Appendix I

The following are geological definitions of the stream bank substrates considered in the Planting Guide. If unsure about which of the stream bank substrates apply at a site, a geological map of the area may be consulted. Relevant characteristics of the streams flowing through these substrates are also given.

Clay soils

The main source of water is overland flow and groundwater. The key characteristics are steep catchments with weathered rocks and clay.

On geological maps, the following major formations will be in this category. -

- 200 million year old greywacke (Waipapa Group) rocks of the Hunua area
- 20 million year old andesite, dacite and basalt volcanic rocks and pyroclastic material (Lone Kauri and Waiatarua formations). In the Waitakere Ranges, this makes up the relatively high plateau area (~300-400m) and some of the coastal cliff and rocky stream gully areas of the ranges.
- 20 million-year-old sedimentary rocks made up of particles from volcanic rocks (Waitakere Group) that today make up the bulk of the Waitakere Ranges.
- 20 million-year-old sedimentary rocks made up mainly of particles from 200 million-year-old rocks (Waitemata Group).

Sandy soils

Sandy soils range from moderately consolidated clayey sands that make up headlands and steep sided gullies, to mobile sands that make up sand dunes. The main source of water is groundwater and it is common to find low water temperatures at the source. The key characteristics are wetlands, small lakes and spring fed streams.

On geological maps, these streams run through the following three major formations:

- The moderately consolidated clayey sands (Awhitu Sand formation) that cap coastal hills and erode into fairly steep cliffs on the coast, or steep-sided gullies inland.
- Moderately consolidated or loose sand dunes (Karioitahi Sand formation).
- Holocene sand formations. Unconsolidated sands (Mitiwai Sand formation) that make up the beach sand, drifting dunes, and fixed dunes of the region.

Alluvial soils

The main source of water is overland flow and groundwater. The key characteristics are low gradient streams on floodplains, with low velocities and natural meanders. Stream bank erosion is a characteristic. The soils are clay in the north and pumice in the south of the region.

On geological maps, the following three major formations will be in this category. A variety of substrates (Tauranga Group) have been deposited within water over the last 2 million years.

- The majority of the deposits are pumice, sometimes with peat or lignite beds (Puketoka Formation). These make up much of the lowland flats of the Auckland Region. These are accumulations deposited approximately 2 million years ago.
- Undifferentiated alluvium is also present in many places along streams, as flood plains and as bayhead flats. They consist of a variety of materials derived from the hinterland.
- Organic-rich alluvium, rich in peat, forms lowlands in places. These are swamp deposits.

Volcanic substrates

The main source of water on volcanic substrates is groundwater and springs. There are high base flows and low water temperatures at the source. In the Franklin area, there are old, deep soil horizons more likely to erode than other volcanic rocks.

The volcanic substrates fall into two types, present in two parts of the Auckland Region mainland.

- Young basaltic volcanic rocks and pyroclastic material of the Auckland Volcanic Field, scattered through much of the urban part of Auckland.
- Older Franklin volcanic rocks in the Pukekohe area, with weathered basalt and tuff, extending from Waiuku across to the foothills of the Hunua Ranges

Appendix II - Actual or potential environmental weeds of indigenous ecosystems

The following table is a list of weed species that may potentially cause significant damage to natural areas and revegetation sites. Many of the species are National Surveillance Plant Pests. Others were designated as medium or high impact or priority weeds in either the draft Auckland City Council weed management policy or the Auckland Conservancy weed management strategy. Other reasons have been itemised in the final column.

