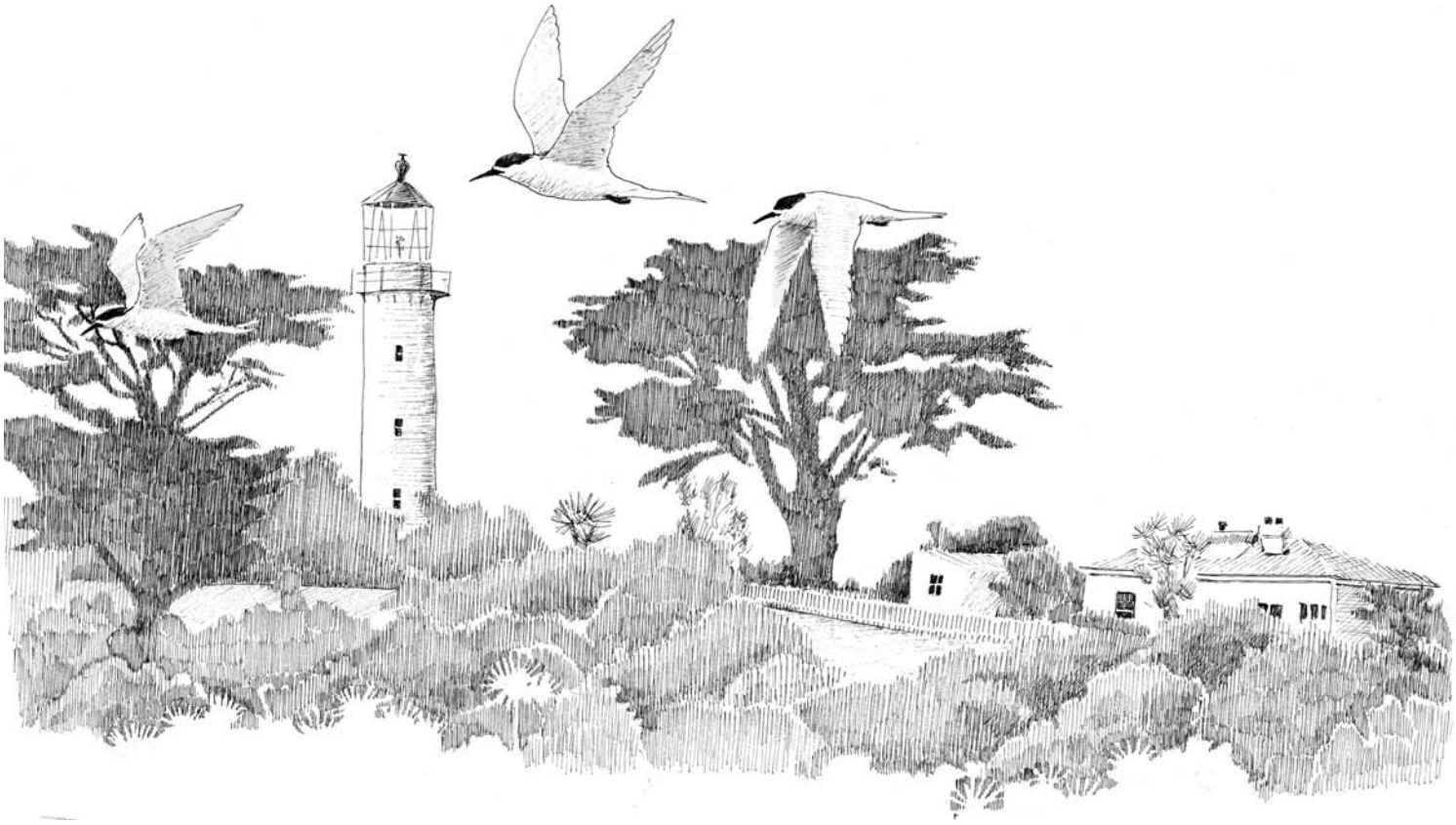
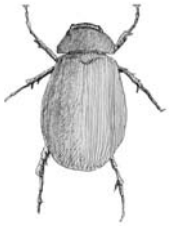


Introducing Tiritiri Matangi

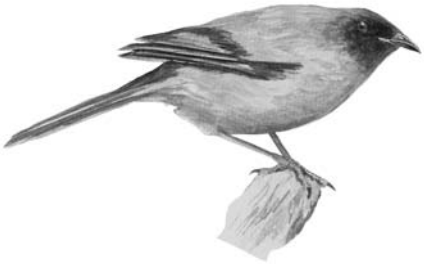
A scientific reserve

The introduction of a new species onto the island only happens after many months, or even years, of intense research and planning.

