to expanding vegetation, especially on the edges, will encourage native recruitment. As the areas develop, the formation of more continuous healthy native vegetation with good structure and diversity will occur.
- Wherever possible, the same team (or at least the same supervisor) should be used to carry out / oversee weed control and any revegetation activities so site knowledge and familiarity with 'hot spots' or threatened species are known, further maximising resources. Where it is not possible to use the same team or supervisor, ensure comprehensive records of all work is recorded each visit and maintained so progress can be clearly communicated with teams and TMR.

2.5 Slashing and fire breaks

Regular slashing (4 rotations per year) will be used to mitigate fire danger. Access tracks and fire breaks will need to be at least 3 m wide and will be maintained over the course of the project. Fire breaks and tracks will be maintained free of rocks or other objects that may serve as ignition sources. Where possible, the same operator should be used for the life of the project to ensure site knowledge is built and maintained.

Slashing should be well-timed to reduce fuel loads at certain times, minimising fire risk. Slashing routines should be amended to combat effects of unseasonable weather such as hot conditions or drought that might lead to increased fuel loads or fire danger. Fire is the biggest risk to the developing offset trees and is a major threat to the existence of the TEC or vine forest community.

It is worth noting that while not part of this OMP, a three metre clear zone will be present either side of the fauna exclusion fence that will border the road /construction corridor which will also operate as a fire break.

2.6 Monitoring

Monitoring the recovery of the site is critical to identifying whether the measures implemented are sufficient and to ensure project goals are met or are on the correct trajectory. Monitoring also identifies if further (or different) interventions are needed to remove obstacles that may be hindering the site's recovery (McDonald et al 2017).

Monitoring for this project will include photo monitoring, Unmanned Aerial Vehicle (UAV) mapping and imagery and planting inspections. The information collected during monitoring will be reported on as a part of daily and annual reporting. The frequency of these events is summarised in Table 4.

Table 4 Monitoring and reporting schedule

Monitoring task	Frequency	Additional information
Photo monitoring	Points established prior to works and photos then taken annually	Section 2.6.1 Appendix 7
UAV monitoring	Baseline established prior to works and then imagery taken annually	Section 2.6.2
Inspections and maintenance (planting inspections)	Monthly for first 6 months post planting then every three months up to one year after planting. Then every 6 months in the second and third years following planting.	Section 2.6.3 Appendix 9
Reporting	DRS completed each visit. Annual report for each year of the project.	Section 2.7 Appendix 8

2.6.1 Photo monitoring

The application of photo monitoring will aid assessing the changes on site and will provide a visual means of demonstrating the progression at key locations. It is recommended that at least 25 photo monitoring points be established e.g. 3 in TEC, 4 in BQ, 7 in WC, 6 in KP and 5 in KA.

Photo monitoring should be undertaken prior to the commencement of works, after follow up weed control, annually and after large events (e.g. completion of planting, high rainfall events that impact the recovery of the site etc.), following the process outlined below:

- mark the exact photo monitoring location with a permanent star picket and label the location with a number on the safety cap. Record the GPS location (either writing the easting and northing or saving the location in Avenza and storing on Dropbox), and take a photo or series of photos in a number of directions (preferably on an overcast day if into forest to avoid dappled light).
- use reference points in the photos (trees, fencepost, track, gully etc.) to frame the photograph and when replicating a photo in future years. Use the star picket markers to capture the exact same frame, height, depth and angle as was previously captured.
- re-mark the safety cap with the number and ensure the star picket features in the photograph are at the same height and distance for easier identification and replication.
- take landscape photographs and centre the photo.
- record details each time (i.e. when the initial photo is taken) which include date, time of day, weather conditions, bearing, camera settings and any other comments relevant to replicating the photo.
- use a proforma (example in Appendix 7) to capture and record photo monitoring data.

2.6.2 UAV monitoring

UAV monitoring will be used to create accurate orthomosaic imagery of the planting areas. This imagery will demonstrate how works are supporting the expansion and connectivity of native vegetation. Prior to on ground works, baseline imagery should be taken which is to be replicated each year of the project. Images will also be taken by UAV to provide photo monitoring at different angles at key locations site.

2.6.3 Inspections and maintenance (planting inspections)

Following plant installation, regular inspections are required to assess the plants. These planting inspections are to occur:

- monthly for first 6 months after planting
- every three months up to one year after planting

- every 6 months in the second and third years following planting.

Aspects such as plant survival, observations of health and growth, insect damage, predation, observations of other disturbance and / or additional threats are to be recorded following the above timeline in each zone. These observations are to be recorded on the Planting Inspection monitoring form provided in Appendix 9.

In addition, ad hoc visual inspections should be undertaken at the same time as work is scheduled to determine if any adaptive management actions are required including:

- follow up watering requirements
- modifications to the frequency of weed control maintenance rotations based on season and growth rates
- any supplementary planting required.

2.7 Documenting works

Daily record sheets and annual reporting should be used to communicate the progress on site.

2.7.1 Daily record sheets

A DRS that documents standard information such as the date, personnel and weather conditions should be completed each day. Other data that should be recorded includes:

- who, what and where works were carried out
- what weed control techniques were applied
- what herbicides, rates and amount of herbicide were applied per technique
- other information such as observations relating to flowering and fruiting of native plants, health of vegetation including germination of native species, fauna, threatened species observed and observations of any additional native woody species within the TEC observed.

The DRSs will also be required to communicate the Inspection and maintenance (planting inspections) information identified in Section 2.6.3. To ensure this information is accurately captured, additional pages should be added to the pro forma provided in Appendix 8 if required.

Record sheets should be securely stored so they can be referenced as required i.e. to assess how works are progressing or what weeds were treated in a particular location.

2.7.2 Annual report

A concise annual report should also be completed for each year of the project. This report should include:

- details of the work undertaken at the site, including location on site for particular works, planting details (species, location, site conditions etc.), weeds treated and methods applied, timing and regularity of maintenance (weed control, watering etc.)
- photo monitoring photographs relative to baseline photos
- UAV imagery relative to baseline images
- maps of worked areas
- the number of plants surviving at the end of the year in which they were planted
- observational comments on the recovery of native vegetation through the area
- details on the challenges experienced on site (e.g. herbivory, disturbance via floods, vandalism etc.) and how they were managed
- recommended actions for the following year and any changes that may need to be made to this plan to continually improve the plan as part of adaptive management.

References

GHD 2020, *Bruce Highway Cooroy to Curra Section D – Detailed Design Project No. 686965 Offset Management Plan*, report for The Department of Main Roads, Brisbane

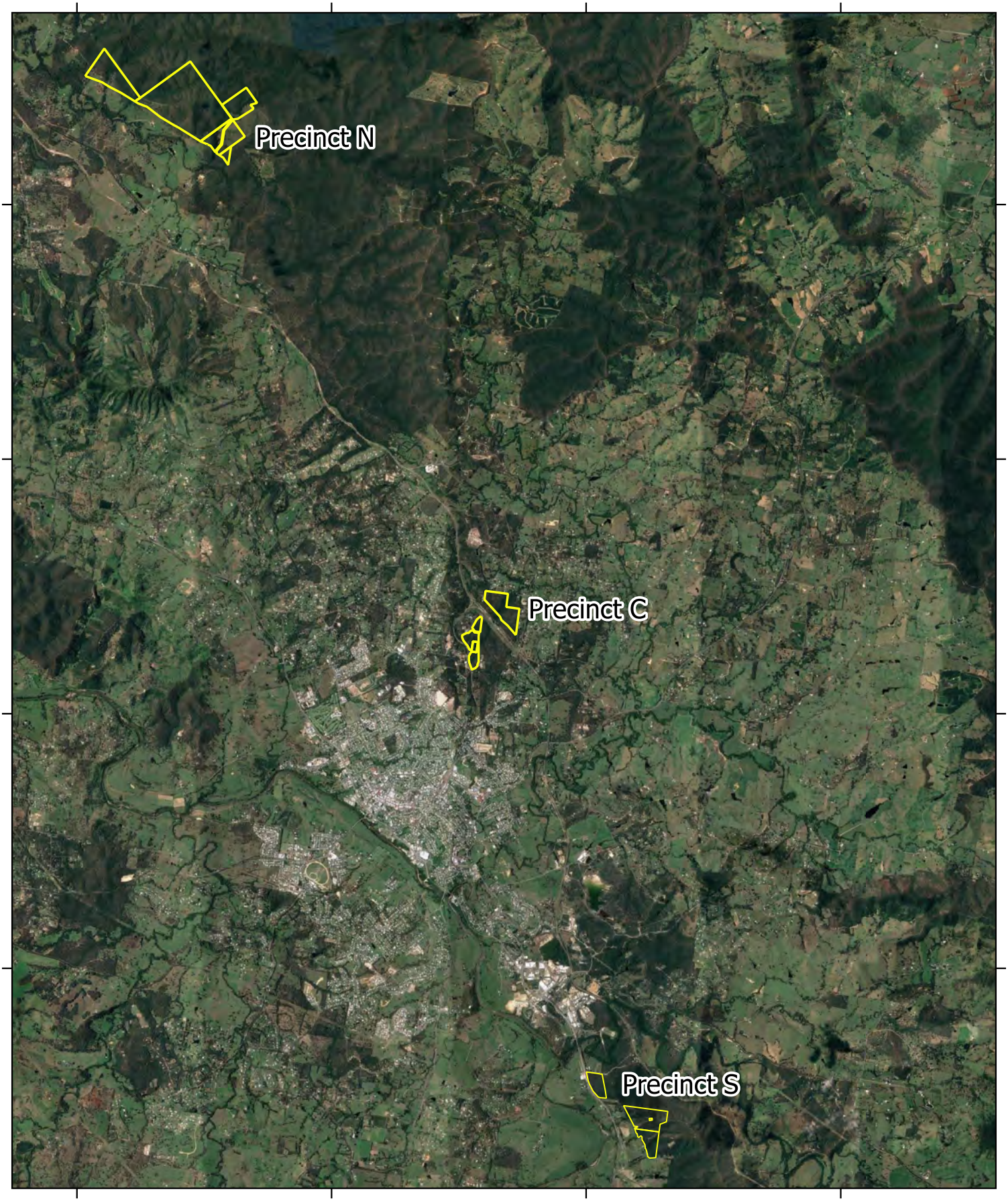
GHD 2020, *Bruce Highway Cooroy to Curra Section D – Detailed Design Project No. 686965 Offset Management Plan – Lowland Rainforest*, report for The Department of Main Roads, Brisbane

