Te Tau Ihu

Seed collection calendar and propagation guide

Te Hoiere Project
HAERE, KAKEA
TE ARA POKA HOU

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Getting started

This booklet provides times when seeds of different native species typically ripen in Te Tau Ihu. However, this calendar is affected by annual weather conditions. We recommend checking your parent trees regularly to make sure you don't miss the best collection period. Some seeds are eaten by birds as soon as they are ripe, while others disappear into the wind as soon as the pods open and need to be collected before this happens.

The information in this guide is based on our experiences and best information at the time of publishing. If you have information or suggestions to add, please let us know at info@tehoiere.org.nz.

Restoration planning

It's important to get a canopy established as quickly as possible to suppress weeds. If you're undertaking a long-term restoration project, then introduce podocarps and long-lived tree species as part of your planning. Add totara, matai, miro, rimu, and kahikatea, as these species dominated most lowland areas in pre-European times. Our ecology, especially native birds, have adapted to these species as part of a "climax community," a stable environment for native flora and fauna.

Ecosourcing

Ecosourcing is collecting seeds near the area where the restoration will take place. It's an important part of a restoration project because the plants will be suited to local conditions and more likely to survive. Local plants that have evolved in certain conditions are genetically predisposed to be successful in those areas. Ecosourcing of seed maintains the local diversity of plants and also increases the success of restoration projects. The diversity and character of local vegetation is kept when seed is ecosourced.

Issues arise when landscapes are modified and remnant vegetation is lost or becomes isolated or disconnected. Native restoration plantings that have been undertaken with non-local stock may in time reduce the local genetic diversity and character of vegetation in the area.

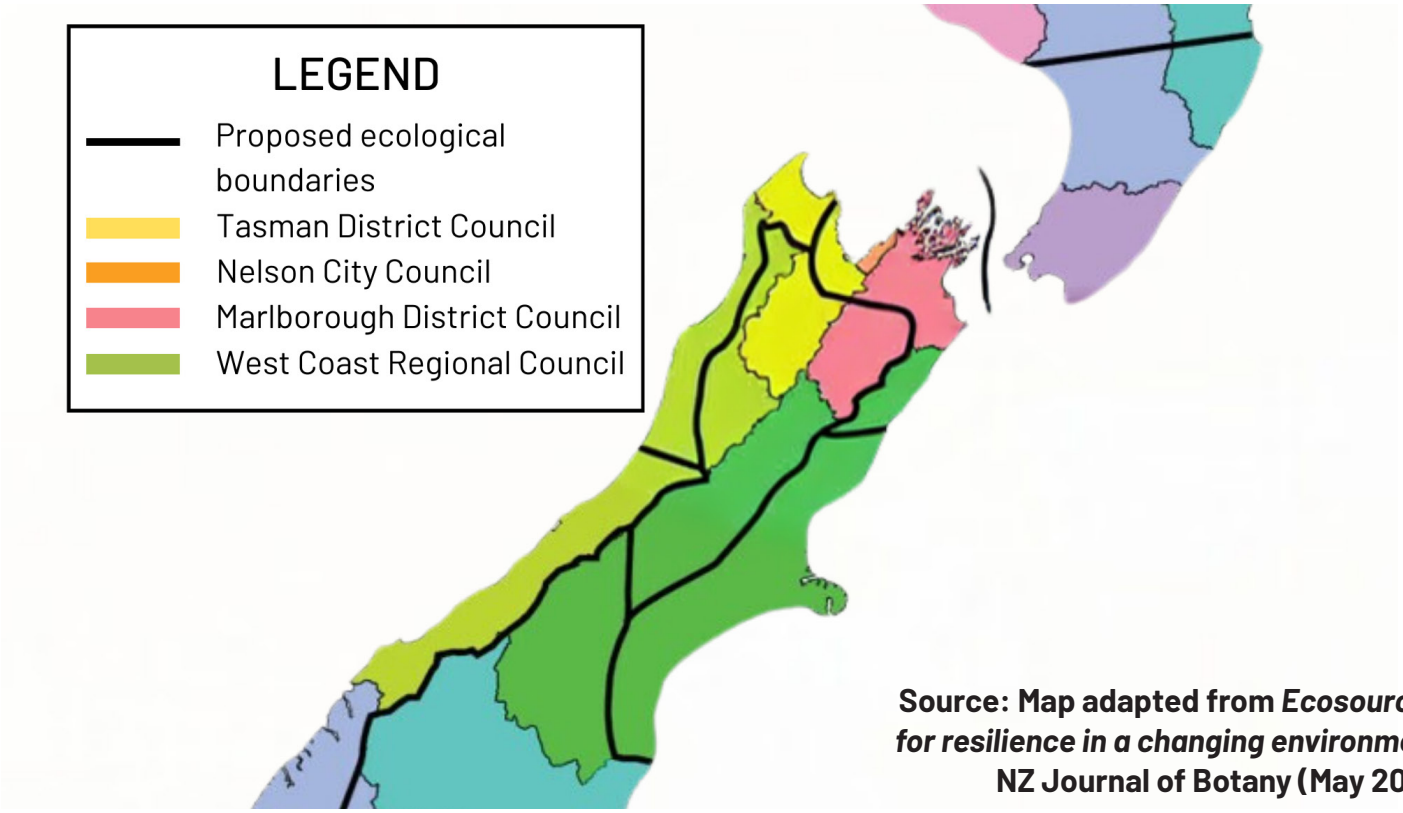
Where possible, seed collection for a single species should be collected from as many local parent plants as possible. This is important for seed and plant success, as well as genetic diversity of future planted communities.

