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**LAND
MANAGEMENT
GUIDE**



This guide was compiled by the
Economic and Environmental
Planning Unit.

Manningham City Council

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Owning a small property is the dream of many Australians. The peace and quiet, fresh air and beautiful scenery attract people to areas like Manningham where they can enjoy the balance between city and country living.

Some people want to run a few horses for the kids, others plan to grow vegetables or just sit back and enjoy the bush.

Owning a small property can bring a great deal of pleasure, but it also brings responsibility. Landholders must ensure their land management practices do not cause land and water degradation on neighbouring

properties, or elsewhere in the catchment. There are also legal requirements for the control of weeds and rabbits.

Close attention to pastures is vital. The overgrazing of horses can lead to severely eroded and weed-infested paddocks in just a few months. It is much easier, and less costly, to prevent land degradation than to repair it.

This guide aims to help you improve the management of your small property. It will not provide all of the answers and we encourage you to seek out more detailed information and advice.

There is no simple formula for successful land management, but learning the basics will have benefits for you, and for the whole Manningham community.



A pony can bring a great deal of pleasure but not all properties are suitable for grazing.

Soil is the basic building block of life. Without soil there would be no vegetation, no animals and consequently no people. If you own a small property your soil is your most valuable asset.

Soil is living matter. It is made up of mineral particles, organic material, water, air and living organisms.

The weathering of rocks and the breakdown of organic material forms soil. It is a very slow process – a centimetre of topsoil can take several hundred years to form. Soil is a dynamic medium. Physical, chemical and biological processes are constantly underway within the soil.

Soils are generally classified according to their depth and structure. The surface soil, rich in organic material and critical for plant growth, is called topsoil. Topsoil is typically between 5-30 centimetres deep.

Soil structure refers to the arrangement of the soil particles and the stability and resilience of the soil. Soil structure is very important for land management. A well-structured soil will easily take in water; excess water will drain away and be replaced with air. Plants need both air and water near their roots to grow well. When surface soils lose their structure they have lower water infiltration rates and are more easily eroded.

Australian soils are some of the oldest and shallowest in the world. They have generally low organic matter and poor surface structure. Most Australian soils contain very little nitrogen and phosphorous.

Soil organisms

Soil organisms help to keep the soil healthy and fertile. These organisms range from tiny bacteria, protozoa and fungi to larger soil animals like beetles, mites, crickets, centipedes, earthworms, spiders, earwigs, springtails and termites.

Each soil organism plays an important role in cycling carbon, nitrogen, sulfur and phosphorous through the soil and in maintaining good soil structure.

One hectare of good quality soil could contain around 1000 kilograms of earthworms, 100 kilograms of other soil animals and millions of fungi, bacteria and protozoa.

Healthy soil is full of earthworms and other soil organisms.



Soil erosion

Erosion is a natural environmental process but activities like farming (especially the grazing of hard-hoofed animals), road building and housing development has accelerated erosion to potentially disastrous levels.

Soil erosion occurs wherever the soil surface is exposed to water, wind or gravity.

When vegetation is lost the soil surface is exposed to the force of the wind and wind erosion increases. The dramatic dust storms of 1983 saw priceless topsoil from the Western districts dropped on Melbourne. An average of nine kilograms of topsoil was dropped on each suburban block.

When there is less vegetation to intercept falling raindrops and surface runoff, water erosion increases. A single drop of rain hitting a bare, wet, soil surface acts like a bomb blast. The force of the impact breaks the soil into particles that splash into the air. If the splashed particles are on a sloping surface they will be transported down the slope – often for considerable distances. This surface runoff fills drains, streams and rivers with sediment. Sediment degrades water quality and may carry polluting chemicals.

Soil erosion causes damage in three places: it damages the land where the soil is removed; it degrades the water that transports the soil; and it damages the site where it is deposited.

Types of erosion

Tunnel erosion is the washing away of subsurface soil while the surface soil is mainly intact. Tunnels start when water moves in soil cracks, root holes and rabbit burrows and when the surface soil is saturated. Tunnel erosion produces long cavities beneath the soil surface. The cavities enlarge until the surface soil is no longer supported and collapses. If the process is allowed to continue the soil surface collapses further and forms open gullies which continue to grow.

Rill erosion is the formation of numerous small channels by concentrated runoff. Rills can often be seen on road batters and after earthworks. Rilling increases with the length of slope and steepness. Severe rill erosion can lead to the formation of gullies.

Gully erosion is the washing away of soil by running water which causes large channels to form. Gully erosion can be caused by relatively small changes in land management – increased discharge to a minor drainage line can be sufficient to start the gully erosion process. Much more effort is required to treat gully erosion once it is underway than to maintain a stable system and prevent it forming.

Treating gully erosion involves changing the flow of water over the land, excluding grazing animals, fencing off and revegetation. If large gullies have formed earthworks are often required.

Streambank erosion is caused by changes in water flow and the loss of streamside (riparian) vegetation. Riparian vegetation stabilises streambanks.



The clearing of vegetation along this stream has caused severe erosion.

Where erosion is severe and the bank collapses this changes the water flow which leads to more erosion. Fencing out and revegetating riparian areas is the key to controlling streambank erosion.

Soil salting

The clearing of trees and vegetation from hillslopes (recharge areas) is a common cause of soil salting. Trees act like pumps. They draw the water they need for growth up by the roots. When trees are removed more water makes its way down to the watertable. This causes the watertable to rise, bringing leached salts up to the surface.

The damaging effects of soil salting are often seen in low-lying areas where the saline water discharges.

The use of deep-rooted perennial pastures and the planting of native vegetation on higher, 'recharge' areas can help prevent waterlogging and soil salting at lower, 'discharge' sites.

Soil compaction and pugging

Constant trampling from livestock and tyre track damage from machinery and off-road vehicles can severely degrade soil structure.

When hard-hoofed animals like horses are fed and watered in a confined area they exert huge pressures on the soil. Horses and cattle are very social animals and will often congregate in one area. Their hooves can make deep holes or 'pugs' in wet soils.

Some soil types, especially clays, can form dense, compacted layers up to several metres below the surface.



Horses can cause severe pugging when they are kept on wet soils.

These compacted layers can cause waterlogging, and other drainage problems which reduce plant growth and increase the likelihood of soil salinity.

Local soils

The soils of the Manningham area are mainly bleached duplex soils.

The topsoils are dark, grayish brown, hard-setting loams. Underneath this is a bleached layer (A2 horizon) which usually contains ironstone nodules and gravel. The next layer (B horizon) is clay. It is tightly structured, sodic and usually grayish yellow but it can be red or brown.

Bleached duplex soils present some specific land management problems. The soils generally have a low nutrient level. The subsurface soil (A2 horizon) is subject

to waterlogging in winter. The cemented A2 horizon makes it difficult for plant roots to penetrate during summer. The tightly structured clay layer in the upper B horizon makes it difficult for plant roots to penetrate during winter.

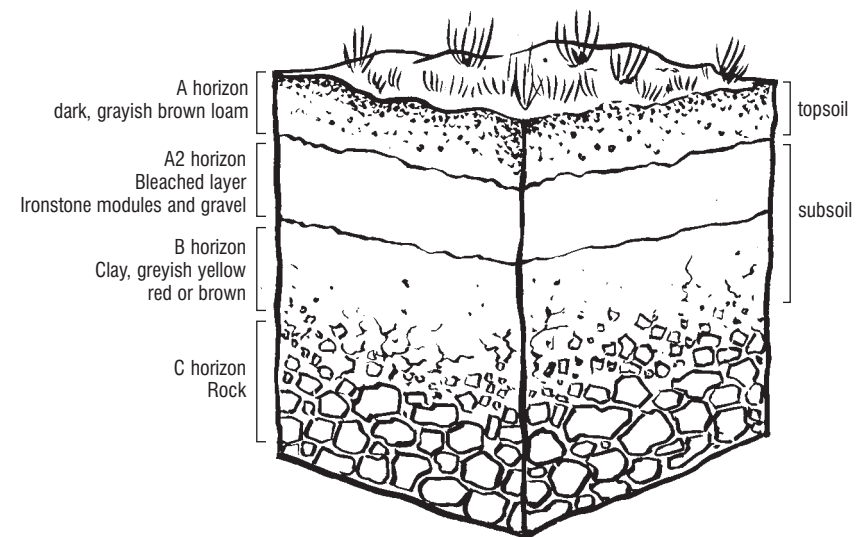
Soils in the bleached duplex group are particularly susceptible to gully erosion. They are sometimes called 'tin-roof soils', as once the topsoils become saturated there is a low rate of infiltration and a high rate of surface runoff. Soil salting is also a common problem.

Warrandyte and Wonga Park are erosion hot spots in the Yarra Catchment. Urban development, unmade roads, rural living and tunnelling dams are contributing to the erosion problems. Warrandyte and Wonga Park are particularly vulnerable areas as they are located on land systems which are highly susceptible to soil erosion.

What to aim for

A good soil on which to maintain sustainable pastures has an open porous structure and a high level of organic matter.

Soil with an open structure is well aerated and allows water to percolate down into spaces that can hold moisture. High levels of organic matter assist in maintaining soil structure and fertility.



A simplified soil profile from the Manningham area. This is what the soil profile should look like. In some areas the topsoil and even some layers of subsoil have been completely eroded away.

Tips for healthy soils

- Maintain ground cover, promote natural regeneration and revegetate any bare areas.
- Fence along the natural contours of the land.
- Protect steep sites, streams and waterways.
- Take care when earthmoving and road building.
- Keep stock movement and feeding sites off wet soils and away from drainage areas.
- Do not overgraze or use heavy machinery on wet soils.

Water is a finite and precious resource. Water cycles through the environment – it moves from the ocean, to the atmosphere, to the land and back to the ocean again. Along the way water is stored in the soil, in dams and wetlands and flows through rivers, streams and creeks.

An eroded creek choked with weeds and rubbish often points to poor water quality.



The waterways in the Manningham area are a vital part of the environment. They provide habitat for plants and animals and recreation and enjoyment for all. Waterways reflect the health of the surrounding land.

A healthy waterway usually means the land around is in good condition, while a degraded and unhealthy waterway points to problems in the catchment.

Hydrology

The way water moves over the land and soil is called hydrology. It is important to understand the hydrology of your land. Watch to see where the water goes after a high rainfall event. Does it drain away completely or does it pool in low-lying areas?

Grading, earthworks and the construction of roads, drains and manages will alter the movement of water across the land surface. These works will have consequences at the site of construction and further away.

Poorly planned drainage of grey water, roof, road and stable runoff can create serious land management problems. Excess water will encourage the growth of weeds which will attract pest animals like rabbits and foxes. Constantly wet soils are prone to erosion and waterlogging. Changes in the water flow and soil levels around established trees can kill them.



Alan Noy's small wildlife dam at Warrandyte has been designed to collect grey water runoff from the house, and stormwater runoff from the roof and road. The water is filtered through native reeds and sedges before it reaches the dam.

Runoff

Runoff doesn't stop at property boundaries. Your land is part of a catchment and the way you manage it impacts on the water quality of local creeks, rivers and streams.

Soil erosion caused by land clearing and overgrazing is causing increasing sedimentation of waterways. Sedimentation is a major hazard for native fish, water creatures, plants and algae, as it reduces light and fills up holes and crevices that provide shelter and breeding sites.

The use of pesticides and herbicides to control pest plants and animals can seriously damage water quality. Spray drift can deposit chemicals in waterways and

they can leach through the soil and runoff into creeks and streams. Some chemicals can persist in the environment for many years and actually increase in toxicity as they move through the food chain.

Chemicals must be used with extreme caution. The smallest possible amount of chemical at the lowest possible toxicity should always be used. Outdated and unwanted chemicals must be disposed of safely.

Nutrients from fertilisers, runoff from intensive grazing and seepage from septic tank systems can cause eutrophication and algal blooms in waterways. Algal blooms are toxic to humans and can cause the death of fish, invertebrates and aquatic plants.

Water supply

Land managers need to plan their water supply and storage needs. Estimating yearly water use is a good place to start.

APPROXIMATE RATES OF ANNUAL DOMESTIC WATER USE:

Use		Water in litres
House	With septic system	65,000 per person
	Without septic system	50,000 per person
Garden	Native garden (no lawn)	0-1000 per square metre
	Lawn with shrubs	3000 per square metre
	Vegetable garden	5000 per square metre
Stock	Horse in work	20,000
	Horse grazing	13,000
	Cattle	20,000
	Sheep	3,000
	Hen	120
Fire fighting reserve	Buildings	1200 per square metre
	Grass areas	750 per square metre

On house blocks and very small properties a rainwater tank and/or the mains water supply may be sufficient. All residents need to be vigilant in reducing water consumption and recycling water wherever possible.

