

The restoration road travelled.....and possible challenges ahead

Murray Williams, School of Biological Sciences, Victoria University, Wellington.
murray.williams@vuw.ac.nz

It is not often that one has the privilege to stand before such a large band of revolutionaries and acknowledge their past and ongoing commitment to profound change. Revolutionaries you truly are, albeit devoid of that iconic Ché Guevara profile, and profound change you are indeed causing. You are introducing to New Zealanders new ways to think about, value, and care for the indigenous life forms of our islands...and I doff my cap to you all.

Collectively I have little doubt that we share a united vision...even though we may never have discussed it. The *Biodiversity Strategy* undoubtedly speaks for us all but while the

Our common vision?

The retention of New Zealand's indigenous lifeforms and the ecological processes that sustain them

preservation of indigenous species requires no debate I do wonder how we consider the "ecological processes that sustain them". I suspect our responses to that are largely the product of our past experiences – of the restoration road we have already travelled – just as in other walks of life past experiences shape future choices.

I shall come back to this question about ecological processes later but I do wish to dwell a little upon the "restoration road travelled". The intent of my presentation is to look forward and finger what may become restoration's challenges in the decade ahead. [It's a pertinent question given that the research impetus provided recently by Landcare Research expires 3 years hence, unless its funding can be renegotiated and new research objectives established.] How we perceive future challenges will be influenced by the restoration experiences already acquired and by individuals who have inspired ...and I encourage you most strongly to reflect upon your own "restoration road travelled"

By way of (hopefully) brief example I highlight some of the most influential events and personalities along my road, a road that effectively started when I joined the NZ Wildlife Service in mid-1965. This was in the wake of the rat colonisation and irruption on Big South Cape Island off Stewart Island, a formative event not just for the

stark demonstration of an alien invasion but for the finality that is extinction... it being the occasion of our last vertebrate extinctions, of a bat, snipe and wren. The photo here is of the wren, Stead's bush wren, and it is a photo of extinction plus 1 hour – the bird, freshly dead, propped up for a last, and only, iconic photo. It made quite an impression on me at first viewing.



I recall those early years dotted with Herculean last-ditch efforts such as hunting for kakapo in Fiordland, attempts at captive confinement of takahe and kakapo, first responses to "clean up" islands (e.g. goat removal from McCauley Is. in the Kermadecs, and Cuvier, sheep from Campbell Is. – the latter controversial because of the "value" of forgotten farm stock), early bird transfers (e.g. Saddlebacks from Hen Is to Cuvier Is), and the heroic replanting of Mangere Is as part of the desperation surrounding black robin. Featuring prominently behind these early restoration initiatives was the Wildlife Service's largely unacknowledged "man of action", Brian Bell.

Ian Crook's landmark 1973 study detailing the effects of rats on island tuatara populations lingers in my memory as driving an attitudinal change to rats on islands. Despite, some 5 years later, a Lands and Survey sponsored conference concluding the removal of rats from islands was not feasible, a subsequent decade of field trials culminated with Bruce Thomas and Rowley Taylor clearing rats from 170 ha Breaksea Island by placing baits in a ground network of bait stations. A pathway forward, used ever since, had been demonstrated!

The divided administration of NZ's environment was unbelievably damaging - Lands & Survey running national parks and clearing scrub to establish subsidy-dependent backcountry farms, Wildlife Service asked to conserve rare wildlife without control over their habitats, and Forest Service dealing to pest ungulates and supporting native forest clearance for exotic plantations. It was a shambles and the joining of all green dots in 1987 to form the Department of Conservation ushered in a much-needed era of hope. Restoration was an idea whose time had come and it was given important

scientific endorsement in the insightful writings of Ian Atkinson.

In retrospect I see that restoration push, and the foundations of what we now do, as arising from three flights of Icarian fancy – kokako, Kapiti and Karori.

The kokako recovery programme under John Innes’s direction was the first to set out to disentangle perceived multiple influences on our endangered endemic fauna. Termed “research-by-management” but reflecting the concept of adaptive management, John’s approach has been copied ever since. An invaluable legacy of this approach was the instilling of partnerships between “researchers” and “managers” - that is now so distinctively NZ, and one of our truly great strengths.

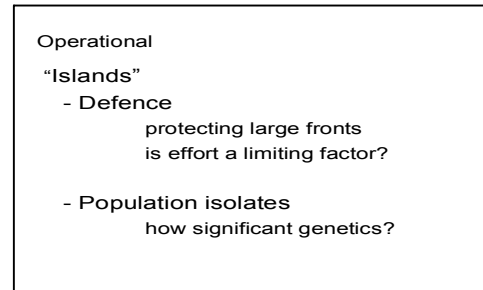
Kapiti’s rat eradication project was pivotal too. Raewyn Empson and her team was able to exploit newly-available military-precision GPS technology (thank you Bill Clinton!) to sow anti-coagulant laden baits and remove all rats from 1700ha – a massive scaling up from Breaksea. It launched a technique that has been used to stunning effect ever since, including over 11,000ha on remote Campbell Island, and it has stimulated island eradications internationally.

