



TAWHARANUI OPEN SANCTUARY SOCIETY INC.
Newsletter No. 48 March 2014



A white-fronted tern arrives with a fish for its camouflaged juvenile while the other adult watches on at a rock stack just east of Anchor Bay. White-fronted tern colonies are itinerant so it is not surprising that one should arrive at Tawharanui. There are approximately 25 pairs on the rock stack with nests at various stages.



New Zealand dotterels are in for the long haul of thirty days and nights on the nest exposed to heat, wind and rain. When the nest fails due to high tides or harriers, or the new chicks are lost to gulls, they start nesting all over again. The bird on the right has its mouth open as a cooling mechanism. Three pairs have tried three times this season each with one full term nest, without fledging any chicks.

Coming Events—Sunday in the Park

- Sat. 8 March Sea Week to be held at Tawharanui. Volunteers required to set up the marquee. Contact Ray Blackburn magsandray@gmail.com. On the day there will be guided snorkelling tours displays and lectures. Bring a picnic and enjoy this day out. Find out more on seaweek.org.nz
- Sun. 6 April 9.15 am. TOSSI Open day planned BBQ provided. Watch the TOSSI email letters for further info.

Sunday in the Park. Bring a drink, gloves, sturdy boots and raincoat.

- Sun. 4 May 9.15 am. Planting begins. BBQ provided. Hosts: Steve Palmer and David Stone.
- Sat. 31 May and Sun 2 June Queens Birthday Weekend. Planting. Hosts: Alison, James and Patte. BBQ provided.
- Sun. 6 July 9.15 am. Planting Day. Hosts: Ngaire Wallen and Ray Blackburn. BBQ provided.
- Sun. 3 August 9.15 am. Planting Day. Hosts: Doreen Guest and James Ross. BBQ provided.

Chairman's Report



With a relatively small group of volunteers from within TOSSI it is always pleasing to have volunteers from outside the membership. It has become traditional to run nursery sessions for the campers at Tawharanui and this year these sessions proved particularly successful. The campers clearly enjoy their camping experience at Tawharanui and many wish to show their appreciation for the work that has been carried out over the years.

It is difficult to give an exact figure of the number of campers who attended the five sessions that we ran through January, as the sessions were simply too hectic to stop and count every camper who attended. My estimate would be a number in excess of 250. Some attended for an hour or so while others stayed until the potting mix was gone or a new record set. Most campers were in relaxed mood but clearly some still had a competitive outlook even to nursery work. It

was pointed out to one group that the previous week approximately 1,500 plants had been potted up. As a consequence the TOSSI helpers were then kept busy bucketing additional potting mix so that a new record of over 1800 plants was set. In all nearly 7,000 plants were potted up by campers and with TOSSI's own weekly sessions continuing as well some 12,000 plants were added to the stand out area. This boost from non TOSSI members means that the nursery is now nearly full with only a couple additional sessions now needed to reach our yearly target of 20,000 plants.

Of course the productivity of these camper's sessions is important but it also gives us an opportunity to show off the work of TOSSI and encourage new members to join and attend planting days. There are always a large number of young children attending and, although sometimes their work does need close supervision, the success of the Tawharanui Sanctuary in the future will be dependent on this next generation. We hope the campers enjoyed these sessions as much as we appreciated their efforts.

Steve Palmer

From the Editor



Spring and summer are wonderful times for photographing the natural world at Tawharanui. Native trees are in flower and the birds are busy with their nesting activities. This season white-fronted terns set up a nesting colony on a rock stack east of Anchor Bay and I wanted a photo despite a pulled calf muscle. I hobbled down in some pain with a walking stick my twin sister picked up for me, and limped pathetically over rocks to the site and whacked off numerous photos from around 40 metres.

By the time I was back at the car I said to my twin sister, "you drive my leg is too sore." I sat in the passengers seat some what disappointed about the painful calf muscle, and scrolled through the photos on the digital camera. Imagine the delight when I discovered the photo on the cover page of this newsletter, a white-fronted tern with fish in its bill delivering it to the juvenile. If you take any startling photos at Tawharanui and you think they would be great in the TOSSI newsletter please send them to alison.purple@xtra.co.nz.