Table 11 List of weed species that may potentially cause significant damage

Common name	Botanical name	Impact (ACC policy)	Priority (DoC Akld)	Reason for significance
African feather grass	*Pennisetum macrourum*	Medium	Medium	
African olive	*Olea europaea* subsp. *Africana*	Low	Medium	
Agapanthus	*Agapanthus praecox*	Medium	High	
alligator weed	*Alternanthera philoxeroides*	High	Medium	
aluminium plant	*Galeobdolon luteum*			
angel's trumpet	*Brugmansia candida*			
apple of sodom	*Solanum linnaeanum*	Medium	Lower	
Aristea	*Aristea ecklonii*		High	
arum lily	*Zantedeschia aethiopica*	Low	Lower	The DOC national tables list this species as established, with an isolated or confined distribution, but distribution/impacts unknown.
asparagus fern; sprengeris fern	*Asparagus densiflorus*	Medium	Medium	
asparagus, climbing	*Asparagus scandens*	High	High	
asparagus, ferny; asparagus fern	*Asparagus setaceus*	Medium		
Australian ngaio	*Myoporum insulare*			This species has been listed as a high priority in the Motutapu weed strategy although Webb et al. (1988) point out that it is rarely properly naturalised.
Australian sedge	*Carex longebrachiata*	Medium	Lower	
bamboo	*Arundinaria japonica*	Medium		
bamboo	*Phyllostachys* sp.			
bamboo, black	*Phyllostachys nigra*	Medium		
bamboo, fishpole	*Phyllostachys aurea*	Medium		
barberry	*Berberis glaucocarpa*	Medium	Medium	
bartlettina	*Bartlettina sordida*	Low	Lower	
bathurst bur	*Xanthium spinosum*	Medium		
bay tree	*Laurus nobilis*			
bindweed	*Calystegia sepium*			
bindweed, field; convolvulus	*Convolvulus arvensis*	High	Lower	
bindweed, great	*Calystegia silvatica*	Low		
blackberry	*Rubus fruticosus* agg.	Medium	Lower	

Table 11 continued

Common name	Botanical name	Impact (ACC policy)	Priority (DoC Akld)	Reason for significance
black-eyed Susan	*Thunbergia alata*	Low		Observed growing profusely on coastal cliffs near Blockhouse Bay (Esler, pers. comm.)
blue morning glory	*Ipomoea indica*	Low	Medium	
blue passion vine	*Passiflora caerula*	Medium	Medium	
blue spur flower	*Plectranthus ecklonii*	Medium	Lower	
blue spur flower, large-leaved	*Plectranthus grandis*	Medium		
boneseed	*Chrysanthemoides monilifera*	High	High	
bougainvillea	*Bougainvillea glabra*	Low		
boxthorn	*Lycium ferocissimum*	Medium	Medium	
broom	*Cytisus scoparius*	Low	Lower	The DOC national tables list this species as only just starting to spread in the conservancy, but distribution/impacts unknown.
brush cherry	*Syzygium australe*	Low	Medium	
buddleia	*Buddleja davidii*	Medium	Medium	
buffalo grass	*Stenotaphrum secundatum*	Low	Lower	
Cape daisy	*Arctotheca calendula*	Medium	Lower	
cape gooseberry	*Physalis peruviana*			
Cape honey flower	*Melianthus major*	Low	Medium	
cape tulip	*Homeria flaccida*	Medium		
castor oil plant	*Ricinus communis*	Low	Lower	
cathedral bells	*Cobaea scandens*	Medium	High	
cestrum	*Cestrum* sp.			
cestrum, green	*Cestrum parqui*	High	Lower	
cestrum, orange	*Cestrum aurantiacum*		Lower	The DOC national tables list this species as only just starting to spread in the conservancy, but distribution/impacts unknown.
cestrum, red	*Cestrum elegans*	Medium		
cherry	*Prunus* sp.	Low	Lower	The DOC national tables list this species as established, with an isolated or confined distribution, but not considered to be either a present or potential significant pest.
Chilean flame creeper	*Tropaeolum speciosum*		Medium	
Chilean needle grass	*Stipa neesiana*	Medium		
clasped pondweed	*Potamogeton perfoliatus*	High		
clematis	*Clematis flammula*		High	
climbing dock	*Rumex sagittatus*	High	Medium	
coral tree	*Erythrina* xsykesii			
cotoneaster	*Cotoneaster glaucophyllus*	Low	Medium	
dally pine (or pine weed)	*Psoralea pinnata*		Medium	
eelgrass	*Vallisneria gigantea*	Medium		
egeria	*Egeria densa*	High		