Permissions to ecosource

While private land may only need the permission of the landowner or occupier, the rules vary between councils and Department of Conservation when ecosourcing from public land. For example, if you're in Marlborough, you may ecosource seeds without permission from public reserves owned by Marlborough District Council, but you'll need a permit from DOC to collect from public conservation land (email: picton@doc.govt.nz).

Totara germinating

Ethics in ecosourcing



Source: Map adapted from *Ecosourcing for resilience in a changing environment*, NZ Journal of Botany (May 2023)

If I'm trying to ecosource, how far can I source the seeds from the future planting site? *It depends*.

There is a range of opinions and guidance around ecosourcing. Department of Conservation has strict standards for collecting seeds and planting seedlings for restoration projects on public conservation land. DOC's guidance for the public on local planting can be found at doc.govt.nz, including maps of ecological districts.

Councils each take a slightly different view on ecosourcing. There may be varied standards across councils for ecosourcing rules when planting on council-owned land or using council funding for private restoration projects.

For yet another view, a perspective published in the New Zealand Journal of Botany by researchers at Manaaki Whenua – Landcare Research paints a different picture of ecological districts. This article from May 2023 suggests that future climate change scenarios call for broadening ecological districts into just nine areas across Aotearoa to increase resilience and genetic diversity.

Where's the agreement on ecosourcing?

Everyone agrees that seeds should be collected from a similar ecosystem to the one being restored - and not too far away. It's most important to consider the type of plant for the conditions. For example, raupo is a wetland and riparian plant that shouldn't be planted on a dry forest floor. Check out nzpcn.org.nz for more information on plant species.

The above map demonstrates a new concept in ecosourcing and the diversity of ecological areas in Te Tau Ihu, such as different ecology in the North versus South Marlborough. If you are receiving funding for restoration plantings, it is best to check with the sponsors for any specific guidelines around ecosourcing.

Preparing and sowing seeds

Seed preparation

Only collect ripe seeds. Each will require different preparation, depending on the type of seed:

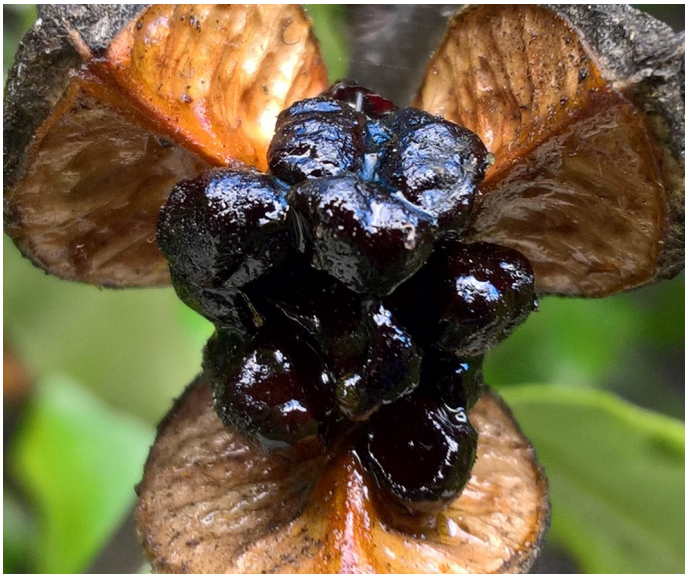
Fleshy seed – coprosmas and cabbage trees
Cover and soak the seeds in water for a few days, then rub off the fleshy part of the seed. This will often float and can be poured off leaving the seed behind. Or, the fruit can be strained off by pouring it all through a sieve, with the seeds falling through. The seeds should then be spread out to dry.

