

Sand dunes west of Matatā - 9 July 2021

Angela Simpson and Sarah Beadel

Thirteen people met at Matatā on a lovely sunny winter's day: 11 of us were there to focus mainly on plants and vegetation, and set off to explore the dunes, whilst two went off to search for beetles. An old access track extends westwards from our meeting point at the western extent of the Matatā settlement, and we proceeded westwards through scrub dominated by brush wattle (*Paraserianthes lophantha*) and pampas (*Cortaderia selloana*), about three metres tall. Kikuyu (*Cenchrus clandestinus*) was the main groundcover, along with occasional saplings and shrubs of *Veronica stricta*, māhoe (*Meliccytus ramiflorus* subsp. *ramiflorus*), and kahili ginger (*Hedychium gardnerianum*). Dense patches of Japanese honeysuckle (*Lonicera japonica*) and blue morning glory (*Ipomoea indica*) were competing for habitat with indigenous seedlings and saplings. Some discussion led to the identification of a small patch of Mexican tea (*Chenopodioides ambrosioides*).

Scattered spinifex (*Spinifex sericeus*) were present on the gentle-sloping foredune, with shore bindweed (*Calystegia soldanella*) and *Lachnagrostis billardierei* subsp. *billardierei* sparsely scattered throughout. Small piles of spinifex seed heads were present in sand hollows where they had been blown during the previous season's flush, with pingao (*Ficinia spiralis*) in two places. Harestail (*Lagurus ovatus*) and catsear (*Hypochaeris radicata*) occur occasionally throughout, with a few patches of marram alongside access tracks on the foredunes. Occasional sea rocket (*Cakile maritima*) were present above the high tide line.

The mid-dunes were dominated by pōhuehue (*Muehlenbeckia complexa*) interspersed with local *Oxalis rubens*, local patches of exotic grasses, and occasional small boxthorn (*Lycium ferocissimum*) shrubs. A few small patwīwī or wiwi (*Ficinia nodosa*) were present amongst the pōhuehue. Most of the boxthorn was dead, following recent control, although some re-sprouting was evident. Lupin (*Lupinus arboreus*) was also scattered throughout. Exotic grasses common on the tracks included Indian doab (*Cynodon dactylis*) and veldt grass (*Ehrharta erecta*), with occasional ratstail (*Sporobolus africanus*). Sand carex (*Carex pumila*) was scattered on sandy patches on the tracks. There were a few small patches of smilax (*Asparagus asparagoides*), markedly reduced in vigour by a self-introduced biocontrol agent, bridal creeper rust (*Puccinia myrsiphylli*).

Dense windshorn kānuka (*Kunzea robusta*)-grey willow (*Salix cinerea*) scrub covered the dune slack behind the foredune, about four metres tall, with local crack willow and mānuka common on the margins, and pampas was scattered throughout the understorey. It appeared that there had been some plantings around the margins of this area, with species present including banksia (*Banksia integrifolia*), a range of *Pseudopanax lessonii* hybrids, flax (harakeke, *Phormium tenax*) cultivars, Tasmanian ngaio (*Myoporum insulare*), and akeake (*Dodonea viscosa*). Some of these are now well established and are naturalising as weeds.

Just before lunch a stand of closely-spaced manuka with a sparse understorey was located in the mid-dunes and five *Kunzea toelkenii* (Threatened – Nationally Critical) trees were found adjacent to this stand. The layering habit indicative of this species was a key feature, although specimens were taken to confirm the identification (lodged in the National Forest Herbarium), because it has not previously been recorded west of Matatā. After this exciting find, we gathered for lunch under the shade of a second group of windshorn *Kunzea toelkenii* trees. As we continued westward, we found several more *Kunzea toelkenii* plants, with over 17 individuals located in total.

There is a large stand of eucalyptus on the dunes and a brief foray around the edges of the stand identified that natural regeneration of indigenous species, although patchy, is still occurring under the canopy. Species not seen elsewhere during the day were present here, including hound's tongue fern (*Microsorium pustulatum*) and mapou (*Myrsine australis*). A field trip is planned for 2022 to explore this area in more detail, to reassess the regeneration and compare it to a 2007 survey (Wildland Consultants 2007) of the indigenous regeneration in this dune forest.