Standards Reference Group SERA (2021) *National Standards for the Practice of Ecological Restoration in Australia. Edition 2.2*. Society for Ecological Restoration Australasia. Available from www.seraustralasia.org

Society of Ecological Restoration 2019, *International Standards for the Practice of Ecological Restoration – Recovery Wheel*, viewed 2 December 2020, http://seraustralasia.com/wheel/index.html

State of Queensland 2019, *Regional ecosystem descriptions*, viewed 27 July 2021, https://apps.des.qld.gov.au/regional-ecosystems/

Appendix 1 Site Maps



Precinct locality site map

Department of Transport and Main Roads

Cooroy to Curra Offset

Offset area

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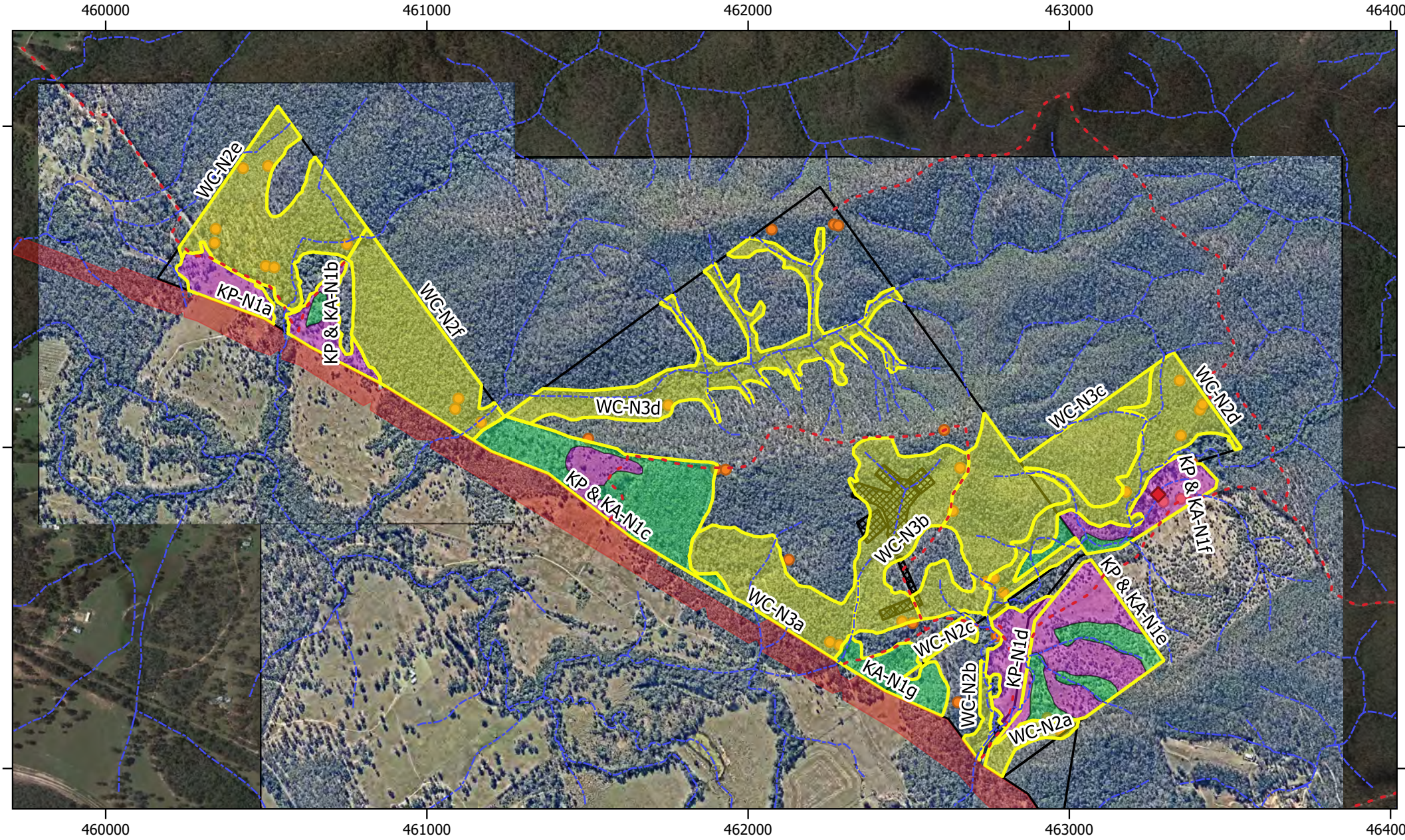
Job number: PR6322
Date: 12/08/2021

0 1 2 km

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct N work zones

Department of Transport and Main Roads

Cooroy to Curra Offset

Offset area
Zone boundary
Weed Control area
Koala Assisted area
Koala Planting area
Track
Water course
Dam
External survey point
Construction footprint
Translocation plot managed by others

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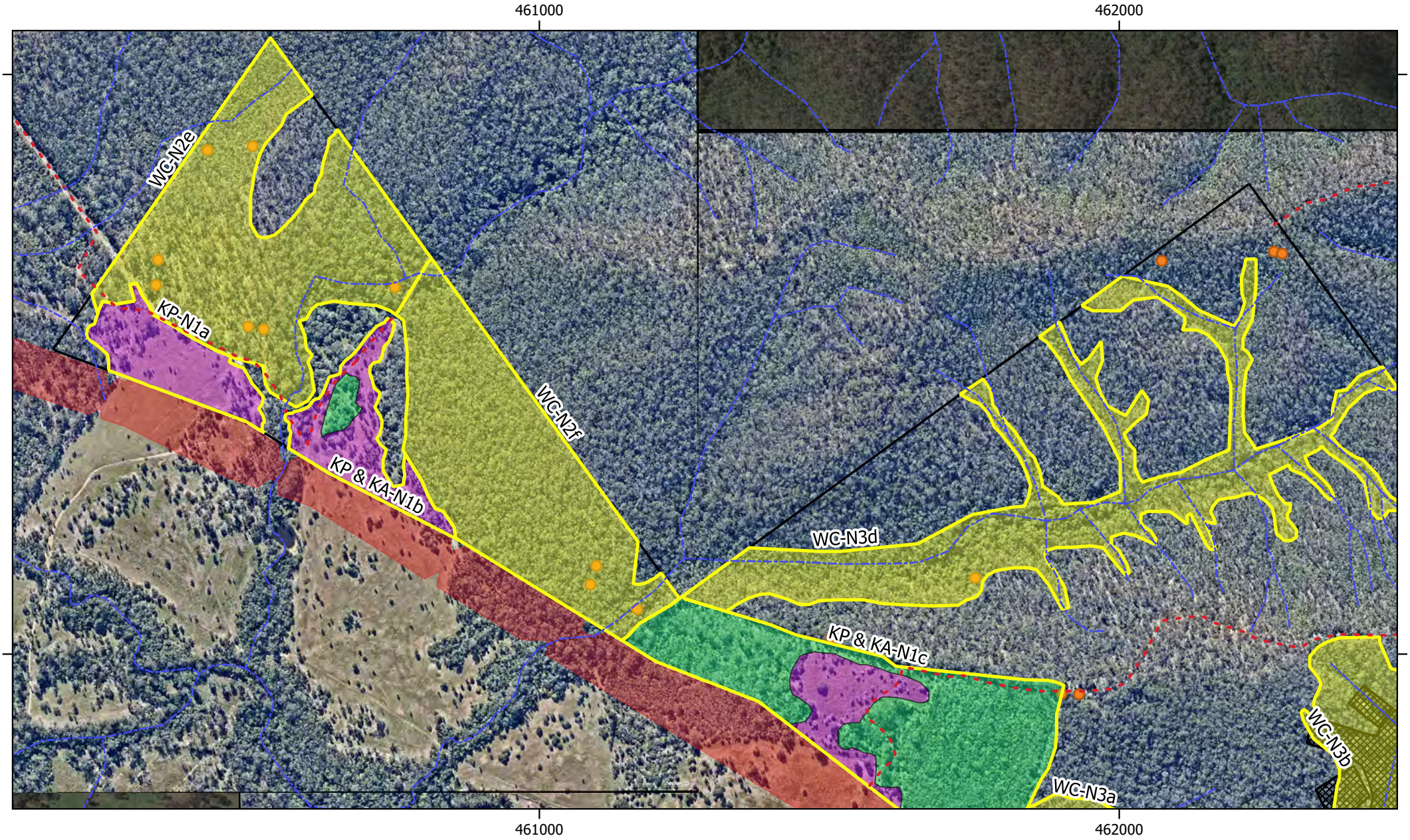
Job number: PR6322
Date: 02/12/2021

