



# Memorandum

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Attention: Graham Ussher

Company: RMA Ecology

Date: 5 July 2019

From: Sarah Flynn

Message Ref: Huia WTP: Preliminary comments regarding S88/ S92 response queries

Project No: A16055C

## **S88 assessment comments**

We disagree that “*no details of targets, methods, strategy or contingency*” have been provided. An outline of the proposed Waima Biodiversity Management Plan (WBMP) is set out in Section 7.4.1 of the Ecological Assessment report, and includes explicit targets, methods, strategy and contingency measures.

Key components are summarised as follows:

The Waima BMP management area is defined in Figure 21 and encompasses 990 ha in total, approximately 720 ha of which is bush-covered and classified as SEA in the AUP.

Management is proposed for both public and private land including:

- 320 ha of regional parkland and Council reserves;
- 608 ha of private land (1,976 properties);
- 53 ha of forested land owned by Watercare.

Summarised goals of the proposed Waima BMP are:

**Goal 1:** Community-wide engagement.

**Goal 2:** Coordinate and increase conservation effort on private land in the catchment.

**Goal 3:** Strengthen connective linkages through promoting forest health and resilience.

Actions to achieve specified goals include:

- 1. Establish an accountable administrative structure that coordinates and implements conservation work on public and private land.**

Targets include:

- Establish a charitable trust
- Permission from a minimum 20% of landowners and residents to undertake pest control on their properties;
- Delivery of annual report to stakeholder groups.

## 2. Multi-species vertebrate pest management throughout the Little Muddy Creek catchment.

Targets include:

- Within 2 years of the Trust's establishment, implementation of pest control in at least 400 private properties, appropriately dispersed across the whole of the catchment. Pests to be targeted include possums, rats, mustelids, hedgehogs, pigs.
- Suppression of pests below threshold values derived from density-impact functions (e.g., Norbury et al. 2015). Targets may be seasonal and will be set and revised in accordance with biodiversity trends.

Specific configuration of trap / bait station locations, and control thresholds for measuring performance are to be determined through the process of management plan development.

### **Additional comments/ clarification**

*Specific thresholds and predator monitoring methods will follow standard Best Practice where available. Configuration of traps/ baits will depend on the layout of properties recruited into the scheme, and their requirements and preferences for using traps and/ or toxic baits.*

*Note that some vertebrate pest species (e.g., rats, possums) have well established and generally accepted trap density target rates (e.g., <5% RTC at 100 m trap spacings for possums). However, effective population targets are not established for many pest species, and will need to be trialled and adjusted to optimise arrays. Furthermore, recent research (e.g., Norbury et al 2015, Walker et al 2019) supports the application of density-impact models (derived from synchronous monitoring of predator species and indicator prey species) to determine optimal target pest population thresholds depending on the vulnerability of prey species present, rather than a standard threshold value. Recent research also indicates that standard 'best practice' trap/ bait station configurations and densities can also be substantially optimised to deliver effective control at a much reduced effort (Warburton & Gormley, 2015).*

*Pest control objectives and targets are to be coordinated with Auckland Council operations in adjacent regional parkland, where these are occurring.*

*The proposed strategy relies on governance and oversight of a qualified and experienced Trust Board with a vested interest in achieving the proposed objectives and targets. As noted in the AEE, the Trust will employ an operations manager and project coordinator to undertake strategic and operational planning, facilitate implementation of project initiatives, and undertake ongoing evaluation against targets.*

## 3. Weed management throughout Watercare-owned land (and public reserve land as required); and funding for contractors to undertake weed management on private land. Target species will be consistent with Auckland Council priorities.

Targets include:

- Permission from landowners of private properties containing native forest (e.g., at a minimum target rate of 20% per year) to allow access for weed control;
  - Suppression of target species to the extent that infestations are controlled before they propagate / disperse (i.e., no mature plants).
4. **“Kauri rescue”, including (but not limited to) tree health assessment, protection of kauri tree roots from damage, and phosphite treatment<sup>1</sup> of diseased kauri, with monitoring and reporting on the ongoing effectiveness of these initiatives.**

Targets include:

- Within 1 year of the Trust's establishment, identify and contact all landowners/ residents in properties with mature kauri and seek permission for access.
- Identification, containment and surveillance of all symptomatic trees in the catchment where access is granted.

