

Planting with integrity

There's no place like home and that adage is never truer than when it comes to ecosystems. **Anna Marie Barnes** explains.

If you've been planning a native planting on your property and doing some research in the process, you may have come across the term 'eco-sourcing' on your travels from website to nursery and back home again. What does this mean exactly, and in the big scheme of things, is it important?

An eco-sourced plant is simply one that has been grown from seed collected from a naturally occurring source, local to the area of the planting site. This process helps retain the biological integrity of our ecosystems - and by planting appropriate species in the right places, these plants will have a far better survival rate as they are already adapted to the local conditions.

You may be undertaking a planting incorporating or solely based on native species for many different reasons - creating a corridor or refuge and food source for native fauna, providing bee fodder, diversifying a shelterbelt, enhancing or augmenting an existing area of native bush (restoration) or creating an entirely new area of indigenous plant cover (revegetation). Eco-sourcing can play a beneficial role in all of these contexts.

New Zealand has its own official biodiversity strategy, around which many local and regional councils have developed their own planting policies and guidelines. Although it is due to be replaced in 2020, the document is well worth a read, especially if you are contemplating restoration. A link to it can be found in the resource list at the end of this article. Eco-sourcing is of particular relevance to Goal Three of The New Zealand Biodiversity Strategy, which aims to "*Maintain and restore viable populations of all indigenous species and subspecies across their natural range and maintain their genetic diversity.*"

The biological basis for eco-sourcing

New Zealand is geographically diverse, not only from the subtropical north to the cooler southern climates, but from the dry lowland plains of the eastern coasts to the lush rainforests in the west. Each of these locales has its own distinct geology, soil characteristics and hence specific plant communities: braided rivers, tussocklands, coastal dunes, forests, estuaries, scree slopes and cliffs to name a few. All are home to species which have carved out niches, honed by years of evolutionary and abiotic processes, for the large part under extreme isolation from external influences such as human settlement and introduced species.

So, how to choose species specific to each planting site? Firstly, look around and find natural areas close by which share similar physical conditions and characteristics. These areas can be used as reference sites, which can give you an indication of what your site may eventually look like once it is restored or revegetated. Make a list of the plant species present - you may need to seek assistance from someone experienced in plant identification to help with this and your local botanical society may be a good starting point.

Many genera are represented by several different species throughout New Zealand and as a result of selection of the wrong species, quite a few have been planted out of their natural range. Each of these individual species may have a very different appearance, physiological characteristics and genetic composition, depending where in the country it is found. North Island species, adapted to the warmer climates of the higher latitudes, will often have larger leaves than their hardy southern counterparts. Kowhai (*Sophora* spp.) provides a good example of this variation amongst species.

There are eight endemic and two introduced members of the genus *Sophora* present in New Zealand. Some of the more common species include *Sophora tetraptera*, the large-leaved kowhai, which grows naturally in the eastern area of the North Island from the East Cape south to Wairarapa and westwards towards Lake Taupo, Taihape and Lake Karapiro. Despite this, it is planted widely (and is able to naturalise) in areas outside of this range. *Sophora microphylla*, weeping or small-leaved kowhai is found throughout New Zealand but is uncommon in Northland and scarce in the area where *S. tetraptera* is found. *Sophora prostrata*, prostrate kowhai, is only found in the eastern South Island from Marlborough in the north to the Waitaki River in the south. Hybridisation is common between many of these species, and unfortunately many kowhai plants sold by garden centres may in fact be hybrids, which then present a risk to genetic preservation of natural populations when they are planted for horticultural purposes or for revegetation. There are also less common, range restricted species such as *Sophora molloyi*, Cook Strait or Molloy's kowhai, which is limited to islands in the Cook Strait area and areas on the North Island's southern coast, and *Sophora longicarinata*, limestone kowhai, the distribution of which is limited to karst landscapes in northwest Nelson and western Marlborough. An exotic species, *Sophora cassioides* or Chilean Pelu, which hails from South America, is also present in New Zealand. Until recently, it was classified as *S. microphylla*, a related species, and is commonly sold by retailers as *S. microphylla* cv. Goldilocks.