Alison Stanes

Open Sanctuary Coordinator Update



I'm back in the office after a lovely day hosting a field trip of attendees from the National Wetland Trust conference. The highlight for me was having to shout over the rowdy bellbirds and tieke at the lower Ecology Stream bridge. It was truly cacophonous! It's always a pleasure to show off Tāwharanui and doing so gives us a chance to pause and reflect on the longer term changes made, as so often we're busy in the here and now. Our day started with a chat by the woolshed, conveniently alongside the banner highlighting TOSSI's first ten years. It is a truly impressive list, especially when you know how many other achievements were omitted due to space.

Field trips provide an opportunity for like-minded folk, both professionals and interested amateurs, to make new connections and exchange war stories from their home patch. With any such collective the value of small bits of information

becomes apparent as you see where these small bits of the puzzle fall into place. We also see this sharing of knowledge and experience at the Sunday in the Park work and planting days, where volunteers, committee members and park staff chat over their tools or lunch on a range of topics.

Shared tales can easily become folklore, especially if repeated often enough, sometimes escaping the necessary scrutiny to ensure they are indeed based on fact. Research and science rightfully play key roles in managing sanctuaries, with the challenge then being, to apply this knowledge to improve the site and our practice. This improves our confidence that we are working in the best interests of the park and sanctuary, and using the resources of ratepayers and supporters wisely.

Tāwharanui Open Sanctuary is very fortunate in being an accessible pest-free environment, and with several universities in the region, it is sought by students and supervisors as a field site for a range of studies. A large number of post graduate theses are based entirely or in part, on field work conducted here. Some studies are very applied and result in direct outcomes for the park, such as reintroductions of tieke and kakariki. Others are informative and help document the outcomes of interventions we make, or inform interventions or improved practice we should consider. A further category of research is the more pure ecological research where the natural world is examined and explained. This last area often seems somewhat esoteric but it is pleasantly surprising how often this pure science translates to, and informs, applied management.

Research applications follow a permitted process to ensure that the activities proposed are compatible with the park and its ecological, social and cultural values. The Tāwharanui Working Group considers these applications and makes recommendations to approve or decline the proposal and relevant conditions if granted. Often we identify further avenues of study to encourage the researcher to help address local questions or opportunities.

Students and researchers with permits to study at Tāwharanui are encouraged to present to the Sunday in the Park workdays and to contribute articles to this newsletter. The Sunday in the Park seminars are another great reason to come along to these monthly events to improve the park and expand your knowledge of the world around us.

With kind regards,
Matt Maitland

I can be contacted at matt.maitland@aucklandcouncil.govt.nz or 09 426 1200

Correction The editor offers an apology. In the last newsletter Moturoa Island in the Bay of Islands where gannets are returning to inspect decoys, was spelt incorrectly. Two international proof readers didn't pick that up! And now, for this newsletter those volunteer proof readers have scarpered. One is in England and the other is sailing somewhere out there in the Hauraki Gulf. That's what happens when they don't get paid. Alison Stanes

Nursery volunteers get stuck into serious work and serious food at the Christmas Party!

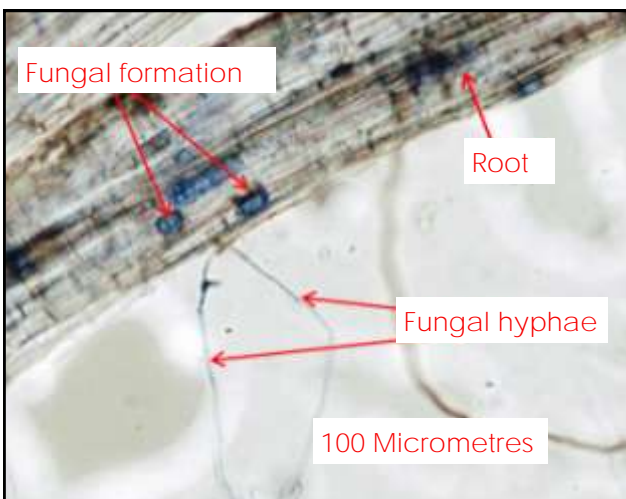


At the end of a morning potting up plants a request goes out to weed the flax . It's done in minutes.



