

Planting Guide for Lower Waikato River

Tuakau Bridge to Ngaruawahia



This planting guide is designed to assist anyone undertaking ecological restoration along the Waikato River from the Tuakau Bridge south to Ngaruawahia. It is the second in a series of three guides covering the stretch of river from just south of Hamilton out to the sea. There is a fourth guide for the Waipa River from Whatawhata to Ngaruawahia before it joins the Waikato River.

The species lists are not intended to be a comprehensive description of the primeval forests along the river 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.

2. Planting guide for Lower Waikato River - Tuakau Bridge to Ngaruawahia

This section of the river is prone to flooding, with winter flood levels likely to be several metres above summer levels every year, often for long periods at a time. This regime eliminates flood intolerant species from a large area of riverbank and shortens the growing season. Suitable plants are listed in the 'sloping river bank' zone while the swamps along the lower reaches of many of the streams flowing into this section of the river are included in the 'back swamp' zone. Each zone has its own assemblage of plants 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.

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.

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.

Planting to attract wildlife

The plants value as bird food is indicated by an N for nectar and F for fruit and seeds. The table below sets out the main food requirements for some of the native birds that live in bush.

Species	Fruit/seeds	Nectar	Insects	Foliage	Other
Bellbird	*	*	*		
Fantail			*		
Grey warbler			*		
Kaka	*	*	*		tree sap
Kakariki	*	*	*		
Kereru	*			*	flowers
Kingfisher			*		fish, rodents, lizards
Kiwi	*		*		spiders, worms, koura
Shining cuckoo			*		
Morepork			*		rodents, birds, lizards
Robin			*		
Tui	*	*	*		
Wax/white/silvereye	*	*	*		
Whitehead			*		

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 the native plant lists for the Lower Waikato and Waipa Rivers with funding support from the Waikato District Council and Department of Conservation.



Waikato River - Tuakau Bridge to Ngaruawahia

Sloping riverbanks up to 5 vertical metres above summer river level

This section of the river has higher flood levels as distance from the river mouth increases. Winter flood levels are expected to be several metres above summer levels and can rise up to seven metres during occasional flood events. Flooding can also be of much longer duration than that experienced higher up in the catchment. This regime eliminates flood intolerant species from a large area of riverbank and shortens the growing season. The species listed are the ones found to best tolerate the conditions.

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	Look for humps of higher ground to plant trees on	maximum height (approx) if over 1 metre	food type	
															Suggested number of plants per 100 m ²
Colonisers					<i>Colonisers are typically quick growing, tolerant of a wide range of environments and effective and early dispersers</i>										
Listed in order from wettest to drier sites		60	10	0											
<i>Phormium tenax</i>	harakeke / flax				●	●	●	●	●	○	●	very wet ground	2	N	
<i>Cyperus ustulatus</i>	giant umbrella sedge				●	●	●	◐	●	○	●	very wet ground	1.2		
<i>Austroderia splendens</i>	toe toe				●	●	●	●	●	○	●	very wet ground	1.5		
<i>Cordyline australis</i>	ti kōuka/cabbage tree				◐	●	●	●	●	◐	●	most areas	12	F/N	
<i>Coprosma robusta</i>	karamu				◐	●	●	●	●	◐	◐	all but very wet ground	5	F	
<i>Kunzea robusta</i>	kanuka				◐	○	●	●	●	○	●	dry sloping ground	16	N	
<i>Plagianthus regius</i>	manatu/ribbonwood				●	◐	●	◐	◐	●	●	very quick growing	15		
<i>Veronica stricta</i>	koromiko				○	○	●	●	●	○	●	above flood level	4		
<i>Coriaria arborea</i>	tutu				◐	○	●	●	●	●	●	well drained moist soil	8		
<i>Aristotelia serrata</i>	makomako/wineberry				◐	○	●	◐	●	◐	●	quick growing, avoid too wet or dry	10	F	
Canopy trees					<i>Canopy trees are long-lived, tall and spreading, but slow to establish</i>										
listed in order from most to least numerous		15	15	0											
<i>Dacrycarpus dacrydioides</i>	kahikatea				●	●	●	◐	●	○	●	most areas	60	F	
<i>Laurelia novae-zelandiae</i>	pukatea				●	●	●	◐	◐	●	○	sheltered areas	35		
<i>Sophora microphylla</i>	kowhai				◐	◐	●	●	●	○	●	margins, well drained, mounds	10	N	
<i>Sophora chathamica</i>	kowhai				◐	◐	●	●	●	○	●	margins, well drained, mounds	10	N	

