



# Perthville Black Gum (*Eucalyptus aggregata*) Offset Site

**Annual Condition Assessment Report** 

Bathurst Regional Council August 2024 THIS PAGE INTENTIONALLY LEFT BLANK

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Perthville Black Gum Offset Site Annual Condition Assessment Report 2024

#### Introduction

During August 2024, a condition assessment was carried out by Bathurst Regional Council (BRC) on 148 planted Black Gum's (*Eucalyptus aggregata*) at the Perthville Black Gum Offset Site, 8km south of Bathurst NSW.

The assessment is part of a twenty-year monitoring program as per the requirements of the *Environmental Planning & Assessment Act (NSW)* (EP&A Act) granted concurrence.

The assessment will allow BRC to determine existing vegetation condition three years on from initial planting in 2020 and assist BRC to understand how the trees are responding to planting treatment. The assessment will also clearly demonstrate that the project is achieving the primary objectives of the NSW Department of Planning & Environment (DPE) endorsed Perthville Black Gum Offset Site Offset Management Plan (OMP) (Bathurst Regional Council, 2020).

As per the requirements of the EP&A Act granted concurrence and OMP, the results of monitoring will be submitted in an annual report to the DPE and will be available online via the BRC website for view by the public.

### Monitoring Method

A revegetation condition assessment methodology devised by Skillset Landworks Pty Ltd was used to score the health condition of each individual tree. Carried out by Council's environmental staff, each tree was assigned a condition score based on the criteria presented in **Table 1**.

Table 1 - Plant condition assessed using a point index assessment method.

Score	Description
3	Tree is alive and in a healthy condition. Tree is actively growing with no signs of significant stress or damage.
2	Tree is alive and in a moderately healthy condition. Tree is still actively growing but showing some evidence of stress.
1	Tree is alive but showing significant signs of stress that are impacting growth.
0	Tree is dead with no evidence of growth.

In addition to the above, it was noted if each individual tree exhibits any visual signs of the following:

- Browsing by herbivores and/or insects
- Frost damage
- Evidence of dehydration
- Evidence of vandalism (specific to people)
- Evidence of nutrient deficiency
- Evidence of damage by parasite

General observational notes were also taken to provide further information on the current condition of the offset site.

As per industry environmental monitoring guidelines, five (5) fixed photo monitoring points were established to provide baseline data on the ecological condition of the site prior to project commencement in February 2020. The projects fourth year of photo monitoring was conducted, almost four years on from the planting of the Black Gums in September 2020, to aid in assessing the impact of the environmental works over the life of the project and allow Council to make adaptive management measures, if required.

In addition to photo monitoring, weed mapping was undertaken to establish current site condition, to assess the effectiveness of weed management as well as the expected recovery of native vegetation following the removal of woody and herbaceous weeds. Although photo monitoring will provide a series of visual records of gross changes in vegetation it will not produce the quantitative records preferred for monitoring hence its use. Five (5) point quadrants using 10m line transects were located at respective photo monitoring points to ensure that different areas of the project site were sampled.

Surveys using indirect method of scat and track identification were conducted to determine the presence of vertebrate pests, livestock and macropods including kangaroo and/or wallaby.

#### Results

#### Revegetation

Overall condition ratings identified that 87.2% (129) of the trees surveyed received the highest health score of three (3) with trees alive and in healthy condition, and actively growing with no signs of significant stress or damage. 6.76% (10) of the trees surveyed received a health score of two (2) with trees alive, in a moderately healthy condition, and actively growing, however showing some evidence of stress. 1.35% (2) of trees surveyed received a health score of one (1) with trees alive but showing significant signs of stress that are impacting on growth. 4.73% (7) of the trees surveyed received the lowest health score of zero (0) as the trees were dead with no evidence of growth.

