# Appendix A: Field survey methodology

### Tabooba – vegetation surveys

To assess the suitability of Tabooba for Koala and GHFF offsets, habitat assessment and BioCondition surveys were undertaken in May 2022 to compare with the habitat quality identified in the action corridor. This applied the methods of the *Guide to Determining Terrestrial Habitat Quality – Version 1.3* (Queensland Government 2020) in line with the habitat assessments undertaken in the action corridor for Koala (Planit 2021a) and GHFF (Planit 2021b), as well as per the *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland* (Eyre et al., 2015); and *Method for the establishment and survey of reference sites for BioCondition*, Version 2.0 (Eyre, et al. 2011) using the most recent Queensland Herbarium Biocondition Benchmarks.

Additional assessment has been undertaken for Koala and GHFF as described below, and the results have been applied in accordance with *How to use the offsets assessment guide* (DSEWPaC, 2012), taking into account site condition, site context and species stocking rate to contribute to the calculation of habitat quality using the EPBC Act Offsets assessment guide.

The site vegetation mapping was ground-truthed, compared to satellite imagery and then adjusted accordingly (refer to BAAM 2022, Figure 5.6). Due to the different ages of regrowth on the property, regrowth vegetation was divided into the following categories:

- Advanced Regrowth: areas supporting a continuous canopy in aerial imagery that was indistinguishable from areas mapped as remnant; and
- Young Regrowth: areas supporting a broken canopy with scattered taller trees, but generally dominated by scattered smaller trees as evident in satellite imagery.

This information was also used to determine the number of transects in each assessment unit (AU; which is the vegetation type and condition) to fulfill the recommendations provided in the BioCondition Framework. This was achieved on 4 of the vegetation classifications; however, significantly wet weather conditions and terrain challenges prevented an additional survey being undertaken on two classifications.

The AUs are described as:

**AU1 REMNANT RE 12.8.16:** 49.831 ha. Remnant *Eucalyptus crebra, E tereticornis +/- Angophora subvelutina* open forest.

**AU2 ADVANCED REGROWTH RE 12.8.16:** 144.823 ha. Advanced regrowth of open forest dominated by *Eucalyptus tereticornis subsp. basaltica, E. crebra +/- Corymbia tessellaris, C. intermedia*. Occasional relictual trees present.

**AU3 YOUNG REGROWTH RE 12.8.16:** 48.105 ha. Young regrowth open forest with occasional emergent relictual trees. Dominant species include *Eucalyptus crebra, E. tereticornis* and *Corymbia tessellaris*.

**AU4 REMNANT RE 12.8.14:** 50.666 ha. Remnant open forest dominated by *Eucalyptus melliodora*, *E. tereticornis* subsp. *basaltica*, *E. eugeniodes, Angophora subvelutina* and *Corymbia intermedia*.

**AU5 ADVANCED REGROWTH RE 12.8.14:** 19.815 ha. Advanced regrowth of *Eucalyptus eugeniodes, E. tereticornis* subsp. *basaltica, E. melanophloia* open forest.

**CLEARED PADDOCK FORMERLY OF RE 12.8.16:** 76.925 ha. Cleared paddocks with lone trees. Queensland Herbarium Pre-clear RE mapping indicates it would have supported RE 12.8.16.

### Tabooba – fauna surveys

Koala were surveyed at Tabooba in both March and May 2022 by Spot Assessment Technique (**SAT**) (as per Phillips and Callaghan, 2011) to determine localised levels of habitat use by koala, and thermal-imaging drone surveys to gather baseline Koala density data in areas that were difficult and/or impossible to survey by foot.

Koala SAT surveys, including searching for individuals in trees and scats within 1m of the base of suitable forage trees, were undertaken in accessible locations on the property on 17 March 2022 and 6-7 May 2022. The nine SAT surveys encompassed 279 koala food trees of *Angophora leiocarpa, Eucalyptus crebra, E. tereticornis, E. melliodora, Lophostemon confertus, Corymbia intermedia* and *C. tessellaris*. These surveys were undertaken predominantly within advanced and young regrowth vegetation, as remnant vegetation on the steeper slopes was relatively inaccessible due to very wet conditions and with dense lantana and/or too steep to survey safely. There was only one site where a SAT survey could be undertaken in riparian vegetation as the channel was relatively shallow and erosion had reduced the amount of weed cover.

Conditions for observing scats were not ideal due to a prolonged wet season, resulting in scats being washed away on steep slopes and riparian areas, degrading quickly in warm and wet conditions, or being lost in the dense grass and/or weed cover. Additionally, weather and terrain challenges prevented access to areas where Koala were identified in the drone surveys.

No surveys targeting GHFF were conducted at Tabooba as there were no flowering events at the time of surveys. However, the property is dominated by preferred forage species of GHFF, including the winter-flowering *Eucalyptus tereticornis* and *E. crebra*, which are critical resources for the species (*National Recovery Plan for the Grey-headed Flying-fox* Pteropus poliocephalus DAWE, 2021).