- Develop and implement site-specific management plans for all mature kauri stands on private property where access is granted, in collaboration with landowners.
- Monitor long-term effectiveness of symptom suppression treatments in controlling disease progression and infection risk over the 10 year timeframe of the WBMP.

## 5. Surveillance for Argentine ants, and evaluation of control feasibility if detected.

Targets include:

- Implementation of a surveillance framework for Argentine ants throughout the catchment within two years of the Trust's establishment.
- Eradication of localised populations, where assessed as viable.
- Specific monitoring methods, control targets and thresholds to be detailed in the Waima Biodiversity Management Plan.

### **Additional comments/ clarification**

*Argentine ants do not naturally disperse widely or rapidly (i.e., <150 m /year), and their invasive spread is generally human-mediated (Ward et al 2005). Early detection substantially improves the likelihood of effective control.*

*Landcare Research advice<sup>2</sup> identifies that a flexible surveillance strategy with regular review is likely to be the most effective for detecting Argentine ants, with a variety of detection methods including direct searching, baited vials, baited tiles and pitfall traps. Key surveillance features include pavement cracks, retaining walls, fences, curbing and the edges of paths and gardens, in and around timber, firewood and landscaping material, rubbish and compost.*

*A specific surveillance framework will to some extent depend on the layout and characteristics of properties recruited into the scheme, as will the control viability assessment.*

## 6. Biodiversity monitoring using key indicator species / guilds.

Targets include:

- Implementation of a monitoring plan and framework within 6 months of the Trust establishment that delivers quantitative data on trends in forest condition and observation frequency of indicator species;
- Delivery of baseline monitoring report within 1 year of the Trust's establishment.

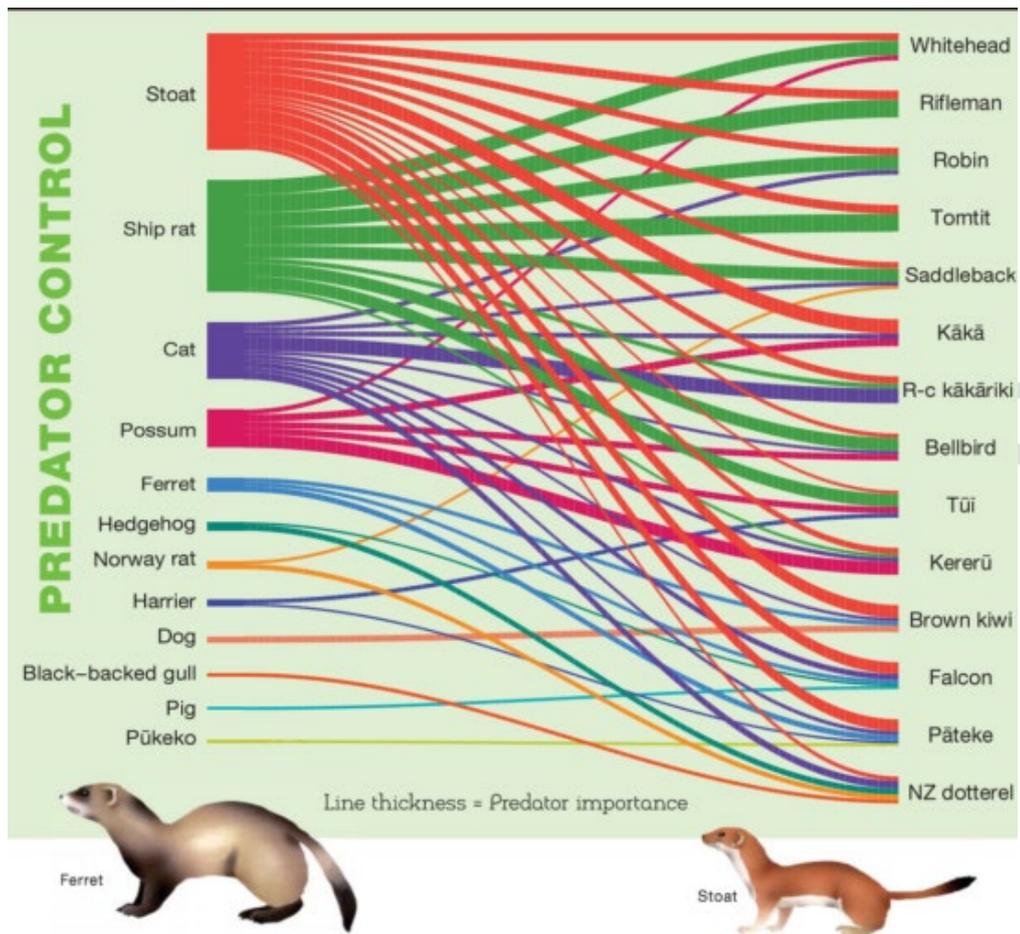
### **Additional comments/ clarification**