The height and growth of trees was also surveyed with 33.1% (49) trees measuring 4m in height, 31.1% (46) trees measuring 2m in height, 26.4% (39) trees measuring 3m in height, 5.4% (8) trees measuring 5m in height and 1.4% (2) trees measuring 1m in height. 5.4% (8) surveyed exhibited stunted growth, however all but three (3) trees received the highest health score rating and exhibited the early stages of new growth.

One (1) tree surveyed showed evidence of vandalism.

The total survival rate of trees surveyed was 95.1% (139).

#### **Weed Management**

A total of five (5) monitoring points were surveyed with all monitoring points showing no evidence of target invasive weed species. The most prominent non-native grass species identified across the site was Prairie Grass (*Bromus sp.*) with a median occurrence rate of 46.7%, with Monitoring Point 2 having the highest occurrence rate of 100% and Monitoring Point 5 having the lowest occurrence rate of 16.7%. Clover (*Trifolium sp.*), Phalaris Grass (*Phalaris sp.*), Dock (*Rumex sp.*), *Plantago sp.* and Dandelion (*Taraxacum sp.*) were also identified across all monitoring points with a median occurrence rate of 10%.

#### **Pest Management**

Of all trees surveyed, 95.3% (141) exhibited partial to full canopy insect damage, with 2% (3) hosting psyllids, ants, and accompanying black sooty mould.

Evidence of rabbit shallow diggings and scats were identified at the base of one (1) tree (no.64) and within the north-eastern quarter of the offset site.

#### Discussion

As with the previous year's results, revegetation over the fourth year of the project has maintained a high survival rate of 95.1% (136) with only seven (7) dead trees at the end of the reporting period. This is well above the minimum required survival rate of 80% identified in the Perthville Black Gum Offset Site OMP TARP.

Health scores of surveyed trees saw an increase of 23.7% on the previous year's data of 63.5% (94) for the highest health score of three (3), with 87.2% (129) trees receiving this high health score, whilst the remainder of trees surveyed scored a moderate or low score of two (2) or less. This was also the first year that tree height was measured with eight (8) trees (5.4%) at the site measuring five (5) meters in height with the median height of all trees surveyed was three (3) meters (26.4%). Whilst 5.4% (8) of trees exhibited stunted growth, all but three (3) trees received the highest health score rating and exhibited the early stages of new growth.

From observations, La Niña conditions between 2020-2023, flooding in November 2022 and the subsequent depositing of alluvial soils rich in humus and organic nutrients, appears to have increased water retention capacity across the site aiding in the uptake of nutrients by the trees. Such conditions tend to promote or assist a climate conducive to healthy vegetation exhibited through the presence of mature foliage (Figure 1) and taller than anticipated tree height (Figure 2), as well as high survival rates of revegetation.





Figure 1 - (left) Mature foliage is now present on most Black Gum trees at the offset site, some 4 years after planting.

Figure 2 - (right)
The tallest Black
Gums at the site
reach heights of 5m
and are located
within 20-30m of
Queen Charlottes
Vale Creek.

Regular weed control works carried out across the site has made a significant contribution to nil (0%) target weed species notably Willow (*Salix sp.*), Blackberry (*Rubus fruticosus sp.*) and Poplar (*Populus sp.*) being present at the site. Although surveys conducted via the point quadrant method identified Prairie Grass (*Bromus sp.*) as a dominant non-invasive weed species with a median occurrence rate of 46.7%, regular slashing between plantings during the growing season will ensure minimal competition with the Black Gums and minimize seed set of the grass and other perennial and herbaceous weed species across the site.

Impacts by invertebrate pest species continue to present challenges in the management of the Black Gums with damage from insects including irregular holes, curled leaves, and chewed leaf margins observed on 95.3% (141) of trees surveyed, with psyllids, aphids and ants observed on 6.76% (310) of trees with accompanying black sooty mould. La Niña conditions between 2020-2023, and milder conditions during the summers of the last four years, tend to promote an environment conducive to increased invertebrate pest activity. It is anticipated that with the establishment and maturity of the Black Gums, and an increase in diversity and predatory activity by insectivorous bird species (as observed at the site), that potential impacts by invertebrate pest species would be negligible.