Dry seed – flax, kowhai, toetoe
The seeds should be separated from their pods/ casings (if applicable) or just stored in a warm, dry place.

Sticky seed – pittosporums
Leave the seed in its case and rub all together with dry sand. This breaks open the case and makes the seed less sticky and easier to handle.


Cabbage tree


Kowhai


Kohuhu (pittosporum tenuifolium)


Toetoe

Seed sowing

Seeds are best sown soon after collection, to replicate natural conditions. Seeds may take anything from weeks or years to germinate, depending on the species. For this reason, it is important to label your trays with the species name and date of sowing.

- **Fill** seed tray almost to the top with commercial seed raising mix (no weed seeds) and gently flatten.
- **Water** the seed trays.
- **Sow** seeds onto the flattened surface.
- **Cover** with a layer of pea gravel. This holds the seed down and helps retain moisture or cover with a thin layer of potting mix.
- **Label** with species name and date.
- **Protect** in an outdoor area – protected from disturbance from cats, and pests such as mice. A shady situation is best, until the seeds germinate. If possible, protect the trays from weed seeds that may be in the area, as fast-growing weeds coming up in the trays makes care difficult.

Any variation to these sowing methods is noted in the tables on the following pages.

Matai seedlings

Recommended equipment

Sacks, bags or containers for seeds
Plants such as kanuka require small branches to be cut off and left in the sack or container until they are dry and fall out. Make sure a container or bag is allocated for each species.

Secateurs and loppers
Extendable loppers or saws are a bonus for reaching higher into the trees.

Old sheets or tarpaulin
These can be used for placing under a tree and shaking the seeds onto.

Nets that can be left under a tree
Rimu, for example, is difficult to reach the fruit so a net provides a place to catch it after falling. Such fruits can also be picked up from the ground, but this method requires more effort.

Sieve for separating seeds
Seeds must be separated from their fruit after soaking.


Sieve to separate seeds


Shown here, a net to collect falling totara seeds

Botanical name	Common name	Ripe fruit/ seed case	Feb	Mar	May	July Aug Sep Oct	Nov Dec Jan	Notes	Estimated Germination
Alectryon excelus	titoki	red-black fruit	y				y	Black seed is enclosed in a bright red fleshy coat. The seedlings germinate quickly and are frost tender when young.	1 month
Aristotelia serrata	makomako wineberry	red-black fruit	y	y				Dioecious and quickly eaten by birds, so harvest slightly underripe berries if you can't make daily checks on them.	2 months
Beilschmiedia tawa	tawa	purple drupe	y	y				Press the whole fruit into a flat bed of seed raising mix. Do not cover the fruit with mix, but place a glass or plastic sheet over the tray and place in a warm shady site for the winter. Seedlings usually appear in early spring. Seeds must be collected and sown fresh.	2 months
Brachyglottis repanda	rangiora	dry brown seed					y	Collect the seed heads as the wings begin to dry. Expect many sterile seeds.	1 month, or in Spring.
Carex secta	purei	small nut	y	y				This has a small window of collecting time so keep an eye on the parent plants. Germination time is erratic.	1-7 months
Carex virgata	wetland segde	small nut	y	y				This has a small window of collecting time so keep an eye on the parent plants. Germination time is erratic.	1-7 months
Carpodetus serratus	putaputaweta	red-black fruit			y				2 months
Clematis paniculata	clematis	dry seed		y				The fluffy seed head can be left attached.	2-7 months
Coprosma areolata	dark blue fruit			y					1-4 months
Coprosma grandifolia	kanono	red fruit	y	y					3-4 months

Botanical name	Common name	Ripe fruit/ seed case	Feb	Mar	May	July Aug Sep Oct	Nov Dec Jan	Notes	Estimated Germination
Coprosma lucida	shining karamu	red fruit		Y					1-4 months
Coprosma propinqua	mingimingi	blue fruit		y	y			Plants tend to fruit in alternate years.	2-3 months
Coprosma rhamnoides		ruby-red fruit		y	y				2-3 months
Coprosma robusta	karamu	orange fruit	y	y	y				1-2 months
Coprosma rotundifolia		red/two-lobed fruit	y				y		2-3 months
Coprosma tenuicaulis	swamp coprosma	black fruit		y	y				2-4 months
Cordyline australis	tī kōuka cabbage tree	cream fruit	y	y				The seedlings can be vulnerable to botrytis (grey mould) if sown too thickly.	2-4 months
Cortaderia richardii	toetoe	dry white fluffy seed		y				Leave seed uncovered or barely covered.	1 month
Dacrycarpus dacrydioides	kahikatea	orange-red fruit	y	y				Collect seed from the ground, lay a large sheet under the tree, or pick from lower branches.	2-3 months
Dacrydium cupressinum	rimu	red fruit	y	y	y			Seed production varies considerably from year to year and is often interrupted before the seed is ripe.	Several months
Elaeocarpus dentatus	hinau	dark brown fruit		y	y			Collect seed from the ground or pick from lower branches.	6 months
Elaeocarpus hookerianus	pokaka	purple-black drupe		y	y			Pick the purple/brown drupe from lower branches or collect either the drupe or black stone off the ground. New seedlings look nothing like their parents, taking several years to develop adult foliage.	1-2 years +

