



Geothermal scrub



Frost hollow scrub

SCRUB IN THE WAIKATO

When European settlers began exploring and writing about the Waikato region they described enormous expanses of scrub. Prior to human settlement, scrub covered about 20 per cent of the region. Most of the Waikato basin was dominated by scrub, with scattered patches of kahikatea forest. Swampy sites supported flax, manuka, rushes and sedges.

Scrub was also common in areas where local Māori had repeatedly burned the vegetation to:

- encourage the growth of bracken, an important food source
- clear land for cultivation
- clear land for pathways.

Scrub was generally considered to be wasteland by European settlers and most of it was cleared for farmland.

Today scrub covers about 6.5 per cent of the region. The largest areas of scrub can be found in the Taupō, Thames-Coromandel, Waitomo and Ōtorohanga districts. It's important we recognise the value of the remaining areas of scrub and the unique species that live in them.

Coastal scrub

THE FUTURE OF SCRUB

Large areas of scrub have been cleared for grazing land or pine plantation, especially on the more productive land within the Waikato Basin. It has been estimated that areas of scrub in our region have been converted to pine at a rate of about 800 hectares per year since 1993.¹

However, in some parts of the region the amount of scrub is increasing. This is particularly noticeable on the Coromandel Peninsula and the west coast, where marginal land is retired and farms are being subdivided for lifestyle blocks. Much of this scrub will develop into young forest, so scrub will again decrease and native forest will increase over time. However, the economic value of scrub as carbon credits may lead to even greater retirement of marginal land.

Where land is still being retired, native scrub plants have to compete for space with introduced plants, such as gorse, woolly nightshade and pampas grass. It seems inevitable that future scrub areas will have many more of these introduced plant species. We don't yet know how aggressive and persistent weed species will affect the type of native forest regenerating under them, or the unique plants and animals that rely on scrub in New Zealand.

¹ - MAF 2004. A National Exotic Forest Description (NEFD) as at April 1, 2003.

SAVE YOUR SCRUB AND EARN MONEY!

New Zealand is obligated under the Kyoto Protocol to off-set its carbon gas emissions. This means in effect cancelling the amount of carbon dioxide (CO₂) produced by industry by making sure we have enough areas of vegetation to 'soak' up the excess CO₂.

Areas of fast-growing vegetation such as scrub absorb high levels of carbon dioxide CO₂ and are referred to as carbon 'sinks'. Recent research suggests that New Zealand's scrub could be accumulating about one million tonnes of CO₂ each year. This is a quarter of New Zealand's reported CO₂ emissions for 1995.

Areas of scrub are eligible for 'carbon credits', which can be sold to businesses or organisations that produce high levels of CO₂. The idea is that CO₂ producers can offset the effects of their emissions by buying carbon credits from people who have forest or scrub CO₂ sinks.

If you have a patch of scrub on your land which is at least 100 hectares (247 acres) in area, you may be able to sell carbon credits from it. To find out about making money from your scrub with carbon credits, contact EBEX21 (Landcare Research). For contact details see their website www.ebex21.co.nz.

MANAGING SCRUB

Most areas of scrub are easy-care. They simply need to be fenced off and left to their own devices. However, weeds can invade scrub that has open patches. Nearly all patches of native vegetation in the Waikato are also home to animal pests such as rodents and stoats, which kill native birds and insects. Contact our Biosecurity team for information about pest and weed control.

SCRUB CLEARANCE RULES

Under various rules in the Waikato Regional Plan, resource consent is required for the clearance of:

- more than 1 hectare per 12 month period of indigenous vegetation on slopes exceeding 25 degrees
- indigenous vegetation within five metres on either side of the banks of a water body exceeding 50 metres in length per kilometre per 12 month period
- any vegetation within 10 metres of a sink hole or cave entrance in karst (limestone) landscapes
- any vegetation within the bed of a river or wetland that are areas of significant indigenous vegetation and/or significant habitats of indigenous fauna
- indigenous vegetation within 20 metres of a significant geothermal feature.

Most district councils also have rules about clearing indigenous vegetation – clearing means spraying as well as cutting. Please check the rules for your area with your local council.