Both REs present on Tabooba rank as high-moderate value foraging habitat for GHFF. The Recovery Plan describes vegetation communities containing (amongst other species) *Eucalyptus crebra, E. tereticornis* and *E. melliodora* as important resources for grey-headed flying-fox on coastal lowlands of Southern Queensland as they flower reliably over the winter and spring period. While the property is not located within the coastal lowlands of southern Queensland, Eby and Law (2008) state that productive areas for winter flowering are concentrated in South East Queensland and northern New South Wales where flowering occurs in small remnants in coastal floodplains, coastal dunes and inland slopes, and during spring the extent of productive habitat increases in northern regions, expanding from the coastal lowlands into the coastal ranges and valleys.

The presence of critical forage species and distance to a nationally important GHFF camp (within 20 km) indicates Tabooba supports habitat critical to the survival of GHFF.

### Greenridge – vegetation surveys

Field surveys were undertaken at Greenridge to assess its suitability for use as an offset for Coastal Swamp Oak TEC, Koala and GHFF. In accordance with the methods of the *Guide to Determining Terrestrial Habitat Quality – Version 1.3* (the guide) Greenridge was mapped into like AUs, differentiated based on:

- RE type; and

- Vegetation condition (remnant, advanced regrowth, young regrowth or cleared).

Ground-truthing of a number of polygons of the RE types supporting *Casuarina glauca* was undertaken through applying the quaternary survey method of Neldner et al. (2017). Field observations and the use of historical aerial photography contributed to delineation of the regrowth vegetation.

The AUs are described as:

**AU1 REMNANT RE 12.1.1:** 14.2 ha. Remnant *Casuarina glauca* open forest. Wholly analogous with the coastal swamp oak TEC.

**AU2 REGROWTH RE 12.1.1:** 5.16 ha. Regrowth *Casuarina glauca* open forest.

**AU3 NON-REMNANT RE 12.1.1:** 22.03 ha. Non-remnant *Casuarina glauca* open forest (presently grassland).

**AU4 REMNANT RE 12.3.20:** 12.9 ha. Remnant *Casuarina glauca*, *Eucalyptus tereticornis* and *Melaleuca quinquenervia* open forest. Where dominated by *Casuarina glauca* the community is analogous with the Coastal Swamp Oak TEC.

**AU5 REGROWTH RE 12.3.20:** 4.77 ha. Regrowth *Casuarina glauca, Eucalyptus tereticornis* and *Melaleuca quinquenervia* open forest.

**AU6 NON-REMNANT RE1 2.3.20:** 11.88 ha. Non-remnant *Casuarina glauca, Eucalyptus tereticornis* and *Melaleuca quinquenervia* open forest (presently grassland).

Additional data were collected during field surveys to inform habitat quality scoring parameters for MNES not captured using the standard BioCondition method. These included the following based on the relevant MNES:

1. *Casuarina glauca* canopy cover

    Using the same method described below for Koala tree canopy cover, the proportion of *Casuarina glauca* cover for some transects was also recorded to assist in identifying patches of Coastal Swamp Oak that would qualify as the TEC.

2. Koala tree canopy cover

    When assessing the quality of food and foraging habitat for koala using the scoring method applied in the Impact Area Assessment prepared by Planit (2021a), it was necessary to record the proportion of canopy cover comprised of Koala food tree species known to support koalas within the region. Gold Coast City Council identify the following species as diet species for Koala in the region:

    Preferred Koala food trees:

    - forest red gum or Queensland blue gum (*Eucalyptus tereticornis*)
    - tallowwood (*E. microcorys*)
    - swamp mahogany (*E. robusta*)
    - grey gums (*E. propinqua* and *E. biturbinata*).

    Important local supplementary food sources:

    - narrow-leaved red gum (*E. seeana*)
    - white stringybark (*E. tindaliae*)
    - red mahogany (*E. resinifera*)
    - brush box (*Lophostemon confertus*)

- broad-leaved paperbark (*Melaleuca quinquenervia*).

The City of Gold Coast Koala Conservation Plan states that many other species are known to be utilised by Koala. An in-situ monitoring program at East Coomera during 2007-2014 identified Koalas using more than 40 tree species including those of the genera *Eucalyptus, Corymbia, Melaleuca, Lophostemon* and *Angophora*; however, it is unclear which species, if any, are utilised solely for shelter as opposed to constituting diet (Gold Coast City Council 2018). Based on the REs recorded on Greenridge that are known to provide suitable habitat for koalas and are dominated by recognised Koala food trees, species from any of the above genera were counted as potential Koala food trees for the purposes of this assessment.

Standard BioCondition surveys record canopy cover by measuring the vertical projection of canopy intercepting a 100m transect line (Eyre et al. 2015). To capture the proportion of the canopy comprised of Koala food trees, these species were distinguished separately from other canopy species when recording canopy cover over the 100m transect. Distances of the Koala tree canopies over the 100m transect were summed and then calculated as a proportion of the total canopy cover (koala tree cover plus non-Koala tree cover, less any overlaps).

### Greenridge – fauna surveys

Transects in general accordance with Dique et al. (2003) were undertaken to measure localised levels of habitat use by Koalas to gather baseline Koala density data (refer to the full report from the surveys as provided at Appendix 3 of BAAM 2022).