Fuchsia excorticata	kotukutuku	red-purple fruit	y				y	Because the seeds are so tiny, it is advisable to mix them with a little sifted seed raising mix or sand before sprinkling over a firm bed of seed raising mix.	1-2 months
Fuscospora solandri	black beech	dry brown seed		y				Use net, fallen branch or pruned branch pre-mature seed	
Geniostema ligustrifolium	hangehange	dry brown capsule	y	y			y		
Grislinia littoralis	broadleaf	blue-black fruit	y	y	y				
Hebe stricta	koromiko	brown capsule		y	y			Collect the capsules before they open and turn brown. Store capsules in a paper bag in a warm, dry place to open and release the seeds, but don't allow them to dry out. Watch carefully for fungal infections.	1 month
Hedycarya arborea	pigeonwood porokaiwhiri	orange fruit	y	y				The seed is most easily collected from the ground and can look similar to plum stones once the orange flesh has gone. Seedlings will come up in the autumn.	2 months
Hoheria sexstylosa	lacebark hohere	dry brown		y	y			Prone to caterpillar damage. Seed can be gathered when still slightly green to lessen this issue.	1 month
Kunzea species	kanuka	dry brown capsule		y				There is only a small window of opportunity to collect the dry capsules as seed is quickly dispersed. Kanuka should always be ecosourced carefully because it is so variable across the country. Store the capsules in a paper bag in a warm dry place until the minute seed is released (may only take a day or two).	1-3 months
Laurelia novae zelandiae	pukatea	green capsule		y	y			Must be sown fresh	

Botanical name	Common name	Ripe fruit/ seed case	Feb	Mar	May	July Aug Sep Oct	Nov Dec Jan	Notes	Estimated Germination
Leptospermum scoparium	manuka	brown capsule	y	y	y	y	y	The flowers appear in early spring and the mature seed capsules can stay unopened on the branches for a long time so there is generally seed available for collection at any time of year. Manuka should always be ecosourced carefully because it is so variable across the country. Place the capsules in paper bag in a warm dry place until the fine red seed is released.	1 month
Leucopogon fasciculatus	mingimingi	crimson fruit	y	y					9 months
Melicytus lanceolatus	narrow-leave mahoe	purple-black fruit	y	y					2 months
Melicytus ramiflorus	mahoe	white-purple fruit	y	y				Sow the washed seeds or whole fruit sparingly on a firm bed of seed raising mix and lightly cover.	2 months
Metrosideros umbellata	southern rata	dry seed		y	y			Leave seed uncovered or barely covered.	2 months
Myrsine australis	mapou red matipo	black fruit		y	y	y		Quickly eaten by birds, so it harvest slightly underripe berries if you can't make daily checks on them.	2-12 months
Myrsine divaricata	weeping mapou	dark purple fruit						Quickly eaten by birds, so harvest slightly underripe berries if you can't make daily checks on them.	2-12 months
Olearia rani	heketara	white fluffy seed					y	Collect the seed heads as the seed wings begin to dry, barely cover them.	9-12 months
Pennantia corymbosa	kaikomako	black fruit	y	y					2-5 months

Kanuka

Kahikatea

Coprosma propinqua (mingimingi)