From here we returned back along the dunes towards Matatā. When we ventured into the dune slack scrub, dense patches of Japanese honeysuckle slowed our progress. Kawakawa (*Piper excelsum* subsp. *excelsum*) was common in the understorey, to about two metres tall, with scattered sapling tree ferns - silver fern (ponga, *Cyathea dealbata*) and mamaku (*Cyathea medullaris*) - and mahoe, which had likely established in areas of relatively damp substrate. Occasional patches of water fern (*Histiopteris incisa*) were present, along with a few rangiora (*Brachyglottis repanda* subsp. *repanda*). The ground surface was cracked mud (including deep holes), an effect of the Matatā flood event in 2005. We spent a while looking for the raupō (*Typha orientalis*) wetland that appeared to be visible on the aerial photographs we had with us, although these were several years old. However, after

fruitless efforts to locate a raupō wetland, we decided that any raupō wetland that may have been present had been overgrown with willow and mānuka scrub and shrubland, and all that remained were a few small patches of wintered-off raupō and *Bolboschoenus fluviatilis*. There was one small area of seasonally-wet ground (and which is wet following rainfall) which supported swamp kiokio (*Blechnum minus*), water forget-me-not (*Myosotis laxa* subsp. *caespitosa*), *Isolepis inundata*, and *Carex geminata*.

Three species of *Cordyline* were found during the day: ti kōuka (*Cordyline australis*) is commonly emergent to about six metres tall; a few ti ngāhere (*Cordyline banksii*) were seen to about four metres, and one *Cordyline pumilio* was observed, at about one metre tall. This is one of few records of *Cordyline pumilio* in this part of the region, and is the eastern-most known location for this species.

This section of the Bay of Plenty coastline contains important indigenous-dominant sand dune and dune slack habitat that remains in relatively good condition, and associated regeneration, despite various major pressures and changes even in recent years. As is often the case, it was a great example showing that you never know what you might find until you go exploring! Weed control would be a positive management action for this stretch of sand dunes. However, although from the outside weeds appear to be dominant, there are nevertheless some very interesting remnant patches of indigenous-dominant vegetation, some of which were unexpected and exciting.

References

- de Lange P.J., Rolfe J.R., Barkla J.W., Courtney S.P., Champion P.D., Perrie L.R., Beadel S.M., Ford K.A., Breitwiser I., Schönberger I., Hindmarsh-Walls R., Heenan P.B., and Ladley K. 2018: Conservation status of New Zealand indigenous vascular plants, 2017. *New Zealand Threat Classification Series 22*. Department of Conservation, Wellington. 82p.
- Landcare Research New Zealand Ltd 2006: What's new in biocontrol of weeds. *Weedbusters: Stopping the Spread of Weeds 35*: 8 p. Accessed from <https://www.landcareresearch.co.nz/uploads/public/Publications/Weed-biocontrol/wtsnew35.pdf>
- Wildland Consultants 2007: Ecological survey of regenerating indigenous dune forest, Matatā, Bay of Plenty. *Wildland Consultants Ltd Contract Report No. 1678*. Prepared for Environment Bay of Plenty. 62 p.

Vascular plants observed in the dunes between Matatā and the eucalyptus stand east of Murphy's Motorcamp, 9 July 2021

Sarah Beadel

Notes

1. All species were observed during the July 2021 field trip.
2. (E) = new record for beneath eucalyptus-houpara-pōhutukawa forest (see Lux and Beadel 2007, (in Wildland Consultants 2007)).
3. Threat rankings are from de Lange *et al.* (2018).

