

# Planting Guide for Hamilton Basin



## Lake Rotokauri

This planting guide is designed to assist anyone undertaking ecological restoration around Lake Rotokauri. It is the second in a series of guides for the peat lakes, another being for the Horsham Downs peat lakes) 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 vegetation surrounding the lake 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 Lake Rotokauri

Lake Rotokauri is situated on the edge of Hamilton city and although there are increasing amounts of urban development in the area, there is still some natural vegetation with potential for restoration. The lake margins would have originally been of low fertility but changing land use in the surrounding catchment has tended to raise nutrient levels. This now presents challenges in terms of re-establishing low fertility plants.

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, silveryeye/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.



# Lake Rotokauri

## Lake margin sedgeland

Peat lake margins are typically low fertility, waterlogged soils, supporting a low stature plant community. However, changing land use in the catchment has raised nutrient levels with the result that vegetation may be taller and woodier than existed on the site previously.

Characteristic species		Planting	Plant tolerances / preferences	Planting tips		
Botanical name	Common name	Suggested number of plants per 100 m <sup>2</sup> in open ground or established cover	Plant tolerances/preferences are relative to this particular site		maximum height (approx) if over 1 metre	bird food type
<i>Typha oreintalis</i>	raupo	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 <sup>2</sup> is recommended	All species in this group tolerate wet soil, full sun and heavy frosts found in this habitat	wet ground to shallow water	1-3	
<i>Eleocharis sphacelata</i>	bamboo spike-sedge			full sun, shallow water	1.2	
<i>Machaerina articulata</i>				full sun, shallow water	1.8	
<i>Carex secta</i>	purei			wet ground	1-2	
<i>Carex virgata</i>	purei		wet ground	1		
<i>Coprosma tenuicaulis</i>	hukihuki		shallow water	3	F	
<i>Coprosma propinqua</i>	mingimingi		shallow water	7		
<i>Leptospermum scoparium</i>	swamp manuka		open area damp ground	8		
<i>Phormium tenax</i>	harakeke/flax		shallow water	2	N	
<i>Machaerina arthropphylla</i>			boggy ground			
<i>Machaerina rubiginosa</i>			boggy ground			
<i>Eleocharis acuta</i>			boggy ground			
<i>Sparganium subglobosum</i>	burr reed		boggy ground			
<i>Coprosma propinqua</i> x			boggy ground	7	F	
<i>Cordyline australis</i>	ti kōuka/cabbage tree		boggy ground	12	F/N	
<i>Dianella spp</i>	turutu		boggy ground		F	
<i>Cyperus ustulatus</i>	upuko tangata	boggy ground	1.2			
<i>Lobelia angulata</i>	pratia	2-5 per m <sup>2</sup>		weed-free ground		

# Lake Rotokauri

## Swamp forest

Tall forest dominated by kahikatea with abundant understory, climbers and epiphytes.

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 other trees	maximum height (approx) if over 1 metre	bird food type
		Suggested number of plants per 100 m <sup>2</sup>			○ unlikely to survive ◐ may survive but not thrive ● well adapted to conditions  Plant tolerances/preferences are relative to this particular site									
<b>Colonisers</b>		<b>60</b>	<b>10</b>	<b>0</b>	<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	F
<i>Cordyline australis</i>	ti kōuka/cabbage tree				●	●	●	◐	●	◐	●	full sun	12	N/F
<i>Leptospermum scoparium</i>	swamp manuka				◐	●	●	●	●	○	●	full sun, damp ground	8	
<b>Canopy trees</b>					<i>Canopy trees are long-lived, tall and spreading, but slow to establish</i>									
<b>Listed in order from wettest to driest habitat</b>		<b>10</b>	<b>15</b>	<b>0</b>										
<i>Dacrycarpus dacrydioides</i>	kahikatea				●	◐	●	◐	●	◐	●	look for higher ground	60	F
<i>Laurelia novae-zelandiae</i>	pukatea				●	●	●	◐	●	●	●	requires some shelter	35	
<i>Prumnopitys taxifolia</i>	matai				●	◐	●	●	●	●	●	very hardy	35	F
<i>Elaeocarpus hookerianus</i>	pokaka	0	0	1	●	◐	●	◐	◐	●	●	moist sheltered area	14	F

