



Sheepwash Creek Catchment Biolink Plan

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Report authors: Michele Sabto and Blair Luxmoore, with Gidja Lee Walker and Sheepwash Creek Catchment Landcare Group

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Introduction

This plan outlines works on 10 private properties that will contribute to the reconnection of patches of indigenous remnant vegetation in the Sheepwash Creek area. The conservation zones proposed for these properties cover an area of approximately 63 ha. (see Figure 1, p. 8).

This plan is part of [Linking the Mornington Peninsula Landscape](#) (LMPL), a 5-year project of the [Mornington Peninsula Landcare Network](#) (MPLN). The project is funded by the [Natural Resources Conservation League](#) (NRCL). LMPL aims to reconnect fragmented remnants of indigenous vegetation to create wildlife corridors (biolinks) on the Mornington Peninsula. LMPL assists Mornington Peninsula Landcare groups and landholders to develop collaborative local biolink plans for catchments across the Peninsula. These plans focus on works required to achieve the biolink on private properties but also consider public land in the biolink area.

Biolink landholder engagement and planning process



Mark Lethlean of Sheepwash Creek Landcare group weeding in Arthurs Seat State Park. Photo: Michelle de la Coeur

Engagement of landholders in the process of planning for biolinks is one of the aims of LMPL. The strategy for engagement followed in both Watson Creek and Sheepwash Creek catchments has been to work closely with the local Landcare groups to:

- identify a target area with approximately 60-70 properties in it
- develop a brochure tailored to the area and mail it out to properties in the area
- refine the number of participating properties to between 8-10 properties, based on response to the brochure, suitability of property and capacity of landholders. This includes initial site visits.
- hold a planning workshop with participating landholders to determine alignment for biolink through the properties
- undertake follow-up site visits where required
- develop works areas for each property and management actions to achieve biolink, in consultation with landholder.

- develop a biolink plan that can be used by the local Landcare group to obtain funding for on-ground works.



Andrew Duncan, biolink landholder and Sheepwash Creek Landcare group president, weeding in Arthurs Seat State Park. Photo: Michelle de la Coeur.

About Linking the Mornington Peninsula Landscape (LMPL)

During the first 3 years of the project the focus will be on the following areas:

- Year 1 (2014-2015): Watson Creek catchment and Sheepwash Creek Catchment
- Year 2: Main Creek catchment and Southwest Mornington Peninsula region
- Year 3: Dunns Creek catchment, Merricks-Coolart Catchment, Red Hill South region

The Sheepwash Creek catchment and Watson Creek catchment biolinks developed in Year 1 (2014-2015) build on a pilot completed October 2014 in the Moorooduc area where a local biolink plan (Devilbend Biolink Plan or 'Western Linkage Plan') was developed with 4 private landholders. The [LMPL website](#) shows the location of this biolink area in the context of the northern Peninsula and the Watson Creek and Sheepwash Creek catchment biolink areas. The Devilbend Biolink plan (also known as the Western Linkage Plan) is now being used to apply for grants to undertake the on-ground works detailed in the plan.

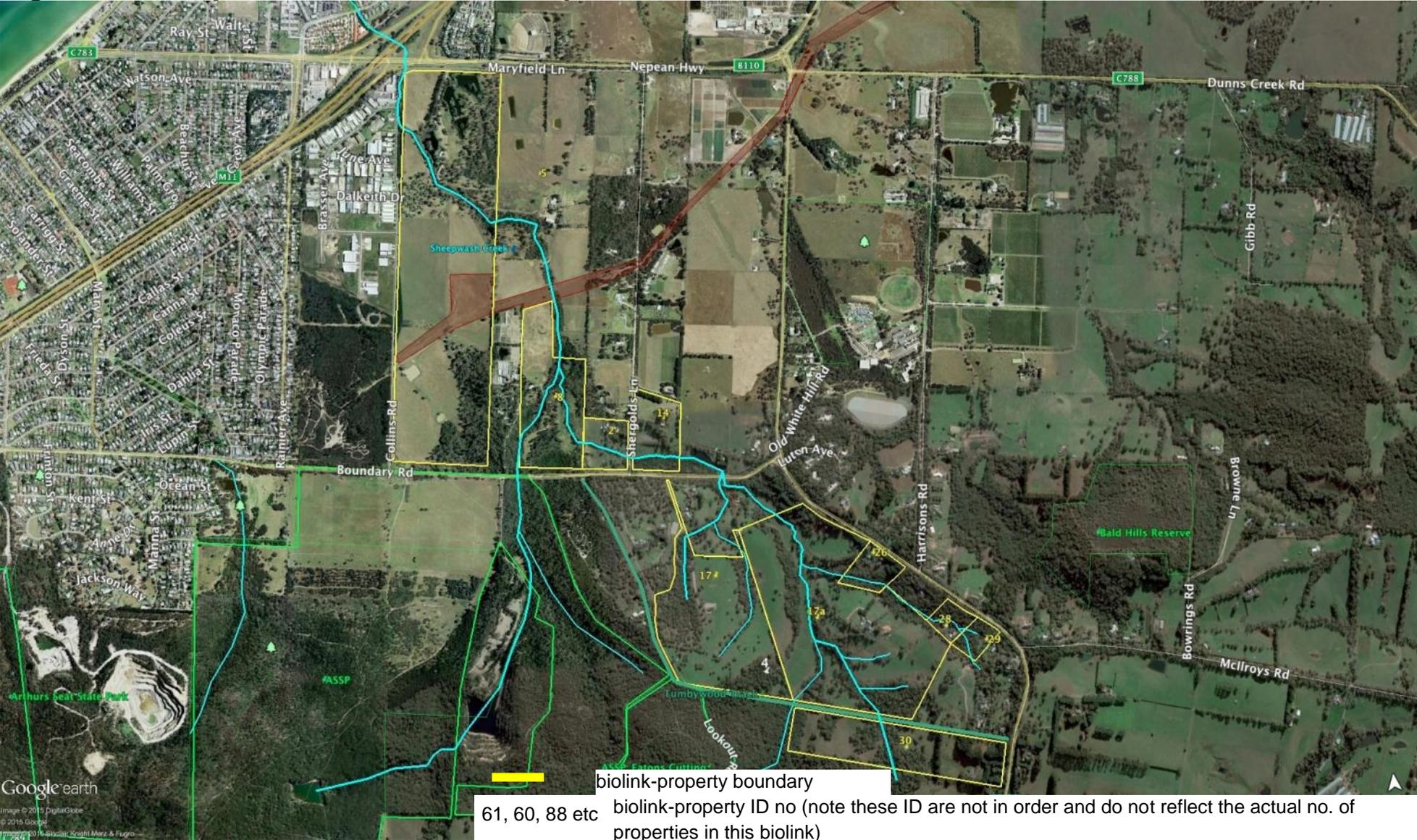
The MPLN represents the 11 Landcare Groups on the Mornington Peninsula. Its mission is to protect and enhance the unique environment of the Peninsula by promoting responsible care of the land. LMPL is a MPLN initiative and is funded by the NRCL.

MPLN was formed in 2013 to enable the local Landcare groups to work together more effectively to address local land management issues and develop constructive projects to enhance the environment. The NRCL, formed in 1951, is a not-for-profit company that promotes conservation, ideas and actions that value, conserve and restore ecosystems in a changing environment characterised by climate change, drought and fire risk.

The Sheepwash Creek biolink is a component of a set of proposed Peninsula-wide biolinks. In 2012, assisted by their local Landcare Facilitator, representatives from (the then) nine Landcare groups on the Mornington

Peninsula developed a [map of proposed biolinks covering the entire Peninsula](#). The proposed biolinks are based on an analysis of vegetation quality of the Peninsula, produced by the Arthur Rylah Institute for Environmental Research. Input was sought from local natural resource management professionals and ecologists to ensure scientific integrity

Figure 1: Sheepwash Creek biolink map



- biolink-property boundary
- 61, 60, 88 etc biolink-property ID no (note these ID are not in order and do not reflect the actual no. of properties in this biolink)
- P1, P2, etc these appear in the individual property maps below and are conservation zones (actions proposed for these zones are covered in the text, and in detail in Appendix 1)
- public reserve boundaries (i.e. Arthurs Seat State Park)
- stream

Why are biolinks required on the Mornington Peninsula?

The Mornington Peninsula is an iconic and beautiful region and is considered [the most biodiverse 750 km² in Victoria](#). More than 80% of the Mornington Peninsula has been cleared for farming and development.

Fragmentation of the landscape over time has led to the decline of many native birds and mammals. As native trees, shrubs, and grasslands have been cleared to make way for farms, residences, and infrastructure, mammals such as swamp wallabies, bandicoots, antechinus, echidna, and skinks have lost habitat and become vulnerable to feral cats and foxes. Many reptiles and birds are also in decline due to loss of habitat and predation from introduced animals.

In order to be healthy, native landscapes must remain connected so that wildlife can move safely between areas of food and shelter. A landscape that is highly fragmented can trap animals in areas that are too small for their needs. Where understorey has been cleared, small mammals and birds that forage on the ground are vulnerable to predators such as cats, dogs and foxes, and their numbers decline rapidly. Those that escape predation may suffer from inbreeding (lack of genetic diversity) and their populations become vulnerable to diseases or sudden death due to disturbances such as pest outbreaks and high-intensity bushfires.

Biolinks are areas of bush and other habitat (such as waterways and stands of paddock trees) that connect areas of valuable habitat and forage. Biolinks enable wildlife to move freely and safely and have access to the broader landscape. This is increasingly important in light of climate change, as the requirement of animals to move to more suitable areas becomes critical.