Broadleaf

Botanical name	Common name	Ripe fruit/ seed case	Feb	Mar	May	July Aug Sep Oct	Nov Dec Jan	Notes	Estimated Germination
Phormium tenax	flax/harakeke	dry brown seed	y	y			y	Pick the whole pod and put it into a container. Open the pods and let the shiny black seeds fall out.	1-4 months
Phyllocladus trichomanoides	tanekaha	cone		y	y				4 months
Piper excelsum	kawakawa	yellow-orange fruit	y				y	Pick the fruit as it begins to turn from green to yellow otherwise the birds might beat you to it.	
Pittosporum eugenioides	lemonwood tarata	sticky brown seed	y	y	y	y	Y	Use techniques for sticky seeds. It is possible to sow whole seed pods and prick out seedlings early before the roots become entangled.	Vari-able) 2-12 months)
Pittosporum tenuifolium	kohuhu	sticky brown seed	y	y	y	y	y	Use techniques for sticky seeds. It is possible to sow whole seed pods and prick out seedlings early before the roots become entangled.	Vari-able) 2-12 months)
Plagianthus regius	ribbonwood manatu	dry brown capsule	y	y				A single seed contained in a tiny capsule, falls attached to a mass of others. These can be collected off the ground in late summer. A small insect sometimes bores a tiny hole in the seed capsule but there is generally no need for treatment if sown when fresh.	4 months
Podocarpus totara	totara	yellow-red fruit	y	y				Collect the seed off the tree or the ground, sifting the leaf litter to remove any unwanted material.	5 months +
Prumnopitys ferruginea	miro	red fruit		y	y			The fruit can be collected from the ground or picked from lower branches. Place the seed trays in a dark place (under a hedge is one option) to discourage weed growth until the seedlings appear.	3 years +
Prumnopitys taxifolia	matai	black fruit	y	y				Collect the seed off the ground or from lower branches.	5 months

Titoki

Swamp maire

Manuka

Southern rata

Botanical name	Common name	Ripe fruit/ seed case	Feb	Mar	May	July Aug Sep Oct	Nov Dec Jan	Notes	Estimated Germination
Pseudopanax arboreus	five finger	black fruit				y	y		1-3 months
Pseudopanax crassifolius	lancewood horoeka	black fruit					y		5 months
Rhopalostylis sapida	nikau	red fruit	y	y			y	Fruit is red when ripe, but dull buff coloured fruit found on the ground will germinate well too. Press whole fruit into a bed of seed raising mix, cover lightly and water well before placing in a warm shady position. When germinated the large (5-7mm) seeds remain attached to the embryo root and shoot for a year or sometimes more. As soon as germinated, prick out into individual containers.	12 months
Schefflera digitata	pate seven-finger	white-purple fruit		y	y				2-4 months
Sophora microphylla	kowhai	dry brown pod	y	y	y			The pea-like pods remain on the tree most of the year. Remove the yellow seeds from the pod. The hard shell makes the seeds very durable but they are also slow to germinate. The process can be speeded up by piercing the seed with a needle and soaking in water until they swell up.	Treated seed, 2 weeks
Streblus heterophyllus	turepo/small leaved milk tree	red fruit	y						2-3 months
Syzygium maire	swamp maire	red-black fruit	y					Pick the fruit from the tree or collect from the ground. Ensure the sown seed is kept moist.	2 months
Weinmannia racemosa	kamahi	capsule	y	y				Collect the capsules when they show the first signs of opening, as they are quickly dispersed. Store capsules in a paper bag in a warm dry place until they split open.	5 months

Acknowledgements

This guide is a collective effort between Te Hoiere Project, NZ Landcare Trust, Dan Moore (Moore and Associates South), and the community. Supported by the Project's first seed workshop in Te Hoiere catchment in March 2023, the community has stepped up to the challenge, ecosourcing and germinating their own seedlings. With the work of Dan Moore, Morgans Road Nursery and Ngāti Kuia over several growing seasons, the Project has been helping to build the knowledge and seedlings to support the Te Hoiere community for native plantings now and into the future.

About the author, Dan Moore

Moore + Associates

Dan is a freelance ecologist in Te Tau Ihu and works on projects across Aotearoa. His area of expertise is primarily terrestrial ecology, with further experience in freshwater restoration, incorporating cultural values, catchment enhancement, and large-scale indigenous restoration programmes. Dan has been involved with Te Hoiere Project since 2021, coordinating the seed collection programme. This has involved working with the community to understand and locate parent plants across diverse species and habitats.

NZ Landcare Trust

NZ LANDCARE TRUST
NGĀ MATAPOPORE WHENUA

NZ Landcare Trust empowers the communities we live and work in to focus on, and improve, the sustainability of our land and water quality. As a partner in Te Hoiere Project, NZ Landcare Trust supports our communities to form catchment groups, as well as collaborate on events to inspire community-led actions for freshwater improvement.

Te Hoiere Project

Te Hoiere Project

Initiated in 2019, this project seeks to revitalise Te Hoiere/Pelorus catchments ki uta ki tai (from the mountains into the sea) and to be a leading example of community-driven environmental restoration. The Project is a collaborative effort between the community, Council, Government, iwi, and many other organisations to work toward the Project vision:

We work together to restore the mauri of Te Hoiere land, waters and coast which flourish, along with peoples' wellbeing and livelihoods.

Ministry for the Environment

Ministry for the Environment
Manatū Mō Te Taiao

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