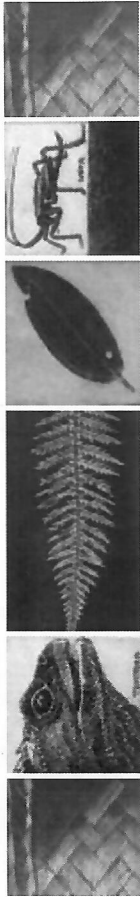


Photo File

Duvaucel's gecko – a colour rendering of the picture on page 6 shows its superb camouflage against a nikau trunk.
Photo: Trent Bell

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Great Barrier Island Charitable Trust

Environmental News



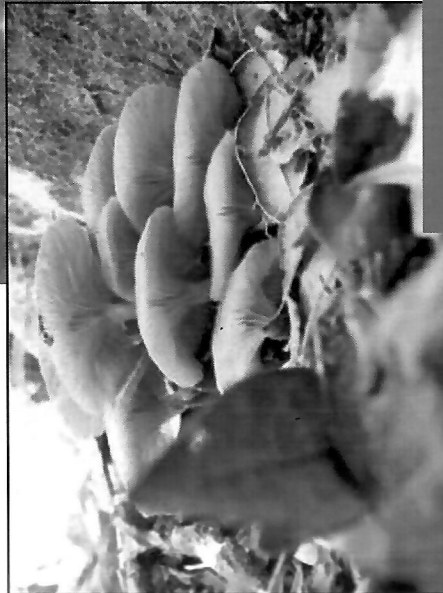
Photo: IslandStay

Duvaucel's Gecko Discovery • Rat Chat Kaka Conclusions • Sanctuaries Report

Mission Statement: To protect native species through the eradication of rats and feral cats, to re-introduce species lost to the island, and to work towards building an ecology-based economic framework for Great Barrier Island.

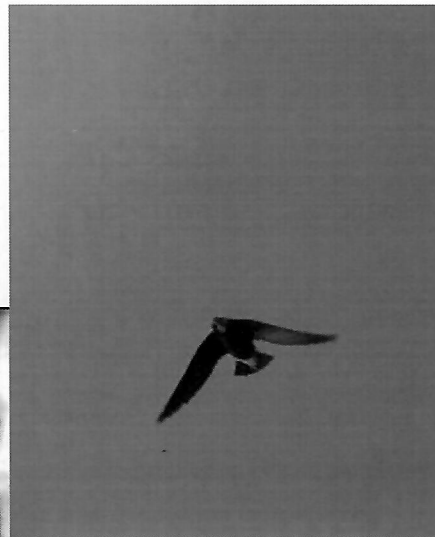


Kevin Parsons shot this unidentified fungus on Little Windy Hill – autumn is the best time for fungi on the Barrier, and you could help us to add to our collection of known fungi on Great Barrier by sending us your photos.



White-throated needletail

(*Hirundapus caudacutus*) circling the summit of Mt. Hobson in January 2009. This is a type of swift which migrates from China to Australia in the northern winter, and occasionally gets blown across the Tasman. The name refers to the tiny projecting spines at the ends of the tail feathers. It is the first record for Great Barrier and serves to make the point that we'd like to hear about any unusual bird observations to extend the check-list in Appendix 2 of the State of Environment Report (www.gbict.co.nz). We'll also start featuring them in Environmental News (Next Issue). The photo was taken by Kathy Ombler, who is author of "Where to Watch Birds in New Zealand" (Reprinted 2010). (with permission).



Editorial

2011: Planning the New Environment for Great Barrier

FROM THE TRUSTEES

The Great Barrier Island Charitable Trust's 2010 State of the Environment Report (SOER) is nearly a year old (see: www.gbict.co.nz). It is the most comprehensive account of the Island's natural biota and land environment, and of the past and current human pressures on these. In keeping with the breadth of the SOER, and the Trust's mission statement, we are asking the Local Board to examine the many ways in which the community can support improving environmental quality and biodiversity on the Island in 2011. Few other issues have been as hotly debated as the idea of pest eradication.

The community deserves now to be involved in a comprehensive and wide ranging consultation process to explore the various options of pest eradication, pest management, and biosecurity. These are not ends in themselves, they are stepping-stones to halting the declines in biodiversity and allowing the reintroduction of lost bird species such as the kokako. We believe that environment and biodiversity are important factors in the Island's future economic development, and that this emphasis will sit well with the priorities of the new Local Board as they are agreed.