MORE INFORMATION

Publications

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Web

- **Auckland Council**
www.arc.govt.nz/albany/fms/main/Documents/Environment/Plants%20and%20animals/Scrubland%20Facts%20.pdf
- **Department of Conservation**
www.doc.govt.nz
- **Forest & Bird**
www.forest-bird.org.nz
- **NZ Native Forests Restoration Trust**
www.nznfrt.org.nz/
- **New Zealand Plant Conservation**
nzpcn.org.nz/page.asp?ecosystems_plant_communities_scrublands
- **QEII National Trust**
www.qe2.org.nz
- **Trees for Survival**
www.tfsnz.org.nz
- **Waikato Regional Council**
www.waikatoregion.govt.nz/scrub
www.waikatoregion.govt.nz/regionalplan
- **Weedbusters**
www.weedbusters.org.nz

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Forest Fragment Management Series

Who cares about scrub?

Scrub is short, dense vegetation made up of shrubs, ferns and young trees. It has long been thought of as weedy wasteland, suitable only for clearing. However, we now know that native scrub is valuable because it provides many ecosystem services. For example, it:

- is a home for many native plants and animals, including kiwi, lizards and rare orchids
- adds diversity to our landscape
- is a nursery for native forests on suitable sites
- holds soil together in hill country, preventing slips and minimising erosion
- absorbs and stores greenhouse gases
- can act as wildlife corridors between other natural areas
- can buffer other natural areas like forests or wetlands
- is a food source for honey bees
- provides us with useful products, such as tea tree oil from manuka scrub
- is a source of traditional medicine (for example from the native shrub, kumarahou).

TOUGH AS OLD BOOTS

The plants that live in scrub are hardy. They also have to be able to send their seeds across large distances between these widely scattered, sometimes short-lived habitats.

This factsheet describes the wide variety of scrub types found in the Waikato region, what lives in them and why we should look after them.



Kanuka

Native scrub provides us with useful products, such as tea tree oil and traditional medicine.



Alpine scrub



Mountain neinei



PLANTS IN SCRUB

Scrubland rarities

Plants that prefer living in scrub often live an uncertain existence. Many areas of scrub develop into areas of forest, resulting in the loss of scrub species in that area. Several of our scrub species are rare, for example the:

- small, ground-dwelling, dwarf greenhood orchid (*Diplodium puberula*), which exists in just a few locations in the Waikato region and is at extreme risk of extinction
- native daphne (*Pimelea tomentosa*) found in only a few disturbed scrubby habitats in our region, such as along tracks and rivers
- pale-flowered kumarahou (*Pomaderris hamiltonii*) found in the hills behind Miranda, and its rare cousin, *Pomaderris apetala*, which mainly grows around Kawhia, although it is also native to Australia
- parasitic mistletoe (*Korthalsella salicornioides*), which is mostly found draped from manuka and kanuka branches, preferring slow-growing, older host plants.

Scrubland oddities

A unique feature of New Zealand's plant life is the high number of shrubs that have very small leaves and twiggy, interlaced branches. Plants with these characteristics are called 'divaricating' species and many of them are only found in scrub. Many scientists believe that this twiggy growth form evolved in response to moa browsing, making it difficult for moa to reach leaves and berries growing within the twiggy mass.

Orchid stronghold

More than 50 species of native orchid have been found in the Waikato – about half the total number of orchids in New Zealand. A large proportion of these can be found in scrub, particularly ground-dwelling species such as horned orchids, sun orchids and the 'greenhood' orchids. Scrub habitats can also be home to epiphytic orchids that perch on the branches of native shrubs.

Divaricate shrub



MORE THAN JUST MANUKA

There are many different types of scrub in the Waikato region. They fall into two main categories:

- short-lived (temporary) scrub, which establishes on bare land or abandoned paddocks and will eventually develop into forest
- long-lived (persistent) scrub, which grows in tough growing conditions, such as geothermal and sub-alpine areas, or areas of infertile soil.

Temporary scrub

When people think of scrub they are usually referring to temporary native scrub, which makes up most of the scrub in the Waikato region. It is usually made up of fast-growing, 'pioneer' species like manuka and other common shrub species like fivefinger, rangiora, mahoe, lancewood and coprosma. Tree species like totara and rimu often germinate under the scrub shelter, eventually growing above the other species to produce mature forest. In sheltered sites and on good soil, temporary scrub usually matures into forest within 30 years.

