

Environmental Management Plan for Bunjil Creek and Howey Creek, Gisborne



Prepared for: Gisborne Landcare, Macedon Ranges Shire Council and Melbourne Water

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Conclusions in this report were based on site observations, testing and other information obtained by Acacia, and on the assumption that this data is representative and reliable. These conclusions must be read in conjunction with the assumptions and uncertainties included in the report. If site conditions or information different to that set out in the report is identified or appears to be present, please advise us promptly. We will re-evaluate our conclusions where necessary.

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Glossary

Term	Definition
Benchmark	A standard vegetation-quality reference point relevant to the vegetation type that is applied in habitat hectare assessments. Represents the average characteristics of a mature and apparently long-undisturbed state of the same vegetation type.
Ecological Vegetation Class (EVC)	a native vegetation classification system that incorporates vegetation structure, floristic and ecological characteristics together with environmental attributes such as aspect, slope, elevation, rainfall and soils
Environmental Weed	Plant species that invade native ecosystems and have the potential to adversely affect the survival of native flora or fauna or the functioning of ecosystems
Exotic	Introduced plant species, non-native to Victoria
Large Non-tufted Graminoid	A robust grass or sedge, with leaves arranged along single, erect flower stalks, which in turn arise from rhizomes or stolons (creeping above or below ground stems), more than 1m tall.
Large Tufted Graminoid	A robust grass, sedge, rush or similar, usually with more than one flower stalk. Usually large numbers of leaves arising from a common, often broad base or clump, more than 1m tall. Includes trunked <i>Xanthorrhoea</i> spp. and palm-like sedges, such as <i>Gahnia clarkei</i> .
Medium to Small Tufted Graminoid	A grass, sedge, rush or similar, usually with more than one flower stalk. Usually large numbers of leaves arising from a common base or clump, between 10cm and 1m tall.
Medium to Tiny Non-tufted Graminoid	A grass, sedge, rush or similar with leaves arranged along single, erect flower stalks, which in turn arise from rhizomes or stolons (creeping above or below ground stems), not exceeding 1 m tall. Also includes plants with a few grass-like leaves arising from a common base (e.g. some lilies, orchids).
Noxious Weeds	Declared Noxious Weeds in Victoria under CaLP Act 1994
Prostrate Shrub	Woody plants with stems and branches that often trail along the ground and do not exceed 20 cm in height.
Revegetation	Establishment of native vegetation to a minimum standard in formerly cleared areas, outside a remnant patch.
Scrambler or Climber	Woody or non-woody plants that rely upon other plants (dead or alive) or other structures (rocks or logs) for support. The main difference between this category and plants described as 'prostrate', is the habit of using other plants to lean on or climb. Species in this group may form dense colonies.
Small or Prostrate Herb	More or less erect, non-woody plants with non-grassy leaves, less than 5 cm in height. Many of this group are ephemerals (i.e. germinate, reproduce and die within a few weeks). The group includes prostrate and carpet-forming herbs.
Small Shrub	More or less erect, woody plants that are between 20 cm and 1 m in height.
WoNS	Weeds of National Significance

1. INTRODUCTION

Acacia Environmental Management was engaged by Gisborne Landcare, in partnership with the Macedon Ranges Shire Council and Melbourne Water, to develop an Environmental Management Plan for Bunjil Creek and Howey Creek, Gisborne.

The objectives of the Environmental Management Plan are to:

- develop a long-term vision for the creeks;
- develop a 5-year Environmental Action Plan;
- confirm the existing ecological values of the waterways;
- identify management objectives for the waterways in collaboration with relevant stakeholders; and,
- identify suitable actions to achieve the management objectives.

Bunjil Creek is located in the township of Gisborne, ~54km northwest of Melbourne. It is a tributary to Jacksons Creek and extends approximately 4.2km south to its origin at the summit of Mount Gisborne. Bunjil Creek was formerly known as South Gisborne Drain and was only officially renamed on 27 September 2018 by Melbourne Water.

The project area covers ~2.8km of riparian zone and open space along Bunjil Creek from the confluence at Jacksons Creek and south of Wyralla Crescent and ~1.7km of Howey Creek, a tributary of Bunjil Creek, from its confluence north of Fersfeld Road to south of Brooking Road (Figure 1).

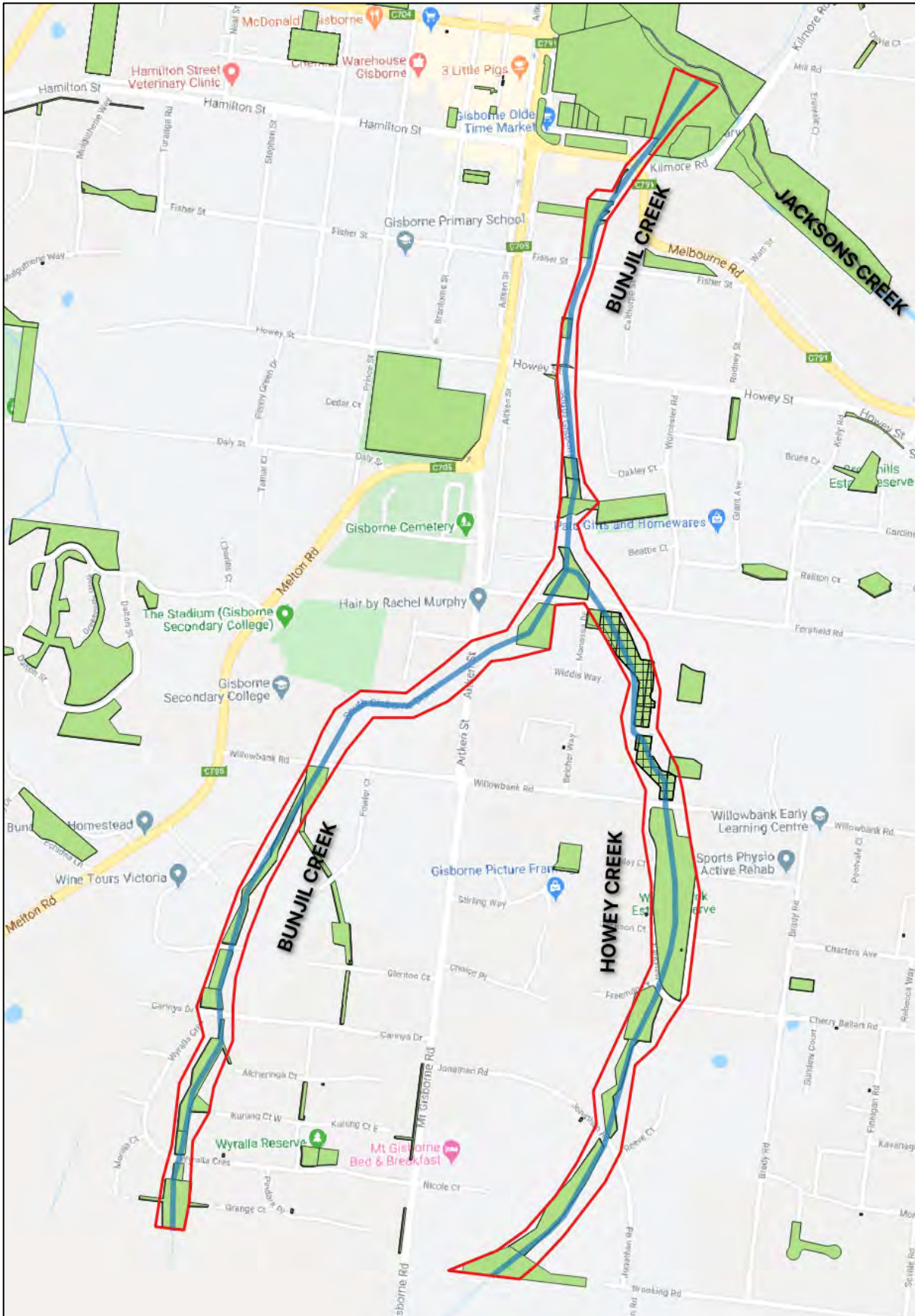


Figure 1: General location of the project area bounded by red polygon. Green areas indicate current Council-managed lands along the project area, crossed green areas indicate future Council-managed lands.

2. METHODOLOGY

2.1 Desktop Assessment

A search of DELWP NatureKit was undertaken to identify the present and historical Ecological Vegetation Classes (EVC) existing within the project area. The EVCs were then mapped using vector data acquired from DELWP Spatial Datamart Victoria.

A search of DELWP Victorian Biodiversity Atlas (VBA) was also undertaken to identify historical records of rare or threatened flora and fauna species recorded in the vicinity of the project area.

Mapping and associated calculations were undertaken in QGIS.

Flora species were classified based on their origin or natural distribution as indicated in Flora of Victoria – RBGV online database. Weed status were based on the following lists:

- Weeds of National Significance 2012. Commonwealth of Australia.
- Victorian noxious weeds list by scientific name 20 July 2017. Agriculture Victoria.
- Your guide to the Weeds of Central Victoria. 2015. MRSC, MSC, MASC and Landcare Victoria.

Relevant EVC Benchmarks were retrieved from DELWP to identify the revegetation species while planting densities were based on the DSE Native Vegetation Revegetation Planting Standards 2006.

2.2 Field Assessment

General flora and fauna surveys were undertaken along Bunjil Creek and Howey Creek on 24 February, 8-9 April and 25 June 2020. Flora and fauna encountered were identified to the lowest possible taxa and encoded into our customised mapping and field data collector tablet paired with our Konect platform.

While every effort was taken to identify all flora and fauna present in the assessment area, it is acknowledged that some species may have avoided detection due to the following:

- A lack of seasonal sampling;
- An absence of nocturnal sampling;
- A lack of intrusive sampling.

It should be noted therefore that there remains the possibility of false absences being recorded at this location. Accordingly, the lack of a positive record for a particular species during the field survey does not necessarily constitute a definitive absence of that species from the site permanently or seasonally.

2.3 Management Zones

To streamline the field assessments and make data records manageable, the project area has been divided into 14 management zones. The management zones were based primarily on major road crossings and areas that can be readily observed together. In some areas, the management zones have been expanded to include open spaces beyond the riparian zone. The management zones are described in Table 1 and mapped in Figure 2.

Table 1: Description of Management Zones.

Management Zone	Description	Start	End
B01	Bunjil Creek confluence at Jacksons Creek; ~200m	Jacksons Creek	Melbourne Road
B02	Bunjil Creek; ~220m	Melbourne Road	Fisher Street
B03	Bunjil Creek; 220m	Fisher Street	Howey Street
B04	Bunjil Creek; ~300m	Howey Street	Curtis Court
BH5	Bunjil Creek (~170m) and Howey Creek (~100m) confluence	Curtis Court	Fersfield Road
B06	Bunjil Creek; ~180m	Fersfield Road	Aitken Street
B07	Bunjil Creek; ~410m	Aitken Street	Willowbank Road
B08	Bunjil Creek; ~570m	Willowbank Road	Carinya Drive
B09	Bunjil Creek; ~320m	Carinya Drive	Wyralla Crescent
B10	Bunjil Creek; ~140m	Wyralla Crescent	Grange Court
H01	Howey Creek; ~420m	Fersfield Road	Willowbank Road
H02	Howey Creek; 400m; Willowbank Estate Reserve	Willowbank Road	Parkview Street
H03	Howey Creek; ~320m	Parkview Street	Jonathan Road
H04	Howey Creek; ~380m	Jonathan Road	Brooking Road