On properties of up to eight hectares rainwater collected in tanks off a clean roof will provide a cheap, good-quality water supply. The amount of runoff from a roof can be calculated by multiplying the annual rainfall with the area of the roof

(in square metres). In a location with a 600-millimetre yearly rainfall average and a roof area of 250 square metres the runoff would be around 150,000 litres a year.

Tank installation must be carried out by a licensed plumber who can issue a certificate stating that the tank has been correctly installed and is operational. Manningham residents may be eligible for rebates when they purchase a new rainwater tank. Contact Council for further information.

Dams

It is important to remember that even small dams have an effect on overall water availability. Dams reduce the amount of water in the catchment and the water flowing into rivers and streams.

Building a dam is a major engineering task with important safety issues to consider. Dams that have a wall of five metres or more and a capacity of 50 megalitres or more are classified as potentially hazardous. Property owners must consider the safety of downstream neighbours in the event of a dam collapse and the safety of children around the dam. New dam construction requires Council planning approval.

Both new and existing dams require regular monitoring and maintenance. Leaking dams waste water and contribute to erosion. One of the keys to keeping a dam healthy is to prevent stock access to the water. When stock drink directly from a dam they cause erosion, foul the water and risk drowning. Dam water should be piped to planned drinking points.

Dams can provide important wildlife habitat. Making your dam wildlife friendly can reduce losses from evaporation, improve water quality, provide shade and shelter for stock and humans, assist with natural pest control in pastures and greatly improve the appearance of the dam.

The first step in improving a dam is to exclude stock by fencing. Fencing should not prevent vehicle access for fire fighting.



Stock trampling at the edge of this dam is causing soil erosion and reducing water quality.

It is important that access tracks are kept clear of vegetation and gates work properly.

Fencing will help native vegetation regenerate around the dam. This can be supplemented with planting. Native trees, shrubs and groundcovers typical of local wetlands are suitable. However, trees should not be planted on the dam rim as their roots can cause tunnelling and leakage.

Dense vegetation provides breeding habitat for a range of species. A log, dead tree or an island in the dam are excellent roost sites. Islands provide security from predators like foxes.



Waterbirds like this Great Egret are attracted to dams.

Vegetation also works as a sediment and chemical filter for the dam and will improve water quality.

A wildlife dam can greatly improve the look of your property and provide a real sense of satisfaction as you enjoy the birds, frogs, bats, mammals, lizards, fish, butterflies and dragonflies that will soon move in.

Wetlands

Over the past 150 years Victoria has lost around a third of its wetlands. As the area of wetlands is shrinking many plants and animals are now under threat. Victoria's wetlands are home to over 100 species of water birds.

A wetland is any area that is covered with fresh or salty water for at least part of the year. Billabongs, river flats, saltmarshes, farm dams and duckponds are all wetlands. Low-lying areas that have seasonal water cover are called ephemeral wetlands.

Wetlands are not always obvious. You may have a seasonally wet, low-lying area on your property that is already functioning as a wetland and providing important habitat for rare wetland plants. Areas like this must be fenced and protected.

Wetlands play an important role in flood mitigation. After heavy rain wetlands absorb runoff which reduces the flow into rivers and the chance of flooding.

Creating and/or protecting wetlands can provide many benefits to the overall health of your property.



These native reeds and sedges provide good nesting material for waterbirds around a small wildlife dam.

Tips for managing water

- Get to know the hydrology of your property.
- Remember that runoff doesn't stop at property boundaries. It can have serious impacts for your neighbours and on local waterways.
- Estimate your water needs and plan appropriately.
- Consider the installation of rainwater tanks – rebates may be available.
- Be aware that dams reduce the overall water available to the catchment.
- Dam management should focus on fencing out stock and piping water to watering points.
- Wildlife dams have many benefits for the environment, the appearance of your property and water quality.
- Protect and conserve wetlands, including sites that have only seasonal water cover.

Pastures are a valuable commodity. They provide feed for grazing animals, prevent weed infestation and protect the soil from erosion.

Good pasture management requires skill and attention to detail. There are no exact recipes to follow as each property and paddock is different and, to complicate matters further, the pastures in each paddock are continually changing.

A good land manager is a student of their pasture – constantly checking and recording the length, condition, species balance and weed threat.

Successful pastures depend on healthy soils. Most pasture varieties require well drained soils and few will survive in waterlogged areas. Shallow soils, where the clay is close to the surface, are especially poor for growing perennial pastures. Soil fertility is crucial. The degree of alkalinity or acidity of the soil as well as the organic material present will have a big impact on the ability of pastures to thrive. Pastures will also do better when they are sheltered from frosts and wind by belts of trees and native vegetation.

Types of pasture plants

Good pastures are a blend of different plant species so that fresh, green feed is available for as long as possible during the year. Pastures are made up of both annual and perennial plants.

Annual plants grow only from seed. They germinate quickly and strongly, grow

to maturity, flower, set seed and die within 12 months. Some early maturing annuals take only a few months to complete the cycle while others take the full year. The life cycle of the plant is linked to the length of the growing season where it is found.

Perennial plants live for longer than two years. Some perennials grow from vegetative parts as well as from seed. They do not grow as quickly or strongly as annuals and take longer to establish. Once they are mature they continue to flower annually until they die.

Perennial plants generally require areas of good rainfall to be successful. They establish strong, deep, root systems and are better at out-competing weeds and withstanding the soil pugging and compaction problems of hard-hoofed animals like horses. Tussocky perennial grasses with upright growth habits provide hardy ground cover but have a lower nutritional value than low-growing clovers.

Perennial pastures have a number of advantages over annuals.

- They are deep-rooted and help control salinity as they use more water.
- They help control erosion by reducing runoff.
- They grow for a longer period than annual pastures.
- They help with weed control by out-competing some weed species.
- They are active in summer and respond quickly to rain.

Good pasture blends can be difficult to achieve as the more dominant pasture species will out-compete the less dominant species.

Close attention to grazing management will help keep the pasture blend in balance. The decline of perennial plants and the domination of annuals should be avoided, as it will result in very bare paddocks each autumn.

Native pastures

Native pastures consist of a variety of perennial grass species including Weeping Grass, Kangaroo Grass and Wallaby Grass. Native grasses are very hardy and persistent and can even survive on soils with low fertility.

In the past 150 years 99% of Victoria's native grasslands have been lost. Native grasslands are now a severely threatened plant community and protection of even small patches of remaining grasses is essential.

Every effort should be made to encourage the persistence of native pastures. They will not withstand such heavy grazing as introduced pastures but, if managed properly, they can provide ground cover for up to 80% of the year.

Many native grasses are perennial so they also help in the control of salinity and erosion. Research on grazing of native pastures is still underway but early recommendations suggest native grasses should not be grazed in spring so as to allow plants to set seed, or after the autumn rains so as to allow seeds to germinate and establish.

Common native pasture grasses:
Kangaroo Grass (*Themeda triandra*)
Wallaby Grass (*Danthonia spp*)
Weeping Grass (*Microlaena stipoides*)
Tussock Poa (*Poa spp*)
Spear Grass (*Stipa spp*)

Kate Sutherland studying a stand of native grasses on a Warrandyte property. This paddock is thick with orchids and native wildflowers each spring. It is lightly grazed by two horses for short periods.



Pasture weeds

A quick drive through Wonga Park or Warrandyte will reveal many hectares of pasture that has been invaded by Cape Weed (*Arctotheca calendula*), Dock (*Rumex crispus*), Sweet Vernal Grass (*Anthoxanthum odoratum*) and other pasture weeds.

A pasture weed is any plant that is toxic to grazing animals, unpalatable or unproductive. Pasture weeds compete with pasture plants for light, moisture and nutrients. Close inspection of paddocks throughout the year is essential for effective control of pasture weeds. Weeds occupy a lot of space when green and can make a paddock look healthy and lush. When they dry off over summer and set seed bare patches become evident and the true state of the paddock is revealed.

Cape Weed has the potential to invade horse paddocks leaving them completely unproductive.



Many pasture weeds were once valued plants of home gardens. Soursob (*Oxalis pes-caprae*) and Spanish Heath (*Erica lusitanica*) are examples of garden escapees. This is also a problem in pastures. Pasture plants like Kikuyu Grass (*Pennisetum clandestinum*) and Phalaris (*Phalaris spp*) are considered serious weeds of bushland and roadsides when they escape from pastures.

Land managers must work to keep weeds out of their pasture paddocks and to keep the introduced pasture species that can cause weed problems elsewhere, in the paddock. This is not an issue when the main grazing species are native pastures.

Some weed seeds can survive dormant in the soil for long periods, others can be introduced with hay. Weed seeds can drop out of the hay before it is eaten or pass through the digestive system and be deposited in manure. Hay should be fed out in the same area so if weed seeds do germinate they will be easier to control.

Other weeds can be present in the paddock in small numbers but will invade when the area is selectively grazed or overstocked.

Effective control of pasture weeds centres on constant monitoring, grazing, slashing and mowing and, as a last resort, herbicides. See page 30 for further information on weed control.

Pest control in pastures

Invertebrate pests like aphids, grubs, caterpillars and cockchafer can damage pasture plants by stunting growth, reducing seed production, weakening plant condition and chewing through leaf matter. Many pests eat all of the green matter leaving only a skeleton of plant membranes intact. Some larvae have a preference for buds and flowers and can prevent plants from establishing and reproducing.

Chemical control of insect pests is both costly and hazardous to stock and the environment. Many insect problems can be controlled with good grazing management, for example, wingless grasshoppers mainly attack annual clovers. In a pasture which has a mixture of perennial as well as annual plants grasshopper damage will not be as severe. Avoiding bare patches and controlling weeds will also assist in controlling pasture pests.

Insect-eating birds are very effective pest controllers. Magpies will eat around 40 scarab grubs from pasture each day. They will also feed on weevils, shield bugs, grasshoppers, beetles and earthworms. Ibis feed mainly on crickets and grasshoppers, eating up to 250 insects each day.

To attract birds to your property you will need to provide native vegetation where they can shelter and breed. A wetland or wildlife dam will greatly increase the number and diversity of different bird species that visit your property. See page 13 on creating a wildlife dam.

Managing horse pastures

How horses graze

An understanding of horse grazing behaviour is important for good pasture management.

Horses are herd animals. They depend heavily upon the herd for a sense of security and prefer to graze, sleep and play as a group. A horse on its own will suffer from boredom which leads to fretting. Solitary horses are more likely to develop 'walk the fence' syndrome which causes soil damage and erosion. Solitary horses are also more likely to strip the bark from trees and to panic during storms and run into fences. A large horse doesn't require a companion of a similar size. A small pony or donkey can make a good companion for a horse.

Horses select which grazing plants they are going to eat by smell, touch and taste. Horses have excellent sideways vision but they are unable to see directly in front of them, or see what they are eating. Smell is their most powerful sense. This is why horses won't eat plants near their own manure.

Touch is also an important sense. The horse sorts out the good grasses from the bad with the tactile hairs on its lips and nose. It is important that these hairs should not be cut as they play an important role in protecting the grazing horse from eating potentially dangerous weeds and grasses. Taste is the last line of defence. Horses have a highly developed sense of taste



Horses will avoid grazing around Sweet Vernal Grass.

and it is not unusual to see them spitting out pasture plants they have just eaten.

Horses are very fussy grazers. They are extremely selective about what they will eat and will graze some areas of a paddock heavily but leave others untouched.

There are three main reasons for this:

- Horses do not like certain grasses such as Fog Grass and Sweet Vernal Grass and will avoid areas where they grow.
- Horses will not eat longer grasses (over 15 centimetres). Unlike sheep and cattle who use their tongues to break off grasses, horses use their teeth. They find it difficult to nip the tops off long grasses and are better adapted to grazing shorter grasses (under 15 centimetres) which are closer to the ground.

- Horses will not eat pasture that has been contaminated with their own manure.

This grazing behaviour results in untouched pastures becoming long and rank and infested with thistle. On heavily grazed areas Cape Weed and Sorrel can take over. Some areas of the paddock, near gates, shelter and the feed and water containers, will be bare from constant hoof pressure. In wet weather these areas will become compacted and boggy. This is known as a horse sick paddock.

It is much easier to avoid a paddock becoming horse sick than to repair it once it has reached this state.

The management aim for horse pastures is to take care of the soil, encourage pastures to persist, and discourage weeds from establishing. The grazing capacity of pastures is constantly changing. It reduces during summer, to early autumn, is low in winter and increases in spring. However the demand for grazing is constant all of the year round. Good management depends on a number of different factors.