In many areas scrub is made up mostly of introduced species, such as gorse and broom. Although generally thought of as weeds, in some situations they can fill a valuable role in aiding the regeneration of native forest. They do this by providing shelter for native seedlings, which will eventually replace them.

Wetland scrub

The Waikato's extensive wetlands support a variety of shrubs, including manuka, small-leaved coprosmas and turingi (native heath). In very wet sites, manuka grows with tangle fern, kiokio, sedges, harakeke (flax) and coprosma shrubs, with the odd tall kahikatea and cabbage tree. Our largest area of wetland scrub is at Whangamarino wetland, east of Meremere.

Upland scrub

Upland scrub can be found on mountains that are high enough to have a treeline. When hiking to the top of Pirongia, Karioi or Maungatautari, look out for rocky outcrops with hebes, mountain flax, shrubby rata and the 'Dr. Seuss-like' tuft tree, mountain neinei.

Frost hollow scrub

In parts of the Pureora Forest there are basins where cold air is trapped on frosty nights, resulting in an 'upside-down' treeline. These 'frost hollows' are too cold for forest to grow, but they do support a small number of hardy shrubs like monoao, swamp coprosma and the twiggy tree daisy.

Legend

- Urban area
- Scrub

Distribution of scrub in the Waikato region

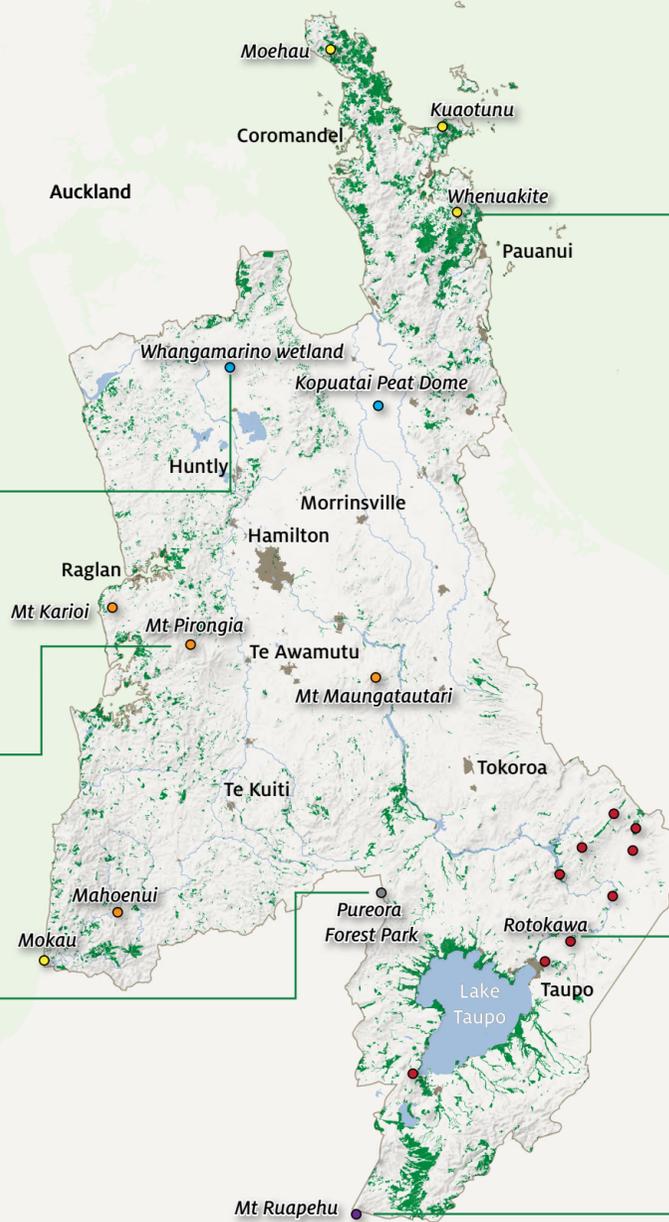
Based on LCDDB3, 2008 scrub classes

Persistent scrub

Scrub can only persist where it's too tough for native forest to take over because of:

- poorly drained or infertile soil
- a harsh climate
- regular disturbance, such as burning.

Persistent scrub is mainly found on our region's high mountains around Tongariro and the Kaimanawa Ranges, and in our wetlands. There are six main types of persistent scrub in the Waikato region: wetland, coastal, upland, alpine, frost hollow and geothermal scrub.