<i>Alectryon excelsus</i>	titoki				○	○	●	●	○	●	○	sheltered	10	F	
<i>Podocarpus totara</i>	totara				○	○	●	○	●	○	●	upper bank	30	F	
<i>Prumnopitys taxifolia</i>	matai				●	○	●	○	●	●	●	most areas	35	F	
<i>Beilschmiedia tawa</i>	tawa				○	○	●	●	○	●	○	sheltered and shaded area	20	F	
<i>Knightia excelsa</i>	rewarewa				○	○	●	●	●	●	●	upper bank	30	N	
<i>Elaeocarpus hookerianus</i>	pokaka				●	○	●	○	●	○	●	level ground	14	F	
Understorey															
Listed in order from wettest to driest habitat		25	25	15	flood	wet	moist	dry	sun	shade	frost	Planting tips			
<i>Coprosma propinqua</i>	mingimingi				●	●	●	○	●	○	●	very wet area	7	F	
<i>Coprosma rigida</i>					●	●	●	●	●	○	●	anywhere	5	F	
<i>Coprosma rotundifolia</i>					●	●	●	○	●	●	○	anywhere	4	F	
<i>Pennantia corymbosa</i>	kaikomako				○	●	●	○	●	●	●	most areas	12	F/N	
<i>Streblus heterophyllus</i>	turepo				○	●	●	○	○	●	●	sheltered site	12		
<i>Coprosma grandifolia</i>	kawariki/kanono				●	●	●	○	○	●	○	sheltered and moist	6	F	
<i>Melicytus micranthus</i>	swamp mahoe				●	○	●	○	●	●	○	sheltered	5	F	
<i>Dicksonia squarrosa</i>	wheki				○	●	●	●	●	●	●	damp shade	2-8		
<i>Melicytus ramiflorus</i>	mahoe				○	○	●	○	●	●	○	sheltered	10	F	
<i>Myrsine australis</i>	mapou				○	○	●	●	●	●	○	anywhere	7	F	
<i>Hedycarya arborea</i>	porokaiwhiri/pigeonwood				○	○	●	○	○	●	○	sheltered and moist	12	F	
<i>Cyathea dealbata</i>	ponga				○	○	●	●	●	●	○	damp shade	10		
<i>Cyathea medullaris</i>	mamaku				○	○	●	●	●	●	○	damp shade	20		
<i>Nestegis lanceolata</i>	white maire				○	○	●	●	●	●	○	moist but well drained	13		
Grasses, sedges and ferns															
Listed in order from wettest to driest ground		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>Schoenoplectus tabernaemontani</i>	kuawa/lake clubrush				●	●	●	○	●	○	○	wet ground exposed during summer	1-2		
<i>Machaerina articulata</i>	jointed baumea				●	●	●	○	●	○	●	very wet area year round	1.8		
<i>Carex virgata</i>	purei/pukio				○	●	●	○	●	○	●	wet areas including light shade	1		
<i>Carex secta</i>	purei/pukio				○	●	●	○	●	○	●	wet	1-2		
<i>Carex dissita</i>	forest sedge				○	●	●	○	●	●	●	damp shady area			
<i>Carex solandri</i>	forest sedge				○	○	●	○	○	●	●	damp shady area			
<i>Carex uncinata</i>	hook sedge				○	○	●	○	○	●	●	damp shady area			
<i>Carex lambertiana</i>	forest sedge				○	○	●	○	○	●	●	damp shady area	1		
<i>Blechnum chambersii</i>	fern				●	○	●	○	○	●	○	damp shady bank			

