Planting guide for Western Waikato

Raglan coast

This planting guide is designed to assist anyone undertaking ecological restoration in the area from coastal Te Akau, around the Whaingaroa shoreline and down the Karioi coast. It is one in a series of planting guides covering different ecosystems in the Waikato District, including the western ranges and hills; sections of the Waikato and Waipa rivers; peat lakes and kahikatea remnants.

The species lists are not intended to be a comprehensive description of the primeval forests that once existed in the area 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 Te Akau hills, Whaingaroa shoreline and Karioi coast

This coastal environment is characterised by a mild, humid climate. Landforms vary from steep rocky exposed coastal cliffs to rolling hills and sheltered salt marsh. Species tolerant of salt spray and which might otherwise be knocked by frost in other parts of the Waikato predominate along the Raglan coast.

Five distinct planting zones are identified. Each zone has its own assemblage of plants grouped into different categories such as colonisers; canopy trees; understory shrubs; grasses/sedges/ferns and ground covers; and climbers and epiphytes. A representative range of species for each category is included in order that something resembling the natural structure of the plant community can be restored over time. 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 for 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. The approximate final height of a plant is given where it is over one metre.

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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

The plants value as bird food is indicated by an N for nectar and F for fruit and seeds.

Some birds like bellbird/korimako, kaka, kakariki, tui and silvereye/tauhou feed on both fruit and nectar. Kereru is a fruit and foliage eater whereas other native birds such as fantail/pïwakawaka, grey warbler/riroriro, shining cuckoo/pipiwharauro and robin/toutawai prefer insects. Kingfisher/kotare and morepork/ruru include rodents and lizards in their diet.

Seabirds also frequent the coastal environment, some using the harbour shoreline as roosting sites while the grey faced petrel (oi) nest in burrows on the coastal cliffs south of Raglan. Retaining a vegetative cover is important in providing protection for the burrows.

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.

Coastal Te Akau

Low hills

Exposed to sea breezes but sheltered from frost, the coastal fringe is dominated by low growing species, tolerant of wind, salt spray and disturbance near the shore. Over a few hundred metres this graduates into a taller coastal forest. As distance from the coast increases this forest merges into a broadleaf forest more typical of the inland ranges

Characteristic species		Planting			Plant tolerances / preferences							Planting tips		
		Suggested number of plants per 100 m^2			○ unlikely to survive ◔ may survive but not thrive ● well adapted to conditions									
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**
Colonisers **Listed in order from shoreline to higher ground**		**60**	**10**	**0**	***Colonisers are typically quick growing, tolerant of a wide range of environments and effective and early dispersers***									
Muhlenbeckia complexa	pohuehue				●	●	●	●	●	○	●	exposed areas		
Phormium tenax	harakeke / flax				●	●	●	●	●	○	●	exposed areas	2.5	N
Austroderia splendens	toetoe				●	●	●	●	●	○	●	exposed areas		
Coprosma repens	taupata				○	○	◔	●	●	○	○	steep ground	8	F
Leptospermum scoparium	manuka				●	●	●	●	●	○	●	exposed areas	8	
Hebe stricta	koromiko				○	◔	●	●	●	○	●	exposed areas	4	
Olearia albidia	tanguru				○	○	◔	●	●	◔	○	exposed areas	8	
Olearia furfuracea	akepiro				?	○	●	●	●	◔	?	exposed areas	7	
Carmichaelia australis	native broom				○	○	◔	●	●	◔	●	exposed areas	10	
Cordyline australis	ti köuka/cabbage tree				●	●	●	◔	●	◔	●	full sum	12	F/N
Coprosma robusta	karamu				●	◔	◔	◔	●	○	◔	good soil	5	F
Kunzea robusta	kanuka				●	○	●	●	●	○	●	exposed areas	16	N

