

More Birds in the Bush – End of programme update

The following questions were asked during our live two-day event but due to time restrictions, we were unable to answer these in the sessions.

John Innes

Presumably the emergence of competition in protected areas is a sign of success? Tough for the grey warblers and silvereyes but a good outcome for the deep endemics.

Exactly! We need to remember that really we have no or at best little idea of what a 'restored' bird community looks like at each site, but it seems likely that intense competition between species is the norm when pest mammal predation is removed and birds become more abundant. And I think that food supply is also very relevant to this. The competition scene (e.g. abundance at K) will be quite different if browsers like possums, deer and goats are removed as well as so-called 'predators'.

Do we have any data on bird window strike?

I am not myself aware of any published accounts of this in NZ but there may be international literature. Urban bird rescue centres are bound to have data about window strikes. Some of these will be 'forest birds' (e.g. kereru) but window strikes are clearly not an issue in large forests.

From a UK site- "An adult hedgehog needs around 130 calories a day to survive. To get this, they will eat roughly 75grams, or 3 ounces, of food a night."

Thanks for this comment. My slide that showed 660 g of food per ha per night in a NZ forest was based on there being 5.5 hedgehogs per ha, which came from just one density estimate, and at least one of my colleagues thinks it is too high. And that was based on a nightly intake of 120 g per animal, much higher than your 'survival diet' of 75g. The subject of hedgehogs as target pests in NZ badly needs much more research and my preliminary statements are mainly to bring attention to this need.

Jo Carpenter

How does iwi allow you to use poison?

We worked with the Tūhoe Tuawhenua Trust to determine what pest control methods would be suitable to use on their lands. The outcome of these conversations was to use a mix of trapping and carefully controlled toxins (e.g. diphacinone in bait stations or very short-term cyanide use). We did not use brodifacoum due to its ability to bio-accumulate.

Has work been done on rat preferences, e.g. protein in autumn/winter - so they preferentially seek out protein at that time?

Research has been done that suggested female ship rats tend to consume protein (specifically invertebrates in this case) when they are breeding, but this would happen from late spring through until early autumn. Another study on rats in beech forest found no seasonal pattern in consumption of invertebrates, so it looks like there is more complexity there that still needs to be unravelled!

Graeme Elliott

Does the kea population still do better overall than those killed by 1080?

The current understanding is that kea suffer significant predation from stoats, cats and possums both while nesting and at other times. At back-country sites where kea mortality rates during 1080 operations are low, kea unequivocally benefit from the increase in survival and nesting success that results from the reductions in stoats and possums (and probably cats) caused by 1080. At sites where kea have learned to "scrounge" mortality rates during 1080 operations are higher and at these sites the balance of costs and benefits is roughly even. At many scrounge sites kea populations are in decline regardless of the use of 1080, so the overall effect of 1080 on kea is positive.

Why do you think there is a difference between nip it in the bud and the glut operations? Why did one work for some birds species but not another do you think?

We think the nip it in the bud operations are sometimes more effective at killing rodents (and secondarily stoats) because at the time that nip it in the bud operations are undertaken there is no beech or rimu seed around. In contrast operations undertaken during the "glut" are undertaken exactly when the rimu and beech seed is on the ground and there is lot of food, and poisoned pellets are thus less likely to be eaten. Nip it in the bud operations are particularly likely to be successful for kaka because kaka don't breed every year, and often don't breed during the "food glut" – they breed in advance of it and their chicks emerge at the beginning of the food glut. We've analysed the results of more than 100 1080 operations and high kill rates are more likely in nip it in the bud operations, than those undertaken in the food glut, but that doesn't mean that all food glut operations have low kill rates, some have very high kill rates. In our study and for the species that we've looked closely at so far (it's a work in progress) miromiro, tititipounamu and kaka appeared to benefit from both kinds of operation while kakariki and korimako only showed benefit from the food glut operations. This probably reflects the fact that the food glut 1080 operations in our study had good rodent kill rates and kakariki and korimako suffer can suffer high rates of nest predation during rat plagues.