0 100 200 300 400 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct N work zones - northwest portion

Department of Transport and Main Roads

Cooroy to Curra Offset

- Offset area
- Zone boundary
- Weed Control area
- Koala Assisted area
- Koala Planting area
- Track
- Water course
- Dam
- External survey point
- Construction footprint
- Translocation plot managed by others

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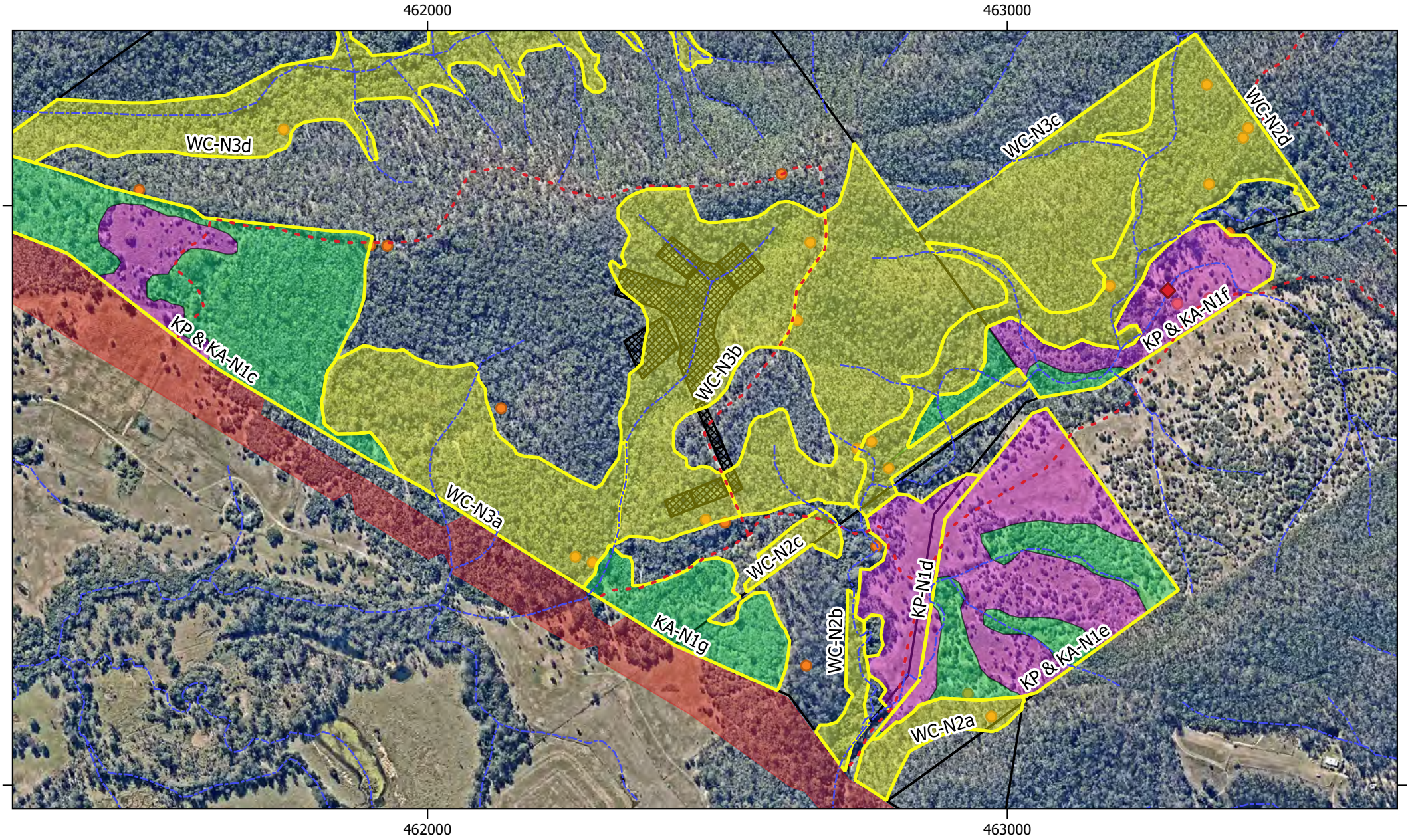
Job number: PR6322
Date: 02/12/2021

0 50 100 150 200 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct N work zones - southeast portion

Department of Transport and Main Roads

Cooroy to Curra Offset

- Offset area
- Zone boundary
- Weed Control area
- Koala Assisted area
- Koala Planting area
- Track
- Water course
- Dam
- External survey point
- Construction footprint
- Translocation plot managed by others

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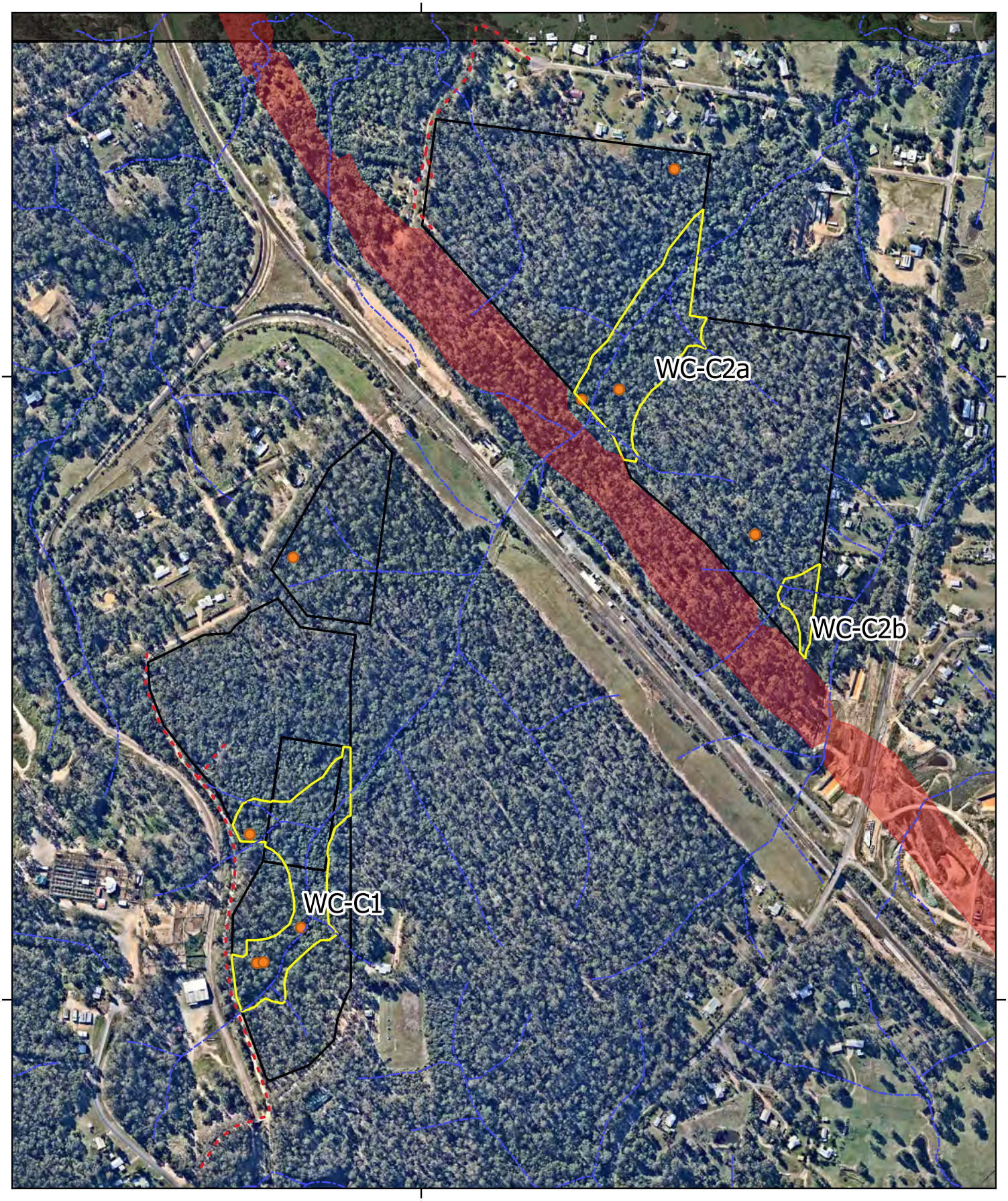
Job number: PR6322
Date: 02/12/2021

0 50 100 150 200 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct C work zones