A horse sick paddock at Wonga Park. The ground is bare and heavy with manure. The horses have started stripping the bark from gum trees.



Rotational grazing

Having several smaller paddocks rather than one large paddock and moving your horses between them is called rotational grazing. Rotational grazing can help prevent the 'under/over' grazing pattern seen in many horse paddocks.



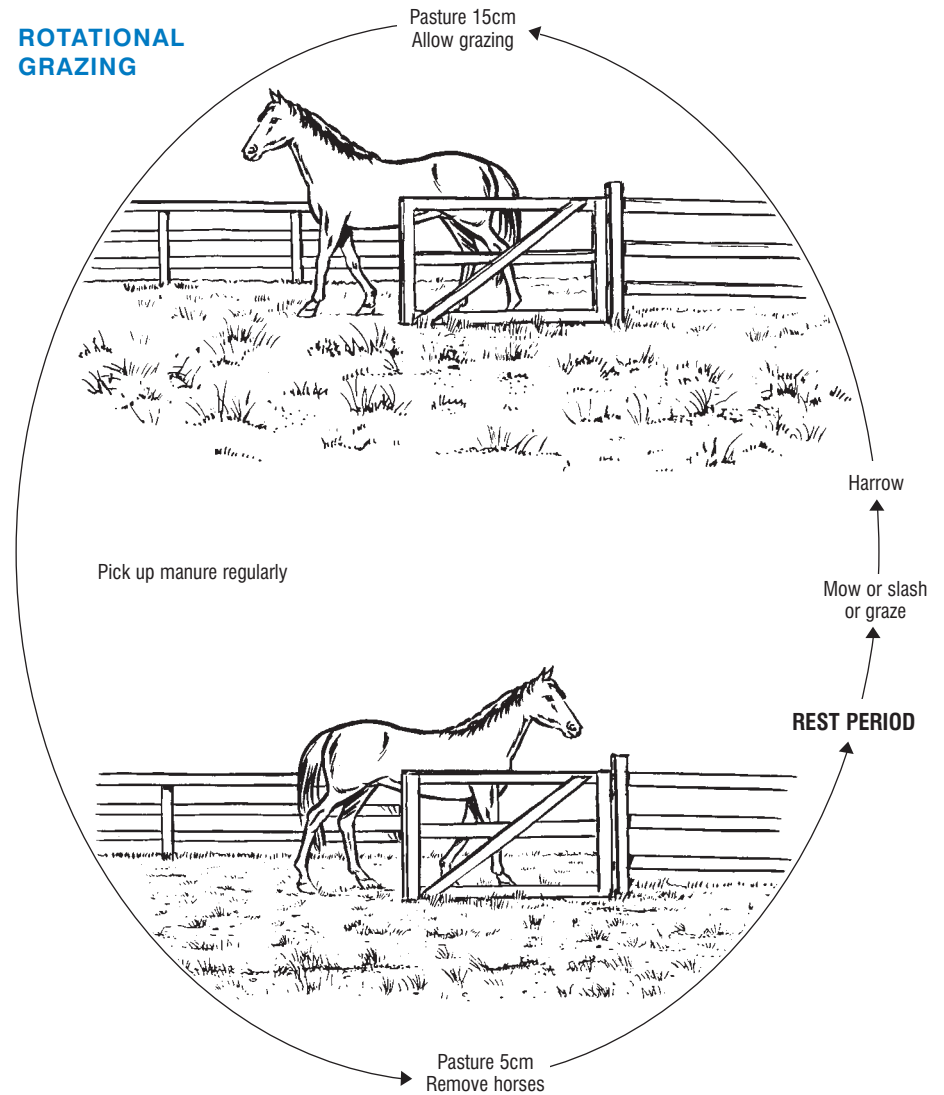
Overgrazing is a serious problem in the Manningham area. Overgrazing weakens plants and may prevent them from setting seed. This leads to bare patches that are quickly invaded by weeds.

Undergrazing leads to selective grazing and a change in the composition of the pasture. More favoured species are grazed out while less favoured species become tall and rank, then flower, set seed and proliferate.

Research has shown that rotational grazing can maintain ground cover, improve the persistence of perennials, improve pasture root growth and water use and reduce the patchy selective grazing habits of horses.

Pastures should be monitored continually but a good guide is to allow grazing down to a height of around five centimetres, remove the horses, allow the pasture to recover to around 15 centimetres in height and then allow grazing again. This pattern should be continued as growth allows.

ROTATIONAL GRAZING



A 5-15 centimetre rotational grazing system. Horses are moved out of the paddock when the lowest plants are around 5 centimetres, and back into the paddock when the lowest plants are around 15 centimetres. Managing the rest period through harrowing, mowing and slashing or follow-on grazing is crucial.

When paddocks are being rested pasture growth improves and parasites die off. The rest period is critical for the survival of perennial plants. Perennials need the rest periods to rebuild root reserves that are essential for growth and vigour.

When pasture growth is slow (dry period, winter) the rest period will need to be longer. When pasture growth is fast (spring) the rest period can be shorter.

Fencing is an important consideration when rotational grazing. The choice between permanent or temporary fencing must be made. Fence placement should consider the slope of the land and the runoff and erosion risks. Fencing with the contour of the land is recommended, as is the fencing out of wetter areas, streams and creeks. See page 61 for guidelines on fence placement.

Electric fencing can provide a relatively low cost fencing option that works well with rotational grazing.

A landholder monitors pasture growth before reintroducing horses to a paddock.



Rotational grazing with sheep or cattle

Grazing horses on rotation with other livestock like sheep and cattle is an effective way of maintaining good production from pastures. Sheep and cattle eat a much greater range of pastures than horses and will graze areas that they have avoided. Sheep will eat most weeds found in horse paddocks.

In a cattle and horse rotation it is best to graze cattle first as they will eat the longer grass while horses prefer shorter grass. Even when horses are grazed first cattle are effective in cleaning up the areas of long grass that have been left. Cattle and horses will not graze near their own dung but they will graze areas near each other's dung.

Alternating cattle or sheep with horses also helps to control parasitic worms in the pasture. Most worms that live in horses cannot survive in cattle or sheep.

Small property owners not wanting to purchase sheep or cattle could consider leasing, or the joint-ownership of stock which can be moved between neighbouring properties.

Mowing or slashing

If cattle or sheep are not available to eat down the long growth in the paddock, mowing or slashing can produce similar benefits.

Mowing or slashing during rapid spring growth can help to keep all of the pasture

short and available for grazing, which will prevent weeds becoming established. However, some broadleaved weeds like Cape Weed will not be controlled by mowing as they grow outward rather than upward.

Mowing or slashing can also be of assistance in removing dry, tough grasses and encouraging young, greener plants. Immature plants have more leaves than stems and are more nutritious than older, stemmy grasses.

Manure removal

Stallions tend to manure in one area but mares and geldings will drop manure throughout the paddock and then avoid grazing near it.

Regular removal of manure will increase the amount of pasture available and discourage patchy grazing and weed competition.

Removing manure will assist with parasite control and reduce the breeding of blowflies.



Harrowing

During the rest period harrowing the paddock can assist the pasture to recover. Harrowing breaks up manure pats, exposing and killing the parasitic worm larvae and reducing the breeding ground for flies.

Harrowing hastens the process of the breakdown of the manure and enables it to be used by the soil as fertiliser.

Harrowing during a cold or dry period will kill worm larvae but harrowing during warmer, wetter weather may increase worm problems by spreading them out and increasing horse exposure to them.

Harrowing can be done by hand on small areas or by pulling an attachment behind a ride-on mower or tractor.

Spraying herbicides

If paddocks become badly overrun with weeds and other control methods have been ineffective, they may need to be controlled by the spraying of herbicides.

Chemical control may also be required where there are infestations of toxic weeds like Paterson's Curse (*Echium plantagineum*). Most horses will avoid eating plants that are poisonous to them but they may do so if they are extremely hungry or unfamiliar with the plant.

Eating large quantities of some plants like St John's Wort (*Hypericum perforatum*) and Storksbill (*Erodium spp*) can cause extreme sensitivity to sunlight while Paterson's Curse (also known as Salvation Jane) can cause irreversible liver damage. Professional veterinary assistance should be sought immediately in cases of suspected poisoning.

Extreme care must be taken when using herbicides. The product label will state a grazing exclusion period that must be strictly adhered to. The label will also recommend the best time to spray. Following this direction will maximise results and minimise the amount of follow-up herbicide required. See page 33 for more information on weed control methods and the use of herbicides.

Tips for managing pastures

- Healthy pastures rely on healthy soil.
- Pasture management requires regular monitoring and recording.
- Aim for a mix of annual and perennial plants.
- Encourage the persistence of native pastures.
- Monitor and control pasture weeds.
- When running horses practise the 5-15 centimetre method of rotational grazing and remove manure regularly. Harrowing, mowing and slashing may also be useful.

However well you manage your pastures, if you have too many horses on a small area you will run into trouble.



Weeds cost Victorian agriculture an estimated \$360 million a year. The weed problem in Australia is so severe it threatens to completely change the face of the landscape. All landholders, including suburban gardeners, have a responsibility to control weed invasions on their land and to prevent them spreading and occurring elsewhere.

A weed is simply a plant growing in the wrong place. Many weeds are attractive and people are often unaware of the harm they cause. Weeds invade and degrade pasture, poison stock, contaminate produce, provide harbour for rabbits and foxes and seriously damage the health and biodiversity of our native vegetation.

Weeds are spread by wind, water and animals, but the main weed spreading agents are humans.

Humans:

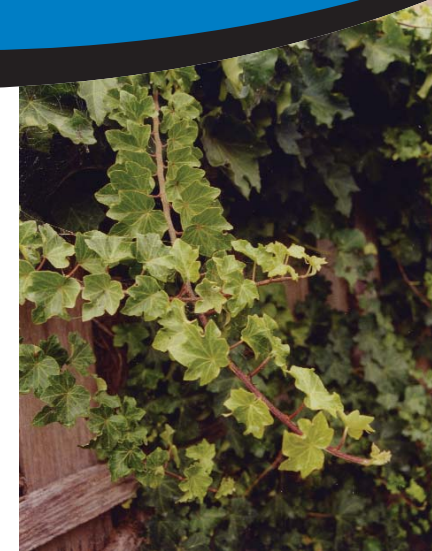
- plant weeds in their gardens;
- dump garden refuse into bushland;
- spread weed seeds on car tyres, clothes and shoes and through mowing;
- spread weed seeds through the movement of soil and fill; and
- allow pasture plants to escape from paddocks into roadsides and bushland where they create huge weed problems.

Weeds can be both plants that have been introduced from overseas or native plants that are growing in the wrong place.

seed collected in another area.

A native, indigenous, local provenance plant has been grown from local seed. It is best suited to Manningham conditions and helps to preserve a strong gene pool of local plant strains.

Consult Council for a list of indigenous native plants for the Manningham area and visit a specialist indigenous nursery that grows plants from local provenance seed.



English Ivy (Hedera helix) was introduced as garden plant. It had a wide appeal for those feeling nostalgic for English country homes and gardens, but in Australia it has become a serious weed and is often seen in bushland smothering native plants.

TYPES OF WEEDS

Term	Meaning	Examples
Introduced or exotic weeds	Plants brought to Australia from overseas either accidentally or on purpose	Paterson's Curse, English Ivy, Blackberry, Cape Broom, Sweet Vernal Grass, Large Quaking Grass
Native weeds	Plants naturally occurring in Australia which have spread or been planted outside of their natural range	Sweet Pittosporum, Cootamundra Wattle, Willow Hakea, Sallow Wattle

Native, indigenous and local provenance plants

Landholders can prevent future weed problems on their properties by planting indigenous native plants that have been

grown from local provenance seed.

When you buy a plant with the term native on the label you could still be buying a weed. A native indigenous plant is the right species, but it may have been grown from



Cootamundra Wattle (Acacia baileyana) may be a native plant but it is not local to this area and is considered a serious environmental weed.

Classes of weeds

The Catchment and Land Protection Act 1994 lists the declared noxious weeds in Victoria and governs weed control. Landholders can face legal action if they fail to control noxious weeds on their land.

There are two main classes of weeds:

Noxious weeds. Noxious weeds are classed as either State Prohibited, Regionally Prohibited or Regionally Controlled. Landholders are responsible for eradicating these weeds on their properties and controlling their growth and spread to other areas.

Environmental weeds. Environmental weeds threaten native vegetation. They invade bushland and out-compete indigenous species which reduces the habitat available for native animals.