Seven SAT surveys and eight Strip Transect surveys were carried out on Greenridge on 30 June, 1 July, 27 July and 3 August 2022. The results of two of each survey type, undertaken on 27 July and 3 August (at locations shown on Figure 6.8 of BAAM 2022), were reported as these were the only sites relevant to a action Koala offset AU4 (remnant RE 12.3.20). An additional SAT survey was carried out in the eastern portion of Greenridge in State-mapped RE 12.3.20; however, the mapped RE 12.3.20 at this location was subsequently determined to represent a heterogenous polygon comprised of three separate REs (including 12.3.20) and the survey results at that location were therefore not considered representative of a homogenous polygon of remnant RE 12.3.20.

No Koala scats were recorded from the three SAT surveys undertaken within AU4 and no Koalas were recorded from the three Strip Transects undertaken within AU4.

No flying-fox camps were recorded on site, and none have been known from Greenridge previously. GHFF surveys were not undertaken on Greenridge as the REs present are known to be of high value to the species. Greenridge is within 20 km of 20 flying-fox camps used by GHFF and the species has been recorded from Greenridge previously, foraging on *Melaleuca quinquenervia* and *Eucalyptus tereticornis* (ddwfauna 2006). During koala surveys in 2022, the EVE Koala survey team noted heavy flying-fox use of flowering eucalypts on site (pers comm. Deidre de Villiers). GHFF is expected to forage on site regularly during *Eucalyptus* and *Melaleuca* flowering events.

# Appendix B: Pest animal control Standard Operating Procedures

There are a number of Standard Operating Procedures (SOPs) relating to the control of pest animals, across several state jurisdictions. The SOPs produced by NSW Department of Primary Industries are the most up-to-date and comprehensive at the time of writing this OAMP. Pest animal control actions will be cognisant of the requirements of the *Biosecurity Act 2014* (Qld). Pest animal control actions carried out under this plan must be consistent with the relevant SOP below.

**Feral pigs**

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1396787/NSWPIG-SOP6-Poisoning-of-feral-pigs-using-HOGGONE-meSN-sodium-nitrite-baits.PDF

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/1396791/NSWPIG-SOP4-Poisoning-of-feral-pigs-with-sodium-monofluoroacetate-1080.PDF

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/1396791/NSWPIG-SOP4-Poisoning-of-feral-pigs-with-sodium-monofluoroacetate-1080.PDF

**Foxes**

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0004/1396777/NSWFOX-SOP1-Ground-baiting-of-foxes-with-sodium-monoflouroacetate-1080.PDF

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/1396773/NSWFOX-SOP5-Trapping-of-foxes-using-padded-foot-hold-traps.PDF

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0012/1396776/NSWFOX-SOP8-Candid-Pest-Ejectors-CPEs-using-sodium-monoflouroacetate-1080-or-para-aminopropiophenone-PAPP.PDF

**Wild dogs**

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/1396764/NSWDOG-SOP4-Ground-baiting-of-wild-dogs-with-sodium-monofluoroacetate-1080.PDF

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0004/1396768/NSWDOG-SOP1-Trapping-of-wild-dogs-using-padded-foot-hold-traps.PDF

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0012/1396767/NSWDOG-SOP7-Canid-pest-ejectors-CPEs-using-sodium-monofluoroacetate-1080-or-para-aminopropiophenone-PAPP.PDF

**Feral deer**

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/1396761/NSWDEER-SOP1-Ground-shooting-of-feral-deer.PDF

**Cats**

https://pestsmart.org.au/?s=cats

**Euthanasia in the field**

https://pestsmart.org.au/pest-animals/general-methods-of-euthanasia-in-field-conditions/