The new Local Board has the task of producing a Strategic Plan, which will describe the local community's aspirations and their preferences and priorities for the next three years and beyond. The 'beyond' is because Auckland Council is preparing a 10-year plan (2012-2022) and the Great

Barrier Strategic Plan is intended to influence that. The Local Board will, presumably, hold public meetings and call for submissions on the plan. The first stage – the Great Barrier Local Board Agreement – has already been published and includes a commitment to 'undertake a consultation exercise on pest management and eradication'. We welcome this, and we believe that it must be done properly and independently. The Local Board has a role of 'Advocacy to Auckland Council' and under this role it can legitimately seek professional advice on how to 'improve bio-security and pest management responses and programmes'. We believe there is a ground-swell of support in the Great Barrier community for more comprehensive pest management, even possibly total eradication, and that every person in the community needs to be consulted about their thinking on this and related issues. Meanwhile, let's see what support we can get for smaller scale local initiatives to improve biodiversity and environmental quality. And, let's keep asking the Dept. of Conservation what they are doing in this area too!

We welcome Emmy Pratt, Wayne Anderson, Peter Edmonds and Kate Waterhouse as new Trustees. We will 'profile' them in our next issue. Our membership continues to grow (now at c. 160) which reflects growing support for our vision and activities. For example over 90 Barrierites have participated in kaka counts since 2007. However, when it comes to main-taining an island lifestyle and a quality environment, numbers are important. So if you support our stance, please fill out a form and join us, or you can do so by visiting our website www.gbict.co.nz or phoning Fenella on 4290414.

RatChat

Rat numbers peak in March/April on the Barrier and this is the best time to try to prevent them getting inside houses or sheds, and from demolishing the last of the summer veges in the garden.

At Windy Hill we have been tracking this rise of rats for eleven years and no matter how effective the pest management we have in place what happens is that there is always an increase in the percentage of rats recorded in tracking tunnels in autumn, particularly in the more mature regenerating and mature forest areas.

However, if you have sufficient rat control happening outside your house or other buildings you can really minimise the risk of rats getting inside your cosy house for the winter. An average size developed section could do with between 4 and 6 trap or bait stations tended regularly. At the peak one can catch several rats a night.

Tips for Trappers

Baits: peanut butter mix with rolled oats; nuts – peanut, macademia; chocolate buttons; chook pellets; bread; fruit; bacon rind; leather bits soaked in oil

Set Traps:

in & under buildings; inside building walls & ceilings; in rock walls; under and in timber stacks; by compost bins; by firewood stacks; in old cars; under climbing vines; by piles of rubbish; in the orchard and garden

Traps - Trouble shooting

If the trap won't set, tip the trap upside down and shake free the pedal.

Place thumb on top of flat part of mechanism to hold up bait pedal when setting.

If the bar won't set in the catch, press the bar in under the catch as setting..

HOT TIPS

- The traps down to stop them disappearing when a rat is partially caught
- Cover traps to stop by-catch and protect the trap from being sprung by debris. Set trap at back of cover to reduce risk of by-catch (rails).
- Plenty of traps outside will lower the risk of rats coming in and
- Change baits regularly and move traps from time to time
- When mice appear rat numbers are way down
- Weigh or staple covers down to prevent them being blown over
- Keep a record – it will astound you how much you catch
- Rat numbers are highest in Autumn, lowest in September
- Have one trap for every 50x50m square area in bush situations
- If using bait ensure that it is fixed inside a station that protects it from the weather and stops non target species accessing the bait.

TRAPS, rat bait, and trap covers, are available from the Windy Hill Rosalie Bay Catchment Trust. Plastic Snap-E Traps - \$8 each Plastic Covers for Traps – free Wooden covers for traps – \$22 BAIT: 10L pails Rat bait (approx 290 x 20gm baits) \$150 plus gst Used bait in good condition \$20 per 10 L pail. Ph Judy on 306

Giant Gecko Rediscovered!

One of New Zealand's heavyweight lizards hangs on

BY TRENT BELL

Who'd have thought? New Zealand's largest living gecko species, and one of the world's largest geckos, has just been rediscovered at Windy Hill Rosalie Bay Catchment Sanctuary in January this year - albeit unfortunately dead in a rat trap. Field worker Rachel Wakefield discovered the decomposing lizard during a routine check of trap and bait stations. With the aid of a lizard field guide, she was able to identify it as a Duvaucel's gecko and this was verified when the preserved remains were sent to Halema Jamieson.