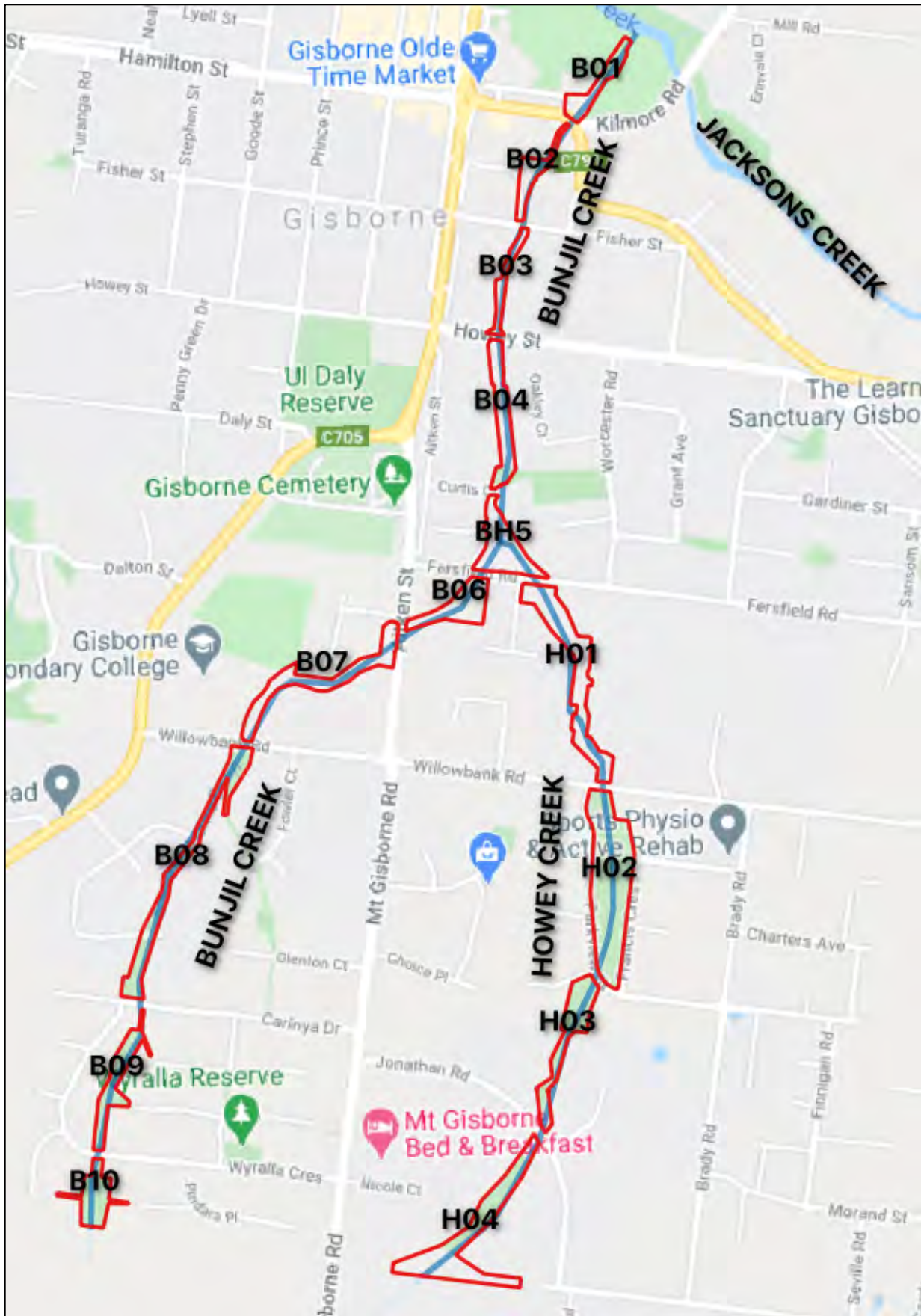


Figure 2: Map showing the designated management zones.

2.4 Site Prioritisation

A site prioritisation assessment was developed for the project to allow the project proponents to objectively prioritise restoration efforts for Bunjil Creek and Howey Creek. The site prioritisation matrix attempts to capture relevant site data and allocates weights to each attribute which can then be summarised to come up with a single score which ranks each site in terms of priority.

The prioritisation matrix employs a modified SWOT and Cost Benefit Analysis to evaluate the attributes and associated restoration works within and along the waterways. The proposed site prioritisation matrix identifies the Values, Threats, Constraints and Opportunities for each management zone. The matrix will then undergo a Cost Benefit Analysis to develop a site prioritisation summary which the stakeholders can evaluate, revise and agree to implement. An example of a site prioritisation matrix showing possible attributes that can be evaluated for a site is shown in Table 2.

Table 2: Site prioritisation matrix.

Values	Threats	Constraints	Opportunities
Presence and density of native species	Presence and density of major weeds	Size and dimension of the management zone	Weed Control
Presence of significant native species	Weed invasion from adjacent areas	Ease of Access	Revegetation
Proximity to nature areas	Pest Invasion	Low Public Visibility	Recreational Use
Significance of EVC to Bioregion, MRSC	Garbage Dumping	Existing Land Use	WSUD
Historical records of rare and threatened species	Vandalism	Seasonal Drying/Flooding	Public Engagement
Historical/Cultural/ Ecological Significance	Future Land Use	Future Land Use	Pest Control/ Fencing
Size and dimension of the management zone	Soil Erosion	Seasonal Drying/Flooding	Bank Stabilisation

To simplify the process, be less subjective and avoid bias when choosing sites to prioritise for rehabilitation, a scaled score is assigned to every entry in the matrix. A higher score is assigned to a favourable state/ condition (e.g. high number of native species = 3 vs. low number of native species = 1; low number of high threat weeds = 3 vs. high number of high threat weeds = 1).

The majority of the attributes are aimed towards success in restoring the riparian area (*i.e.* the least effort that will yield the highest quality or rate of success) except for the Major Weeds and Weed Density components which captures 1) legislative obligations and 2) the urgency to work on a site so that the site does not further deteriorate in ecological value.

2.5 Costing

Costing for restoration work is based on the following items, rates and assumptions.

Item	Cost (\$)
Tubestock	2.00
450mm Black Mesh Guard	1.32
750mm Hardwood Stakes	2.70
Weed Mat 30cm x 30cm	1.70
Total cost per plant	\$7.72

2.5.1 Revegetation in High Priority Management Zones

Assumptions:

- Revegetation will aim to further establish all structural layers within the relevant EVC
- Plants will be spaced at one stem per 2m²
- Labour costs are based on each operator planting 100 stems per day

Item	Cost (\$)
Materials Cost/Ha	38,600
Labour Cost/Ha	26,000
Total Cost/Ha	\$64,600

2.5.2 Revegetation in Low and Medium Priority Management Zones

Assumptions:

- Revegetation will aim to establish canopy species from the relevant EVC
- Plants will be spaced at one stem per 10m²
- Labour costs are based on each operator planting 100 stems per day

Item	Cost (\$)
Materials Cost/Ha	7,720
Labour Cost/Ha	5,000
Total Cost/Ha	\$12,720

2.5.3 Weed Control

Assumptions:

- Both knapsack spraying and woody weed control works will consist of one day for two operators (16hrs total) per management zone.
- The daily charge for each operator is assumed to be \$550.00 (inclusive of herbicide charges).

2.5.4 Fauna Surveys

It is envisioned that fauna surveys will consist of rapidly assessed (20 minute), passive avian richness and abundance counts plus a 5-minute frog call recording at a pre-selected location within each management zone. The timing of surveys will be standardised over the duration of the five-year plan. Two operator days will be allocated for this activity. Surveys will be conducted within the same week of each year.

2.5.5 Watering

Assumptions:

Supplementary watering will occur between November and March (inclusive) and will be conducted within revegetation zones that have been planted during the preceding winter (first year revegetation only). Watering will be carried out via a vehicle-mounted water cart. Local hydrants will be utilised as fill points. It is assumed that the required watering at each management zone will take 16hrs (on average) to complete. Each plant will receive at least 10L of supplementary water per month. As such, it is estimated that the cost of supplementary watering per habitat zone per month will be \$1400.00 (2 x operator days @ \$550.00/day plus daily water cart hire estimated to be \$300.00).

2.5.6 Revegetation Preparation

Revegetation preparation will consist of spraying circles of 1m diameter for each stem to be planted the following season. This will reduce competition for the newly planted stems

2.5.7 Progress Report

A progress report shall be commissioned at the end of the initial five-year management period. The report shall address the success of intervention efforts (revegetation and weed control), describe any changes in local wildlife observations and make further land management recommendations. The preparation of the report will consist of site visits, desktop analysis and report writing.

3. SITE ANALYSIS

3.1 Ecological Vegetation Class

A search of DELWP NatureKit indicated that the project area historically supported several Ecological Vegetation Classes (Pre-1750 EVC). These historical EVCs are described below and summarised in Table 3. A map of the historical EVCs along with the management zones is presented in Figure 3.

Table 3: Summary of historical (pre-1750) Ecological Vegetation Classes within the project area.

EVC Name	EVC No.	Bioregion	Conservation Status
Riparian Woodland	EVC 641	Central Victorian Uplands	Endangered
Valley Grassy Forest	EVC 47	Central Victorian Uplands	Vulnerable
Grassy Forest	EVC 128	Central Victorian Uplands	Vulnerable
Plains Grassy Woodland	EVC 55	Central Victorian Uplands	Endangered
Plains Grassy Woodland	EVC 55	Victorian Volcanic Plains	Endangered
Scoria Cone Woodland	EVC 894	Victorian Volcanic Plains	Endangered

Riparian Woodland (EVC 641) Central Victorian Uplands - occurs beside permanent streams, typically on narrow alluvial deposits. Woodland to 15m tall generally dominated by *Eucalyptus camaldulensis* over a tussock grass-dominated understorey. Tall shrubs may be present and amphibious herbs may occur in occasional ponds and beside creeks. While flooding may be common, sites are rarely inundated for lengthy periods.

Valley Grassy Forest (EVC 47) Central Victorian Uplands - occurs under moderate rainfall regimes of 700-800 mm per annum on fertile well-drained colluvial or alluvial soils on gently undulating lower slopes and valley floors. Open forest to 25m tall may carry a variety of eucalypts, usually species that prefer more moist or more fertile conditions over a sparse shrub cover. In season, a rich array of herbs, lilies, grasses and sedges dominate the ground layer but at the drier end of the spectrum the ground layer may be sparse and slightly less diverse, but with the moisture-loving species still remaining.

Grassy Forest (EVC 128) Central Victorian Uplands - low growing forest to 20m tall with an understorey of small and medium shrubs and a rich diversity of herbs. Large shrubs and understorey trees may also be conspicuous. Often grows in areas transitional between drier box stringybark forests and taller herb-rich forests typical of more favourable environments.

Plains Grassy Woodland (EVC 55) Central Victorian Uplands - an open, eucalypt woodland to 15m tall occurring on a number of geologies and soil types. Occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer.

Valley Grassy Forest (EVC 47) Victorian Volcanic Plains - An open, eucalypt woodland to 15m tall. Occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer. This variant occupies areas receiving approximately 500 – 700mm annual rainfall.

Scoria Cone Woodland (EVC 894) Victorian Volcanic Plains - Eucalypt woodland to 15m tall or non-eucalypt woodland to 10 m tall over a grassy to bracken-dominated understorey with a range of herbs. Occurs on the slopes of freely-draining scoria cones and spatter areas of more coarse boulder-forming flow sources. Soils are fertile but often skeletal.



Figure 3: Pre-1750 Modelled Ecological Vegetation Classes of the project area.

3.2 Historical Records of Rare or Threatened Species

A search of DELWP Victorian Biodiversity Atlas for rare or threatened species recorded within in the past 20 years showed that Bacchus Marsh Wattle *Acacia rostriformis* and Lewin's Rail *Lewinia pectoralis* have been recorded within 0.5km of the project area in 2013 and 2018, respectively. Both species are EPBC Act-listed as *Vulnerable* and FFG Act-listed.

3.3 Floral Species Diversity

Field assessments undertaken on 24 February, 8-9 April and 25 June 2020 recorded a total of 140 flora species within the project area. The inventory consisted of 52 native and 88 introduced species.

Significant native species recorded within the project area include eucalypt species such as Manna Gum *Eucalyptus viminalis*, Narrow-leaf Peppermint *E. radiata*, River Red Gum *E. camaldulensis*, and Swamp Gum *E. ovata*.

Of the 88 introduced species observed, nine are Weeds of National Significance (WoNS), 14 are Declared Noxious Weeds in Victoria and 16 species are regarded as Environmental Weeds in Central Victoria.

The complete list of flora species recorded within the project area is attached as **Appendix 1**.

4. SITE PROFILES and PRIORITISATION

Site profiles for each of the management zones, including site recommendations are presented in the succeeding sections. A summary of these is presented in Table 4.

A site prioritisation matrix was developed for the project using the attributes in the summary table. The results are shown in Table 5.

The analysis resulted in the following site prioritisation:

- High priority – BH5, H01, H02, B07, B08
- Medium priority – B01, B02, B04, H03, H04,
- Low – priority - B03, B06, B09, B10

A review of the attributes affecting the prioritisation ranking show that high priority sites are driven by the lower effort required for weed control and revegetation works on Council-managed lands. While low priority site rankings appear to be influenced by areas in lower risk of ecological deterioration as they have lower risk from weed invasion and smaller riparian areas.

The site profiles of each management zone are presented in the following sections.