					flood	wet	moist	dry	sun	shade	frost	Planting tips		
<b>Understorey</b>		25	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>Streblus heterophyllus</i>	turepo				●	○	●	○	●	●	●	sheltered site	12	
<i>Pennantia corymbosa</i>	kaikomako				○	○	●	○	●	●	●	sun or shade	12	F
<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	
<b>Grasses, sedges, lilies and ground covers</b>		0	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 place		
<i>Gahnia xanthocarpa</i>	giant sedge				●	●	○	○	●	●	●	boggy sun or shade	1.5	
<i>Lobelia angulata</i>	pratia				○	○	●	●	●	●	●	shaded boggy place		
<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		
<b>Climbers and epiphytes</b>		0	0	10										
<i>Freycinetia banksii</i>	kiekie				○	○	●	○	○	●	○	moist shaded area		
<i>Fuchsia perscandens</i>							●	○	●	○		moist sunny area		F
<i>Ripogonum scandens</i>	kareao/supplejack				●	●	●	○	●	●	○	damp shaded area		F
<i>Parsonia heterophylla</i>	kaihua				●	○	●	○	●	○	●	damp sheltered area		
<i>Rubus australis</i>	Swamp lawyer				●	●	●	○	●	●	●	damp shaded area		

*Take care to ensure plants are ecosourced from natural areas in the Hamilton Basin to preserve the local heritage.*

*The local forms of many of our native plants are unnamed botanically e.g. k nuka and m nuka, and could become extinct if we do not ecosource.*

# Lake Rotokauri

## Sloping ground

A rich diverse forest initially dominated by kahikatea and tötara with rimu and a broadleaf canopy developing over time.

Characteristic species		Planting			Plant tolerances / preferences							Planting tips		
Botanical name	Common name	open ground	established cover	mature stage	flood	wet	moist	dry	sun	shade	frost	maximum height (approx) if over 1 metre	bird food type	
		Suggested number of plants per 100 m <sup>2</sup>			○ unlikely to survive ◐ may survive but not thrive ● well adapted to conditions  Plant tolerances/preferences are relative to this particular site									
<b>Colonisers</b>		<b>60</b>	<b>10</b>	<b>0</b>	<b>Colonisers are typically quick growing, tolerant of a wide range of environments and effective and early dispersers</b>									
<i>Austroderia fulvida</i>	toe toe				●	●	●	●	●	○	●	open area, wet ground	1.5	
<i>Coprosma robusta</i>	karamu				◐	●	●	●	●	◐	◐	open area	5	F
<i>Cordyline australis</i>	ti kōuka/cabbage tree				◐	●	●	●	●	◐	●	most areas	12	N/F
<i>Kunzea ericoides</i>	kanuka				●	◐	●	●	●	○	●	open area drier ground	16	
<i>Plagianthus regius</i>	manatu/ribbonwood				●	○	●	◐	●	◐	●	open area, quick growing	17	
<i>Hoheria sexstylosa</i>	lacebark				◐	○	●	◐	●	◐	●	open area	12	
<b>Canopy trees</b>		<b>10</b>	<b>15</b>	<b>0</b>	<b>Canopy trees are long-lived, tall and spreading, but slow to establish</b>									
<i>Alectryon excelsus</i>	titoki				○	○	●	◐	◐	●	◐	sheltered area	10	F
<i>Beilschmieda tawa</i>	tawa				○	○	●	◐	◐	●	◐	sheltered area	20	F
<i>Dacrycarpus dacrydioides</i>	kahikatea				◐	◐	●	◐	●	○	●	sunny moist area	60	F
<i>Elaeocarpus hookerianus</i>	pokaka				●	◐	●	◐	●	●	●	moist sheltered area	14	F
<i>Laurelia novae-zelandiae</i>	pukatea				◐	●	●	◐	◐	●	○	sheltered area	35	
<i>Podocarpus tötara</i> var. <i>totara</i>	totara				●	○	●	●	●	◐	●	wide range of tolerances	30	F
<i>Prumnopitys taxifolia</i>	matai				●	◐	●	◐	●	●	●	wide range of tolerances	35	F

<i>Dacrydium cupressinum</i>	rimu				○	○	○	●	●	●	●	drier ground	35	F
<i>Sophora microphylla</i>	kowhai				○	○	●	●	●	○	●	forest margins	10	F/N
<i>Syzygium maire</i>	maire tawake					●	○	○	○	●	○	always boggy sheltered area	15	