Research is regularly carried out on Tiritiri Matangi, and a small sample of the research includes:[1]



1. The dynamics of beetle communities in replanted areas.
2. Competition amongst skinks on Tiritiri Matangi and implications for future lizard reintroductions.
3. Bat translocation research.
4. The effect of people on Tiritiri Matangi wildlife.
5. Long-term population dynamics of North Island robins on Tiritiri Matangi.
6. Reproductive behaviours of hihi (stitchbird).
7. Importance of food quality on hihi breeding success.



8. Identifying whether quail on Tiritiri Matangi is *Coturnix novaezelandiae* (NZ species) *Coturnix ypsilophorus* (Australian species) or a hybrid of the two.
9. Social dynamics and genetics of the bellbird.
10. Clutch size, chick survival and sex ratio of kakariki.
11. Long term effect of kiore (Pacific rat) eradication on invertebrate population and habitats.
12. Vegetation development and historic kiore populations.

Researchers come from all parts of the world, and from several New Zealand universities. The Supporters of Tiritiri Matangi help provide funding for research.

To quote Dr Graham Ussher, a herpetologist (expert on reptiles), who has been involved with Tiritiri Matangi for many years:[2]

'Results from wildlife research on Tiritiri were one of the drivers for the original restoration plan for the island in 1982. . . Projects as diverse as weed control and species reintroductions now require the sorts of information that only well-structured research and monitoring programmes can deliver.'

References:

1. 'Dawn Chorus' Bulletins 53, 54, 58, 59, 60, 61, 64, 65 and 66.
2. Graham Ussher, 'Dawn Chorus' Bulletin 53, autumn 2003.

Ecosystems and coevolution

Birds, plants and reptiles

When we think of Tiritiri Matangi we think of an island full of birds and birdsong.

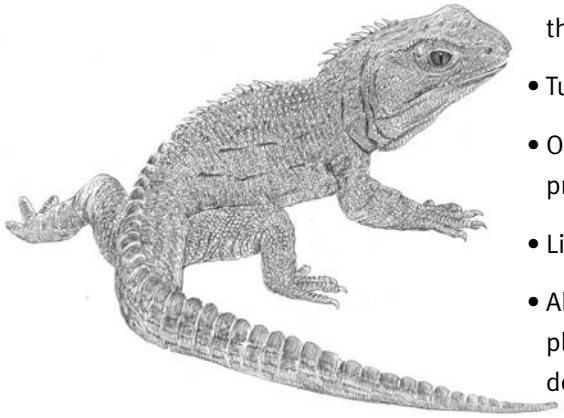
What is not generally known is that plants that have been struggling to survive in the wild have also been translocated to Tiritiri Matangi. Some of these species such as kaka beak and wood rose were not historically represented on the island.

Other non-bird translocations such as those of tuatara and lizards have also occurred, and Tiritiri Matangi is also beginning to enter an era as a sanctuary for rare reptiles, and perhaps in the future insects such as giant weta. Exciting times are still ahead of us!

The ecosystem

An ecosystem is an interacting system of living and non-living parts including plants, animals, sunlight, air, water, minerals and nutrients.

Ecosystems can be small or large, e.g. a rotting log on the forest floor or an entire forest. Examples of ecosystem interactions are:



- Petrels deposit rich guano in their burrows and this provides fertiliser for the land.
- Tuatara often share the burrows that petrels have created.
- Old rotting trees provide homes and food for insects, which in turn provide food for birds.
- Little birds provide food for raptors and owls.
- All living things rely on each other for survival, and the lives of native plants, birds and animals in New Zealand have evolved so that many are dependent on each other and couldn't survive without them.