Indigenous species

Monocot. trees and shrubs

<i>Cordyline australis</i>	tī kōuka, cabbage tree
<i>Rhopalostylis sapida</i>	nīkau

Dicot. trees and shrubs

<i>Brachyglottis repanda</i> subsp. <i>repanda</i>	rangiora
<i>Coprosma grandifolia</i>	kanono, raurākau, manono
<i>Coprosma lucida</i>	karamū, glossy karamū
<i>Coprosma repens</i>	taupata
<i>Coprosma robusta</i>	karamū, kāramuramu
<i>Coriaria arborea</i> var. <i>arborea</i>	tutu
<i>Dodonaea viscosa</i>	akeake
<i>Geniostoma ligustrifolium</i> var. <i>ligustrifolium</i>	hangehange
<i>Hedycarya arborea</i>	porokaiwhiri; pigeonwood
<i>Kunzea robusta</i> (Threatened-Nationally Endangered)	kānuka
<i>Kunzea toelkenii</i> (Threatened-Nationally Vulnerable) (E)	Thornton kānuka
<i>Leptospermum scoparium</i> agg. (At Risk-Declining)	mānuka
<i>Melicytus ramiflorus</i> subsp. <i>ramiflorus</i>	māhoe
<i>Metrosideros excelsa</i> (Threatened-Nationally Vulnerable)	pōhutukawa
<i>Myrsine australis</i>	māpou, matipou, māpau
<i>Piper excelsum</i> subsp. <i>excelsum</i>	kawakawa
<i>Pittosporum crassifolium</i>	karo
<i>Pseudopanax arboreus</i> var. <i>arboreus</i>	whauwhaupaku, five-finger
<i>Pseudopanax crassifolius</i> × <i>P. lessonii</i>	
<i>Pseudopanax lessonii</i>	houpara
<i>Veronica stricta</i> var. <i>stricta</i>	koromiko, kōkōmuka

Dicot. lianes

<i>Calystegia sepium</i> subsp. <i>roseata</i>	pink bindweed
<i>Calystegia soldanella</i>	panahi, shore bindweed
<i>Muehlenbeckia australis</i>	puka
<i>Muehlenbeckia complexa</i> var. <i>complexa</i>	small-leaved pōhuehue

Ferns

<i>Asplenium flaccidum</i> subsp. <i>flaccidum</i>	makawe
<i>Asplenium polyodon</i>	petako

<i>Cyathea dealbata</i>	ponga, silver fern
<i>Cyathea medullaris</i>	mamaku
<i>Diplazium australe</i>	
<i>Histiopteris incisa</i>	mātātā, water fern
<i>Microsorium pustulatum</i>	kowaowao, hound's tongue fern
<i>Parablechnum novae-zelandiae</i>	kiokio
<i>Pneumatopteris pennigera</i>	pakau
<i>Pteridium esculentum</i>	rārahu, bracken
<i>Pteris tremula</i>	turawera, shaking brake

Grasses

<i>Lachnagrostis billardierei</i>	sand wind grass
<i>Microlaena stipoides</i>	pātītī, meadow rice grass
<i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i>	
<i>Spinifex sericeus</i>	kōwhangatara, spinifex

Sedges

<i>Bolboschoenus fluviatilis</i>	pūrua grass, kukuraho
<i>Bolboschoenus medianus</i>	pūrua grass
<i>Carex breviculmis</i>	
<i>Carex geminata</i>	
<i>Carex inversa</i>	
<i>Carex maorica</i>	
<i>Carex pumila</i>	
<i>Carex testacea</i>	
<i>Carex virgata</i>	
<i>Cyperus ustulatus</i> f. <i>ustulatus</i>	toetoe upoko-tangata
<i>Ficinia nodosa</i>	wīwī
<i>Ficinia spiralis</i> (At Risk-Declining)	pīngao
<i>Gahnia pauciflora</i> (E)	takahikahi

Rushes

<i>Juncus edgariae</i>	wi
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Monocot. herbs (other than orchids, grasses, sedges, and rushes)

<i>Dianella nigra</i>	tūrutu
<i>Phormium tenax</i>	harakeke, flax
<i>Typha orientalis</i>	raupō

Composite herbs

<i>Pseudognaphalium luteoalbum</i> agg.	
<i>Senecio bipinnatisectus</i>	Australian fireweed

Dicot. herbs (other than composites)

