Warburton Mountain Bike Destination: Environmental Protocols

Endorsed December 2019

The Warburton Mountain Bike Destination: Environmental Protocols (the Protocols) outline the environmental standards to be met in the alignment of trails.

The protocols are intended to guide the design of alignments that result in minimal environmental disturbance and ensuring that any disturbance to environmental values can be appropriately mitigated where they cannot be avoided. These protocols relate to the alignment of the trail, but include some measures relating to the construction and operation of the trail where there is a reasonable expectation that these will impact the alignment itself. It is acknowledged that further work will be undertaken to develop a Construction Environmental Management Plan and an Operations Management Plan to provide further guidance on these factors.

These protocols were developed in conjunction with species experts for Cool Temperate Rainforest, Leadbeaters Possum and Mt Donna Buang Wingless Stonefly and are the combined work of the following organisations:

- Yarra Ranges Council
- Department of Environment, Land, Water and Planning (DELWP)
- Parks Victoria
- Practical Ecology
- World Trail

The following standards and mitigation measures are based on information about the natural values that is currently known, and it is acknowledged that due to the remoteness and lack of disturbance in some of these areas, further ecological assessments, including field surveys at seasonally appropriate times of year will be required. The results of these surveys may require amendments to this document and further approval by the relevant land manager.

The protocols have been divided to provide clarity and to better define the risk to each value. However, there are sections within the landscape where these values overlap and the protocols for each individual value will need to be applied in these instances. For example, on the summit of Mount Donna Buang, there are known occurrences of Cool Temperate Rainforest, Cool Temperate Mixed Forest, Leadbeaters Possum, Mount Donna Buang Wingless Stonefly and native vegetation.

Application of the protocols:

These protocols are divided into ecological values that are present in the landscape and attempts to summarise the potential risk to these values resulting from the construction and operation of the trail. The column labelled 'Protocol' sets out the standard that should be met to completely avoid the risk to the value. However, it is acknowledged that not all standards will be realistic throughout the landscape and mitigation measures have been developed to minimise the impact to the values in these cases. There are some standards where no mitigation measures have been described and in these cases, the risk to the value is considered so high, that the protocol must be implemented.

In cases where neither the standard, nor the mitigation measure is considered possible to implement, then direct negotiations with the land managers will be required to develop an appropriate response. This may include meetings on site and consultation with values experts. Any negotiations for works that are inconsistent with these protocols must be agreed in writing by the relevant public land manager and/or Melbourne Water.

Ecological value	**Risk to value**	**Protocol**	**Mitigation measures**
Native Vegetation (NV)	A break in the canopy will increase light to the forest floor which will create changes in microclimate and have a negative impact on the ecological system.	NV P1 - Any native vegetation removal requires avoidance, minimisation and offsetting in accordance with the 'Guidelines for The Removal, Destruction or Lopping of Native Vegetation (DELWP 2017)'	NV M1 – The trail alignment is to be determined based on minimising the removal of vegetation, including mid-story and ground cover.
		NV P2 – No vegetation is to be removed to accommodate rest stops or viewing areas in National Park.	NV M2 - Rest stops and viewing areas along the trail are to use existing cleared areas and breaks in vegetation to minimise vegetation removal.
		NV P3 - No trees, including mid-storey trees of more than 10cm DBH are to be removed.	NV M3 - In State Forest where there is a stand of single age Eucalyptus sp (ie regrowth following bushfire), trees of up to 20 cm DBH may be removed.
	Damage to tree roots during construction and use of the trail will negatively impact the long-term health of tree species.	NV P4 – Avoid aligning the trail within the structural root zones of all trees.	NV M4 – Where the structural root zones (defined by AS) of trees cannot be avoided, then a design solution will need to be implemented to reduce impact on tree root zones.

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			NV M5 – Align the trail on the higher elevation side of large trees, especially on steeper side slopes as tree roots are likely to be closer to the surface on the lower side.
	A break in vegetation connectivity at any strata layer will negatively impact movement corridors of native fauna that rely on heavy vegetation cover to move through the landscape protected from predators.	NV P5 – Avoid existing stands of dense vegetation, particularly mid-storey vegetation between 1-5m in height.	NV M6 – Avoid removal of mid-storey vegetation within 10m of known or probable nesting sites of native fauna within National Park. NV M7 - Avoid removal of mid-storey vegetation within 10m of known nesting sites of listed (within VBA) fauna species within State Forest.
	A break in vegetation connectivity will create movement corridors for predatory and pest animals.		
	Disturbance to the ground cover and removal of vegetation will allow introduction and spread of weed species and pathogens. This includes the spread of Myrtle Wilt and Phytophthora.	NV P6 – Avoid disturbance to the ground surface in areas known to contain invasive weeds and pathogens including Myrtle Wilt and Phytophthora.	NV M8 – Undertake weed and pathogen control along the trail corridor during construction in accordance with an approved CEMP.
	The introduction of fill material may introduce weeds and pathogens and potentially alter pH levels of the soil which will have a negative impact on the health of	NV P7 – Minimise the introduction of fill material for the construction and ongoing management of the trail.	NV M9 – Any fill material introduced to the site must be certified clean and be weed and pathogen free and be of a similar pH to natural soils.