Environmental weeds can be either introduced or native to Australia. Sweet Pittosporum (*Pittosporum undulatum*) and Cootamundra Wattle are native plants that are serious environmental weeds in the Manningham area. Landholders should make every effort to control these weeds on their land and to prevent their spread to other areas.

Weed biology

Effective weed control depends on knowing your weed before you decide on a control method. There are three main types of weeds.

Annual weeds grow to maturity, set seed and die within one year. The roots of annuals are usually shallow. Annuals rely heavily on annual seed production for their survival. Cape Weed and Large Quaking Grass (*Briza maxima*) are annual weeds.

Biennial weeds live for two years. They germinate and grow to a small plant in the first year then flower and set seed in the second year. Many species of thistles are biennials.

Perennial weeds live for many years. They usually flower and set seed in the first few years and continue to do so until they die. Some perennial plants reproduce by sending up shoots from underground roots or stems. Blackberry, Sweet Vernal Grass and Cat's Ear (*Hypochoeris radicata*) are perennial weeds. Perennial shrubs and trees are often referred to as woody weeds.

Weed control methods

Prevention and plant competition

Weeds are always more of a problem in areas that have been disturbed by grazing or earthworks or are subject to soil erosion. Simply keeping the soil in good condition will mean plants can strongly compete with weeds and help to control them.

Grazing

Well-planned rotational grazing regimes can assist in the control of pasture weeds. Following up with mowing and slashing will ensure that weeds not eaten by stock do not gain an advantage and crowd out the preferred plants.



Sweet Pittosporum invades the shrub layer of local bushland and out-competes indigenous species.



Agapanthus (*Agapanthus praecox*) commonly escapes from gardens into bushland. The flowers of garden plants should be cut before they seed.

Hand pulling

Hand pulling is the preferred weed control method in small areas and where the weeds are scattered. It is suited to areas of native bushland as it causes little disturbance. Hand pulling provides a good opportunity to get close to plants and to increase your knowledge of identification and biology.



Watsonia (*Watsonia meriana*) is a popular garden plant that has invaded large areas of bushland and roadsides. It reproduces by vegetative corms.



Panic Veldt Grass (*Ehrhata erecta*) is native to South Africa. It out-competes native groundstorey species.

Hand pulling can be assisted by tools such as knives, trowels and forks but should always aim to cause the least possible disturbance to the soil. Hand pulling should be done before plants drop their fruits or seeds. Care should be taken to ensure all of the plant is removed and that it is disposed of without causing a potential weed threat elsewhere.



Hand pulling is time consuming but can be very effective in small areas and in larger areas where the weeds are sparse.

Mowing and slashing

Regular use of a brushcutter, whippersniper or mower (a push mower with grass catcher attached) can help keep weeds under control. Timing is important. Annual weeds should be cut before they drop seed. Cutting the weeds close to the ground does more damage to the weeds than cutting them high.

Perennial weeds may need to be mowed or slashed several times over the growing season to limit growth and prevent fruits or seeds from developing.

Mulching

Mulching involves smothering the weeds with a layer of impenetrable material.

The weed seeds are denied access to the light which prevents them from germinating. Mulching preserves the moisture in the soil which can assist the more desirable plants to establish. It is also useful when revegetating areas that have been badly disturbed.

Many different materials can be used as mulch. These include commercial mulch, wood chips, newspaper and plastic. Care must be taken when purchasing commercial mulch or using organic mulches as they often contain weed seeds. **Mulching should never be used where there are indigenous groundstorey plants as it smothers them and prevents germination.**

Burning

Burning is a complex weed control method that should only be used by those with experience. When used carefully fire can destroy mature weeds, exhaust weed seedbanks and stimulate the growth of indigenous native species. Fire can be used to open up larger areas infested with woody weeds or to spot-burn smaller invasive weeds with a hand-held flame-thrower.

The impact of a fire must be closely considered. Burning can hasten erosion by removing groundcover and not all indigenous species are adapted to survive fire. Burning will stimulate the germination of both weeds and indigenous plants, so follow up weed control will be necessary.

It may be possible to dovetail burning for weed control with fuel reduction burning being carried out for bushfire prevention. Fire always poses some risk to people and property. Bans must be observed and a Council permit is required. See page 54 for further information

Chemical control

Chemicals designed to control weeds are called herbicides. The use of herbicides in the environment is a cause of great community concern. Spray drift, the persistence of herbicides in the soil, damage to non-target species and the health risks involved in handling and storing herbicides are some of the potential problems associated with herbicide use. But when used selectively by an experienced operator, herbicides can be highly effective.

Herbicides can be either specific – meaning they target a particular type of plant but not others – and non-specific – meaning they have the potential to kill any type of plant.

Herbicide manufacturers are required by law to provide application rates and

methods and safety information on product labels.

It is important to choose both the right herbicide and the right method of application. The most common methods of application are spraying using a pump pack or spray can, wiping and dabbing using specialised applicators and painting with a brush or sponge.

The smallest possible amount of herbicide at the lowest possible toxicity must always be used. Some chemical weed control can only be undertaken by contractors as the herbicide required can only be legally handled by the holder of an Agricultural Chemical Users Permit. There are many experienced weed control contractors in the Manningham area. A list of contractors is available from Council.

Tips for effective weed control

- Plan ahead. It may take years to completely eradicate certain species. Set realistic, achievable goals.
- Correctly identify the weed and the indigenous species growing around it.
- Choose a safe and appropriate control method.
- Consider environmental impacts. Are there waterways nearby? What are the risks to indigenous species?
- Minimise disturbance at the site so the weeds don't spread further. This includes limiting vehicle access and checking tools, clothing and footwear.
- Time treatments to get maximum results.
- Remove weeds carefully to avoid re-infestation.
- Encourage the spread of local species or revegetate with indigenous species.
- Record and evaluate all treatments. Modify if necessary.
- Work co-operatively with your neighbours.

Contact Council for a copy of the Manningham Weed Identification Guide.

Pest animals wreak havoc on the environment. They cause huge losses for farmers, degrade bushland, prey on and out-compete native animals and cost the community millions of dollars each year.

Pest animals are a living reminder of the mistakes of history. Rabbits, foxes, deer and trout were brought to Australia by the early white settlers for sport and food. Cats and goldfinches were pets that escaped and established wild populations.

Landholders must be vigilant in controlling existing pests on their land and preventing the release of new pest species.

Rabbits

Under the Catchment and Land Protection Act 1994, landholders are required to control rabbits on their land and legal action can be taken if they fail to do so.

Rabbits are the most serious of Australia's pest animals. They compete with native wildlife for food and shelter and have contributed to the extinction of numerous native species. They compete with livestock for food, and damage native vegetation. Rabbits graze selectively. They feed heavily on palatable grasses and herbs and avoid weeds like Sweet Vernal Grass and Montpellier Broom (*Genista monspessulana*). This leads to the loss of native species and the spread of weeds.

Rabbits are prolific breeders and reproduce throughout most of the year. Under ideal conditions one pair of rabbits can increase to 180 rabbits in around 18 months.



Woody weeds provide cover for rabbits.

When the rabbits reach maturity they fan out from the family burrow seeking new territory. Survival rates of young rabbits increase significantly when they have safe harbour.

In autumn and winter rabbits feed on newly germinated seedlings. In spring they eat the seed heads of grasses and the green leaves of broadleaf plants. Over summer, when the grass dies off, they eat the seed heads of weeds. In drought conditions they will eat leaves, roots and bark. Eight rabbits will eat as much as one sheep.

Rabbit control methods

The key to effective rabbit control is planning and persistence. Tolerating even small numbers of rabbits is unacceptable – one rabbit is too many and action should be taken. Monitoring is important. Take a walk around your property with a torch at dusk or early in the morning (2-3 am) and count how many rabbits you see. Observe what the rabbits are feeding on and where they run to when disturbed. Record your findings.

Several of the following control methods used together will give the best results.

The rabbit population was significantly reduced in the 1950s with the release of the Myxoma virus. The recently released Rabbit Calici virus also reduced numbers but in the Manningham area they have already recovered to pre-Calici levels.

Calici virus does not affect all rabbits and it cannot be relied upon for effective rabbit control.

Destroying harbour

Rabbits do not need burrows or extensive warrens to survive. They can live amongst thickets of weeds and native plants, under buildings, in sheds, woodpiles and even abandoned car bodies.

Trimming around hedges and controlling weeds will help to destroy rabbit habitat. Fences can be built around woodpiles and wire netting installed around the base of buildings.

Take care when trimming or slashing in bushland areas. Contact Council before clearing any indigenous vegetation on your property.

Cathy Willis checks rabbit burrows in old soil fill at Wonga Park.



Rabbit proof fencing

Well-constructed and maintained fences can keep rabbits out of your property for the long term. Working with adjoining neighbours to fence a larger area can also be worthwhile.

Rabbit proof fences require special construction. A section of wire mesh must be buried beneath the fence or angled across the ground in the direction of possible rabbit entry.

Once an area has been securely fenced other control methods (poisoning, fumigation, and warren destruction) must be used to remove rabbits within the fenced area.

Fence maintenance is essential. Fences will need to be regularly patrolled and checked for damage and incursions. Rabbit proof fences cause problems for some native animals by preventing their movement. Wildlife can also become entangled in the fences – another reason for regular checking.

Fumigation and warren destruction

Fumigation involves placing a poisonous fumigant in warrens and burrows and blocking all exits. Running dogs over the area or creating loud noise will scare rabbits into their burrows before fumigation. Every hole or burrow must be treated and then securely blocked.

Fumigation of warrens must be undertaken by contractors as the fumigant can only be legally handled by the holder of an Agricultural Chemical Users Permit.

Destroying warrens after fumigation will prevent re-infestation. Warrens can be destroyed by digging them out with a shovel, mattock or pick. Backhoes are very useful but care must be taken to avoid excessive soil disturbance which can cause erosion.

Check the area regularly so any newly-constructed burrows can be quickly closed up.

Baiting

Carrot or oat baits laced with Pindone, an anti-coagulant poison, are effective in controlling large rabbit infestations but there are some risks to native animals and pets. The safety and handling directions on the product label must be strictly adhered to. An antidote is available from veterinarians if pets accidentally consume baits.

A baiting program must be carefully planned and will include the notification of neighbours and the erection of warning signs.

Baiting has the most impact during the late summer and early autumn period when rabbit feed is at a premium and they are foraging for food. Providing a 'free feed' of untreated carrots before baiting helps the rabbits to acquire a taste for the carrots and increases the effectiveness of baiting. It also allows for monitoring and re-adjustment of the amount of bait that is required.

Several poison feeds are then given, generally a few days apart. Carcasses must be collected daily. Fresh carcasses may still be found up to 12 days after the last baits were laid. Carcasses must be properly disposed of so there is no risk to non-target species.

Thorough monitoring and early action is essential if new rabbit activity is found.

Baiting is a complex and potentially hazardous procedure and is best carried out by a group of landholders working together, or a registered pest control contractor.

Ferreting

This technique is useful for clearing a few remaining rabbits once numbers have been reduced by other methods. Ferreting is effective inside fenced off areas or under buildings where access is difficult. Care must be taken to ensure that any native animals using rabbit burrows are not threatened or injured by ferrets.

Working together

There is no quick-fix solution for rabbits. Landholders must be patient and persistent. The most effective control programs use a combination of different methods and involve co-operation with neighbours.

Rabbit control on your property will be wasted if rabbits can quickly re-colonise from neighbouring areas. Talk to your neighbours about rabbits. They may be unaware of the problem and what to do about it.

See page 68 for information on Community Rabbit Control Groups in the Manningham area.

Foxes

Melbourne has one of the highest densities of urban foxes in the world with around 14 foxes per square kilometre. Fox dens can be found underneath houses, schools and factories and in bowling clubs, cemeteries, railways, golf clubs, creekbanks, drains and rubbish heaps.

Foxes prey heavily on rabbits but around a quarter of their diet is native wildlife. Ground-dwelling mammals are easy targets, as are birds, possums, lizards, beetles and other insects. Researchers have estimated that one fox can eat around 32 kilograms of native wildlife each year and can range over 20-30 kilometres a night. With an estimated one million foxes in Victoria the impact is staggering.

Foxes carry a variety of canine diseases and would be a prime carrier of rabies if it were to enter Australia.

Fox control methods

Controlling foxes in an area of rural/urban interface like Manningham is difficult. The range of treatments is limited for safety reasons. Effective control should centre on making your property less attractive to foxes.

Control rabbits and weeds

Foxes prey heavily on rabbits and reducing rabbit numbers will impact directly on foxes, however, it will also force foxes to meet the rabbit shortfall with native species. For this reason it is critical that fox and rabbit control programs are co-ordinated.