Wetland scrub

Coastal scrub

Coastal scrub must be able to survive strong winds, salt spray and often unstable, salty or infertile soil. Coastal cliffs often have mountain flax (wharariki) as well as shrubs of taupata, tauhinu, prickly mingimingi, coastal tree daisy, manuka and kanuka. Coastal wetland scrub, with manuka and salt-tolerant species like marsh ribbonwood and oioi, fringes many of our estuaries.

Geothermal scrub

Geothermal scrub is one of the rarest habitat types in New Zealand. The scrub that grows in the thermal areas of the Waikato supports a unique collection of plants and is classed as a critically endangered habitat. Dominant plants in these areas include prostrate kanuka, manuka, monoao and prickly mingimingi. Beneath these plants grow species from warmer climates, such as the dainty comb fern, the primitive twig-like fern ally (*Psilotum nudum*), the threatened fern species *Dicranopteris linearis*, and the ground orchids *Calochilus robertsonii* and *C. paludosus*.

Alpine scrub

Alpine scrub grows on the Waikato's highest mountains. Whip-cord hebes, mountain toatoa, snow totara, inaka, pink pine, pygmy pine, bog pine and snowberry all grow above the treeline. At even higher altitudes they give way to tussocks and alpine herbs.

ANIMALS IN SCRUB

Scrub can provide a great deal of food for native animals. Because many scrub plants are short-lived, lots of dead plant material builds up, providing food and habitat for a variety of invertebrates. Many scrub plants, including fivefinger, coprosma, bush lawyer, wineberry and pittosporum species, produce lots of berries and nectar that feed native birds and lizards. Some native animals, like long-tailed bats and moreporks, roost mainly in forest but benefit from nearby scrub, flying out at night to feed on the insects.

Birds

Many bird species would have made scrub their home in pre-human times, including kakapo, takahe and species of moa. The most common native birds found in scrub today are fantails, grey warblers and silvereyes. The fernbird is the only bird that comes close to being a 'scrub specialist', though they also live in coastal saltmarshes.

Scrub also provides important habitat for our national icon, the kiwi. Kiwi seem to prefer varied areas of forest and scrub. On the Coromandel Peninsula, the best populations of kiwi are in the Moehau, Kuaotunu and Whenuakite areas, where they live in large areas of scrub and forest.

Reptiles

Most lizards (geckos and skinks) and tuatara like to bask in the sun, and many find scrub a suitable habitat.

The most common native lizards found in the Waikato region are the copper skink and common green gecko. Although the common green gecko is widespread, climbing predators such as cats, stoats and ship rats prey upon it. Geckos are well camouflaged and can be hard to spot. Until recently the Stephens Island gecko (or striped gecko as it is now called) was thought to reside only on the Stephens and Maud islands in the Marlborough Sounds. However, in recent years, striped geckos have been found in areas of scrub on the Coromandel Peninsula.



Tuatara once lived in scrublands around our region's coasts. However, predation by introduced pests means they are now restricted to offshore islands, including Middle Island and the Mercury Island group in the Waikato region. On some islands tuatara have been recorded at densities of up to 1,500 per hectare in pasture and scrubland areas. Scrubland is ideal for incubating tuatara eggs, which need warm, sunny nest sites.

Insects

Scrub provides an ideal habitat for many insects. Areas of scrub with an ungrazed, diverse understorey and a thick leaf layer will have a wide range of insects. In just three nights, scientists collected almost 200 species of moth in one scrubland reserve. Another scientist once counted more than 200 stick insects in a single manuka bush.

The best way to see what insects live in scrub is to go on a night search with a spotlight or torch. A night search may reveal hundreds of stick insects moving around the tops of shrubs, feeding on the new growth. On still, humid summer nights, geckos feast on young adult cicadas that emerge from their larval holes in the ground.

In manuka scrub look out for the tiny metallic-green manuka beetle, and in late summer, its larger cousin, the mumu chafer beetle. These clumsy insects can be seen in their thousands for a few weeks of the year, when they often provide a feast for lizards and birds.

Puriri moth larvae bore into the trunks of kanuka, wineberry and marbleleaf (also known as putaputaweta). Putaputaweta means 'holes where the weta appear' and true to their word, weta take up residence after the moths emerge.