Although not significant enough to trigger contingency measures as per the Perthville Black Gum Offset Site OMP TARP i.e. vertebrate pest control program, the presence of rabbit scratching's and scats at the base of one (1) tree (no.64) and within the north-eastern quarter of the offset site will require regular inspections to ensure that there is not a 20% loss of Black Gums. Whilst the removal of mesh tree guards will be applied to trees exhibiting larger trunk diameter and maturity, mesh tree guards will be retained on trees that are 2m or less in height to prevent browsing by vertebrate pest species.

Upgrading of fencing including the installation of a locked gate along North Street, and the installation of interpretative signage as per the Perthville Black Gum Offset Site OMP, have yet to be undertaken due to increased contractor rates, manufacturing costs, and budgetary constraints. It is proposed that these works will be undertaken when funding becomes available.

#### Recommendations

- Dead trees replaced with Black Gums or Box-Gum Grassy Woodland PCT species as per OMP TARP.
- 2. Repair or replace damaged mesh tree guards as per OMP TARP.
- 3. Increase slashing of groundcover across site during growing season to reduce competition by perennial and annual non-native grasses.
- 4. Replace degraded fencing along North Street with new fence posts, stock netting, sighter wire and gate.
- 5. Install interpretative signage at the North Street entrance to educate the public on the project.
- 6. Continue to monitor trees for leafhopper, sawfly, psyllids, ants and corresponding black sooty mould and implement control program as per updated OMP TARP.
- 7. Continue to monitor rabbit activity and implement contingency measures if triggered as per updated OMP TARP.

#### Reference

Bathurst Regional Council, 2020. *Perthville Black Gum Offset Site Offset Management Plan*, Bathurst NSW Australia: Bathurst Regional Council.

#### **Attachments**

Perthville Black Gum Offset Site - Site Map and Monitoring Points

Perthville Black Gum Offset Site Photo Point Monitoring Datasheets PP1-PP5

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Photo Point ID	Site		Bearing		Longitude		Latitude	
PP1	North S	treet, Perthville	72°		149.551453		-33.486819	
Baseline (before works)	1	End of Year 1	- I	End of Year 2		End of	Year 3	
Date		Date		Date		Date		
7 February 2020		27 August 2021		10 August 2022	2	11 Aug	ust 2023	
Description		Description		Description		Descri	ption	
Baseline photo prior to site p weed control and planting of			nting of Black Gums, hing of grass between				nths after planting Black Gums, short due to regular slashing.	
Comments		Comments		Comments		Comm	ents	
Floodplain between North Street flood levee and Queen Charlotte Vale Creek with stockpiled soil and road base from flood levee mitigation works. Ground highly compacted due to heavy machinery used on site.  machinery, concrete fo mitigation v transect co species, 30 unidentified Clover. 0%			7% of 10m line of dead grass earth, 10% species and 3% reed species were	inundation and line transect cor 10% Indian Mus Prairie grass an respectively. 09 were identified a transect. Signific Gums with 0.7%	comprising of Phalaris, Mustard, 3% Purple top, and dead grass 0% target weed species d along the 10m line ificant growth on Black 7% trees exhibiting early ver buds, and 44% having detritus. 67% of comprising of Clc and dead grass of weed species we 10m line transect. Gums are stunted exhibiting new foll trees exhibiting ur		ce of recent floods (Nov 22) with 6.67% of 10m line transect sing of Clover, 17% Prairie grass ad grass respectively. 0% target pecies were identified along the e transect. Although 16% of Black are stunted in growth, 92% are ng new foliage growth, and 10.8% khibiting unopened flower buds.	