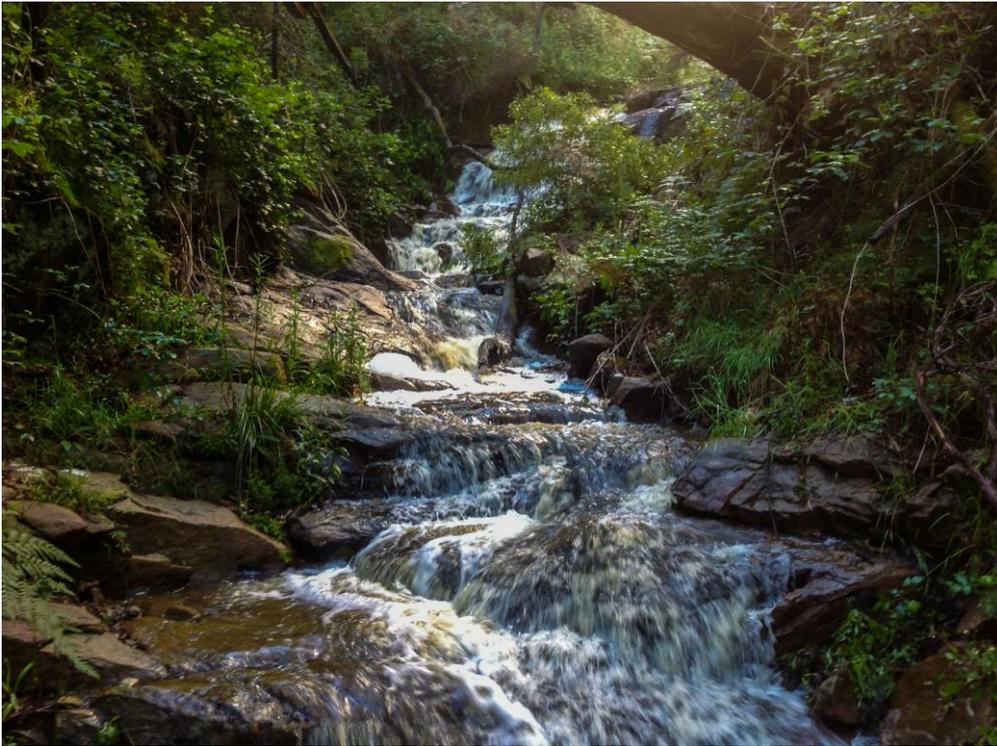
In a highly fragmented (partially cleared) landscape such as the Mornington Peninsula, creating biolinks may involve the following:

- developing corridors of native vegetation on public and private property
- removing barriers such as electrified fences where possible.

These activities can help provide an effective connection between habitat patches and facilitate wildlife movement. A biolink can also be created by developing patches of bushland that act like 'stepping stones' for wildlife, reducing the distances between individual habitat patches¹. Some actions taken to create biolinks include weeding, planting, strategic fencing to keep out stock and feral animals and the building of underpasses and overpasses at roads to enable safe passage of wildlife

¹ Bennett A. 2003., *Linkages in the Landscape: The Role of Corridors and Connectivity in Wildlife Conservation.*, International Union for Conservation of Nature: Forest Conservation Programme, 2003.

About Sheepwash Creek catchment



Sheepwash Creek. Photo: Mark Fancett, Sheepwash Creek Landcare

The upper reaches of Sheepwash Creek catchment include a large section of the northern escarpment of Arthurs Seat State Park and adjoining properties. Sheepwash Creek catchment encompasses the land south and above OT Dam (in Arthurs Seat State Park), and east to White Hill Rd. Below the escarpment, several small tributaries combine to form Sheepwash Creek near the intersection of Boundary Rd and Shergolds Lane. Sheepwash Creek then flows through private & public land and urban areas to Port Phillip Bay, entering the bay between Dromana and Safety Beach.

The portion of Arthurs Seat escarpment within Sheepwash Creek catchment contains the only granite outcrop on the Mornington Peninsula that still retains significant areas of native vegetation. With a soil structure unique to granite outcrops, the native vegetation in this area is valuable habitat and food source for many native animals, including migratory birds such as the Rufous Fantail, the Satin Flycatcher, the Crested Shrike-tit and the Pink Robin.

In the context of increasing fragmentation of bushland on the Mornington Peninsula, Sheepwash Creek catchment's areas of native vegetation form an important wildlife corridor, connecting the western section of Arthur's Seat escarpment with Mornington Peninsula National Park at Greens Bush and Bushrangers Bay/Cape Schanck. There is also potential connectivity of land for wildlife between the northern Arthurs Seat escarpment and Bald Hills and Kangerong Flora and Fauna Reserves (last two adjoining McIlroys Rd).

Sheepwash Creek biolink properties: ecological assets and connectivity



Swamp Skink – *Lissolepis coventryi*. A rare species found in recent surveys less than 500m from some of the Biolink properties in identical vegetation. Photo: Blair Luxmoore.

Sheepwash Creek biolink properties form a continuous corridor reaching from the upper reaches of Sheepwash Creek in Red Hill down to the lower reaches in Dromana. The resulting biolink area has connectivity with sites containing major ecological assets. A number of the biolink properties also contain significant ecological assets. Sheepwash Creek or branches thereof run through all of the biolink properties.

In the southern corner of the biolink area, a 16 ha property (property no. 30), itself containing significant areas of good quality remnant native vegetation, connects with the eastern edges of Arthurs Seat State Park. Travelling north along White Hill Rd, three Biolink properties (properties no. 29, 28 and 26) contain areas of good quality native vegetation including EVCs 53 Swamp Scrub (listed as 'Endangered' in the region by Department of Environment, Land, Water and Planning Vic) and 23 Herb-rich Foothill forest (listed as 'Vulnerable' in the region). In the middle reaches of Sheepwash Creek, on the northern side of Boundary Rd, are two relatively large biolink properties (properties no. 17a and 17) covering 72.5 ha in total. A total of approx. 31 ha of conservation zones have been proposed for these 2 properties, containing the EVCs 53 Swamp Scrub (listed as 'Endangered' in the region), as well as 23 Herb-rich Foothill Forest, 793 Damp Heathy Woodland and 16 Lowland Forest (these last 3 listed as 'Vulnerable' in the region). These properties also contain over 5km of Sheepwash Creek frontage.

Across Boundary Rd in the lower reaches of Sheepwash Creek, are four biolink properties. The two smaller of these (properties no. 2 and 14) contain the EVCs 53 Swamp Scrub (listed as 'Endangered' in the region) and 793 Damp Heathy Woodland (listed as 'Vulnerable' in the region). To the west of these are the two final properties in the biolink (nos 5 & 18), both relatively large grazing properties covering a combined area of 52.4 ha. The larger of the two (property no. 5) is bordered to the west by a property that contains a number of wetlands and dam, with extensive areas of scattered trees. These wetlands are known to be inhabited by a variety of rare birds such as Hardheads (*Aythya australis*) and Spoonbills (*Platalea regia*) to name a few. A little further west lies a property in Shergold's Lane known to contain Swamp Skinks (*Lissolepis coventryi*) inhabiting very similar vegetation

In 2004-05 local ecologist Malcolm Legg conducted a fauna survey on a nearby property in Shergolds Lane² (survey commissioned by the landholder) and found that:

² Legg, Malcolm 2005. *Fauna Survey and Management Prescriptions for [REDACTED]*: May 2004-April 2005. Unpublished.

The environs of the study area can be considered to be of state significance, with the taxa [species] along the study area listed at local, regional and State levels.

...Overall the significant taxa includes eleven species of high local significance, ten species of regional significance, three species of State significance and the remaining native species are of local significance based upon large-scale depletion of habitat and populations on the Mornington Peninsula.

Fauna species in the biolink area listed as critically endangered, threatened or vulnerable

Species	Source	Status
Common Bent-wing Bat (<i>Miniopterus schreibersii</i>)	Legg 2005	Threatened - <i>Flora and Fauna Guarantee Act 1988</i> (Vic) -
		Critically endangered - <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
Southern Toadlet (<i>Pseudophryne semimarmorata</i>)	Legg 2005	Vulnerable - Advisory List of Threatened Vertebrate Fauna in Victoria, Victorian Dept. of Environment, Land, Water and Planning, 2013
Swift parrot (<i>Lathamus discolor</i>)	Birdline (Mark Lethlean, Sheepwash Creek Catchment Landcare group)	Endangered - <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
		Threatened - <i>Flora and Fauna Guarantee Act 1988</i> (Vic)
Powerful owl (<i>Ninox strenua</i>)	Biolink landholders at 110 Boundary Rd, Dromana Birdline (Mark Lethlean, Sheepwash Creek Catchment Landcare group)	Vulnerable - Advisory List of Threatened Vertebrate Fauna in Victoria, Victorian Dept. of Environment, Land, Water and Planning, 2013
Hardhead [duck] (<i>Aythya australis</i>)	Birdline (Mark Lethlean, Sheepwash Creek Catchment Landcare group)	Vulnerable - Advisory List of Threatened Vertebrate Fauna in Victoria, Victorian Dept. of Environment, Land, Water and Planning, 2013
Latham's snipe (<i>Gallinago hardwickii</i>)	Birdline (Mark Lethlean, Sheepwash Creek)	Near threatened - Advisory List of Threatened Vertebrate Fauna in Victoria, Victorian Dept. of Environment, Land, Water and

	Catchment Landcare group)	Planning, 2013
Nankeen night heron	Birdline (Mark Lethlean, Sheepwash Ck Catchment Landcare)	Near threatened - Advisory List of Threatened Vertebrate Fauna in Victoria, Victorian Dept. of Environment, Land, Water and Planning, 2013
Royal spoonbill	Birdline (Mark Lethlean, Sheepwash Creek Catchment Landcare group)	Near threatened - Advisory List of Threatened Vertebrate Fauna in Victoria, Victorian Dept. of Environment, Land, Water and Planning, 2013

EVCs in the biolink area

- 23 Herb-rich Foothill Forest BSC status: Vulnerable
- 53 Swamp Scrub BSC status: Endangered
- 16 Lowland Forest BSC status: Vulnerable
- 175 Grassy Woodland BSC status: Endangered
- 793 Damp Heathy Woodland BSC status: Vulnerable

Works required on private land

Explanatory note

The headwaters of Sheepwash Creek consist of a number of tributaries spread across the northern face of Arthurs Seat escarpment. Sheepwash Creek, whether formally or informally, is referred to in terms of the 'Eastern Branch' and the 'Western Branch' which come together just north of Boundary Road (in Property 8) before flowing into Port Phillip Bay. Rather than attempt to name each tributary in the following Property Plans, we have simply stated whether the property is positioned on the Eastern Branch, Western Branch or just 'Sheepwash Creek' (north of Boundary Rd).