At the Christmas party Paul Williams replies to a big vote of thanks for years of contribution .

Mycorrhizae and Honey dew droplets.



Left Photo. Microscopic image of Arbuscular Mycorrhizal fungi (AMF) from a Tawharanui soil sample. The image shows the fungal hyphae entering the cortex of the root, extending into fungal formation inside the root cells.

Questions related to restoration plantings.

Mycorrhizae

Many plant-loving people might never have heard of mycorrhizae: myco means fungal; rhiza means root. Mycorrhizae are a permanent symbiotic (mutually beneficial) relationship between the roots of plants and some species of fungi. The microscopic web of threadlike fungal hyphae helps the plant's water and nutrient intake as well as improving soil structure and plant stability. The plants in return supply the fungus with organic nutrients assimilated by photosynthesis.

Mycorrhizae are especially important for trees and other woody species as their lack of fine root hairs results in reliance on the hyphal web for water and nutrient absorption. The presence of these useful fungi therefore plays an important role in successful restoration. Intensive farming, however has been proven to inhibit mycorrhizal activity. Soil compaction by livestock trampling and excess nutrients, especially phosphates, slow down and may even completely stop the inoculation of roots by mycorrhizae.

In my study I assessed the differences in the quantity of mycorrhizae in the soil at the edge of northern coastal broadleaf forests and the adjacent farmland. One of my five sampling locations was in the Tawharanui Regional Park. The results from all these areas showed significantly higher amounts of mycorrhizae at the forest edge and 5m from there, than at 50m distance from the forest. Such results indicate planting of seedlings close to the forest edge may result in higher restoration success due to the root-to root connection of the mycorrhizal network. If it was possible to inoculate seedlings with native mycorrhizae then this could also be beneficial.

Edit Simpson MSc, University of Auckland

Questions arise. As the absence of mycorrhizae puts restoration planting at more risk during draughts should we be transplanting karaka seedlings, for example, with soil from original bush into restoration established plantings? If we planted seedlings from original forest into the plant areas, will the soil of the ex farmland still be too compacted to produce mycorrhizae?

Honey dew droplets

Honey dew is produced by a range of small foreign scale insects that have taken to living in the bark of manuka and kanuka at Tawharanui. Scale insects are simple in body structure and are related to aphids. They are just mouth parts with a very long anal tube. They insert the mouth into the phloem of the tree—the internal tube that conducts sugar from the leaves throughout the tree to the roots. The fluid in the phloem provides the scale insect with all it needs to live, but the fluid has so much sugar that the insect takes in far more than it needs. Instead of using all this food and getting fat, it secretes the excess sugar through its anal tube, forming small droplets of honey that are eaten by tui and bellbirds.

This food source is available all year round, so in the winter months when nectar is scarce, the honeydew is an important food source for the birds. Other organisms also benefit from this sweet sugary syrup. As honeydew drops from the end of the anal tube, it covers the bark and ground surrounding the tree. This promotes the growth of black sooty mould fungi that eventually grow to cover the bark of the tree. These dense black fungi, are an important food source for a range of beetles and moths. These insects also provide food for birds, and a complex web builds up all sustained by the small scale insect lodged inside the bark.

Foreign wasp species have discovered honeydew, but instead of sipping the droplets as they form, the wasps have found that they can access more honey dew if they eat the end off the anal tube that is protruding from the tree branch. Temporarily this causes an increase in the amount of the honey dew that the scale insect produces, which wasps eat voraciously. The wasps eat more and more off the end of the anal tube until they kill the scale insect.