It should be noted that revegetation works within the waterway should be consulted with and approved by Melbourne Water and MRSC Engineering team to ensure that the proposed works do not impact the hydraulic capacity of the waterway.

Table 4: Summary of site attributes for each management zone.

Attribute	B01	B02	B03	B04	BH5	H01	H02	H03	H04	B06	B07	B08	B09	B10
Area (ha)	0.52	0.44	0.34	0.81	0.95	1.62	2.54	0.94	1.75	0.74	1.11	1.34	0.74	0.64
Riparian Length (m)	200	220	220	300	170 + 100	420	400	320	380	180	410	570	320	140
Total Species	19	15	18	24	27	38	17	18	16	20	38	29	9	31
Native	2	4	1	11	13	19	10	9	14	4	15	11	5	11
Major Weeds	9	6	13	6	4	7	2	4	2	9	9	5	1	9
Large Trees	nil	nil	nil	nil	nil	1	2	nil	3	nil	3	1	nil	nil
Proposed Weed Control Area (ha)	0.34	0.22	0.28	0.6	0	0.61	0.13	0.56	1.13	0.38	0.86	0	0	0.49
Proposed Revegetation Area (ha)	0.41	0.27	0.33	0.68	0.34	1.11	0	0.86	1.75	0.74	0.72	0.46	0.74	0.64
Council-managed Land	majority	majority	partial	majority	majority	majority	full	full	full	no	no	full	full	full
Historical EVC	RW/ VGF	VGF	VGF	GF	GF/ PGW	PGW	PGW	PGW/ SCW	SCW	PGW	PGW	PGW	PGW	PGW/ SCW
Significant Species	1	1	0	4	3	7	4	5	8	3	7	7	4	5
Woody Weed Density	severe; partial	medium	severe	severe; partial	severe; partial	medium; partial	small	medium; partial	medium	severe	medium	small	small	small
Grassy Weed Density	severe	severe	severe; partial	severe; partial	medium	severe	medium; partial	medium; partial	medium	medium; partial	medium	medium	medium	small
Existing Revegetation	Yes	Yes	no	Yes	Yes	Yes	Yes	Yes	no	no	Yes	Yes	no	no

Table 5: Site prioritisation matrix for Bunjil Creek and Howey Creek.

Attribute	B01	B02	B03	B04	BH5	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Riparian Length</i>	1	1	1	3	1	3	2	2	2	0	3	3	2	0
<i>Native Species</i>	0	0	0	2	2	3	2	1	2	0	3	2	1	2
<i>Large Native Trees</i>	0	0	0	0	0	1	2	0	3	0	3	1	0	0
<i>Major Weeds</i>	2	1	3	1	1	0	1	0	0	2	2	1	0	2
<i>Weed Control Effort</i>	1	1	0	1	3	2	3	1	1	1	0	3	3	0
<i>Revegetation Effort</i>	0	3	3	2	3	1	3	2	0	2	2	2	2	2
<i>Council-managed Land</i>	2	2	1	2	2	2	3	3	3	0	0	3	3	3
<i>EVC Conservation Status</i>	3	1	1	1	3	2	2	3	2	2	2	2	2	3
<i>Significant Species</i>	0	0	0	1	0	2	1	1	2	0	2	2	1	1
<i>Woody Weed Density</i>	2	1	3	2	2	2	0	1	1	3	1	0	0	0
<i>Grassy Weed Density</i>	3	3	2	2	1	3	1	1	1	1	1	1	1	0
<i>Existing Revegetation</i>	1	1	0	1	1	1	1	1	0	0	1	1	0	0
<i>Heritage Value</i>	1	1	1	0	0	0	0	0	0	0	0	0	0	0
<i>Community Value</i>	0	1	0	0	1	0	0	0	0	1	0	0	0	0
Total	16	16	15	18	20	22	21	16	17	12	20	21	15	13
Priority	med	med	low	med	high	high	high	med	med	low	high	high	low	low

4.1.1 Management Zone – B01

Management Zone B01 is approximately 200m of riparian zone located at the northern tip of Bunjil Creek at the confluence with Jacksons Creek and bounded by Melbourne Road to the south. The zone was heavily modified for recreational use and dominated by introduced species, supporting only two native species out of the total of 19 species recorded during the field assessments (see **Appendix 1**). A summary of the observations and recommendations for management zone B01 is presented in Table 6.

Table 6: Summary of observations and recommendations for management zone B01.

Management Zone	B01
Area	0.52ha
Riparian Length	200m
Total Species	19
Native Species	2
Large Trees	nil
Significant Species	Blackwood
Major Weeds	9
Weeds of National Significance	Blackberry, Crack Willow, Montpellier Broom
Declared Noxious Weeds	Angled Onion, Blackberry, Crack Willow, Hemlock, Montpellier Broom, Spear Thistle
Environmental Weeds	Cherry Plum, Desert Ash, White Poplar
Woody Weed Infestation	Severe
Grassy Weed Infestation	Severe
Historical EVC	Riparian Woodland and Valley Grassy Forest
Land Management	Majority Council-managed
Constraints	Public recreation use area, adjacent bowls club, netball courts and a skate park; public perception of old trees. Removal of large exotic tree might be hampered by future heritage listing
Opportunities	Large scale weed removal and revegetation enhancement

Proposed Weed Control Area / Estimated Cost	0.34ha / \$2,200
Proposed Revegetation Area / Estimated Cost	0.41ha / \$5,190
Estimated Total Restoration Works	\$7,390
Notes/Remarks	Temporary heritage order; existing partial revegetation works



Representative view of B01 – Bunjil Creek



Condition at confluence of Jacksons Creek



Partial revegetation works within Bunjil Creek

Site Priority

MEDIUM

B01 could be improved by implementing large scale weed control to address severe woody weed and grassy weed infestations, including nine major weeds. This should be followed by revegetation works using a combination of species within the Riparian Woodland and Valley Grassy Forest EVC. These areas are shown in Figure 4 and a list of revegetation species with corresponding planting densities is presented as **Appendix 2** and **Appendix 3**, respectively, these planting recommendations have been informed by DSE Native vegetation revegetation planting standards (2006).



Figure 4: Management B01 (within yellow polygon) showing recommended areas for weed control (red polygons) and revegetation areas (white hatch lines). Light blue circles indicate nominated heritage trees.

Sections of B01 have been proposed for heritage overlays (see Figure 4), therefore, woody weed control efforts should be coordinated with Council to ensure that the nominated heritage trees - English Elms *Ulmus procera* and English Oaks *Quercus robur*, are not impacted.

4.1.2 Management Zone – B02

Management Zone B02 is approximately 220m of riparian zone of Bunjil Creek located between Melbourne Road and Fisher Street. The zone is narrow between residential properties while the open area is adjacent to ongoing land development. The zone supports very few native species (only four out of the total 15 species recorded) and is dominated by grassy and woody weeds including six major weeds. A summary of the observations and recommendations for management zone B02 is presented in Table 7.

Table 7: Summary of observations and recommendations for management zone B02.

Management Zone	B02
Area	0.44ha
Riparian Length	220m
Total Species	15
Native Species	4
Large Trees	nil
Significant Species	Manna Gum
Major Weeds	6
Weeds of National Significance	Blackberry, Montpellier Broom, Willow
Declared Noxious Weeds	Blackberry, Montpellier Broom, Sweet Briar, Willow
Environmental Weeds	Blue Periwinkle, English Ivy,
Woody Weed Infestation	Medium
Grassy Weed Infestation	Severe
Historical EVC	Valley Grassy Forest
Land Ownership	Majority Council-managed
Constraints	Very close proximity to houses on eastern side
Opportunities	Further weed control, enhance existing revegetation
Proposed Weed Control Area / Estimated Cost	0.22ha / \$2,200
Proposed Revegetation Area / Estimated Cost	0.27ha /\$3,434
Estimated Total Restoration Works	\$5,634

Notes/Remarks	Heritage Bluestone rockwork in creek; existing partial revegetation works
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Representative view of B02 – Bunjil Creek showing existing revegetation works.



Bluestone rockwork and drains within Bunjil Creek.



View of other weedy section of Bunjil Creek.

Site Priority

MEDIUM

B02 could be improved by implementing weed control along the whole stretch of the creek and building on the existing revegetation within the open area with species belonging to Valley Grassy Forest EVC. These areas are shown in Figure 5 and a list of revegetation species with corresponding planting densities is presented in **Appendix 3**.



Figure 5: Management B02 (yellow polygon) showing recommended areas for weed control (red polygon) and revegetation areas (white hatch lines). Northern section of B02 with Heritage Overlay along bluestone channel shown in light blue polygon.

A Heritage Overlay exists for the bluestone channel, as such, weed control works in this area should be coordinated with Council to ensure the heritage rockwork is not impacted. Revegetation works along the open space should be conducted at a later stage once the future land use has been finalised for the area.

4.1.3 Management Zone – B03

Management Zone B03 is approximately 220m of riparian zone of Bunjil Creek located between Fisher Street and Howey Street. This zone is narrow and passes through several residential properties. Similar to the previous zones, B03 supports very few native species (only one of the total 18 species recorded) and is heavily dominated by grassy and woody weeds including 13 major weeds. A summary of the observations and recommendations for management zone B03 is presented in Table 8.

Table 8: Summary of observations and recommendations for management zone B03.

Management Zone	B03
Area	0.34ha
Riparian Length	220m
Total Species	18
Native Species	1
Large Trees	nil
Significant Species	nil
Major Weeds	13
Weeds of National Significance	Blackberry, Grey Sallow, Tortured Willow, Willow
Declared Noxious Weeds	Blackberry, Grey Sallow, Hawthorn, Hemlock, Tortured Willow, Willow
Environmental Weeds	Blue Periwinkle, Cherry Plum, English Holly, English Ivy, Radiata Pine, Toowoomba Canary Grass, White Poplar
Woody Weed Infestation	Severe
Grassy Weed Infestation	Severe
Historical EVC	Valley Grassy Forest
Land Ownership	Partially Council-managed
Constraints	Difficult access to some areas, residential interface
Opportunities	Large scale weed removal; revegetation
Proposed Weed Control Area / Estimated Cost	0.28ha / \$2,200
Proposed Revegetation Area / Estimated Cost	0.33ha / \$4,147

Estimated Total Restoration Works	\$6,347	
Notes/Remarks	Heritage Bluestone rockwork in creek	
		
Representative view of B03 – Bunjil Creek		
		
Section of the creek showing severe weed infestation	Another section of the creek showing severe weed infestation	
Site Priority	LOW	

B03 could be improved by implementing weed control along the whole stretch of the creek and revegetating with species belonging to Riparian Woodland EVC. These areas are shown in Figure 6 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2**.






Figure 6: Management B03 (yellow polygon) showing recommended areas for weed control (red polygon) and revegetation areas (white hatch lines).

4.1.4 Management Zone – B04

Management Zone B04 is approximately 300m of riparian zone of Bunjil Creek located between Howey Street and Curtis Court. The narrow area is severely infested with woody and grassy weeds including six major weeds but also supports a large number of native species along Bunjil Creek (11 out of 24 species recorded). A summary of the observations and recommendations for management zone B04 is presented in Table 9.

Table 9: Summary of observations and recommendations for management zone B04.

Management Zone	B04
Area	0.81ha
Riparian Length	300m
Total Species	24
Native Species	11
Large Trees	nil
Significant Species	Blackwood; Manna Gum, Narrow-leaf Peppermint; Kangaroo Grass
Major Weeds	6
Weeds of National Significance	Gorse, Montpellier Broom; Weeping Willow
Declared Noxious Weeds	Gorse, Hawthorn, Montpellier Broom; Weeping Willow
Environmental Weeds	Cherry Plum, English Ivy
Woody Weed Infestation	Severe - partial
Grassy Weed Infestation	Severe - partial
Historical EVC	Grassy Forest
Land Ownership	Partially Council-managed
Constraints	Residential interface
Opportunities	Build on small revegetation area; large scale weed removal in remaining areas
Proposed Weed Control Area / Estimated Cost	0.60ha / \$2,200
Proposed Revegetation Area / Estimated Cost	0.68ha / \$8,650

Estimated Total Restoration Works	\$10,850	
Notes/Remarks	Existing partial revegetation works	
		
Representative view of B04 – Bunjil Creek		
		
Section of the creek showing severe weed infestation	Existing revegetation works	
Site Priority	MEDIUM	

B04 could be improved by implementing weed control along the majority of the creek and building upon the existing revegetation by supplementary planting with species belonging to Riparian Woodland EVC. These areas are shown in Figure 7 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2**.



