

RAUKAWA,

WATERCRESS RESTORATION GUIDE



HE PUKA TĀTAKI WHAKARAUORA
WĀTAKIRIHIO RAUKAWA



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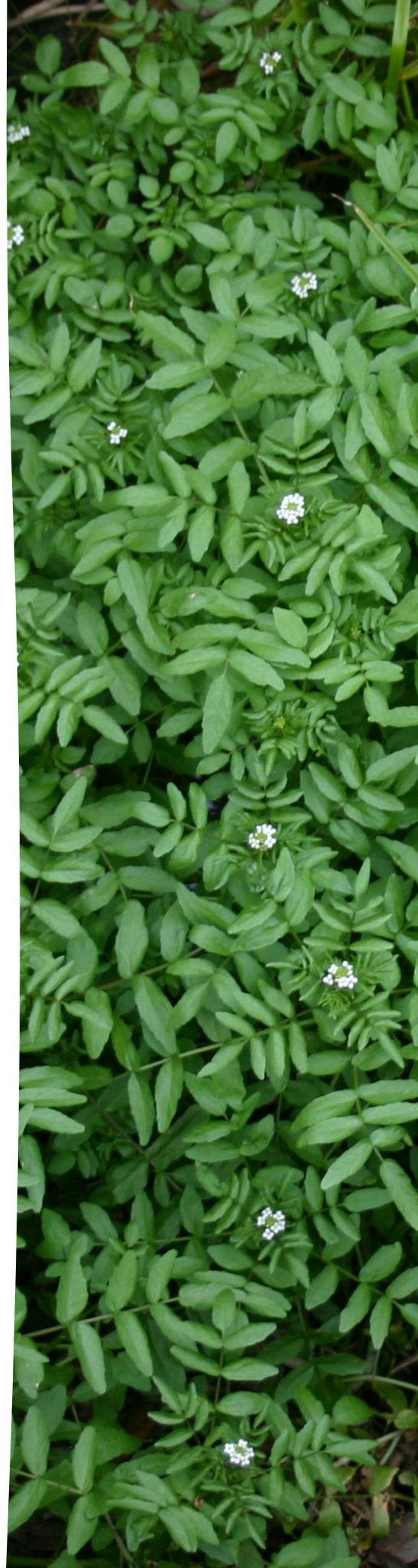
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KUPU WHAKATAKI

Kua whakawhanakehia tēnei puka tātaki e Raukawa me NIWA hei whakapuaki i te mātauranga me ngā mōhiohio pūtaiao e pā ana ki te wātakirihi. Ko te aronga matua o tēnei puka tātaki, kia hōrapa haere ngā mātauranga o Raukawa hei tauira mā ngā 'Kaitiaki' e wawatahia ana ki te whakarite me te whakahaere i ngā 'wānanga whakarauora wātakirihi', mō te whānau, ngā marae, me ngā hapū. He maha ngā hua ka puta i ēnei wānanga, kua ko te whakaora wātakirihi anake, engari, ko te whakaora i ngā rerenga rauropi o roto i ngā awa tipuna.

INTRODUCTION

This guide has been developed by Raukawa and NIWA to share mātauranga and scientific information about watercress. It also aims to share Raukawa mātauranga as a template for 'Kaitiaki' who aspire to develop and facilitate 'watercress restoration projects', for their whānau, marae or hapū. Not only will these projects focus on restoring watercress and the practices involved, but also the biodiversity within their own tipuna awa.



WATERCRESS SPECIES

Native to Europe, Asia and north Africa, watercress was deliberately introduced to Aotearoa (and other countries) and has since become naturalised.



Watercress belongs to the mustard family (Brassicaceae) which is known for having a peppery or tangy flavour. It is considered one of the oldest known leaf vegetables consumed by humans, with the Persian, Greek, Roman and Egyptian civilisations all having consumed watercress.

Native watercress was identified as different species

by settlers in early botanical surveys. Native watercress was most likely *Rorippa palustris* and *R. divaricata*. *R. palustris* can be found around the world whereas *R. divaricata* can only be found in Aotearoa.

In Aotearoa, watercress is also referred to as wātakirihi, kōwhitiwhiti, panapana, ponui and matangaoa.

WATERCRESS SPECIES

There are two main types of exotic (non-native) watercress in Aotearoa:

1 *Nasturtium officinale*



2 *Nasturtium microphyllum*



These two species are very similar and may grow together. The main differences between the two species are seen in the surface of the seeds and seed pods.

SIGNIFICANCE

Kai

Watercress is a main component of traditional recipes and the plants are generally cooked before being eaten. Therefore, harvest sites are greatly valued by whānau and hapū.