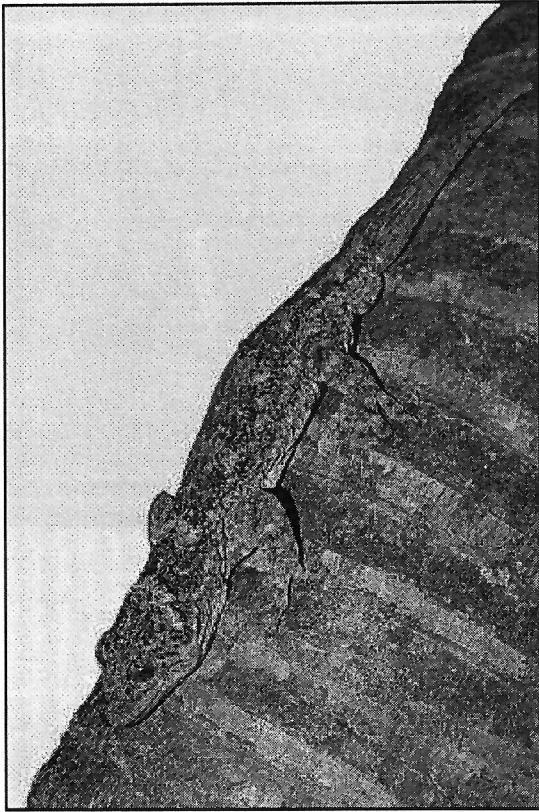
Duvaucel's gecko (*Hoplodactylus duvaucelii*) are very large and heavy-bodied geckos, with the largest recorded specimens reaching to 32cm long, and up to 118g. Although chevron skinks are known as one of New Zealand's longest lizards, they are not as fat or heavy (40g). This discovery comes on the heels of the rediscovery of the rare striped skink (*Oligosoma striatum*) near Windy Hill in 2009.

The last – and only – recorded and verified sighting of Duvaucel's gecko on the Barrier was exactly 40 years ago in 1971

What is the significance of this rediscovery? The last – and only – recorded and verified sighting of Duvaucel's gecko on the Barrier was exactly 40 years ago in 1971, by Brian Gill of the Auckland Museum, at Okupu. The closest existing populations are those of the Mokohinau Islands in the north, Little Barrier Island and also the Mercury islands to the south. Anecdotal rumours do persist of 'large lizards' being seen on Great Barrier Island on the odd occasion but these are usually attributed to chevron skinks.

However, sightings last year of 'very large gecko' in Okupu may have been a Duvaucel's. Have Duvaucel's geckos on Great Barrier Island survived the onslaught by the pirates that ship rats are? That was considered highly unlikely, but in light of the rediscovery, is now clear that at least a few have.

Duvaucel's gecko were once widespread on the New Zealand mainland, with subfossil or museum records indicating presence in Northland, Waikato, Hawke's Bay, Wellington, Canterbury and even Otago. Distressingly, the species' current range is now disjoint, with a 400 km straight line gap between the closest north-eastern island populations and the southern island populations on the opposite ends of the North Island. (NB, the Maungatautari gecko found in a rat



• *Duvaucel's gecko (Hoplodactylus duvaucelii) – long life and slow breeding makes the species highly vulnerable to rats. Photo by Trent Bell.*

trap has been determined by genetic analyses as most likely have been a released captive-bred animal). The extinction of Duvaucel's gecko on both the main islands, and some offshore islands is attributed to predation by rats, cats and mustelids.

So what puts such large geckos at risk of rats and other predatory mammals? It is thought that Duvaucel's gecko faces enhanced risks from predation by rats due to a combination of factors. As the geckos are strongly nocturnal (active at night), their activity period coincides with rats, a time where the geckos are most vulnerable while they are foraging for food or mates without protective and secure refugia nearby. In order to 'escape' predators, Duvaucel's gecko run and 'freeze', a strategy probably effective for birds, but clearly not very smart when encountering rodents and cats.

Another vulnerability that

Duvaucel's gecko have are their own large sizes. Being too fat to squeeze into many of the narrow protective refugia often available to the many other smaller gecko and skinks leads to limited avenues for escape and protection from predation. This is especially problematic for heavily gravid female geckos that often look rather obese, and waddle rather than scurry when attempting to escape!

Duvaucel's geckos are also extremely long lived, probably the longest living gecko species in the world. Most geckos in the world live about several years, but an individual Duvaucel's gecko was recently recaptured 50 years after being first marked as an adult in 1958 on the North Brother Island, and is possibly still alive even today. Other individuals have also been recaptured after 36 and 43 years since their first capture.