Figure 7: Management B04 (yellow polygon) showing recommended areas for weed control (red polygons) and revegetation areas (white hatch lines).

4.1.5 Management Zone – BH5

Management Zone BH5 located at the confluence of Bunjil Creek and Howey Creek is positioned between Curtis Court and Fersfield Road. The zone is approximately 170m of riparian zone of Bunjil Creek and 100m of riparian zone of Howey Creek. The zone is severely infested with woody weeds in the northern section including four major weeds but supports a large number of native species as well (13 out of 27 species recorded). A summary of the observations and recommendations for management zone HB5 is presented in Table 10.

Table 10: Summary of observations and recommendations for management zone BH5.

Management Zone	BH5
Area	0.95ha
Riparian Length	270m
Total Species	27
Native Species	13
Large Trees	nil
Significant Species	Common Tussock Grass; Kangaroo Grass; Narrow-leaf Peppermint
Major Weeds	4
Weeds of National Significance	Montpellier Broom
Declared Noxious Weeds	Hawthorn; Montpellier Broom; Hemlock
Environmental Weeds	Cherry Plum, English Ivy
Woody Weed Infestation	Severe - partial
Grassy Weed Infestation	Medium
Historical EVC	Grassy Forest and Plains Grassy Woodland
Land Ownership	Majority Council-managed
Constraints	
Opportunities	Continue to enhance revegetation efforts, maintain weed control, develop triangular area after confluence
Proposed Weed Control Area / Estimated Cost	nil
Proposed Revegetation Area / Estimated Cost	0.34ha / \$21,964

Estimated Total Restoration Works	\$21,964	
Notes/Remarks	Existing revegetation works; good public exposure	
		
Representative view of BH5		
		
Existing revegetation works within the creek	Overview of BH5	
Site Priority	HIGH	

BH5 is in a relatively better condition than the rest of the management zones due to current land management efforts by Melbourne Water and Gisborne Landcare. Nonetheless, the area could still be improved by building upon the existing revegetation works with species belonging to Riparian Woodland, Grassy Forest or Plains Grassy Woodland EVC. These areas are shown in Figure 8 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2, 4 and 5**.

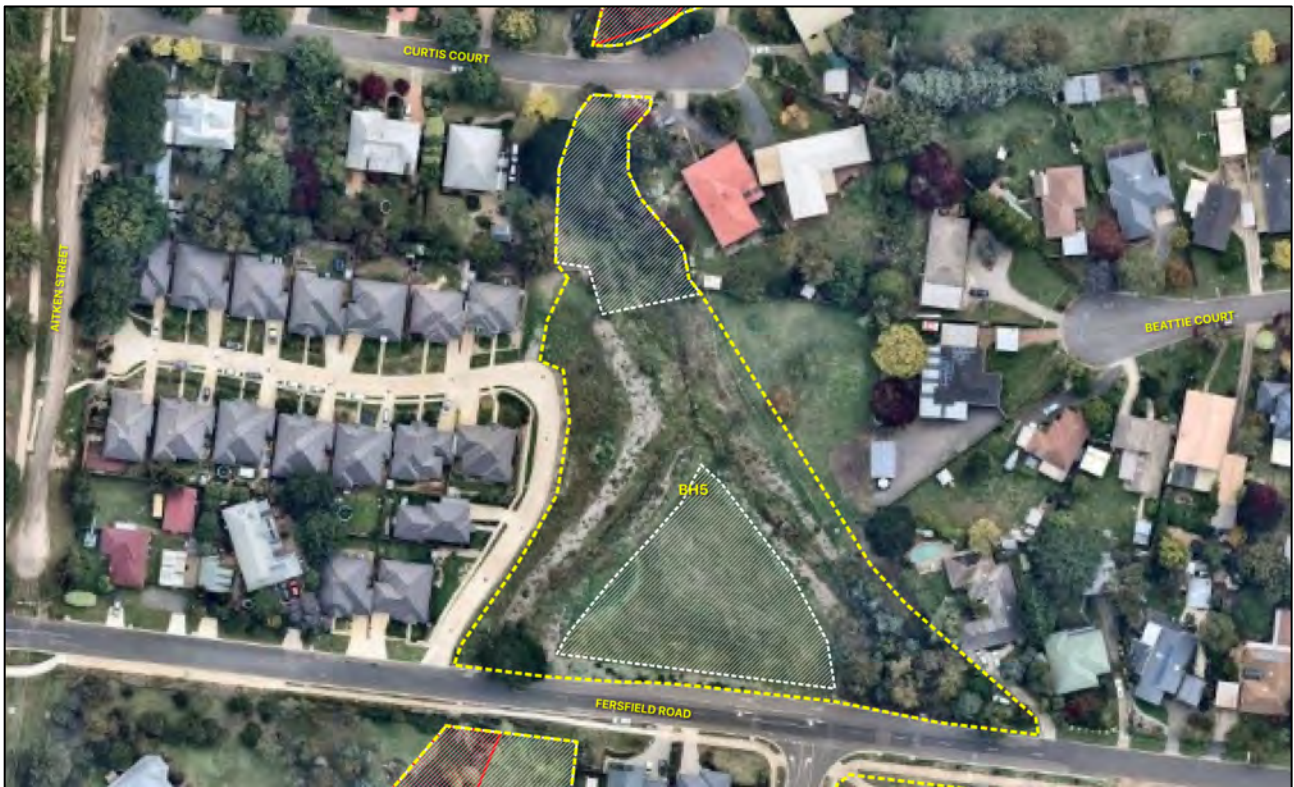


Figure 8: Management BH5 (yellow polygon) showing recommended area for revegetation (white hatch lines).

4.1.6 Management Zone – H01

Management Zone H01 is approximately 420m of riparian zone of Howey Creek passing through an area under development and farm area between Fersfield Road and Willowbank Road. The area is severely infested with grassy weeds including seven major weeds but supported a large number of native species along Howey Creek (19 out of 38 species recorded). A summary of the observations and recommendations for management zone H01 is presented in Table 19.

Table 11: Summary of observations and recommendations for management zone H01.

Management Zone	H01
Area	1.62ha
Riparian Length	420m
Total Species	38
Native Species	19
Large Trees	Manna Gum
Significant Species	Blackwood; Common Tussock Grass; Kangaroo Grass; Manna Gum; Narrow-leaf Peppermint, Sheep's Burr; Yellow Box
Major Weeds	7
Weeds of National Significance	Gorse, Tortured Willow; Weeping Willow
Declared Noxious Weeds	Gorse, Hawthorn, Sweet Briar, Tortured Willow; Weeping Willow
Environmental Weeds	Radiata Pine, Toowoomba Canary Grass
Woody Weed Infestation	Medium - partial
Grassy Weed Infestation	Severe
Historical EVC	Plains Grassy Woodland
Land Ownership	Majority Council-managed
Constraints	Unknown status of development in northeast corner – development is underway, drainage works
Opportunities	Good access, weed control particularly around ephemeral wetland
Proposed Weed Control Area / Estimated Cost	0.61ha / \$2,200

Proposed Revegetation Area / Estimated Cost	1.11ha / \$71,641
Estimated Total Restoration Works	\$73,841
Notes/Remarks	Existing partial revegetation works



Representative view of H01 – Howey Creek



Section of creek with severe blackberry infestation



Existing revegetation works

Site Priority

HIGH

H01 could be improved by implementing weed control along the majority of the creek and building on the existing revegetation by revegetating with species belonging to Riparian Woodland EVC. These areas are shown in Figure 9 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2**.



Figure 9: Management H01 (yellow polygon) showing recommended areas for weed control (red polygons) and revegetation areas (white hatch lines).

It should be noted that the parts of the adjoining area is undergoing major development which will involve works on the waterway. Therefore, enhancement works for this management zone should be planned for a later stage once this development work has been completed.

4.1.7 Management Zone – H02

Management Zone H02 is approximately 400m of riparian zone of Howey Creek located between Willowbank Road and Parkview Street and designated as Willowbank Estate Reserve. The area appears to be well-managed and supports 10 native species out of the 17 species recorded. A summary of the observations and recommendations for management zone H02 is presented in Table 12.

Table 12: Summary of observations and recommendations for management zone H02.

Management Zone	H02
Area	2.54ha
Riparian Length	400m
Total Species	17
Native Species	10
Large Trees	River Red Gum
Significant Species	Common Tussock Grass; River Red Gum; Sheep's Burr; Weeping Grass
Major Weeds	2
Weeds of National Significance	nil
Declared Noxious Weeds	Sweet Briar
Environmental Weeds	Brown Top Bent
Woody Weed Infestation	Small
Grassy Weed Infestation	Medium - partial
Historical EVC	Plains Grassy Woodland
Land Ownership	Fully Council-managed
Constraints	
Opportunities	Appears to be well managed; enhance revegetation works, control False Oat-grass
Proposed Weed Control Area / Estimated Cost	0.13ha / \$2,200
Proposed Revegetation Area / Estimated Cost	nil
Estimated Total Restoration Works	\$2,200

Notes/Remarks	Existing substantial revegetation
	
<p>Representative view of H02 – Howey Creek</p>	
	
<p>Area dominated by False Oat-grass recommended for weed control</p>	<p>Remnant River Red Gum</p>
<p>Site Priority</p>	<p>HIGH</p>

H02 could be improved by implementing weed control along a section of the creek and enhancing the existing revegetation works (Figure 10).



Figure 10: Management H02 (yellow polygon) showing recommended area for weed control (red polygon).

4.1.8 Management Zone – H03

Management Zone H03 is approximately 320m of riparian zone of Howey Creek located between Parkview Street and Jonathan Road. The area has a moderate infestation of woody and grassy weeds including four major weeds. A summary of the observations and recommendations for management zone H02 is presented in Table 13.

Table 13: Summary of observations and recommendations for management zone H03.

Management Zone	H03
Area	0.94ha
Riparian Length	320m
Total Species	19
Native Species	9
Large Trees	River Red Gum
Significant Species	Blackwood; Common Tussock Grass; River Red Gum; Sheep's Burr; Weeping Grass,
Major Weeds	4
Weeds of National Significance	nil
Declared Noxious Weeds	Hawthorn, Sweet Briar
Environmental Weeds	Brown Top Bent, Toowoomba Canary Grass
Woody Weed Infestation	Medium - partial
Grassy Weed Infestation	Medium - partial
Historical EVC	Plains Grassy Woodland/ Scoria Cone Woodland
Land Ownership	Fully Council-managed
Constraints	Residential interface
Opportunities	Build and enhance revegetation area in northern section, possible weed control beyond that, followed by revegetation
Proposed Weed Control Area / Estimated Cost	0.56ha / \$2,200
Proposed Revegetation Area / Estimated Cost	0.86ha / \$10,939
Estimated Total Restoration Works	\$13,139

Notes/Remarks	Presence of exotic garden nearby; existing partial revegetation	
		
Representative view of H03 – Howey Creek		
		
Existing partial revegetation	Residential interface	
Site Priority	MEDIUM	

H03 could be improved by implementing weed control along the whole stretch of the creek and building upon the existing revegetation by supplementary planting with species belonging to Riparian Woodland and Plains Grassy Woodland EVC. These areas are shown in Figure 11 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2** and **Appendix 5**, respectively.



Figure 11: Management H03 (yellow polygon) showing recommended area for weed control (red polygon) and revegetation areas (white hatch lines).

The project proponents should engage the landholders in the adjacent areas to reduce the impact of nearby exotic garden plants to the waterway.

4.1.9 Management Zone – H04

Management Zone H04 is approximately 380m of riparian zone of Howey Creek passing through bushland, farm and residential properties between Jonathan Road and Brooking Road. The area supports a large number of native species (14 out of 16 species recorded) and has a moderate infestation of woody and grassy weeds. A summary of the observations and recommendations for management zone H04 is presented in Table 14.

Table 14: Summary of observations and recommendations for management zone H04.