Honey dew scale insects are not easily transplanted into new restored forests areas. Although at the end of the season wind assists reproduction.

Alison Stanes

Questions arise. Do we encourage these foreign scale insects to establish in our restoration plantings? Should we be transplanting trees or branches where honeydew has established into restoration plantings, to acquire this valuable food source for native birds? Will honeydew ever establish in our restoration plantings without assistance as our plantings are a long way from established honeydew insects? If any one has any answers please email alison.purple@xtra.co.nz



The nursery group is in full swing and is well under way towards the target 20,000 plants for the season.



This is a first nursery experiment using peat pots. Body language questions 'is this going to work?' knowing that pukeko do more damage to planted peat pots than PB3s. However peat pots are easier to deliver to steep slope planting sites.



From the top of the Ecology Loop Track a planting view unfolds in the distance from Lookout Paddock. A corridor of bush vegetation is evolving across the park. Paul Williams former nursery coordinator was known to have said "habitat, habitat, habitat, that's what the birds need," and that is what is happening.



Visitors from the camping ground enthusiastically helped in the nursery for four Thursday sessions keeping nursery volunteers busy organising table areas and teaching potting skills. A big thank you to the campers.



Camping volunteers overflowed from this crowded workshop area onto tables in the yard.



After each potting session Penny Palmer took volunteers on a guided tour around the nursery.



Nursery volunteers out collecting kowhai seeds for **the next season's planting.**



Are these berries *coprosma macrocarpa* or *coprosma robusta*. Steve and Penny knew!

Update on the robins at Tawharanui, 2013-14 season – Tim Lovegrove & Richard Chambers

Background

The Tawharanui robin population is derived from releases during 2007 when 25 birds (15 males and 10 females) were introduced from Tiritiri Matangi and Puhoi (see Newsletter No. 43, December 2012 for further details).

Apart from monitoring the Tawharanui population to gather data on survival and breeding success to compare with populations elsewhere, we also use it as an indicator of the health of the open sanctuary. Since they are tame and can be trained to take mealworms, which are then taken to nests or nesting females, it is possible to find and monitor almost every nest and to colour band most of the young. This allows us to gain quite accurate measures of nesting success and of survival and productivity. It also provides us with another means of detecting possible incursions of mammalian predators, which might have escaped detection by other methods.

2013-14 is the 7th breeding season for the robins at Tawharanui. There was a spectacular increase this season with at least 32 pairs compared with 18 pairs last season. The big increase is mainly due to higher numbers of young than usual being recruited into the breeding population during 2013.

Survival, population size and breeding success in the years since release

The size of the Tawharanui robin population and recruitment of young in the years since release is summarized in Table 1. The population increased gradually from 23 to at least 68 birds from 2007-2013. Although large numbers of young have fledged each year, with the exception of 2013 when nearly half of the young were recruited, only a small proportion has been recruited each year (see Tables 1 & 2).

Table 1. Tawharanui robin population size and recruitment of young into breeding population in the years since release*

Year	Founders	07-08 young n=34	08-09 young n=33	09-10 young n=58	10-11 young n=48	11-12 young n=63	12-13 young n=65	Un- known age	Total birds*
07-08	23								23
08-09	18	3							21
09-10	13	2	9						24
10-11	12	0	8	12					32
11-12	8	0	6	9	8				31
12-13	7	0	4	7	6	12		1	37
13-14	7	0	4	5	4	10	31+	6	67

*Population estimate at start of breeding season

We do not know where all the missing young are going. There is probably some mortality (e.g. from morepork predation) after the young leave the nest. However, some may disperse well away from Tawharanui, as they did at Wenderholm, where some went 10-15 km. Last season we surveyed 150 ha Hubbard's Bush, on the inland boundary of Tawharanui, in an attempt to locate some of them, but we found nothing. We have had no reports at all of robins being found further inland. Mt Tamahunga, the Dome Forest and adjacent pine forests could be good places to search for them. Next year Kevin Parker plans to radio-tag young robins at Tawharanui. This study should provide some answers.