# Appendix C: Coastal swamp oak TEC revegetation plan

| Timeline/Stage | Action | Rationale |
|---|---|---|
| **1.0 Delineation of offset areas in pasturelands**<br><br>*Aim: To define the land zones of the pasturelands, to determine suitable areas for re-establishing either RE 12.1.1 or RE 12.3.20. This is currently not possible due to site conditions and subsequent challenges, in particularly the dense exotic grass cover.* | 1.1 Burn exotic grass pasturelands using the QPWS Planned Burn Guidelines (SEQ Bioregion) | Burning will reduce the above ground structure to allow for accurate aerial LiDAR imagery. This is to ascertain the current distribution of land zone 1 and 3 in the pasturelands, which are required to determine suitable RE revegetation.<br>Burning will consider current *Casuarina glauca* regrowth along the drainage lines of the exotic pasturelands, as well as other fire sensitive species (e.g. mangroves), with fire breaks incorporated accordingly. |
| | 1.2 Capture LiDAR imagery of pasturelands | Following burning of the target areas, these will be subject to aerial LiDAR survey. |
| | 1.3 Digital Terrain Modelling (DTM) | Using LiDAR imagery, develop a Digital Terrain Model (DTM) of the pasturelands to identify areas of lowlands (land zone 1), and alluvial plains (land zone 3).<br>Hydrological modelling will be undertaken to ensure there is no risk of revegetated areas being impacted by changes in water levels or water salinity should the current (off site) tidal gate be removed in the future, either anthropogenically or by natural disaster/degradation. |
| | 1.4 Soil testing post burn) | Undertake soil testing throughout the pasturelands to determine soil conditions: pH, electrical conductivity (EC), available Bray phosphorus, Emerson Aggregate Test, organic carbon, plant available water-holding capacity (PAWC), hydraulic conductivity (Ksat), and particle size distribution. Consideration may need to be given to testing for macro and microelements, heavy metals, and persistent organochloride pesticides (Dieldrin). This will provide information on recent and current water parameters, as well as for planning suitable revegetation. In particular, some species in Regional Ecosystem (RE) 12.3.20 are less tolerant to salt and may require amelioration measures prior to rehabilitation. |
| | 1.5 Risk assessment | Based on the soil testing and DTM, undertake a risk assessment using the LiDAR, hydrological and soil testing data to determine areas of the pasturelands that are suitable for establishment of RE 12.1.1 and RE 12.3.20.<br>Note, minimum areas for offsetting requirements are:<br>Coastal Swamp Oak Threatened Ecological Community Offset – represented by RE 12.1.1<br>• Sensitive ecological data<br><br>Koala Offset - RE 12.3.20<br>• Sensitive ecological data |
| **2.0 Site preparation**<br><br>*Aim: To prepare site for revegetation activities* | 2.1 Spray with suitable herbicide | Following burning of the subject pasturelands, emerging and unburnt weeds will be sprayed with an appropriate herbicide. Herbicides must be registered by the Australian Pesticides and Veterinary Medicine Authority for use within proximity to waterways, be used in strict accordance with the product label directions and applied by an appropriately qualified person in accordance with the *Agricultural Chemicals Distribution Control Act 1996*. |
| | 2.2 Follow-up burn | Once any emerging or remaining weeds have died following herbicide application, a second burn will be carried out with the same consideration for fire-sensitive species as described in **Section 1.0**. |
| | 2.3 Amelioration | Should soil testing indicate soil amelioration is required, this will be undertaken post-burn and prior to seeding and/or planting preparation. |
| | 2.4 Row preparation | Following the second burn, rows will be prepared for planting the canopy trees (Stage 1 planting). Rows will be 3 m apart to allow for subsequent management of re-emerging exotic grasses through mechanical slashing or by hand if conditions are not suitable for machinery. |

| Timeline/Stage | Action | Rationale |
|---|---|---|
| **3.0 Revegetation**<br><br>*Aim: To reinstate RE 12.1.1 and 12.3.20 to achieve offset requirements. This will be undertaken in two stages:*<br>*1) establish canopy cover, and*<br>*2) establish midstory and ground cover species.* | 3.1 Species selection for RE 12.1.1:<br>• Canopy – *Casuarina glauca*<br>• Mid-storey – *C. glauca*<br>• Ground cover – *Sporobolus virginicus, Imperata cylindrica, Cyperus polystachyos, Juncus usitatus.* | Species have been selected considering both the technical description for RE 12.1.1, as well as the native species detected on site during field surveys. The latter are particularly relevant as these species are able to persist in the current conditions of the site. While *Eucalyptus tereticornis* is also described as an emergent species in the state government technical descriptions, this species has been omitted due to the potential water inundation in the lowland areas that are designated for revegetation with RE 12.1.1.<br>Stocking density and general habitat requirements are described in **Attachment 1**. The final restoration target density is also provided, with the planting density to be determined at the time of planting based on environmental and climatic considerations, as well as the form of plantings (tubestock vs seeding). In particular, increased planting density (compared to target density) is required to account for establishment or sapling mortality; however, each site needs to consider mortality factors such as current weather conditions (e.g. drought), capacity/requirement to provide on-going watering, weed management and pest management.<br>Additionally, overplanting is required to facilitate rapid canopy closure to enable Stage 2 planting of the ground cover between years 2 and 3.<br>Should stem density be too high by Stage 2 (2-3 years after initial planting), these can be manually thinned prior to planting of the understory, which will also provide valuable course woody debris to the ecosystem.<br>Tree guards may need to be considered if herbivory by pest animals (e.g. European hare) and natives (e.g. kangaroo species) occur on newly planted tubestock. Pigs and corresponding damage to *C. glauca* roots currently exist on site; further control of feral animals is described in the OAMP. |
| | 3.2 Species selection for RE 12.3.20:<br>• Canopy – *Casuarina glauca, Eucalyptus tereticornis, Melaleuca quinquenervia*<br>• Mid-story – *C. glauca, Alphitonia excelsa, Melaleuca salicina*<br>• Ground cover – *Sporobolus virginicus, Dianella brevipedunculata, Imperata cylindrica, Juncus kraussii.* | Species have been selected considering both the technical description for RE 12.3.20 (previously RE 12.3.5a), as well as the native species detected on site during field surveys. The latter is particularly relevant, as these species are able to persist in the current conditions of the site.<br>Stocking density and general habitat requirements are described in **Attachment 1**. The final restoration target density is also provided, with the planting density to be determined at the time of planting based on environmental and climatic considerations, as well as the form of plantings (tubestock vs seeding). In particular, increased planting density (compared to target density) is required to account for establishment or sapling mortality; however, each site needs to consider mortality factors such as current weather conditions (e.g. drought), capacity/requirement to provide on-going watering, weed management and pest management.<br>Additionally, overplanting is required to facilitate rapid canopy closure to enable Stage 2 planting of the ground cover between years 2 and 3.<br>Should stem density be too high by Stage 2 (2-3 years after initial planting), these can be manually thinned prior to planting of the understory, which will also provide valuable course woody debris to the ecosystem.<br>Tree guards may need to be considered if herbivory by native or pest animals (e.g. Grey Kangaroo, European hare) is expected on tree species. |
| | 3.3 Planting | Planting is to be undertaken in two stages: 1) tree canopy species, and 2) midstory and ground cover species.<br>Planting is to be carried out at the beginning of the growing season (September-October) to allow maximum growing time prior to extreme temperatures (summer heat and winter frost). Planting should be undertaken in the morning or late afternoon to avoid heat/desiccation stress.<br>Stage 1 is aimed at establishing the canopy cover, with trees planted in the prepared rows at a distance of ~1.7-2.2 m (to equal ~1,500 -2,000 stems/ha) between trees of the same row. All canopy plants will be planted at tubestock pot size and be sun-hardened prior to planting. A risk assessment of weed emergence should be undertaken at the time of planting to determine whether tree mulch rings (e.g. made from coir or other biodegradable products) or loose mulch along rows are required to minimise weed growth and competition.<br>Stage 2 planting (after canopy cover reaches 80% cover; estimated 2-3 years after initial planting) consists of the midstory and ground cover species. These species are likely to be outcompeted by exotic grasses/weeds if planted during Stage 1. However, many of these exotic species are not adapted to shade, and therefore will have less competitive influence when the canopy is near closure. Midstory species and Salt Couch (*Sporobolus virginicus*; reproduces primarily by stolons) will be planted at tubestock pot size and be sun-hardened prior to planting. Other grasses or sedges may be able to be direct seeded in lightly ripped soil.<br>Seeding at a rate of 20 kg per ha can be considered as an alternative to tubestock planting in smaller revegetation areas in Stage 2.<br>Tree guards may need to be considered if herbivory by native or pest animals is expected. |
| | 3.4 Watering regime | All plants must be watered in their pots prior to planting, as well as after placement in the soil. Watering must be with low pressure water stream only.<br>Further watering will be subject to weather conditions and planting season (more watering required during dry weather). Plant health and soil moisture levels must be assessed by site inspection at least weekly in the first month after planting, to determine a suitable water schedule. |