Table 11 continued

Common name	Botanical name	Impact (ACC policy)	Priority (DoC Akld)	Reason for significance
elaeagnus	*Elaeagnus xreflexa*	High	High	
elephant's ear	*Alocasia brasiliensis*	Low		The DOC national tables list this species as thought to be present, but distribution, trends and impacts unknown.
eucalyptus species	*Eucalyptus* sp.		Medium	
fairy crassula	*Crassula multicava*		Lower	A significant problem on the rocklands of Rangitoto and on coastal cliffs - potentially stream banks.
fatsia	*Fatsia japonica*			Was listed in Webb et al. (1988) as being known in the North Island from only 3 collections, but has been found to be numerous in surveys in the Auckland Region.
fig, Moreton Bay	*Ficus macrophylla*	Medium		
fig, Port Jackson	*Ficus rubiginosa*	Medium	Lower	
fountain grass	*Pennisetum setaceum*	Low	Medium	
giant reed	*Arundo donax*	High	Medium	
ginger, kahili	*Hedychium gardnerianum*	High	High	
ginger, yellow	*Hedychium flavescens*	High	Medium	
gladiolus, wild	*Gladiolus undulatus*	Medium		
gorse	*Ulex europaeus*	Medium	Medium	
grape	*Vitis vinifera*	Low		
guava, purple	*Psidium cattleianum*	Medium	High	
hakea, downy	*Hakea gibbosa*	Medium	Medium	
hakea, prickly; needlebush	*Hakea sericea*	Medium	Medium	
hakea, willow-leaved	*Hakea salicifolia*	Medium	Medium	
hawthorn	*Crataegus monogyna*	Medium	Medium	
heather	*Calluna vulgaris*	Low	Medium	
honeysuckle, Himalayan	*Leycesteria formosa*	Medium	Lower	
honeysuckle, Japanese	*Lonicera japonica*	High	High	
hornwort	*Ceratophyllum demersum*	High		
houttuynia	*Houttuynia cordata*			
ice plant, African	*Carpobrotus edulis*		Lower	
inkweed	*Phytolacca octandra*		Lower	The DOC national tables list this species as established and widespread, but distribution/impacts unknown.
iris, stinking	*Iris foetidissima*	Low	Lower	The DOC national tables list this species as established, with an isolated or confined distribution, but distribution/impacts unknown.
Italian arum	*Arum italicum*		Lower	The DOC national tables list this species as established, with an isolated or confined distribution, but not considered to be either a present or potential significant pest.