Department of Transport and Main Roads

Cooroy to Curra Offset

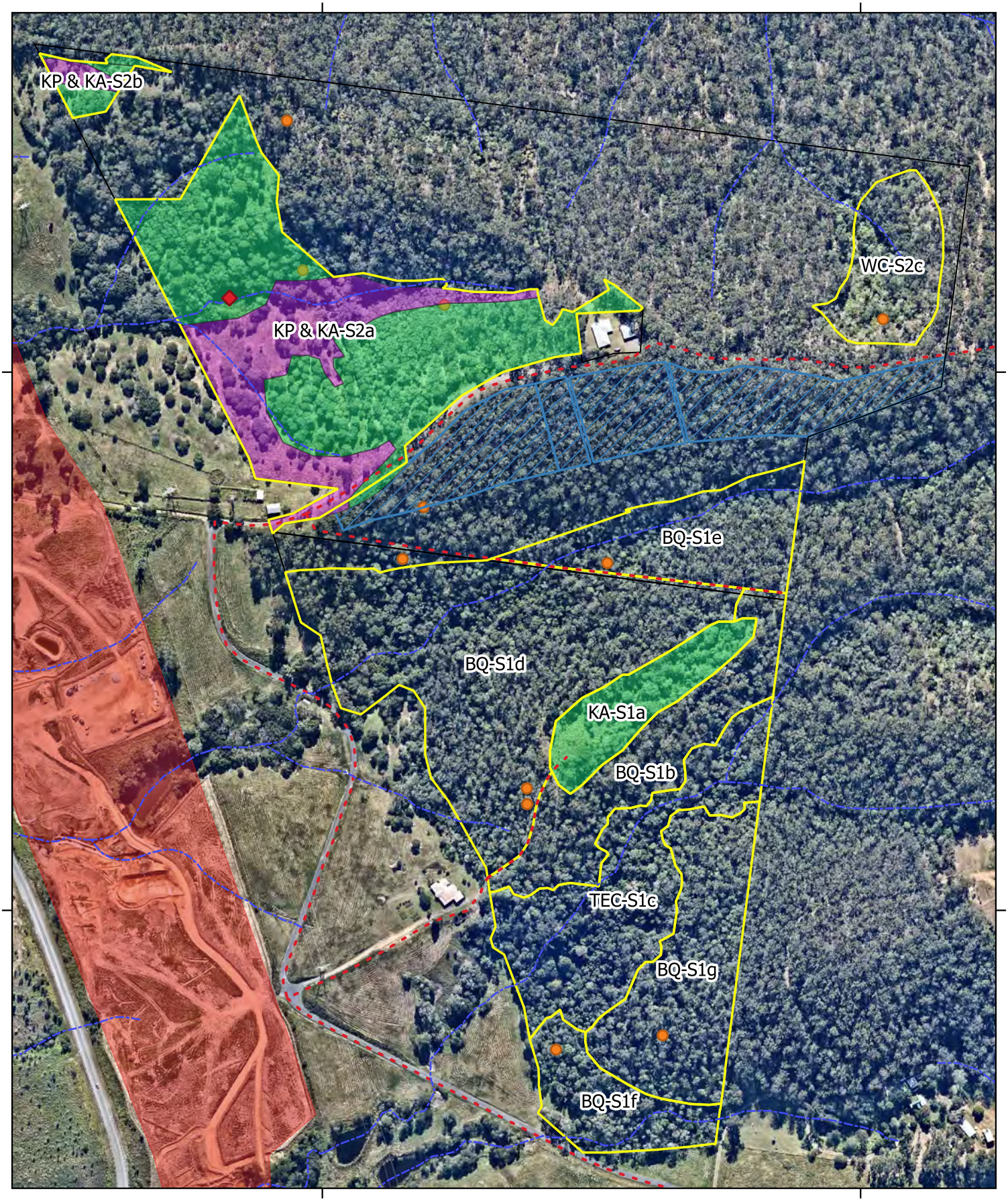
Zone boundary
Water course
Offset area
External survey point
Track
Construction footprint

ecosure
improving ecosystems

Job number: PR6322
Date: 12/08/2021

0 50 100 150 200 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct S work zones 1 and 2

Department of Transport and Main Roads

Cooroy to Curra Offset

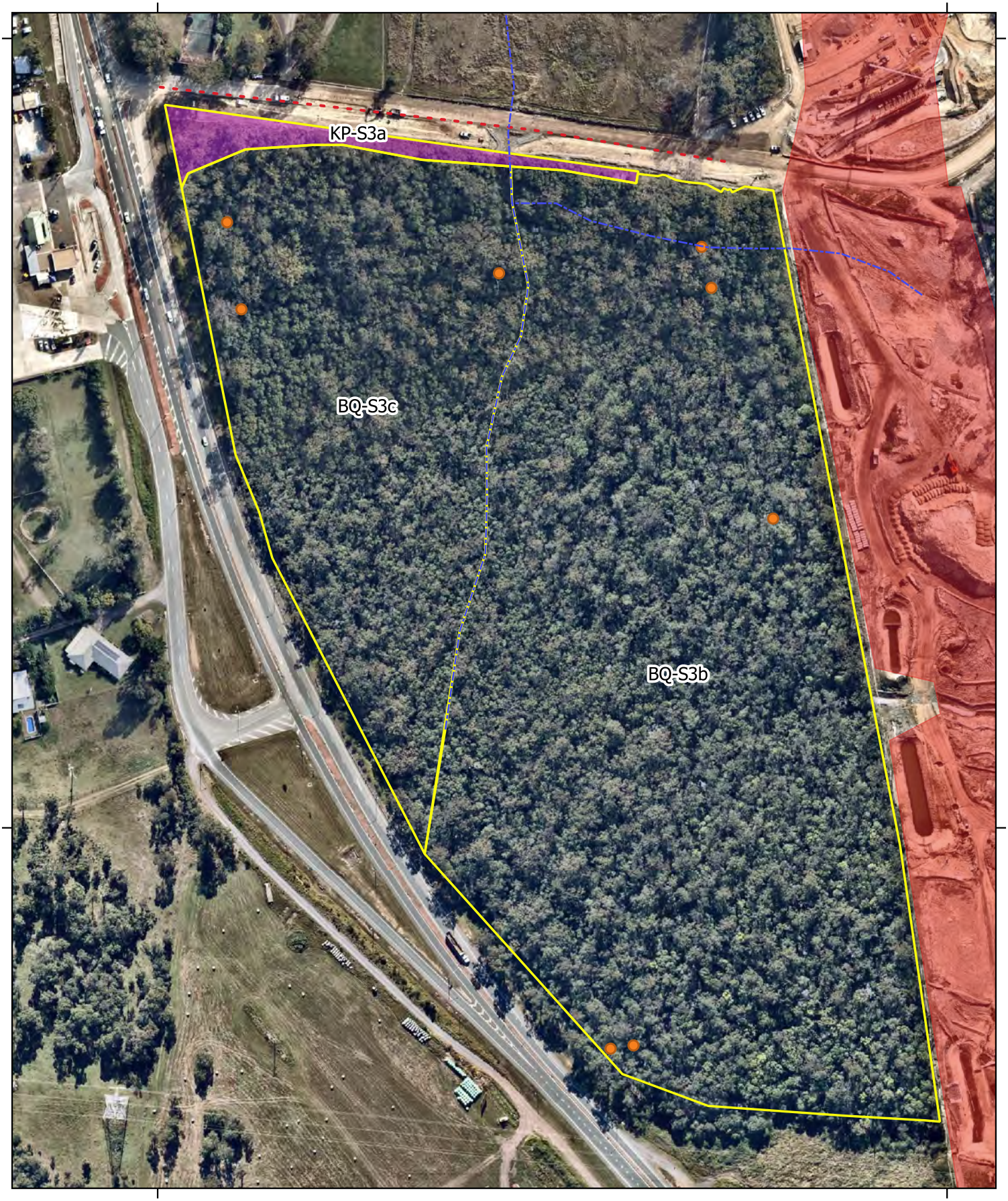
- Zone boundary
- Offset area
- Koala Assisted area
- Koala Planting area
- Water course
- Track
- Dam
- External survey point
- Construction footprint
- Translocation plot managed by others

ecosure
improving ecosystems

Job number: PR6322
Date: 02/12/2021

0 25 50 75 100 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre



Precinct S work zone 3

Department of Transport and Main Roads

Cooroy to Curra Offset

Zone boundary
Track
Koala Planting area
External survey point
Water course
Construction footprint

ecosure
improving ecosystems

Job number: PR6322
Date: 02/12/2021

0 20 40 60 80 m

GDA 2020 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 2020
Units: Metre

Appendix 2 Restoration principles

Restoration approaches

To facilitate recovery at a site, a variety of ecological restoration approaches can be applied including natural regeneration, assisted regeneration and reconstruction, mainly done via revegetation. The most suitable approach or combination of approaches was determined through a detailed site assessment as appropriate restoration approaches depend largely on the conditions of the site, the type and extent of degradation and the ability of a site to recover. In many cases, a combination of approaches is required as conditions may vary widely including within one site.