Property 8, Billayanawa, 150 Shergolds Lane, Dromana

This is a 4 ha (10 acre) property on the corner of Boundary Road and Shergolds Lane, Dromana.



Figure 2: Property 8, 150 Shergolds Lane, Dromana

This property contains a section of the main arm of the Eastern Branch. The section is already fenced and contains a good stand of Swamp Paperbark, but the understory is dominated by blackberry. This section appears to have been channelled at some point as it is deep, straight and heavily eroded. The property also contains an area of low-quality indigenous vegetation in the south-west corner and a wet paddock in the north-west corner. The property is surrounded to south, east and west by rural properties and state parks that contain vast areas of indigenous vegetation of varying quality.

There is a variety of significant flora and fauna species in the immediate area, including the Swamp Skink that inhabits identical vegetation just 1km away.

The paddocks are currently used for low-intensity grazing, so the main creekline section has already been fenced, and blackberry removal has begun. Revegetation (concentrating on ground and mid story) has also started. The landholders are considering fencing off the wet paddock and allowing it to become a seasonal wetland.

Melbourne Water has been advising the landholders on small-scale rockwork remediation of the creek to try to halt further erosion, in addition to weed control and revegetation. It is hoped that upon woody weed removal, the Swamp Paperback will rhizomally bind the banks together and contribute to a reduction in erosion and water speed.

Relevant works to date

- Main creekline is fenced.
- Weed control along main creekline is well underway.
- Revegetation is following weed control along creekline.

Works Recommended For Biolink

No. of polygons	4
Linear creek frontage in polygons	200m
Area in polygons (measured flat from above)	0.73 Ha

- P1 (Figure 2) will require further weed control (blackberry and broadleaf weeds, and eventually grassy weeds) followed by installation of indigenous species. Focus should be on ground and middle-story species consistent with *EVC 53 Swamp Scrub* that is endangered in the Port Phillip region. Spear Thistle is beginning to move in after blackberry removal. Landholders have begun grassy weed control too, but this is likely to further increase Spear Thistle. Recommend to concentrate on blackberry, Spear Thistle and only address grassy weeds where they impose upon installed plants.
- Large Poplars should be killed in P1, but their root systems should be left in place, or further erosion will occur until the revegetation grows up to replace them. This will require a Vegetation Removal Permit from Mornington Peninsula Shire Council.
- P2 will need to be fenced. Woody weeds not present, but Kikuyu Grass will block regeneration so it will need staged control.
- P3 has been shown on the map to indicate the proposed 'wet paddock' area. No costings have been estimated for this zone as it is not yet defined in terms of size or revegetation required (if any). It will need to be fenced though. As shown on the map, this zone measures half an acre. It is free of woody weeds.
- There are piles of branches & logs in some of the grazing paddocks. Rather than burning them, the more substantial pieces (especially hollow ones) should be moved into the conservation areas.

Additional information

EVC's present onsite: 53 Swamp Scrub (severely depleted). Listed as 'Endangered' in the region.

Property 5, 36 Maryfield Lane, Dromana

Property and landholders

This is a 36.4 ha (90 acre) property on Maryfield Lane, Dromana, near the corner of Nepean Hwy and Mornington Peninsula Fwy. Cattle are grazed on this property.

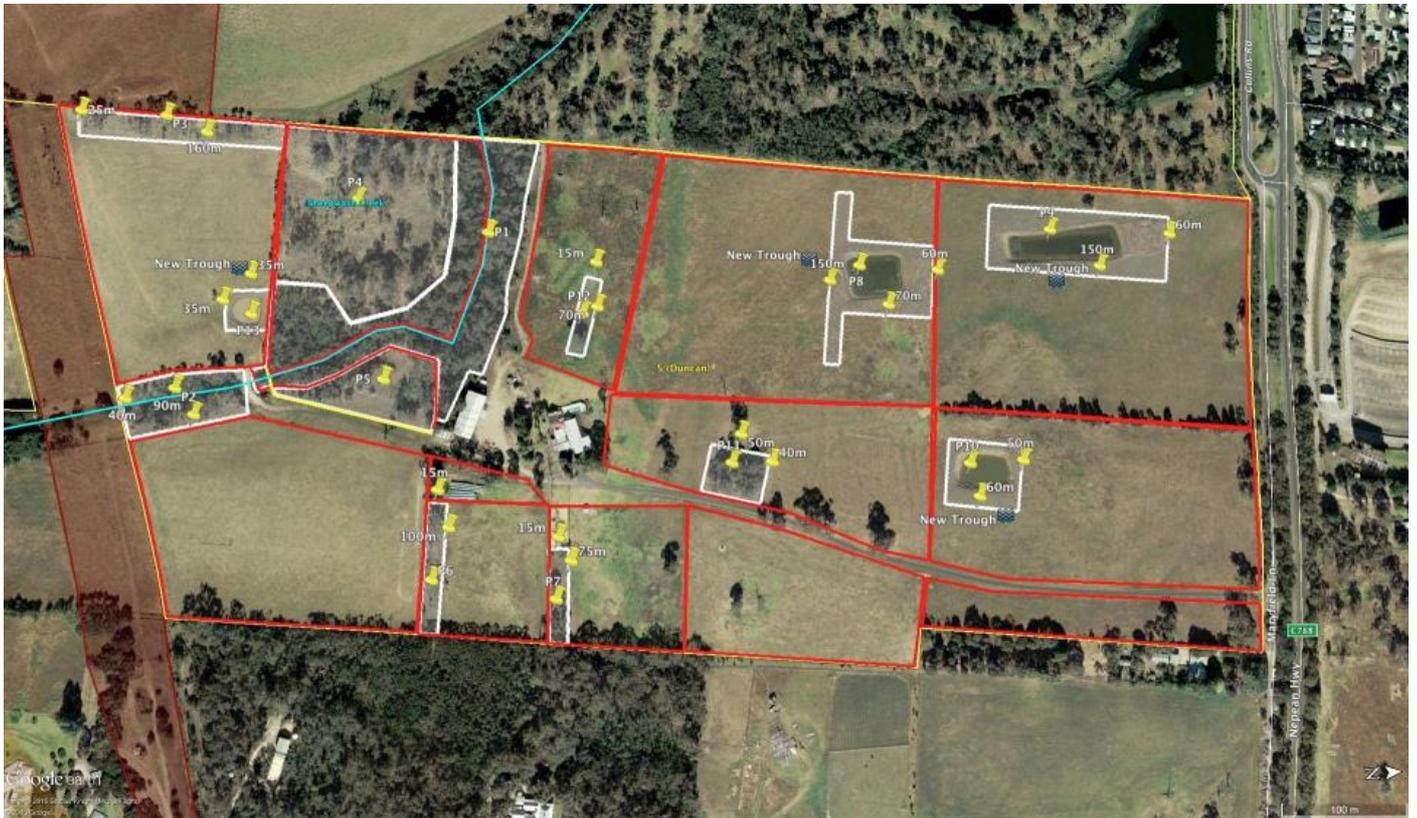


Figure 3: Property 5

This property has significant areas of pasture and remnant woodlands, with Sheepwash Creek running through it. Sheepwash Creek itself is deeply eroded and infested with weeds, however it is bordered by remnant 'Damp Heathy Woodland' and 'Grassy Woodland'. Although this is also heavily weed infested, it still contains the structural elements to enable a strong recovery i.e. large old trees, understory and ground layer floral diversity.

The landowner is currently creating a whole farm plan that will see significant changes to how the property is managed. This includes installation of indigenous windbreaks, fencing off dams, eliminating/reducing cattle access to treed areas. The whole farm plan will be designed to ensure agricultural activities remain sympathetic to the environment, and the works proposed in this Biolink Plan are also designed to balance conservation and production.

The property is bordered to the west by a property that contains a number of wetlands and dam, with extensive areas of scattered trees. These wetlands are known to be inhabited by a variety of rare birds such as Hardheads (*Aythya australis*) and Spoonbills (*Platalea regia*) to name a few. A little further west lies the property known to contain Swamp Skinks (*Lissolepis coventryi*) inhabiting very similar vegetation.

To the east, there are several properties covered in good-quality indigenous vegetation being actively managed. To the south lie all the other properties involved in this Biolink Plan.

The red lines on the map above show how the current paddock (fencing) layout is arranged. This is provided to aid in the understanding of how the proposed conservation actions below will fit in with grazing activities .

Relevant works to date:

- Small-scale woody weed control in worst-affected grazing paddocks. Most paddocks are already in very good condition weed-wise.
- Reduced intensity of grazing in treed areas.