Table 11 continued

Common name	Botanical name	Impact (ACC policy)	Priority (DoC Akld)	Reason for significance
ivy	*Hedera helix* subsp. *Helix*	Medium	Medium	
ivy, Cape	*Senecio angulatus*	Low	Medium	
ivy, german	*Senecio mikanioides*	Low	Medium	
Japanese spindle tree	*Euonymus japonicus*	Low	Medium	
jasmine	*Jasminum polyanthum*	High	High	
jasmine, yellow (or Italian)	*Jasminum humile*		Medium	
Jerusalem cherry	*Solanum pseudocapsicum*		Lower	The DOC national tables list this species as established, with an isolated or confined distribution, but distribution/impacts unknown.
jointed rush	*Juncus articulatus*		Medium	
kikuyu grass	*Pennisetum clandestinum*	High	High	
lantana	*Lantana camara*	High	High	
loquat	*Eriobotrya japonica*	Low	Medium	
lotus	*Lotus pedunculatus*		Medium	
lupin, tree	*Lupinus arboreus*		Lower	The DOC national tables list this species as established and widespread, but distribution/impacts unknown.
Madeira vine, mignonette	*Anredera cordifolia*	High	High	
Manchurian rice grass	*Zizania latifolia*		High	
Mercer grass	*Paspalum distichum*	Low	Medium	
Mexican daisy	*Erigeron karvinskianus*	High	Medium	
Mexican devil	*Ageratina adenophora*	Low	High	
mile-a-minute	*Dipogon lignosus*	Low	Medium	
mist flower	*Ageratina riparia*	High	High	
monkey apple	*Acmena smithii*	Medium	High	
montbretia	*Crocosmia* x *crocosmiiflora*	Medium	Medium	
Montpellier broom	*Teline monspessulana*		Lower	Webb et al. (1988) describe this species as locally common in waste places and scrubland and able to grow in very dry situations. This species has been given a medium priority in the Motutapu weed strategy.
moth plant, cruel plant	*Araujia sericifera*	Medium	High	
mountain pawpaw	*Carica pubescens*			
Mysore thorn	*Caesalpinia decapetala*		Medium	
nasturtium	*Tropaeolum majus*		Lower	The DOC national tables list this species as established and widespread, but not considered to be either a present or potential significant pest.
nightshade, white-edged	*Solanum marginatum*	Medium		
nightshade, woolly	*Solanum mauritianum*	Low	Medium	
old man's beard	*Clematis vitalba*	High	High	
oxygen weed	*Lagarosiphon major*	High		

Table 11 continued

Common name	Botanical name	Impact (ACC policy)	Priority (DoC Akld)	Reason for significance
oxylobium	*Oxylobium lanceolatum*	Low	Medium	
palm grass	*Setaria palmifolia*	Low		The DOC national tables list this species as only just starting to spread in the conservancy, but distribution/impacts unknown.
palm, Chinese windmill	*Trachycarpus fortunei*			Potentially a problem, with wild plants well established in Auckland City, Little Barrier and Kawau (Webb et al., 1988).
palm, phoenix	*Phoenix canariensis*	Low	Lower	Listed as low impact in Auckland City weed strategy, but observed to be a potentially considerable problem on coastal cliffs.
pampas	*Cortaderia sp.*			
pampas, purple	*Cortaderia jubata*	High	High	
pampas, white	*Cortaderia selloana*	Medium	High	
parrots feather	*Myriophyllum aquaticum*	High		
passionfruit, banana	*Passiflora mixta*	Low	High	
passionfruit, banana	*Passiflora mollissima*	Low	High	
passionfruit, black	*Passiflora edulis*		Medium	The DOC national tables list this species as only just starting to spread in the conservancy, but present distribution/numbers not affecting high conservation value sites.
periwinkle	*Vinca major*	Medium	Medium	
pine	*Pinus* sp.		Medium	
pine, maritime	*Pinus pinaster*	Low	Lower	
pine, radiata	*Pinus radiata*	Low	Medium	
pink-head knotweed	*Polygonum capitatum*	Low		A low priority species in the Auckland City Council weed policy, but has potential to be a significant problem on open lands and rock lands
plectranthrus	*Plectranthus ciliatus*	Medium	Lower	
Port St John creeper	*Podranea ricasoliana*	Low	Medium	
potato vine	*Solanum jasminoides*		Medium	
prickly Moses	*Acacia verticillatum*		Medium	
privet, Chinese	*Ligustrum sinense*	Medium	Medium	
privet, tree	*Ligustrum lucidum*	High	High	
purple nut sedge (nut grass)	*Cyperus rotundus*	Medium		
pyp grass	*Ehrharta villosa*		Medium	
queen of the night	*Cestrum nocturnum*		Lower	
Queensland poplar	*Homalanthus populifolius*			
ragwort	*Senecio jacobaea*	Medium	Lower	
red hot poker	*Kniphofia uva*			