Long-lived species must therefore



• *Duvaucel's gecko* - one of *New Zealand's largest*. Photo taken on *Little Barrier Island*.

reach maturity later in life? Yes, that would be correct for this species. In order to breed for the first time, a female *Duvaucel's* must wait six years before she is sexually mature, and a male also matures at around seven years. *Duvaucel's* gecko also have a 'low reproductive output' - in other words it has been estimated that females have 1.12 young per year on average, and that every female only breeds every other year.

A study on *Ohinau Island* prior to and six months after the removal of *kiore* from that island found that only 4% of their population was under 100mm SVL (an adult *Duvaucel's* range in size from 100mm to 161mm snout to vent length, SVL). This contrasts with *kiore*-free *Korapuki* and *Green Island* populations comprising of 20% and 14% newbies under 100mm SVL. Were the *kiore* taking the *mokopuna* of these geckos? As there are no other invasive mammal species on *Ohinau*, it is apparent that *Duvaucel's* gecko

populations cannot sustain themselves even from the seemingly innocuous *kiore*. It is also likely that in the face of the presence of the more voracious ship rats elsewhere, no *Duvaucel's* gecko are able to survive long enough to even get their leg over to carry on the family line and inheritance.

Research has indicated that on *kiore*-inhabited islands, *Duvaucel's* gecko populations were restricted to shore and cliff habitats, and nearly absent in forest. Interestingly, upon eradication of *kiore* on *Ohinau*, nearly 70% of *Duvaucel's* gecko suddenly switched their habitat within six months, by leaving their cliff-bound coastal refuges to explore the forests that once comprised part of their kingdom. The geckos also spent less time in their predator-secure refugia and also came down to the ground more often. Did a similar phenomenon occur with the *Duvaucel's* gecko caught in a rat trap in forest at *Windy Hill*, about 3 kilometres away from the *Rosalie Bay's* rugged coastal bluffs, where a remnant population may potentially still exist? This may indeed be the case.

So what do *Duvaucel's* gecko do in their spare time? The species is a habitat generalist occupying coastal boulders, bluffs, scrub and also forest, and is both arboreal and terrestrial. These geckos like to take up refugia in hollows, crevices and even the odd empty petrel burrow. Dietary analysis indicate that these geckos feed on a variety of invertebrates, including moths, weta, crickets, cockroaches,

beetles and earwigs. However, this is when things start to get really interesting. *Duvaucel's* gecko have been observed congregating on *pohutukawa*, *ngao* and *flax* in bloom, engorging themselves on nectar, and thus spreading pollen to other trees, considering the pollen's tendency to attach to the gecko's chins, undersurfaces and limbs for at least 12 hours, and the geckos ability to disperse to distances greater than 50m in short time frames. The ecological services of this gecko do not end there. They also feed on fruits of several tree and shrub species, and excrete viable seeds in what is often a suitable location for germination. The sweet tooth of *Duvaucel's* gecko seem to know no limits, with geckos also recorded feeding on honeydew on *ngao* and *kanuka*. As such is their appetites, *Duvaucel's* have also been recorded eating other geckos and even shearwater eggs. Since

Duvaucel's gecko have been recorded in densities up to 750 geckos per hectare on some predatory mammal-free islands, they must have played a very important role in many ecosystems in which they formerly occupied.

Duvaucel's gecko are thought to have large home ranges, although as no precise estimates are available yet, this is probably around 200-500m². These geckos can cover great distances, with one animal on the *Poor Knights* islands recaptured 77m away from the original capture location three days earlier. In another account, a gecko released on *Mana Island* was found 1 kilometre away from the release location! Yet, despite the gecko's apparent ability to range far and wide, they also show tenacious site fidelity, with a single animal relocated in the exact same refugia on

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...it is apparent that *Duvaucel's* gecko populations cannot sustain themselves even from the seemingly innocuous *kiore*.

the *North Brother Island* after 36 years! Not only do they like their homes, they also like to share. *Duvaucel's* gecko like to aggregate, and often appear to have a 'family group' of geckos sharing the same crevice, potentially suggesting paired adults along with differently-aged offspring or a tolerance for younger geckos.

The news is not all bad for *Duvaucel's* gecko. The gecko is still widespread and abundant along the (mainly rat-free) north-eastern islands and on several small islands in the *Cook Strait*. *Duvaucel's* gecko have also been reintroduced to *Mana Island*, *Tiritiri Matangi* and *Motuora Islands*, where they appear to have successfully established.

Unfortunately, it is highly unlikely that the *Barrier's* newly rediscovered gecko species are currently able to sustain their own *mokopuna* - or even themselves. Although *Duvaucel's* gecko populations seem to have somewhat persisted on the *Barrier* to date, these populations are almost certainly doomed. The rats will get to them eventually, if we don't get to the rats first.