A red fox with a bandicoot in suburban Melbourne.

Foxes use Blackberry thickets and other woody weeds as cover. Controlling weeds and removing rubbish heaps, building materials and unused outbuildings reduces fox harbour.

Reduce access to food

Foxes are scavengers and will eat a wide variety of foods. Pet food should not be left out at night and food scraps should be cleaned up. Fallen fruit under fruit trees should be removed quickly and compost heaps covered or enclosed in a sealed bin. Chickens, ducks, guinea pigs and pet rabbits must be enclosed in a secure pen each night.

Fumigation

Den fumigation can only be carried out by a registered pest controller as an Agricultural Chemical Users Permit is required. Contact Council for a list of pest control contractors. Den fumigation can be a good option if a breeding den is discovered early in the breeding season (July-August).

Dens should be destroyed after fumigation.

Other pests

Introduced mammals are the most widespread pests but birds, fish and even insects can have a damaging impact on the environment.

Feral and domestic cats destroy around 28 million native animals in Australia every year. **Domestic cat registration is compulsory in the Manningham area.** Cat bells are not effective in saving native wildlife from pet cats. Pet cats should be contained to reduce the impact of their hunting behaviour.

Pet dogs can also destroy wildlife or prevent them from using certain areas. Dogs should not be left to roam your property during the day when you are not home.

Starlings, Indian Mynas, Mallard Ducks, Blackbirds, Sparrows and Turtle Doves are introduced birds. Introduced birds spread diseases to native birds and compete with them for food and habitat. Indian Mynas attack nests of Rosellas, drive the parents away and kill the chicks. Both Mynas and Starlings damage fruit trees.

If you have nest boxes on your property they must be checked regularly to make

sure they have not been taken over by introduced birds. House eaves and sheds that provide breeding harbour for introduced birds can be secured with netting.

European Honey Bees that have escaped from hives are a threat to native bees and nectar-eating birds. They may also reduce the seed set of plants. European Honey Bees are known to occupy tree hollows and nesting boxes, depriving native mammals and birds of habitat and breeding sites.

Nest boxes and tree hollows should be checked for bees regularly. Extreme caution is necessary. An expert apiarist should always be consulted if bees need to be moved.

The release of any live exotic animal into the wild can have dire consequences. Aquarium fish (including Goldfish) released into creeks and streams are now serious aquatic pests.

Tips for effective pest control

- Identify and monitor pest numbers.
- Work together with your neighbours or a local rabbit control group.
- Combine several proven control methods including the destruction of harbour.
- Strictly adhere to the safety and handling directions on poisons.
- Record and evaluate all methods and modify if necessary. Continue to monitor pest activity after control.
- Be vigilant and persistent. Pest control is time consuming and there are no quick-fix solutions.
- Keep cats inside at night and control other potential pests.
- Control your dogs. Dogs should not be allowed to roam your property during the day when you are not home.

Protecting and improving the bush on your property will increase its value.

But the bush is much more than a commodity with economic benefits. Observe the unfolding of a delicate native orchid, follow the path of a dragonfly as it dances over a puddle and watch a family of koalas as they take an all-day nap – the bush is a source of awe and wonder.

Spending time in the bush is important for our physical and mental health. It gives us a sense of connection with the natural world and helps us to make connections with each other.

The beautiful Silver Wattle is commonly seen along Manningham's rivers and streambanks.



Children who grow up observing the rich diversity and natural cycles of the bush will learn to value ecosystems and give their protection a high priority.

Only a small portion of the bushland in the Manningham area is in parks and reserves. The majority of it is on private land where landholders are responsible for its management and protection.

Because the potential for preserving a fauna species is directly related to the area of bush it can move through, private landholders are the custodians of Manningham's biodiversity. How they manage their land will have a direct impact on the survival of our unique and precious flora and fauna.



The threatened Greening Grass Frog amongst some native sedge.

Biodiversity

Biodiversity refers to the complex variety of all life forms – the plants, animals and micro-organisms and the ecosystems that they are part of.

Humans are also part of these ecosystems and without the services the ecosystems provide we would not be able to survive.

Ecosystems provide us with clean air and water, food, pharmaceuticals (antibiotics originally come from the soil), fibre and energy. Then there are the processes that are constantly underway stabilising, repairing and sustaining ecosystems – the water cycle, filtration processes, the carbon cycle, pollination, the nutrient cycle and natural pest control.

If a dollar value were put on these ecosystem services they would be worth trillions every year. But of course they are worth much more than that – ecosystems and the services they provide are irreplaceable. We cannot make air or water or replicate the genetic structure of the millions of organisms that cycle nutrients through the soil.

Scientists can identify many individual organisms, but their knowledge of the billions of different interactions between organisms that make up ecosystems is poor. As we are not able to identify precisely which species are needed to maintain a particular ecosystem we are also not able to identify which we can do without.

The loss of any species – whether it is a tiny soil organism or a large mammal – can have potentially catastrophic consequences.

Australia's biodiversity has dramatically declined since European settlement. Many types of organisms have become extinct and in some areas whole ecosystems are disappearing.

Manningham is home to over 500 indigenous plant species including approximately 15 indigenous eucalypt species, over 20 species of wattle, over 45 species of orchids, and over 40 different species of native grasses. There are 56 threatened animal species. Some of these species are of National and State Significance like the Regent Honeyeater, Swift Parrot, Brush-tailed Phascogale, Powerful Owl, Barking Owl, Great Egret and Macquarie Perch.

The key to maintaining the biodiversity of an area is the protection and restoration of habitat.

Habitat

Loss of habitat is the most significant reason why species become extinct.

Most of the Manningham environment has been altered by gold mining, agriculture and housing. Other sources of impact are intense fires, rabbits, foxes and environmental weeds.

All of these activities reduce habitat biodiversity. The impact of blackberry provides a good example. When blackberry invades bushland the smaller herbaceous plants such as grasses and orchids are shaded out.



Native animals like this Grey Kangaroo will not survive if its habitat is reduced or degraded.

Vegetation communities

Insects that depend on these plants for food and shelter disappear and the ground-foraging birds that feed off insects no longer visit the site. The result is a degraded ecosystem that has lost its biodiversity.

The range of habitats directly effects how many species will be present in a landscape. Most plants and many animals are specially adapted to a particular habitat and will not be found beyond its range. The more types of habitat you can protect and restore on your property the better.

By promoting regeneration in patches of forest, preventing overgrazing of native grasslands, fencing off and revegetating riparian areas and creating a floating vegetation island in your dam you will have protected four different habitats.

Habitat restoration should aim to create habitats that have high ecological value. This means that all of the different layers of vegetation are present. Learning about the vegetation communities in your area will help you to appreciate the diversity of plant species found in different habitats.

A vegetation community is made up of the various plants that grow in a particular habitat. Over 20 separate vegetation communities have been described for the Warrandyte area alone.

Vegetation communities are influenced by the topography of an area, its aspect, soil, and micro-climate. Each vegetation community is quite distinct, although some species are common to a number of vegetation communities. There are also areas where a number of different vegetation communities overlap.

Vegetation communities in the Manningham area have been classified according to how common they are and what percentage remains of their original distribution. A number of them are depleted or endangered.

A detailed species list of local vegetation communities is available from Council.



Manna Gums on the riverbank at Pound Bend.



Grass Trigger-plant (Stylidium graminifolium) is common on the sheltered slopes.



Native Tussock Grass (Poa labillardieri) on a hillside.

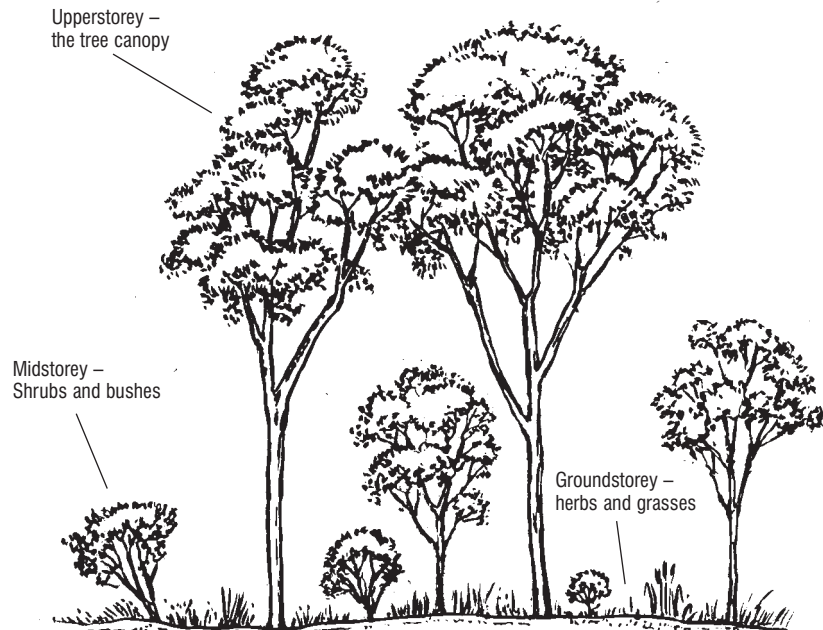


Chocolate Lily (Arthropodium strictum) can be found amongst the groundstorey on the slopes and hills.



Nodding Green Hood Orchids (Pterostylis nutans) are found in both damp and dry areas.

A vegetation community is made up of different layers of plants.



Bushland management

Our knowledge of how bushlands function is still evolving and much is yet to be learnt. Most of this learning comes from first-hand experience. The bush is in a constant state of change. Climate conditions are highly variable and the complex interrelationships between organisms are endlessly diverse.

Bushland management centers on **retaining** the existing remnant vegetation and allowing it to regenerate, **restoring** areas that have been degraded, and **revegetating** areas that have been cleared.

Protecting and restoring remnants

The term remnant refers to any native indigenous vegetation left in a particular area. A single mature tree is an important remnant, as are patches of shrubs, herbs, grasses, lichens and fungi. Remnants can be very small and localised, or larger – perhaps including a whole block or paddock.

Remnant patches of native vegetation on private land are vital to the biodiversity of the Manningham area.

An Imperial Blue Butterfly rests on a native Cassinia.





A patch of remnant vegetation at Warrandyte. This site is in a relatively intact condition and contains some rare and threatened plant species.

Some remnant patches may contain rare or endangered plants and animals or provide habitat for nomadic and migratory birds. Other remnants link areas of bush together, increasing the range of different species and contributing to the health of the remnant patches.

Good condition remnants are both rare and valuable. They provide us with unique examples of what the pre-existing flora and fauna may have been like and are an important source of seed.

The location, size and shape of the remnant are important. If possible the remnant should be connected with other areas of native vegetation to create pathways for wildlife movement. However thin, linear remnants should be avoided as they favour certain species. The Noisy Miner dominates linear habitats by aggressively defending its territory against other birds. Larger patches or blocks are actually easier to manage as they have a greater core area which is generally healthy.

Managing remnant vegetation on your property starts with assessing the health of the remnant and planning how it can be protected and improved. The aim should be to maintain or restore as much of the natural ecosystem as possible.

Reducing the pressure of grazing animals by fencing is generally the starting point. This will encourage natural regeneration. Landholders are often surprised at how quickly natural regeneration occurs. When grazing pressure is reduced and weeds and rabbits are controlled, native seeds that have been dormant in the soil for long periods can germinate. Wildlife will also bring native seeds into remnant areas.

Fire can be used as tool to promote natural regeneration of remnant vegetation. The use of fire is complex. The season in which the area is burned, the time between fires and the intensity of the fire can produce very different results.

Most Australian vegetation is designed to withstand fires of a certain frequency and intensity. Some plants shed seed from woody capsules after fire while others produce seeds with a thick coating that needs to be cracked by the heat of a fire before germination can occur. The creation of an ash bed will provide ideal conditions for the germination of groundstorey plants but it will also provide ideal conditions for weeds.

Regeneration burning should mimic the natural fire regime of the area as closely as possible. Expert advice should be sought. **A Council permit is required for any burning in the Manningham area.**

See page 55 for further information

Controlling pest animals, especially rabbits, is important for the protection of remnants.

See page 35 for further information on rabbit control. Weed control is also essential. See page 30 for information on methods of weed control.

Tree decline

The continuing loss of mature remnant trees from the landscape is known as tree decline. Tree decline has a variety of causes:

- Deliberate clearing and ringbarking.
- Natural ageing and death.
- Premature death due to grazing, disturbance or other environmental pressures.

Mature trees play an integral role in the landscape. Trees planted now will take several hundred years before they have the same value. Trees start to develop useful wildlife hollows at around 100 years of age. The hollows increase and deepen with age. Around 40% of woodland birds are hollow dwellers. Animals like sugar gliders simply can't survive without hollows in trees.