*Biodiversity health indicators may include (but not necessarily be limited to):*

- *Herpetofauna monitoring (multiple detection methods);*
- *Seasonal (November–December) 5-min bird counts (throughout catchment for between-year comparisons) and slow-walk 500 m transect counts through native bush tracks (for population density estimates).*
- *Invertebrate surveys (flightless beetles and weta).*
- *Browse transects (targeting palatable species (e.g., kohekohe, tree fuchsia, mamaku).*
- *Pest indices (wax tags/ tracking tunnels/ camera traps etc).*

*Location and frequency of each monitoring parameter will to some extent depend on the layout and characteristics of properties recruited into the scheme. Pest species affect suites of prey to varying levels of intensity (see graphic for examples), hence monitoring of specific species/ guilds can be correlated with pest data to assess effectiveness of control effort.*

<sup>2</sup> [https://argentineants.landcareresearch.co.nz/surveillance\\_techniques.asp](https://argentineants.landcareresearch.co.nz/surveillance_techniques.asp)



Credit to John Innes (Manaaki Whenua), Neil Fitzgerald (Manaaki Whenua), Nicolette Faville (Manaaki Whenua), Morgan Rothwell (Kakariki Games) and Derek Orley (The Field Guide to the Birds of New Zealand).

Monitoring and pest control data can be directly captured in a GIS-based digital database of participating properties. Service records, bait uptake, catch rates and monitoring data will be digitally recorded and uploaded to the database via the cloud using an application such as Survey 123 or similar.

## 7. Annual review and update the WBMP and Annual Plan.

Targets include:

- Annual reporting of results and trends, including recommendations of revisions to management actions or monitoring methods as required.

### S92 response comments

#### 1. Extent of native vegetation clearance

Boffa Miskell's ecological assessment (dated 21 May 2019) contains numerous statements that the proposed development will result in the clearance of 3.5 ha of native vegetation from within the 4.3 ha works footprint. The report contains a typographical error in Section 7.4.3, paragraph 7, where it makes reference to "partial compensation for the loss of 3.3 ha of vegetation".

#### 2. Rationale for why revegetation is not part of the compensation package

Proposed on-site mitigation measures do include revegetation of localised grassland and weedland areas in and around areas of bush that are retained within the Project Site to improve their condition (refer Section 7.3.1 of ecological assessment).

Revegetation of the decommissioned WTP site is not proposed, in order to preserve the long term resilience of the water supply system through allowing space for future refurbishment and/ or expansion of the plant. Investigations elsewhere throughout the catchment identified only limited opportunities for revegetation, comprising small, fragmented patches of grassland, none of which would offer a sufficient scale to offset the proposed loss (allowing even modest discounts for uncertainty, lag time, etc).

As noted in your question, the catchment has extensive naturally established forest cover, and we consider resources are better directed at improving the condition of existing natural areas in the wider catchment, rather than revegetation of localised areas with no clear strategic purpose.

We acknowledge that biodiversity gains achieved through the 10 year duration of the project will require some level of ongoing investment to maintain, though we consider that the systems, data, and coordinated network of traps and bait stations that will be established in the course of the project will facilitate maintenance, particularly if methods deployed are specifically designed to reduce the amount of time, effort and resources involved in maintaining a widespread trap network. The Cape to City project<sup>3</sup> presents a useful model approach.

We do not support the view that revegetation without pest management would provide comparable or greater biodiversity benefits than the proposed compensation measures, either in the immediate or long term.

### **3. Compensation for permanent loss of native forest and scrub**

The working premise of the proposed compensation approach is that predation by introduced mammals limits the distribution and abundance of vulnerable indigenous species.

Effective pest control has an immediate benefit to prey populations, as the presence of pests results in high rates of total reproductive failure, while their absence produces high rates of breeding success in the following season. This observation is well substantiated in recent studies<sup>4</sup>.

