

Planting Guide for Hamilton Basin

Horsham Downs Peat Lakes



This planting guide is designed to assist anyone undertaking ecological restoration of the peat lakes in the Hamilton Basin. It is the first in a series of guides for the peat lakes (another being for Lake Rotokauri) and one of a number of planting guides covering different ecosystems in Waikato District, including sections of the Waikato and Waipa Rivers, the western ranges and kahikatea remnants.

This species list is not intended to be a comprehensive description of the primeval wetlands and forests surrounding the peat lakes but a simplified recipe for the reconstruction of natural patterns and processes based on the practical knowledge and experience of plant growers involved in ecological restoration. It is worth remembering that ecological restoration is not usually a one-off activity but may require a number of interventions in order to restore natural patterns and processes. Restoring less common species may require specialist advice.

Planting guide for Horsham Downs peat lakes

The peat lakes of the Hamilton Basin formed where sand and gravel from the Waikato River blocked valleys. Subsequently, thick peat has developed around them. Peat lake margins have low fertility waterlogged soils supporting a low stature plant community. The conversion of surrounding land to productive farmland, however, has tended to raise nutrient levels. If drainage has been associated with this, the resulting vegetation may be taller and woodier than existed in the site previously, making it challenging to re-establish low fertility species. Weeds can also be a problem. Further back from the lake edge, the mineralised zone at the foot of low hills supports a tall many layered forest dominated by kahikatea.

Three distinct planting zones now occur around the lake. Each zone has its own assemblage of plants, and except for the sedgeland on the lake margin, is grouped into five categories – colonisers; canopy trees; understory shrubs; grasses sedges, ferns and ground covers; and climbers and epiphytes.

A representative range of species for each of the five categories is included in order that something resembling the natural structure of a forest can be restored. An indication is provided as to the total number of plants of each category (not individual species) that might be planted in a 100 square metre (10 x 10m) section in each of three situations - open ground, established cover and mature native canopy. Where a canopy already exists, the planting density will be less than open ground. It is worth looking at similar natural areas in the locality to gain a better appreciation of the mix and densities of species. The approximate final height of a plant is given where it is over one metre.



The guide to tolerances/preferences is intended to give guidance for the positioning of each plant. This is only a rough guide. On the table ○ means this species is unlikely to survive the condition, ◐ means it may survive but may not thrive or compete well with other vegetation and ● indicates the species is well adapted to the conditions. It is recommended that plants are located in positions indicated by ● in the tolerances/preferences section.

Some plants such as ferns and epiphytes may be best left to see if they come back naturally once conditions are right. Epiphytes are not the easiest plants to establish but if you want to assist natural processes there are several things you could do:

- place spores or seeds directly onto tree fern trunks (a good growing medium);
- surround roots of plant with a mixture of sphagnum moss and potting mix or compost, enclose with a suitable support (windbreak cloth, bird netting) and tie to a tree (do not use wire or nails);
- plant on a mound on the ground close to a tree in a shady place.

Planting to attract wildlife

A lake edge with reeds and rushes provides ideal habitat for a range of wetland birds, especially ducks and pūkeko, but it is also possible for Australasian bittern/matuku, spotless crane/pūweto and fernbird/mātātā to frequent the site. Kingfisher/kotare feed on fish and rodents while surrounding trees and shrubs can offer food for tui, fantail/piwakawaka, silvereye/tauhou, grey warbler/riroriro and morepork/ruru in particular. The plants value as bird food is indicated by an N for nectar and F for fruit and seeds.

Ecological restoration in the Waikato

Always choose ecosourced plants when undertaking ecological restoration. Ecosourced plants are those which are grown from seeds or propagules (including spores and cuttings) collected from naturally-occurring vegetation in a locality close to where they are to be replanted as part of a restoration project. With seeds, attention must be paid to possible cross-pollination from nearby garden plants.