Ecological value	Risk to value	Protocol	Mitigation measures
	the system.		
	The construction and use of the trail may have negative impacts on significant native flora, including listed species.	NV P8 – Prior to the trail alignment being finalised, detailed field surveys are required to identify the likely presence of significant species or communities identified in appendix 1.	
		NV P9 – Avoid areas known or are likely to contain significant species or communities, as identified in appendix 1, including species listed under FFG and EPBC and advisory listed.	NV M10 – Apply an appropriate buffer to significant native flora species and communities identified in appendix 1, in consultation with the relevant public land manager.
	Large fallen debris (>30cm DBH) is part of the natural cycle of the area and provides important habitat for local fauna and assists in soil stabilisation.	NV P10 – Avoid any removal or disturbance to large fallen timber.	NV M11 – Any removal of fallen timber must be to the minimum extent necessary and any material removed must be retained on site.
Cool Temperate Rainforest (EVC 31) & Cool Temperate Mixed Forest EVC145) (CTR)	The reduction in overall area of Cool Temperate Rainforest and Cool Temperate Mixed Forest given their current limited distribution and listing under FFG.	CTR P1 – Prior to finalising the trail alignment, field surveys are required to identify the extent of Cool Temperate Mixed Forest within the area.	
		CTR P2 – Avoid areas of Cool Temperate Rainforest and Cool Temperate Mixed Forest.	CTR M1 – Minimise the length of the alignment through Cool Temperate Rainforest and Cool Temperate Mixed Forest.
		CTR P3 - No rest stops or viewing areas are to be located within Cool Temperate Rainforest or Cool Temperate Mixed Forest.	

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	The introduction and spread of Myrtle Wilt caused by damage to trees, including disturbance to the root zone will lead to the death of Myrtle Beech species.	CTR P4 – Avoid areas showing signs of Myrtle Wilt.	CTR M2 – Prior to finalising the trail alignment, undertake detailed mapping to clearly identify areas showing signs of Myrtle Wilt (Attach check list of Myrtle Wilt from DELWP as appendix).
		CTR P5 - Avoid the drip line of Myrtle Beech within Cool Temperate Rainforest and Cool Temperate Mixed Forest.	CTR M3 - Where areas containing Myrtle Beech cannot be avoided, minimise disturbance within the drip line of all Myrtle Beech trees using a design/engineered solution. CTR M4 – In the event of any disturbance within the root zone or to any part of Myrtle Beech trees occurs, fungicide must be immediately applied to prevent the spread of Myrtle Wilt.
	The introduction of imported fill material will introduce pathogens and damage the integrity of Cool Temperate Rainforest and Cool Temperate Mixed Forest.	CTR P6 – No imported fill material (including gravel, rock and soil) is to be used within Cool Temperate Rainforest or Cool Temperate Mixed Forest.	CTR M5 – Where soils are damp and boggy, trail must be elevated using boardwalk or another appropriate engineered/design solution.
	Any change to the surface hydrology will have a negative impact on the ecosystem.	CTR P7 – No excavation is to be undertaken within Cool Temperate Rainforest or Cool Temperate Mixed Forest to avoid changes to existing ground surface gradients.	CTR M6 –Trail construction is to be undertaken using hand tools only within Cool Temperate Rainforest and Cool Temperate Mixed Forest.
		CTR P8 – Avoid artificial changes to natural gradients to reduce changes to surface hydrology.	CTR M7 – A trail design approved by a suitably qualified professional should be used to reduce the potential for soil compaction and other impacts to surface hydrology over time.

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Native Fauna	Construction and ongoing use of the trail (including night-time use) will interfere with the existing movement corridors of native fauna, including significant and listed species, which may cause displacement, impact available food sources and reduce available habitat areas.	NF P1 – Avoid all areas which are known or likely to contain significant native fauna as identified in appendix 2.	NF M1 – Apply an appropriate buffer to identified nesting sites of significant native fauna identified in appendix 2, including applying a 5m buffer to rocky outcrops with cracks and crevices. NF M2 – Apply a 20m buffer to lyrebird display mounds.
		NF P2 – Existing habitat trees (>40cm DBH, or hollow bearing trees) are to be avoided.	NF M3 – Apply a 50m buffer to owl nesting sites. NF M4 – Apply an appropriate buffer/visual buffer to all tree hollows.
		NF P3 – Avoid known or probable nesting sites of VBA listed species by at least 10m.	NF M5 – Apply an appropriate buffer to identified nesting sites of significant native fauna identified in appendix 2, including applying a 5m buffer to rocky outcrops with cracks and crevices.
Leadbeater's Possum (LBP)	There are 3 essential components to leadbeaters habitat which are, an appropriate food source, access to nesting hollows and dense connected vegetation to allow movement. Any impact to one of these factors will have a negative impact on the population and future viability of Leadbeaters in these areas.	LBP P1 – Avoid areas of known and potential LBP habitat. LBP P2 – Apply a 50m buffer zone around known or potential Leadbeaters colonies.	LBP M1 - No removal of dense stands of Callistemon or Tea Tree species within potential or suitable habitat for Leadbeaters possums.

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		LBP P3 – No removal of vegetation within potential or suitable Leadbeaters habitat.	LBP M2 - Where removal of vegetation cannot be avoided, the alignment must utilise existing cleared areas.
	Creation of the trail in close proximity to Leadbeaters habitat will facilitate movement by predatory species such as foxes and cats which will increase predation and reduce population size.		
	Removal of dense stands of mid-story vegetation, specifically Callistemon and Tea Tree species will negatively impact the movement and therefore health of Leadbeaters populations.		
	Disturbance to existing Australia National University monitoring plots will impact long term monitoring results of Leadbeaters Possum.	LBP P4 – Apply a 200m exclusion zone from the centre of all ANU monitoring plots.	
	The construction and ongoing use of the trail may create disturbance to Leadbeaters and increase the likelihood of human interaction and interference.	LBP P5 - No rest stops or viewing areas within 200m of LBP nest boxes or known or potential colonies.	LBP M3 – The alignment of the trail cannot result in increased visibility to existing nest boxes or occupied tree hollows.

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Mount Donna Buang Wingless Stonefly (SF)	Any disturbance to known and potential habitat of Mt Donna Buang Wingless Stonefly will result in a reduction in the current population and future viability of the species.	SF P1 – Avoid areas of known and potential habitat for Mt Donna Buang Wingless Stonefly.	SF M1 – Align trail as close as possible to the verge of Mt Donna Buang Road or use existing tracks.
	Ground disturbance in close proximity to surface water flowing into Wingless Stonefly habitat will negatively impact available habitat through sedimentation, water pollution, obstructions in waterways and shading of waterways.	SF P2 – No loss of connectivity or change in hydrology patterns in known or potential habitat. SF P3 – No increase in sediment transport in identified areas of known or potential habitat.	SF M2 - Any work within the potential range of the species must minimise habitat disturbance and sedimentation by elevating the trail to cross waterways, bogs, damp areas or seasonal drainage lines within the mapped suitable habitat zone.
		SP P4 – No change in solar radiation (ie. natural light) in identified areas of known or potential habitat. SF P5 – No ground disturbance or soil compaction within 30m of known or potential habitat.	SF M3 – Any elevated trail must be constructed to minimise ground disturbance and maintain natural light levels.
	Construction during the critical life cycle stages of Wingless Stonefly will negatively impact the species.	SF P6 – Construction of the trail is to be undertaken between December and February.	
Water Quality (WQ)	Trail construction and ongoing use will create sedimentation, contribute to pollution in waterways and facilitate increases in weed distribution.	WQ P1 - Apply Water Act definition to determine presence and extent of waterways – ie natural channel where water regularly flows whether or not the flow is continuous or lake, lagoon, swamp or marsh. (Vegetation class can be a good indicator of presence and extent of water on site and thus	

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		whether waterway exists or not.)	
		WQ P2 – Minimise the number of water crossings.	WQ M1 - Where waterway crossing is required, identify the narrowest practicable location. WQ M2 - All waterway crossings are to be elevated (no rock armouring, no wheels crossing through the flow path).
		WQ P3 – Apply a 20m streamside buffer to minor waterways (<60ha catchment).	
		WQ P4 – Apply a 30m streamside buffer for larger waterways (>60ha catchment)	
		WQ P5 – No trails within Coranderrk Creek water supply drinking catchment.	
		WQ P6 - Implement Melbourne Water requirements for works on waterways and crossings.	
		WQ P7 – No ford crossings through waterway flow paths.	

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		WQ P8 - No creation of fish barriers in any waterways that support, or could support, native fish.	WQ M3 – Span bridges are to be used in preference to culverts wherever practical.
		WQ P9 - Avoid areas of wet or boggy ground, including areas where vegetation changes suggest such conditions may be present (ie. sedges, rushes, mosses etc.).	WQ M4 – Where wet or boggy ground is present, use suitable rock armouring to harden and reinforce the trail
Hydrological Values	Any interruption to the existing surface flows on the southern face of Mt Donna Buang will impact ecosystem health.	HV P1 – Avoid changes to surface water flows.	HV M1 – Minimise alignment through steep slopes to reduce the amount of excavation in National Park.