Works recommended for biolink

No. of polygons	13
Linear creek frontage in polygons	450m
Area in polygons (measured flat from above)	7.64 Ha

- Redefine a number of areas designated to grazing, conservation and a mixture of the two. On the map above, the red lines show the *existing fence layout* (plus a few physical barriers to livestock movement). This has been provided to better understand the context of proposed biolink actions.
- Install fenced indigenous windbreaks in grazing paddocks (P11, P12, See Figure 3).
- Fence off dams, and provide 'off-dam' watering troughs. Consider revegetation options within the newly fenced areas to provide shade but also to cater for different species of wildlife (P8, P9, P10, P13). Also install aquatic plants to improve water quality.
- Install new fencing or repair existing fencing to areas of remnant native vegetation and the creekline (P1, P2, P3, P4, P5, P6, P7).
- Conduct woody weed control throughout creekline, and revegetation in the most degraded areas (P1). A foot bridge or some other means of crossing the creek is needed for maintenance access. No earthworks should occur without approval/consult from Melbourne Water.
- Conduct woody weed control, and consider options for revegetation in degraded areas of native vegetation (P2, P3, P4, P5).
- Consider the options for P4 i.e grazing versus revegetation, or a mixture of both. The landowner is still considering options. Two scenarios have emerged as the stronger options. Both involve woody weed control throughout, and fencing to protect the creek. Further actions will depend on whether cattle will still be allowed in the paddock and under what conditions.

Additional information

EVC's present onsite: 175 Grassy Woodland and 53 Swamp Scrub. Both listed as 'Endangered' in the region. Also 793 Damp Heathy Woodland, listed as 'Vulnerable' in the region.

At the southern border of the property, there is a Melbourne Water easement that includes a weir across Sheepwash Creek. The owner reports that the overflow pipes are blocked and water comes over the top after rain. Melbourne Water should be contacted about fixing this.



Weir across Sheepwash Creek (on Melbourne Water easement). Photo: Blair Luxmoore

Property 8, 110 Boundary Rd, Dromana



Figure 4: Property 8, 110 Boundary Rd, Dromana

Property and landholders

This is a 16 ha (40 acre) property on Boundary Road, Dromana (Figure 4). The Eastern and Western Branches of Sheepwash Creek converge on this property and there is remnant vegetation along all creeklines, although it is very weedy in most sections. Across the road to the south, there is the Pioneer Quarry. This quarry is currently

abandoned, and it has extensive remnant native vegetation throughout, which then leads into the Arthurs Seat State Park. This property is also bordered to the east and west by properties that contain good indigenous tree cover at the least. The property is only 600m from a known Swamp Skink population inhabiting identical vegetation.

The owners are passionate about conservation, and hosted the LMPL Sheepwash Creek biolink workshop in their home. They are also dedicated to chemical-free property management. Therefore, herbicides as a weed management tool are not an option. Appendix 2 contains a management plan and costings estimates for non-chemical weed control, prepared by coastal and fire ecologist Gidja Lee Walker.

Additional information

EVC's present onsite: 175 Grassy Woodland and 53 Swamp Scrub. Both listed as 'Endangered' in the region. Also 793 Damp Heathy Woodland, listed as 'Vulnerable' in the region

Property 14, 63 Boundary Rd, Dromana

Property and landholders

This is a 15 acre (6 ha) property on the corner of Boundary Road and Shergolds Lane, Dromana.



Fig 5: Property 14, 63 Boundary Rd, Dromana

The southern quarter of the property contains a stand of Swamp Paperbark, through which runs the Eastern Branch of Sheepwash Creek. The rest of the property consists of paddocks and traditional gardens and trees. The property to the west is also involved in the Biolink (property 2) as are several of the properties to the south. These properties contain large areas of remnant vegetation and are themselves connected to Arthurs Seat State Park.

The paddocks are lightly grazed, but the remnant vegetation along the creek has not been grazed in recent history. There are woody weeds present to varying levels, as well as patches of good indigenous understorey that will enable successful regeneration. The creekline was probably once trenched, but fortunately the indigenous vegetation has mostly been allowed to recover, so it's arguably in the best condition of all the LMPL Sheepwash Creek biolink properties north of Boundary Road.

The property known to contain Swamp Skinks is only 1km away, with identical vegetation.

There is a small Melbourne Water easement in the south-east corner that is severely infested with blackberry, so the cooperation of the authority will be required if the landowners are to successfully eradicate their own weeds. There is also a leaking dam in this corner (within the landowner's boundary). It's probably excessive and rather unnecessary to involve earthworks to reinstate the dam, if it is only required for wildlife habitat. Woody weed control and possibly the installation of indigenous aquatic plants are all that is required to create habitat.

The landowners are concerned about limited, or in some areas, zero access to their rear gate/fenceline for general maintenance purposes. There will be enough woody weeds removed along the fences such that some of the resulting bare ground may be utilised for a walking path.

Relevant works to date

Ad-hoc woody weed control along creekline.

Works recommended for biolink

No. of polygons	3
Linear creek frontage in polygons	200m
Area in polygons (measured flat from above)	1.44 Ha

- Woody weed control throughout Swamp Paperbark.
- Fence and possibly revegetate northern side of creek. Depends on width agreeable with the landowners, after discussion with Melbourne Water.

Additional information

EVC's present onsite: 53 Swamp Scrub, listed as 'Endangered' in the region. 793 Damp Heathy Woodland, listed as 'Vulnerable' in the region.

Melbourne Water should be made aware of this biolink plan, in reference to the weed threat posed by their easement.

Property 17, 57 Boundary Rd, Dromana

Property and landholders

This is a 26 ha (65 acre) property on Boundary Road, Dromana.



Figure 6: Property 17, 57 Boundary Rd, Dromana

There are rolling open paddocks with scattered Eucalypts, woodland areas and two gullies which feed water into the Eastern Branch. About half of the woodland area is currently grazed by cattle, while the other half is fenced and is in very good condition.

The property is bordered by Arthurs Seat State Park to the west and south, and by a similar large Sheepwash Creek biolink property to the east (property no. 17a).

Relevant works to date

No works yet, as the owners have only recently begun living at the property. Ideally they would like to fence off all remnant vegetation from cattle, but this needs to be balanced with the financial returns from agriculture as well as their ability to manage weeds etc within fenced areas.

Works recommended for biolink

No. of polygons	4
Linear creek frontage in polygons	800m
Area in polygons (measured flat from above)	11 Ha

- Low – intensity woody weed control in P1 (Figure 6), and continue to exclude livestock.
- Consider realigning existing fencing, and install new fencing, to:-
 - create a ‘creekline zone’ with no stock access (P3). Access to a farm shed would need to be maintained. This is the zone that Melbourne Water may be most interested in as part of its grants program.
 - create a ‘shade and shelter’ paddock for limited livestock grazing (P2)

- create 'shade and shelter' paddock for limited livestock grazing (P4). This paddock would be quite large and it also contains a dam, so the exact size & configuration will need to take these aspects into consideration. One possible configuration is shown on the map.
- With the dam fenced off as shown, new watering point/points are needed for stock. Without detailed knowledge of current or future paddock layouts, it is not possible to provide robust recommendations for a new stock watering system across the entire property. Instead, for the purposes of this plan, we have assumed that water needs to be pumped from the dam in polygon 4 to at least 3 new stock troughs at locations to be determined by the landholder.
- In regards to P2 and P4, reduced grazing will stimulate both indigenous and weedy plant species to regenerate. The extent of this cannot be fully determined in advance. Strategic and adaptive grazing recommendations will be included in an Expression of Interest (EOI) for a separate project being run by the Port Phillip and Westernport Catchment Management Authority, 'Sustainable Farming Practices Demonstration Site for Grazing Farmers'. These will be aimed at preventing a weed-dominated understorey, which would be of no benefit to the old eucalypts in these polygons, and encouraging a greater diversity of indigenous plant species to occur. Other measures designed to protect existing mature trees may also be included in the EOI, such as fencing off individual trees or/and protection of the trees by placement of timber around the bases.

Additional information

EVC's present onsite: 23 Herb-rich Foothill Forest and 793 Damp Heathy Woodland. Listed as 'Vulnerable' in the region. 16 Lowland Forest is also present.