<i>Asplenium bulbiferum</i>	pikopiko				○	●	●	○	○	●	○	damp shady bank		
<i>Blechnum fluviatile</i>	kiwakiwa				○	○	●	○	○	●	○	damp shady bank		
<i>Asplenium oblongifolium</i>	shining spleenwort				○	○	●	●	○	●	○	damp shady bank		
Climbers and epiphytes		0	0	10	flood	wet	moist	dry	sun	shade	frost	Planting tips		
<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>Freycinetia banksii</i>	kiekie				○	○	●	○	○	●	○	higher ground shady area		F/N
<i>Astelia hastata</i>	kahakaha				○	○	●	●	●	●	○	raised soil or attach to tree fork		
<i>Parsonsia heterophylla</i>	kaihua/NZ jasmine				●	●	●	○	●	●	○	damp shady place		
<i>Microsorium pustulatum</i>	kowaowao				○	○	○	●	●	●	○	attach to tree		
<i>Asplenium polyodon</i>	sickle spleenwort				○	○	●	●	●	●	○	attach to tree		
<i>Ripogonum scandens</i>	kareao/supplejack				●	●	●	○	●	●	○	damp shady place		F
<i>Passiflora tetrandra</i>	kohia/NZ passionfruit				●	○	●	●	●	○	●	open area		F/N

Waikato River - Tuakau Bridge to Ngaruawahia

Back swamp

This section covers not only the river margins, but the swamps along the lower reaches of so many of the streams flowing into this section of the Waikato River. The Opuatia stream is a good example. Vegetation in this zone grades from low stature plants of peat bogs, through manuka shrublands up to kahikatea swamp forest.

Characteristic species		Planting			Plant tolerances / preferences							Planting tips			
Botanical name	Common name	Suggested number of plants per 100 m ²			○ unlikely to survive ◐ may survive but not thrive ● well adapted to conditions							Plant frost sensitive species under other trees	maximum height (approx) if over 1 metre	food type	
		open ground	established cover	mature stage	flood	wet	moist	dry	sun	shade	frost				
Colonisers Listed in order from wettest to drier sites		35	10	0	<i>Colonisers are typically quick growing, tolerant of a wide range of environments and effective and early dispersers</i>										
<i>Typha orientalis</i>	raupo				●	●	◐	○	●	○	●	shallow open water	1-3		
<i>Phormium tenax</i>	harakeke / flax				●	●	●	●	●	○	●	very wet ground	2	N	
<i>Carex geminata</i>	cutty grass				●	●	◐	○	●	○	●	wet open area	1-2		
<i>Cyperus ustulatus</i>	giant umbrella sedge				●	●	●	◐	●	○	●	wet open area	2		
<i>Leptospermum scoparium</i>	swamp mānuka				◐	●	●	◐	●	○	●	very boggy to quite damp	8		
<i>Machaerina rubiginosa</i>	baumea				◐	●	●	◐	●	○	●	open boggy area			
<i>Cordyline australis</i>	ti kōuka/cabbage tree				◐	●	●	●	●	◐	●	most areas	12	F/N	
<i>Coprosma robusta</i>	karamu				◐	●	●	●	●	◐	◐	most areas	5	F	
Canopy trees listed in order from most common to least common		15	15	0	<i>Canopy trees are long-lived, tall and spreading, but slow to establish</i>										
<i>Dacrycarpus dacrydioides</i>	kahikatea				●	●	●	◐	●	○	●	drier sites of swamp	60	F	
<i>Laurelia novae-zelandiae</i>	pukatea				●	●	●	◐	◐	●	○	sheltered site	35		
<i>Sophora microphylla</i>	kowhai				◐	◐	●	●	●	○	●	margins, well drained, mounds	10	N	
<i>Sophora chathamica</i>	kowhai				◐	◐	●	●	●	○	●	margins, well drained, mounds	10	N	
<i>Syzygium maire</i>	maire tawake				◐	●	●	○	◐	●	○	sheltered always boggy	15		