The rediscovery of *Duvaucel's* gecko as yet another piece of the rare *taonga* of *Aotearoa* also brings home the

Continued on page 14

Boxing Day Kaka Counts — and some conclusions

How many pesky parrots in pohutukawas, plums or pines?

BY JOHN OGDEN.

Kaka is an endemic species, found nowhere else but New Zealand. Nationally kaka numbers have declined dramatically since European arrival, and continued to do so between nation-wide surveys in 1985 and 2004 (Robertson et al. 2007). Stoat- and Possum-free Great Barrier Island is recognized as one of the major kaka population centres, so it is important to get to know how many are here. There is also local concern about kaka numbers as they deplete yield on fruit trees and make orchards uneconomic.

A total of 5 kaka counts have been made on Great Barrier since the first boxing-day count in December 2007. After that, the next three counts were all made in the winter period, between 2008 and 2010. As the original boxing day count indicated much larger numbers of kaka than the subsequent winter counts, it was thought prudent to do another summer count to check that the seasonal differences indicated were real, and not just a consequence of huge 'counter enthusiasm' on the first count for instance! The 'final' count was on boxing-day 2010, and here I summarise the results for that count, and make comparisons with the earlier data.

First, it is very pleasing to report on the level of support shown to the Trust by participation in these counts. While I'm not so naive as to think that all participants support all the GBICT



• Feeding kaka can become quite tolerant of human presence. Photo: IslandStay

aspirations, presumably participation does indicate an interest in understanding more about this endangered bird. Ninety-one participants sent in 193 data sheets over the five counts, with 30 people participating in up to three counts (Fig 1). Participation per count ranged from 33 to 45 persons. Actually participation is greater than this, because some 'participants' were more than one person! Anyway, you all know who you are, so a big 'thankyou' from the Trust!

The Boxing-day 2010 results are in Table 1, which follows the format used in previous reports (GBI Environmental News #13, 16, 23). Individual sheets were grouped by 'location' (e.g. there were three sheets from Awana). The Total AM and PM are the sums of all counts by all

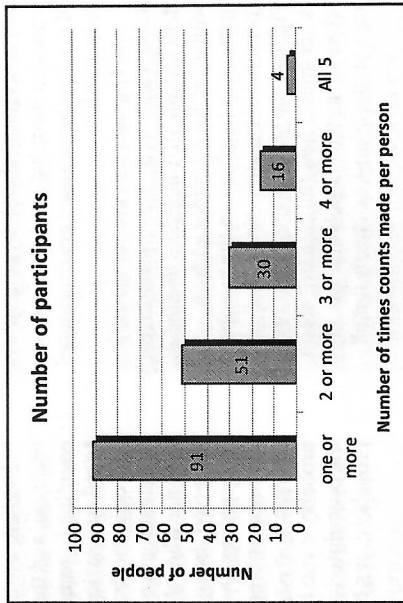


Fig 1. Number of participants covering all five counts.

observers and this assumes that all birds are different individuals.

'Minimum at location' takes the largest number actually counted by any observer at the location as the minimum that must have been present (i.e. there were at least that number). Maximum uses the largest 'numbers' usually seen over past two weeks' or

the largest count at the location on the day if that was greater.

Some quite large flocks were recorded in 2010, for example 39 birds at Tryphena and 26 at Whangaparapara. It is very difficult to count the birds in fast-moving groups flying or feeding, and it is likely that some birds were counted twice. However, in these

Table 1. Kaka count results 26/12/2010.

Location	No Sheets	Total AM	Total PM	Minimum @ location	Maximum @ location
Awana	3	2	3	3	9
Fitzroy	2	14	37	14	37
Harataonga	2	8	9	6	11
Kaiarara	1	4	4	4	6
Karakā Bay	1	2	1	2	7
Medlands	3	7	5	6	10
Motairuhe	1	5	7	7	35
Nagle Cove	1	0	0	0	0
Okiwi	1	3	2	3	3
Okupu	7	8	5	5	8
Rosale Bay	1	8	12	12	12
Schooner Bay	2	17	0	17	22
Tryphena	8	84	59	39	39
Wairahi	2	21	26	17	12
Whangaparapara	2	33	19	26	26
Windy Hill	1	0	7	7	7
Totals	38	216	196	168	244

two cases (and others), large numbers were also recorded by other observers at the location, so they are considered to be reliable.