Rongoā

Watercress (*N. officinale*) contains high amounts of vitamins and minerals such as iron, calcium, vitamin A and vitamin C. As such, watercress has been used for a variety of medicinal purposes, including digestion, congestions, ulcers, skin irritations and headaches.



Tikanga

There are tikanga around watercress that are specific to whānau, hapū, and iwi around Aotearoa. These tikanga are intergenerational and encompass harvesting practices, traditional stories, and wider environmental management systems.



WHERE TO FIND WATERCRESS

Distribution

Watercress can be found throughout Aotearoa.

Habitat

Watercress plants thrive in wet areas such as slow flowing seeps, streams, drains and ditches as well as the margins of larger rivers where there are sheltered or low flow areas.

NGĀ KŌRERO Ā NGĀ KAUMATUA

TE HAU KĀINGA

*HOKI ATU KI TŌ
MARAE*

HOME

*TAKE YOURSELF
BACK TO THE MARAE.*



WĀNANGA

Wānangatia me tō whānau e pā ana ki te whenua, ngā tikanga, te whakapapa me te wātakirihi.

WORKSHOP

Hold a wānanga around the connection to the whenua, the wai, our whānau, our whakapapa and wātakirihi.



NGĀ KŌRERO Ā NGĀ KAUMATUA



TIKANGA 1 :
MĀTAURANGA MĀORI

*NGĀ ĀHUA O TE
MAHINGA KAI I MUA.*

METHOD 1 :
MĀORI KNOWLEDGE

*RETURN TO THE
TRADITIONAL
WATERCRESS SITE.*



NGĀ ĀHUATANGA PAI KI TE
WĀTAKIRIHI

1. E āta haere ana te rere o te wai.
2. He wāhi whakaruruhau.
3. Kāore ngā kararehe e noho tata Ana.
4. He wāhi haumaruru, ā, he ngāwari te kuhu atu.

IDEAL CONDITIONS TO SUPPORT
HEALTHY WATERCRESS GROWTH

1. Slow flowing water.
2. Shaded area.
3. No grazing animals.
4. Safe & easy access.

WHAKAORANGA TIKANGA

TIKANGA 2: HORANGA TIPU

1. Tārakea te wāhi wātakirihi i ngā otaota.
2. Katohia te wātakirihi kia kotahi te tō i te wāhanga o te toru tekau mitarau, waiho ngā pakiaka kia tautau te āhua.
3. Mō ia pūtoi wātakirihi e rite ana kia whakaparahia, tangohia kia kotahi waiho kia rere.



METHOD 2: SPREAD GROWTH

1. Clear the watercress site of weeds.
2. Pick a single stem of the watercress at 30 cm, leaving the white roots dangling.
3. For every bunch of watercress picked, release some to start the process of growing again.



**NB: DON'T PICK WATERCRESS
FROM ANOTHER CATCHMENT**

WHAKAORANGA TIKANGA



TIKANGA 3: HOROI WĀTAKIRIHI

1. E noho ana ngā puhi wātakirihi i raro i te wai maōri kia horoi i ngā puhi rau atau.
2. Tahuritia ngā rau kia anga whakamua i te au o te wai.
3. Āta mirimiri i ngā pūtoi kua taupungahia.
4. Tangohia i te wai, āta pīoioi kia makere te wai i mua i te tuku ki te pēke hangarua.

METHOD 3: WASHING WATERCRESS

1. Submerge each bunch in the flowing part of the stream.
2. Face the leaves towards the current.
3. Gently agitate the submerged bunches.
4. Remove from water, gently shake removing any excess water before placing into recycled bag.



WHAKAORANGA TIKANGA

TIKANGA 4: KOHI WĀTAKIRIHI

1. Whakamahia ētahi rauemi raranga.
2. Kia uru ai ngā rau wātakirihi ki ngā kōwhao kia kaua ngā hua e pakaru nō te kaha me te teitei o te wai.
3. Panaia rānei ngā tātā o te wātakirihi ki roto/raro i te whenua.

METHOD 4: GATHERING WATERCRESS

1. Weave whāriki, kete, pōtae.
2. Stabilise mat, bag, hat to the bank and transplant watercress between the weaves. (This is to ensure watercress is not moving during floods and rising water).
3. Alternatively push stem into the awa floor.

TIKANGA 5: MĀTAI ORANGA

Mātai oranga ia wā.

METHOD 5: MONITOR HEALTH

Monitor the site regularly.