Management Zone	H04
Area	1.75ha
Riparian Length	380m
Total Species	16
Native Species	14
Large Trees	Manna Gum; Narrow-leaf Peppermint
Significant Species	Blackwood; Bidgee Widgee; Common Tussock Grass; Cotton Fireweed; Kangaroo Grass; Manna Gum; Narrow-leaf Peppermint; Spear Grass
Major Weeds	2
Weeds of National Significance	Blackberry
Declared Noxious Weeds	Blackberry; Hawthorn
Environmental Weeds	
Woody Weed Infestation	Medium
Grassy Weed Infestation	Medium
Historical EVC	Scoria Cone Woodland
Land Ownership	Fully Council-managed
Constraints	Residential interface
Opportunities	Relatively moderate weed control, vegetation enhancement and possibly cultural activity
Proposed Weed Control Area / Estimated Cost	1.13ha / \$2,200
Proposed Revegetation Area / Estimated Cost	1.75ha / \$22,260

Estimated Total Restoration Works	\$24,460	
Notes/Remarks	Stunning waterfall, excellent existing ecological value	
		
Representative view of H04 – Howey Creek		
		
Top of waterfall	Opportunity for weed control and revegetation at the waterfall area	
Site Priority		MEDIUM

H04 could be improved by implementing weed control along the whole stretch of the creek and revegetating the whole zone with species belonging to Riparian Woodland and Scoria Cone Woodland EVC. These areas are shown in Figure 12 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2** and **Appendix 5**, respectively.



Figure 12: Management H04 (yellow polygon) showing recommended area for weed control (red polygon) and revegetation area (white hatch lines).

4.1.10 Management Zone – B06

Management Zone B06 is approximately 180m of riparian zone of Bunjil Creek located between Fersfield Road and Aitken Street and passes through residential properties. The area supported very few native species (four out of 20 species recorded) and has a severe woody weed infestation including nine major weeds. A summary of the observations and recommendations for management zone B06 is presented in Table 15.

Table 15: Summary of observations and recommendations for management zone B06.

Management Zone	B06
Area	0.74ha
Riparian Length	180m
Total Species	20
Native Species	4
Large Trees	nil
Significant Species	Sheep's Burr; Manna Gum; Narrow-leaf Peppermint
Major Weeds	9
Weeds of National Significance	Blackberry, Gorse, Willow
Declared Noxious Weeds	Blackberry, Gorse, Hawthorn, Hemlock, Willow
Environmental Weeds	Cherry Plum, English Ivy, Radiata Pine, Sycamore Maple
Woody Weed Infestation	Severe
Grassy Weed Infestation	Medium - partial
Historical EVC	Plains Grassy Woodland
Land Ownership	Private
Constraints	Property interface
Opportunities	Good access, vacant land could be revegetated, weed control and planting on creek
Proposed Weed Control Area / Estimated Cost	0.38ha / \$2,200
Proposed Revegetation Area / Estimated Cost	0.74ha / \$9,349
Estimated Total Restoration Works	\$11,549

Notes/Remarks	Presence of exotic gardens nearby	
		
Representative view of B06 – Bunjil Creek		
		
Section of creek dominated by pine trees	Vacant land within B06	
Site Priority	LOW	

B06 could be improved by implementing weed control along the whole stretch of the creek and revegetating the whole zone with species belonging to Riparian Woodland and Plains Grassy Woodland EVC. These areas are shown in Figure 13 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2** and **4**, respectively.

As this management zone is under private ownership, the project proponents should engage the landholder/s with the recommended creek enhancement works, including the support available via Melbourne Water's Stream Frontage Management Program, aimed at reducing the impact of nearby exotic garden plants.



Figure 13: Management B06 (yellow polygon) showing recommended areas for weed control (red polygon) and revegetation areas (white hatch lines).

4.1.11 Management Zone – B07

Management Zone B07 is approximately 410m of riparian zone of Bunjil Creek located between Aitken Street and Willowbank Road and passes through residential areas. The area supports a large number of native species (15 out of 38 species recorded) but has a severe woody weed infestation including nine major weeds. A summary of the observations and recommendations for management zone B07 is presented in Table 16.

Table 16: Summary of observations and recommendations for management zone B07.

Management Zone	B07
Area	1.11ha
Riparian Length	410m
Total Species	38
Native Species	15
Large Trees	Manna Gum; Narrow-leaf Peppermint; Swamp Gum
Significant Species	Blackwood; Common Tussock Grass; Kangaroo Grass; Manna Gum; Narrow-leaf Peppermint; Sheep's Burr; Spear Grass; Yellow Box
Major Weeds	9
Weeds of National Significance	Blackberry, Gorse, Montpellier Broom, Tortured Willow
Declared Noxious Weeds	Blackberry, Gorse, Montpellier Broom, Sweet Briar, Tortured Willow
Environmental Weeds	Agapanthus, Blue Periwinkle, Bluebell Creeper, English Ivy, Toowoomba Canary Grass
Woody Weed Infestation	Severe
Grassy Weed Infestation	Medium - partial
Historical EVC	Plains Grassy Woodland
Land Ownership	Private
Constraints	School adjacent lower section, difficult access for large woody removal
Opportunities	Excellent section to develop, public education, build on existing landholder involvement, get school involved
Proposed Weed Control Area / Estimated Cost	0.86ha / \$2,200

Proposed Revegetation Area / Estimated Cost	0.72ha / \$46,577
Estimated Total Restoration Works	\$48,777
Notes/Remarks	Presence of exotic gardens nearby; active MW Stream Frontage Management Program - existing revegetation works



Representative view of B07 – Bunjil Creek



Existing revegetation works



Plantings behind school, proposed revegetation area in the foreground

Site Priority

HIGH

B07 could be improved by implementing weed control along the whole stretch of the creek and building upon the existing revegetation works by revegetating the majority of the zone with species belonging to Riparian Woodland and Plains Grassy Woodland EVCs. These areas are shown in Figure 14 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2** and **Appendix 5**, respectively.

As this management zone is under private ownership, the project proponents should engage the landholder/s with the recommended creek enhancement works, including the support available via Melbourne Water’s Stream Frontage Management Program, aimed at reducing the impact of nearby exotic garden plants.



Figure 14: Management B07 (yellow polygon) showing recommended areas for weed control (red polygon) and revegetation areas (white hatch lines).

4.1.12 Management Zone – B08

Management Zone B08 is approximately 570m of riparian zone of Bunjil Creek passing through residential properties between Willowbank Road and Carinya Drive. Only 11 of the 29 species recorded were native but eight of those were significant species (*i.e.* species that are indigenous to the local EVCs) indicating a good basis for further restoration. The area has a moderate grassy weed infestation including five major weeds. A summary of the observations and recommendations for management zone B08 is presented in Table 17.

Table 17: Summary of observations and recommendations for management zone B08.

Management Zone	B08
Area	1.30ha
Riparian Length	570m
Total Species	29
Native Species	11
Large Trees	River Red Gum
Significant Species	Blackwood; Bidgee Widgee; Common Tussock Grass; Hedge Wattle; Narrow-leaf Peppermint; River Red Gum; Sheep's Burr; Spear Grass
Major Weeds	5
Weeds of National Significance	Blackberry
Declared Noxious Weeds	Blackberry; Spear thistle
Environmental Weeds	Agapanthus; Desert Ash; Toowoomba Canary Grass
Woody Weed Infestation	Small
Grassy Weed Infestation	Medium
Historical EVC	Plains Grassy Woodland
Land Ownership	Fully Council-managed
Constraints	Public thoroughfare, property interface, public plantings
Opportunities	Track development with interpretive signage, further weed control and revegetation
Proposed Weed Control Area / Estimated Cost	nil

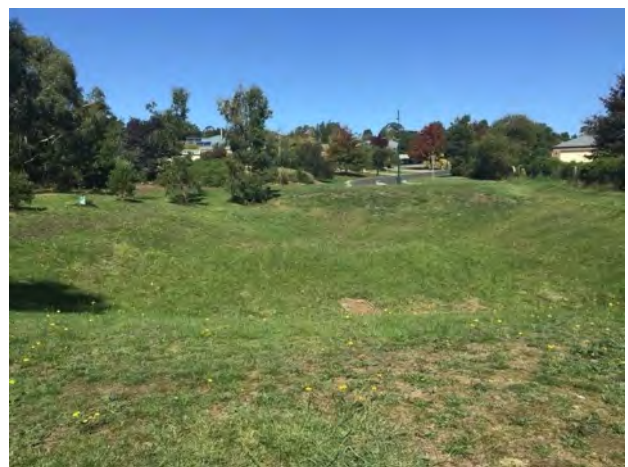
Proposed Revegetation Area / Estimated Cost	0.45ha / \$29,515
Estimated Total Restoration Works	\$29,515
Notes/Remarks	Presence of exotic gardens nearby; existing substantial revegetation and ongoing weed control works



Representative view of B08 – Bunjil Creek



Existing revegetation works



Retarding basin within B08

Site Priority

HIGH

B08 could be improved by supplementing existing revegetation works with species belonging to Riparian Woodland and Plains Grassy Woodland EVC. These areas are shown in Figure 15 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2** and **Appendix 5**, respectively.



Figure 15: Management B08 (yellow polygon) showing recommended areas for revegetation areas (white hatch lines).

It should be noted that part of the management zone is a designated retarding basin, as such, any proposed planting in this area should be done in consultation with MW and Council's engineering team to ensure that hydraulic capacity is not significantly impacted.

The project proponents should engage the landholders in the adjacent areas to reduce the impact of nearby exotic garden plants to the waterway.

4.1.13 Management Zone – B09

Management Zone B09 is approximately 320m of riparian zone of Bunjil Creek passing through residential properties between Carinya Drive and Wyralla Crescent. Only nine species were recorded from this zone with five of those native. A summary of the observations and recommendations for management zone B09 is presented in Table 18.

Table 18: Summary of observations and recommendations for management zone B09.

Management Zone	B09
Area	0.74ha
Riparian Length	320m
Total Species	9
Native Species	5
Large Trees	nil
Significant Species	Blackwood; Manna Gum; Spear Grass; Weeping Grass
Major Weeds	1
Weeds of National Significance	nil
Declared Noxious Weeds	nil
Environmental Weeds	Lombardy Poplar
Woody Weed Infestation	Small
Grassy Weed Infestation	Medium
Historical EVC	Plains Grassy Woodland
Land Ownership	Fully Council-managed
Constraints	Existing land use, residential interface
Opportunities	Potential to reinstate creekline, revegetate and extend walking tracks from previous zones
Proposed Weed Control Area / Estimated Cost	nil
Proposed Revegetation Area / Estimated Cost	0.74 / \$9,464
Estimated Total Restoration Works	\$9,464
Notes/Remarks	Presence of exotic garden plants nearby



Representative view of B09 – Bunjil Creek



Retarding basin within B09



Potential area for revegetation works

Site Priority

LOW

B09 could be improved by revegetating the whole zone with species belonging to Riparian Woodland and Plains Grassy Woodland EVC. These areas are shown in Figure 16 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2** and **Appendix 5**, respectively.

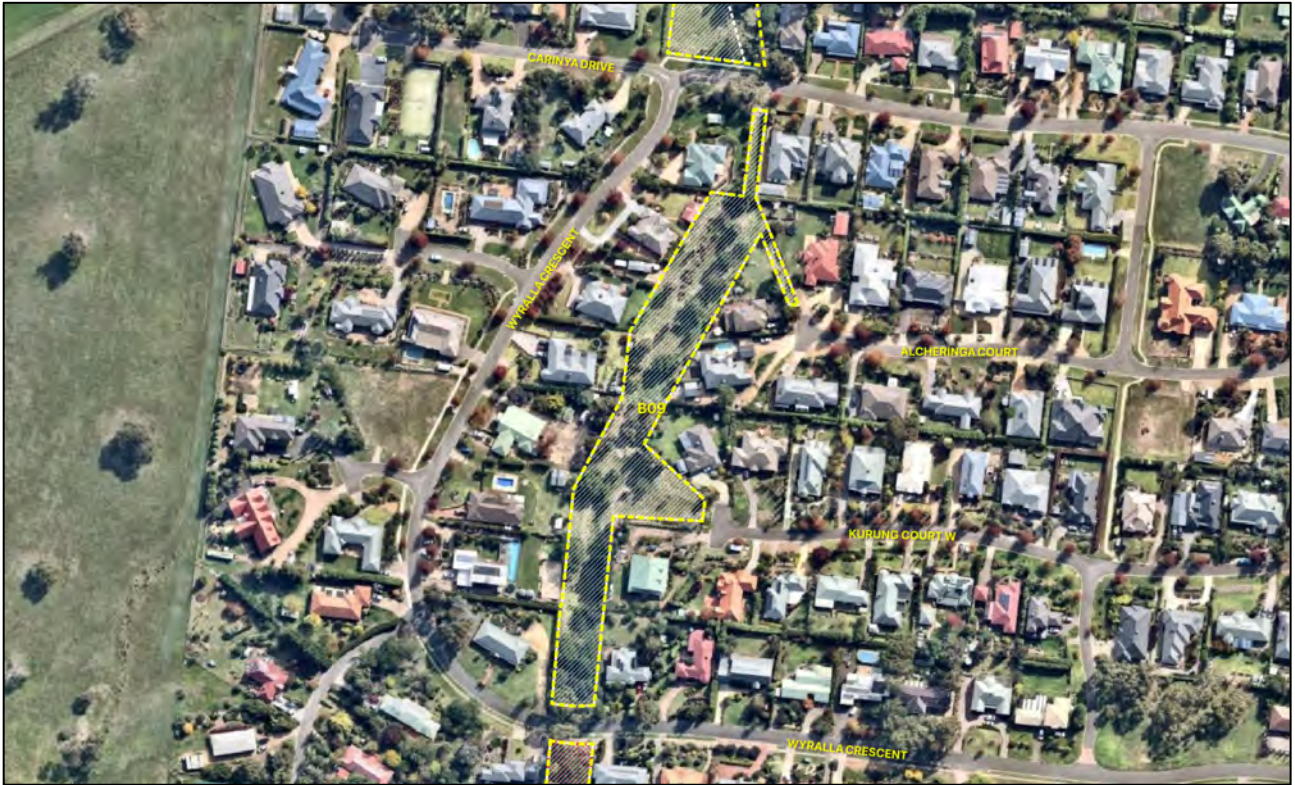


Figure 16: Management B09 (within yellow polygon) showing recommended areas for weed control (in red polygons) and revegetation areas (in white hatch lines).