Is that a stunning photo an Antarctic tern from one of the subantarctic islands?

The Antarctic tern photo was taken at a small breeding colony on Antipodes Island.

The DOC interpretation panel of the Mast to predator chain. Who gets the task of providing suitable graphics to present this updated information supporting predator control to the public?

The comms team that support DOC's National Predator Control Programme will produce material for public consumption that explains DOC's new predator control timings in masting forests.

Josh Kemp & Jason Malham

Looking at the colonisation of forest by cats (and hedgehogs and ferrets). It seems that the habitat is a bit marginal for them, so should we look at their demographic makeup? Might be poor survival of kits or females. Might this lead to identify ways to curb them?

At first thought I would suggest that in Kahurangi, the habitat becomes more marginal the further west one travels- i.e. it gets wetter out west. But then I think about the climate on Rakiura and that would seem very marginal for cats and yet there are lots. So maybe for cats at least, the forest habitat isn't so marginal, and a limiting factor has been suppression by stoats? Looking at their demographic makeup would be interesting and potentially useful as you suggest, but it seems first we need a way of effectively monitoring them- I don't believe we are there yet. I am hoping that the recent ferret incursions in eastern Kahurangi are a symptom of the very dry past year we have had up here, anecdotally I have heard there have been more rabbits around (e.g. in the Graham Valley draining the eastern edge of the park) this past summer, which could have improved things for ferret recruitment. I guess watch this space for them!

Am I right in assuming you've answered the question (in the case of kea) that we can't down throttle high inference studies for cheaper monitoring with weaker inference because we don't really understand the dynamics and there are novel effects now in play (e.g. deep forest cats & climate change)?

Hi Nathan, yes and no. If our invasive species surveillance had been more comprehensive, covering the full potential assemblage, then perhaps that would be all we need. The high inference studies are quite expensive and there's always risk of inadequate sample size making the whole exercise arguably pointless, so great care needs to be taken sorting out the right questions and study sites, and pre-empting unplanned changes to predator control regimes, before launching into it. Having said that, we have been asked to prepare a research plan that includes all of the above (comprehensive invasive mammal surveillance, kea radio tracking, and kea survey tool) with post-germination aerial 1080 pellets and, hopefully, aerial meat sausage baiting. Hopefully this would be last tranche of intensive kea monitoring, but somehow I think I'm dreaming...

Ferrets. FYI. Can confirm that we now encounter ferrets (visual sightings and trapped, outside the Sanctuary fence) in beech forest at 600 to 900m altitude a few times every year. This only started about 3-4 years ago. Before that we have never seen or caught any ferrets in beech forest habitat and treated them as absent

Thanks Robert – I didn't know this and am very grateful to you for saying so.

What methods are being deployed to kill cats in our National parks?

Presently it's a somewhat haphazard affair. People hope that cats get secondary poisoning after aerial 1080, but it's not well measured just yet. We hope to improve on that soon. Otherwise, people are doing some ground trapping, but it's small scale due to the labour required to service traps. In the South Island, trapping for cats carries some risk to kea, which complicates things – need to balance risks against benefits, in the absence of much data for doing the sums! It's a bit painful. The prospect of aerial sausage baits for carnivores is quite exciting, as it can then happen on a scale where we can actually quantify any off target risk and trade off against benefits, and if positive, deliver on the large scales we need.

Manaia Pearman-Fenton

I'm assuming you looked at alternate models with and without vegetation type as a variable. How certain are you that vegetation type is actually important for this species (e.g.. high, med, low)?

When we created our models to assess the influence of various predictors on kakaruai presence, we employed multiple binomial generalised linear mixed effect models with a log-link function which were then model averaged. Model comparisons were based on AIC scores corrected for small sample sizes (AICc) and the top ten performing models (each within a narrow AICc range) were then averaged to create our final model. Confidence intervals were also constructed to quantify the uncertainty around these parameter estimates. All the highest-ranking models contained habitat type/vegetation type. Based on the consistency of our results across model comparisons and averaging, as well as the assessment of confidence intervals, we are reasonably confident that vegetation type plays a significant role in determining kakaruai presence.