Restoration of the island of Tiritiri Matangi has taken the interaction of ecosystems into account because unless we can get all the 'pieces of the puzzle' joined together, the island will fail to thrive as it should.

The island needs not only the trees, birds and reptiles, but also fungi and moulds, insects, spiders, worms, beetles and grubs.

Ever since Tiritiri Matangi Island became a scientific reserve, researchers have not only been busy researching the birds, but also studying the variety and health of its smaller plants, mosses and lichens, invertebrates (including insects and spiders) and micro-organisms.

Food producers

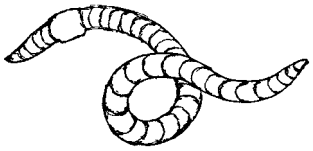
In everyday life on earth, food consumers rely on food producers, which in turn could not exist without decomposers.

Food producers are mainly plants, and they capture the sunlight and turn water and carbon dioxide into food. They then also become a source of food themselves. Forest trees, bushes and other plants are food producers.

Food consumers

Consumers may be carnivores (meat eaters), herbivores (plant eaters) or omnivores (plant and meat eaters). Examples of carnivores are tuatara, birds such as tieke (saddle back), which eat predominantly invertabrates, and skinks, which only rarely eat small fruits.

For much of the year kokako are herbivores. Omnivores include kiwi, takahe and tieke. Many forest birds are omnivorous favouring fruits, berries and leaves or nectar, but also taking insects, grubs and spiders, especially when they need protein for raising their young. New Zealand geckos are also omnivorous.



Decomposers

These are the most important of all, even though we hardly ever notice them. Because of their great diversity and their hidden nature, they are one of the least known areas of life. Fifteen percent of organic matter in the soil consists of biota (animal and plant life) and many of these are micro-organisms (organisms that are invisible to the naked eye). Those we can see include worms, native earwigs, insect larvae, native cockroaches, fungi and moulds.

Both visible and invisible decomposers break down dead plants and animals so they rot and decay. If they didn't, the soil would stop being fertile and the world would be piled up with dead plants and animals. In fact, the whole ecosystem would break down because soil forms a vital and finite (limited) resource, the biological components of which are crucial for the above-ground parts of ecosystems. So even though we cannot see many decomposers, they are very important.

Coevolution

Coevolution exists where species depend on each other for survival, for example, bees and flowering plants, and where a change in the composition of one species is caused by a genetic change in another (reciprocal change).

Some examples of coevolution

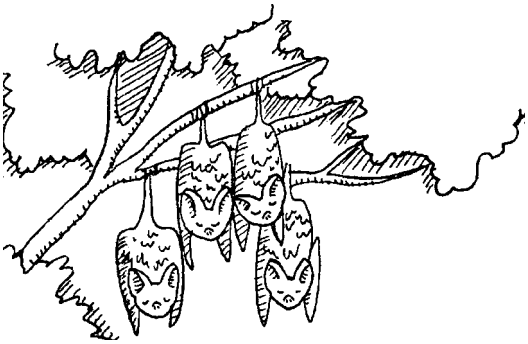
1 Pua o te reinga (wood rose) and the short-tailed bat

The wood rose is ancient and unique, and is New Zealand's only fully parasitic flowering plant. Its strong musky-scented flowers produce huge amounts of nectar, which is especially loved by the short-tailed bat. Because of this, they are its main pollinator, as the wood rose cannot self–pollinate. The bat needs the wood rose, and the wood rose needs the bat. On the mainland, possums and rats destroy the wood rose flowers before they get a chance to set seeds, so the plant is now close to extinction, and so is the short tailed bat.

Note that although the wood rose was placed among the roots of suitable host trees on Tiritiri Matangi there is no evidence that it has survived. Its inclusion here is simply to provide an example of the need to protect plants.