It should be noted that part of the management zone is a designated retarding basin, as such, any proposed planting in this area should be done in consultation with MW and Council's engineering team to ensure that hydraulic capacity is not significantly impacted.

The project proponents should engage the landholders in the adjacent areas to reduce the impact of nearby exotic garden plants to the waterway.

4.1.14 Management Zone – B10

Management Zone B10 is approximately 140m of riparian zone of Bunjil Creek passing through residential properties and a farm area between Wyralla Crescent and Grange Court. Only 11 of the 31 species recorded were native and the area also had a moderate infestation of grassy weeds including nine major weeds. A summary of the observations and recommendations for management zone B10 is presented in Table 19.

Table 19: Summary of observations and recommendations for management zone B10.

Management Zone	B10
Area	0.64ha
Riparian Length	140m
Total Species	31
Native Species	11
Large Trees	nil
Significant Species	Bidgee Widgee; Common Tussock Grass; Cotton Fireweed; Sheoak; Weeping Grass
Major Weeds	9
Weeds of National Significance	Blackberry; Cut-leaf Bramble; Montpellier Broom
Declared Noxious Weeds	Blackberry; Cut-leaf Bramble; Montpellier Broom; Spear thistle
Environmental Weeds	Blue Periwinkle, Capeweed, Olive, Sweet Vernal Grass, Toowoomba Canary Grass
Woody Weed Infestation	Small
Grassy Weed Infestation	Medium
Historical EVC	Plains Grassy Woodland and Scoria Cone Woodland
Land Ownership	Fully Council-managed
Constraints	Landholder annex of site, small area, fire concerns
Opportunities	Easy win for Landcare, small amount of weed control, good revegetation potential and trail development
Proposed Weed Control Area / Estimated Cost	0.49ha / \$2,200
Proposed Revegetation Area / Estimated Cost	0.64ha / \$8,189

Estimated Total Restoration Works	\$10,389
Notes/Remarks	Presence of exotic garden plants nearby
	
Representative view of B10 – Bunjil Creek	
	
Section of B10 showing adjacent private property	Weed infestation (Cape Broom) within Bunjil Creek
Site Priority	LOW

B10 could be improved by undertaking weed control along the whole stretch of the creek and undertaking revegetation works within the whole zone with species belonging to Riparian Woodland and Scoria Cone Woodland EVC. These areas are shown in Figure 17 and a list of revegetation species with corresponding planting densities is presented in **Appendix 2** and **Appendix 5**, respectively.



Figure 17: Management B10 (yellow polygon) showing recommended areas for weed control (red polygon) and revegetation areas (white hatch lines).

The project proponents should engage the landholders in the adjacent areas to reduce the impact of nearby exotic garden plants to the waterway.

5. ENVIRONMENTAL ACTION PLAN

This section details the recommended actions required to be undertaken for Bunjil Creek and Howey Creek.

5.1 Weed Management

The *Catchment and Land Protection Act 1994* (CaLP Act) sets out a framework for managing noxious weeds and pest animal matters to prevent degradation to catchments. The Act is applicable across all public and privately managed land throughout Victoria. The Act provides a hierarchy by which invasive species can be ranked based on their potential to degrade landscapes, both agricultural and natural, and specifies management responsibilities for land managers. (MRSC)

Essentially, Declared Noxious Weeds are classified under four levels under CaLP Act 1994:

- State Prohibited - The Victorian State Government is responsible for the eradication of these weeds on all land.
- Regionally Prohibited - The relevant land manager is responsible for the eradication of these weeds.
- Regionally Controlled - The relevant land manager is responsible for prevention of growth and spread of these weeds.
- Restricted - The relevant land manager is responsible for preventing trade or spread (by contamination) of these weeds.
- The Victorian State Government is responsible for ensuring land managers comply with their legal requirements to control weeds.

Section 20 of the CaLP Act lists the following general duties of a landowner that in regard to weed and pest management, a landowner must take all reasonable steps to:

- eradicate regionally prohibited weeds;
- prevent the growth and spread of regionally controlled weeds; and
- prevent the spread of, and as far as possible eradicate, established pest animals.

In addition, some species are considered agricultural or environmental weeds, depending on location (see *Your Guide to the Weeds of Central Victoria*, MRSC et al. 2015).

A list of high threat weed species requiring control within the project area is presented in Table 20. Ideally, all non-native (introduced) species are to be removed from a site but it is understood that this is not always possible due to limited resources or access to the site. Therefore, the species have been ranked in priority as to the urgency for weed control. High priority has been assigned to Declared Noxious Weeds as landowners are required by law to control/eradicate these species. Medium priority has been assigned to environmental weeds that have the potential to spread rapidly and in a wide area (e.g. grassy weeds) while Low priority has been reserved to environmental weeds that are woody in nature and have less potential to spread rapidly in a wide area.

Table 20: List of high threat weed species requiring control within the project area.

Scientific Name	Common Name	Weed Status	Control Method	Priority
<i>Acacia baileyana</i>	Cootamundra Wattle	Environmental Weed	Cut and Paint; Drill and Fill	Low
<i>Acer pseudoplatanus</i>	Sycamore Maple	Environmental Weed	Cut and Paint; Drill and Fill	Low
<i>Agapanthus praecox</i>	Agapanthus	Environmental Weed	Manual Removal	Medium
<i>Agrostis capillaris</i>	Brown Top Bent	Environmental Weed	Foliar Spray	Medium
<i>Allium triquetrum</i>	Angled Onion	Restricted Weed	Foliar Spray	High
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Environmental Weed	Foliar Spray	Medium
<i>Arctotheca calendula</i>	Capeweed	Environmental Weed	Foliar Spray; Hand Weed	Medium
<i>Cirsium vulgare</i>	Spear Thistle	Regionally Controlled Weed	Foliar Spray	High
<i>Conium maculatum</i>	Hemlock	Regionally Controlled Weed	Foliar Spray	High
<i>Crataegus</i> sp.	Hawthorn	Regionally Controlled Weed	Cut and Paint	High
<i>Fraxinus angustifolia</i>	Desert Ash	Environmental Weed	Cut and Paint; Drill and Fill	Low
<i>Genista monspessulana</i>	Montpellier Broom	WoNS; Regionally Controlled Weed	Foliar Spray; Hand Weed; Cut and Paint	High
<i>Hedera helix</i>	English Ivy	Environmental Weed	Foliar Spray	High
<i>Ilex aquifolium</i>	English Holly	Environmental Weed	Cut and Paint	Low
<i>Olea europaea</i>	Olive	Environmental Weed	Cut and Paint; Drill and Fill	Low
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	Environmental Weed	Foliar Spray	Medium
<i>Pinus radiata</i>	Radiata Pine	Environmental Weed	Drill and Fill; Cut and Paint	Low
<i>Populus</i> spp.	Poplars	Environmental Weed	Cut and Paint; Drill and Fill	Low
<i>Prunus cerasifera</i>	Cherry Plum	Environmental Weed	Cut and Paint; Drill and Fill	Low
<i>Rosa rubiginosa</i>	Sweet Briar	Regionally Controlled Weed	Cut and Paint;	High
<i>Rubus fruticosus</i> spp. agg.	Blackberry	WoNS; Regionally Controlled Weed	Cut and Paint; Foliar Spray;	High
<i>Salix</i> spp.	Willows	WoNS; Restricted Weed	Drill and Fill; Cut and Paint	High
<i>Ulex europaeus</i>	Gorse	WoNS; Regionally Controlled Weed	Cut and Paint; Foliar Spray	High
<i>Vinca major</i>	Blue Periwinkle	Environmental Weed	Foliar Spray; Slashing	Medium

A variety of weed control methods are available for each species but a general approach would include the following:

- Spot spraying of grassy species;
- Foliar spray and cut and paint for tall herbs and small shrubs;
- Drill and fill or cut and paint for woody weeds; and,
- Hand weeding for small, scattered species.

In general, weed control is timed before the species sets seed and large woody weeds are typically left onsite to be used as habitat and only removed, if needed, when the dependent organisms have had time to migrate to a suitable alternative or acclimatise to the demise of that woody weed.

5.2 Revegetation and Enhancement Planting

Revegetation is recommended to be undertaken in majority of the management zones, mostly undertaken after weed control.

Revegetation should be guided by the historical EVC of the area with the goal of restoring a degraded habitat into an ecologically functional habitat that resembles the historical EVC as close as possible. It should be noted that not all areas require large-scale revegetation, some areas only require enhancement planting, nonetheless, the species to be used for planting in these areas should still refer to the recommended planting schedule for each corresponding EVC. These planting schedules are presented in **Appendix 2 – 5**.

Typically, revegetation is preceded by weed control and depending on the method for weed control (e.g. soil scalping which exposes large areas of bare soil) then revegetation should immediately follow weed control or jute matting is installed to prevent soil erosion and control the resurgence of new weeds.

Where revegetation is planned for areas currently supporting grassy vegetation the ground shall be prepared by spot spraying circles (1m diameter) for each woody stem to be planted (grasses and sedges excepted). This action shall be performed 4-8 weeks before revegetation takes place. In addition, each plant shall be protected by a 900m black mesh guard held in place by three 1400mm hardwood stakes. This shall protect the revegetation from grazing animals (e.g. Kangaroos, Rabbits, stock). The revegetation shall be inspected and competing vegetation controlled, sprayed or slashed, biannually. The protective tree guards may be removed 18 months after planting for grasses and sedges or when trees/shrubs are above 1.5m height.

To avoid erosion issues arising following weed control works, it is recommended that planting is to be commenced during the Autumn/Winter period following the weed removal works.

To further mitigate erosion issues, monthly watering of the revegetation will be prescribed through the drier months (November-March), to ensure an increased survival rate and establishment of the plantings.

For erosion-prone areas and where practically possible, jute matting shall be installed, while vegetation planted in the upper bank will only require mulch. Maintenance will include watering, especially during drier months and follow-up weed control.

A summary of the recommended actions associated with this environmental management plan is presented in Table 21. This table can be used as a guide for land managers in the implementation of an Environmental Action Plan. It should be noted, however, that these actions are subject to Council budget and funding availability

Photo point monitoring and baseline fauna surveys have been incorporated into the plan to allow project evaluation at the end of the implementation period.

Table 21: Recommended works program for Bunjil Creek and Howey Creek.