<i>Haloragis erecta</i> subsp. <i>erecta</i>	toatoa
<i>Oxalis rubens</i>	sand oxalis
<i>Persicaria decipiens</i>	tutunawai

Naturalised and exotic species

Gymnosperms

Pinus radiata radiata pine

Dicot. trees and shrubs

Erica lusitanica Spanish heath
Eucalyptus botryoides eucalyptus, bangalay
Helichrysum petiolare liquorice plant
Lupinus arboreus lupin
Lycium ferocissimum boxthorn
Paraserianthes lophantha brush wattle
Rubus phoenicolasius Japanese wineberry
Rubus sp. (*R. fruticosus* agg.) blackberry
Salix cinerea grey willow
Ulex europaeus gorse

Monocot. lianes

Asparagus asparagoides smilax

Dicot. lianes

Ipomoea indica blue morning glory
Lonicera japonica Japanese honeysuckle

Grasses

Agrostis stolonifera creeping bent
Ammophila arenaria marram
Anthoxanthum odoratum sweet vernal
Bromus willdenowii prairie brome
Cenchrus clandestinus kikuyu grass
Cortaderia selloana pampas
Cynodon dactylon Indian doab
Dactylis glomerata cocksfoot
Ehrharta erecta veldt grass
Holcus lanatus Yorkshire fog
Lagurus ovatus haretail
Lolium arundinaceum subsp. *arundinaceum* tall fescue
Paspalum dilatatum paspalum
Pennisetum clandestinum kikuyu grass
Setaria gracilis knot-root bristle grass
Setaria palmifolia palm grass
Sporobolus africanus ratstail

Sedges

Cyperus eragrostis
Cyperus involucratus umbrella sedge

Monocot. herbs (other than orchids,
grasses, sedges, and rushes)

Agapanthus praecox

agapanthus

Gladiolus sp.

gladiolus

Zantedeschia aethiopica

arum lily

Composite herbs

Achillea millefolium

yarrow

Aster subulatus

sea aster

Crepis capillaris

hawksbeard

Erigeron sumatrensis

broad-leaved fleabane

Gamochaeta coarctata

cudweed

Hypochaeris radicata

catsear

Senecio elegans

purple groundsel

Sonchus oleraceus

puha, sow thistle

Dicot. herbs (other than composites)

Anagallis arvensis

scarlet pimpernel

Cakile maritima

sea rocket

Digitalis purpurea

foxglove

Foeniculum vulgare

fennel

Fumaria muralis

scrambling fumitory

Galium aparine

cleavers

Lepidium africanum agg.

pepper cress

Lotus pedunculatus

lotus

Modiola caroliniana

creeping mallow

Oenothera stricta

evening primrose

Oxalis sp.

oxalis

Phytolacca octandra

inkweed

Plantago lanceolata

narrow-leaved plantain

Plantago major (E)

broad-leaved plantain

Prunella vulgaris

selfheal

Ranunculus repens

creeping buttercup

Rumex acetosella

sheep's sorrel

Rumex obtusifolius

broad-leaved dock

Silene gallica

catchfly

Solanum chenopodioides

velvety nightshade

Solanum nigrum

black nightshade

Trifolium repens

white clover

Verbena bonariensis

purple-top

Veronica anagallis-aquatica

water speedwell

Veronica arvensis

field speedwell

Vicia sativa

vetch

Vascular plants of eucalyptus forest at Matata

Sarah Beadel and Jenny Lux, July 2007 (in Wildland Consultants 2007)

Updated 9 July 2021 - Sarah Beadel

Notes

1. Observed in 2007
2. Natural and planted in the indigenous plantings near railway east of motor camp.
3. One young plant seen; appeared to be *Phormium cookianum* (wharariki, mountain flax) but could be *P. tenax*.
4. Seedling(s) only.
5. Planted (no natural karaka seen).
6. Seedlings and saplings only.
7. Greg Jenks (Coast Care Bay of Plenty), pers. comm. 2007.
8. Environmental pest plant.
9. Observed in 2021.