Property 17a, 600 White Hill Rd, Red Hill

Property and landholders

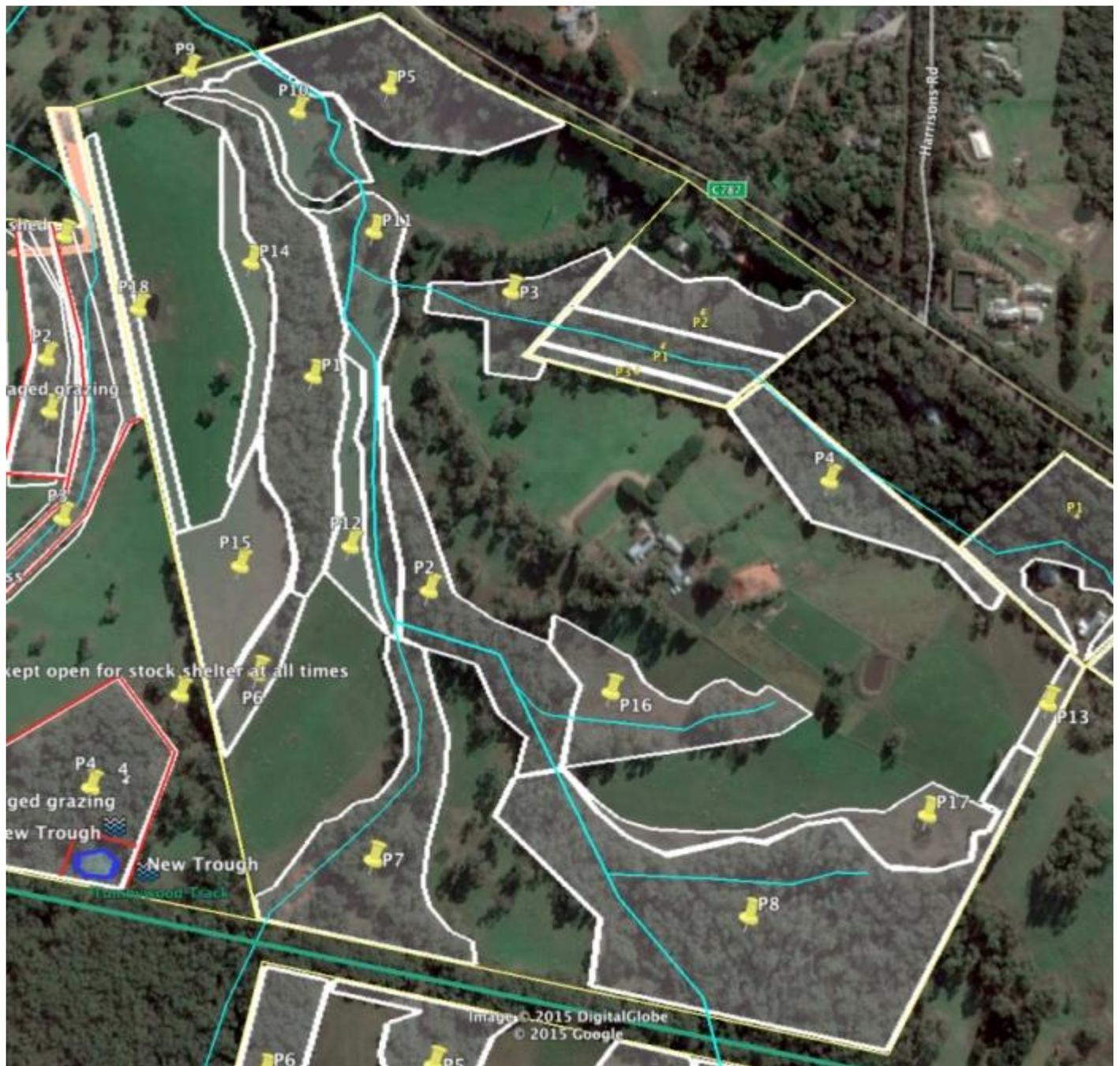


Figure 7: Property 17a, 600 White Hill Rd, Dromana

This large property of approximately 46.5 ha (115 acres) (Figure 7) consists of steep rolling hills, a domestic area, horse stables, large areas of bushland with varying weed levels, large areas of pasture in good condition, a considerable length of the Eastern Branch and a number of lesser tributaries and several dams.

It borders no less than five other Sheepwash Creek biolink properties, as well as Arthurs Seat State Park and other non-participating properties that also contain bushland. It has by far the largest scope of works and would serve as a testament to what can be achieved in terms of sustainable land management practices. It could therefore be said that this property is the keystone of the LMPL Sheepwash Creek biolink in the upper part of the catchment.

The landholders do not wish to run livestock, but they do have a number of sheep and horses, and wish to ride the latter around the property. The desire to be able to ride freely around the property has been incorporated

into the proposed actions i.e lower-density planting in areas where riding will occur so as not to create a physical barrier.

Relevant works to date

The landholders have only recently purchased the property and are still exploring the balance between how much paddock area they need vs how much bushland they can protect and maintain. We have attempted to bring the numerous options and ideas of the landholders, as well as good environmental principles together to provide a cohesive vision for the landholders.

Works recommended for biolink

No. of polygons	18
Linear creek frontage in polygons	2.16 km
Area in polygons (measured flat from above)	21.8 ha

This is a large property in the context of the Peninsula, so it's likely that the following recommendations will be implemented in stages over a number of years. We have proposed a 'Vision plan' for the purposes of the overall LMPL Sheepwash Creek Biolink Plan, and we have attempted to provide a general order of importance in terms of achieving maximum benefit for investment in the shortest time frame. It should be read as a guide only, given that circumstances may change over time. Also, we have costed only an initial stage of works, as estimates calculated now would be out-of-date in a few years' time.

The actions proposed here, their scale and their relative importance, have been determined by considering environmental values, ease of implementation and meetings/correspondence with the landholders and their property manager Peter Scott.

P1 through to P9 are all areas of existing bushland that only require woody weed control (to varying intensity).

Some of the zones have been allocated to align with areas of highest importance to Melbourne Water's grant system.

P10 through to P18 are all areas that will require revegetation and currently have little, if any existing native vegetation. Some of these areas (P14, P15, P16) were proposed by Peter Scott, as the slope is too steep for slashing and the landholders do not wish to have livestock on the property. The 'type' of revegetation will vary in density of plant installation. Gullies/creeklines will be planted more densely than some of the sloped areas. This is a strategy to provide maximum coverage of revegetation with limited resources. Waterways will be treated as a priority.

P18 has been proposed by Peter Scott to be complementary to work proposed on the adjoining property. It is not necessary to revegetate this zone if the neighbours don't do likewise.

The landholders intend to reduce the amount of old fencing throughout the property, as they do not intend to run livestock. No new fencing is currently required for the same reason.

Additional information

EVC's present onsite: 53 Swamp Scrub - listed as 'Endangered' in the region.

23 Herb-rich Foothill Forest and 793 Damp Heathy Woodland – both listed as 'Vulnerable' in the region.

Property no. 26, 620 White Hill Rd, Red Hill

Property and landholder



Figure 8: Property 26, 620 White Hill Rd, Red Hill

This is a property of approximately 8 acres (3.2 ha) (Figure 8), at least half of which is covered in high-quality native vegetation. The other half of the property has been terraced in the past for agricultural activities including a Pine plantation, house and gardens. The Eastern Branch runs through the property's bushland area, and there are woody weed issues throughout this area.

The property is nestled amongst other similar properties containing areas of bushland and pasture/domestic areas on all sides. Some of these are Sheepwash Creek biolink properties, and share the same weed problems.

The landholder has reported having a resident population of Sugar Gliders living near the house, as well as Echidnas and even a wombat several years ago. She is not living at the property full-time yet, but she has a strong desire to see the bushland restored and the pine plantation 'kept in check' but not totally removed. She has requested that chemical use be kept at absolute minimums (but not eliminated completely), so that has been taken into account in the costings.

There are several dams that are acting as frog habitat currently. However if they were to be used for irrigation/agriculture/fire emergencies, they would need substantial renovation. This has not been costed in the plan as it is not a critical action, and would need specific expert evaluation and earthworks to achieve a worthwhile outcome.

Relevant works to date

No works have begun as yet, however the landholder is keen to get started once the Biolink Plan is finished and grants can be sought.

Works recommended for biolink

No. of polygons	3
Linear creek frontage in polygons	200m
Area in polygons (measured flat from above)	2 ha

- Eradication of woody weeds (Blackberry, Karamu, Sweet Pittosporum, Inkweed, Pine) from all bushland and creekline areas (p1, P2, P3). The shape labelled P3 has been created to indicate the zone that Melbourne Water may be most interested in as part of its grant system.
- Removal of woody weeds will allow a foot track to develop without the need to clear any indigenous vegetation.
- Consider revegetation using indigenous plants around the back terraces to encourage wildlife closer to the house and replace the senescing Eucalypts (P2).

Additional information

EVC's present onsite: 53 Swamp Scrub - listed as 'Endangered' in the region,
and 23 Herb-rich foothill forest – listed as 'Vulnerable' in the region.

Property 28, 650 White Hill Rd, Red Hill

Property and landholders



Figure 9: Property 28, 650 White Hill Rd, Red Hill

This is a property of approximately 5 acres (2 ha) (Figure 9), and is covered almost entirely by high-quality bushland, apart from the domestic area. The Eastern Branch runs through the middle of this property. The property is nestled amongst other similar properties containing areas of bushland and pasture/domestic areas on all sides. Some of these properties are participants in this Biolink, and share the same weed problems. No livestock are kept on the property, so there are no fences and for the most part, this site is already complete in terms of Biolink objectives. There is a high diversity of floral species present on the site, and although there is evidence of past agricultural activities, it is a beautiful example of what the bushland should look like once restored.

Relevant works to date

The landholders have been receiving Melbourne Water grants as well as contributing their own funds and labour for many years, concentrating on woody weed control. Hence there is only a relatively small area (approx 1 acre) left to treat.

Works recommended for biolink

No. of polygons	1
Linear creek frontage in polygons	200m
Area in polygons (measured flat from above)	1.57 Ha

Complete the removal of mature woody weeds, and continue low level maintenance of weed seedlings in areas where mature woody weeds have already been removed (P1).

Additional information

EVC's present onsite: 23 Herb-rich Foothill Forest.

Property no. 29, 680 White Hill Rd, Red Hill

Property and landholders



Figure 10: Property 29 680 White Hill Rd, Red Hill

This is a property of approx 5 acres (2 ha) (Figure 10). It contains a house and domestic area with gardens and mowed lawns. However, the majority of the property is bushland in varying condition. The Eastern Branch runs through the middle of this property. The property is nestled amongst other similar properties containing areas of

bushland and pasture/domestic areas on all sides. Some of these are Sheepwash Creek biolink properties, and share the same weed problems. No livestock are kept on the property, so there are no fences and for the most part, this site is already complete in terms of biolink objectives.