Mature healthy trees produce more nectar, foliage and fruits than young trees. They also drop more limbs and leaf litter. The leaf litter cycles nutrients, reduces water runoff and feeds a huge variety of invertebrates. Rotten limbs underneath the tree provide habitat for snakes, frogs, lizards, mammals and birds.

Fencing off mature trees can significantly increase their lifespans. The fenced off area should be as large as possible. It must extend well beyond the canopy area so that young, establishing trees are not competing with the mature tree for light or water.

In many areas some revegetation will also be necessary to restore the middlestorey and groundstorey vegetation. Wherever possible fencing of mature trees should link with other areas of vegetation.

Revegetation

Revegetating a cleared site will improve the health of the soil and greatly increase the habitat biodiversity of the area. The first step in any revegetation project is assessing what native vegetation is already on the site. The aim of revegetation is to create a mosaic of diverse vegetation rather than simply to plant larger tree species. Middlestorey and groundstorey are all equally important.

Even a small-scale revegetation project requires planning. It is better to delay planting until all of the preparation and maintenance issues have been considered rather than rush in while the weather is good.

Site preparation should minimise weed competition by hand pulling, mowing and/or the use of a herbicide.

Care must be taken when ordering and purchasing plants. **Only indigenous plants grown from local provenance seed should be used.** Non-indigenous native plants can create serious weed problems. Indigenous plants grown from seed collected outside of the area may not be well adapted to local conditions and could interbreed with local strains and weaken them.

Plants should be sourced from a local specialist indigenous nursery that grows stock from local provenance and can give advice about site suitability. You will need to contact the nursery around six months prior to planting to find out what local provenance species will be available.

In highly degraded areas with a lot of weed competition it is better to get larger trees and shrubs established before adding smaller groundstorey species.

Planting should be timed to avoid extremes in weather such as frosts or hot, dry conditions. Planting after the autumn rains usually meets these requirements and allows the root systems to get an early start. Follow-up watering and weed control must also be considered.

Revegetation is a long-term commitment, but one with many rewards.

Some points to consider:

- What remnant vegetation is present on the site?
- What was the original vegetation community?
- Will the revegetation be acting as a screen?
- What are the fire management considerations?
- How much sun or shade does the site get?
- How will the plantings fit in with the contour of the site?
- Are there any vulnerable areas? For example, eroding hilltops or gullies.
- Will weeds from neighbours or roadsides threaten the revegetation?



A male King Parrot forages in leaf litter under a mature eucalypt.

Phytophthora root disease

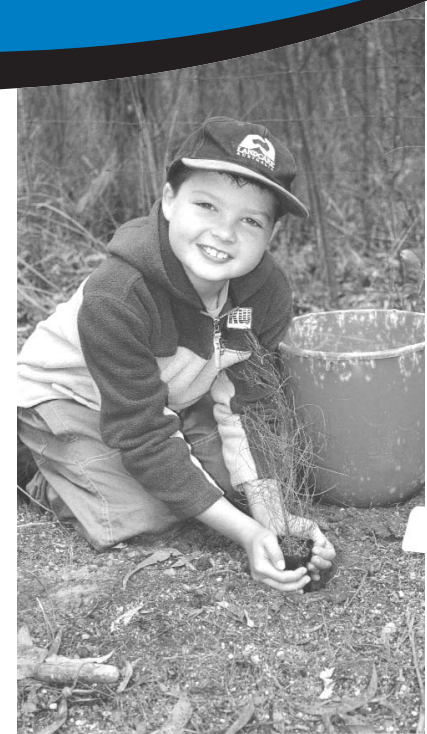
Phytophthora root disease is a serious threat to native bushland in the Manningham area. Originally introduced from Asia, this disease can destroy the tree canopy, middlestorey and groundstorey layers in bushland reducing the habitat for wildlife to breed, feed and shelter.



Tree guards will protect new plants from mowers, rabbits, wind and frost and create a micro-climate that encourages growth.

Phytophthora root disease is caused by a microscopic pathogen (*Phytophthora cinnamomi*) that penetrates the roots of plants and kills the root cells. As the cells die the plant is unable to take up water and starts to show symptoms similar to drought stress. The leaves yellow and wilt and then fall off. Leaf loss starts at the outer branches and moves in towards the trunk of the tree. This is why the disease is sometimes called dieback – referring to the dying back of the leaves.

There is no known way of eradicating Phytophthora, but you can prevent it by purchasing plants from reputable nurseries that have a good knowledge of plant hygiene, and taking extreme care when moving soil. Check that soil or gravel being brought on to your property is from uninfected areas.



Tips for effective bushland management

- Identify areas for protection, restoration and/or revegetation.
- Protecting higher quality remnant vegetation should take priority.
- Identify the type of vegetation community you are protecting or restoring.
- Take photographs of the site before work has started and at regular intervals once it is underway.
- Planning and site preparation is essential for successful revegetation.
- Plant only indigenous native plants grown from local provenance seed.
- Be vigilant with monitoring and follow-up.
- Be patient. Restoring or recreating bushland is a slow process.
- Assess the risks to mature trees on your property. Fencing may be required.
- Learn to identify Phytophthora and take precautions to prevent it spreading to your property.



A large bushfire can quickly alter its course with changes in wind speed and direction.

Fire is a natural part of the Australian landscape and Victoria is one of the most fire prone places in the world. Each summer brings a high risk of bushfire. Severe fires have been recorded in Victoria on a regular basis and may occur annually.

Large fires are most likely to develop on hot days when strong gusty winds blow from the north. The intensity of a fire is determined by the fuel type, volume, temperature, relative humidity, wind direction and speed. Fires travel faster up a slope than down a slope. Steep, dry northerly slopes pose the greatest hazard. Wind pattern changes can quickly change the direction of a fire and further complicate fire fighting.

Fire needs three elements – heat, oxygen and fuel. Reducing fuel around your property can help prevent a fire from starting, reduce fire intensity or aid in the suppression of a fire once it is underway.

Reducing fuel loads

Clearing of groundfuel like bark, leaves, twigs and dead grass will reduce the spread and severity of a fire. Very fine twigs (less than a finger's width) actually provide the best fuel, not larger logs and branches.

A bushfire that either starts in a fuel-reduced area or burns into one will have less intensity, a lower flame height and will spread more slowly. These factors make fire fighting much easier.

Mowing, raking and slashing are all good methods of reducing groundfuel. Eradicating weeds and replacing them with less flammable native species also provides a fire advantage. Most weedy grasses dry off over the summer while native grasses stay greener for longer. Where possible, do not slash native grasses until after they have set seed to ensure their survival.

Weeds often contribute to high fuel loads and priority should be given to weed control. When removing weeds to replace them with indigenous native plants, look for species that have less dry matter and provide less fuel.

Contact Council before removing any native vegetation as a permit may be required.

Fuel reduction burning

Burning is one method of reducing groundfuel over large areas.

Fuel reduction burns are also called controlled burns, low intensity burns or cool burns. They are used to remove the fine, highly flammable material in areas of bush and forest.

The impact of a fuel reduction burn will vary according to the intensity of the fire, the season in which it is lit, the length of time since the last fire and the species that are present.

Fuel reduction burns are usually carried out in autumn or spring when the weather is milder and the fire will be easier to manage. Burning later in autumn minimises damage to nesting species and allows seeding of native plants.

Even a small burn requires planning. Landholders must consider:

- Regulations – a Council permit is required for all burning in the Manningham area. The permit sets

out the conditions for burning, which include the notification of neighbours. There is no need to inform the CFA or fire brigade.

- Timing – fires cannot be lit on fog alert days or when the wind speed is greater than 10 kilometres an hour.
- Resources – including people, water and firefighting equipment to control the fire and keep it within the planned boundaries.
- Safety – what are the threats to property, neighbours or surrounding bushland? Landholders must ensure fires are fully extinguished before leaving the area.

Fuel reduction burning is a specialised skill. It can be useful but it can also be dangerous. Landholders thinking about conducting a fuel reduction burn should seek advice on how to plan and carry out a burn.

Council issues permits for fuel reduction burning to landholders with properties over a certain size. The permits are issued on an annual basis for burns conducted outside of the fire danger period.

The permits outline the strict conditions under which fuel reduction burns can be conducted. Contact the Council's Health and Local Laws Unit on 9840 9237 for more information, advice or assistance.

Bushfire regulations

Fire restrictions apply throughout the fire danger period. On days of extreme weather conditions a total fire ban may be declared.

A total fire ban can be declared for a region (Manningham is in the Central Fire Ban Region), or across the whole of the State. Bans are published in newspapers and broadcast on the radio and television. The lighting of any fires is prohibited on total fire ban days – even if you have a permit. Solid fuel barbecues, campfires and incinerators cannot be lit.

Bushfire survival planning

Although the chances of your property being threatened by fire may seem remote it is essential that you and your family prepare a bushfire survival plan. Planning can make the difference between surviving a fire and losing a house, or even a life.

Preparing a bushfire survival plan will increase your knowledge of the bushfire threat. It will help you identify fire risks on your property and involve all members of the family in making important fire protection decisions.

A bushfire survival plan will include:

- The conditions that contribute to fire weather warnings.
- The likely direction and intensity of a fire in your area.

- How houses burn.
- Protecting your houses and shedding from ember attack.
- The decision to leave or stay.
- Looking after your animals.
- Landscaping for fire prevention and protection.
- Protecting the environmental assets on your property (streambank vegetation and hollow trees).
- Identifying potential fire starting spots around your property.
- House and garden maintenance.
- Defending your home on the day.

The plan will also identify where stock should be moved. Animals must be clearly identifiable with your name, address and telephone number. Nylon halters should be removed from horses as they can melt. Horses suffer most burns to the face, as they tend to turn towards the fire. Hoof paint and coat crayons can be used to mark horses.

Contact the CFA's Yarra Office on 9735 0511 for copies of the Bushfire Survival Plan Workbook. The CFA also has information about Community Fireguard Groups. These local groups get together with the CFA to learn about fire protection. Many people find Community Fireguard Groups a great way to make links with other people and work together to take responsibility for local fire safety.



A burnt paddock. Your bushfire survival plan will identify where stock should be moved to in the event of a fire. Paddocks with the shortest grass cover are generally the safest.

Tips for bushfire prevention and protection

- Prepare a bushfire survival plan.
- Be alert for Total Fire Ban days. Look out for local CFA fire warning signs and listen to the radio for weather information and warnings.
- Be vigilant in reducing fire risks around your property, especially the protection of your house and sheds from ember attack.
- Remember that clearing up and removing fire hazards is a constant job to be carried out throughout the year, not just in the fire season.
- Reduce fine groundfuel by mowing, slashing, raking or fuel reduction burning.
- Ensure that fire breaks and tracks are clear.
- Check that water supplies have adequate capacity and easy access.
- Keep vegetation clear of overhead power lines and away from your house – especially the roof.
- Plan where you would move your stock.

Property management planning requires landholders to do a stocktake of their property's assets – the soil, water, pastures, fences, trees and wildlife, and plan how to manage them sustainably. The plan will also identify the risks to the property's assets.

Preparing a plan gives you something to work towards and makes you more aware of the continual changes underway on your property. A plan also increases your understanding of the interrelationships between the different components of your property – for example how grazing can contribute to weed infestation and erosion.