Many species have a natural distribution delimited by latitude. For example, plants commonly found in forest ecosystems in the northern region of New Zealand such as pohutukawa, kauri and puriri reach their absolute southern limits at 38°S, around Taupo. Another cohort of forest plants, including northern rata, titoki, kawakawa and rewarewa and rangiora reach their southern limit in the northern South Island, the switch happening south of Nelson at about 42°S.

A number of native species, shrubs in particular, have become very popular for landscaping purposes, which sometimes leads to them being planted 'out of place' and can result in species becoming inappropriately naturalised and/or invasive in neighbouring natural ecosystems as a result. Common examples include akeake (*Dodonaea*), broadleaf (*Griselinia*), and *Pittosporum* spp. Many other natives now exist as named 'cultivars', varieties that are again popular for landscape gardening purposes because of desirable traits resulting from chance mutations that have been selected for, such as variegated flaxes or variable flower colour in hebe or manuka (*Leptospermum*) species. These should definitely be avoided in the context of restoration, as they pose a threat to the genetic stability of natural populations. In addition, over time they may revert back to their original ancestral forms. The advent of online ordering and mass transport has done little to assist those selecting appropriate plants for small-scale restoration projects. In the former instance, there is little opportunity for buyers to discuss the provenance of plants with the nursery, and it is not uncommon for larger chains to ship plants originating from, and propagated in one region to another at the other end of the country for sale and eventual planting out, quite possibly in an unsuitable area.

The golden rules of eco-sourcing

1. Choose only plant species confirmed to be native to your region.
2. Propagate from seed, not cuttings. Using seed ensures genetic diversity is maintained, as all offspring will differ from their parents, whereas plants grown from cuttings are clones of the parent plant.
3. The closer your seed source is to your planting site the better. Locally extinct species may need to be collected from an adjacent region.

4. Match the seed collection ecosystem type to that of your planting site, and spread seed collection across a number of plants – any individual plant should not contribute more than 10% of the total quantity of seed collected for a given species.
5. Collect seed only from recognised natural areas, not developed areas such as roadsides or parks – these plants may originate from non-local sources or be hybrids.
6. Allow time, lots of time! It may take up to two years lead-in from planning to planting. It really can take this long for plants to be propagated and grow to a size appropriate for planting out.
7. Consult your local council, community nursery or DOC office for advice on steps to take such as succession planting and how to group plants together to maximise mutual benefits. Large blocks of single species don't occur in nature and this type of planting should be avoided at all cost.

The best strategy for a successful restoration planting is do your research – plan ahead – and support your local nursery!

Advice from the experts

Chris and Brian Rance from Invercargill's Southland Community Nursery offer us their views on eco-sourcing from a nursery perspective. They have their own restoration project on site, which was established over 20 years ago.

Can you tell us a little about yourselves and your nursery operation?

Brian and Chris Rance have been running the Southland Community Nursery for over 25 years. The Nursery and Education Centre is a Charitable Trust and was established when they moved to their property in Otatara. At that time it was a house in 10 acres of paddocks with a small fragment of kahikatea swamp forest in the corner. Establishing the nursery helped them, their neighbours and other individuals and conservation groups to grow locally sourced plants to use in their restoration projects.

What would be the most important piece of advice you could offer someone planning a restoration planting on private land?

The most important thing is to take time to plan your project. Look at the site conditions and choose the plants carefully. Seek out reference sites – those places locally that are similar to what you want to achieve. Get advice and if you can eco-source plants, give the nursery or yourselves time to collect the seed and grow the plants. Support your local nurseries and businesses. Talk to others in your area involved with restoration projects. They will have useful tips and advice and this will help avoid repeating mistakes and will maximise your success.

What do you consider to be the key benefits locally-grown, eco-sourced plants offer over their mass-produced commercial counterparts?

Locally grown plants are well adapted to their environment, they are likely to survive better and have better growth rates. By doing so you are also preserving the local species, their traits, forms and local characteristics and thus help preserve the special character of your particular region. There is a lot we still don't know about how ecosystems function, the connections between species – insects, plants, fungi etc. When we eco-source we are helping to preserve those important links for the future.