Nest success and productivity

The robins have bred very successfully in all years since release. Nest success has ranged from 72-96%, productivity has ranged from 3.77 young/pair to 5.27 young/pair, and 428 young are known to have fledged in total (see Table 2). A total of 26 nests failed during incubation, mostly through infertile clutches being laid, while 16 nests are known to have failed during the nestling period. Failures of these nests were due to flooding, drought (last year), nest collapse or suspected morepork predation. There have been no known nest losses to mammalian predators.

New Zealand Robins photographed this season in the Ecology Bush area.

The year the bird was banded is indicated by a specific colour over the metal band.

The other colour bands are individual identities specific for that bird.



2008-09 Right leg red over metal.



2008-10 Left leg orange over metal.



2010-11 Left leg white over metal.



2011-12 Left leg green over metal.



2012-13 Left leg blue over metal.



2013-14 Right leg black over metal.

Table 2. Summary of robin breeding at Tawharanui 2007-2014

Year	No. pairs	No. nests	Failed during incub.	Failed during nestling period	% nest success	Min no. young fledged	No. fledged per pair
2007-08	9	21	1	1	90.5	34	3.77
2008-09	8	20	2	0	90.0	33	4.13
2009-10	11	29	0	1	96.6	58	5.27
2010-11	12	29	3	2	82.8	48	4.0
2011-12	12	35	4	2	82.9	63	5.25
2012-13	18	48	6	7	72.0	65	3.61
2013-14	32	75	10	3	82.0	127	3.96

Robin update continued over page

Robin update continued

Work this season and colour banding.

We have done most of the monitoring work this season with help from Jane Andrews, Kevin Parker, Carola Kaltofen (a German volunteer this summer) and several TOSSI volunteers. Of the 127 young robins known to have fledged this season, we managed to band 117 of them while they were still in the nest. All of this year's young are banded black over metal on either the right or left leg, with two colours on the other leg. As usual, we are keen to get reports of any colour-banded birds that are seen.

Success at Tawharanui

The robins seem to be thriving at Tawharanui. This season we had 21 pairs in Ecology Bush, 4 pairs in Possum Gully and 7 pairs in Takatu Bush. Unlike smaller failed sites such as Wenderholm, where there was high dispersal of young and too few staying to replace adult losses, Tawharanui is big with several linked patches of forest inside the park. Our colour banding shows that young have been dispersing back and forth between Possum Gully, Ecology Bush and Takatu Bush. Most importantly, plenty of young birds are being recruited to replace adult losses.

Tim Lovegrove and Richard Chambers

Bird notes

Saddleback. These birds are doing well and may be seen and heard all over the park especially in Ecology Bush and on the south coast. Cheri Crosby was walking the south coast checking NZ dotterels and heard falling stones off the cliff. She sat on a rock to watch a pair of saddleback building a nest under astelia well up the cliff face. At the time of this newsletter going to print Kevin Parker has confirmed two chicks in the nest. White-fronted tern. Roger Grace was sailing by Tawharanui and alerted Sharon Kast to guano on a rock stack that indicated a white-fronted tern colony. He was right. Just beyond Anchor Bay are two lines of rock stacks and on the far one white-fronted terns have a colony of 25 pairs some on nests and some with fluffy chicks and young juveniles as seen on the front cover of this newsletter. White-fronted tern colonies are itinerant so might be there next year and might not be!