Ten years of reproductive success has the potential to produce an relatively rapid and significant increase in the population sizes of native fauna species present (provided the founder population is sufficiently large), with associated increases in dispersal to new areas, better mixing of gene pools, and population recovery to the point where moderate perturbations (a low level of predation; disease; or environmental factors) do not pose an existential threat.

In a similar vein, selective browsing by possums of fruit, flowers and new growth on plants (rats are also important seed predators) can constrain productivity and recruitment of palatable species, altering their representation in the community assemblage and ultimately changing forest structure and diversity. Releasing the productive potential of suppressed plants allows new recruitment and reduces tree mortality (Byrom et al 2016). These outcomes will persist and build resilience throughout the ecosystem, extending the window of viability for some species if pest populations progressively return in the long term. Recovery of the flora will also support fauna recovery through increased food abundance and (to some extent) habitat diversity.

In our view, the population growth rates, increased species richness and habitat complexity, and enhanced food and habitat resources throughout the catchment over 10 years will adequately offset the loss of existing and potential biomass, habitat, flora and fauna from within the development footprint.

### **4. Extension of the WBMA boundary to include all of Little Muddy Creek catchment**

Yes. I support aligning the management area to ensure a configuration that best fits with Auckland Council's management programme.

### **5. Allocation of funds**

An indicative breakdown of estimated costs will be provided. Nevertheless, it will be for the Trust Board to make the final determination of how funds are best used to undertake the work.

### **6. Minimum participation rate**

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<sup>3</sup> <https://www.capetocity.co.nz>

<sup>4</sup> E.g., Johnstone MacLeod et al. (2015); Byrom et al (2016). A review of biodiversity outcomes from possum-focused pest control in New Zealand

As specified in the Ecological Assessment report, the target participation rate is 20%. A statistically robust survey of the community indicates a strong willingness to participate (in the region of 85 – 90+% - final figures to be confirmed). If not achieved, the Trust board will be empowered to allocate the funds to projects with similar ecological objectives and evidence-based outcomes, with preference for projects in the local environs.

## **7. Control targets**

As outlined above, control targets are site specific and should be developed as part of the detailed management plan. Indicative minimum targets consistent with those Auckland Council employs can be used in the interim if preferred, and able to be provided.

## **8. Additionality of works proposed in WBMA**

This aspect is addressed in some measure in Section 7.4.1, under the heading “*Council Funds and Existing Initiatives within the Little Muddy Creek Catchment*”. We cannot provide a more comprehensive answer as we do not have detailed information on Council on its proposed works for the area (although the schedule of weed control works for nominated parks is useful).

To clarify, the programme of works to be funded through the trust is not yet devised, as this will be a matter for the Trust board and staff to plan and administer. We envisage that the Trust Board will include representation from Auckland Council’s Biodiversity and/ or Biosecurity team, to ensure Trust work is prioritised to support but not duplicate Council efforts.

In general, the intent is that Trust fund will prioritise work on private land, except where excluding public land would compromise the results (for example, Auckland Council has not signalled an intention to control rats in public reserves, hence the trap arrays would need to incorporate reserve land).

## **9. Contingency in the event of performance failure**

Annual monitoring and review will detect non-performances at an early stage in the life of the project. Responses include revision of methods to improve performance. In the event of repeated failures (over a specified interval, for example, three years; and in the absence of extenuating circumstances), dissolution of the trust and forfeit of the fund to Auckland Council.

## **10. & 11. Ambiguity in Trust deed**

If required, the Trust deed will be revised to bind the trust to the intent of the WBMP and associated management plans.

## **References**

Byrom, A.; Innes, J.; Binney, R (2016). A review of biodiversity outcomes from possum-focused pest control in New Zealand. *Wildlife Research* 43(3):228.

Johnstone MacLeod L.; Dickson R.; Leckie C.; Stephenson B.; Glen A. 2015: Possum control and bird recovery in an urban landscape, New Zealand. *Conservation Evidence* 12, 44-47.

Warburton B.; Gormley A. 2015: Optimising a kill trap network for cost-effective control of predators in the Hawkes Bay. Prepared by Landcare Research for Hawke’s Bay Regional Council.

Ward DF, Harris R, Stanley MC 2005. Human-mediated range expansion of Argentine ants in New Zealand. *Sociobiology* 45: 401-408.