Table 11 continued

Common name	Botanical name	Impact (ACC policy)	Priority (DoC Akld)	Reason for significance
rhamnus or evergreen buckthorn	*Rhamnus alaternus*	High	High	
saggittaria, arrowhead	*Saggittaria graminea* subsp. *platyphylla, S. montevidensis*	High		
salvinia; Kariba weed	*Salvinia molesta*			The DOC national tables list this species as established, with an isolated or confined distribution, and known to be significantly affecting the structure, species composition, or regeneration of several high conservation value sites.
selaginella, African club moss	*Selaginella kraussiana*	High	Medium	
Senegal tea	*Gymnocoronis spilanthoides*			The DOC national tables list this species as only just starting to spread in the conservancy. Known to be present on several high conservation value sites. Impacts unknown, but suspected of having a significant impact.
sharp rush	*Juncus acutus*	High	Lower	
smilax	*Asparagus asparagoides*	High	High	
Spanish heath	*Erica lusitanica*	Medium	Medium	
spindle tree	*Euonymus europaeus*		Lower	The DOC national tables list this species as established, with an isolated or confined distribution, but distribution/impacts unknown.
St Johns wort	*Hypericum perforatum*	Medium		
sweet briar	*Rosa rubiginosa*	Medium	Lower	
sweet pea shrub	*Polygala myrtifolia*	Low	High	
thistle, variegated	*Silybum marianum*	Medium		
three-cornered garlic	*Allium triquetrum*	Medium	Lower	
tree lucerne	*Chamaecytisus palmensis*		Lower	While this species is only scattered through the North Island, it establishes particularly well in dry coastal hilly sites.
tuber ladder fern	*Nephrolepis cordifolia*	High	Medium	
tutsan	*Hypericum androsaemum*	Low	Medium	
umbrella sedge	*Cyperus eragrostis*			
veldt grass	*Ehrharta erecta*		Medium	
velvet groundsel	*Senecio petasitis*	Low		
walnut, Japanese	*Juglans ailantifolia*		Lower	The DOC national tables list this species as only just starting to spread in the conservancy, but not considered to be either a present or potential significant pest.
wandering Jew	*Tradescantia fluminensis*	High	High	
water primrose	*Ludwigia peploides* subsp. *Montevidensis*	Medium		

Table 11 continued

Common name	Botanical name	Impact (ACC policy)	Priority (DoC Akld)	Reason for significance
watsonia	*Watsonia meriana* subsp. *Bulbillifera*	Low	Medium	
wattle	*Acacia* sp.			
wattle - entire leaves	*Acacia* sp. - entire leaf			
wattle - pinnate leaves	*Acacia* sp. - pinnate leaf, *Paraserianthes lophantha*			
wattle, black	*Acacia mearnsii*	Low	Medium	
wattle, brush	*Paraserianthes lophantha*	Medium	Medium	
wattle, kangaroo	*Acacia paradoxa*	Low	Lower	The DOC national tables list this species as established, with an isolated or confined distribution, but distribution/impacts unknown.
wattle, silver	*Acacia dealbata*		Lower	The DOC national tables list this species as established, with an isolated or confined distribution, but distribution/impacts unknown.
wattle, Sydney golden	*Acacia longifolia*		Medium	
white poplar	*Populus alba*	Medium		
willow	*Salix* sp.			
willow, crack	*Salix fragilis*	High	Medium	
willow, grey	*Salix cinerea*	High	Lower	
willow, weeping	*Salix babylonica*	Medium		
wisteria	*Wisteria sinensis*	Medium		
wonga wonga vine	*Pandorea pandorana*	Medium	Medium	

Appendix III- Plant species – performances & tolerances

(see end of table for key)