Year	Seasonal Timing of Works	Management Zones	Actions	Comments
1	Winter	B01; B02; B04; BH5; H02	Weed Control	Commence works in High Priority management zones (with the exception of H01). Works at H01 will commence once adjacent development works have been completed
		B01; B02; B04; BH5; H02	Select monitoring locations and establish photo points	Establish future evaluation areas
	Spring	B01; B02; B04; BH5; H02	Weed Control	Continue weed control over spring growing season
		B01; B02; B04; BH5; H02	Conduct Baseline Fauna Survey	Obtain baseline data for future project evaluation efforts
	Summer	No Works		
	Autumn	B01; B02; B04; BH5; H02	Revegetation Preparation Works (Halo Spraying)	Prepare revegetation areas
2	Winter	B01; B02; B04; BH5; H02	Revegetation	
		B07	Select monitoring locations and establish photo points	Establish future evaluation areas
		B07	Weed Control	Winter weeds (Bulbs and pasture grasses)
	Spring	B07	Fauna Survey	Annual Data collection
		B07	Weed Control	Spring weeds.
	Summer	B01; B02; B04; BH5; H02	Watering First Year Revegetation (Nov – Mar)	10L per plant per month
Autumn	B07	Revegetation Preparation Works (Halo Spraying)	Prepare revegetation areas	
3	Winter	B07	Revegetation	
		H04; B08	Select monitoring locations and establish photo points	Establish future evaluation areas
		H04; B08	Weed Control	Winter weeds (Bulbs and pasture grasses)
	Spring	H04; B08	Fauna Survey	Annual Data collection

Year	Seasonal Timing of Works	Management Zones	Actions	Comments
		H04; B08	Weed Control	Spring weeds.
	Summer	B07	Watering First Year Revegetation (Nov – Mar)	10L per plant per month
	Autumn	Revegetation Preparation Works (Halo Spraying)	Prepare revegetation areas	Revegetation Preparation Works (Halo Spraying)
4	Winter	H04; B08	Revegetation	
		H01	Select monitoring locations and establish photo points	Establish future evaluation areas
		H01	Weed Control	Winter weeds (Bulbs and pasture grasses)
	Spring	H01	Fauna Survey	Annual Data collection
		H01	Weed Control	Spring weeds
	Summer	H04; B08	Watering First Year Revegetation (Nov – Mar)	10L per plant per month
	Autumn	H01	Revegetation Preparation Works (Halo Spraying)	Prepare revegetation areas
5	Winter	H01	Revegetation	
		B03; H03; B06; B09; B10	Select monitoring locations and establish photo points	Establish future evaluation areas
		B03; H03; B06; B09; B10	Weed Control	Winter weeds (Bulbs and pasture grasses)
	Spring	B03; H03; B06; B09; B10	Fauna Survey	Annual Data collection
		B03; H03; B06; B09; B10	Weed Control	Spring weeds
	Summer	H01	Watering First Year Revegetation (Nov – Mar)	10L per plant per month
	Autumn	B03; H03; B06; B09; B10	Revegetation Preparation Works (Halo Spraying)	Prepare revegetation areas
6	Winter	B03; H03; B06; B09; B10	Revegetation	

Year	Seasonal Timing of Works	Management Zones	Actions	Comments
	Summer	B03; H03; B06; B09; B10	Watering First Year Revegetation (Nov – Mar)	10L per plant per month
	Autumn	All Zones	Progress Report including future management recommendations	Assess program success and plan future management

Note: these actions are subject to Council budget and funding availability.

6. REFERENCES

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7. APPENDICES

Appendix 1: List of flora species recorded within the project area during field assessment.

Appendix 2: Recommended planting schedule for Riparian Woodland (EVC 641 CVU).

Appendix 3: Recommended planting schedule for Valley Grassy Forest (EVC 47 CVU).

Appendix 4: Recommended planting schedule for Plains Grassy Woodland (EVC 55_61 VVP).

Appendix 5: Recommended planting schedule for Scoria Cone Woodland (EVC 894 VVP).

Appendix 1: List of flora species recorded within the project area during field assessments.

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Acacia baileyana</i>	Cootamundra Wattle	Environmental Weed														
<i>Acacia dealbata</i>	Silver Wattle	Native				Y										
<i>Acacia floribunda</i>	White Sallow Wattle	Introduced												Y		
<i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sallow Wattle	Native						Y								
<i>Acacia mearnsii</i>	Late Black Wattle	Native	Y					Y			Y					
<i>Acacia melanoxylon</i>	Blackwood	Native	Y			Y		Y		Y	Y		Y	Y	Y	
<i>Acacia paradoxa</i>	Hedge Wattle	Native												Y		
<i>Acacia provincialis</i>	Wirilda	Native				Y										
<i>Acaena echinata</i>	Sheep's Burr	Native						Y	Y	Y		Y		Y		
<i>Acaena novae-zelandiae</i>	Bidgee-widgee	Native									Y			Y		Y
<i>Acer negundo</i>	Box-elder Maple	Introduced		Y									Y			
<i>Acer pseudoplatanus</i>	Sycamore Maple	Environmental Weed										Y				
<i>Agapanthus praecox</i>	Agapanthus	Environmental Weed											Y	Y		
<i>Agrostis capillaris</i>	Brown Top Bent	Environmental Weed							Y	Y						
<i>Alisma plantago-aquatica</i>	Water Plantain	Native											Y			
<i>Allium triquetrum</i>	Angled Onion	Restricted Weed	Y													
<i>Allocasuarina</i> spp.	Sheoak	Native														Y

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Environmental Weed														Y
<i>Arctotheca calendula</i>	Capeweed	Environmental Weed														Y
<i>Arrhenatherum elatius</i>	False Oat-grass	Introduced							Y							
<i>Asperula conferta</i>	Common Woodruff	Native					Y				Y			Y		
<i>Aster subulatus</i>	Aster-weed	Introduced	Y													
<i>Austrostipa</i> spp.	Spear Grass	Native									Y		Y	Y	Y	
<i>Banksia marginata</i>	Silver Banksia	Native					Y									
<i>Billardiera heterophylla</i>	Bluebell Creeper	Introduced											Y			
<i>Bothriochloa macra</i>	Red Leg-grass	Native									Y					
<i>Brassica</i> spp.	Turnips/Mustards	Introduced	Y									Y				Y
<i>Bromus catharticus</i>	Prairie Grass	Introduced					Y					Y	Y	Y		Y
<i>Bursaria spinosa</i>	Sweet Bursaria	Native					Y	Y	Y	Y			Y			
<i>Callistemon sieberi</i>	River Bottlebrush	Native		Y				Y								
<i>Callistemon</i> spp.	Bottlebrush	Introduced													Y	
<i>Carex pendula</i>	Giant Sedge	Introduced														
<i>Cassinia sifton</i>	Sifton Bush	Native				Y										
<i>Centella cordifolia</i>	Centella	Native							Y							
<i>Cirsium vulgare</i>	Spear Thistle	Regionally Controlled Weed	Y											Y		Y

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Conium maculatum</i>	Hemlock	Regionally Controlled Weed	Y		Y		Y					Y				
<i>Conyza</i> spp.	Fleabane	Introduced											Y			
<i>Cordyline australis</i>	New Zealand Cabbage-tree	Introduced				Y										
<i>Cortaderia</i> spp.	Pampas Grass	Introduced					Y	Y								
<i>Crassula helmsii</i>	Swamp Crassula	Native						Y								
<i>Crataegus</i> sp.	Hawthorn	Regionally Controlled Weed			Y	Y		Y		Y	Y	Y				
<i>Crocsmia X crocosmiiflora</i>	Montbretia	Introduced	Y													
<i>Cynodon dactylon</i>	Couch	Introduced						Y								
<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue	Native														Y
<i>Cyperus eragrostis</i>	Drain Flat-sedge	Introduced						Y								
<i>Cytisus scoparius</i>	English broom	Introduced														Y
<i>Dactylis glomerata</i>	Cocksfoot	Introduced	Y	Y	Y	Y	Y	Y		Y		Y	Y	Y		Y
<i>Dietes</i> spp.	Peacock Iris	Introduced													Y	
<i>Dimorphotheca ecklonis</i>	Cape Daisy	Introduced											Y			
<i>Ehrharta erecta</i>	Panic Veldt-grass	Introduced	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y		Y
<i>Epilobium</i> spp.	Willow Herb	Native														Y
<i>Eryngium vesiculosum</i>	Prickfoot	Native						Y								
<i>Eucalyptus botryoides</i>	Southern Mahogany	Introduced														

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Eucalyptus camaldulensis</i>	River Red Gum	Native							Y	Y						
<i>Eucalyptus cladocalyx</i>	Sugar Gum	Introduced								Y				Y		
<i>Eucalyptus crenulata</i>	Buxton Gum	Introduced											Y			
<i>Eucalyptus globulus</i>	Southern Blue-gum	Introduced														
<i>Eucalyptus melliodora</i>	Yellow Box	Native						Y					Y			
<i>Eucalyptus ovata</i>	Swamp Gum	Native		Y			Y			Y			Y			
<i>Eucalyptus radiata</i>	Narrow-leaf Peppermint	Native				Y	Y	Y			Y	Y	Y	Y		
<i>Eucalyptus saligna</i>	Sydney Blue Gum	Introduced			Y		Y	Y								
<i>Eucalyptus</i> spp.	Eucalypts	Introduced				Y		Y		Y					Y	
<i>Eucalyptus viminalis</i>	Manna Gum	Native		Y		Y		Y			Y	Y	Y		Y	
<i>Exocarpos cupressiformis</i>	Cherry Ballart	Native											Y			
<i>Festuca arundinacea</i>	Tall Fescue	Introduced	Y					Y								
<i>Fraxinus angustifolia</i>	Desert Ash	Environmental Weed	Y											Y		
<i>Fumaris</i> spp.	Fumitory	Introduced														
<i>Galium aparine</i>	Cleavers	Introduced											Y			
<i>Genista monspessulana</i>	Montpellier Broom	WoNS; Regionally Controlled Weed	Y	Y		Y	Y						Y			Y
<i>Geranium solanderi</i> var. <i>solanderi</i> s.s.	Austral Crane's-bill	Native									Y					Y
<i>Goodenia ovata</i>	Hop Goodenia	Native						Y								
<i>Gynatrix pulchella</i>	Hemp Bush	Native					Y									

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Hakea salicifolia</i>	Willow-leaf Hakea	Introduced							Y							
<i>Hedera helix</i>	English Ivy	Environmental Weed		Y	Y	Y						Y	Y			
<i>Helminthotheca echioides</i>	Ox-tongue	Introduced		Y												Y
<i>Hesperocyparis macrocarpa</i>	Monterey Cypress	Introduced				Y							Y	Y		Y
<i>Holcus lanatus</i>	Yorkshire Fog	Introduced						Y								
<i>Ilex aquifolium</i>	English Holly	Environmental Weed			Y											
<i>Juncus</i> spp.	Rush spp.	Native			Y	Y	Y	Y	Y		Y					
<i>Lactuca serriola</i>	Prickly Lettuce	Introduced					Y					Y				
<i>Leptospermum lanigerum</i>	Woolly Tea-tree	Native				Y	Y	Y					Y			
<i>Leptospermum myrsinoides</i>	Heath Tea-tree	Native											Y			
<i>Lolium rigidum</i>	Annual Ryegrass	Introduced			Y											
<i>Lomandra filiformis</i>	Wattle Mat-rush	Native														Y
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Native				Y	Y									
<i>Lonicera japonica</i>	Japanese Honeysuckle	Introduced				Y								Y		
<i>Melaleuca hypericifolia</i>	Hillock Bush	Introduced												Y		
<i>Melaleuca linariifolia</i>	Flax-leaf Paperbark	Introduced												Y		
<i>Melaleuca</i> spp.	Honey-myrtle	Introduced						Y								
<i>Melicytus dentatus</i>	Tree Violet	Native				Y			Y							
<i>Melissa officinalis</i>	Lemon Balm	Introduced											Y			

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Mentha</i> spp.	Mint	Introduced					Y									
<i>Mentha x piperata</i>	Peppermint	Introduced											Y			
<i>Microlaena stipoides</i>	Weeping Grass	Native							Y	Y					Y	Y
<i>Modiola caroliniana</i>	Red-flower Mallow	Introduced														Y
<i>Myoporum parvifolium</i>	Creeping Myoporum	Native						Y								
<i>Myosotis</i> spp.	Forget-me-not	Introduced														
<i>Olea europaea</i>	Olive	Environmental Weed														Y
<i>Oxalis</i> spp.	Wood Sorrel	Native														
<i>Paspalum distichum</i>	Water Couch	Introduced						Y								
<i>Paspalum</i> spp.	Paspalum	Introduced						Y		Y		Y	Y	Y		Y
<i>Persicaria decipiens</i>	Slender Knotweed	Native						Y				Y	Y			
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	Environmental Weed			Y		Y	Y		Y			Y	Y		Y
<i>Pinus radiata</i>	Radiata Pine	Environmental Weed			Y		Y	Y				Y				
<i>Plantago lanceolata</i>	Ribwort	Introduced														Y
<i>Poa labillardierei</i>	Common Tussock-grass	Native					Y	Y	Y	Y	Y		Y	Y		Y
<i>Populus alba</i>	White Poplar	Environmental Weed	Y		Y											
<i>Populus nigra</i> 'Italica'	Lombardy Poplar	Environmental Weed													Y	
<i>Potamogeton crispus</i>	Curly Pondweed	Native											Y			