Photo Point ID	Site		Bearing		Longitude		Latitude
PP1	North S	Street, Perthville			149.551453		-33.486819
End of Year 4	,	End of Year 5		End of Year 6		End of	Year 7
Date		Date		Date		Date	
28 August 2024							
Description		Description		Description		Descrip	otion
48 months after planting Black G grass short due to regular slashir							
Comments		Comments		Comments		Comme	ents
40% of 10m line transect comprisciover, 23.3% prairie grass ( <i>Bron</i> and dead grass respectively, 6.7' ( <i>Rumex sp.</i> ) and <i>Plantago sp.</i> respectively, and 3.3% Black Guitarget weed species were identifialong the 10m line transect. 0% tweed species were identified along 10m line transect. Although 95.3% Black Gums show evidence of insedamage, 87.2% of trees scored the highest health rating of 3.	nus sp.) % dock m. 0% ed arget g the of ect						

Photo Point ID	Site		Bearing	Longitude			Latitude
PP2	North S	treet, Perthville	71°	149.552308			-33.486112
Baseline (before works)	)	End of Year 1	1.0	End of Year 2	71	End of	Year 3
Date		Date		Date		Date	
7 February 2020		27 August 2021		10 August 2022		11 Aug	ust 2023
Description		Description		Description		Descri	ption
Baseline photo prior to sit weed control and planting		and ongoing monthl	after slashing of grass between grass :		24 months after planting of Black Gums, grass short due to recent slashing.		nths after planting Black Gums, short due to regular slashing.
Comments	TO THE PARTY OF TH	Comments	- No. 19 19 19 19 19 19 19 19 19 19 19 19 19	Comments		Comm	ents
Riparian zone along Que Vale Creek. Significant w including Brassica sp. Ru Foeniculum sp. and Rubu Ground highly compacted machinery use on site. En barrier from flood levee m visible however not functi due to damage.	eed growth amex sp. as fruticosus. d due to heavy rosion control nitigation works	of perennial grasses transect comprising	storey short due to grass and dormancy 5.70% of 10m line of dead grass rairie Grass ( <i>Bromus</i> d species were	water inundation 10m line transe Phalaris, and 39 (Rumex sp.) 0% were identified a transect. Signific Gums with 0.7%	ent flooding due to n and Detritus. 97% of ct comprising of % comprising of Dock target weed species long the 10m line ant growth on Black trees exhibiting early buds, and 44% having liage.	detritus compri sp.) an species transed are stul new fol	ce of recent floods (Nov 22) with s. 83% of 10m line transect sing of Prairie grass ( <i>Bromus</i> d 17% Phalaris. 0% target weed s were identified along the 10m line t. Although 16% of Black Gums nited in growth, 92% are exhibiting lage growth, and 10.8% trees ng unopened flower buds.

Photo Point ID	Site		Bearing		Longitude		Latitude
PP2	North S	Street, Perthville		149.5523455			-33.4860883
End of Year 4		End of Year 5		End of Year 6		End of	Year 7
Date		Date		Date		Date	
28 August 2024							
Description		Description		Description		Descri	ption
48 months after planting B grass short outside of no r (riparian zone) due to regu	now zone						
Comments		Comments		Comments		Comm	ents
100% of 10m line transect prairie grass ( <i>Bromus sp.</i> ) weed species were identifie 10m line transect. Although Black Gums show evidence damage, 87.2% of trees so highest health rating of 3.	. 0% target ed along the 95.3% of of insect						