There is a good diversity of floral species present on the site, and although there is evidence of past agricultural activities, at least half of this bushland is capable of regenerating itself to a high standard once woody weeds are removed (P1). The other half (P2) contains indigenous overstorey, and some understory too, but the main problem is a weed called Angled Onion. This bulbous weed is widespread in P2, and it is preventing regeneration of the bushland so it can't be ignored. However, it is very hard to kill with chemicals, and it is capable of growing in a variety of conditions. It is prevalent throughout the lower mown lawns and gardens, which will provide a constant reinvasion source to the bush, even if it was eradicated from the bush. It is going to take a sustained effort to eradicate it from the bushland area, and it is impractical to eradicate it from the lawns/gardens. Where possible, this weed should be tackled before the woody weeds are removed, so as not to prompt even faster invasion. Hence I have not included woody weed control for P2 in the first 2 years of actions. The amount shown is only for use in tackling woody weeds to open access for Angled Onion control. The amount calculated for Grassy/Herbaceous weed control shall cover Angled Onion & English Ivy as a priority. This task is difficult to quantify, as it must be conducted slowly so as to safeguard indigenous vegetation. It would be best to begin with a budget of say \$1,000 and see how far the contractors get, then multiply that over the rest of the site.

Relevant works to date

The landholders have begun woody weed control, as well as attempting the control of other grassy/herbaceous weeds such as Angled Onion.

Works recommended for biolink

No. of polygons	2
Linear creek frontage in polygons	200m
Area in polygons (measured flat from above)	1.32 Ha

- Continue woody weed control throughout P1. Woody weed control in P2 should be held back as per above rationale.
- Continue to target high-threat non-woody weeds such as Angled Onion in P1 and P2.
- In order to put limited resources into the most important actions first, grassy weeds are the least important. The shadows cast by the overstorey and the topography will disfavour the grassy weeds as the bushland regenerates (in all but the top edge near the adjoining paddocks with little tree cover).
- No fencing is required as there is no livestock on the property.

Additional information

EVC's present onsite: 23 Herb-rich Foothill Forest.

Caution should be exercised when selecting plants for general landscaping near the house and gardens. Some common and quite beautiful garden plants (even if they are native!) are known to be environmental weeds on the Peninsula. Excessive planting of species like Cootamundra Wattle may attract too many Wattlebirds and Noisy Miners that will chase away the smaller insect-eating birds like Blue Wrens.

Property 30, Tumbywood, 760 White Hill Rd, Red Hill

Property and landholders



Figure 11: Property 30, Tumbywood, 760 White Hill Rd, Red Hill

This 16ha (40 acre) (Figure 11) property consists of paddocks, domestic areas, bushland and agricultural crops. The paddocks are in good condition. The only real threat from the paddocks on the bushland is seed from the existing Pine Tree windbreaks. The bushland covers approximately 50% of the property, through which flows the Western Branch. It is in fairly good condition apart from the weed invasion and so will regenerate beautifully. This property shares a boundary with other Biolink participants, as well as Arthurs Seat State Park. Some of the nearby properties are also conducting weed control outside of the Biolink Project. Just below the property boundary runs another tributary of Sheepwash Creek. There is no livestock on the property, so no fencing is required.

Relevant works to date

No works have begun as yet. The landholder is awaiting the recommendations of this Biolink Plan before beginning conservation work.

Works recommended for biolink

No. of polygons	7
Linear creek frontage in polygons	200m
Area in polygons (measured flat from above)	7.1 Ha

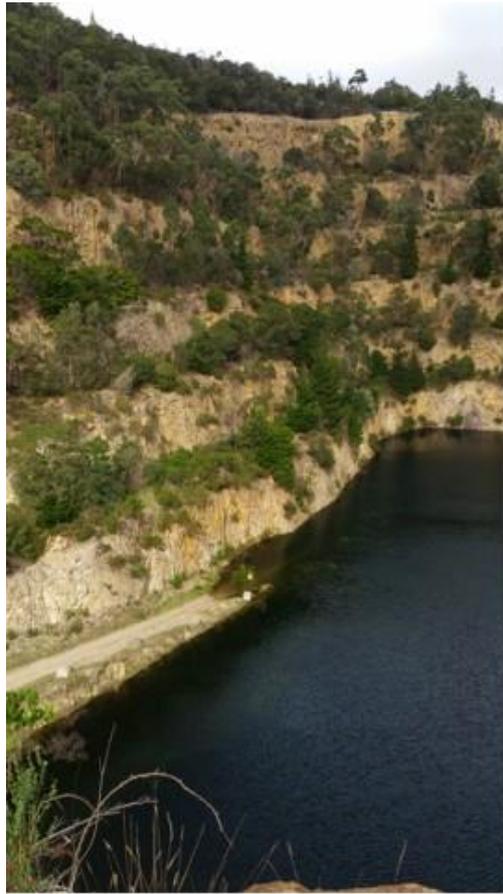
Woody weed (Blackberry, Willow, Sallow Wattle, Sweet Pittosporum etc) control throughout all bushland areas is recommended. A rectangular zone (P1) has been allocated around the creekline as this is the zone that Melbourne Water will be most interested in as part of its grants program.

Additional information

EVC's present onsite: 23 Herb-rich Foothill Forest. Listed as 'Vulnerable' in the region.

Complementary works on nearby private and public land

Pioneer Quarry



Pioneer quarry, June 2015. Photo: Blair Luxmoore

This large, currently disused, quarry is covered in bushland and weeds. The bushland is continuous with bushland in the state park, and contains some important animals such as Peregrine Falcons. Even as a quarry, it is an important area for wildlife and flora alike.

Several years ago, there was a proposal to turn the quarry into a tip, but this did not eventuate. There are recent plans by the owners to recommence quarrying activities, the details of which are not known yet but it can be assumed that the environmental effects will be considered. A representative of Hillview Quarries has confirmed that Hillview would like to be involved in the LMPL Sheepwash Creek biolink as the Western Branch goes through their property. They have asked that their involvement in the Biolink, and any proposal to resume quarrying, be treated as separate concerns. Hillview Quarries hopes by being involved in the Biolink, Hillview could maintain a positive relationship with biolink landholders and the local community.

Arthurs Seat State Park



Arthurs Seat State Park. Can you spot the two koalas in the trees? Photo: Blair Luxmoore.

This extensive park covering hundreds of acres, extends right across the northern and western face of the escarpment, and borders several Biolink properties. If not already present, it will certainly provide the source of wildlife that will migrate into the Biolink properties. It will also provide ample seed collection opportunities for revegetation of the catchment. Please note you need a licence and permission from the local Parks Vic office to do this. Local indigenous nurseries have these conditions covered as a matter of normal business.

Dromana Bushland Reserve (Mornington Peninsula Shire Council land), Boundary Rd, Dromana

A 3-acre bushland reserve on the corner of Collins Road and Boundary Road. This is an easy-to-access roadside reserve that has good indigenous vegetation and serves as a good example of what the Biolink properties north of Boundary Road can aim for.

Hillview Community Reserve (Mornington Peninsula Shire Council land), Boundary Rd, Dromana

This reserve has a Masterplan that will eventually see significant revegetation, and weed control throughout the entire 30 acre property. This is a joint project by Dromana Rotary Club, Mornington Peninsula Mountainbike Park

Committee and [Habitat Restoration Fund](#). This project will connect Arthurs Seat State Park to Dromana Bushland Reserve also on Boundary Road.

Private Property near corner Boundary Rd and Collins Street

This 70 acre property is covered in indigenous vegetation and woody weeds. Surveys in recent years have found Swamp Skinks (regionally vulnerable to extinction). Unfortunately the landholders are intending to develop it. If this was to happen, there may be an opportunity to relocate these skinks to LMPL biolink properties nearby.

Tumbywood Track

There is talk that Mornington Peninsula Shire Council will be restoring access along this track for public use. This would require weed removal, but it will likely become a track devoid of vegetation so it is hard to know what, if any, advantage this weed control will actually have on the overall Biolink.

White Hill Road and Boundary Road roadsides

Both these roads occur within the Sheepwash Creek biolink area. In fact they are the only two roads that really pose a serious risk to wildlife. While little can be done about the impact of roadkill, something can be done about the quality of vegetation. Both these roadsides contain indigenous vegetation and weeds. Mornington Peninsula Shire does have a roadside management program but it is severely underfunded and as a result it can take years for these roadsides to become a priority, if at all.

The authors of this report and Sheepwash Creek Catchment Landcare group urge biolink landholders and other local residents to approach Mornington Peninsula Shire Council to address the condition of the roadside. Unless these roadsides are already included in the Shire's long-term strategy, residents have prove that: there is ecological value in fixing the roadside, that amenity/erosion and other 'Planning Act' concerns are considered, that the community supports the rehabilitation, that roadside weed control helps you keep your weed levels down and that the adjoining landholders also contribute a meaningful level of weed control on their own land.

Meanwhile, as individuals, you can place 'Service Requests' to have the Shire deal with weeds when they impact upon you or your property.

Where to from here?: for biolink landholders and Sheepwash Creek Landcare group

For biolink landholders

One of the main purposes of producing this community-driven biolink plan is to enable you, the participating landholders to expand your environmental works beyond your current level. This can largely be achieved by attracting grant money from government, business and philanthropists. For legal and other reasons these grants normally require applicants to be some sort of legal entity. This is especially the case when dealing with business and philanthropic organisations, and where larger sums of money are required. By far the simplest option is for you to join Sheepwash Creek Catchment Landcare group, which is already established in the area to apply for these grants. Landcare groups have access to grant offers that are unique to this organisation.