Restoration approaches include:

- Natural regeneration – applies in circumstances where resilience of the system or an area within a site is strong and recovery is likely following the removal of the cause of damage / disturbance e.g. some natural disturbances and where no ongoing human intervention is required.
- Assisted regeneration – this approach is appropriate where degrees of resilience exist and 'triggering' interventions (either disturbance or resource provision) can affect the recovery by natural regeneration. The most common form of assisted regeneration is via weed control where the soil seedbank is released through timely and ongoing weed treatments. The recovery of vegetation may also accelerate when other pressures are removed e.g. track closure, fencing, cessation of grazing.
- Reconstruction – this approach is required in highly disturbed, modified and / or degraded areas where the potential for native plant regeneration or recruitment is considered to be limited. In these situations, native species are unlikely to return to the site without greater intervention, such as planting and large-scale weed control, rehabilitation of drains and / or the importation of soil.

The approaches recommended in this plan are based on the characteristics of the project site and current best-practice ecological restoration standards outlined in the National Standards for Ecological Restoration Practice in Australia (Standards Reference Group SERA 2017).

Stages of weed control

Weed control must be applied in a systematic and sensitive manner and in a way that ensures weeds are replaced with native species rather than by other weeds. Promoting the germination and growth of native species following weed control is paramount to the success of any restoration project. To ensure weeds are replaced by native species, it is important that each zone is worked and weed regrowth has stabilised before works progress into the next zone. It is essential to the restoration process that previously worked areas receive timely, systematic and accurate follow up and weed control maintenance. To assist this process including ensuring resources are spent efficiently, weed control should be undertaken in the following stages:

1. primary weed control
2. secondary weed control or follow up
3. maintenance of the zone, number of zones and / or site.

Primary weed control

Primary weed control is the initial and strategic control of weed species. Accurate plant identification is paramount to ensure that weeds are targeted and that native species are not negatively affected. Each weed species or suite of weeds impacting a zone or an area within a zone is to be assessed to determine how the area will be approached, what techniques will be applied, how certain attributes (e.g. habitat for birds, stability of the slope) can be maintained, and how the area will be maintained efficiently and effectively. An assessment of how native species suited to the area will likely regenerate (e.g. do they need shade or light for germination) may also influence the technique/s applied.

Primary weed control may involve several techniques and is predominantly manual work using methods such as cut, scrape and paint, spot spraying and over-spraying. Primary work will often include the control of woody weeds and vines in the understory as well as the initial spray to control herbaceous weeds, vines or weed seedlings on the ground. It may also involve the over-spraying of patches of lantana once they have been prepared (i.e. cut away from native plants or after the creation of tracks to assist safe and accurate application and follow up). Where native species and ground layer weeds occur together (i.e. sporadic and small native seedlings, ferns etc.), some hand weeding may be necessary to prepare the area for spot spraying.

Secondary weed control (follow up)

On completion of primary weed control, resources vital to plant growth (light, space, moisture and nutrients) are made available to growing plants and soil seed banks. Some treated weeds will re-shoot (particularly those with underground storage systems such as cat's claw creeper) and a flush of seedlings and groundcovers, both native and exotic, are likely to occur. Identifying regenerating plant species accurately is important to ensure that correct targeted control can be applied. This may involve recognition of individual plant species at cotyledon (seed leaf) and seedling stage. Incorrect identification or weed control that is not well timed (too frequent, early or too late) and not accurate may adversely impact native species and reduce the availability of the native soil seed bank. Similarly, weeds may become established again, and if misidentified as a native and not treated, again out-compete native plants. Well-timed follow up weed control by experienced operators is essential to ensuring soil seed banks are not wasted as this significantly slows the recovery process, sometimes by years.

Site maintenance and ongoing weed control

Ongoing weed control and site maintenance are essential to ensure that the site continues to develop, and that exotic species remain at manageable levels. It can take many years of control to exhaust the soil seedbank of weed seed and reduce the capacity for modified root systems such as underground tubers associated with weeds such as cat's claw creeper, kudzu or glory lily to stop re-shooting. Furthermore, birds and other fauna, as well as natural

disturbance events (e.g. storms / cyclones, floods etc.) may assist the continued dispersal of weed seeds into an area necessitating the need for ongoing management.

The frequency and duration of site maintenance works will vary according to the capacity of a site to recover, the viability of weed seed within the soil seed banks, the weed species impacting the site, soil types, the proximity of weed sources for re-infestation, the level of edge to area ratio, the approach to restoration and by the amount of native vegetation filling available gaps. Maintenance and weed control efforts required at a site will decrease over time as the health of the site improves and gaps are filled with native vegetation instead of weeds. Ensuring that weed control maintenance is regular and matches the rates of regrowth, that works are carried out regularly and where possible by experienced bush regenerators, and that maintenance is accurate and well timed, will reduce the maintenance efforts over time.

Appendix 3 Weed control techniques

Specific techniques recommended for a range of weed species are provided below.

Cut-scrape-paint method (CSP)

This method applies to all woody shrubs, trees and some vines.

1. Cut plant low to the ground (approx. 1–2 cm above soil level) and level so herbicide does not run off, and cut stems are less hazardous to workers who may kneel on the ground.
2. Apply herbicide immediately at the suitable rate with a paintbrush approximately 1.5 cm wide.
3. Scrape 3-4 sides of the remaining stump to reveal green tissue and immediately apply the herbicide to the scraped area.
4. Take care that the brush is not contaminated with soil.

Note: All seed that has high viability and longevity should be removed from the parent plant and removed from site e.g. *Senna* spp. and other members of the Fabaceae family or plants with a high invasive potential and where fruits and seeds can easily be collected.

Larger trunks, stems or tubers should be scraped and painted in sections as cells quickly shut down once exposed preventing the translocation of herbicide.

Treating *Ochna serrulata*, the scrape must be **light** so herbicide is effectively transported to the root system. In addition, excavating soil from immediately around the base of the stem to approx. 2-3 cm depth and re-cutting and lightly scraping the base will better ensure herbicide travels further into the very deep taproot ensuring a reduction in this plant re-shooting.

Gouge-paint method

This method applies to those plant species that have a fleshy root system such as rhizomes or large bulbs. It is particularly appropriate for the treatment of exposed rhizomes of climbing asparagus fern (*Asparagus africanus*).

1. Cut the stems of the plant at head height, off native vegetation in the lower stratum and then at ground level. The stems are then cut up and spread over the ground to act as part of the leaf litter.
2. Gouge out sections of the fleshy base (rhizome) with a knife.
3. Apply herbicide at the recommended rate with a paintbrush approximately 1.5 cm wide avoiding contact with soil.

Stem Injection method

This method applies to all woody trees and shrubs with a diameter of 6-10 cm or greater.

1. With a tomahawk make a cut the width of the blade at an angle of about 45º into the base of the trunk.
2. Apply herbicide at recommended rate immediately into the cut using a tree injecting device.
3. Repeat this procedure in a brickwork pattern around the circumference of the tree as close to the ground over lapping cuts, not joining cuts. Where the presence of a crotch angle makes this difficult make a cut above it. Ensure cuts are also made on the inside of forks. This may need to be done with a drill or hand saw to get the appropriate angle. Note two rows of cuts will be sufficient for trees with trunks of 6-10 cm. Larger trunk diameters will need correspondingly more.
4. Treat all visible lateral roots as per 1 and 2.

Note stem injection can also be carried out using a drill. Holes can be inserted approximately 10 cm apart and filled with the appropriate herbicide. Lateral roots should also be drilled and filled with the appropriate herbicide.

Spot spraying method

This is carried out using a 15 L backpack spray unit with a modified spray nozzle that gives an accurate and easily adjustable spray pattern e.g. Rega®. It is advised to fill the backpack to 10 L only, to avoid back strain and spills, particularly where spraying for extended periods and on slopes.

Overspray method

This method is applicable to large, dense infestations of plants such as lantana. This method may be used where it is desirable to leave partially dead or dead plants intact to prevent erosion and over exposure of large areas, to protect native seedlings from predators such as wallabies, to avoid trampling, retain habitat and to save on resources.

1. Ensure the area is fully prepared by cutting around developing native plants and creating tracks through the lantana to assist application and maintenance.
2. Spray over the top of the infestation using a solution of water, herbicide and marker dye at the recommended rate. **Note** any native plants that may be under dense weed will be protected by the foliage cover of the weed.
3. Leave the sprayed plants intact so that native seedlings can establish under the shelter provided.
4. **Alternatively,** weeds can be cut and flattened with brush hooks or loppers and the subsequent regrowth spot sprayed.

Appendix 4 Rates of Control for weeds

Ratios for application of herbicide

Dilution ratios for the application of herbicide are provided in the table below. Always read and follow the directions on the product label and obtain a Safety Data Sheet (previously known as a Material safety data sheet) for each chemical and additive.

For some weeds a combination of glyphosate and metsulfuron-methyl (such as Associate®) is recommended, permitted under APVMA off-label permit numbers PER 11463 and PER 82307.

A surfactant such as Pulse® is added in some treatments to assist the transfer of the herbicide through the surface tissue – particularly plants with waxy leaves, such as camphor laurel, hairy commelina and umbrella tree.