All five data sets are compared in Table 2 and Fig 2. These results clearly demonstrate that numbers decline in winter, which coincides with an increase in numbers on the mainland (personal communications: Suzi Phillips; see www.kakawatchnz.org). It is not known how the data in Table 2 relate to the true population size of kaka on the Island, as clearly not all

individuals are counted on each occasion, and there may be double counting in some cases. "Maximum based on locations" is probably the best estimate, but this may underestimate numbers, especially in summer when the birds are more dispersed through remote bush areas for breeding. Overall it appears that the summer breeding population is between 200 – 300 birds (guess at probably < 100 breeding pairs), while the overwintering population is probably c. 125 birds ± 50.

Table 2. Kaka population estimates.

Date	No data sheets	Total AM - all counts	Total PM - all counts	Average AM / PM counts	Minimum based on locations (1)	Maximum based on locations (2)
26 Dec 2007	45	224	nc	nc	129	221
07 Sept 2008	40	85	53	69	61	117
27 June 2009	38	111	62	86.5	83	105
25 July 2010	33	61	73	67	68	107
26 Dec 2010	38	216	196	206	168	244

Notes: nc = not counted. (1) This minimum is the *maximum* actually counted by one of the observers at a 'location' (i.e. at least this number was definitely present at the location). (2) This maximum is based on either the maximum actually counted by an observer at the location or (usually) the estimate of numbers usually seen by the observer over the last two weeks.

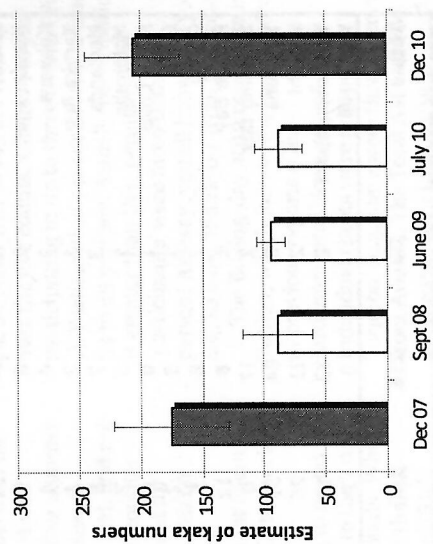


Fig 2. Fig 2. Mean, maxima and minima estimates of kaka counts based on locations. Winter counts in white, summer counts in grey. The bars give the average, the thin lines give the maxima and minima ("Error bars").

The data (Fig 2) might suggest that kaka numbers have increased in summer between 2007 and 2010. However, there is no proof that this is so because the error bars overlap. Moreover, one important location (Motairehe) wasn't counted in 2007. This could easily account for the difference. It is also very difficult to separate real population changes in from changes in conspicuousness in this species.

Movement from Great Barrier to the mainland appears to be in April and May, while the return is in September. Our previous (2006-08) Island-wide bird counts clearly show that by September kaka are as conspicuous in most places as they are in December (Table 3). Those results also suggest that the summer population is about twice the winter, though numbers remain in some locations where food is available. Not everyone noted what tree species the kaka frequented; often they were only seen flying. However, the data set has 196 records of tree species visited by kakas, with roughly as many winter as summer records. If

we express the records for each species as a percentage of all records (Table 4), and assume that presence in a tree is proportional to the value of the tree as a food source (an assumption that needs considerable qualification!), then we can make a few conclusions.

Native plants are most important in December. Pohutukawa (presumably mostly flowering) is top of the list, comprising 30% of all observations. Puriri and flax are also important. Fruit trees comprise 17% of observations, though of course many do not have ripe fruit in December. In the Winter native trees seem to be less important, but puriri (which carries some fruit almost throughout the year), is significant. Exotic trees, especially pines, gum trees and Banksia, seem to be important for the (smaller) overwintering population. Citrus are important in the orchard fruits category, which overall stays about the same as in summer (17 vs. 19%).

It would be unwise to make too much of these data, but they do seem to confirm the impressions gained

Table 3. Probability (% frequency) of seeing or hearing a kaka (at any distance) in a five minute stop in different locations on Great Barrier. Data from GBICT bird counts 2006-2008 and Glenfern Sanctuary 2002-2006.