Canopy trees listed in order of tolerance to extreme coastal conditions		**15**	**15**	**0**	**flood**	**wet**	**moist**	**dry**	**sun**	**shade**	**frost**	**Planting tips**		
Sophora microphylla	kowhai				●	◐	●	●	●	○	●	exposed areas	10	N
Vitex lucens	puriri				◐	●	●	●	●	●	○	rich soil	20	F/N
Dysoxylum spectabile	kohekohe				◐	○	●	◐	◐	●	○	sheltered sloping ground	17	
Coprosma arborea	mamangi				○	○	◐	●	●	◐	○	well drained sloping ground	10	F
Podocarpus totara	totara				●	◐	●	◐	●	◐	●	anywhere	30	F
Knightia excelsa	rewarewa				◐	○	●	◐	●	◐	●	damp clay banks	30	
Prumnopitys ferruginea	miro				?	○	◐	●	●	●	●	well drained sloping ground	35	F
Weinmannia racemosa	kamahi				○	○	●	●	●	◐	●	steep ground	26	
Understorey		**25**	**25**	**15**	***Understorey plants thrive in the stable conditions created under trees***									
Brachyglottis repanda	rangiora				○	○	◐	●	●	●	?	well drained areas	7	
Coprosma areolata					◐	○	●	◐	●	●	?	sloping ground	5	F
Coprosma grandifolia	kawariki/kanono				●	◐	●	○	◐	●	○	moist shady stream banks	6	F
Coprosma lucida	shining karamu				◐	○	◐	●	●	●	●	well drained sloping ground	5	F
Coprosma rhamnoides					◐	○	●	◐	●	●	●	well drained sloping ground	2	F
Cordyline banksii	te ngähere/bush cabbage tree				?	○	◐	●	●	◐	?	well drained sloping ground	3	F
Geniostoma ligustrifolium	hangehange				◐	◐	●	◐	●	●	◐	wide range of tolerances	4	
Hedecarya arborea	porokaiwhiri/pigeonwood				●	◐	●	◐	◐	●	◐	sheltered site initially	12	F
Leucopogon fasciculatus	mingimingi					◐	◐	◐	●	◐	●	light shade	5	F
Melicope ternata	wharangi				?	?	●	●	●	◐	○	exposed areas	8	
Melicytus ramiflorus	mahoe				◐	◐	●	◐	●	●	◐	sheltered site initially	10	F
Myrsine australis	mapou				◐	◐	●	●	●	●	◐	anywhere	7	F
Olearia ranii	heketara				○	○	◐	●	●	●	?	well drained	8	
Piper excelsum	kawakawa				○	○	●	●	●	●	○	sheltered areas	3-7	F
Pseudopanax crassifolius	horoeka/lancewood				?	●	●	●	●	◐	●	exposed areas	13	F
Rhabdothamnus solandri	taurepo				◐	◐	●	○	◐	●	○	steep wet banks	2	
Rhopalostylis sapida	nikau				?	?	●	○	◐	●	◐	sheltered areas	10	F
Schefflera digitata	pate/patete				○	◐	●	○	●	●	◐	wet areas above any flood	8	F
Streblus heterophyllus	turepo					◐	◐	◐	◐	●	●	sheltered site initially	12	F
Carpodetus serratus	putaputaweta				○	◐	●	○	●	●	●	damp areas above any floods	10	F

Fuchsia excorticata	kotukutuku				○	◔	●	○	◔	●	◔	damp areas above any floods	12	F
Grasses, sedges and ferns		**0**	**10**	**15**	**flood**	**wet**	**moist**	**dry**	**sun**	**shade**	**frost**	**Planting tips**		
Peperomia urvilleana	wharanui				?	○	●	◔	◔	●	○	amongst rocky outcrops		
Polystichum neozelandicum	*subsp neozelandicum*				○	○	●	●	◔	●	?	sheltered areas		
Asplenium oblongifolium	shining spleenwort				?	?	◔	●	◔	●	?	sheltered areas		
Blechnum parrisiae	rasp fern				?	?	◔	●	◔	●		light shade		
Gahnia lacera	cutty grass				?	?	?	?	?	?	?	exposed areas		
Carex solandri	forest sedge				?	◔	●	◔	◔	●	?	moist soil		
Climbers and epiphytes		**0**	**0**	**10**	***These plants take advantage of trees to get their leaves up into the sunlight***									
Asplenium flaccidum	hanging spleenwort											attach to tree		
Asplenium polyodon	sickle spleenwort											attach to tree		
Astelia solandri	kaiwharawhara											attach to tree		
Astelia hastata	kahakaha											attach to tree fork		F
Microsorum pustulatum	kowaowao/hounds tongue											attach to tree		N
Microsorum scandens	mokimoki											attach to tree		
Pyrrosia eleagnifolia	leather leaf fern											attach to tree		
Earina autumnalis	Easter orchid				Never collect orchid plants from natural areas							attach to tree		
Earina mucronata	peka-a-waka											attach to tree		
Dendrobium cunninghamii	winika											attach to tree		
Clematis paniculata	puawhananga				○	○	●	○	◔	●	○	sheltered areas, cool root run		
Freycinetia banksii	kiekie				◔	●	●	◔	◔	●	◔	moist sheltered areas		F/N
Metrosideros fulgens	rata				○	○	○	●	●	●	○	dry ground		N
Metrosideros diffusa	akatea				○	○	○	●	●	●	○	sheltered area at base of tree		N
Metrosideros perforata	akatea				○	○	○	●	●	●	○	sheltered area at base of tree		N
Parsonsia heterophylla	kaihua/NZ jasmine				●	●	●	○	●	●	○	moist sheltered areas		
Passiflora tetrandra	kohia/NZ passionfruit				●	○	●	●	●	○	?	open areas		
Ripogonum scandens	kareao/supplejack				●	◔	●	◔	●	●	?	damp shady area		F
Rubus cissoides	bush lawyer				●	◔	●	●	●	◔	?	open areas		F