The Karori sanctuary initiative of Jim Lynch and his fellow Wellington Forest & Birders we can all agree was as imaginative and brave as it has been inspirational. Karori is still showing the way over a decade later, testing management and economic models for all to learn from while at the same time helping transform Wellington’s wider avian environment.

All three K’s were attempted without obvious or guiding precedent, and their successes have been built upon to shape the way sanctuary-scale restoration is advancing. What stands out for me is the extraordinary speed of our advances. In less than a generation, within a single working lifetime, we are witnessing a quite astonishing turnaround in perception, practice, and (importantly) expectation. Has there been a more breathless revolution?

Our revolution has now arrived at a fork in the road.....to fence or not to fence. These 2 contrasting paradigms both have their adherents and their doubters and it is for this reason that I shall park the obvious comparison in favour of considering challenges ahead for large scale restoration by either approach.

The challenges I foresee can be categorised thus:



I see future **operational** challenges arising as a consequence of our defence of habitat “islands”. For example, with the exception of a couple of DoC “mainland islands”, our focus is on ecological isolates. These inevitably have all-round invasion fronts and their boundaries are pre-determined by a combination of topography and adjacent land use. Could boundaries be re-thought by considering how unwanted animals or plants might disperse within the wider landscape? Could significant invasion fronts be created or predicted by such an exercise in order to limit defence efforts elsewhere? Should our principal line of defence lie somewhere beyond rather than directly at the boundary of our “island”. In short, could we become a bit more strategic about what we choose to defend?

I pose this question because there are clearly limits to what can be defended. I wonder whether the effort required to achieve minimum pest animal densities in unfenced sanctuaries increases somewhat brutally beyond about 500 ha such that 1000 ha is near the limit of this restoration approach...perhaps that is an important pointer coming from DoC’s Boundary Stream.

Another consideration arising from population theory is the size of the species pools being defended. Are they too small to ensure their long-term persistence? There is considerable evidence that small founder groups of birds on islands encounter inbreeding depression within a few generations of release and one would expect the same to apply in mainland isolates too. Multiple introductions from disparate sources as well as periodic transfers between sanctuaries, all with assiduous monitoring to ensure all introductions leave descendants is an obvious operational response....but it is not yet part of standard practice for birds, or for reptiles or invertebrates.

On the **economic** front, there is no doubt that sanctuaries operate under considerable financial strain. Matching ambition with resource alongside an impatience for change I have heard

described as “character building” although I’m sure I detected a hint of exasperation with the comment.

- | |
|---|
| <p>Economic</p> <ul style="list-style-type: none">- Drinking from the same financial cup
funders spread thinly
ambition reduced?- Why no private \$\$
subsidies, incentives- Cost/benefit evaluations |
|---|

The reality is that sanctuaries, and the plethora of other restoration initiatives around the country, are all attempting to drink from the same cup. The cup is almost exclusively filled by government (national, regional, local) grant – public money that is largely discretionary (as the impending demise of the community conservation fund highlights). Presently these funding agencies appear to give a little to a lot, and for the now rather than for years ahead. I can’t see this changing in the near-term and one adaptive strategy may have to involve a reduction of ambition, an extension of timeframes, and a revision of existing plans.

High funding demand may force a change to a subsidy model of funding....whatever you raise earns a 2:1 or 1:1 top-up from the government cups. That would surely concentrate the mind just as it may unleash contributions from other quarters, and especially from private funds or foundations.

There is no denying that another response will also become necessary; can we do what we do cheaper (as well as better)? I suspect there is room for considerable between-sanctuary communication here but I also believe this to be a priority area for some well-constructed research from DoC and Landcare.

Finally it would be remiss of me not to raise the question on many lips...are fences sustainable? Right now we simply don’t know. Construction costs are known, annual maintenance costs are becoming known, but replacement cost and longevity remain a guess at best. Good financial practice requires accumulation of a maintenance fund wherein is parked an annual contribution to maintenance and replacement. Who presently does this? How are the figures derived? It’s not too early to consider this very carefully because it is such a crucial element in the evolution of our approach to restoration at the sanctuary scale.