It's worth taking care to ensure plants are ecosourced from natural areas to:

- avoid the risk of planting species which are not native to the local area and which could become invasive;
- help maintain the unique local characteristics of the native plants in your area;
- obtain plants that have a greater chance of growing successfully because they are adapted to local conditions.

Ecosourced Waikato (a group representing plant growers, the Department of Conservation and local and regional authorities) has developed native plant lists for different habitat types in Waikato district with funding support from the Waikato District Council and Department of Conservation.



Horsham Downs Peat Lakes

Peat Lake margins/sedgeland

Low fertility waterlogged soils support a low stature plant community. The soil is less aerated and nutrients less available to plants than in the surrounding mineralised soil.

Characteristic species		Planting	Plant tolerances / preferences							Planting tips		
Botanical name	Common name	Suggested number of plants per 100 m ² in open ground	These tolerances/preferences are relative to this particular habitat							Be aware that peat soils can dry out in a hot summer	maximum height (approx) if over 1 metre	bird food type
			flood	wet	moist	dry	sun	shade	frost			
Listed in order from wettest to driest site												
<i>Machaerina articulata</i>		The density of planting and relative abundance of each species will depend on existing native plants, the nature of the ground and the resources available. Between 50 -100 plants per 100m ² is recommended	All species in this group tolerate wet soil, full sun and heavy frosts found in this habitat. Protection of natural or original plant communities must be the first priority. Planting of additional native species in order to re-establish those species or to out-compete invasive plants is also important.							wet ground to shallow water	1.8	
<i>Eleocharis sphacelata</i>	Bamboo spike-sedge									full sun, shallow water	1.2	
<i>Carex secta</i>	purei									wet ground	1-2	
<i>Carex virgata</i>	purei									wet ground	1m	
<i>Machaerina arthropylla</i>										exposed boggy ground		
<i>Machaerina rubiginosa</i>										exposed boggy ground		
<i>Machaerina teretifolia</i>										exposed boggy peat		
<i>Eleocharis acuta</i>										exposed boggy ground		
<i>Lobelia angulata</i>	pratia									moist weed-free ground		
<i>Nertera scapanoides</i>										moist soil/moss, weed free		
<i>Coprosma tenuicaulis</i>	hukihuki									wet ground	3	
<i>Coprosma propinqua</i>	mingimingi									wet ground	7	
<i>Coprosma propinqua</i> x										wet ground	7	
<i>Dianella</i> spp.	turutu									drier ground		
<i>Phormium tenax</i>	harakeke/flax									shallow water	2	N
<i>Hypolepis distans</i>	fern	damp ground, infertile soil										

<i>Gleichenia dicarpa</i>	tangle fern			damp ground, infertile soil		
<i>Leptospermum scoparium</i>	swamp manuka			damp ground full sun	8	
<i>Cyperus ustulatus</i>	upuko tangata			prefers rich soil		

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Peat Lake margins/swamp forest

In contrast to the peat soil, the mineralised soils at the foot of the low hills support a tall, many layered forest dominated by kahikatea. Shallow or drained peat in the transition zone will support a graduation between this forest type and the sedgeland found on the waterlogged peat.

Characteristic species		Planting			Plant tolerances / preferences							Planting tips		maximum height (approx) if over 1 metre	bird food type
Botanical name	Common name	open ground	established cover	mature stage	flood	wet	moist	dry	sun	shade	frost	Plant frost sensitive species under willow or other trees			
Colonisers		60	10	0	<i>Colonisers are typically quick growing, tolerant of a wide range of environments and effective and early dispersers</i>										
<i>Coprosma robusta</i>	karamu				●	○	●	○	●	○	○	full sun		5	
<i>Cordyline australis</i>	ti kōuka/cabbage tree				●	●	●	○	●	○	●	full sun		12	
<i>Leptospermum scoparium</i>	swamp manuka				○	●	●	●	●	○	●	tolerates shallow water, full sun		8	
Canopy trees					<i>Canopy trees are long-lived, tall and spreading, but slow to establish</i>										
Listed in order from wettest to driest habitat		10	15	0											
<i>Dacrycarpus dacrydioides</i>	kahikatea				●	○	●	○	●	○	●	full sun		60	
<i>Laurelia novae-zelandiae</i>	pukatea				●	●	●	○	●	●	●	requires some shelter		35	
<i>Syzygium maire</i>	maire tawake				?	●	○	○	○	●	○	stable boggy sheltered areas		16	
<i>Prumnopitys taxifolia</i>	matai				●	○	●	●	●	●	●	very hardy		35	
<i>Elaeocarpus hookerianus</i>	pokaka	0	0	1	●	○	●	○	○	●	●	requires some shelter		14	
<i>Alectryon excelsus</i>	titoki				○	○	●	○	○	●	○	sheltered areas		10	
<i>Podocarpus totara</i>	totara				●	○	●	○	●	○	●	drier areas		30	F

<i>Knightia excelsa</i>	rewarewa				○	○	●	○	●	○	●	damp clay soil	30	N
<i>Sophora microphylla</i>	kowhai				○	○	●	●	●	○	●	forest margins	10	N

					flood	wet	moist	dry	sun	shade	frost	Planting tips		
Understorey		20	25	15										
<i>Coprosma rigida</i>					●	●	●	○	●	●	●	wet ground, sun or shade	5	F
<i>Coprosma rotundifolia</i>					●	●	●	○	●	●	●	wet ground, sun or shade	4	F
<i>Carpodetus serratus</i>	putaputaweta				○	○	●	○	●	●	●	damp soil but avoid flooding	10	
<i>Pennantia corymbosa</i>	kaikomako				○	○	●	○	●	●	●	sheltered site	12	F
<i>Streblus heterophyllus</i>	turepo				●	○	●	○	●	●	●	sheltered site	12	
<i>Myrsine australis</i>	mapou				●	●	●	○	●	●	○	higher ground	7	F
<i>Melicytus ramiflorus</i>	mahoe				●	○	●	○	○	●	○	higher ground	10	F
<i>Dicksonia squarrosa</i>	wheki				○	○	○	○	●	●	●	higher ground	2-8	
Grasses, sedges, lilies and ground covers		10	10	15	<i>These plants are well adapted to situations where nothing much else grows, sometimes under taller vegetation, sometimes in boggy or very wet places</i>									
<i>Machaerina tenax</i>					●	●	○	○	○	●	●	shaded boggy palce		
<i>Gahnia xanthocarpa</i>	giant sedge				●	●	○	○	●	●	●	boggy sun or shade	1.5	
<i>Lobelia angulata</i>	pratia				○	○	●	●	●	●	●	weed-free ground		
<i>Astelia grandis</i>	swamp astelia				●	●	●	○	●	●	●	boggy shaded place	1	
<i>Carex dissita</i>	forest sedge				?	○	●	○	●	●	●	damp site		
<i>Blechnum filiforme</i>	thread fern				○	○	●	●	○	●	○	damp shade		
<i>Blechnum novae-zelandiae</i>	kiokio				●	●	●	○	●	●	●	anywhere		
Climbers and epiphytes		0	0	10	<i>These plants take advantage of trees to get their leaves up into the sunlight</i>									
<i>Freycinetia banksii</i>	kiekie				○	○	●	○	○	●	○	moist shaded area		
<i>Fuchsia perscandens</i>							●	○	●	○		moist sunny area		
<i>Ripogonum scandens</i>	kareao/supplejack				●	●	●	○	●	●	○	damp shaded area		
<i>Parsonsia heterophylla</i>	kaihua/NZ jasmine				●	●	●	○	●	●	○	moist sheltered area		
<i>Rubus australis</i>	swamp lawyer				●	●	●	○	●	●	●	damp shaded area		

This guide is based on the best knowledge available at time of publication but experience and research can change over time and may require refinement of the information in the future.