Coastal Raglan / Whaingaroa

Harbour shore

Tolerant of salt laden spray and vulnerable to frosts should they occur. The forest margin surrounding the Whaingaroa Harbour is lower stature than forest further back from the shore. This may be partly due to the rocky substrate and partly due to the exposed conditions. Some species which elsewhere might be considered colonisers are here part of the canopy. It is interesting to note that on rocky outcrops, puka (Grisilinea lucida), usually an epiphyte elsewhere, is the predominant tree.

Characteristic species		Planting			Plant tolerances/preferences							Planting tips		
		Suggested number of plants per 100m^2			○ unlikely to survive ◔ may survive but not thrive ● well adapted to conditions									
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**
Colonisers Listed in order of tolerance to extreme coastal conditions		**60**	**10**	**0**										
Muhlenbeckia complexa	pohuehue				●	●	●	●	●	○	●	sand and clay		F
Leptospermum scoparium	manuka				●	●	●	●	●	○	●	clay banks	8	N
Hebe stricta	koromiko				○	○	●	●	●	○	●	clay banks and rocky outcrops	4	
Olearia furfuracea	akepiro				○	○	◔	●	●	◔	?	clay banks	7	
Kunzea robusta	kanuka				●	○	●	●	●	○	●	back from water's edge	16	N
Canopy trees Listed in order from most common to least common		**15**	**15**	**0**	***Karaka (Corynocarpus laevigatus) while common along the shore, is currently thought to be a native plant of Northland introduced to the area and so is not included in the species list.***									
Vitex lucens	puriri				?	?	●	●	●	●	○	rich soil	20	F/N
Griselina lucida	puka				?	?	◔	●	●	◔	?	on rocky outcrops	8	
Sophora microphylla	kowhai				●	◔	●	●	●	○	●	exposed areas	10	N
Olearia albida	tanguru				?	?	◔	●	●	○	?	exposed areas	8	