Zoe Stone

Might a soft release reduce the initial post release dispersal?

Soft releases, or delayed releases have been tried as methods to reduce post-release dispersal in a range of species with varying degrees of success. For toutouwai, soft releases have been found to have no influence on post-release dispersal. They can also be more harmful, increasing the duration that individuals are under stress which can lead to increased translocation related mortality or increased stress responses after release. Hence soft releases are not recommended for best practice of toutouwai translocations.

Do you have some advice for the distribution and type of predator control in the breeding area?

For Turitea at least, it appears that the original 20% RTI was not enough to reduce predation pressure, and that <5% seems to be a necessary target. In comparison, Taranaki managed fairly good population growth under ~15% RTI, but they had a more intensive grid. The problem seems to be maintaining those levels in the long term. The outcomes we have got at Turitea with the striker baits have been quite promising, with 20m spacing (possibly more than needed?) of bait for an intensive winter knockdown across the 300ha core area, accompanied by a less intensive trapping grid to help maintain those lower levels throughout the year. Our results are fairly consistent with previous work of needing good predator control at a 100m resolution. I don't think traps alone are good enough to maintain the low rat numbers needed, as potentially indicated at Taranaki where 3 years post 1080 the A24 grid wasn't effective on its own.

Your predictors showed water deficit mattered but didn't include elevation, which in the study area looked to be correlated with all the predictors you did find significant? Do they just like low warm sites?

Good question Dave, sorry I forgot to mention the elevation aspect. Yes, elevation was a considerable variable associated with toutouwai presence in our early models. Which was pretty clear at both sites, with toutouwai basically avoiding habitat above 500-600m elevation. But

elevation is a rather coarse variable, which when included in models can mask other finer environmental relationships. So we removed elevation from the final models to see if we could get any more detail from the predictions to help managers with selecting sites/predator control. But ultimately, toutouwai do seem to be fans of low altitude broadleaf forest habitats, which may contribute to the habitat preferences detected in our models. Another question asked also relates to this - about the importance of distance to forest edge. This relationship is probably also due to lower forest habitat being historically cleared, so the more optimal toutouwai habitat just happens to be closer to the edge.

Kara Macdermid

Acknowledging the difficulty of keeping rat abundance sustainably low, how likely is it to maintain 5% tracking rate throughout the home ranges of the monitored robins? The terrain in the reserve seems challenging.

I think the last two years have proven that we can maintain a low tracking rate in a small area (ca. 280ha). However, as you say, that is a massive effort by the predator control team and a decent cost even for just that small area and requires constant attention - I doubt we could just leave it without that extra control for a few years and expect rats to stay low. The terrain is challenging in that it is made up of fairly steep ridges with often steep drop offs to either side. Many trap and bait lines run down ridges or gullies because of this. The Striker bait deployment takes a team the better part of a month of crawling through supplejack, sliding down steep faces, etc. in order to really cover the areas between lines with baits every 10 - 20 metres as possible. I don't think we will be able to continue to use diphacinone to knock back indefinitely as we already saw a change in how the mice responded last winter so may need to reconsider our strategy at some point. There is also the fact that toutouwai may disperse out of this area, especially if our population grows, in which case we will need to decide whether to spread our efforts wider or continue to concentrate on just this core area. The advantage of adaptive management is that through our monitoring of rats and toutouwai we can learn from the management we are implementing here - what works, what doesn't, for how long, etc. - and use that when making future decisions to try and achieve best possible outcomes.

Tristan Rawlence

Is there any research on other alternatives to 1080 kill mice and rats?

There are no alternative poisons currently being trialled for mainland applications on public conservation land. Aerially applied pindone could be an option, but is unlikely to provide secondary poisoning to mustelids, so would have limited use. Aerially applied brodifacoum is used for eradications, but not control operations as it accumulates in the ecosystem.

Outside of aerial poisons there is a suite of new traps as various stages of development and in some cases efficacy trials for front country use.