| Timeline/Stage | Action | Rationale |
|---|---|---|
| **4.0 Monitoring and management**<br><br>*Aim: To monitor revegetation areas to guide short- and long-term management activities* | 4.1 Monitor revegetation areas to guide management actions | Monitoring will include:<br>• Weed species present and spatial spread (to guide weed control requirements)<br>• Pest species present and indicative damage to stock and/or ground area (to guide pest control requirements, as per the OAMP)<br>• Revegetation health (to provide information on whether additional water or revegetation requirements are needed)<br>• Presence and extent of erosion (to provide information for additional site stability works, if required)<br><br>Monitoring timeframe from initial planting:<br>• Year 1: 1 month, 3 months, 6 months, 9 months, 12 months<br>• Year 2: 3-month intervals (i.e. 15 months from initial planting, then 18 months, 21 months, 24 months)<br>• Year 3: 6-month intervals (i.e. 30 months from initial planting, then 36 months) |
| | 4.2 Weed management | Weed management will be one of the key ongoing management requirements for the revegetation areas. Weeds detected on site during field surveys in 2022, and recommended methods for control, are provided in **Attachment 2**. Further weed species may become apparent during monitoring events.<br>For dense, exotic grasses, mechanical slashing (when possible), manual brush-cutting and spot-spraying of suitable herbicide may be required.<br>Herbicides must be registered by the Australian Pesticides and Veterinary Medicine Authority for use within proximity to waterways, be used in strict accordance with the product label directions and applied by an appropriately qualified person in accordance with the *Agricultural Chemicals Distribution Control Act 1996*.<br>Note, pre-emergent herbicides are not known to be safe for use near waterways and are therefore not recommended. |
| | 4.3 Pest management details are provided in the OAMP due to the need to control pest animals at the site level | Pests that are known to occur at Greenridge and require monitoring and management include:<br>• Feral pigs (*Sus scrofa*), which are particularly problematic for *Casuarina glauca* (as they specifically target the root nodules of this species) and vegetation establishment in general; and<br>• Red imported fire ants (*Solenopsis invicta*), which will increase initially without management due to favoured habitat being created from the burning and grass clearing of revegetation areas. |
| | 4.4 Fire management:<br>• Fire management to be undertaken in accordance with QLD Government Planned Burn Guidelines (SEQ Bioregion)<br>• Fire breaks around revegetation areas are described in the OAMP<br>• Fuel loads within the revegetation areas should be assessed during monitoring events, with fuel reduction burns only undertaken when necessary due to the sensitivity of *Casuarina glauca* to fire and the regenerative condition of the revegetation areas | Due to the revegetation areas being in a recovery phase, they may be more sensitive to fire disturbance than the recommendations provided in the RE descriptions below. As such, careful consideration should be given to whether the below recommendations are suitable at any given time. Additionally, as RE descriptions may be updated when new information is available, the fire requirements for each RE should be revisited regularly.<br>The recommended fire requirements for RE 12.1.1 are to have a low to moderate intensity burn in early winter or during the storm burning season, at an interval of 6-7 years minimum. Approximately 25-50% minimum should be retained as unburnt per any given year. Active fire management is required to reduce dry fuel layers. However, the fire ecology for this RE is poorly known and monitoring of the impact and recovery is recommended. Note a seven-year minimum fire interval is required for obligate seeding Allocasuarina and Casuarina success in this RE.<br>For 12.3.20, the recommended fire requirements include late summer to mid-winter (after rain) burns, at intervals of 6-20 years for mixed grass/shrub combination vegetation found on site. Management burns of 25-70% burn mosaic per any given event is the recommended guideline for this RE. |
| | 4.5 Monitoring revegetation for progress to offset targets at two-year intervals | Monitoring transects will be established at the time of first planting, and permanently identified by both GPS and survey markers (e.g. star picket with yellow caps at centre and end points) to ensure consistent monitoring and photo locations over time.<br>Monitoring will follow the BioCondition survey process that was used during offset determination to ensure consistent data collection, assessment, and reporting. In addition to data, this includes standardised photos of each plot locations (see Attachment 4 of the *BioCondition Assessment Manual*).<br>An adaptive management approach (**Attachment 3**) will be undertaken following each offset monitoring, whereby management and revegetation activities are modified if necessary to ensure the revegetation areas are progressing towards the intended target. For example, replacement plantings, manual thinning, etc. |