Location	Winter (1)	Spring(2)	Summer(3)	Rank (4)
Montane bush	27	70	100	2
Kanuka/manuka	10	75	60	2
Lowland bush	50	80	50	3
Coastal/housing	22	64	70	3
Paddocks	12	24	23	16
Glenfern Sanctuary	76	69	72	1
Average	32.8	63.7	62.5	

Notes for GBICT counts: (1) July 2006, (2) Average Sept. 2006 and 2007, (3) Sept. 2007. For Glenfern: (1) Aug 2004, (2) Average Sept. Oct. 2005, 2006, (3) Average Jan 2002 & 2003, (4) Rank of conspicuousness, 1 = most conspicuous, 2 = next most etc.

from other observations; just as abundant food supply may trigger kaka breeding (Powlesland et al. 2009), food shortage may be what drives over half the birds off-island in the winter. At that time it is the exotic trees, especially pines, which comprise the main food source.

Table 4. Relative frequencies of records of trees visited by kaka (from all five data sets).

Species	Summer	Winter
Pohutukawa	30.1	8.7
Puriri	6.5	12.6
Flax	6.5	0.0
Kanuka	5.4	4.9
Kowhai	2.2	1.0
Kauri	2.2	1.9
Kohokohe	2.2	1.0
Maruika	2.2	1.9
Rata	1.1	2.9
Cabbage tree	1.1	0.0
Rewarewa	1.1	0.0
Taupata	1.1	1.0
Totara	0.0	1.0
Nikau	0.0	1.0
Kahikatea	0.0	1.9
Tararua	0.0	1.0
Pseudopanax	0.0	1.0
Total natives trees	61.3	41.8
Pines	11.8	18.4
Poplar	3.2	1.9
Macrocarpa	2.2	1.0
Eucalyptus	2.2	6.8
Banksia	1.1	6.8
Wattles	1.1	0.0
Coral tree	0.0	1.9
Protea	0.0	1.0
Hibiscus	0.0	1.9
Total exotic trees	21.5	39.7
Apples	4.3	1.9
Plum	3.2	0.0
Peach	3.2	0.0
Citrus	2.2	7.8
Pear	2.2	1.0
Macadamia	1.1	1.0
Figs	1.1	0.0
Cherimoya	0.0	1.0
Loquats	0.0	1.0
Guava	0.0	3.9
Feljoa	0.0	1.0
Total "fruit trees"	17.2	18.6
Total all observations	100	100
Number of records	93	103

Exotic trees, especially pines, are seen mainly as problem 'weeds' on Great Barrier by the Department of Conservation and some land-owners. These data add another perspective. Pines comprise an important food resource for kaka (perhaps more than 18% of calories in winter?). If exotics such as pines, macrocarpa, gums, Banksia, wattles and coral trees were totally removed from the Island, kaka would either leave for the mainland in winter – where they might be at much greater risk – or else seek other food sources. It seems most likely that they would turn to "fruit trees" rather than the native forest, which has so little food that half the population already leaves.

All we can really conclude from Table 4 is that native trees (especially Pohutukawa) are important to kaka in December, and exotics (especially pines) are important in winter. The data tell us nothing about depredations on orchards, or the economic effects, although they indicate a problem for anyone trying to grow fruit commercially – we already knew that! The point is that having numbers shifts the argument to a new level – for example the data support the view that pines are probably the most important food source for kaka in the winter. This knowledge should be used to formulate new ecosystem management practices to balance the kaka population numbers at a sustainable level – which also allows humans to grow fruit. Currently kaka are the meat in the sandwich in a conflict between conservation aims, and the legitimate aspirations of many fruit tree owners on Great Barrier.

That is not a good place for kaka, or for anyone else.

Pest Projects on Great Barrier

Three steps forward and two back

Pest management projects at Glenfern Sanctuary, Motu Kaikoura, Windy Hill Rosalie Bay, Katherine Bay, Mohunga Peninsula, the Flat Islands, and Okivi School are all working to keep rats at zero or low levels so that native species have a better opportunity to survive. Each project uses different methods and all have the goal of finding the most efficient, cost effective, and socially acceptable way of eliminating or minimising the impact of rats on native flora and fauna.

Glenfern Sanctuary continues to battle with kiore reinvasion and colonising within the 230 hectare pest-proof fenced area. Interesting dynamics between ship rats and kiore are being observed with kiore responding more quickly to the opportunity to invade and re-establish in this habitat. Rabbits have also managed to invade but have been contained by gassing their burrows. A new pest-proof fence has been added inside the Sanctuary in an effort to prevent rats coming across from Fitzroy. Rat numbers within the Sanctuary are still low compared to unmanaged areas however, so despite reinvasion biodiversity gains are still being made. Bird counts taken in October have shown a dramatic increase in many of the native species over the last counts done in 2006. Additionally four new black petrel burrows all with chicks in the nests have been located.