		20	25	15	flood	wet	moist	dry	sun	shade	frost	Planting tips		
<b>Understorey</b>														
<i>Coprosma areolata</i>					○	○	●	○	●	●	●	sloping ground	5	F
<i>Coprosma grandifolia</i>	kawariki/kanono				●	○	●	○	○	●	○	moist shady ground	7	F
<i>Coprosma lucida</i>	karamu				○	○	○	●	●	●	○	well drained sloping ground	5	F
<i>Coprosma rhamnoides</i>					○	○	●	○	●	●	●	well drained sloping ground	2	F
<i>Fuchsia excorticata</i>	kotukutuku				○	○	●	○	○	●	○	wet area above flood level	12	F
<i>Geniostoma rupreste</i>	hangehange				○	○	●	○	●	●	○	wide range of tolerances	4	
<i>Hedecarya arborea</i>	porokaiwhiri/pigeonwood				●	○	●	○	○	●		initially sheltered site	12	F
<i>Leucopogon fasciculatus</i>	mingimingi				○	○	○	○	●	○	●	light shade	5	F
<i>Piper excelsum</i>	kawakawa				○	○	●	○	○	●	○	sheltered sloping ground	7	F
<i>Melicytus ramiflorus</i>	mahoe				○	○	●	○	○	●	○	initially sheltered site	10	F
<i>Myrsine australis</i>	mapou				○	○	●	●	●	●	○	anywhere	7	F
<i>Olearia ranii</i>	heketara				○	○	●	○	○	●	○	well drained, light shade	8	
<i>Schefflera digitata</i>	pate/patete				○	○	●	○	●	●	○	damp soil, above floods	8	F
<i>Streblus heterophyllus</i>	turepo				●	○	○	○	○	●	●	initially sheltered area	12	
<i>Brachyglottis repanda</i>	rangiora				○	○	●	○	○	●	○	steep bank, dry shade	6	
<b>Grasses, sedges, ferns, and ground covers</b>		<b>10</b>	<b>10</b>	<b>15</b>	<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>Carex solandri</i>	forest sedge				○	○	●	○	○	●	●	damp shady area		
<i>Carex dissita</i>	forest sedge				○	●	●	○	●	●	●	damp shady area		
<i>Blechnum parrisiae</i>	rasp fern				○	○	●	●	●	●	○	dry shade to semi-shade		
<i>Asplenium bulbiferum</i>	pikopiko						●	○	○	●	●	damp shade		
<i>Nertera depressa</i>							●	○	○	○	●	damp shade weed-free		
<i>Elatostema rugosum</i>	parataniwha	0			○	●	○	○	○	●	○	wet and shady		

Climbers and epiphytes		0	0	10										
<i>Astelia hastata</i>	kahakaha				○	○	●	●	●	●	○	raised soil or attach to tree fork		
<i>Astelia solandri</i>	kōwharawhara				○	○	●	●	●	●	○	well drained soil or attach to tree		
<i>Asplenium flaccidum</i>	hanging spleenwort				○	○	●	●	●	●	○	rich soil or attach to tree		
<i>Asplenium polyodon</i>	sickle spleenwort				○	○	●	●	●	●	○	attach to tree		
<i>Microsorium pustulatum</i>	kowaowao/hounds tongue				○	○	●	●	●	●	○	attach to tree		
<i>Microsorium scandens</i>	mokimoki				○	○	●	●	●	●	○	attach to tree		
<i>Pyrrosia eleagnifolia</i>	leather leaf fern				○	○	●	●	●	●	○	attach to tree or natural germination		
<i>Clematis paniculata</i>	puwhanga				○	○	●	○	○	●	○	moist well drained, cool roots		
<i>Metrosideros perforata</i>	akatea				○	○	○	●	●	●	○	well drained soil or base of tree		N
<i>Metrosideros diffusa</i>	akatea				○	○	○	●	●	●	○	well drained soil or base of tree		N
<i>Metrosideros fulgens</i>	rata				○	○	○	●	●	●	○	well drained soil		N
<i>Passiflora tetrandra</i>	kohia/NZ passionfruit				●	○	●	●	●	○	●	open area		F
<i>Freycinetia banksii</i>	kiekie				○	○	●	○	○	●	○	damp shady ground		N
<i>Parsonsia heterophylla</i>	kaihua/NZ jasmine				●	●	●	○	●	●	○	damp shady ground		
<i>Rubus cissoides</i>	tātārāmoa/bush lawyer				●	○	●	●	●	○	○	well drained margin		

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