**Species list and relevant details for the 12.1.1 revegetation areas.** Note, the first column details the minimum number of species for offset requirements and the final restoration target density (based on RE Technical Descriptions). Priority status was determined based on presence and abundance at Greenridge, and dominance within the RE/TEC.

| Strata and RE Requirements | Botanical Name | Common Name | Planting Stage | Habitat Preference | Presence at Greenridge | Priority of Species in Revegetation | Form Availability* |
|---|---|---|---|---|---|---|---|
| **Canopy species**<br>Min. 1 species<br>Stem density: 500/ha | *Casuarina glauca* | Swamp Sheoak | 1 | Moist; high salt tolerance | Very common | Essential | Seed; Tube |
| **Midstory species**<br>Min. 1 species<br>Stem density: 180/ha | *Casuarina glauca* | Swamp Sheoak | 1 | Moist; high salt tolerance | Very common | Essential | Seed; Tube |
| **Ground Cover (Grasses)**<br>Min. 2 species<br>Stem density: nd | *Sporobolus virginicus* | Salt Couch | 2 | Moist; high salt tolerance | Very common | High priority grass | Tube |
| | *Imperata cylindrica* | Blady Grass | 2 | Moist | Uncommon | Priority grass | Seed; Tube |
| | *Enteropogon acicularis* | Curly Windmill Grass | 2 | Drought and flood tolerant | Common | Potential grass replacement | Seed |
| | *Paspalidium distans* | Shotgrass | 2 | - | Common | Potential grass replacement | Seed |
| **Ground Cover (Forbs/Sedges)**<br>Min. 3 species<br>Stem density: nd | *Juncus usitatus* | Common Rush | 2 | Moist; moderate salt tolerance | Common | Priority sedge | Seed; Tube |
| | *Cyperus polystachyos* | Bunchy Sedge | 2 | Moist; moderate salt tolerance | Common | Priority sedge | Seed; Tube |
| | *Fimbristylis ferruginea* | Fringe Rush | 2 | Moisture tolerance | Common | Priority sedge | Tube |
| | *Einadia nutans* | Nodding Saltbush | 2 | Moist; high salt tolerance | Uncommon | Potential forb replacement | Seed; Tube |
| | *Gahnia clarkei* | Tall Saw Sedge | 2 | Moist; moderate salt tolerance | Uncommon | Potential sedge replacement | Seed; Tube |

*Availability at time of writing RMP; see stockists closer to planting date to confirm availability and form (seed or tubestock)
nd Not detailed in the RE Technical Description