NGĀ TIKANGA MĀTAURANGA

TIKANGA 6: NGĀ TIKANGA MĀTAURANGA

1. Mai i te marama o Paenga-whāwhā tae noa ki te marama o Whiringa-ā-nuku ngā marama e pōike ana te wātakirihi.
2. E taea ana te whakatipu i te wātakirihi i roto i ngā oko horoi, heoi anō me āta whakarite te rere o te wai kia ora ai te wātakirihi.
3. Mā te karakia i mua i te mahi ka whakatau i ngā whakaaro tika me ngā mahi tika. Me pēnei i mua i te urunga atu ki te awa me te tīmatanga o ngā mahi.

METHOD 6: KNOWLEDGEABLE PRACTICES

1. From the months of April – October, watercress is bountiful.
2. You are able to grow watercress in a bathtub as long as you ensure the water is flowing steadily, to ensure the watercress survival.
3. Karakia is a part of our tikanga to ensure that our thoughts and our work ethics are clear and safe. This must be protected before the start of our work and also before entering the stream.

RESTORING

Watercress has been cultivated for hundreds of years



Recently, watercress has been commercially cultivated using hydroponics or large scale purpose-built watercress beds with managed water flows.

This section focuses on natural cultivation, in existing habitats, not requiring an investment in infrastructure or specialist equipment.

Key things to consider are where to source your plants and how to choose your site.

RESTORING

Plant selection

Sourcing plants from a nearby site is ideal as these plants are most likely to have adapted to local conditions such as seasonal temperature fluctuations.

Harvested shoots should be kept cool and shaded so that they do not dry-out while being

transported between sites. This could be achieved by using a chilly bin or covering your collection bucket or kete with a damp sack or towel.



Site selection

It is important to consider the purpose of restoring watercress to a site. If the purpose is to later harvest for human consumption, the potential for contamination of the watercress by parasites, disease, and faeces must be considered.

Sites receiving farm runoff are unlikely to be suitable if the watercress is for human consumption.

Ideal conditions for growing watercress include shallow slow flowing water with a neutral pH and high light.

Suitable water depth is also related to flow and water clarity. For example, when water flow is very slow, and the water is clear, watercress can grow in deeper water with some leaves submerged. When the water movement is faster, shallow (ankle-deep) or sheltered areas are required to ensure that plants can remain anchored.





Watercress prefers high light. An open site is ideal or one that has little shade throughout most of the day.

Sites with large areas occupied by invasive marginal aquatic species will require a high degree of on-going maintenance. Otherwise, it is unlikely to be suitable for watercress.

If there is an abundance of birds, it may be necessary to protect your transplanted site until the plants are established or select an alternative site. Watercress plants can easily be protected by inserting wire mesh (e.g. chicken wire) around small areas.

Transplanting

Watercress is relatively easy to grow. New roots are produced readily from nodes (the point on a stem where leaves, buds, shoots, and roots can arise), enabling transplanted shoots to anchor and form new plants.

Stems that are 25 to 30 cm long with healthy leaves, and stems that may also be rooting from the nodes are ideal for transplanting. Smaller or shorter stems and shoots may also be suitable, depending on your site, for example when the water is very shallow.

Suitable sites on the margins of streams or seeps will likely have soft sediments that will enable individual shoots to be transplanted directly into the sand or mud by hand. For example, by using your hands to push the watercress stem into the sediment, and then gently pressing the sediment around the base.



Example of a shallow site (ankle deep water) with very soft sediments, fast flow and small watercress just planted (top). The same site one year later (bottom).

THREATS

Watercress abundance and quality has decreased in a lot of traditional harvesting sites around Aotearoa.

There are many possible causes for this decline including:

- Land use intensification activities such as farming. For example, because watercress commonly grows in drains, slow flowing streams and wet grounds, watercress may be vulnerable to browsing by stock and stream bank erosion from trampling.
- Increased erosion which can lead to excess sedimentation (soil in the water) that can be harmful to watercress. This can smother leaves and block the sunlight needed for photosynthesis and growth.
- Animal faeces and urine which can infect watercress with diseases such as liver fluke (*Fasciola hepatica*) from sheep manure and *E. coli* (*Escherichia coli*).
- Competition from other plants, particularly wetland and riparian weed species.



**“EHARA TAKU TOA I TE TOA
TAKITAHU, ENGARI HE TOA
TAKITINI”**

**“MY STRENGTH IS NOT DUE TO ME
ALONE, BUT DUE TO THE
STRENGTH OF MANY”**

RAUKAWA

RAUKAWA CHARITABLE TRUST | TE POARI MANAAKI O RAUKAWA