Common names	*Species*	*Planting units*									*Lifeform*	*Height*	*Sun/shade requirements*	*Moisture requirements*	*Salt tolerance*	*Planting stage*	*Response to flood water*	*Bank stabilisation*	*Comment*
		1 se	2 fa	3 bw	4 cs	5 as	6 vs	7 ss	8 sse	9 sal									
Clump formers																			
flat leaved sedge	*Carex dissita*	✓	✓								Sedge	50cm	○ ◔ ☁	wet		pioneer	lies prostrate	• prostrate plant protects soil surface	Can spread seeds under forest canopy when ground cover weeds have been controlled.
flax, harakeke	*Phormium tenax*				✓	✓			✓	✓	Monocot clump former	2m	○ ◔	wet or dry	coastal	nurse	resists	• poor, except on wide alluvial flats	Very hardy with wide environmental tolerances. Unless the alluvial flats are wide, this species should be planted above frequent flood levels as it resists flood waters and can be torn out of bank.
giant umbrella sedge	*Cyperus ustulatus*	✓	✓	✓					✓		Sedge	80cm	○ ◔	wet	coastal	pioneer	lies prostrate	• prostrate plant protects soil surface	
jointed wirerush (oioi)	*Leptocarpus similis*									✓	Restiad	1m	○ ◔	wet or dry	coastal	pioneer	lies prostrate	• prostrate plant protects soil surface	Spreads slowly with creeping rhizomes.
marsh clubrush, kukuraho	*Bolboschoenus fluviatilis*									✓	Sedge	1.5m	○	wet		pioneer	lies prostrate	• prostrate plant protects soil surface	Perennial, but dies back in winter. Spreads by creeping rhizomes.
purei	*Carex secta*	✓	✓	✓							Sedge	1m	○ ◔	wet		pioneer	lies prostrate	• prostrate plant protects soil surface	Establishes particularly well on Auckland stream banks, even though it was not a particularly common species naturally. Can form short trunks.
rautahi	*Carex lessoniana*	✓	✓	✓							Sedge	1m	○ ◔	wet		pioneer	lies prostrate	• prostrate plant protects soil surface • rhizomatous root system spreads and holds unstable banks	Good for bank stability.
sea rush (wiwi)	*Juncus maritimus*									✓	Rush	1m	○	wet	coastal	pioneer	lies prostrate	• prostrate plant protects soil surface	Used in saltiest stream stretches at lowest possible level of edge
small swamp sedge	*Carex virgata*	✓	✓	✓					✓		Sedge	80cm	○ ◔	wet or dry		nurse	lies prostrate	• prostrate plant protects soil surface	
toetoe	*Cortaderia fulvida*		✓		✓	✓					Grass	1.5m	○ ◔	wet or dry	coastal	nurse	lies prostrate	• prostrate plant protects soil surface	Smallest of the toetoes. Can be distinguished from invasive pampas by its drooping flowering spike. Able to grow on dry, disturbed, compacted sites.
Ferns																			
gully fern	*Pneumatopteris pennigera*			✓							Fern	1m	◔ ☁	wet		shaded site pioneer or forest diversity	collects debris		Can form short trunks. Requires damp and shaded position.
swamp kiokio	*Blechnum novae-zelandiae*			✓					✓		Fern	60cm	○ ◔ ☁	wet or dry		pioneer	collects debris		Is a hardy plant that is widespread throughout the region. Particularly important on sandy substrates.
Shrubs, climbers & small trees																			
akepiro	*Olearia furfuracea*						✓				Broadleaf shrub	3m	○ ◔	dry		pioneer	above floods		
hangehange	*Geniostoma rupestre*										Broadleaf shrub	2m	◔ ☁	mid		forest diversity	above floods		Fast-growing shade tolerant species that is capable of growing well beneath a canopy or beneath gorse.
karamu	*Coprosma robusta*				✓	✓	✓	✓			Broadleaf shrub	2-3m	○ ◔ ☁	wet or dry	coastal	nurse	above floods		Fast-growing shade tolerant species that is capable of growing well beneath a canopy or beneath gorse. Bird-distributed, with abundant autumn berries for birds.
karamu (large seeded)	*Coprosma macrocarpa*						✓				Small broadleaf tree	4m	◔ ☁	mid		pioneer	above floods		Bird-distributed.