Pay particular attention to your particular site – is it coastal, inland or mountainous, the plants naturally adapted and grown for those situations will grow best for the long run.

Can you describe the process you would go through in the nursery to produce an eco-sourced line of Cordyline australis, from seed collection to having a plant ready to go in the ground?

Producing eco-sourced plants is the same process and timeframe as any other plant, it is the lead-in time that the nursery needs to supply those plants to the buyer that is the issue. Often the buyer will know well in advance what they want but fail to tell the nursery in advance and then choose the cheapest option on-line. That disadvantages those nurseries that are trying to supply to their local area. For *Cordyline australis* in Southland seeds would be collected in May, sown around June and germinate in September, it then takes about a year for the plant to attain size for sale and hardened off (in our case a plant in a PB3 size planter bag). Commercial nurseries that produce plants in smaller pots can probably sell sooner. We have a website listing the seed collecting times for Southland at the following link:

<https://www.southlandcommunitynursery.org.nz/restoring-your-patch/get-growing/seeds/>

Taking into account planting site variability, are there some plants you would consider keystone or foundation species, worthy of a special mention?

We always recommend “colonising” or “nursery” species as the first to be planted for various scenarios. In essence we are often planting into rank pasture so the primary reason for planting these keystone species (*Coprosma*, flax, *Pittosporum* etc.) is their speed of growth, to suppress the grass to enable other species to flourish later. On our website we have a number of different habitats with profile drawings and plant lists with plant tolerances to help people decide which plants are best for their site. Again look at local reference sites and put the right plant in the right place (e.g. plants that can tolerate wet feet for ponds and riparian areas).

<https://www.southlandcommunitynursery.org.nz/restoring-your-patch/planning-your-project/>

<https://www.southlandcommunitynursery.org.nz/restoring-your-patch/planning-your-project/creating-ponds/>

Are there any local success stories relating to eco-sourcing and restoration planting initiatives you can share?

We have been involved in a number of restoration projects for many years. Three of the longest standing are Te Rere yellow-eyed penguin reserve, Bushy Point Restoration Project and our own restoration project on our own land. All use eco-sourced plants and all are successful with much hard work! We are 20—30 years into these projects and they are very long term projects. What we can say for certain is that it is much easier to leave an ecosystem in place than try to re-create it, so protect what you have and enjoy it for all the benefits it brings – be it water storage, water quality, prevention of erosion, shelter, increased native birds and biodiversity.

While we are mainly growing native plants at the nursery we also have orchards with fruit and nut trees on our property and welcome visitors – especially those Tree Crops members who can increase our knowledge of those plants we are not so familiar with.

Chris and Brian Rance

www.southlandcommunitynursery.org.nz

Recommended reading

Bennett W (2019). The forest for the trees. Forest Flora NZ, Ngaruawahia, New Zealand. Also available online at https://issuu.com/forestflora/docs/forest_master_v4_8d170b0e3e0591

New Zealand Plant Conservation Network <https://www.nzpcn.org.nz/>

The NZPCN website provides a wealth of information on all facets of our native flora and an annual membership (\$40 p.a.) is highly recommended.

Department of Conservation (2000). The New Zealand Biodiversity Strategy.

<https://www.doc.govt.nz/Documents/conservation/new-zealand-biodiversity-strategy-2000.pdf>

References (for website)

Auckland Council (2020). Ecosourcing: protecting local biodiversity.

<https://www.aucklandcouncil.govt.nz/environment/plants-animals/plant-for-your-ecosystem/Documents/biodiversityecosourcebrochure.pdf> Accessed 12 July 2020.

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Rance B (n.d.). Some revegetation tips.

https://www.southlandcommunitynursery.org.nz/site/assets/files/1591/revegetation_tips_-_brian_rance.pdf Accessed 12 July 2020

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Simpson P (n.d.). Why I believe in eco-sourcing.

https://www.southlandcommunitynursery.org.nz/site/assets/files/1591/why_ecosource_-_philip_simpson.pdf Accessed 12 July 2020.

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