Abbreviations

CSP	Cut, Scrape and Paint	Usually with a mixture of Glyphosate and water at 1:1 or 1:1.5
S&P	Scrape and Paint	Usually with straight Glyphosate
C&P	Cut and Paint	Usually with a mixture of Glyphosate and water at 1:1 or 1:1.5
SI	Stem Inject	Usually with a mixture of Glyphosate and water at 1:1 or 1:1.5
Gly	Glyphosate	e.g. Weedmaster Duo®, Roundup Biactive®
MM	Metsulfuron methyl	e.g. Associate®, Brushkiller®
S	Surfactant	e.g. Pulse®, LI700®, Prosil®
A	Spray adjuvant	e.g. Agral®, Protec®, Codacide®
dye	Colour Marking Dye	e.g. Herbi Liquid Dye®

1:1.5	1 part chemical to one and a half parts water (eg.100 ml chemical to 150 ml water)
1:50	1 part chemical to 50 parts water (e.g. 200 ml chemical to 10 litres water)
1:100	1 part chemical to 100 parts water (e.g. 100 ml chemical to 10 litres water)
1.5g:10L	1.5 gram (usually MM) to 10 litres water

Scientific name	Common name	Control methods
Herbs, ferns, grasses and groundcovers		
Ageratina adenophora	crofton weed	Spray 1:100 Gly + A + dye or 1g MM:10Lwater + A + dye. Can be hand weeded and debris hung up to prevent re-shooting
Ageratina riparia	mistflower	Spray 1:100 Gly or 1:200 Gly + A + dye or 1g MM:10Lwater + A + dye. Can be hand weeded and debris hung up to prevent re-shooting
Ageratum houstonianum	blue billygoat weed	Spray 1:100 Gly + dye or 1g MM:10Lwater + A + dye. Can be hand weeded
Asparagus aethiopicus	ground asparagus	Crown out. Hang up rhizome off ground (leaves, stems, fibrous roots and storage bulbs) can be cut up and left on ground). Spray1:100 Gly + 1.5g MM:10Lwater + A + dye
Brachiaria decumbens	signal grass	Spray 1:100 Gly + A + dye, crown or hand weed and leave in-situ
Chloris gayana	Rhodes grass	Hand pull or dig up. Spray 1:100 Gly + A + dye

Scientific name	Common name	Control methods
Gomphocarpus fruticosus	balloon cotton bush	Hand pull or spray 1:100 Gly + A + dye
Megathyrsus maximus var. *maximus*	Guinea grass	Spray 1:100 Gly + dye
Melinis minutiflora	molasses grass	Spray 1:100 Gly + dye
Praxelis clematidea	praxelis	Spray 1:100 Gly + dye or 1g MM:10Lwater + A + dye. Can be hand weeded.
Rivina humilis	coral berry	Hand pull or Spray 1:100 Gly + S + dye. Will die quicker at 1:75 or 1:50 and/or 1.5g MM :10L water + S + dye
Setaria sphacelata	setaria	Hand pull or dig up. Spray 1:100 Gly + A + dye
Sphagneticola trilobata	Singapore daisy	Spray 1.5g MM:10Lwater + S + dye or hand pull ensuring all root nodes are removed, bag and dispose. For best results - 1:100 gly + 1gMM + S + dye
Sporobolus pyramidalis, S. natalensis	giant rat's tail grass	Spray 1:100 Gly + dye:10Lwater + A + dye. Can be hand weeded
Tagetes minuta	stinking Rodger	Spray 1:100 Gly + dye or 1g MM:10Lwater + A + dye. Can be hand weeded
Trees and shrubs		
Baccharis halimifolia	groundsel bush	Hand pull seedlings. Saplings and trees CSP 1:1 Gly. Spray seedlings/regrowth 1:50 Gly + S + dye
Celtis sinensis	Chinese celtis	Hand pull seedlings. Saplings CSP or SI at 1:1 Gly. Spot spray regrowth and seedlings 1:50 Gly + A + dye or 1:50 Gly + 1.5g MM:10Lwater + A + dye
Cinnamomum camphora	camphor laurel	Hand pull seedlings or spray 1:50 Gly + S + dye or for better results spray 1:50 Gly + 1g MM:10Lwater + S + dye. Saplings CSP Gly 1:1 larger specimens SI at 1:1 Gly
Corymbia torelliana	cadaghi	Hand pull seedlings or spray 1:100 Gly + A + dye. Saplings CS&P 1:1 Gly. Larger specimens SI at 1:1 Gly
Eugenia uniflora	Brazilian cherry	Spray seedlings 1:50 Gly + 1.5g MM:10Lwater + S + dye. Saplings Cut, Scrape (LIGHTLY) and Paint 1:1 Gly + 1gMM. Larger specimens SI at 1:1 Gly + 1gMM
Lantana camara	lantana	Lopper, then CS&P base 1:1 Gly. Spot spray regrowth and overspray large infestations 1:100 Gly+ A + dye. Red flowering species will require a rate of 1: 50 Gly + A + dye. Splatter gun method Gly 1:9. (1 part Gly to 9 parts water) + dye (best results when plants actively growing) Hang thick large stems or base of stems off -ground
Ligustrum sinense	small-leaved privet	Spray seedlings 1:50 Gly + A + dye or 1g MM:10Lwater + A + dye. CSP saplings 1:1 Gly. Larger specimens SI at 1:1 Gly
Mangifera indica	mango	Hand pull seedlings or spray 1:50 Gly + A + dye. Saplings CSP 1:1 Gly. Larger specimens SI at 1:1 Gly. (Do NOT stem inject when in fruit)
Murraya paniculata	murraya	Hand pull seedlings or spot spray 1:50 Gly + S + dye. Shrubs CSP 1:1 Gly or larger specimens SI at 1:1 Gly
Ochna serrulata	ochna	Excavate 2-4 cm around base of plant and CSP low ensuring Scrape is LIGHT Gly + water and 1g MM. Spot spray regrowth and seedlings <30cm tall 1:50 Gly + 1.5g MM: 10L water + A + Dye. DO NOT TRY TO HAND PULL,

Scientific name	Common name	Control methods
		for larger specimens – SI or cut + drill or split down tap root + paint or frill with Gly 1:1 + 1g MM
Pinus elliottii	slash pine	Seedlings hand pull or spray 1:50 Gly + A + dye. Saplings and trees, cut close to ground or ringbark. Larger specimens SI at 1:1 Gly
Schefflera actinophylla	umbrella tree	Hand pull seedlings or spray 1:50 Gly + 1.5g MM:10Lwater + A + dye. Saplings CSP and larger specimens SI at 1:1 Gly (Do NOT stem inject when in flower as it can affect birds feeding on nectar)
Senna pendula var. *glabrata*	Easter cassia	Hand pull young plants. Spray seedlings 1:50 Gly + A + dye. CSP saplings 1:1 Gly. Large specimens SI at 1:1 Gly (bag seed pods and dispose where possible)
Senna septemtrionalis	smooth senna	Hand pull young plants. Spray seedlings 1:50 Gly + A + dye. CSP saplings 1:1 Gly. Larger specimens SI at 1:1 Gly (bag seed pods and dispose where possible)
Solanum chrysotrichum	giant devil's fig	Seedlings hand pull or spray 1:100 Gly + A + dye. Saplings CSP 1:1 Gly. Larger specimens SI at 1:1 Gly
Solanum torvum	devil's fig	Seedlings hand pull or spray 1:100 Gly + A + dye. Saplings CSP 1:1 Gly. Larger specimens SI at 1:1 Gly
Syagrus romanzoffianum	Cocos palm	Hand pull or crown young seedlings. Cut down and cut out below growing point. Larger specimens SI at 1:1 Gly (various results)
Vines and scramblers		
Aristolochia elegans	Dutchman's pipe	Hand pull seedlings or spray 1:50 Gly + S + dye or 1.5g MM:10Lwater + S + dye. Climbing vines CSP 1:1 Gly
Asparagus plumosus	climbing asparagus	Cut off at head height (first) then cut low to ground and either crown out rhizome and hang off ground or spray regrowth 1:50 Gly + A + dye. Spot spray seedlings
Dolichandra unguis-cati	cat's claw creeper	Large climbing vines, cut at waist height and again at the base by CSP 1:1 Gly + 1g MM. This assists in visually checking for regrowth. Spray seedlings and regrowth 1:100 Gly + S + dye or 1:100 Gly + 1g MM + S + dye
Passiflora foetida	stinking passionflower	Hand pull seedlings and smaller vines or spray regrowth and vines scrambling on ground 1:50 Gly + S + dye. Follow large vines on ground and CSP 1:1 Gly or carefully hand pull
Passiflora suberosa	corky passionfruit	Hand pull seedlings and smaller vines or spray regrowth and vines scrambling on ground 1:50 Gly + S + 1.5g MM:10L water + dye. Follow large vines on ground and CSP 1:1 Gly or carefully hand pull
Passiflora subpeltata	white passionfruit	Hand pull seedlings and smaller vines or spray regrowth and vines scrambling on ground 1:50 Gly + S + dye. Follow large vines on ground and CSP 1:1 Gly or carefully hand pull. Collect and remove fruits where practical
Solanum seaforthianum	climbing nightshade	CSP 1:1 Gly. Spray seedlings/regrowth 1:00 Gly + A + dye