New Zealand dotterel. There were 13 pairs, 24 nests, 68 eggs, and four chicks fledged. This was the biggest season for the number of pairs and the number of nests since we started monitoring NZ dotterel eight years ago. All that effort to result in declining outcome sounds like Art in the Woolshed! We lost nests to tides and eggs to a harrier videoed on the Huntsmen cameras. We also videoed a black-backed gull gulping three dotterel chicks alive in under four seconds. Naturally I feel that we should be producing more chicks and hope that by next year the avian predator problem will be addressed, especially as NZ dotterel are endemic and more rare than kiwi! Alison Stanes

Pateke. Good news! 68 pateke in good condition were surveyed by 12 volunteers taking part in the annual pateke survey at Tawharanui 10 February. Volunteers clambered through wetlands counting pateke at Tawharanui as well as neighbouring properties. 25 were found at Tawharanui, 22 at Christian Bay wetlands and 21 on the Omaha Storm Water Pond. Sharon Kast

Grey-faced Petrels On Their Way. Megan Friesen from the University of Auckland has been keeping an eye on four of the grey-faced petrel chicks at Tawharanui for the past few months (see TOSSI Newsletter December 2013). In late January Megan reported that all four of these chicks had fledged and had left their burrows. Hopefully they remain healthy and in the coming years they may range over thousands of miles as far as the Chatham Rise, up towards the Kermadec Islands and out in the Tasman Sea to the New South Wales and Tasmanian coasts. Grey-faced petrels begin to return to colonies at three years of age and generally breed from about six years of age. All these chicks have been banded so we look forward to seeing them again. James Ross

Rangers' varied tasks.



Ranger Maurice Puckett was called to assist a bus which had dropped school children off for camp and then became embedded front and back in the sand. It took hours of digging and pulling with the tractor before it was extricated.

Rangers' varied tasks.



Ranger Lois Clayton is seen here identifying a snake eel picked up by a visitor on Ocean Beach. Apparently they are common in NZ waters.



Ranger Hamish Blampied with a frozen rat demonstrates catching rats to the children from Warkworth Primary School.

TOSSI Committee

Chair	Steve Palmer	09 422 6441
Vice Chair	James Ross	09 422 6760
Secretary	David Stone	09 528 5712
Treasurer	Ngairie Wallen	09 627 1526
Editor	Alison Stanes	09 524 0291
	Doreen Guest	09 422 7974
	Patte Williams	09 425 9127
	Ray Blackburn	09 425 4995

Correspondence Chair or Membership Secretary
P.O Box 112 Matakana 0948

Email secretary@tossi.org.nz
Website: www.TOSSI.org.nz

Application form for NEW MEMBERS Tawharanui Open Sanctuary

Name(s): _____

Address: _____

Phone No. _____

E-Mail _____

Occupation _____

How did you hear about TOSSI?

Please tick how you would like to help:

- | | |
|--|---|
| <input type="checkbox"/> Planting/workdays | <input type="checkbox"/> Bird Counts |
| <input type="checkbox"/> Fund raising | <input type="checkbox"/> Administration |
| <input type="checkbox"/> Monitoring Pests | <input type="checkbox"/> Nursery |
| <input type="checkbox"/> Predator fence monitoring | |
| <input type="checkbox"/> Environmental educational | |
| <input type="checkbox"/> Publicity/promotion | |
| <input type="checkbox"/> Art in the Woolshed | |
| <input type="checkbox"/> Other _____ | |

Membership fee:

\$20 single membership \$ _____

\$30 Family membership \$ _____

Additional contribution (optional) \$ _____

Donations over \$5 are tax deductible

Gift Membership:

Please send membership to

Name: _____

Address: _____

Amount of Gift membership(as above)\$ _____

Total amount enclosed \$ _____

Please make cheques payable to Tawharanui
Open Sanctuary Society Inc. and return the
completed form to:

TOSSI Membership Secretary P.O. Box 112
Matakana 0948

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The summer season is great for photographing baby birds on the park. Here is a juvenile fantail without defined white markings of the adult.



A nest with either skylark or native pipit chicks begging for food. If anyone can identify these please contact alison.purple@xtra.co.nz



Three New Zealand dotterel chicks well camouflaged in the seaweed this season were not able to avoid the black-backed gulls and disappeared two days after this photo was taken



A fluffy white-fronted tern chick with an adult on the rock stack east of Anchor Bay.



Two fluffy red-billed gull chicks with an adult on Phoenix Rock, Anchor Bay.