

4 Analysis of risks to achieving management objectives and offset completion criteria

Potential risks to achieving the management objectives and outcomes have been considered in this plan, as shown in *Table 10* for the Tabooba property and in *Table 11* for Greenridge. These risks include those that have been derived from an assessment of the threats to each of the impacted matters that are discussed in the relevant DCEEW listing advice, conservation advice, threat abatement plans and recovery plans, as detailed in *Table 5*. They have been assessed against the risk matrix (*Table 9*) supplied by DCCEEW. The risk matrix has been used to assess the risk that the plan's objectives will not be met and identify the sources of those risks and strategies for managing them.

The risk assessment:

- identified threats that will, may, or are likely to impact the attainment of the completion criteria
- assesses the likelihood and consequences of those threats, and characterises residual risk levels, taking into consideration the mitigation of the risk by implementing the management actions
- identifies the level of uncertainty in mitigating the risk with the management actions and trigger criteria and corrective actions until the risk is reduced to an acceptable level.

The management actions and corrective actions are described in full detail in *Section 5*.

Table 9: Risk matrix

RISK MATRIX	
Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management activities are implemented)	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor	Minor incident of environmental damage that can be reversed (e.g. short-term delays to achieving plan objectives, implementing low-cost, well-characterised corrective actions)
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts (e.g. short-term delays to achieving plan objectives, implementing well-characterised, high-cost/effort corrective actions)
High	Substantial instances of environmental damage that could be reversed with intensive efforts (e.g. medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions)

Major		Major loss of environmental amenity and real danger of continuing (e.g. plan objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies)				
Critical		Severe widespread loss of environmental amenity and irrecoverable environmental damage (e.g. plan objectives are unable to be achieved, with no evidenced mitigation strategies)				
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Table 10: Risk assessment for the terrestrial offset sites at Tabooba

Note: The risk ranking codes relate to the risk matrix as follows: L = Likelihood C = Consequence R = Risk

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Force majeure events									
Drought	The threat posed by an extreme weather event, in the form of drought, causes habitat degradation and mortality of vegetation within the restoration area during the establishment period	Likely	High	High	Offset area management	Exclude livestock from the offset area during periods of declared drought. Maintain firebreaks for wildfire response readiness. Commence any necessary woodland rehabilitation/restoration actions in locations where there is greatest spring-fed water availability (e.g. creek flood zones and lower slopes), building outwards from these areas to take advantage of improved microclimatic conditions (reduced solar radiation and wind, increased humidity) from increased tree cover.	Likely	Moderate	Medium
Cyclones/ severe tropical lows/ flooding	The most significant threat from tropical cyclones or tropical lows is flooding and high winds causing habitat degradation.	Likely	Moderate	Medium	Offset area management	Understand on-site flood areas ensure habitat restoration is suited to these areas. Improve all-weather access if flooding could potentially restrict management access. Provide drainage (culverts) on access tracks where they are intersected by flows from spring water.	Likely	Minor	Low
Severe fire event	Catastrophic bushfire causes habitat degradation and loss of habitat for Koala and GHFF	Likely	Critical	Severe	Fire management	Fire breaks re-formed every 2 years and slashed every 2 months in winter and every month in summer. Develop a wildfire response procedure. Undertake planned burns in remnant and regrowth Koala and GHFF habitat in accordance with relevant RE fire management guidelines.	Possible	Major	High
Degradation of koala and grey-headed flying-fox habitat									
Degradation of Koala and GHFF habitat	The degradation of Koala and GHFF habitat due to the lack of environmental management of the offset area including appropriate invasive plant control, pest animal control, fire management, and/or infrastructure maintenance.	Possible	High	Medium	Offset area management	Implementation of the management invasive plant control, pest animal control and fire management actions to best practice standards and adaptive management framework as outlined in this OAMP (Table 12)	Unlikely	Minor	Low
Habitat or vegetation loss through land clearing									
Unplanned clearing and illegal access causing habitat degradation (i.e., Illegal timber harvesting/ collection, Illegal access by the public causes habitat degradation and increases fire risk)	The offset site occurs near semi-rural and urban areas. It is possible for unplanned / illegal clearing for agriculture activities but considered improbable as the offset site will be mapped as Category A on the property map of assessable vegetation (PMAV). Clearing may however occur by vehicles traversing the area off designated roads/tracks and/or illegal camping.	Unlikely	Major	High	Offset area management Site access control	Clearing of native vegetation in the offset area is only permitted under the OAMP where it would result in a benefit for Koala and GHFF habitat. Within 12 months of the approval (17 March 2024), register a declared area over the offset site, ensuring it is shown as Category A vegetation on the PMAV. All monitoring (rapid and detailed) will report on any evidence of clearing.	Rare	Major	Medium
Degradation of habitat by overgrazing									
Unauthorised or inappropriate grazing in offset area	High density grazing over an extended period destroys shrubs and native grass cover and slows the regeneration of habitat.	Possible	High	Medium	Grazing management	Fences are in working order and allow for exclusion of livestock from the offset area. Livestock to be excluded from the Koala and GHFF offset areas during periods of drought and/or if dry matter yield (DMY) is <1400kg/ha (January) (see Appendix D). Livestock to be managed in the offsets area in accordance with management measures as outlined in this OAMP (Table 12)	Unlikely	Minor	Low

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Invasive plants: introduction, establishment and spread of non-native weeds including restricted invasive plants listed under the Biosecurity Act 2014 (Qld)									
New infestations of invasive and environmental weed species in the offset area.	If a weed infestation is unchecked, it may cause a significant deterioration in the offset site.	Possible	Major	High	Invasive plants and environmental weeds management listed under the <i>Biosecurity Act 2014</i> (Qld)	All vehicles accessing the offset area are required to have undergone a weed inspection and vehicle hygiene check, confirming that they are weed free, before accessing the site. If a new weed infestation is identified, consult with local NRM Catchment Group, Healthy Land and Water, Council and Queensland Department of Agriculture and Fisheries to determine the invasiveness of the weed and tested/recommended control measures. Control the spread of new infestation/s. Treat new infestation/s promptly to reduce the extent and spread of the infestation.	Unlikely	Minor	Low
Expansion of existing infestations of declared weed species in the offset area	The extent of existing infestations of invasive plants and environmental weed species expands, or the species become more abundant within the area.	Highly likely	High	High	Invasive plants and environmental weed management listed under the <i>Biosecurity Act 2014</i> (Qld)	All vehicles accessing the offset area are required to have undergone a weed inspection and vehicle hygiene check, confirming that they are weed free, before accessing the site. Map invasive plant and environmental weeds as part of baseline and ongoing environmental monitoring. Chemical and/or mechanical control of all invasive plants and environmental weeds in accordance with the control measures outlined in the Biosecurity Queensland Fact Sheets or other sources of information.	Unlikely	Minor	Low
Pest/feral animals in the offset area									
Increased population of wild and feral animals in the offset area.	Feral cat, feral pig and wild dog populations are extensive and highly transient, and therefore the scale of impact is potentially large (anecdotal data suggests up to seven wild dogs on property). Major damage to the environment/habitat occurs when large numbers of animals congregate in the area. Feral deer have not been recorded on the offset site but are known in the area and could become established, causing environmental impacts (especially to regrowth).	Highly likely	High	High	Pest animal management Feral pig management Feral deer incursion	The land manager will cooperate with and participate in any and all best practice pest control programs on adjoining properties. Pest animal control program to be implemented according to industry best practice standards via appropriately qualified person/s. Controlling feral pigs, and wild dogs by implementing a coordinated multiple pronged management program . Additionally, if the land manager, during quarterly inspections of the offset area notes an incursion of feral deer, feral pig or wild dog activity, an additional coordinated multiple pronged management program is to be instigated until the increased activity has ceased and/or the deer, feral pigs and wild dogs are removed.	Possible	Minor	Low
Fire: the impact from uncontrolled wildfire or inappropriate fire regimes cause degradation in offset area habitat quality									
Unplanned or uncontrolled fire in offset area.	The impact from uncontrolled wildfire or inappropriate fire regimes cause degradation in offset area habitat quality.	Likely	Moderate	Medium	Fire management	Fire breaks re-formed every 2 years and slashed every 2 months in winter and every month in summer. Wildfire response procedure developed.	Possible	Minor	Low
Inappropriate fire regimes	The impact from uncontrolled wildfire or inappropriate fire regimes cause degradation in offset area habitat quality.	Possible	High	Medium	Fire management	Undertake planned burns in remnant and regrowth Koala and GHFF habitat in accordance with relevant RE fire management guidelines (<i>Table 14</i> and <i>Table 14</i>) and/or weed control works. Livestock will be used to reduce fuel loads, when required.	Unlikely	Minor	Low
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5-, 10-, 15- and 20-year timeframes, respectively									

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5, 10-, 15- and 20-year timeframes, respectively.	Failure to achieve and maintain offset completion criteria	Possible	High	Medium	Offset area management	Implement the management actions of this OAMP. Monitor and report on attainment of interim environmental performance targets and completion criteria.	Unlikely	High	Medium

Table 11: Risk assessment for the terrestrial offset sites at Greenridge

Note: The risk ranking codes relate to the risk matrix as follows: L = Likelihood C = Consequence R = Risk

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Force majeure events									
Drought	The threat posed by extreme weather events, in the form of drought, causes habitat degradation and mortality of vegetation within the restoration area during the establishment period.	Likely	High	High	Offset area management	Consider seasonal forecasts and areas of water availability (e.g. in/adjacent to the freshwater wetlands) prior to commencing any necessary replanting activities. Monitor onsite water availability to ensure an adequate supply is available for use if required. Monitor restoration plantings for mortality. Undertake replanting as required.	Likely	Moderate	Medium
Cyclones/severe tropical lows/flooding	The most significant threat from tropical cyclones or tropical lows is flooding and high winds causing habitat degradation.	Likely	Moderate	Medium	Offset area management	Understand on-site flood areas ensure habitat restoration is suited to these areas. Improve all-weather access if flooding could potentially restrict management access. Monitor restoration plantings for mortality. Undertake replanting as required.	Likely	Minor	Low
Severe fire event	Catastrophic bushfire causes habitat degradation and loss of habitat for Coastal Swamp Oak TEC, Koala and GHFF.	Likely	Critical	Severe	Fire management	Fire breaks reformed every 2 years and slashed every 2 months in winter and every 2 weeks in summer. Undertake planned burns in remnant and regrowth Coastal Swamp Oak TEC, Koala and GHFF habitat in accordance with relevant RE fire management guidelines.	Possible	Major	High
Degradation of habitat swamp oak TEC									
Degradation of Coastal Swamp Oak TEC	Failure to rehabilitate 21.84 ha (AU3) of Coastal Swamp Oak TEC.	Possible	High	Medium	Coastal Swamp Oak TEC rehabilitation and enhancement plan	Implementation of the Coastal Swamp Oak TEC rehabilitation and enhancement plan (refer to <i>Appendix C</i>).	Unlikely	Minor	Low
Degradation of Coastal Swamp Oak TEC	The degradation of Coastal Swamp Oak TEC due to the lack of environmental management of the offsets area including appropriate invasive plant control, pest animal control, fire management, and/or infrastructure maintenance.	Possible	High	Medium	Offset area management	Implementation of the management invasive plant control, pest animal control (especially feral pigs) and fire management actions and adaptive management framework as outlined in this OAMP (<i>Table 13</i>).	Unlikely	Minor	Low
Degradation of habitat for koala and grey-headed flying-fox									

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Degradation of Koala and GHFF habitat	The degradation of Koala and GHFF habitat due to the lack of environmental management of the offsets area including appropriate invasive plant control, pest animal control, fire management, and/or infrastructure maintenance.	Possible	High	Medium	Offset area management	Implementation of the management invasive plant control, pest animal control and fire management actions and adaptive management framework as outlined in this OAMP (<i>Table 13</i> and <i>Table 15</i>).	Unlikely	Minor	Low
Habitat or vegetation loss through land clearing									
Unplanned clearing and illegal access causing habitat degradation (e.g., illegal timber harvesting/ collection, illegal access by the public causes habitat degradation and increases fire risk)	<p>The offset site occurs near semi-rural and urban areas.</p> <p>It is possible for unplanned/illegal clearing for agriculture activities but considered improbable as the offset site will be mapped as Category A on the property map of assessable vegetation (PMAV).</p> <p>Clearing may however occur by vehicles traversing the area off designated roads/tracks and/or illegal camping.</p>	Unlikely	Major	High	<p>Offset area management</p> <p>Site access control</p>	<p>Clearing of native vegetation in the offset area is only permitted under the OAMP where it would result in a benefit for Coastal Swamp Oak TEC, Koala and GHFF.</p> <p>Complete the installation of signage at all vehicle accesses identifying the areas as an environmental offset, within six months of the approval of this OAMP.</p> <p>Suitable fencing and/or signage of property to prevent access (where possible) from unauthorised personnel, within twelve months of the approval of this OAMP.</p> <p>Within 12 months of the approval date (17 March 2024), register a declared area over the offset site, ensuring it is shown as Category A vegetation on the PMAV.</p> <p>All monitoring (rapid and detailed) will report on any evidence of clearing.</p>	Rare	Major	Medium
Degradation of habitat by overgrazing									
Unauthorised or inappropriate grazing in offset area	High density grazing over an extended period destroys shrubs and native grass cover and slows the regeneration of habitat.	Possible	High	Medium	Grazing management	<p>Domestic grazing livestock to be excluded from the offset areas.</p> <p>Fences are in working order and allow for exclusion of domestic livestock from the property.</p> <p>Signage will be installed on all major access gates to ensure the environmental offset area is well signposted.</p>	Unlikely	Minor	Low
Invasive plants: introduction, establishment and spread of non-native weeds including restricted invasive plants listed under the Biosecurity Act 2014 (Qld)									
New infestations of invasive and environmental weed species in the offset area.	<p>The offset site is in close proximity to urban areas and the risk of new invasive plants and/or environmental weeds is considered high.</p> <p>If a weed infestation is unchecked, it may cause a significant deterioration in the offset site.</p>	Possible	Major	High	Invasive plants and environmental weeds management listed under the <i>Biosecurity Act 2014</i> (Qld)	<p>All vehicles accessing the offset area are required to have undergone a weed inspection and vehicle hygiene check, confirming that they are weed free, before accessing the site.</p> <p>If a new weed infestation is identified, consult with local NRM Catchment Group, Healthy Land and Water, Council and Queensland Department of Agriculture and Fisheries to determine the invasiveness of the weed and tested/ recommended control measures</p> <p>Control the spread of new infestation/s.</p> <p>Treat new infestation/s promptly to reduce the extent and spread of the infestation.</p>	Unlikely	Minor	Low
Expansion of existing infestations of declared weed species in the offset area	The extent of existing infestations of invasive plants and environmental weed species expands, or the species become more abundant within the area.	Highly likely	High	High	Invasive plants and environmental weed management listed under the <i>Biosecurity Act 2014</i> (Qld)	<p>All vehicles accessing the offset area are required to have undergone a weed inspection and vehicle hygiene check, confirming that they are weed free, before accessing the site.</p> <p>Map invasive plant and environmental weeds as part of baseline and ongoing environmental monitoring.</p> <p>Chemical and/or mechanical control of all invasive plants and environmental weeds in accordance with the control measures outlined in the Biosecurity Queensland Fact Sheets or other sources of information.</p>	Unlikely	Minor	Low
Pest/feral animals in the offset area									

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Increased population of feral animals in the offset area.	Feral cat, feral pig and wild dog populations are extensive and highly transient, and therefore the scale of impact is potentially large. Major damage to the environment/habitat occurs when large numbers of animals congregate in the area. Feral deer have not been recorded on the offset but are known in the area and could become established, causing environmental impacts (especially to regrowth)	Highly likely	High	High	Pest animal management Feral pig management Feral deer incursion response	Pest animal control program to be implemented vis appropriately qualified person/s. Control feral pigs, wild dogs and European foxes via a coordinated multiple pronged management program. Additionally, if the land manager, during quarterly inspections of the offset area notes an incursion of feral deer, feral pig or wild dog activity, an additional coordinated multiple pronged management program is to be instigated until the increased activity has ceased and/or the deer, feral pigs and wild dogs are removed	Possible	Minor	Low
Increased population of fire ants	Potential further spreading of fire ants into the offset areas.	Highly likely	High	High	Fire ant control program	TMR will coordinate this program with the Department of Agriculture and Fisheries who have carriage of fire ant control programs. ¹⁵	Possible	Minor	Low
Fire: the impact from uncontrolled wildfire or inappropriate fire regimes cause degradation in offset area habitat quality									
Unplanned or uncontrolled fire in offset area.	The impact from uncontrolled wildfire or inappropriate fire regimes cause degradation in offset area habitat quality	Likely	Moderate	Medium	Fire management	Fire breaks reformed every 2 years and slashed every 2 months in winter and every 2 weeks in summer. Wildfire response procedure developed.	Possible	Minor	Low
Inappropriate fire regimes	The impact from uncontrolled wildfire or inappropriate fire regimes cause degradation in offset area habitat quality	Possible	High	Medium	Fire management	Undertake low-intensity planned burns in remnant and regrowth Coastal Swamp Oak TEC, Koala and GHFF habitats in accordance with relevant RE fire management guidelines (<i>Table 15</i> and <i>Table 15</i>) and/or weed control works and/or Coastal Swamp Oak TEC rehabilitation and enhancement plan.	Unlikely	Minor	Low
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated timeframes									
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5, 10-, 15- and 20-year timeframes, respectively	Failure to achieve and maintain offset completion criteria	Possible	High	Medium	Offset area management	Implement the management actions of this OAMP. Monitor and report on attainment of interim environmental performance targets and completion criteria.	Unlikely	High	Medium

¹⁵ See <https://www.daf.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/ants/fire-ants>