Appendix 5 Revegetation Species Lists

Table 5 Koala food tree planting species and numbers by subzone

Species	N1a	N1b	N1c	N1d	N1e	N1f	S2a	S2b	S3a	Total
Corymbia citriodora subsp. *varigata*	96	73	89	81	243	122	105	4	8	**821**
Corymbia intermedia	112	73	104	83	250	122	105	4	8	**861**
Eucalyptus crebra	96	0	89	33	226	75	0	0	0	**519**
Eucalyptus major	96	0	89	26	165	50	77	3	0	**506**
Eucalyptus microcorys	0	0	0	22	183	75	115	5	0	**400**
Eucalyptus moluccana	96	0	89	11	43	0	0	0	0	**239**
Eucalyptus propinqua	0	0	0	16	137	56	77	3	0	**289**
Eucalyptus siderophloia	96	73	89	81	243	122	105	4	8	**821**
Eucalyptus tereticornis	112	122	104	119	317	166	115	5	13	**1073**
Eucalyptus tindaliae	0	49	0	49	148	88	0	0	5	**339**
Lophostemon confertus	96	0	89	36	256	88	77	3	0	**645**
Lophostemon suaveolens	0	122	0	88	89	103	0	0	13	**415**
Melaleuca quinquenervia	0	122	0	81	28	78	0	0	13	**322**
Total	**800**	**634**	**742**	**726**	**2328**	**1145**	**776**	**31**	**68**	**7,250**

Appendix 6 TEC species lists

Table 6 Species recorded within the TEC (Reproduced from the WSP report to the Department for Transport and Main Roads from November 2020 entitled 'Lowland Rainforest TEC Baseline Monitoring Report Kawana and Woodum Offset Areas 2020 Cooroy to Curra Stage D – Appendix B')

Species Name	Lowland Rainforest TEC Appendix A Flora Species (see table below)
Acacia disparrima	
Acacia glaucophylla	
Acacia maidenii	
Acronychia laevis	
Actephila lindleyi	x
Adiantum hispidulum	
Alchornea ilicifolia	
Alectryon tomentosus	
Alphitonia excelsa	x
Alyxia ruscifolia	
Aphananthe philippinensis	x
Araucaria cunninghamiana	x
Argyrodendron trifoliolatum	x
Arytera distylis	x
Arytera divaricata	
Asplenium attenuatum	
Atractocarpus chartaceus	x
Austrosteenisia blackii	
Backhousia subargentea	
Bosistoa medicinalis	
Capparis arborea	x
Cissus antarctica	x
Clerodendrum tomentosum	
Commersonia bartramia	x
Cordyline rubra	x
Corymbia citriodora var. *variegata*	
Corymbia intermedia	
Croton verreauxii	
Cryptocarya laevigata	
Cupaniopsis parvifolia	
Cupaniopsis serrata	x
Dioscorea transversa	x
Diospyros fasciculosa	
Dissiliaria baloghioides	
Drypetes deplanchei	
Erythroxylon australe	
Eucalyptus acmenoides	
Eucalyptus propinqua var. *propinqua*	

Species Name	Lowland Rainforest TEC Appendix A Flora Species (see table below)
Eucalyptus siderophloia	
Eustrephus latifolius	x
Everistia vacciniifolia	
Flindersia australis	x
Flindersia schottiana	x
Geitonoplesium cymosum	x
Gossia bidwillii	x
Jagera pseudorhus	x
Lophostemon confertus	x
Mallotus philippinensis	x
Medicosma cunninghamii	
Melia azedarach	x
Mischocarpus pyriformis	
Oplismenus aemulus	
Pilidiostigma rhytispermum	
Pittosporum multiflorum	x
Platycerium superbum	x
Polyalthia nitidissima	
Polyscias elegans	x
Psydrax odorata	
Rhodamnia dumicola	
Sarcopteryx stipata	x
Sloanea australis	x
Smilax australis	x
Solanum aviculare	
Stenocarpus sinuatus	
Streblus brunonianus	x
Syzygium luehmannii	
Tabernaemontana pandacaqui	x
Vitex lignum-vitae	
Wilkiea austroqueenslandica	x
Wilkiea macrophylla	

Table 7 Species associated with the TEC to achieve a diversity of >50 woody species (Appendix A from the listing advice for the TEC of Lowland Rainforest of Subtropical Australia available from http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=101)

Species	Common name
Acacia bakeri	marblewood
Acacia chrysotricha	Newry golden wattle
Acalypha eremorum	acalypha
Ackama paniculata	soft corkwood, rose-leaved marara
Acmena ingens	red apple; southern satinash

Species	Common name
Acmena smithii	lilly pilly, lilly pilly; satinash
Acradenia euodiiformis	bonewood
Acronychia baeuerlenii	Byron Bay acronychia
Actephila lindleyi	actephila
Alphitonia excelsa	red ash; soapbush
Amyema plicatula	
Angiopteris evecta	giant fern
Anopterus macleayanus	Macleay laurel
Anthocarapa nitidula	incense tree, bog onion
Aphananthe philippinensis	rough leaved elm, grey handlewood
Araucaria cunninghamii	hoop pine
Archidendron hendersonii	white laceflower
Archidendron muellerianum	veiny laceflower
Archontophoenix cunninghamiana	Bangalow palm; piccabeen
Ardisia bakeri	ardisia bakeri
Argyrodendron actinophyllum	black booyong
Argyrodendron trifoliolatum	white booyong
Arthraxon hispidus	hairy jointgrass
Arthropteris palisotii	lesser creeping fern
Arytera distylis	twin-leaved coogera
Asperula asthenes	trailing woodruff
Asplenium australasicum	bird's nest fern
Atractocarpus chartaceus	narrow leaved gardenia
Baloghia inophylla	brush bloodwood, scrub bloodwood
Baloghia marmorata	jointed baloghia
Beilschmiedia elliptica	grey walnut
Belvisia mucronata	needle-leaf fern
Bosistoa transversa	yellow satinheart, heart-leaved bonewood
Brachychiton acerifolius	flame tree
Breynia oblongifolia	coffee bush
Bridelia exaltata	brush ironbark
Bulbophyllum globuliforme	hoop pine orchid
Calamus muelleri	lawyer vine
Callicoma serratifolia	black wattle, callicoma
Capparis arborea	brush caper berry
Cassia marksiana	brush cassia
Castanospermum australe	black bean
Ceratopetalum apetalum	coachwood
Choricarpia subargentea	giant ironwood
Cinnamomum oliveri	Oliver's sassafrass, camphorwood
Cissus antarctica	native grape vine, water vine
Cissus hypoglauca	giant water vine
Citrus australasica	finger lime
Cleistanthus cunninghamii	cleistanthus, omega
Clematis fawcettii	northern clematis

Species	Common name
Clerodendrum floribundum	lolly bush
Coatesia paniculata	axe-breaker
Commersonia bartramia	brown kurrajong
Cordyline congesta	palm lily
Cordyline rubra	red-fruited palm-lily
Corokia whiteana	corokia
Corynocarpus rupestris subsp. *arborescens*	southern corynocarpus
Cryptocarya foetida	stinking cryptocarya
Cryptocarya obovata	pepperberry tree, white walnut
Cupaniopsis newmanii	cupaniopsis newmanii
Cupaniopsis serrata	smooth tuckeroo
Cynanchum elegans	white-flowered wax plant
Davidsonia jerseyana	Davidson's plum
Davidsonia johnsonii	smooth Davidson's plum
Dendrobium speciosum	rock lily
Dendrocnide excelsa	giant stinging tree
Dendrocnide moroides	Gympie stinger
Desmodium acanthocladum	thorny pea
Dioscorea transversa	native yam
Diospyros mabacea	red-fruited ebony
Diospyros major var. *ebenus*	shiny-leaved ebony
Diospyros pentamera	myrtle ebony, grey persimmon, grey plum
Diploglottis australis	native tamarind
Diploglottis campbellii	small-leafed tamarind
Dysoxylum fraserianum	rosewood
Dysoxylum mollissimum	red bean
Dysoxylum rufum	hairy rosewood, rusty mahogany
Elaeocarpus grandis	blue quandong
Elaeocarpus obovatus	hard quandong
Elattostachys nervosa	green tamarind
Elaeocarpus sedentarius	Minyon quandong, Rocky Creek quandong
Elaeocarpus williamsianus	hairy quandong
Endiandra floydii	Crystal Creek walnut
Endiandra globosa	black walnut
Endiandra hayesii	rusty rose walnut
Endiandra muelleri subsp. *bracteata*	green-leaved rose walnut
Endiandra pubens	hairy walnut
Eupomatia bennettii	small bolwarra
Eustrephus latifolius	wombat berry
Ficus spp.	figs
Ficus coronata	creek sandpaper fig
Ficus fraseri	sandpaper fig
Ficus macrophylla	Moreton Bay fig
Ficus obliqua	small leaved fig
Ficus watkinsiana	strangling fig