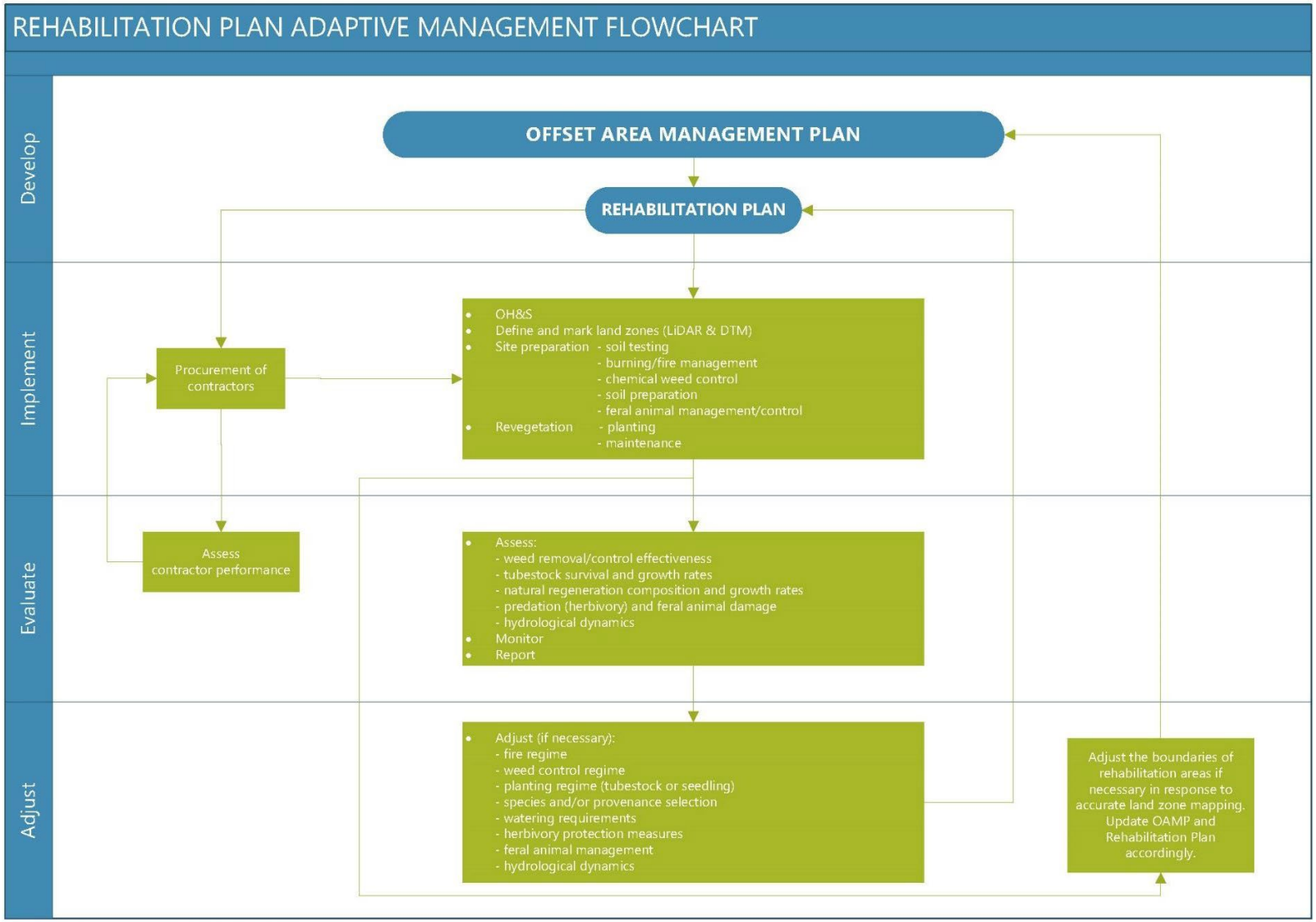
**Species list and relevant details for the 12.3.20 revegetation areas.** Note, the first column details the minimum number of species for offset requirements and the final restoration target density (based on RE Technical Descriptions). Priority status was determined based on presence and abundance at Greenridge, and dominance within the RE/TEC.

| Strata and RE Requirements | Botanical Name | Common Name | Planting Stage | Habitat Preference | Presence at Greenridge | Priority of Species in Revegetation | Form Availability* |
|---|---|---|---|---|---|---|---|
| **Canopy species** Min. 4 species Stem density: 1498/ha | *Casuarina glauca* | Swamp Sheoak | 1 | Moist; high salt tolerance | Very common | Essential | Seed; Tube |
| | *Melaleuca quinquenervia* | Broad-leaved Paperbark | 1 | High moisture tolerance | Very common | Essential | Seed; Tube |
| | *Corymbia intermedia* | Pink Bloodwood | 1 | - | Uncommon | Priority | Seed; Tube |
| | *Eucalyptus tereticornis* | Queensland Blue Gum | 1 | - | Common | Priority | Seed; Tube |
| **Midstory species** Min. 4 species Stem density: 2560/ha | *Alphitonia excelsa* | Red Ash | 1 | - | Common | Priority | Seed; Tube |
| | *Casuarina glauca* | Swamp Sheoak | 1 | Moist; high salt tolerance | Very common | Priority | Seed; Tube |
| | *Melaleuca salicina* | Willow Bottlebrush | 1 | Moisture tolerance | Common | Priority | Seed; Tube |
| | *Myrsine variabilis* | Muttonwood | 1 | - | Common | Priority | Tube |
| | *Cupaniopsis anacardioides* | Tuckeroo | 1 | - | Common | Priority | Seed; Tube |
| **Ground Cover (Grasses)** Min. 2 species Stem density: 500/ha (both Grasses and Forbs) | *Imperata cylindrica* | Blady Grass | 2 | - | Very common | High priority grass | Seed; Tube |
| | *Paspalidium distans* | Shotgrass | 2 | - | Common | Priority grass | Seed |
| | *Sporobolus virginicus* | Salt Couch | 2 | Moist; high salt tolerance | Uncommon | Potential replacement grass | Tube |
| | *Ottochloa gracillima* | Graceful grass | 2 | Shade preference | Common | Potential replacement grass | Tube |
| **Ground Cover (Forbs/Sedges)** Min. 8 species Stem density: 500/ha (both Grasses and Forbs) | *Centella asiatica* | Gotukola | 2 | - | Very common | Priority forb | Seed |
| | *Parsonsia straminea* | Monkey Rope | 2 | - | Very common | Priority forb | Tube |
| | *Dianella brevipedunculata* | Blue Flax Lily | 2 | - | Common | Priority forb | Seed; Tube |
| | *Cyperus polystachyos* | Bunchy Sedge | 2 | Moist; moderate salt tolerance | Common | Priority sedge | Seed; Tube |
| | *Commelina diffusa* | Wandering Jew | 2 | Shade preference | Common | Priority forb | Tube |
| | *Lobelia purpurascens* | White Root | 2 | Shade preference | Common | Priority forb | Tube |