- | |
|--|
| <p>Conceptual</p> <ul style="list-style-type: none">- Moves away from the “ideal”
minimum pest densities- Novel ecosystems
exotic inclusion or tolerance- Beyond “islands” to catchments
change scale of ambition
dispersal and connectivity |
|--|

Conceptually we aspire to a 100% pest-free, exclusively indigenous ideal but we face a difficult ecological reality. At the past two sanctuaries workshops I have heard the question “what are the minimum pest densities that will still allow me to introduce robins?”, a question that reflects the difficulty and costs associated with the final 10% of the pest-free ideal. Although greeted with largely equivocal responses, it is a question that won’t go away because it is in the vanguard of significant conceptual change.

Recent academic discussion has raised the concept of a “ragamuffin” world wherein a blend of the indigenous and the exotic constitute “novel” ecologies and processes come to be seen as an acceptable and pragmatic alternative to the 100% indigenous ideal. It should not be seen as a lowering of the bar but as a pragmatic shifting of the goalposts. Already we know that kiwi and whitehead do well in pine forests, gorse functions well as a nursery crop, tui and kaka seek out eucalypts and banksias just as kereru do willows and tree lucerne. Coveted iconic species can be sustained by a blend of the exotic and indigenous, and attracted to urban areas as a consequence.

I predict these “novel” ecosystems will command a significant place in our conservation toolbox in the decades ahead....and what we will see tomorrow at Cape Kidnappers wildlife preserve is an exciting early example of just that. Keep an open mind!

There is another conceptual change pending; a move from viewing our sanctuaries as laagers to operating them as nurseries for the wider landscape. While we presently cut our operational teeth on “mainland island” sanctuaries just as we did on true islands 2-3 decades ago, we can to look forward to extending our management horizons well beyond their boundaries. Practicing restoration on a landscape scale is the obvious next ambition. The source – sink model is a well-established ecological concept that can be built upon but...and it’s a big but...not without a better understanding of dispersal. If there is an Achilles heel to a more expansive restoration ambition it is the present rudimentary understanding of animal dispersal, especially across or through otherwise “alien” environments.

Corridors to facilitate dispersal and promote connectivity are widely extolled, but I have yet to encounter convincing demonstrations that they work in New Zealand as we might imagine they should. If Landcare is looking for research direction then I offer this, and I’d go further and suggest the Taranaki ring plan with its many remaining forest patches and extensive riparian fringes to its many rivers as a great experimental site.

Extending ambition to the landscape or catchment scale may finally bring water into the sanctuary-scale restoration mix. Rivers, the veins of our land, are in a generally shocking state but their restoration, and all other wetlands for which Gordon Stephenson so tirelessly advocates, cannot be addressed without a catchment-scale approach.

<p>Political</p> <p>Urbanisation 1080, chemical accumulation Community willingness to pay Community participation</p> <p>Carbon farming cumulative value of restoration</p>

New Zealand is a highly urbanised country – approx. 84% of us have an urban address. Experiences within urbania shape attitudes to plants, animals and the conservation ethic. This presents a **political** challenge of considerable magnitude and urban-sited sanctuaries (e.g. Karori, Orokonui, The Brook, Tiritiri Matangi) assume an importance we would do well not to underestimate.

If we need a demonstration of societal attitude affecting conservation practice then look no further than the waning tolerance of 1080 and “killing for conservation”. What we consider as standard predator control practice may be well beyond the urbanite’s experience and likely tolerance if responses in some of my undergraduate conservation classes are anything to go by. If we can wean ourselves off chemical-based pest control and away from highlighting pictures of pussy in boxes we might delay the next onslaught of an opinionated urban-based “environmental” lobbyist, politician, or conservation minister.

Urbanite support for sanctuaries and for restoration in general, is best secured through offering participation. The astonishing proliferation of urban-based community restoration groups is testament to a willingness to become involved, at least by grey-headed people at the small and local scale. The challenge for sanctuaries is to broaden their participation base, to include (and retain) the more youthful age groups, and to offer the same sense of “ownership” that local community groups provide. Because of their nature and size, sanctuaries are at the “corporate” end of the management spectrum; keeping a weather eye on the enjoyment of participating volunteers is an investment of necessity I suggest.

My final speculation centres upon climate change and the mantra of carbon sequestration. All restoration accumulates carbon. Depending on political shenanigans, nationally and internationally, carbon sequestration might just come to offer sanctuaries an unanticipated but much-needed

revenue stream. Perhaps we should attempt to influence local expression of this debate so that the cumulative value of all restoration initiatives is recognised and rewarded.

In concluding, let me express two nagging fears. The first is that the pace of our progress over the past 1-2 decades may have given us false expectations of progress in the future. I am conscious that restoration is a long-term pursuit, indeed a multi-generational pursuit. A decade of consolidation need not be seen as an arresting of progress. The second is that as the tools of restoration are improved it fosters a shift in emphasis from retention of natural character to the acceptance of human exploitation and imprint. The need for preservation of the best of what remains has not diminished and we need to guard against mitigation through restoration becoming an acceptable environmental paradigm.