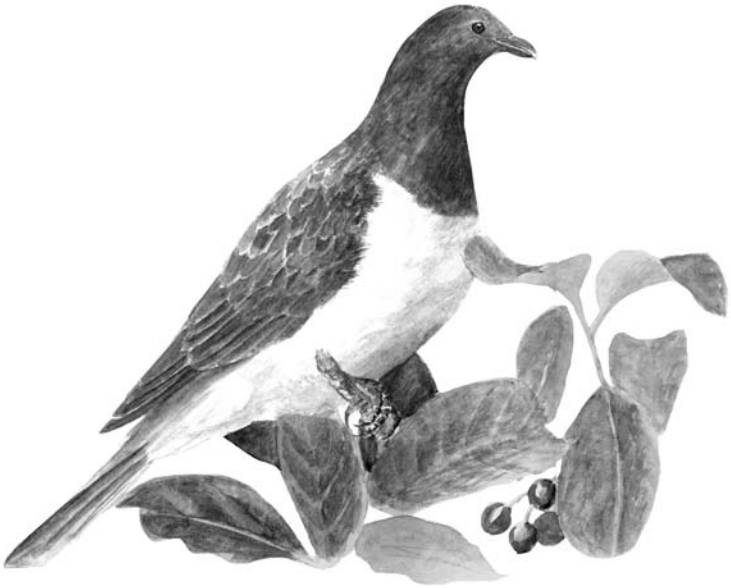
2 Large native tree fruits and the kereru and kokako

Now here is an excellent example of the need to protect birds, other than for their beauty or song.



The kereru (wood pigeon) is the largest canopy fruit eater closely followed by the kokako. Both are vital to the distribution of seeds that come from large berries, especially tawa, and taraire. The way in which kereru and kokako disperse the seeds of these trees is very important, because the seeds germinate far better once their fruit coat has been digested by a kereru or kokako, and it passes out ready-coated in fertiliser! Without kereru and kokako some of our forest giants would eventually disappear.

On the mainland, kereru are under threat from people who hunt them to eat, and from possums, which eat the same fruits and buds as kereru, and destroy their flimsy nests. In a bad season on the mainland, kereru may not be able to breed at all. Kokako are poor fliers and have become increasingly rare on the mainland. They have recently been declared extinct from the South Island.



3 Flowering trees and honey-eaters

Tui, bellbirds and stitchbirds are some of the most important flower pollinators. They have long brush-tipped tongues that allow them to reach deep into flowers to drink the nectar. To a lesser extent, other birds do this too. As the birds reach deep into the flowers they collect pollen on their heads and transfer it from flower to flower. On Tiritiri Matangi, tui and bellbirds in particular, can often be seen with yellow heads in springtime.

Native trees such as kowhai, rewarewa and puriri, as well as harakeke (flax) are pollinated in this way. And without a variety of flowering trees to provide them with food year round, these lovely songbirds would die.

Protection from storms and droughts

The land also needs protection from weather extremes, and tree and plant life provide this.

On Tiritiri Matangi, from the moment farming began in the 1850's until the transplanted trees and bushes began to take hold in the late 1980's, most of the island was a sunburnt hump of lank grass and bracken. Fortunately, being a dry island, it did not suffer from storm rains washing away its soil.

At first small shrubs and trees, then larger trees provided cool areas where dampness could exist and seedlings could grow without further help from humans.

In places in New Zealand where native forests have been completely cleared from even the tops of very steep hills, storms remove the soil, making the land unable to support any life at all. The soil washes into streams and rivers, causing their beds to rise and increasing the risk of flooding.

Thankfully, because of careful scientific study and planning, and the involvement of keen supporters, this is not so on Tiritiri Matangi. The ongoing translocations of plants and animals, as well as careful monitoring of existing species, will ensure the island's growth toward true ecological health will continue.

References:

Ministry of Agriculture and Fisheries website: www.maf.govt.nz

Biosecurity New Zealand website: www.biosecurity.govt.nz

Shirley Kerr (teacher from Katikati) website: www.kaimaibush.co.nz

Auckland Museum website: www.aucklandmuseum.com

Horne, Don 'Mushrooms and other fungi of New Zealand' Auckland: Reed Nature Series.

'Dawn Chorus' 50, winter 2002 p4.

Below: The lighthouse settlement, photographed by Henry Winkelmann in 1902.

Auckland War Memorial Museum. C17896 (2380) Winkelmann 1445