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Prunus cerasifera</i>	Cherry Plum	Environmental Weed	Y		Y	Y						Y				
<i>Quercus robur</i>	English Oak	Introduced	Y	Y		Y								Y		
<i>Rhagodia parabolica</i>	Fragrant Saltbush	Native														Y
<i>Rosa rubiginosa</i>	Sweet Briar	Regionally Controlled Weed		Y				Y	Y	Y			Y			
<i>Rubus fruticosus</i> spp. agg.	Blackberry	WoNS; Regionally Controlled Weed	Y	Y	Y						Y	Y	Y	Y		Y
<i>Rumex</i> spp.	Docks	Introduced												Y		
<i>Rytidosperma</i> spp.	Wallaby Grass	Native							Y	Y	Y				Y	Y
<i>Salix babylonica</i>	Weeping Willow	WoNS; Restricted Weed				Y		Y								
<i>Salix cinerea</i>	Grey Sallow	WoNS; Restricted Weed			Y											
<i>Salix fragilis</i>	Crack Willow	WoNS; Restricted Weed	Y													
<i>Salix matsudana</i> 'Tortuosa'	Tortured Willow	WoNS; Restricted Weed			Y			Y					Y			
<i>Salix</i> sp.	Willows	WoNS; Restricted Weed		Y	Y							Y				
<i>Schinus molle</i>	Pepper Tree	Introduced					Y									

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Senecio angulatus</i>	Climbing Groundsel	Introduced												Y		
<i>Senecio quadridentatis</i>	Cotton Fireweed	Native									Y					Y
<i>Senecio</i> spp.	Groundsel	Native					Y									
<i>Solanum laciniatum</i>	Large Kangaroo Apple	Native							Y	Y				Y		
<i>Solanum nigrum</i>	Blackberry Nightshade	Introduced											Y			
<i>Sonchus</i> spp.	Sow Thistle	Introduced					Y									Y
<i>Themeda triandra</i>	Kangaroo Grass	Native				Y	Y	Y			Y		Y			
<i>Tragopogon porrifolius</i>	Salsify	Introduced							Y							
<i>Tricoryne elatior</i>	Yellow Rush-lily	Native												Y		
<i>Typha latifolia</i>	Lesser Reed-mace	Introduced														
<i>Typha orientalis</i> s.l.	Broad-leaf Bullrush	Native		Y			Y	Y								
<i>Ulex europaeus</i>	Gorse	WoNS; Regionally Controlled Weed				Y		Y				Y	Y			
<i>Ulmus procera</i>	English Elm	Introduced	Y									Y				
<i>Veronica gracilis</i>	Slender Speedwell	Native												Y		
<i>Viburnum</i> spp.	Viburnum	Introduced							Y							
<i>Vicia</i> spp.	Vetch	Introduced					Y									
<i>Vinca major</i>	Blue Periwinkle	Environmental Weed		Y	Y								Y			Y

Scientific Name	Common Name	Origin/ Status	B01	B02	B03	B04	BH05	H01	H02	H03	H04	B06	B07	B08	B09	B10
<i>Zantedeschia aethiopica</i>	White Arum-lily	Introduced														
		Total	19	15	18	24	27	38	17	18	16	20	38	29	9	30
		Native	6	6	9	6	10	15	8	7	5	8	13	9	2	14
		Introduced	13	9	9	18	17	23	9	11	11	12	25	20	7	16

Appendix 2: Recommended planting schedule for Riparian Woodland (EVC 641 CVU).

Scientific name	Common Name	Form/ Habit	Planting Density
<i>Eucalyptus camaldulensis</i>	River Red Gum	Canopy Tree	50/ha
<i>Acacia melanoxylon</i>	Blackwood	Tree	150/ha
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria	Medium Shrub	400/ha
<i>Viminaria juncea</i>	Golden Spray	Medium Shrub	
<i>Rubus parvifolius</i>	Small-leaf Bramble	Small Shrub	100/ha
<i>Wahlenbergia gracilis</i> s.s.	Sprawling Bluebell	Large Herb	1500/ha
<i>Senecio quadridentatus</i>	Cottony Fireweed	Large Herb	
<i>Muriophyllum crispatum</i>	Upright Water-milfoil	Large Herb	
<i>Rumex brownii</i>	Slender Dock	Medium Herb	1000/ha
<i>Oxalis perennans</i>	Grassland Wood-sorrel	Medium Herb	
<i>Mentha australis</i>	River Mint	Medium Herb	
<i>Acaena novae-zelandiae</i>	Bidgee-widgee	Medium Herb	
<i>Dichondra repens</i>	Kidney Weed	Small Herb	500/ha
<i>Poa labillardierei</i>	Common Tussock-grass	Large Tufted Graminoid	1000/ha
<i>Carex appressa</i>	Tall Sedge	Large Tufted Graminoid	
<i>Phragmites australis</i>	Common Reed	Large Non-tufted Graminoid	500/ha
<i>Lachnagrostis filiformis</i> var. <i>filiformis</i>	Common Blown-grass	Medium Tufted Graminoid	2000/ha
<i>Triglochin procerum</i> s.l.	Water-ribbons	Medium Tufted Graminoid	
<i>Eleocharis acuta</i>	Common Spike-sedge	Medium Non-tufted Graminoid	500/ha
<i>Calystegia sepium</i>	Large Bindweed	Scrambler or Climber	1000/ha

Note: Revegetation works within the waterway should be consulted with and approved by Melbourne Water and MRSC Engineering team to ensure that the proposed works do not impact the hydraulic capacity of the waterway.

Appendix 3: Recommended planting schedule for Valley Grassy Forest (EVC 47 CVU).

Scientific name	Common Name	Form/ Habit	Planting Density
<i>Eucalyptus melliodora</i>	Yellow Box	Canopy Tree	100/ha
<i>Eucalyptus radiata</i>	Narrow-leaf Peppermint	Canopy Tree	
<i>Eucalyptus obliqua</i>	Messmate Stringybark	Canopy Tree	
<i>Eucalyptus rubida</i>	Candlebark	Canopy Tree	
<i>Acacia melanoxylon</i>	Blackwood	Tree	100/ha
<i>Acacia dealbata</i>	Silver Wattle	Tree	
<i>Daviesia leptophylla</i>	Narrow-leaf Bitter-pea	Medium Shrub	400/ha
<i>Epacris impressa</i>	Common Heath	Medium Shrub	
<i>Hovea heterophylla</i>	Common Hovea	Small Shrub	500/ha
<i>Pimelea humilis</i>	Common Rice-flower	Small Shrub	
<i>Dillwynia cinerascens</i> s.l.	Grey Parrot-pea	Small Shrub	
<i>Acacia aculeatissima</i>	Thin-leaf Wattle	Small Shrub	
<i>Acrotriche serrulata</i>	Honey-pots	Prostrate Shrub	100/ha
<i>Bossiaea prostrata</i>	Creeping Bossiaea	Prostrate Shrub	
<i>Senecio tenuiflorus</i>	Slender Fireweed	Large Herb	100/ha
<i>Senecio quadridentatus</i>	Cottony Fireweed	Large Herb	
<i>Gonocarpus tetragynus</i>	Common Raspwort	Medium Herb	1500/ha
<i>Drosera peltata</i> ssp. <i>auriculata</i>	Tall Sundew	Medium Herb	
<i>Burchardia umbellata</i>	Milkmaids	Medium Herb	
<i>Opercularia varia</i>	Variable Stinkweed	Small Herb	500/ha
<i>Goodenia lanata</i>	Trailing Goodenia	Small Herb	
<i>Poa labillardierei</i>	Common Tussock-grass	Large Tufted Graminoid	1000/ha
<i>Deyeuxia quadriseta</i>	Reed Bent-grass	Large Tufted Graminoid	
<i>Lomandra filiformis</i>	Wattle Mat-rush	Medium Tufted Graminoid	2000/ha
<i>Poa sieberiana</i>	Grey Tussock-grass	Medium Tufted Graminoid	
<i>Dianella revoluta</i> s.l.	Black-anther Flax-lily	Medium Tufted Graminoid	
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass	Medium Non-tufted Graminoid	500/ha
<i>Pteridium esculentum</i>	Austral Bracken	Ground Fern	500/ha
<i>Hardenbergia violacea</i>	Purple Coral-pea	Scrambler or Climber	100/ha

Note: Revegetation works within the waterway should be consulted with and approved by Melbourne Water and MRSC Engineering team to ensure that the proposed works do not impact the hydraulic capacity of the waterway.

Appendix 4: Recommended planting schedule for Plains Grassy Woodland (EVC 55_61 VVP).

Scientific name	Common Name	Form/ Habit	Planting Density
<i>Eucalyptus camaldulensis</i>	River Red Gum	Canopy Tree	50/ha
<i>Acacia pycnantha</i>	Golden Wattle	Medium Shrub	400/ha
<i>Acacia paradoxa</i>	Hedge Wattle	Medium Shrub	
<i>Pimelea humilis</i>	Common Rice-flower	Small Shrub	100/ha
<i>Astroloma humifusum</i>	Cranberry Heath	Prostrate Shrub	100/ha
<i>Bossiaea prostrata</i>	Creeping Bossiaea	Prostrate Shrub	
<i>Oxalis perennans</i>	Grassland Wood-sorrel	Medium Herb	1500/ha
<i>Gonocarpus tetragynus</i>	Common Raspwort	Medium Herb	
<i>Acaena echinata</i>	Sheep's Burr	Medium Herb	
<i>Dichondra repens</i>	Kidney Weed	Small Herb	500/ha
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort	Small Herb	
<i>Austrostipa mollis</i>	Supple Spear-grass	Large Tufted Graminoid	500/ha
<i>Austrostipa bigeniculata</i>	Kneed Spear-grass	Large Tufted Graminoid	
<i>Themeda triandra</i>	Kangaroo Grass	Medium Tufted Graminoid	4500/ha
<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheat-grass	Medium Tufted Graminoid	
<i>Rytidosperma setaceum</i>	Bristly Wallaby-grass	Medium Tufted Graminoid	
<i>Rytidosperma racemosum</i>	Stiped Wallaby-grass	Medium Tufted Graminoid	
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass	Medium Non-tufted Graminoid	500/ha

Note: Revegetation works within the waterway should be consulted with and approved by Melbourne Water and MRSC Engineering team to ensure that the proposed works do not impact the hydraulic capacity of the waterway

Appendix 5: Recommended planting schedule for Scoria Cone Woodland (EVC 894 VVP).

Scientific name	Common Name	Form/ Habit	Planting Density
<i>Eucalyptus viminalis</i>	Manna Gum	Canopy Tree	50/ha
<i>Allocasuarina verticillata</i>	Drooping Sheoak	Canopy Tree	
<i>Acacia melanoxylon</i>	Blackwood	Tree	50/ha
<i>Bursaria spinosa</i>	Sweet Bursaria	Medium Shrub	400/ha
<i>Senecio pinnatifolius</i>	Variable Groundsel	Large Herb	500/ha
<i>Rumex brownii</i>	Wiry Dock	Large Herb	
<i>Senecio quadridentatus</i>	Cottony Fireweed	Large Herb	
<i>Acaena novae-zelandiae</i>	Bidgee-widgee	Medium Herb	1000/ha
<i>Geranium potentilloides</i>	Cinquefoil Cranesbill	Medium Herb	
<i>Acaena echinata</i>	Sheep's Burr	Medium Herb	
<i>Viola hederacea</i>	Ivy-leaf Violet	Medium Herb	
<i>Dichondra repens</i>	Kidney-weed	Small Herb	500/ha
<i>Oxalis exilis</i>	Shady Wood-sorrel	Small Herb	
<i>Poa labillardierei</i>	Common Tussock-grass	Large Tufted Graminoid	500/ha
<i>Lomandra filiformis</i>	Wattle Mat-rush	Medium Tufted Graminoid	1500/ha
<i>Dianella revoluta</i> s.l.	Black-anther Flax-lily	Medium Tufted Graminoid	
<i>Carex breviculmis</i>	Short-stem Sedge	Medium Tufted Graminoid	
<i>Austrodanthonia pilosa</i>	Velvet Wallaby-grass	Medium Tufted Graminoid	
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass	Medium Non-tufted Graminoid	500/ha
<i>Pteridium esculentum</i>	Austral Bracken	Ground Fern	2000/ha

Note: Revegetation works within the waterway should be consulted with and approved by Melbourne Water and MRSC Engineering team to ensure that the proposed works do not impact the hydraulic capacity of the waterway.