Species	Common name
Flindersia australis	native teak, crows ash
Flindersia schottiana	bumpy ash
Flindersia xanthoxyla	long jack, yellowwood
Floydia praealta	ball nut
Fontainea australis	southern fontainea
Fontainea oraria	coastal fontainea
Geitonoplesium cymosum	scrambling lily
Glochidion ferdinandi	cheese tree, buttonwood
Gmelina leichhardtii	white beech
Gossia bidwillii	python tree
Gossia fragrantissima	sweet myrtle
Grammitis stenophylla	narrow-leaved finger-fern
Grevillea hilliana	white yiel
Grevillea robusta	silky oak
Guioa semiglauca	guioa
Helicia glabriflora	smooth or pale helicia, pale oak, leather oak, brown oak
Helmholtzia glaberrima	stream lily
Hicksbeachia pinnatifolia	red boppel nut
Hymenosporum flavum	native frangipani
Isoglossa eranthemoides	isoglossa
Jagera pseudorhus	foambark
Lenwebbia prominens	velvet myrtle
Lepiderema pulchella	fine-leaved tuckeroo
Lindsaea brachypoda	short-footed screw fern
Linospadix monostachya	walking stick palm
Litsea australis	brown bolly gum
Livistona australis	cabbage tree palm
Lophostemon confertus	brushbox
Macadamia integrifolia	macadamia nut
Macadamia tetraphylla	rough-shelled bush nut
Maclura cochinchinensis	cockspur thorn
Mallotus discolor	green kamala
Mallotus philippensis	red kamala
Marsdenia longiloba	slender marsdenia
Melia azedarach	white cedar
Melicope micrococca	white euodia
Melicope vitiflora	northern euodia
Morinda jasminoides	sweet morinda
Myrsine richmondensis	ripple-leaf muttonwood
Neolitsea australiensis	bolly gum
Neolitsea dealbata	white bolly gum
Niemeyera chartacea	
Niemeyera whitei	rusty plum
Notelaea johnsonii	veinless mockolive
Notelaea longifolia	mock olive

Species	Common name
Oberonia complanata	yellow-flowered king of the fairies
Oberonia titania	red-flowered king of the fairies
Ochrosia moorei	southern ochrosia
Owenia cepiodora	onion cedar
Pandorea floribunda	wonga vine
Pararchidendron pruinosum	snow wood
Pararistolochia praevenosa	Richmond birdwing vine
Parsonsia straminea	monkey rope; silkpod
Pellaea falcata	sickle fern
Pentaceras australe	bastard crow's ash
Peristeranthus hillii	brown fairy-chain orchid
Phyllanthus microcladus	brush sauropus
Pittosporum multiflorum	orange thorn
Pittosporum revolutum	hairy pittosporum, rough-fruited pittosporum
Pittosporum undulatum	sweet pittosporum
Planchonella australis	black apple
Platycerium bifurcatum	elkhorn fern
Platycerium superbum	staghorn fern
Plectranthus nitidus	Nightcap plectranthus
Pollia crispata	pollia
Polyscias elegans	silver basswood, celerywood
Pomaderris notata	McPherson Range pomaderris
Psilotum complanatum	flat fork fern
Samadera sp. *Mt Nardi* (B.L.WalkerAQ330746)	southern quassia
Quintinia verdonii	grey possumwood, smooth possumwood
Randia moorei	spiny gardenia
Rhodamnia maideniana	smooth scrub turpentine
Rhodamnia rubescens	brush turpentine
Sarcochilus dilatatus	brown butterfly orchid
Sarcochilus fitzgeraldii	ravine orchid
Sarcochilus weinthalii	blotched sarcochilus
Sarcomelicope simplicifolia	yellow acronychia
Sarcopteryx stipata	steelwood, corduroy
Senna acclinis	rainforest cassia
Sloanea australis	maidens blush, blush alder
Sloanea woollsii	yellow carabeen
Smilax australis	sarsaparilla
Sophora fraseri	brush sophora
Stephania japonica var. *discolor*	snake vine; tape vine
Streblus pendulinus	whalebone tree
Syzygium australe	brush cherry, creek satinash
Syzygium crebrinerve	purple cherry, rose satinash
Syzygium floribundum	weeping lilly pilly, weeping satinash
Syzygium francisii	giant watergum, rose satinash
Syzygium hodgkinsoniae	red lilly pilly

Species	Common name
Syzygium moorei	durobby, coolamon, rose apple
Tabernaemontana pandacaqui	banana bush
Triflorensia cameronii	Cameron's tarenna
Tinospora tinosporoides	arrow-head vine
Toechima dasyrrhache	blunt-leaved steelwood
Toona ciliata	red cedar
Triunia youngiana	honeysuckle bush, spice bush
Wilkiea austroqueenslandica	smooth wilkiea
Wilkiea huegeliana	veiny wilkiea
Zieria collina	hill zieria

Appendix 7 Photo monitoring proforma

Photo Monitoring Data Sheet

Project details

Photographer

Date:

Photo ID point	GPS Settings (GDA 94/WGS 84, UTM grid system, Zone 56)		Bearing (deg°)	Filename	Weather		Camera Setting			Comments
	Northing	Easting			Fine	Overcast	Auto	Landscape	Portrait	
e.g. 1a(i)	e.g. 547287	6886371	0°	GV405-MM.PMP001 2014 03 31						Photo taken head height from star picket at 2.30 pm (commence file name with GV405-MM. photo point number then the date (year, month, day)

Appendix 8 Daily record sheet proforma

Daily Herbicide Use Sheet Retain for 2 Years (*Agricultural Chemicals Distribution Control Act 1966*)

Environmental Conditions			
☐ Clear	☐ Dry	Wind speed (*km/hr*):	
☐ Overcast	☐ Mild	Wind direction (*N,E,S,W*):	
☐ Showers	☐ Humid	Temperature (^{O}C):	

Zone Vegetation Type		
☐ Dry Eucalypt	☐ Rainforest	☐ Coastal
☐ Wet Eucalypt	☐ Riparian	☐ Dune system
	☐ Wetlands	☐ Other:

Site:		Date:	
Work Location:		Time start:	
		Time finish:	

Personnel using herbicide	

Equipment Used	Chemicals Used (trade name)	Total quantity applied on site		Rate:	Plants treated	Method
☐ Knapsack ☐ Power spray ☐ ATV unit ☐ Poison Pot ☐ Injector Kit ☐ Quikspray ☐ Splatter Gun	☐ Glyphosate:	amount used	*ml.*			
	☐ Metsulf. methyl:	amount used	*g.*			
	☐ Surfactant:	amount used	*ml.*			
	☐ Penetrant:	amount used	*ml.*			
	☐ Dye:	amount used	*ml.*			
	☐ Other:	amount used	*ml.*			
		Tot. volume of mixture:		Litres		
		Total area treated:		m^2		

Equipment Used	Chemicals Used (trade name)	Total quantity applied on site		Rate:	Plants treated	Method
☐ Knapsack ☐ Power spray ☐ ATV unit ☐ Poison Pot ☐ Injector Kit ☐ Quikspray ☐ Splatter Gun	☐ Glyphosate:	amount used	*ml.*			
	☐ Metsulf. methyl:	amount used	*g.*			
	☐ Surfactant:	amount used	*ml.*			
	☐ Penetrant:	amount used	*ml.*			
	☐ Dye:	amount used	*ml.*			
	☐ Other:	amount used	*ml.*			
		Tot. volume of mixture:		Litres		
		Total area treated:		m^2		

Equipment Used	Chemicals Used (trade name)	Total quantity applied on site		Rate:	Plants treated	Method
☐ Knapsack ☐ Power spray ☐ ATV unit ☐ Poison Pot ☐ Injector Kit ☐ Quikspray ☐ Splatter Gun	☐ Glyphosate:	amount used	*ml.*			
	☐ Metsulf.methyl:	amount used	*g.*			
	☐ Surfactant:	amount used	*ml.*			
	☐ Penetrant:	amount used	*ml.*			
	☐ Dye:	amount used	*ml.*			
	☐ Other:	amount used	*ml.*			
		Tot. volume of mixture:		Litres		
		Total area treated:		m^2		

Vegetation Field Work Sheet

Park Name:		**Date:**	
Total hours personnel x hours		**Contractor:**	
Personnel:			

	Precinct	Zone	Primary (hrs)	Follow up (hrs)	Planting/ Other Hrs	Planting No' s	Comments
Work Completed (description of work undertaken)							

Follow-up Comments	
Native flora notes (Scientific name)	**Flowering:**
	Fruiting:
	Germinating:

Reportable incidents	**Details**
Client Contact:	
Fauna Notes: Observations	
Flora Notes: flowering/seeding	
OH&S Issues	
Public Contact	
Weather Conditions	
Project Blockages	
Environmental Issues	

Name:_____ Signature:_____

Appendix 9 Example planting inspection monitoring form

N1b

Created	2021-12-02 03:58:37 UTC by Ian Roberts
Updated	2021-12-02 04:09:37 UTC by Ian Roberts
Location	-27.9929613881, 153.315806156
Date	2021-10-04
Zone	N1b
Number of dead plants	2
Observations of plant damage	Some predation where plants have grown over tree guard
Observations of health and growth	Many plants showing new growth
Other comments	Soil wet underfoot
Photos	

Revision History

Revision No.	Revision date	Details	Prepared by	Reviewed by	Approved by
00	07/12/2021	Cooroy to Curra Offset Management Plan	Ian Roberts, Senior Restoration Ecologist	Jen Ford, Principal Restoration Ecologist	

Distribution List

Copy #	Date	Type	Issued to	Name
1	07/12/2021	Electronic	Department of Transport and Main Roads	Justin Sanderson
2	07/12/2021	Electronic	Ecosure	Administration

Citation: Ecosure 2021, *Cooroy to Curra Offset Management Plan*, report to the Department of Transport and Main Roads, Ecosure, Brisbane.

Report compiled by Ecosure Pty Ltd

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PR6322-RE.Cooroy to Curra Offset Management Plan.FI

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