Understorey **Listed in order of most common to least common**		**25**	**25**	**15**	**flood**	**wet**	**moist**	**dry**	**sun**	**shade**	**frost**	**Planting tips**		
Geniostoma rupestre	hangehange				◐	◐	●	◐	●	●	◐	wide range of tolerances	4	N
Melicytus ramiflorus	mahoe				●	◐	●	◐	◐	●	◐	moist sheltered areas	10	F
Leucopogon fasciculatus	mingimingi				?	●	●	●	●	◐	●	well drained areas	5	
Coprosma rhamnoides					◐	○	●	◐	●	●	●	exposed site	2	
Piper excelsum	kawakawa				○	◐	●	◐	◐	●	○	sheltered sloping ground	7	F
Myrsine australis	mapou				◐	◐	●	●	●	●	◐	anywhere	7	F
Coprosma areolata					◐	○	●	◐	●	●	?	sloping ground	5	F
Coprosma lucida	shining karamu				◐	○	◐	●	●	●	●	well drained sloping ground	5	F
Cordyline banksii	bush cabbage tree				?	○	◐	●	●	◐	?	well drained sloping ground	6	F
Melicope ternata	wharangi				?	?	●	●	●	◐	○	exposed areas	8	
Pseudopanax crassifolius	horoeka/lancewood				?	●	●	●	●	◐	●	exposed areas	13	F
Rhabdothamnus solandri	taurepo				◐	◐	●	○	◐	●	○	steep wet banks	2	
Rhopalostylis sapida	nikau				?	?	●	○	◐	●	◐	sheltered areas	10	F
Fuchsia excorticata	kotukutuku				○	◐	●	○	◐	●	◐	damp sheltered areas	12	F
Brachyglottis repanda	rangiora				○	○	◐	●	●	●	?	well drained areas	7	
Olearia ranii	heketara				○	○	◐	●	●	●	?	well drained	8	
Grasses, sedges, ferns and ground covers		**0**	**10**	**15**										
Peperomia urvilleana	wharanui				?	○	●	●	◐	●	○	crevasses on rocky outcrops		
Carex solandri	forest sedge				●	◐	●	◐	●	●	●	damp areas		
Gahnia lacera	cutty grass				?	?	●	●	●	○	?	exposed areas		
Astelia banksii	Coastal astelia				?	?	●	●	●	○	?	on rocky outcrops		F
Blechnum parrisiae	rasp fern				?	○	●	●	●	●	?	well drained moist areas		
Asplenium oblongifolium	shining spleenwort				○	○	●	●	◐	●	○	well drained shady areas		
Climbers and epiphytes		**0**	**0**	**10**										
Pittosporum cornifolium	tawhirikaro				?	?	●	●	●	◐	?			
Astelia hastata	kahakaha				○	○	●	●	●	●	○	attach to tree fork		F
Astelia solandri	kaiwharawhara													F
Asplenium flaccidum	hanging spleenwort													

Asplenium polyodon	sickle spleenwort				○	○	●	●	●	●	○	damp shady ground		
Microsorum pustulatum	kowaowao/hound tongue fern				◍	○	◍	●	●	●	○	attach to tree		N
Pyrrosia eleagnifolia	leather leaf fern													
Metrosideros perforata	akatea				○	○	○	●	●	●	○	sheltered area at base of tree		N
Metrosideros diffusa	akatea				○	○	○	●	●	●	○	sheltered area at base of tree		N
Passiflora tetrandra	kohia/NZ passionfruit				●	○	●	●	●	○	?	open areas		F
Parsonsia heterophylla	kaihua/NZ jasmine				●	●	●	○	●	●	◍	moist sheltered areas		N

Coastal Raglan/Whaingaroa

Saltmarsh

Planting is not encouraged in this sensitive environment. However plants from this environment may be useful amenity species for the areas immediately inland from the shore. Planting of typical saltmarsh species is encouraged in order to preserve the natural character of the area while maintaining views.

Characteristic species		Planting			Plant tolerances/preferences							Planting tips		
		Suggested number of plants per 100m^2			○ unlikely to survive ◌ may survive but not thrive ● well adapted to conditions									
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**
Listed in order from most tolerant of extreme coastal conditions		**50**												
Sarcornia quinqueflora	ureure / glasswort				●	●	●	●	●	○				
Selliera radicans	remuremu				●	●	●	●	●	○		Easy care may require weeding		
Samolus repens	māakoako / sea primrose				●	●	●	●	●	○		Easy care may require weeding		
Cotula coronofolia	bachelors button				●	●	●		●	○		Easy care may require weeding		
Juncus kraussi	wiwi				●	●	●	●	●	○		Easy care may require weeding		
Apodasmia similis	oioi				●	●	●	●	●	○	●	Easy care may require weeding		
Plagianthus divaricatus	mākaka / saltmarsh ribbonwood				●	●	●		●	○	●	Easy care may require weeding	2	
Muhlenbeckia complexa	pohuehue				●	●	●	●	●	○	●	Easy care may require weeding		F

Karioi Coast

Low forest on exposed coastal headlands

Nestled amongst the rock crevices, buffeted by strong winds, exposed to harsh sun and drenched by salt spray, these hardy plants take advantage of the lack of competition from less hardy species