| Strata and RE Requirements | Botanical Name | Common Name | Planting Stage | Habitat Preference | Presence at Greenridge | Priority of Species in Revegetation | Form Availability* |
|---|---|---|---|---|---|---|---|
| | *Dianella caerulea* | Blue Flax Lily | 2 | - | Uncommon | Potential additional/ replacement forb | Seed; Tube |
| | *Geitonoplesium cymosum* | Scrambling Lily | 2 | Shade preference | Uncommon | Potential additional/ replacement forb | Tube |
| | *Juncus kraussii* | Salt Marsh Rush | 2 | Moist; moderate salt tolerance | Uncommon | Potential additional/ replacement sedge | Seed; Tube |

*Availability at time of writing RMP; see stockists closer to planting date to confirm availability and form (seed or tubestock).
nd Not detailed in the RE Technical Description

| Botanical Name | Common Name | Qld Biosecurity Act / WONS | Occurrence within site | Treatment Method |
|---|---|---|---|---|
| **Woody weeds** | | | | |
| *Baccharis halimifolia* | Groundsel bush | Category 3 restricted | Frequent | Complete removal (small plants); biological control; basal bark; cut stump; stem injection; foliar spray |
| *Lantana camara* | Lantana | Category 3 restricted / WONS | Infrequent | Mechanical removal (followed by foliar spray of regrowth); foliar spray (incl. splatter gun); cut stump; basal bark |
| *Schinus terebinthifolius* | Broad-leaved pepper tree | Category 3 restricted | Infrequent | Complete removal; basal bark; cut stump; foliar spray |
| *Solanum chrysotrichum* | Giant devil's fig | - | Infrequent | Cut stump; foliar spray |
| *Solanum mauritianum* | Wild tobacco | - | Infrequent | Complete removal (small plants); ring-bark (tall plants); cut stump; basal bark; foliar spay |
| **Grasses** | | | | |
| *Chloris gayana* | Rhodes grass | - | Frequent | Slashing; foliar spray (glyphosate) |
| *Setaria sphacelata* | South African pigeon grass | - | Frequent | Slashing; foliar spray (glyphosate) |
| *Sporobolus pyramidalis, S. natalensis* | Giant rats tail grass | Category 3 restricted | Infrequent | Foliar spray, wick-wiping (multiple treatments, pre-emergent and glyphosate); complete removal, burn stools (small infestations) |
| **Vines** | | | | |
| *Ipomoea cairica* | Mile-a-minute | - | Infrequent | Complete removal; foliar spray; cut stump; basal bark |
| *Passiflora suberosa* | Corky passion | - | Infrequent | Cut stump; foliar spray; complete removal |
| *Solanum seaforthianum* | Brazilian nightshade | - | Infrequent | Cut stump; foliar spray; complete removal (bag and remove fruit) |
| **Forbs** | | | | |
| *Ageratum houstonianum* | Blue billy-goat weed | - | Infrequent | Foliar spray; complete removal |
| *Asparagus aethiopicus* | Basket asparagus | Category 3 | Infrequent | Complete removal (remove entire crown, underground stem and berries); basal bark; cut stump; foliar spray (short-term knock down) |
| *Bidens pilosa* | Cobbler's pegs | - | Infrequent | Foliar spray; complete removal |
| *Rumex crispus* | Curly dock | - | Infrequent | Foliar spray |
| *Senecio madagascariensis* | Fireweed | Category 3 / WONS | Frequent | Foliar spray |




Greenridge Revegetation Plan - Attachment 3

# Appendix D: Pasture photo standards – SEQ (basalt)

**Basalt**

**300 kg/ha**


**800 kg/ha**


**1400 kg/ha**


Queensland Government

# Basalt


2000 kg/ha


3000 kg/ha


4000 kg/ha

Queensland Government