The **Motu Kaikoura** Trust has not been able to sustain its eradication of two years ago. The island is suffering from significant rat reinvasion and long-term management will be needed to maintain the benefits of reduced pests.



• *Glenfern Sanctuary now has a secondary rat fence controlling rodents arriving from across Karohara Bay. Photo: Tony Bouzaid*

Over 600 trap and bait stations are deployed on the island and on the 'mainland' property closest to the island. Rat tracking tunnels stood at 17% density in November.

DNA sampling of rats has not clearly indicated whether some of the rats present are survivors of the eradication process or if all are re-invaders. However, one ship rat sampled was clearly identified as having come from the Flat Islands so those pesky ship rats are still travelling by boat!

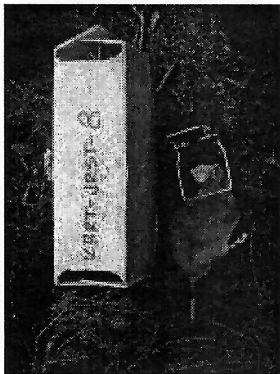
Since the **Flat Islands** rat eradication two years ago there have been two reinvasions that have been quickly detected by trap catches or

residents seeing evidence of rats. These have been responded to and the invaders dealt with by the Biosecurity team at Auckland Council (formerly the ARC), the residents, and local business EnviroKiwi. There are 100 stations with traps, bait, and tracking tunnels spread between the four islands and these are checked regularly to detect any further reinvasion.

These three projects illustrate the difficulty in achieving their goals of eradication when rats are within swimming distance and boats are travelling short distances between areas with and without rats.

Okiwi School tamariki are kaitiaki for its grounds, adjoining bush and wetlands with the goal of managing pests at low levels. This is important work as the area supports a number of native species including the kakariki and pateke. Tamariki operate tracking tunnels and collect data to calculate rat density, and evidence of indicator species such as weta and lizards. The tamariki gain a greater understanding of the impact of rats and the resulting benefits of controlling their numbers.

Mohunga Peninsula Restoration Trust maintains a virtual fence consisting of a buffer zone of bait stations across the base of the peninsula. These stations also control rat densities in areas of native bush, which are of course important food sources for a wide range of fauna. The Abercrombie shore line is also controlled recognising the considerable rodent activity over tidal areas. Residents are steadily extending the areas of predator control so that now a major percentage of the peninsula is covered. This year we are looking forward to the results of lizard and seabird surveys.



• Black rat snapper. Photo: Peter Hoey

The Katherine Bay Restoration Trust has been established in the Bay area with local Peter Hoey coordinating the establishment and management of 40 trap and bait stations along trapping routes. Pre-management tracking tunnels stood at 100% in Dec. 2009. Cages are used to trap feral cats and a local hunter keeps pig numbers down.

The 620 hectare Sanctuary in the **Windy Hill Rosalie Bay Catchment** now has 4800 trap and bait stations and seven either part or full-time employees. Both plant and animal pests are targeted with a recent focus on reducing rabbit numbers. Using a professional contractor 32 rabbits were shot and 8 burrows gassed in February. The rat tracking tunnel results for January from the four project areas within the sanctuary varied from 0 to 20%. Following the significant discovery of an adult Duvaucels gecko in a rat trap in January a comprehensive monitoring programme is now underway with the hopes of finding a live specimen of this highly secretive gecko. Monitoring is also underway for short and long tailed bats using specialized equipment on loan from DoC. The North Island robins in the catchment had a moderately successful breeding season with 13 young fledged with four of these remaining in the Sanctuary area.

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realization that in order to preserve all of the faunal elements of the Barrier into perpetuity, the rats must go. The question is not if, but when?

Since we have already lost the tuatara, kokako, hihi, rifleman, and saddleback, among other species from the Barrier, we cannot afford any more of Aotea's treasures to be further plundered. As long as the impasse over the rats remains, we run the risk of losing even more of our valuables.

For those who want to find out more about Duvaucel's gecko, a visit to Landcare Research's NZ Lizards Database is well worth the time (<http://nzlizards.landcareresearch.co.nz>). Click on the Species Synopses tab to reach a list of NZ lizard species, and look for *Hoplodactylus duvaucelii*. For references to the facts within this article, contact Trent.



TRENT BELL is a consultant herpetologist with EcoGecko Consultants. He is a frequent visitor to the Barrier, with a long-term lizard monitoring programme at Windy Hill. Trent is also following up a Duvaucel's gecko translocation to Mana Island, Wellington. Trent may be contacted at trent@ecogecko.co.nz, or visit his website at www.ecogecko.co.nz

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