Common names	Species	Planting units									Lifeform	Height	Sun/shade requirements	Moisture requirements	Salt tolerance	Planting stage	Response to flood water	Bank stabilisation	Comment
		1 se	2 fa	3 bw	4 cs	5 as	6 vs	7 ss	8 sse	9 sal									
karamu (shining)	*Coprosma lucida*							✓			Broadleaf shrub	3m	○ ◔ ☁	dry		nurse	above floods		Fast-growing shade tolerant species that is capable of growing well beneath a canopy or beneath gorse. Bird-distributed.
kawakawa	*Macropiper excelsum*										Broadleaf shrub	2m	◔ ☁	dry		underplanting	collects debris		Bird-distributed.
kiekie	*Freycinnetia banksii*										Vine		◔ ☁	wet		underplanting	collects debris		Useful for planting above rocky areas as it will drape down and cover rocks, helping to prevent weed growth.
koromiko	*Hebe stricta var. stricta*						✓				Broadleaf shrub	1-2m	○ ◔	dry	coastal	nurse	above floods		Very hardy. Capable of growing in partially shaded areas.
manuka, tea tree	*Leptospermum scoparium*			✓	✓	✓	✓	✓	✓	✓	Broadleaf tree	4m	○	wet or dry	coastal	nurse	low resistance - single trunked when mature	• forms well developed root system that stabilises banks	Grows vigorously and has a wide ecological tolerance, including the ability to colonise inhospitable, low fertility sites and the lower slopes along brackish streams. Needs to be planted in autumn and must not have roots disturbed when being transplanted.
pate, seven finger	*Schefflera digitata*			✓							Broadleaf tree	3m	○ ◔ ☁	wet		shaded or wetland edge pioneer or forest diversity	low resistance – short single trunked when mature		Grows rapidly in damp sites, particularly if there is some shade.
pohuehue (wirevine)	*Muehlenbeckia complexa*								✓	✓	Vine		○ ◔	dry	coastal	pioneer	collects debris	• forms dense mounds that protect soil surface	Grows rapidly. Scrambles over shrubs or forms hummocks on open ground.
saltmarsh ribbonwood	*Plagianthus divaricatus*									✓	Broadleaf shrub	2m	○	wet	coastal	pioneer	collects debris		Grows in very salty conditions. Necessary for fernbird habitat.
Trees																			
cabbage tree, ti kouka	*Cordyline australis*	✓	✓	✓	✓	✓			✓	✓	Monocot tree	8m	○ ◔	wet or dry		nurse	low resistance - single trunked when mature		Bird-distributed. Can grow on lower slopes on brackish streams.
kahikatea, white pine	*Dacrycarpus dacrydioides*	✓	✓	✓	✓				✓		Conifer tree	12m	○ ◔ ☁	wet		forest diversity	low resistance - single trunked when mature		Bird-distributed.
kanuka, white tea tree	*Kunzea ericoides*				✓	✓		✓			Broadleaf tree	8m	○ ◔	dry		nurse	above floods	• forms well developed root system that stabilises banks	Major nursery species. Needs to be planted in autumn and must not have roots disturbed when being transplanted.
karaka	*Corynocarpus laevigatus*		✓		✓	✓	✓	✓			Broadleaf tree	8m	○ ◔ ☁	dry	coastal	forest diversity	low resistance - single trunked when mature		Bird-distributed.
kauri	*Agathis australis*				✓			✓			Conifer tree	20m	○ ◔	dry		forest diversity	above floods		Survives in infertile soils.
kohekohe	*Dysoxylum spectabile*				✓	✓	✓	✓			Broadleaf tree	15m	◔ ☁	mid		forest diversity	above floods		Bird-distributed.
kowhai	*Sophora microphylla*					✓				✓	Broadleaf tree	6m	○ ◔	dry	coastal	pioneer	low resistance - single trunked when mature		
mahoe	*Melicytus ramiflorus*		✓		✓	✓		✓			Broadleaf tree	6m	○ ◔	wet or dry		nurse	collects debris	• forms well developed root system that stabilises banks	Best planted in autumn. Establishes more slowly than other bank stabilising species, but is a very common species in young riparian vegetation throughout the region. Very fast growing when it becomes established. Shade tolerant species that is capable of growing well beneath a canopy or beneath gorse. Bird-distributed.
mangeao	*Litsea calicaris*						✓				Broadleaf tree	8m	◔ ☁	mid		forest diversity	above floods		Difficult to grow, but is an important and characteristic species on volcanic rocky substrates. Bird-distributed.
mapou	*Myrsine australis*				✓	✓					Broadleaf tree	6m	○ ◔ ☁	dry		pioneer	above floods		Characteristic species of young lava flow vegetation. Bird-distributed.

Common names	*Species*	*Planting units*									*Lifeform*	*Height*	*Sun/shade requirements*	*Moisture requirements*	*Salt tolerance*	*Planting stage*	*Response to flood water*	*Bank stabilisation*	*Comment*
		1 se	2 fa	3 bw	4 cs	5 as	6 vs	7 ss	8 sse	9 sal									
matai	*Prumnopitys taxifolia*					✓					Conifer tree	10m	○ ◔ ☁			forest diversity	above floods		Slow growing, but characteristic of more fertile sites. Bird-distributed.
pohutukawa	*Metrosideros excelsa*							✓		✓	Broadleaf tree	10m	○ ◔	dry	coastal	nurse	above floods	• has well developed and far-reaching root system	Establishes more slowly than other bank stabilising species. Most important lava flow nursery species.
pukatea	*Laurelia novae-zealandia*			✓					✓		Broadleaf tree	10m	○ ◔ ☁	wet		forest diversity	low resistance - single trunked when mature		Slow growing, but characteristic of wet sites.
puriri	*Vitex lucens*				✓	✓	✓	✓			Broadleaf tree	10m	○ ◔	wet or dry	coastal	forest diversity	above floods		Prefers fertile sites. Bears flowers and berries all year round, so is therefore a valuable food source. Bird-distributed.
putaputaweta, marbleleaf	*Carpodetus serratus*	✓	✓						✓		Broadleaf tree	6m	○ ◔ ☁	wet		forest diversity	low resistance - single trunked when mature		Bird-distributed.
rimu	*Dacrydium cupressinum*				✓						Conifer tree	10m	○ ◔ ☁	mid		forest diversity	above floods		Bird-distributed. Midslope species.
swamp maire, maire tawake	*Syzygium maire*			✓					✓		Broadleaf tree	7m	○ ◔ ☁	wet		forest diversity	low resistance - single trunked when mature		Needs moisture. Bird-distributed.
titoki	*Alectryon excelsus*					✓	✓				Broadleaf tree	6m	○ ◔	mid		pioneer and forest diversity	above floods		Prefers fertile sites. Bird-distributed.
totara	*Podocarpus totara*				✓	✓		✓			Conifer tree	8m	○ ◔ ☁	wet or dry		forest diversity	above floods		Survives well on dry and exposed sites. Bird-distributed.

Planting units
1 – se - Stream edge
2 – fa - Flood area
3 – bw - Back wetland or spring
4 – cs - Clay slope
5 – as - Alluvial slope
6 – vs - Volcanic slope
7 – ss - Sandy slope
8 – sse - Sandy stream edge and flood area
9 – sal - Saline stream edge and flood area

Planting stage
nurse – planted first, establishes rapidly to shelter other plants in planting
pioneer – planted first, establishes more slowly or does not shelter other plants in planting
forest diversity – planted when pioneer and early specie have established, added beneath the existing shelter

Sun / shade requirements
○ - Tolerates full sun
◔ - Tolerates semi-shaded positions
☁ - Tolerates shade