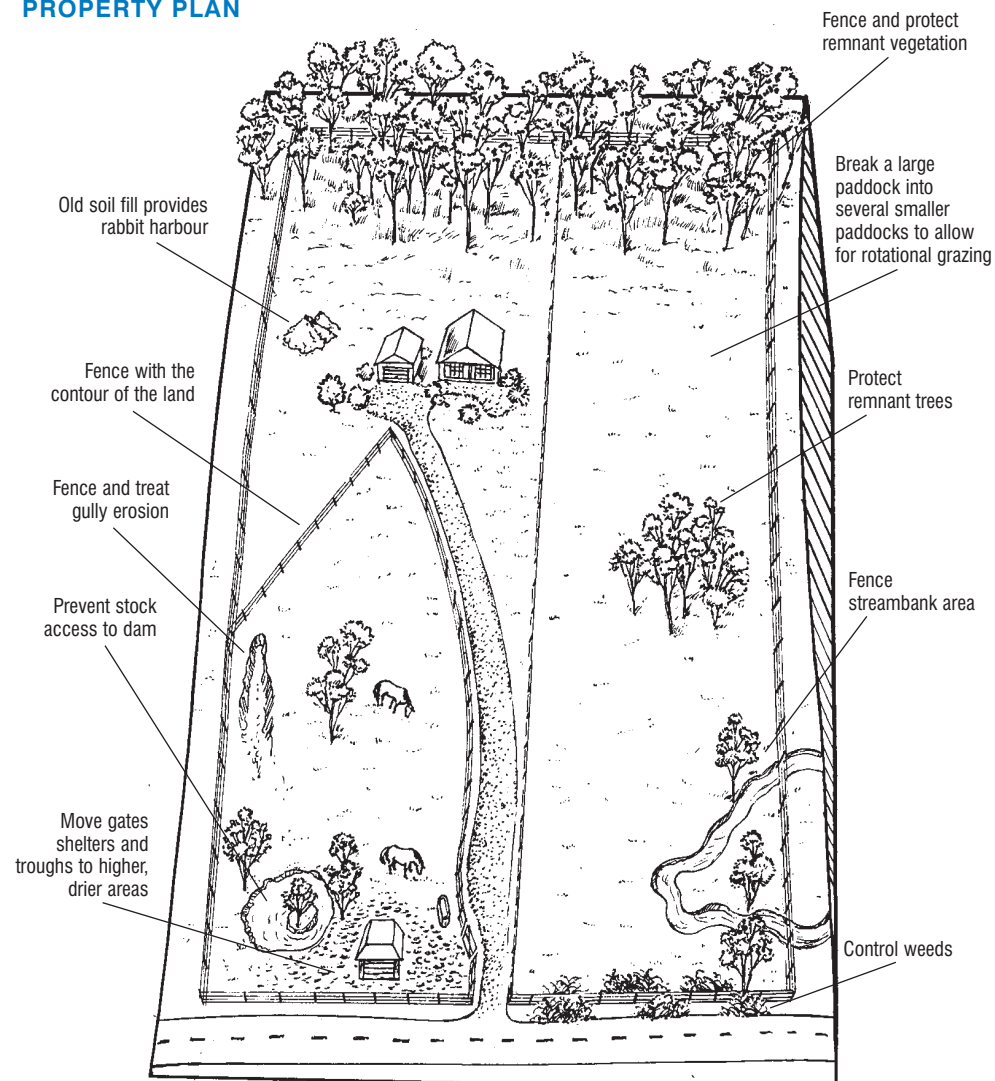
A plan can also assist you in working with your neighbours on issues of common concern and in applying for grants for various improvement projects.

The first step in completing a property management plan is to map and record your natural and built assets.

A map should show:

- Property boundary. The shape of your property can impact on how you manage it. A long thin block of land has a high ratio of boundary. This can increase the need for weed and pest animal control and the requirement to work with your neighbours.
- Houses, sheds and fences, driveways, tracks and gates.
- Landforms and contours. In the Manningham area steep land needs careful management. Land can be classified as crest, upper slope, steep upper slopes, mid to lower gentle slopes, and drainage depressions.
- Drainage lines, streams, dams and wetlands, water supply.
- Any historical or archaeological sites.
- Remnant vegetation.

PROPERTY PLAN



A property management plan identifies the assets on a property and the risks to those assets. The plan is an important tool for planning and prioritising improvements.

The next step is to divide the land into land classes. There are five different land classes.

Class 1 has the highest capability, with little risk of degradation. This land can support a wide variety of uses with few hazards.

Class 2 & 3 have reduced capability, more limitations and more hazards. This land is able to support some uses but there are risks of land degradation that will need to be managed.

Class 4 has low capability and high hazards. It is generally unsuitable for the intended use. This land has severe land degradation potential and would need specialised management.

Class 5 indicates the intended use could never be sustained on this land, even with substantial works. This land, if not already degraded, has a severe risk of serious land degradation.

Once the land capability of the property has been mapped you can assess whether it is suitable for its current use or the use to which you would like to put it.

Alpacas have soft feet and cause fewer soil erosion problems than horses and cattle.



General property management guidelines

Carrying capacity

The number of stock you can sustainably graze on your property is called its carrying capacity. Carrying capacity depends on the type of animal you want to graze, the type of pasture you have and the land capability of your paddocks.

Horses and cattle require high amounts of feed for maintenance and growth. Five goats or six alpacas are roughly equal to one horse. The highest rate of carrying capacity in the Manningham area is one horse per two hectares on land that is flat or gently sloped.

Soils are also relevant to carrying capacity. Horses, donkeys and cattle have hard hooves which cause soil compaction and erosion. Alpacas, llamas, emus and ostriches have soft, padded feet and cause few soil problems.

Fencing

Your property management plan will identify where new fences are needed and/or recommend the moving or upgrading of existing fences. Electric fencing is a popular way of rejuvenating permanent fences and creating temporary fences suited to rotational grazing.

Fences should follow the contour of the land. Fencing across the contour can divert runoff leading to erosion. Drainage lines and ridges should be fenced out.

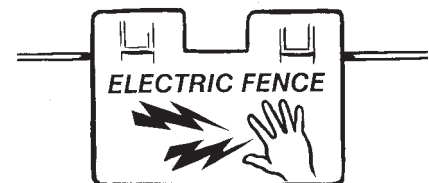


A survey of horse injuries showed that one in six injuries were caused by a fence or a gate. Improving your fencing is a worthwhile investment.

Fenced tracks and laneways can provide good opportunities for revegetation.

Gates are areas of concentrated stock movement. They should be on high ground where there is less erosion risk.

Some types of fences reduce the movement of wildlife and can cause entanglements. Seek advice on fencing designs that are wildlife friendly.



Electric fencing must be clearly marked.

Shade and shelter

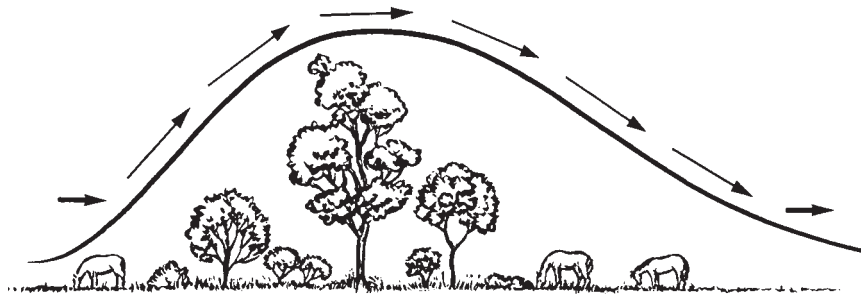
Strong or hot winds reduce soil moisture which slows down pasture growth and reduces the survival rate of native vegetation. Animals unable to find shade over the hot summer months are at risk of sunburn and heat exposure.

Cold winds will force stock to congregate anywhere that shelter can be found. Horses in cold, windy paddocks will require more supplementary feeding than those in protected areas.

A well-designed shelterbelt will protect stock and provide important wildlife habitat. Shelterbelts are most effective when they are at right angles to the critical wind. The belt should be as wide as possible. Gaps can be avoided by planting large trees, middlestorey and groundstorey plants.

A shelterbelt should be designed around indigenous native plants grown from local provenance seed. These plants are best suited to local conditions and provide habitat for ground foraging birds that will reduce insect pests in the surrounding paddocks.

The most effective shelterbelts are wide and include large trees, middlestorey and groundstorey plants.



Driveways and tracks

Traffic on driveways and tracks can create a high risk of erosion. If tracks are on slopes the erosion risk is reduced by running tracks as close to the contour as possible. Avoid angling tracks across the slope as they will divert water flow.

Avoid moving stock, machinery or vehicles in areas where soils are wet and easily compacted.

Driveways and tracks often double as firebreaks and will need to be kept clear for fire fighting access.

Streams and creeks

Streams and creeks and the vegetation that grows alongside them have a very high conservation value. Fencing to prevent stock access will prevent the banks from erosion and allow native vegetation to regenerate.

Streamside vegetation provides habitat, food and spawning sites for native fish.

Restoring streams and creeks can create corridors for wildlife to move between isolated patches of habitat. It will also improve water quality and aid flood mitigation.

Dams

The key to good dam management is preventing stock from drinking from the side of the dam. Stock access to dams causes trampling and erosion around the dam banks and reduces water quality.

Water should be piped from the dam to planned watering points around the property.

Stock should also be excluded from land directly above the dam as they will cause soil and manure to run into it.

A dam can be a great way to attract wildlife to your property. See page 13 on creating a wildlife dam.

Menages

Building a menage – a flat sand-covered area for schooling horses – can create land management problems if the menage is not properly sited or constructed. **A Council permit is required to construct a menage.** Landholders will need to consider possible drainage and soil erosion problems caused by major earthworks.

Some steep properties are not suitable for menages and the clearing of remnant native vegetation to make way for menages is not appropriate.

Landholders should investigate whether a local pony club, riding school or private menage can be hired, or consider sharing a menage between a number of neighbouring properties.

Remnant vegetation

Managing existing native trees, shrubs and grasses should be given a high priority in property management. These patches of remnant vegetation provide us with an important link to the natural history of Manningham and provide a guide we can use when restoring degraded areas.



Single mature trees in a paddock, areas of native herbs and grasses and 'the bush paddock' down the back, all require protection and management. With fencing, weed control and rabbit eradication many remnants will start to regenerate naturally. Where a number of layers of vegetation are missing revegetation may be appropriate.

See page 47 for more information on managing bushland.

Using all of the information above you can mark proposed improvements on your property map and start to plan how and when you will make them.

Tips for property management planning

- By mapping your property and assessing its assets and risks you will be better able to plan and prioritise improvements.
- Completing a property management plan will greatly increase your knowledge and appreciation of your land and the local area.
- A good property management plan takes time to develop.
- Your plan should be flexible and take into account changes in the family, in finances and the natural environment.
- A property management planning course and/or consultant can be of great assistance in the planning process.

Contact Council about local Property Management Planning Courses. These courses (subsidised by Council) help landholders to complete a five-year plan for their properties.

Local planning restrictions

Manningham City Council is responsible for implementing the State Government's Planning Scheme throughout the municipality. The Planning Scheme defines a series of zones and overlays that cover all land.

The zones control the land use, development type and the minimum size of the property. The overlays influence how subdivisions, buildings and works are carried out. They operate in addition to the zone requirements and are designed to protect environmental, landscape and heritage values, built form, and land and site management issues. The overlays can restrict and control activities such as the clearing of native vegetation and building works.

A property may be covered by several separate overlays and not all properties in the same area are covered by the same overlays.

The Manningham Green Wedge (see map page 66) is an Environmental Rural Zone defined by the Planning Scheme. This zone has many significant planning restrictions.

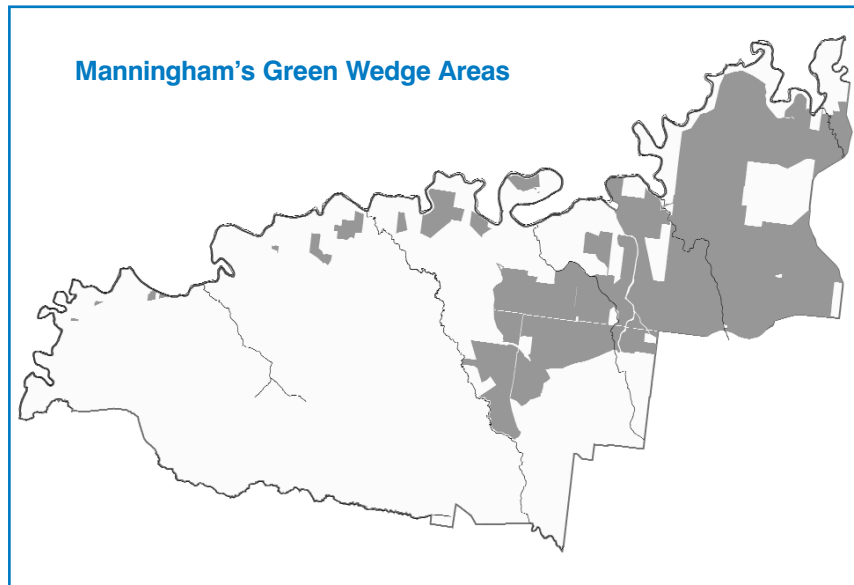
It is important to contact Council and clarify the planning restrictions that apply to your property before any property improvement works have commenced. Failing to comply with planning restrictions can attract substantial penalties and the onus is on the landholder to be aware of and comply with local planning restrictions.

People living or managing land in Manningham often face highly challenging land management issues including weeds, rabbit and fox invasion and soil erosion.

Manningham City Council provides financial incentives to help landholders combat these problems so they can maintain and improve their land for present and future generations.