Photo Point ID	Site		Bearing	Longitude			Latitude
PP3	North S	treet, Perthville	151°	149.552833			-33.485959
Baseline (before works)		End of Year 1	<u> </u>	End of Year 2	av =	End of	Year 3
Date		Date		Date		Date	
7 February 2020		27 August 2021		10 August 2022	2	11 Aug	ust 2023
Description		Description		Description		Descri	ption
weed control and planting of Black Gum		and ongoing month	nting of Black Gums ly maintenance, 4 ng of grass between	24 months after planting Black Gums, grass short due to recent slashing			nths after planting Black Gums, short due to regular slashing.
Comments		Comments		Comments		Comm	ents
Looking south toward North Street. Confluence of Queen Charlotte Vale Creek and drainage channel behind. Stockpiled soil and road base from flood levee mitigation works. Significant weed growth including Brassica sp. Rumex sp. Foeniculum sp. and Rubus fruticosus. Ground highly compacted due to heavy machinery use on site.  slashing of grown perennial grants and growns sp. (Bromus sp. 3.3% bare es sp.). 0% targitied all Sightings of however no		slashing of grass ar perennial grasses. ( transect comprising (Bromus sp.), 30%	63.3% of 10m line Prairie Grass dead grass species, d 3.3% Dock (Rumex d species were 10m line transect. within the vicinity signs of scats,	water inundatio the 10m line tra Phalaris, and 3' Dandelion (Tar. weed species w 10m line transer Black Gums with	cent flooding due to n and detritus. 97% of nasect comprising of % comprising of axacum sp.) 0% target ere identified along the ct. Significant growth on n 0.7% trees exhibiting lower buds, and 44% ature) foliage.	detritus compri sp.), 10 (Rume, were id transec are stur new fol	ce of recent floods (Nov 22) with s. 87% of 10m line transect sing of Prairie grass ( <i>Bromus</i> ) % dead grass and 3% Dock ( <i>x sp.</i> ). 0% target weed species entified along the 10m line t. Although 16% of Black Gums ted in growth, 92% are exhibiting tage growth, and 10.8% trees ing unopened flower buds.

Photo Point ID	Site		Bearing		Longitude		Latitude
PP3	North St	reet, Perthville			149.5528485		-33.4859696
End of Year 4		End of Year 5		End of Year 6		End of	Year 7
Date		Date		Date		Date	
28 August 2024							
Description		Description		Description		Descri	ption
48 months after planting E grass short due to regular	Black Gums, slashing.						
Comments		Comments		Comments		Comm	ents
76.7% of 10m line transed prairie grass ( <i>Bromus sp.</i> ) grass and dandelion ( <i>Tara</i> respectively, and 6.7% do <i>sp.</i> respectively. 0% targe were identified along the 1 transect. 0% target weed s identified along the 10m line Although 95.3% of Black G evidence of insect damage scored the highest health ra	axacum sp.) ack and Phalaris at weed species and mine species were e transect. ums show , 87.2% of trees						

Photo Point ID	Site		Bearing		Longitude		Latitude
PP4	North S	treet, Perthville	312°		149.552871		-33.487148
Baseline (before works)	7.	End of Year 1		End of Year 2		End of	Year 3
Date		Date		Date		Date	
7 February 2020		27 August 2021		10 August 2022		11 Augi	ust 2023
Description		Description		Description		Descrip	otion
Baseline photo prior to site pr weed control and planting of I			slashing of grass between Gums, g		24 months after planting of Black Gums, grass short due to recent slashing		ths after planting Black Gums, hort due to regular slashing.
Comments		Comments		Comments		Comme	ents
Floodplain between North Street flood levee and Queen Charlotte Vale Creek with stockpiled soil and road base from flood levee mitigation works. Ground highly compacted due to heavy machinery used on site.		Floodplain between levee and Queen Ch Grass understorey s slashing of grass an perennial grasses. 5 transect comprised (Bromus sp.), 46.7% species, and 3.3% C (Taraxacum sp.). 0% species were identification in transect.	narlotte Vale Creek. short due to previous d dormancy of 50% of 10m line of Prairie Grass d dead grass Dandelion 6 target weed	because of vehi 10m line transe Phalaris, 10% c 7% Dandelion ( target weed spe along the 10m li growth on Black exhibiting early s	isoil compaction icle movement. 83% of ct comprised of lover ( <i>Trifolium sp.</i> ) and <i>Taraxacum sp.</i> ) 0% icles were identified ine transect. Significant Gums with 0.7% trees stages of flower buds, and it (mature) foliage.	detritus compris (Taraxa species identifie Althoug in growth growth,	ce of recent floods (Nov 22) with 53% of 10m line transect sing of Clover, 43% Dandelion acum sp.) and 3% unknown 6.0% target weed species were d along the 10m line transect. In 16% of Black Gums are stunted th, 92% are exhibiting new foliage and 10.8% trees exhibiting ed flower buds.