However, it is also a good idea for you, as the participating landholders in this particular biolink, to work together to achieve your shared vision of a biolink in the Sheepwash Creek region. After all, you have now met each other, and know about each other's properties and conservation aspirations. This is a good base from which to build an ongoing productive group in which members can support each other into the future to carrying out the works set out in this plan. Our recommendation is that someone in your group should act as 'communications manager'. That is to say, someone should be in charge of keeping the landholders up to date on progress. This can be done via group email, newsletter, regular meetings etc. Most importantly, this will alert everyone to grant opportunities. Application periods are usually short, so you need to know the moment they are released.

As a group, you should build a database of people you can go to for expertise, in-kind contributions, legal issues etc.

For Sheepwash Creek Catchment Landcare group and biolink landholders

The information below is addressed to both the Landcare Group and participating landholders.

With this biolink plan in existence, you have a much better chance of securing larger funding amounts. You can highlight the:

- landscape-scale approach of your group,
- length of creekline within the project area,
- the fact that the biolink is aligned to reconnect important existing natural areas
- community-driven cooperative approach,
- the grand design - each grant application contributes to this incrementally.

Regular sources of government-based funding:

- [Melbourne Water](#)
- [Port Phillip and Westernport Catchment Management Authority](#) (PPWCMA)
- [Department of Environment, Land, Water and Planning](#) (DELWP) (State government)
- Various sources via [Landcare](#)

Last but not least, don't just rely on government grants. There are many other sources of funding out there; you just have to find them. A good place to start is the Australian Environmental Grantmakers Network website, which has a [section of resources for grantseekers](#).

Appendix 1: Sheepwash Creek biolink works plans and costings estimates

See spreadsheet 'Appendix 1'.

Appendix 2: Management plan and costings estimates for non-chemical weed control at 110 Boundary Rd, Dromana (property no. 8)



Gidja Lee Walker BSc. Dip. Ed.

Coastal Ecologist, Fire Ecologist

Management plan and costings estimate for non-chemical weed control at 110 Boundary Rd Dromana 6/9/2015

A rapid assessment was done of the property on the afternoon of 4/9/15. Approximately 3 hours was spent on the site with the landholder. The property comprises an ecotonal node of five different Ecological Vegetation Classes (EVC) with a confluence of Sheepwash Creek and its tributary meeting at the Northern end of the property

Remnants of the following Vegetation types are present along with their own suite of environmental weeds

EVC	Bioregional Status
23 Herb-rich Foothill Forest	Vulnerable
53 Swamp Scrub	Endangered
175 Grassy Woodland	Endangered
793 Damp Heathy Woodland	Vulnerable
902 Gully Woodland	Endangered

The vegetation is regenerating from a fire in January 2008 and most of the woody weeds are a response to that fire.

The underlying geology and resultant soils are also complex with the creekline cutting into old Silurian bedrock and degraded granite verging into more recent sandstones.

The site had been broken up into management zones prior to my visit



The following system was used to prioritise weeds on the site

STATUS/RISK	CHARACTERISTICS	MANAGEMENT STRATEGY	PRIORITY
Keystone weeds =K	historical-introduced a long time ago= dominate both structurally & floristically	work slowly and systematically from high quality areas out	Long term management required = containment first step
	has potentially become habitat for indigenous species	maintain habitat and buffer areas remove mature fruiting individuals first (females)	
Small Patch Weeds =S	Of variable risk but easiest to eliminate		
S1=small patch high risk	High Risk weeds	Eliminate across the site	Highest Priority - includes new and emerging weeds
	Weeds that hybridise and pollute gene pools		
	Weeds that are known to be difficult to eradicate once established		

	Weeds that are directly hazardous to wildlife on site (&/or stock in eg landcare situation)		
	Weeds that are allelopathic (ie produce chemicals which inhibit other species)		
S2= small patch moderate risk	Weeds that spread vegetatively	Eliminate from high quality areas first	moderate risk, moderate priority in high quality sites
S3=small patch low risk	Species that are long lived few if any seedlings observed	Lowest priority no action needed	Lowest priority
	May have been planted in the past		
Ubiquitous Weeds	Scattered Weeds of disturbed areas	Hardest to eliminate / look at management regime to reduce seed production	Low priority except in the highest quality retention sites or to protect threatened species
		Eliminate in Highest quality retention sites but low priority else where	ongoing management of eg track edges

The following species were noted and prioritised for control

Common Name	Botanical Name	Priority	Comments
Blackberry	<i>Rubus anglocadicans</i>	K	Appears contained/no fruit production/defoliated ?green jewel beetles & Wallabies, mostly restricted to Creek Gully
Boneseed	<i>Chrysanthomoides monilifera</i>	K	Scattered across the open woodlands and cleared edges- longlived in seed bank
Cape Ivy	<i>Delairia odorata</i>	S2	Spreading vegetatively from creekline infestation
Cootamundra Wattle	<i>Acacia baileyana</i>	S1	Planted in past, potential to hybridise with Black Wattle

Flax-leaf Broom	<i>Genista linifolia</i>	S1	Invading from roadside verge/ major problem in National Park opposite
Gorse	<i>Ulex europaeus</i>	S1	Long lived seed/ currently only a few scattered plants
Hemlock	<i>Conium maculatum</i>	S2	In higher quality areas can be brushcut when just starting to flower
Kikuyu	<i>Pennisetum clandestinum</i>	S2	Across much of the cleared areas of the property/won't tolerate shade (contained), mown by owner (avoid Tussock grass patch)
Pampas Grass	<i>Cortaderia selloana</i>	S1	A few plants noted/being controlled on other properties across the Kangerong valley where it was invading
Pittosporum	<i>Pittosporum undulatum</i>	K	Scattered through the woodland and along gully/ control females first
Radiata Pine	<i>Pinus radiata</i>	S1	A few patches along gullies where it is suppressing streamside vegetation and adding to gully steepening/owner proposing to mill wood
Scrambling Dock	<i>Rumex sagittata</i>	S1	Very difficult to eradicate without digging out root system/needs further mapping/contain in interim
Tree Lucerne	<i>Chamaecytisus palmensis</i>	S1	Only a couple of individuals noted but very long lived seed and potential to spread further
Watsonia	<i>Watsonia bulbifera</i>	S1	Boundary roadside was covered with this species in the past where it was spread by slashing. Many years of work now have it under control

Localised infestations were [mapped](#) (this map is by no means complete given the time on site) and a management plan developed as a map layer to be able to determine the person hours required to do the work.

All S1 weeds have been prioritised for elimination across the site in Stage 1 with the exception of Scrambling Dock, Cootamundra Wattle and Radiata Pine. Scrambling Dock needs to be contained by flowering stem removal until its distribution and the size of the infestation can be assessed. The Cootamundra Wattles are close to the house and discussion needs to be had with the owners regarding their removal as they may be filling an amenity role. The wood could be potentially put in the wetland to provide snags. The Pines are suppressing any vegetation along the gully where they occur. In some areas they could be ringbarked and allowed to die but in other areas their eventual collapse would destabilise the bank. The owner would consider milling the wood if they were dropped onto the open clearings. These actions have not been included in the costings

Removal of Keystone weeds has been prioritised to occur in high quality areas as part of Stage 1. Restoration of this site will need a long term management approach

Action	Area Ha	Number of person hours	Cost (\$50/hr)
Blackberry and Pittosporum P3	1.03	100	\$5000
Blackberry control P2	1.29	120	\$6000
Blackberry control P1	0.28	20	\$1000
Boneseed & Female Pittosporum P2	1.33	180	\$9000
S1 weeds as per plan	scattered	50	\$2500
Access track clearing to gully for future works	3 tracks	30	\$1500
	total	500	\$25,000
Seed collection/planting Blackwood/Gahnia			

Appendix 3: Additional information regarding proposed actions and indicative costings

Author: Blair Luxmoore

Introduction

This information is addressed directly to landholders and to Sheepwash Creek Catchment Landcare group members.

While every care has been taken to accurately represent the cost of activities, these figures should only be taken as a guide. You should always seek up-to-date quotes, as market forces will affect pricing over time. More importantly, I have chosen an underlying methodology that I believe is most appropriate in each case, which therefore directly influences price calculations. There are other methodologies to consider, but to price all options would be almost open-ended.

My costings are based on the assumption that professional contractors are completing all works for you! Any time/equipment/materials you can contribute yourself may bring the cost down.

My prices are based on measuring dimensions off Google Earth, which is very accurate however it's still a good idea to seek exact site-based quotes that have been 'ground-truthed'.

There is a wide variety of capability, experience, equipment and work ethic amongst professional environmental companies. They also have differing opinions on what is the 'right' way to do things, given the complexity of dealing with natural systems and risk to wildlife. You can ask for references, or ask them to show you one of their comparable projects that are further advanced than your own, and decide for yourself which contractor you will put your trust in.

Most professional contractors with appropriate OHS and insurance in place charge from \$40 p/h to \$60 p/h ex GST. Price estimates have been based on the lower end of this range, however keep in mind that the cheapest hourly rate is not necessarily the best, as it still depends on the skill level and quantity of work that can be achieved 'per hour'.

You may be able to reduce the cost of your project by delegating simple tasks to your in-house staff such as groundskeepers, farmhands etc. Discuss this option with your contractor to make sure that what you see as 'simple' is actually simple. For example, a common mistake is made when people mistake Native Raspberry for Blackberry. Another common mistake is to assume that Bracken is a weed. In conservation projects, Bracken is not a weed. It is actually highly beneficial.

Woody weed control

The bulk of the cost of woody weed control is usually incurred in the first 3 years. There will be a significant drop in maintenance costs after this, and you should even be able to start skipping a year or two between maintenance passes.

These figures are based on your individual property needs as of August 2015. Please note that Blackberry in particular grows rapidly, so applicable estimates should be revised yearly.