Indigenous species

Monocot. trees and shrubs

<i>Cordyline australis</i> ^{1,2,9}	ti kouka, cabbage tree
<i>Phormium</i> sp. ^{1,3}	
<i>Phormium tenax</i> ^{1,2,9}	harakeke, flax
<i>Rhopalostylis sapida</i> ^{1,4,9}	nikau

Dicot. trees and shrubs

<i>Beilschmiedia tawa</i> ^{1,4}	tawa
<i>Brachyglottis repanda</i> subsp. <i>repanda</i> ^{1,9}	rangiora
<i>Coprosma grandifolia</i> ^{1,9}	kanono
<i>Coprosma lucida</i> ^{1,9}	karamu
<i>Coprosma repens</i> ^{1,9}	taupata
<i>Coprosma robusta</i> ^{1,9}	karamu
<i>Coriaria arborea</i> var. <i>arborea</i> ^{1,9}	tutu
<i>Corynocarpus laevigatus</i> ^{1,5}	karaka
<i>Dodonaea viscosa</i> ^{1,9}	akeake
<i>Entelea arborescens</i> ^{1,7}	whau
<i>Fuchsia excorticata</i> ^{1,6}	kotukutuku
<i>Geniostoma ligustrifolium</i> var. <i>ligustrifolium</i> ^{1,9}	hangehange
<i>Hebe stricta</i> var. <i>stricta</i> ^{1,9}	koromiko
<i>Hedycarya arborea</i> ^{1,9}	porokaiwhiri
<i>Knightia excelsa</i> ^{1,9}	rewarewa
<i>Kunzea robusta</i> ^{1,9}	kānuka
<i>Kunzea toelkenii</i> ¹	
<i>Leptospermum scoparium</i> agg. ^{1,9}	mānuka
<i>Leucopogon fasciculatus</i> ¹	mingimingi
<i>Litsea calicaris</i> ^{1,6}	mangeao
<i>Melicytus ramiflorus</i> subsp. <i>ramiflorus</i> ^{1,9}	mahoe
<i>Metrosideros excelsa</i> ^{1,2,9}	pohutukawa
<i>Myoporum laetum</i> ¹	ngaio
<i>Myrsine australis</i> ^{1,9}	mapou

<i>Piper excelsum</i> subsp. <i>excelsum</i> ^{1,2,9}	kawakawa
<i>Pittosporum crassifolium</i> ^{1,9}	karo
<i>Pseudopanax arboreus</i> var. <i>arboreus</i> ^{1,9}	whauwhaupaku, five finger
<i>Pseudopanax crassifolius</i> × <i>P. lessonii</i> ^{1,9}	
<i>Pseudopanax lessonii</i> ^{1,9}	houpara
<i>Vitex lucens</i> ^{1,6}	puriri

Monocot. lianes

<i>Ripogonum scandens</i> ^{1,4}	karea, supplejack
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Dicot. lianes

<i>Calystegia sepium</i> subsp. <i>roseata</i> ^{1,9}	pohue
<i>Calystegia sepium</i> × <i>C. soldanella</i> ¹	
<i>Calystegia soldanella</i> ^{1,9}	panahi
<i>Muehlenbeckia australis</i> ^{1,9}	puka
<i>Muehlenbeckia complexa</i> ^{1,9}	pohuehue

Ferns

<i>Asplenium flaccidum</i> subsp. <i>flaccidum</i> ^{1,9}	makawe
<i>Asplenium polyodon</i> ^{1,9}	petako
<i>Cyathea dealbata</i> ^{1,9}	ponga
<i>Cyathea medullaris</i> ^{1,9}	mamaku
<i>Dicksonia fibrosa</i> ¹	wheki-ponga
<i>Diplazium australe</i> ^{1,9}	
<i>Hypolepis ambigua</i> ¹	
<i>Microsorium pustulatum</i> ^{1,9}	kowaowao, hounds tongue fern
<i>Paesia scaberula</i> ^{1,9}	matata
<i>Parablechnum novae-zelandiae</i> ^{1,9}	kiokio
<i>Pneumatopteris pennigera</i> ^{1,9}	pakau
<i>Pteridium esculentum</i> ^{1,9}	bracken, rarahu
<i>Pteris tremula</i> ^{1,9}	turawera, shaking brake

Grasses

<i>Lachnagrostis billardierei</i> ^{1,9}	perehia
<i>Microlaena stipoides</i> ^{1,9}	patiti, meadow rice grass
<i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i> ^{1,9}	

Sedges

<i>Bolboschoenus fluviatilis</i> ^{1,9}	rirewaka
<i>Carex breviculmis</i> ^{1,9}	
<i>Carex geminata</i> ^{1,9}	
<i>Carex inversa</i> ^{1,9}	
<i>Carex maorica</i> ^{1,9}	
<i>Carex pumila</i> ^{1,9}	
<i>Carex secta</i> ¹	purei
<i>Carex solandri</i> ¹	
<i>Carex testacea</i> ^{1,9}	
<i>Carex virgata</i> ^{1,9}	purei
<i>Cyperus ustulatus</i> ¹⁹	toetoe upokotangata

Ficinia nodosa^{1,9}
*Gahnia pauciflora*⁹

wīwī
takahikahi

Rushes

Juncus edgariae^{1,9}
*Juncus planifolius*¹

wi

Monocot. herbs (other than orchids, grasses, sedges and rushes)

Dianella nigra^{1,9}
Typha orientalis^{1,9}

turutu
raupo

Composite herbs

Pseudognaphalium luteoalbum agg.^{1,9}
*Senecio hispidulus*¹
*Senecio bipinnatisectus*¹

Australian fireweed

Dicot. herbs (other than composites)

*Geranium solanderi*¹
Haloragis erecta subsp. *erecta*^{1,9}
Oxalis rubens^{1,9}
Persicaria decipiens^{1,9}
*Solanum americanum*¹

toatoa

Adventive species

Dicot. trees and shrubs

Eucalyptus botryoides^{1,8,9}
Lupinus arboreus^{1,9}
Lycium ferocissimum^{1,8,9}
Myoporum insulare^{1,8,9}
Paraserianthes lophantha^{1,8,9}
Rubus phoenicolasius^{1,9}
Rubus sp. (*R. fruticosus* agg.)^{1,8,9}
Salix cinerea^{1,8,9}
Salix ×fragilis^{1,8}

bangalay, southern mahogany
lupin
African boxthorn
Australian ngaio; Tasmanian boobialla
brush wattle
Japanese wineberry
blackberry
grey willow
crack willow

Dicot. lianes

Lonicera japonica^{1,8,9}

Japanese honeysuckle

Grasses

*Agrostis capillaris*¹
Agrostis stolonifera^{1,9}
*Alopecurus geniculatus*¹
Anthoxanthum odoratum^{1,9}
*Axonopus fissifolius*¹
Bromus willdenowii^{1,9}
Cortaderia selloana^{1,8,9}
Cynodon dactylon^{1,9}

browntop
creeping bent
kneed foxtail
sweet vernal
narrow-leaved carpet grass
prairie brome
pampas
Indian doab

<i>Dactylis glomerata</i> ^{1,9}	cocksfoot
<i>Ehrharta erecta</i> ^{1,9}	veld grass
<i>Elytrigia pycnantha</i> ^{1,8}	sea couch
<i>Holcus lanatus</i> ^{1,9}	Yorkshire fog
<i>Lagurus ovatus</i> ^{1,9}	haretail
<i>Lolium arundinaceum</i> subsp. <i>arundinaceum</i> ^{1,9}	tall fescue
<i>Paspalum dilatatum</i> ^{1,9}	paspalum
<i>Paspalum distichum</i> ¹	Mercer grass
<i>Pennisetum clandestinum</i> ^{1,8,9}	kikuyu grass
<i>Poa pratensis</i> ¹	Kentucky bluegrass
<i>Setaria gracilis</i> ¹	knot-root bristle grass
<i>Setaria palmifolia</i> ^{1,9}	palm grass
<i>Sporobolus africanus</i> ^{1,9}	ratstail
<i>Stenotaphrum secundatum</i> ¹	buffalo grass

Sedges

<i>Cyperus eragrostis</i> ^{1,9}	
<i>Cyperus involucratus</i> ^{1,8,9}	umbrella sedge