Photo Point ID	Site		Bearing		Longitude		Latitude	
PP4	North S	Street, Perthville			149.552871		-33.487148	
End of Year 4		End of Year 5		End of Year 6	1	End o	f Year 7	
Date		Date		Date		Date		
28 August 2024								
Description		Description		Description		Descr	ription	
48 months after planting grass short due to regula								
Comments		Comments		Comments		Comn	nents	
46.7% of 10m line transe of prairie grass ( <i>Bromus</i> clover ( <i>Trifolium sp.</i> ), 20% ( <i>Taraxacum sp.</i> ), and 10% <i>sp.</i> ). 0% target weed spe along the 10m line transe 95.3% of Black Gums shi insect damage, 87.2% of the highest health rating	sp.), 23.3% % dandelion % dock (Rumex cies identified act. Although ow evidence of trees scored							

Photo Point ID	Site		Bearing		Longitude		Latitude
PP5	North S	treet, Perthville	106°		149.552911		-33.487168
Baseline (before works)	<i>.</i>	End of Year 1		End of Year 2	- T	End of	Year 3
Date		Date		Date		Date	
7 February 2020		27 August 2021		10 August 2022	2	11 Augu	ust 2023
Description		Description		Description		Descrip	otion
Baseline photo prior to site p weed control and planting of			nting of Black Gums, ning of grass between		planting Black Gums, to recent slashing		ths after planting Black Gums, hort due to regular slashing.
Comments		Comments		Comments		Comme	ants.
Comments		Comments		Comments		Comme	ents
Recently installed bank of the Perthville flood levee looking east southeast and running parallel with North Street. Ground highly compacted due to heavy machinery used on site. New fencing installed along northern boundary.  slashing perennia transect ( <i>Bromus</i> species, 3.3% Ind rogusum identified Presence		slashing of grass an perennial grasses. 4 transect comprised ( <i>Bromus sp.</i> ), 46.7% species, 3.3% Dock 3.3% Indian Mustan	46.7% of 10m line of Prairie Grass 6 dead grass (Rumex sp.) and d (Rapistrum t weed species were 10m line transect.	because of vehi 10m line transe Phalaris, 17% E Clover ( <i>Trifoliun</i> species were ide transect. Signific Gums with 0.7%	Dock (Rumex sp.) 7% in sp.) 0% target weed entified along the 10m line cant growth on Black trees exhibiting early buds, and 44% having	detritus compris sp.), 10 (Rumex were ide transect are stun new folia	ce of recent floods (Nov 22) with . 73% of 10m line transect sing of Prairie grass ( <i>Bromus</i> % dead grass and 3% Dock & sp.). 0% target weed species entified along the 10m line t. Although 16% of Black Gums age growth, and 10.8% trees ag unopened flower buds.

Photo Point ID	Site		Bearing		Longitude		Latitude
PP5	North St	reet, Perthville			149.552911		-33.487168
End of Year 4	<b>!</b> .	End of Year 5		End of Year 6		End of	Year 7
Date		Date		Date		Date	
28 August 2024							
Description		Description		Description		Descri	ption
48 months after planting E grass short due to regular							
Comments		Comments		Comments		Comm	ents
53.3% of 10m line transection (Trifolium sp.), 23% 16.7% prairie grass (Brom Plantago sp. and native corespectively. 0% target we identified along the 10m lin Although 95.3% of Black (evidence of insect damage trees scored the highest h	o Phalaris sp., nus sp.), and 3% ouch grass eed species ne transect. Gums show e, 87.2% of						