Incentives are available to groups and to individuals who meet the eligibility criteria, which include:

- Specified large hectare properties in the Green Wedge
- Properties with Land for Wildlife status
- Properties covered by a Conservation Covenant
- Properties adjoining a conservation park or reserve
- Properties with adjoining stream frontage
- Properties with an environmental significance overlay
- Landholders undertaking fox control works



The Green Wedge. Dark shaded areas show parks and reserves. Light shaded areas show private land.

Local Environment Assistance Fund (LEAF)

The Local Environmental Assistance Fund provides assistance and advice to individuals or groups in the non-urban area to help them maintain and improve the environmental quality of their land.

Landowners are eligible for up to \$800 (on a dollar for dollar basis), for weed, rabbit and fox control, revegetation with local native plants and erosion control.

Other programs

Protection through covenanting

Council provides a one-off grant of \$35 per hectare of affected land up to a maximum of \$800. Landowners are encouraged to protect native bush forever by placing conservation covenants on their land with Trust for Nature. A conservation covenant is an agreement between the Trust and a landowner, which permanently protects land of high conservation value from clearing and other damaging activities.

Protection through Land for Wildlife

Council provides a one-off grant of \$10 per hectare of land covered by the agreement up to a maximum of \$200. Land for Wildlife is a voluntary scheme operated by the Department of Sustainability and Environment to encourage and assist private landholders to provide habitats for wildlife on their property.



This Land for Wildlife sign on the front gate of a Warrandyte property demonstrates that the owners have made a commitment to providing wildlife habitat on their property.

Park Care and Urban Stream-Frontage

Council provides up to \$200 (on a dollar for dollar basis) for environmental works in an area covered by an environmental significance overlay, within 20 metres of a stream or on park/reserve boundaries.

This scheme targets park neighbours (properties adjoining a conservation park/reserve) and those with an environmental significance overlay or stream frontage.

Fox Control

Council provides assistance to landowners undertaking integrated fox control works on their property. Landowners are eligible for up to \$200 (on a dollar for dollar basis). Funding priority is given to co-ordinated groups and projects across the municipality.

Groups, courses and seminars

Community Rabbit Control Groups

Rabbits are one of the most critical management issues for landowners in Manningham. Over 1500 Manningham residents participate in community rabbit control programs throughout the region each summer.

Working together with neighbours has a much greater impact on reducing rabbit numbers, than trying to eradicate rabbits alone. To find out more about how you can get involved in the annual rabbit control program, contact the Council's Economic and Environmental Planning Unit.

Property Management Planning Course

Are you prepared for the fire season? Concerned about weed or rabbit invasion on your property? Want to know more about the environmental value of your land? Want to be able to identify local native plants?

Participants in the Manningham City Council Property Management Planning Course learn how to improve the environmental quality of their land, how to tackle land management issues and how to get the most out of pastures. Each landholder develops a detailed five-year management plan for their property.

The course runs once a week for seven weeks with costs subsidised by Council. Several Courses run each year. To find out more about future courses and dates, call Council's Economic and Environmental Planning Unit.

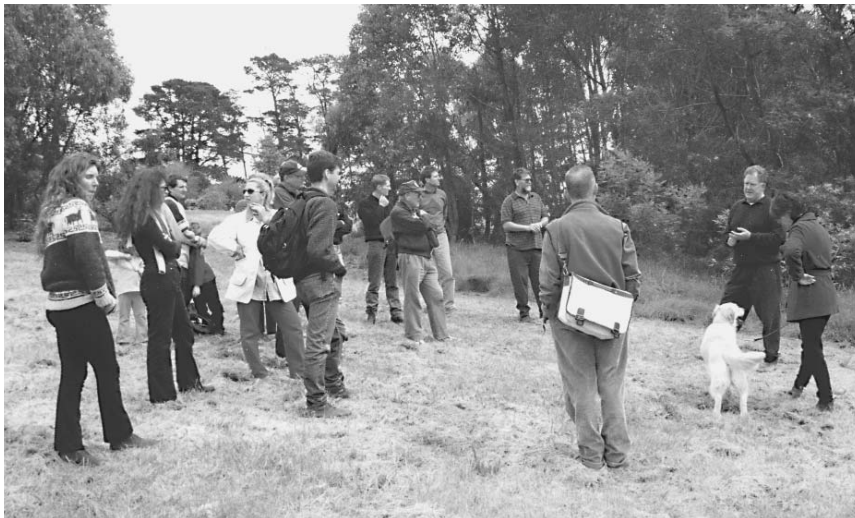
Monthly Environmental Seminar Series

Free environmental seminars are held in the Manningham area each month. All residents are welcome. The seminars explore everything from eco-living to bushland management, habitat creation and pests. To obtain this year's program, contact the Economic and Environmental Planning Unit.

Environmental Community Email Group

Council operates an environmental community email group to help people keep up to date on the latest environmental events and stories and share ideas with others. To be added to the group email list contact the Economic and Environmental Planning Unit.

Property Management Planning Course participants inspect revegetation work at Tuscany Rise.



For further information on all of the above programs, grants, groups and courses contact:

**Manningham City Council
Economic and Environmental Planning Unit
PO Box 1
Doncaster, VIC 3108
Tel: 9840 9333**



General information

Manningham City Council

The Environment & Economic Planning Unit can provide advice on all aspects of land management in Manningham.

City Offices:

699 Doncaster Road

Doncaster, VIC 3108

Tel: 9840 9333

www.manningham.vic.gov.au

The City Parks Unit can provide information on the parks and reserves managed by Council.

Depot:

cnr Blackburn & Warrandyte Roads

East Doncaster, VIC 3109

Tel: 9846 0515

www.manningham.vic.gov.au

Whitehorse Manningham

Regional Library Corporation

Our local libraries have a good range of titles on native plants, managing bushland, horse husbandry, landcare and property management planning.

Call for a list of library addresses and opening hours.

Tel: 9841 0555

www.wev.vic.gov.au

Department of Sustainability & Environment

Department of Primary Industries

These State Government departments provide a broad range of general environmental and land management information and run a specialist bookshop.

DSE/DPI Information Centre

8 Nicholson Street

East Melbourne, VIC 3002

Tel: 9637 8325

www.dse.vic.gov.au

(Follow the links to 'Agriculture' on the DSE website to access Landcare Notes & Agnotes)

Parks Victoria

Information about the local parks and reserves that they manage.

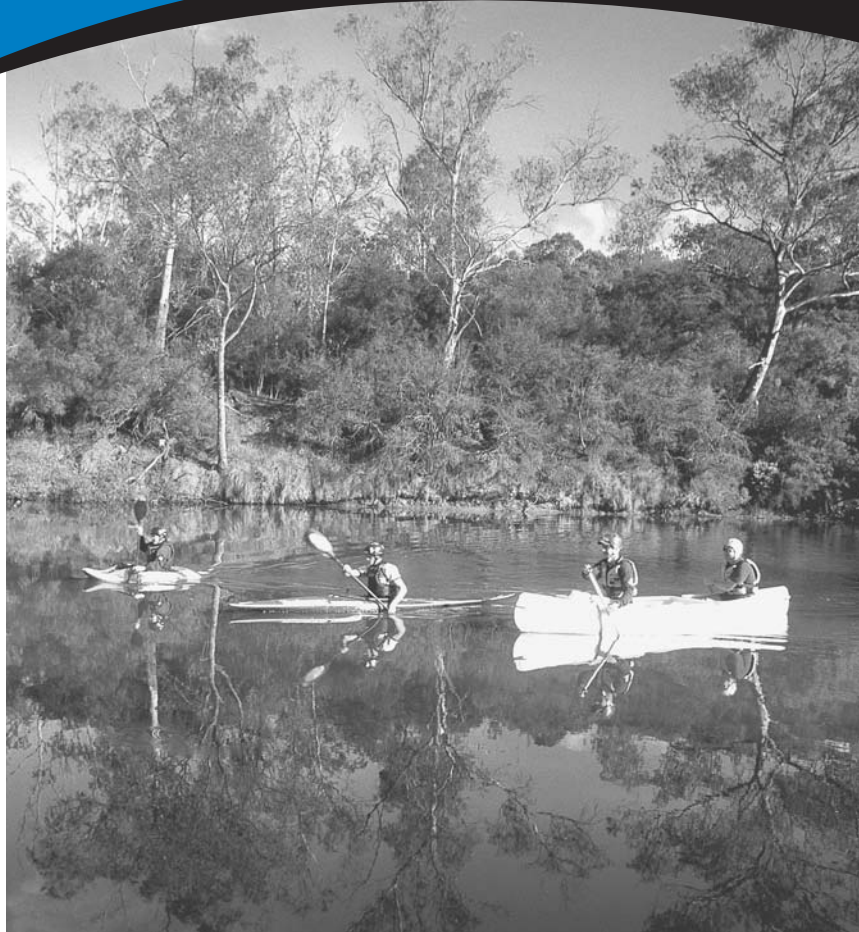
Warrandyte State Park

Pound Bend Road

Warrandyte, VIC 3113

Tel: 9844 2659

www.parkweb.vic.gov.au



Specific information

Bushland

Land for Wildlife

Information and advice on wildlife habitat on private land.

Department of Sustainability & Environment
Port Phillip Region.
KTRI Ballarto Road
Frankston, VIC 3199
Tel: 9785 0134
www.dse.vic.gov.au

Trust for Nature

Advice and information about conservation covenants
Level 2 385 Little Lonsdale Street
Melbourne, VIC 3000
Tel: 9670 9933
www.tfn.org.au

Conservation Volunteers Australia

Linking volunteers to environmental projects.
62-74 Pickles Street
South Melbourne, VIC 3205
Tel: 9686 5554
www.conservationvolunteers.com.au

Greening Australia Victoria

Technical advice and support for vegetation management projects.
10 Buckingham Drive
Heidelberg, VIC 3084
Tel: 9450 5300
www.gavic.org.au

Contractors

There are a number of weed and vermin control contractors in the Manningham area. Ask your neighbours for a recommendation, check the local paper and yellow pages or call Council's Economic & Environmental Planning Unit for a list of contractors and the services they provide.
Tel: 9840 9122

Fire

Country Fire Authority

Free copies of the Bushfire Survival Plan Workbook and information about fire in the local area.
Yarra Office:
18-22 Lakeview Drive
Lilydale, VIC 3140
Tel: 9735 0511
www.cfa.vic.gov.au

Native plants

Native Splendour

Call Council's Economic & Environmental Planning Unit for a copy of this free guide to the indigenous plants of Manningham. The guide also lists local indigenous nurseries.
Tel: 9840 9333



Wildlife

Wildlife Victoria

A referral service putting people with injured or orphaned wildlife in touch with local wildlife shelters.

Tel: 0500 547 000



Weeds

Manningham Weed Identification Booklet

Call Council's Economic & Environmental Planning Unit for a copy of this free guide.
Tel: 9840 9333

Books on weed identification and management

RG & FJ Richardson
PO Box 42
Meredith, VIC 3333
www.weedinfo.com.au

Local conservation and friends groups

These groups of volunteers work together to protect and conserve local bushland. They can be an excellent source of local knowledge and advice.

Friends of Mullum Mullum Creek Valley, Inc
53 Arum Crescent
Ringwood North, VIC 3134
Tel: 9870 2541

Friends of Harris Gully Reserve
13 Mopoke Hill Road
Warrandyte, VIC 3113
Tel: 9844 1056

Friends of Yarra Valley Park
6 Manningham Road West
Bulleen, VIC 3105
Tel: 9850 5155

Friends of Warrandyte State Park
PO Box 220
Warrandyte, VIC 3113
Tel: 9844 1650

Hillcrest Association, Inc
27 Chippewa Avenue
Donvale, VIC 3111
Tel: 9874 1227

Wonga Park Environment Group
Lot 8 Styles Court
Wonga Park, VIC 3115
Tel: 9722 1776

Manningham Conservation Society, Inc
4 Pinewood Drive
Templestowe, VIC 3106
Tel: 9846 2651

Friends of Tunnel Street Roadside
104 Webb Street
Warrandyte, VIC 3113
Tel: 9844 3906

Friends of 100 Acres Reserve
81 Arundel Road
Park Orchards, VIC 3114
Tel: 9876 5350

Friends of Tuscany Rise
57 O'Briens Lane
Templestowe, VIC 3106
Tel: 9846 4895

Friends of the Island
328 Warrandyte-Ringwood Road
Warrandyte, VIC 3113
Tel: 9722 1117

Josh Revell at Warrandyte State Park Nursery. The nursery is run by the local community and provides low-cost indigenous native plants grown from local provenance seed.



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Melissa King, Clive Marks, Ian Moodie,
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Carrie Tiffany, Cathy Willis.