Understorey														
Listed in order from wettest to driest habitat		25	25	15	flood	wet	moist	dry	sun	shade	frost	Planting tips		
<i>Coprosma tenuicaulis</i>	hukihuki/swamp coprosma				●	●	○	○	●	○	●	very boggy to damp place	3	F
<i>Coprosma propinqua</i>	mingimingi				●	●	○	○	●	○	●	very boggy to damp place	7	F
<i>Coprosma rigida</i>					●	●	●	●	●	○	●	anywhere	5	F
<i>Carpodetus serratus</i>	putaputaweta				○	●	○	○	○	●	●	above flood levels	10	F
<i>Streblus heterophyllus</i>	turepo				○	○	●	○	○	●	●	sheltered	12	
<i>Melicytus micranthus</i>	swamp mahoe				●	○	●	○	●	●	○	flood zone, sheltered	5	F
<i>Dicksonia squarrosa</i>	wheki				○	●	●	●	●	●	●	damp shade	2-8	
<i>Myrsine australis</i>	mapou				○	○	●	●	●	●	○	anywhere	7	F
<i>Melicytus ramiflorus</i>	mahoe				○	○	●	○	●	●	○	sheltered	10	F
<i>Cyathea dealbata</i>	ponga				○	○	●	●	●	●	○	damp shade	10	
<i>Cyathea medullaris</i>	mamaku				○	○	●	●	●	●	○	damp shade	20	
<i>Pseudopanax crassifolius</i>	horoeka/lancewood				○	○	●	○	●	○	●		15	F
Grasses, sedges, lilies, ferns and ground covers					<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>									
Listed in order from wettest to driest ground		25	10	15										
<i>Machaerina articulata</i>	jointed baumea				○	●	●	○	●	○	●	shallow water	1.8	
<i>Empodisima minus</i>	wire rush				○	●	●	○	●	○	●	mature peat	1	
<i>Gleichenia dicarpa</i>	tangle fern				○	●	●	○	●	○	●	mature peat		
<i>Carex virgata</i>	purei/pukio				○	●	●	○	●	○	●	wet	1	
<i>Carex secta</i>	purei/pukio				○	●	●	○	●	○	●	wet	1-2	
<i>Carex lessoniana</i>	rautahi/forest sedge				○	●	●	○	●	○	●	wet	1	
<i>Gahnia xanthocarpa</i>	giant sedge				●	●	○	○	●	●	●	boggy sun or shade	1.5	
<i>Astelia grandis</i>	swamp astelia				●	●	●	○	●	●	●	boggy shaded place		
<i>Blechnum minus</i>	swamp kiokio				○	●	○	○	●	●	●	boggy shaded place	1	
<i>Eleocharis acuta</i>	sharp spike sedge				○	●	●	○	●	○	●	boggy open area		
<i>Sparganium subglobosum</i>	maru/burr reed				○	●	●	○	●	○	●	boggy open area		
<i>Machaerina sinclairii</i>	strap sedge				●	●	●	○	○	●	●	boggy shaded place		
<i>Elatostema rugosum</i>	parataniwha	0			○	●	○	○	○	●	○	moist shady place		
<i>Dianella haemata</i>	swamp blueberry				○	●	●	●	●	●	●	damp semi-shade		F
<i>Carex dissita</i>	forest sedge				○	○	●	○	○	●	●	damp semi-shade		
<i>Carex solandri</i>	forest sedge				○	○	●	○	○	●	●	damp semi-shade		
<i>Carex uncinata</i>	hook sedge				○	○	●	○	○	●	●	damp semi-shade		

Climbers and epiphytes		0	0	10	food	wet	moist	dry	sun	shade	frost	Planting tips		
<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>Freycinetia banksii</i>	kiekie				◐	●	●	◐	◐	●	◐	damp shady ground		F/N
<i>Astelia hastata</i>	kahakaha				○	○	●	●	●	●	○	raised soil or attach to tree fork		
<i>Parsonsia heterophylla</i>	kaihua/NZ jasmine				●	●	●	○	●	◐	◐	semi-shade		
<i>Microsorium pustulatum</i>	kowaowao				◐	○	◐	●	●	●	○	attach to tree		
<i>Ripogonum scandens</i>	kareao/supplejack				●	●	●	◐	●	●	○	damp shade		F

Take care to ensure plants are ecosourced from natural areas