Characteristic species		Planting			Plant tolerances/preferences							Planting tips		
		Suggested number of plants per 100m^2			○ unlikely to survive ◌ may survive but not thrive ● well adapted to conditions									
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**
Colonisers		**40**			***In this context, colonisers are species which establish early and are expected in time to yield tall trees***									
Hebe stricta	koromiko				○	○	●	●	●	○	●	exposed sites	4	
Coprosma robusta	karamu				●	●	●	●	●	○	◌	moister sites	5	F
Leptospermum scoparium	manuka				●	●	●	●	●	○	●	exposed sites	8	N
Kunzea robusta	kanuka				●	●	●	●	●	○	●	deeper soil	16	N
Canopy trees		**15**	**15**	**0**	***On this site, this group includes shorter species which form a canopy in the exposed conditions***									
Hoheria sextylosa	houhere / lacebark				●	◌	●		●	◌	●	moist deep soil	6	
Olearia albida					○	○	●	◌	●	○	○	rocky places	5	
Vitex lucens	puriri				●	◌	●	◌	●	◌	○	moist deep soil	20	F
Dysoxylum spectabile	kohekohe				◌	○	●	◌	●	●	○	moist deep well drained soil	15	F
Rhopalostylis sapida	nikau				○	◌	●	○	◌	●	○	moist deep soil	10	F
Entelea arborescens	whau						●	●	●	◌		rocky places	6	
Pseudopanax crassifolius	horoeka / lancewood				●	●	●	●	●	◌	●	almost anywhere	13	F
Cordyline banksii	te ngähere/bush cabbage tree				?	○	◌	●	●	◌	?	well drained sloping ground	4	

Understorey		**45**	**25**	**15**	**flood**	**wet**	**moist**	**dry**	**sun**	**shade**	**frost**	***Although normally understorey plants, sometime these tough plants form a low canopy***		
Geniostoma ligustrifolium	hangehange					●	●	◌	●	●	●	avoid very dry spots	4	
Piper excelsum	kawakawa				○	○	●	◌	●	●	○	avoid wet areas	7	F
Coprosma rhamnoides							●	◌	●	●	●	avoid very dry and sunny areas	2	F
Melicytus ramiflorus	mahoe				●	◌	●	◌	◌	●	◌	moist sheltered areas	10	F
Melicope ternata	wharangi						●	◌	●	◌		likes a little shelter	6	
Grasses, sedges, ferns and ground covers		**0**	**10**	**15**										
Polystichum wawranum							●	◌	◌	●		under other cover		
Leucopogon fraserii	patotara						●	●	●	○		very exposed rocky sites		
Carex solandri	sedge				●	●	●	◌	◌	●		moist sites under other cover		
Oplismenus hirtellus	grass						●	●	◌	●		shady less productive sites		
Climbers and epiphytes		**0**	**10**	**10**										
Metrosideros perforata	akatea				○	○	◌	●	●	●	○	sheltered area at base of tree		N
Clematis paniculata	puawhananga						●	◌	◌	●		near trees to climb		
*Astelia hastat*a	kahakaha				○	○	●	●	●	●	○	attach to tree fork		F

Karioi Coast

Steep cliffs close to shore from Manu Bay to Ruapuke

Nestled amongst the rock crevices, buffeted by strong winds, exposed to harsh sun and drenched by salt spray, these hardy plants take advantage of the lack of competition. These are ideal species for a native rock garden along this coast.

Characteristic species		Planting			Plant tolerances/preferences							Planting tips		
		Suggested number of plants per 100m^2			○ unlikely to survive ◍ may survive but not thrive ● well adapted to conditions								maximum height (approx) if over 1 metre	bird food type
		open ground	established cover	mature stage	flood	wet	moist	dry	sun	shade	frost			
Listed in order from most tolerant of extreme coastal conditions		**50**	**0**	**0**										
Apodasmia similis	oioi				●	●	●	●	●	○	●	easy care, may require weeding		
Samolus repens	màakoako/sea primrose				●	●	●	●	●	○		easy care, may require weeding		
Apium prostratum	tūtae kōau/native celery				●	◍	●	●	●	○		easy care, may require weeding		
Austrostipa stipoides	coastal immorality grass						◍	●	●	○		plant in crevasses		
Austroderia splendens	toetoe					○	●	●	●	○		easy care, may require weeding		
Arthropodium cirratum	rengarenga/rock lily						●	●	●	○	○	easy care, may require weeding		
Disphyma australe	horokaha/ice plant						◍	●	●			easy care, may require weeding		
Carex solandri	sedge				●	●	●	●	●	◍	●	plant in moist deep soil		
Phormium tenax	harakeke/flax				●	●	●	●	●	◍	●	anywhere in sunlight	3	N
Coprosma repens	taupata						●	●	●	◍		plant in crevasses		F

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