Rushes

<i>Juncus bufonius</i> ¹	
<i>Juncus effusus</i> ¹	soft rush
<i>Juncus tenuis</i> ¹	track rush

Monocot. herbs (other than orchids, grasses, sedges and rushes)

<i>Agapanthus praecox</i> ^{1,8,9}	agapanthus
<i>Amaryllis belladonna</i> ^{1,8}	naked lady, belladonna lily
<i>Asparagus asparagoides</i> ^{1,8,9}	smilax
<i>Canna indica</i> ^{1,8}	canna lily
<i>Crocsmia</i> × <i>crocsmiiflora</i> ^{1,8}	montbretia
<i>Hedychium gardnerianum</i> ^{1,8,9}	kahili ginger
<i>Zantedeschia aethiopica</i> ^{1,8}	arum lily

Composite herbs

<i>Achillea millefolium</i> ^{1,9}	yarrow
<i>Artemisia verlotiorum</i> ¹	Chinese mugwort
<i>Aster subulatus</i> ^{1,9}	sea aster
<i>Cirsium arvense</i> ¹	California thistle
<i>Cirsium vulgare</i> ¹	Scotch thistle
<i>Crepis capillaris</i> ^{1,9}	hawksbeard
<i>Erigeron sumatrensis</i> ^{1,9}	fleabane
<i>Gamochaeta coarctata</i> ^{1,9}	cudweed
<i>Hypochoeris radicata</i> ^{1,9}	catsear
<i>Lactuca serriola</i> ¹	prickly lettuce
<i>Lapsana communis</i> ¹	nipplewort
<i>Leontodon taraxacoides</i> ¹	hawkbit
<i>Osteospermum jucundum</i> ^{1,8}	freeway daisy

*Senecio jacobaea*¹
*Senecio skirrhodon*¹
Sonchus oleraceus^{1,9}
*Taraxacum officinale*¹

ragwort
gravel groundsel
puha
dandelion

Dicot. herbs (other than composites)

Anagallis arvensis^{1,9}
*Chenopodium album*¹
*Euphorbia peplus*¹
*Foeniculum vulgare*¹
Fumaria muralis^{1,9}
*Galium aparine*¹
*Galium divaricatum*¹
*Geranium robertianum*¹
*Lotus pedunculatus*¹
Modiola caroliniana^{1,9}
*Myosotis sylvatica*¹
*Orobanche minor*¹
Oxalis sp.^{1,9}
*Pastinaca sativa*¹
Pelargonium × *hortorum*^{1,8}
*Physalis peruviana*¹
*Phytolacca octandra*¹
Plantago lanceolata^{1,9}
*Plantago major*⁹
*Polycarpon tetraphyllum*¹
*Portulaca oleracea*¹
Prunella vulgaris^{1,9}
Ranunculus repens^{1,9}
Rumex obtusifolius^{1,9}
Silene gallica^{1,9}
*Sison amomum*¹
Solanum chenopodioides^{1,9}
Solanum nigrum^{1,9}
*Spergularia rubra*¹
*Trifolium repens*¹
Verbena bonariensis^{1,9}
*Verbena officinalis*¹
Veronica anagallis-aquatica^{1,9}
Veronica arvensis^{1,9}
*Veronica persica*¹
*Veronica serpyllifolia*¹
Vicia sativa^{1,9}
*Vinca major*¹
*Viola arvensis*¹
Wahlenbergia sp.¹

scarlet pimpernel
fathen
milkweed
fennel
scrambling fumitory
cleavers

herb Robert
lotus
creeping mallow
garden forget-me-not
broomrape
oxalis
wild parsnip
geranium
cape gooseberry
inkweed
narrow-leaved plantain
broad-leaved plantain
allseed
wild portulaca
selfheal
creeping buttercup
dock
catchfly
stone parsley
velvety nightshade
black nightshade
sand spurrey
white clover
purple-top
vervain
water speedwell
field speedwell
scrambling speedwell
turf speedwell
vetch
periwinkle
field pansy
harebell