Grassy/herbaceous weeds

There are two sub-categories here i.e. grassy/herbaceous weed control within *existing bushland*, and within *revegetation sites*.

Bushland Situation: Usually, the sheer cost, consistency and level of botanical skill required to effectively manage grassy and other herbaceous weeds makes it unfortunately impractical to address this problem on a large scale. Therefore, in my costings, I have concentrated on obvious priorities only, such as Cape Ivy, Bridal Creeper, Pampass Grass. This is one of those tasks where different contractors will have varying views. All you can do is hear them out, look at their other projects, and decide for yourself.

Revegetation Situation: In contrast to the above situation, most contractors will all agree that grassy/herbaceous weed control in young revegetation sites is necessary and often overlooked. Since most of you are intending some revegetation, thereby making handweeding hugely expensive, I have opted for a method where a person would use their feet only to stomp the weeds down, and spray a general herbicide around the plant like a halo. While this is not 100% effective, it will significantly reduce the competition of pasture towards the newly installed plants. For large projects where no mulch is being used, this is a good compromise on a 'cost vs benefit' basis. If you see \$0 values for your property in this column, it means there is enough 'good' understory that this task is not needed for your particular revegetation zones.

Fencing

You will probably only ever install your fencing once, so try to think towards the future and be generous where you can regarding how much land you devote to conservation. Besides the ecologically beneficial concept that 'more is better', there are some more practical realities to consider.

When applying for grants, particularly from Melbourne Water, your case is that much stronger if you have devoted enough land to make a real habitat corridor. Grants are generally assessed by people that know about ecological principles. Melbourne Water is much more interested in projects that fence off/devote at least 20m *each side* of the waterway. You will also get a higher % of your costs covered if you go wide. Even if you cant afford to undertake all the actions within the fence straight away, at least you have the infrastructure in place for when you are ready.

The more land you devote to conservation, the less 'edge-effect' of weed invasion you will have, therefore the less weed maintenance you will have. Wider revegetation areas are also more resilient to wind and drought, thus decreasing the likelihood that trees will come down across your paddock every time there is a storm. Also, don't expect a Koala to cross an entire paddock just to get to a couple of trees!

Your fence may be actively restricting cattle, hence the need for barbed wire and/or electric wiring. Kangaroos and wallabies are most at risk of these devices. They will either go under the lowest wire, or over the highest wire. Try running the barbed/electrified wire at positions other than the top and bottom strand. Think about installing wildlife gates such as depicted in the photo below. It only takes a few; animals will find them.



Wildlife-friendly stock fencing. This wildlife 'gate' on a property in Moorooduc, allows wildlife such as kangaroos and wallabies, but not cattle, to pass through. Photo: Michele Sabto

Plant supply & install

The cost of plant supply and installation varies widely, depending on three main points. They are:-

- 1) The overall number of plants you purchase in a single order. Obviously the more you buy, the cheaper they get.
- 2) The planting density i.e. how many plants per acre you intend to install. The closer they are, the faster it is to install. This actually makes a bigger difference than the first point!
- 3) Access to AND AROUND the planting site.

Nurseries may require a deposit, and may even offer a discount if you are willing to pay this. There are large up-front outlays in growing plants, which specialist indigenous nurseries are sensitive to when quoting you a price. If you are in a position to offer a deposit, bring this up early in negotiations.

My costings are based on the assumption that the nursery that grows the plants will also be employed to install the plants, hence attracting a wholesale price. If the plants are grown by one company and installed by either yourselves or another company, expect to pay at least 50 cents more per plant.

Supply & install guards

The supply and installation of guards is a relatively expensive activity. I have not recommended using guards on any of your sites as there is no reason to assume they are needed until proven otherwise. If you see rabbits, wallabies and/or kangaroos, you will need to consider guards.

The correct guard must be chosen for the situation. It is a common misconception that guards are 100% effective in protecting plants from animals, especially kangaroos/wallabies. Guards can also make weed maintenance more difficult.

A typical green treeguard (or bag as commonly known) with three bamboo stakes only costs about 50 cents. The expense is really in the installation, and similar to plant installation pricing, depends on spacing, access, hardness of the ground etc. For most sites within this biolink, installing guards on a plant spacing of approx. 1 plant per m² would cost about \$2.00 per guard. This is close to the cost of the plant itself so you can see how much cost it adds to a project.

Make sure you consider the removal and disposal of guards about three years (or less in many cases) after installation. Not all guards are biodegradable, so do check into this before purchasing. I have not priced the removal of guards as I have assumed all guards will be biodegradable. Having said that, your revegetation will not look 'natural' until all these guards (and stakes) disappear from view, and a lot of people don't like the look of them in the meantime. This is a personal choice for you to consider.

Installing hollow logs on the ground

I did not go to the extent of quoting this item due to too many variables. Having said that, I've never met owners of a large parcel of land who didn't accumulate branches, logs and leaf litter somehow. Provided you wait till the branches/logs are dead and free of seeds (to avoid spreading weeds), throw them around your revegetation area or into your creek, rather than burning or chipping them. You'll be surprised how quickly it builds up. Try offering this disposal method to your neighbours too.

Installing nest boxes above ground

I did not go to the extent of quoting this item in full, as there are too many variables. However please don't ignore this important aspect. Just think, ten thousand seedlings will not produce one useable tree hollow for maybe 20 years! Ready-made nestboxes (starting at \$25 ea) and 'How-to-Install' guides are available from Latrobe University Wildlife Reserve. They are custom-made for the actual creatures you are trying to attract, and have been researched and developed over a number of years, so they are very effective. Watson Creek Catchment Landcare also have experience building and installing nest boxes.

Nest boxes require some maintenance to the extent that they may be colonised by feral creatures such as Indian Mynas, exotic bee species (Italian Honey Bee), Starlings and European Wasps.

Fox control

Fox control is another one of those aspects that is often overlooked, as the average person cannot 'see' the results in comparison to seeing the results of, for example, installing 500 plants. However, research being done particularly over the last 10 years is consistently showing that foxes are having a much greater impact than previously thought. Foxes are also one of the main spreaders of Sweet Pittosporum berries, Blackberries and other woody weeds that have berries.

Fox control is only effective if adjoining landowners have a coordinated plan, or if your own property is so large that it can be considered a 'landscape-scale program' in its own right. It's actually not that expensive, but just like weed control, it should only be started if you have the means to conduct follow-ups on a yearly basis.

I have not quoted this task for each property as there are too many variables. Furthermore, given that there are ethical concerns here, there are alternate options which are a very personal decision for each landowner to make. These will affect the price too.

Planning permits

Planning Permits from Mornington Peninsula Shire are actually required in some circumstances for killing trees/large shrubs *even if they are known weeds*. You should check with the Shire if you are unsure.

Appendix 4: EVCs

About EVCs

Some of this information is reproduced from the Mornington Peninsula Shire Council website (http://www.mornpen.vic.gov.au/Environment_Waste/Environment/Flora_Fauna)

What is an Ecological Vegetation Class?

Native vegetation in Victoria has been classified into distinctive groupings known as Ecological Vegetation Classes or EVCs. These groupings are based on floristic, structural and ecological features of the vegetation. The Department of Sustainability and Environment (DSE) have defined over 300 EVCs within Victoria. Each EVC has been assigned a distinct descriptive name (e.g. 'Coast Banks Woodland') and number (e.g. 002).

EVC profiles

The Shire also commissioned Jeff Yugovic to put together a profile for each EVC that occurs on the Peninsula. These EVC profiles describe the structure of vegetation within that EVC, what sort of environment it occurs in, its bioregional conservation status, its past and present distribution and major species (all specific to the Mornington Peninsula).

What are bioregions?

EVCs are classified according to the geographic area or bioregion in which they occur. Victoria has been divided into 28 bioregions - the Mornington Peninsula occurs within the Gippsland Plains Bioregion. The bioregional conservation status of an EVC is an assessment of its conservation status within a particular bioregion based on a number of factors including how commonly it originally occurred, its current level of depletion and current level of degradation. For example, the EVC Grassy Woodland (no. 122) has a bioregional conservation status of vulnerable within the Gippsland Plains Bioregion.

Why use EVCs?

EVCs are a very useful way to describe different types of vegetation; it means everyone across Victoria is using the same system and common terminology when talking about vegetation. Becoming familiar with the EVC maps and profiles for your area is a great starting point to help you to understand the natural environment around you. Recognising how the composition and structure of native vegetation in your area changes and how these changes relate to soil, topography and other features can really help you to understand the broader ecological picture of what is happening in your patch. EVC profiles can also be used a guide to help you restore a particular EVC.

Limitations

EVC are a somewhat simplified way to look at vegetation - we humans have a tendency to want to categorise the natural world into distinct units such as EVCs, but nature is not so straight forward, plants do not always arrange themselves into clear, distinct groupings. It can be difficult for the untrained eye (and sometimes the trained one!) to discern just what EVC a certain patch of vegetation should be categorised as - especially if the vegetation is highly modified through weed infestation. But try not to get too bogged down in the finer details - there is no need to draw a definitive line in the sand on your site where one EVC stops and another starts (most of the time in nature there is almost always a gradual change where EVC overlap one another anyway). Just think of EVCs as a useful tool to for describing vegetation and use the maps and profiles provided by the Shire to help you to understand more about the bushland in your area.

Further information

A list of EVCs by bioregion can be found on the website of The Victorian Department of Sustainability and Environment, at:

<http://www.dse.vic.gov.au/conservation-and-environment/ecological-vegetation-class-evc-benchmarks-by-bioregion#gipp>

To locate EVCs in your area, you can use this Victorian government website:

<http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim>