

# Waitakere City Parks



Five Year Animal Pest Control Programme



Waitakere City Council  
Te Taiao o Waitakere

# Waitakere City Five Year Animal Pest Control Work Programme

## July 2006

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## 1.0 Animal Pest Issues in Waitakere

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The Waitakere Ranges, in the western part of the city, are largely covered in native vegetation. Some is virgin bush, but most is in various stages of regeneration after substantial clearance pre-1900. Nevertheless, the Waitakere Ranges are botanically rich, containing more than a quarter of New Zealand's flowering plant species and two thirds of all native fern species.

Native fauna within Waitakere includes:

- Twenty-three rare threatened or uncommon bird species (e.g. tomtit).
- Common bird species in decline (e.g. kereru (Waitakere City Council, 2005)).
- All resident lizard species, including forest, pacific and Auckland green geckos.
- Large invertebrates including the Kahikatea, Kauri Snail and ground weta.
- Long tailed bat.
- Hochstetters frog.

There is a wide range of animal pests within Waitakere including rats, mustelids (i.e. stoats, weasels and ferrets), possums, goats, pigs, magpies, mynahs, exotic fish species, and rabbits. All these animal pests, along with feral and domestic cats and dogs, impact either directly or indirectly on native vegetation and wildlife; including birds, frogs, lizards and invertebrates.

Animal pests significantly and adversely affect the health of native plant and animal communities, and the survival of many native species. Some animal pests are more widespread and numerous than others therefore have greater impacts on native communities. Failure to manage key animal pest threats in Waitakere will potentially lead to local extinction of plant and animal species, and the progressive degradation of native ecosystems and their ability to provide essential ecosystem services to the environment.

Animal pests alter the structure, composition, abundance and health of native fauna and flora within the environment. This in turn will compromise the ability of native communities to:

- Sustain vegetation cover through pollination, seed dispersal, natural regeneration and successional processes.
- Regulate water quality by feeding and filtering processes of native animals and plants.
- Purify air through plant processes including oxygen production (photosynthesis).
- Break down waste material (i.e. decomposition)
- Generate, regenerate and purify soil.
- Mitigate flooding
- Maintain biodiversity
- Regulate the climate through carbon storage (*Daily et. al.*, 1997).

A large number of species within diverse communities are required for these ecosystem services to continue. Animal pests either directly and/or indirectly negatively impact a number of these native communities through predation or competition for resources such as habitat or food. Animal pests can also alter the environment so that it is no longer suitable for sensitive species to exist (Waitakere City Council, 2004).

Waitakere's history of extensive native bush areas, coupled with surrounding ecological corridors, and more recently, urban expansion, has rendered many of its natural areas vulnerable to high numbers of animal pests. A lack of education and understanding has also seen numbers of animal pests soar in the last century, particularly possum numbers. Streams, railway lines and roads act as connecting corridors, facilitating the spread of animal pests. Development of large land areas has also seen a movement of animal pests into urban areas.

Waitakere's reserves should be sanctuaries for native fauna, however recent reports suggest that populations are on the decline (Waitakere City Council, 2005). Of particular concern are locally, regionally and nationally endangered species. These species in particular require management intervention to help enhance their numbers, or in some cases facilitate the return of the species. A local example of this is Ark in the Park, a project within Cascades Kauri Park, Waitakere Ranges run in partnership with Forest and Bird and Auckland Regional Council. Control of possums, rats, wild cats and stoats has allowed for the reintroduction of North Island Robin and Whiteheads (Forest and Bird, 2006). Significant benefits of animal pest control have also been noted with an increase in other bird and invertebrate numbers (Forest and Bird, 2006).

Without animal pest control native fauna, flora will continue to decline.

## 1.1 Roles and Responsibilities

Waitakere City Council (WCC) has a number of roles in relation to animal pest management. These include:

- Responsibilities as a landowner, including legal obligations under the Biosecurity Act and any responsibilities that arise from the reviewed Regional Pest Management Strategy (RPMS) operative in July 2007.
- Commitment to progress a sustainable eco-city under the City's Long Term Council Community Plan.
- Obligations for sustainable resource management under the Resource Management Act.
- Commitment to protecting the City's native vegetation and fauna habitat under the District Plan and Wildlife Act and the goals of the New Zealand Biodiversity Strategy.
- A role in advocacy and educating the public and community groups regarding animal pest management and the threat of animal pests to the environment.

## 1.2 Waitakere City Council's Strategic Framework

Waitakere City Council's Annual Plan and Long Term Council Community Plan 2006-2016 contain a vision for integrating the Council's social, economic and environmental goals. Of particular relevance to animal pest control is recognition of the need to protect and restore the health of the natural and physical environment. Animal pest management is a key component of this policy goal, as animal pests pose one of the greatest threats to the integrity of the City's native ecosystems.

The aims of the Annual Plan and Long Term Council Community Plan have been translated into specific, short to medium term outcomes (termed "Strategic Platforms"), with objectives and targets that determine the Council's implementation programmes. The Annual Plan and Long Term Council Community Plan also sets out the level of service Waitakere City Council will provide to meet the objectives and how this will be funded within the next 10 years. These programmes are tested and adjusted on a yearly basis through the Annual Plan process.

The Animal Pest Strategy fits within Waitakere City Council's strategic framework as a mechanism to support the goals and 2020 vision of the Green Network Strategic Platform.

### **1.3 Purpose of the five year work programme**

This five year work programme is designed to implement the objectives and targets in the Waitakere Animal Pest Strategy.

This five year programme outlines the Best Practice Methodologies for animal pest control in Waitakere's prioritised reserves. Control methods vary for each species depending on:

- Their classification within the RPMS.
- Best Practice control methods.
- Health and safety issues.
- The priority of controlling each animal pest.
- Practicalities of control within annual budgets.



## 2.0 Goal and Objectives

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The following five year work programme will assist the Council in achieving the overriding goal and objectives of the Animal Pest Strategy.

The goal of the Animal Pest Strategy is for the:

*"Protection of the quality, resilience, biodiversity and ecological integrity of Waitakere's natural habitat and ecosystem services from the impacts of animal pests".*

### 2.1 Objectives

The following objectives define the Animal Pest Strategy's approach to achieving this goal:

1. Protect priority (high value) areas from the impacts of animal pests.
2. Minimise future costs by adopting Best Practice Guidelines (Section 7).
3. Address legal responsibilities under the Regional Plant Pest Management Strategy (RPMS).



## **3.0 Best Practice Methodologies**

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### **3.1 Phases of Animal Pest Control**

All animal pest control should begin with an initial control phase and then move in to the on-going maintenance control phase, to ensure numbers are reduced to low densities and then kept at low densities.

#### **3.1.1 Initial control of animal pests**

Animal pests are generally present in an area for some time before they develop into a serious threat. As their breeding capacity increases in a certain area, numbers also increase and their impact on the surrounding native bush, birds, reptiles and invertebrates increases. To achieve effective and efficient control, works must be undertaken following the Best Practice Guidelines within the Waitakere Animal Pest Strategy.

Animal pest control should ideally be undertaken during the prime target times, e.g. possum control should be undertaken during early winter (April-May) when juveniles are present and again in spring to early summer (Oct-Nov). Timing of animal pest control should also consider timing of seasonal events such as fruiting, and new bird arrivals.

Initial control must be undertaken on a regular basis in the first year to ensure numbers are reduced to a low density (e.g. possum and rat numbers in a site to be reduced to a 5% trap catch rate). The frequency of initial control required will depend on the target animal pest species, pest densities and control methods (see Section 2.0 for details). Once initial control has achieved the desired 5% trap catch rates or, 15% bait take, the emphasis should shift to ongoing maintenance control to ensure pest populations are maintained below these target rates. The frequency of maintenance control will again be determined by variables such as the density of the initial pest population (see Section 3.0).

#### **3.1.2 Maintenance control of animal pests**

The Animal Pest Strategy aims to minimise future costs by adopting Best Practice Guidelines for the management of animal pest populations. To ensure this is the case, initial control must be followed by maintenance control.

Animal pest control is an ongoing process due to the likelihood of continual animal pest immigration into sites from adjoining areas. A 'vacuum effect' typically occurs where after initial control animal pest numbers decrease significantly, then adjoining populations colonise the area, and numbers quickly return to pre-control levels.

If bush or a corridor of vegetation/ trees surrounds a site, animal pest species will utilise these areas for dispersal and movement. If a long-term management programme is proposed for such a site, then a buffer control zone will need to be established around the area to ensure pest species are managed systematically in to the future. Reserve boundaries could also be the focus of control efforts to target immigrating pests.

The most cost effective approach to reducing the extent of either single or multiple animal pest populations is to undertake control work within targeted areas (i.e. site-led). Maintenance control is a vital component of this process.

Once pest populations within any given site are reduced to a maintenance control level, the frequency of control visits will decrease, as will the resources required for control within the site. Resources then can be used in reserves next on the priority list.

## 3.2 Best Practise Methodologies

The Best Practice Control Methodologies provided within Section 7 of the Strategy are to be adhered to when designing and implementing animal pest control programmes within Waitakere.

The RPMS considers a number of animal pest species, some of which may be the target of control programmes within Waitakere.

It is recommended that trapping and bait stations be used for undertaking animal pest in the five year work programme.

These procedures are necessary to:

- Continue previous animal pest control undertaken in WCC.
- Ensure efficient and cost-effective methods are used.
- Work in conjunction with the RPMS objectives and actions.
- Ensure all contractors undertake correct methodology.

The different animal pest control methods are discussed below.

### 3.2.1 Trapping methodology

Trapping is the main method proposed in this five year programme. Timms traps (possums), Snap-e traps (rats) and DOC 150 traps (mustelids) are likely to be the main traps required. Different sites will require different trapping methodologies depending on:

- **Accessibility:** Traps should not be placed within inaccessible sites such as cliff areas. This may require adjustment of the trapping 'grid'.
- **Terrain:** Depending on the target animal, a particular habitat may prove more favourable to some species (e.g. possums prefer ridges over gully areas); therefore the layout of traps should follow favoured habitats where appropriate.
- **Public access and usage:** Traps should be placed away from public tracks.
- **The size of buffers to residential areas:** The size of a buffer can influence the density of target pest populations; therefore will help determine the required spacing for traps.
- **Vegetation type:** Select likely catch areas, i.e. focus efforts within areas of high food resources and suitable habitat for each target species.

Trapping should occur during optimal periods. These are times when animal pest species are at their lowest population density and when sensitive native species are

vulnerable to predation/grazing. Generally, trapping should be timed to reduce pest populations during the breeding season (i.e. trap during early winter (April-May) and again in early summer (October-November) if required).

Trap catch rates must be at a minimal level of 5% by the end of the first year.

### Trap catch rates

Trap catch rates are calculated using trap nights. Trap nights must be recorded for the duration of the trapping period, and are based on species caught and the setting of the traps per night.

One trap night occurs when:

- A target pest is caught; or
- The trap is still set.

Half a trap night occurs when:

- Something other than the target pest is caught; or
- The trap is set off and nothing is caught.

The total 'trap nights' for each trap in the reserve then becomes the total trap catch for the day. For previous day(s) that traps were not checked, assume trap nights are the same.

The following formula is then be used to calculate the trap catch rate:

$$\frac{\text{Total number of target pests caught} \times 100}{\text{Total trap nights}} = \text{Trap catch rate}$$

#### Example:

As part of the possum control contract for North Shore City Te Ngahere caught 22 possums over 779.5 trap nights (using the definition of trap nights above).

Using these numbers in the formula below, calculates a trap catch rate of:

#### Target

A 5% trap catch rate for targeted pest control is the set target to achieve within the first year of initial control.

Monitoring (i.e. recording catches per trap) must be undertaken to determine if this target is being achieved. Adaptive management will then be required to either increase or decrease the trapping frequency within each reserve, depending on yearly trap catch results.

### 3.2.2 Bait stations and poison

Bait stations are generally more effective than trapping methods in a large area. The use of poison targets a number of species and many individuals simultaneously, whereas trapping only controls one animal at a time. Bait stations are also less labour intensive than trapping, as bait only needs to be replaced when bait stations are empty, the bait has deteriorated, or after a specified period of time for the second 'pulse'. Poisoning also avoids animal pests becoming trap shy.

Despite greater efficiency of controlling animal pests, the perceptions and effects of poison use on the environment need to be considered. Issues to consider when using poison include:

- Bioaccumulation of poisons in the environment, soils and other animals.
- The risk of effecting non-target species (e.g. dogs, cats, birds and invertebrates).
- Public perceptions of the risk of poisons.
- Risk of animals becoming bait shy.

Due to the risk to domestic animals and the resources required for community liaison when using poison (e.g. public notification), it is recommended that poison is only used in reserves that have no (or very limited) public access, no neighbouring residential areas, and a vegetation buffer around all reserve boundaries. Further precautionary measures to be taken include:

- Use 'Philproof' bait stations.
- Display appropriate signage at reserve entrances (include dates and duration of the control programme).
- Place bait stations away from public walking tracks and open areas (i.e. minimise contact with people and their domestic animals).
- Use Philproof bait stations to minimise the likelihood of secondary poisoning.
- Use 'Pest off' or 'Talon' bait with green dye to repel birds and other non-target animals.
- Take advantage of animal behaviour to reduce the probability of people or non-target animals coming into contact with dead animals (e.g. possums frequently die in their dens when using Brodifacoum).

In reserves where poisoning is the preferred method of control (see tables below), 'pulses' will be required once every three months for the first year. A pulse involves the initial filling of bait stations with poison, followed by a refill approximately two weeks later. The percentage take of each bait station will be recorded during every visit. Assuming the previous amount of bait used is known, bait take can quickly be measured, by assessing the amount of bait remaining in each station. Where incomplete pellets remain, an estimate of the remaining portion of bait to the nearest  $\frac{1}{4}$  can be used.

### **Target**

All control operations using bait stations/poison must aim for a percentage take of 15% or less in all the bait stations. Once this has been achieved, the frequency of control can reduce to annual visits (see Section 3.0 for more details on how to adaptively manage animal pest control).

### **Poison options for bait stations**

When considering the use of poison it is important to assess all available options. Appendix one outlines the advantages and disadvantages of poisons commonly used in possum control.

Brodifacoum is the preferred poison for animal pest control. Brodifacoum is effective in controlling most animal pests to low densities for sustained periods, and has a comparatively low risk to the public and pets when compared with Feratox, cyanide and 1080. These factors, combined with the general acceptance of Brodifacoum throughout the animal pest management industry as an effective and comparatively



safe poison, means Brodifacoum is the preferred poison for use during animal pest control within suitable priority parks (as per North Shore City Council possum control 2001 - ongoing).

### 3.2.3 Trapping vs. bait stations

Timms traps are the most appropriate control methodology for possum control within most reserves for the five year work programme. Trapping is chosen for the following reasons:

- Lower perceived risk in reserves with public access.
- Trapping lowers the risk of killing domestic animals.
- Fewer resources are required for community liaison and public notification.
- Reduced risk to the environment through bioaccumulation of poisons in the environment, soils and other animals.
- Reduced risk to non-target species.

It is hoped that through time with education, the more effective methodology of poisoning can be slowly integrated into urban reserves.

A few of Waitakere City Council reserves are selected as appropriate for pest control using bait stations and poison, for the following reasons:

#### Remoteness:

- Domestic animals and the public are less likely to utilise these reserves as houses are located at least 100 metres away from any reserve boundary.
- The reserve has a bush buffer around all reserve boundaries of at least 100 metres.
- Reserves with no public access.
- The size of the reserve (>15 hectares) means bait stations will be more efficient and cost effective.

#### Degree of public access:

Reserves such as Kay Road Balefill (50.762ha) are permanently closed to the general public and are therefore appropriate areas for installing bait stations. Large reserve areas such as Waitakere Quarry (57.350 ha) have no walking tracks, allowing for the careful siting of bait stations away from areas of high public use.

### 3.2.4 Recording

To be able to learn from and amend the pest control programme, daily records must be kept including:

- Animal pest species sighted
- Animal pest species killed
- Animal pest species caught per trap
- Bait take per bait station
- Trap catch rates if applicable
- Hours spent in each area

This is a simple way to ascertain if objectives are being achieved. For example, when recording trap catch rates, it would soon become apparent if the frequency of control visits needed to be increased due to persisting high numbers of target animals.



### 3.3 Monitoring

Monitoring involves the measurement of change in animal pest abundance and environmental indicators following animal pest control. It is useful in any evaluation of the effectiveness of individual animal pest control programmes and of this work programme and the Animal Pest Management Strategy. Fundamentally a field exercise, monitoring costs time and money, but without it, it is hard to evaluate ongoing investment into animal pest control.

Examples of control objectives to use during monitoring includes:

- Increased abundance and diversity of five minute bird count results
- Increased breeding success of kereru
- Increased abundance and diversity in invertebrate pitfall trap samples
- Presence of juvenile lizards

#### 3.3.1 Purpose of Monitoring

Monitoring should be undertaken before, during and after scheduled programme control and where practical response control to assess the effectiveness of best practise methodologies and to ascertain that target objectives are being met, including objectives of this Strategy.

Monitoring methods include a variety of measures using data that will already have been collected during animal pest control operations. These include:

- Trap catch rates
- Costs per hectare
- Time spent per hectare
- Species controlled

Monitoring results such as trap catch rates can be compared to the control efforts of Auckland Regional Council to help ascertain similarities or disparities between results. These measures will help determine if current methodologies are helping restore the control sites to functioning native ecosystems.

### 3.4 Non-Target Species

Non-target species are animal species excluding the current animal pest targeted. Any non-target species must be recorded. If any non-target animal pest species are injured, the contractor must kill them on-site, in a humane manner.

Injured or uninjured non-target species that are not animal pests must be released from traps and taken for treatment immediately and returned to their owner. Any protected or native non-target animals that are caught and injured in traps shall be delivered to the nearest agency that can care for them. This may be the Department of Conservation or Bird Rescue centre.

Should any non-target native species be caught, steps must be taken to try and reduce the number of non-target species caught.

### 3.5 Public Notification

Notification of animal pest control in reserves is the responsibility of both the contractor and the Council. Scheduled notification (work specified in detail in a



scheduled programme i.e. possum control) and service request notification (ad hoc responses to service requests) should follow similar procedures as required by the Council. They are as follows:

### **3.5.1 Scheduled notification**

Details of scheduled animal pest control being undertaken should be given to the Council by the contractor three weeks prior to undertaking the work for public notification in a local newspaper and the Councils internet site. Notification must include:

- Dates of control scheduled for each reserve
- Method of control for each animal specie(s)
- Type of bait (if used)
- Re-entry time if appropriate
- Any possible hazards
- Contact details of the contractor

It will be the responsibility of the Council to notify the public (at least a week in advance) of planned control work. The proposed reserves for control and the methods of control will be made available.

### **3.5.2 Service request notification**

The contractor will be responsible for public notification for any request for services control at least two weeks prior to undertaking the work. Procedures must follow the same as scheduled notifications as above apart from the following:

- Use of agrichemicals (e.g. wasp control) requires door-to-door notification of residents within a 100-metre radius of the control operation prior to any control work being undertaken.
- Notification can be given to residents after control operations only in extreme emergency situations where time does not permit.

Signs must also be erected at all public access points of the operational area where animal pest control is being undertaken. This is the responsibility of the contractor. The notice must state what control method is being undertaken and a warning against pets in the area. Contact details of the contractor and the Council must also be included.

## 4.0 Control of Regional Pest Management Strategy Animal Pest Species

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Possum control is the only scheduled programme for the prioritised list of reserves. The Council should consider the control of all animal pest species listed in the Regional Pest Management Strategy (RPMS) by prioritising service requests. Waitakere's Biodiversity Monitoring Programme (Waitakere City Council, 2005) and Project Twin Streams ecological monitoring programme (Waitakere City Council, 2005b) recommend rodent and mustelid control in high priority sites. The Council should strive to achieve this goal by the end of this five year programme.

The current budget however does not allow for this intensive control. Rodent control is an ongoing cost that requires intensive effort. The breeding and reinvasion rates of rats is such that continual control would be required to keep densities to low numbers (e.g. 5% trap catch rate). The species identified during the biodiversity monitoring programme are persisting in low numbers despite the presence of rodents and mustelids. It will be very beneficial to control other pests, however the targets and objectives need to be very clear and prioritised as the costs will be high.

### 4.1 Scheduled Possum Control

Possums are a nation-wide problem that have a huge impact on native ecosystems. They browse many native tree species, prevent regeneration, limit food sources for native animals, prey on native birds and invertebrates and are a source of Tb. Humans are their only predator and given their numbers, control is vital in protecting and restoring our native ecosystems.

In accordance with the RPMS, regional intervention and co-ordination is necessary to limit the environmental and economic damage caused by possums. Control operations should primarily target areas of significant environmental and conservation value. Auckland Regional Council currently controls all possum populations within the Waitakere Ranges and the surrounding buffer zone. Possum control by Waitakere City Council needs to complement this work (i.e. similar areas around the ranges); therefore this five year programme proposes a scheduled programme, to be undertaken in reserves prioritised for their ecological, cultural and social significance as per the Animal Pest Strategy.

As described above (Section 1.2) possum control should utilise Timms traps, or bait stations.

#### 4.1.1 Possum control – Timms traps

The following procedures must be followed when setting out Timms possum traps (as per North Shore City Council possum control, 2001-ongoing):

1. Traps must be set out on the ground at 50 metre intervals where the terrain, access and vegetation allow.
2. Traps need to be placed at least 10 metres from a path edge.
3. Reserve edges can be targeted to increase catch rates (this is particularly effective in large reserves bounded by pasture).
4. Set traps at food sources i.e. fruiting trees, palatable native trees and resting sites (cabbage trees, and epiphytes).

5. Place traps within clear areas and ridges (possums do not favour scrubby, low-vegetation) but away from public walking tracks and clearings.
6. Bait used will attract possums, not non-target species (e.g. apple and cinnamon).
7. Timms traps must be checked every 2 days to ensure maximum use of trap.
8. All possums and dead carcasses are to be removed from the reserve and disposed of.
9. Commence control in winter months to help reduce the negative impact of possum browse on spring growth and breeding native birds.

Trapping is to occur until no possums are caught in any trap over three consecutive fine trap nights. A fine trap night is one where rain did not commence until at least four hours after nightfall.

Once trapping is completed the trap catch rate should be calculated to determine when it is appropriate to re-visit the site (see Section 3.0).

#### **4.1.2 Possum control – bait stations**

The following procedures must be followed when setting out bait stations for possum control:

- Bait stations should be placed throughout the reserve in a grid at a maximum of 100m intervals.
- Place bait stations near favourable sites such as food sources, clear areas and ridges, but away from public paths or clearings.
- Use Brodifacoum as the preferred poison

A list of the specific prioritised reserves and control methods can be found in Section 3.0.

#### **4.1.3 Service requests**

All animal pests listed under the RPMS, other than possums, should be controlled on a prioritised response basis.

Service requests will be based on public demand where the Council will handle all inquiries. The Council must approve control operations based on the following criteria:

- Within the objectives of the Animal Pest Strategy?
- Within the objectives of the reserve/area in question?
- Compliments other control operations in the area.
- Contribute to Green Network objectives.
- Are located within or adjacent to areas of high ecological value.
- Have a high public profile and hence are useful for education and public awareness.
- Can be incorporated into an existing or proposed community project.

Ad hoc animal pest control may be undertaken to meet the concerns of the public, particularly in cases where members of the community draw attention to issues that match the priorities set out in the Animal Pest Strategy. In some instances, it may be worthwhile to provide a "one-off" response, for example, to meet good neighbour responsibilities, or to provide a positive response to a public awareness campaign. Such work however is not generally regarded as strategic, hence the level of

resources allocated to unplanned animal pest control is limited, and should weigh costs against the likely long-term benefits.

All calls must be entered into a database so such ad hoc events can help provide information of the distribution of different animal pest species, any new introductions of animal pests, and provide a more holistic picture to Waitakere's animal pest problem.

Contractors must be notified of all details of the requests. All actions must be recorded by the contractor and made available to the Council.

### **Categories of service requests**

All contractors undertaking animal pest control must follow the following categories of service requests:

- **Emergency** – situations where the pests (e.g. wasps) are causing an immediate threat to public safety. All contractors must respond within four hours and complete the work within eight hours.
- **Normal** – All non-emergency situations must be responded to within 48 hours and the work completed within 5 working days.

Below is an introduction to animal pests that may require control through service requests:

#### ***Feral cats***

The Auckland Regional Council defines feral cats as cats that are not provided for by humans, and their population size fluctuates largely independently of humans. Feral cats are known to have significant impacts on native bird, lizard and invertebrate species.

The objective of the RPMS is to reduce the negative impacts of feral cats in selected high conservation values areas, where other pest numbers have already been significantly reduced. Waitakere City Council should follow the RPMS in that they are not considered a priority until other pests (e.g. possums, rats and mustelids) are controlled. Feral cat numbers in Council reserves are likely to be high; therefore cat control must be a response-based programme.

If response control is required, live traps must be used in case a non-feral pet is caught. Trapped cats must be kept for 1 week before being disposed of humanely in case an owner comes forward.

#### ***Feral deer control***

Feral deer destroy the under storey of native forest by over-browsing, grazing, bark stripping and trampling, which in turn, increases soil erosion. They can also act as vectors of bovine tuberculosis.

Under the RPMS, Auckland Regional Council carry out feral deer control operations in areas of high conservation value, and in a 1km buffer zone around the areas of high conservation value, where priority for feral deer control exceeds the priority for control of other pests. Feral deer control should be a response-based programme with Waitakere City Council referring any notifications of deer to the Auckland Regional Council for action.

***Feral goat control***

Goats are one of the most destructive animals found in forests. They severely impact native vegetation, fauna and land stability. Feral goats also damage young plantings, impeding restoration and soil conservation revegetation projects.

Under the RPMS feral goats are controlled in areas of high conservation value where priority for feral goat control exceeds or equals the priority for other animal pest control and in a buffer area beyond the high conservation area. Feral goat control must therefore be a response-based programme with Waitakere City Council referring any notifications of goats to the Auckland Regional Council for action.

***Feral pig control***

Feral pigs are damaging to the environment and are a vector for bovine Tb. Feral pigs are known to destroy seabird burrows and are the cause of the decline of some species. They are currently the responsibility of Auckland Regional Council, therefore are not considered a priority within this five year animal pest programme.

***Feral hens and roosters***

Hens and roosters have potential to impact on native invertebrates, and regenerating native seedlings. They also could affect the success of native revegetation projects.

At this point in time the control of hens and roosters is not considered a priority for control.

***Hedgehog control***

Hedgehogs are mainly insectivores, but they prey on mice, birds, lizards, frogs, chicks and eggs of ground nesting birds. They are a potentially serious threat to native invertebrates (e.g. snails, wetas, slugs, moths), skinks, geckos and ground nesting birds in some parts of the Auckland region. They may also compete with kiwi for food and nesting sites.

The objective of the RPMS is to reduce the impacts of hedgehogs on natural areas with significant ecological/conservation values, where the Auckland Regional Council will provide information, education and advice on hedgehogs. Hedgehog control should be a response-based programme because the high costs and impracticalities of controlling this pest. Hedgehogs should only be controlled where other pest number have already been significantly reduced as they are considered a low priority.

When control of hedgehogs is required, the best traps to use are fenn traps.

***Magpie control***

Magpies are a growing nuisance to people, animals and other bird species because of their territorial behaviour. They have been implicated in restricting native bird movement between forest patches and competing with, and displacing, native species for food and nesting sites.

Under the RPMS the adverse effects of magpie infestations are minimised by promoting community awareness and making people aware of the control methods available. They are difficult to control because they are intelligent, mobile and widely spread throughout the Auckland region (as per North Shore City Council control of magpies, 2003-2004). Due to magpies having a relatively minor impact on native fauna, the high cost of controlling magpies does not justify the positive impact to the environment. Control would have to be ongoing as another pair is likely to inhabit the

vacant territory of any controlled bird. Magpie control must therefore be a response-based programme.

If control is required magpies can either be shot, or use specially designed live traps, with a mirror installed as an attractant. Shooting should only be carried out if there is no risk to the public's safety.

### ***Mustelid control***

Mustelids (ferrets, stoats and weasels) are major predators of native birds, which have led to the extinction of some native birds, and have aided the decline of many other native bird species. They are also carriers of bovine Tb, parasites and toxoplasmosis.

The objective of the RPMS in controlling mustelids is to minimise the adverse effects of mustelids on the environment and control mustelids where there are links with other site-led pest control operations. Mustelid control must be a response-based programme within Waitakere.

Mustelids are difficult and costly to control, so should only be considered as a scheduled programme when other animal pests are at low densities within ecologically significant sites. As funding becomes available this could be the aim by the end of this current five year programme.

If mustelids do require control, then DOC 150 traps would be the most appropriate method. Traps should be placed within a cylindrical object (e.g. cover of chicken wire or placed within cylindrical trap tunnels). Fresh or plastic eggs are effective lures to bait traps with.

As in the recommendations of the biodiversity monitoring programme (Waitakere, 2005), tacking tunnels could be installed in the priority sites identified (Rahui Kahika Reserve, Shona Esplanade, Te Henga Wetland, Moire Park, Karaka Park, Harbourview – Orangihina and Warner Park) to monitor stoat abundances and to help assess the need for stoat control in future work programmes

### ***Myna control***

Mynas are territorial birds but only show aggression to other birds within their territory. They are also known to evict other birds from their nests and eat eggs, chicks, invertebrates and lizards (Auckland Regional Council).

The objective of the RPMS is to minimise the adverse effects of myna infestations by promoting community awareness of their impacts and the control methods available, where Auckland Regional Council will provide traps on a hire basis. Myna control should be a response-based programme with Waitakere City Council referring any notifications of myna to the Auckland Regional Council for action.

### ***Exotic bird control***

In addition to mynas and magpies, rooks and sulphur-crested cockatoos can become pests. Rooks are a major potential threat to agriculture; while sulphur crested cockatoos can form flocks that may displace kaka, kereru and native bats.

At this point in time, sulphur crested cockatoos and rooks are not considered a priority for control.



**Exotic fish control**

A number of exotic fish species (e.g. koi, marron, gudgeon, gambusia, catfish, perch, rudd and orfe) can cause a reduction in native fish abundance and diversity through predation, competition and changes to aquatic plant communities and water quality impacts.

At this point in time, exotic pest fish species are not considered a priority for control.

**Exotic reptiles**

Exotic reptiles that pose a potential threat to New Zealand's environment include rainbow skink, blue-tongued skink, red-eared slider turtle, bearded dragon and iguana.

At this point in time exotic reptiles are not considered a priority for control.

**Rabbit control**

Rabbits cause considerable physical and economic damage throughout New Zealand, including commercial gardens, pasture (food source for stock), soil erosion, plantation and forestry seedlings.

A cost benefit analysis of the cost of rabbit control by the Auckland Regional Council found the people to benefit most from rabbit control are those who are directly affected. Auckland Regional Council provides a referral service for the control of these pests. Rabbit control is only required as a response-based programme within this five year programme. In a similar manner to the current contract, rabbits are to be controlled once they reach conspicuous levels and/or are eroding important landscapes such as sand dunes in Te Henga and Piha beaches. Rabbit control may also be required within sports grounds on a response basis.

If control is required the poison Pindone should be used. Letter drops and public notification within newspapers will also be required.

**Rat control**

Rats have huge impacts on New Zealand's natural environments. They eat seeds, fruit and leaves, indirectly compete with native wildlife for food resources are thought to be the cause of the extinction or reduction of many native animals e.g. frogs, lizards and birds.

The objective of the RPMS in controlling rats is to reduce the negative impacts of rats in selected areas, where other pest numbers have already been significantly reduced. Rat numbers in Council reserves are likely to be significant, difficult to maintain at low densities and costly to control to a density where there is a positive effect on the environment. Within this five year programme rat control remains a response-based programme. Note, however that a by-catch of rats is likely through using Broadifacoum to control possums in selected reserves.

As in the recommendations of the biodiversity monitoring programme (Waitakere, 2005), tacking tunnels could be installed in the priority sites identified (Rahui Kahika Reserve, Shona Esplanade, Te Henga Wetland, Moire Park, Karaka Park, Harbourview – Orangihina and Warner Park) to monitor rat abundances and to help assess the need for rat control in future work programmes.

**Wasp and wild bee control**

Wasps create a nuisance for users of the bush environment. Wasps compete with birds and lizards for nectar and honeydew and prey directly on other invertebrates.



The threat of a wasp sting to some people can be life threatening. Wasps are also a major pest to the New Zealand beekeeping industry, as they rob beehives of honey and kill bees.

Under the RPMS large-scale operations are not undertaken; however to help alleviate the wasp problem in the Auckland region, a referral service for wasp removal was established. Waitakere City Council has adopted a similar approach; in accordance with the RPMS, wasp and wild bee control should be undertaken on a service request basis only.

There are a number of exotic and native bees in New Zealand. Only exotic species of bees should be controlled.

## 5.0 Prioritisation of Reserves for Animal Pest Control

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The tables below list priority reserves for the next five years animal pest control programme. The highest priority for year one is given to those reserves currently under animal pest management programmes (i.e. contract no. PK 05001). This ensures that resources already invested in the maintenance of parks are utilised effectively. Year one should see possum densities in current reserves reduced further to 5% trap catch rates so that additional reserves can be included in the second year of the control programme.

The prioritised list of reserves provided for years 2–5 of the animal control programme follows the procedures outlined in the animal pest strategy. That is, the ecological significance, urgency of control, practicality of control and significance to iwi were considered during the prioritisation process.

Within each group of parks with the same prioritisation score, a higher rank was given to larger reserves over smaller reserves. This is due to the fact possums are more likely to have home sites within larger reserves with greater food resources.

With the exception of year one, reserves were not allocated to a specific year of the programme, as there is currently not enough data available to enable accurate planning. Allocating reserves requires adaptive management as the programme progresses.

### 5.1 Trapping

Possums will be controlled using Timms traps in most reserves.

It is assumed that the current year one reserves will be in the maintenance phase of control. This should require one visit per year (commencing in July to achieve a 5% catch rate. Regardless of the current densities of animal pests, traps should be left in each reserve until no possums are caught during three continuous fine trap nights. A fine trap night is one where rain did not commence until at least four hours after nightfall.

Trap catch rates should be recorded as a monitoring tool for each reserve, so that the frequency of control can be adjusted accordingly:

- If possum control within a priority reserve is not achieving a 5% trap catch rate, then trapping should increase to twice a year (October – November and again during April - May) in the following year of the control programme.
- If possum control within a priority reserve is achieving a 5% trap catch rate, then trapping should continue annually.
- If possum control within a priority reserve is achieving a trap catch rate less than 3%, trapping can reduce to once every two years.

Assessing monitoring results in the above manner will help calculate resources available to commence initial control in additional reserves the following year. Suitable reserves should be taken from the top of the supplied priority list for years 2-5.

Monitoring trap catch rates will allow for efficient management of possum populations within significant sites. The accumulation of data will allow for increased accuracy in

scheduling work programmes and assessing the number of hectares of control possible within certain budgets. It should be noted however that ongoing pest control would be required within most Waitakere reserves.

## 5.2 Bait Stations

An adaptive management regime will also be required for possum control using Brodifacoum in bait stations. As in trapping, bait take should be recorded as a monitoring tool for each reserve so that the frequency of control can be adjusted accordingly:

- If bait take is greater than 15%, poisoning should continue every three months.
- If bait take is 15% or less then poisoning should continue annually.

In a similar manner to trapping, these monitoring results will help assess what resources are available to include additional priority reserves in the next year of control.

## 5.3 Prioritised Reserves

### Year One: 2006/2007

As previously mentioned, parks that have already been subject to possum control (in the past year) should be the first priority. The following list of reserves is taken from the current contract (PK 05001).

Control of possums within these reserves should help achieve the goals and objectives of the Animal Pest Strategy.

Note that Opanuku Esplanade and the Waitakere Quarry have not been included despite currently being the animal pest control contract (PK 05001) because they are within the boundaries of Auckland Regional Council's possum control programme. The Waitakere Quarry is a priority for control as a buffer to the Ark in the Park programme.

**T = Trapping (Timms traps), P = poisoning (Brodifacoum in bait stations).**

Area/Ward	Reserve	Hectares	Recommended Control Methodology
Rahui-Kahika Reserves	Rahui-Kahika Reserve	12.06	T
Opanuku Stream Reserves	Opanuku Marginal Strip Reserve	1.62	T
	Pareira Esplanade	2.05	T
	Vale Park	0.29	T
	Grassmere Reserve	0.62	T
	Palamino Esplanade	5.97	T
	Border Road Esplanade Reserve	2.16	T
	Shona Esplanade Reserve	9.63	T
	Henderson Valley Green	1.38	T
	Henderson Valley Park	15.97	T
	Henderson Park	10.32	T
	Opanuku Stream Reserve	1.21	T

	Catherine Esplanade	0.45	T
	Plummer Domain	2.13	T
	Vintage Reserve	2.59	T
	Epping Esplanade	4.26	T
	Epping Plant Reserve	0.12	T
	Opanuku Reserve	1.38	T
	Tawa Esplanade	1.50	T
	Cranwell Esplanade	2.07	T
	Hart Domain	2.22	T
	Forest Hill Park	1.49	T
	Cranwell Park	7.28	T
Swanson Stream Reserves	Crows Park	7.08	T
	Swanson Stream Esplanade Reserve	4.48	T
	Swanson Scenic Reserve	7.78	T
	Birdwood Park	2.35	T
	Ulrich Esplanade	5.45	T
	Te Rangi Hiroa Park	30.18	P
	Helena Park	2.46	T
	Sunline Esplanade	1.65	T
	Sunline Park	1.34	T
	Chorley Reserve	1.95	T
Kay Road Bale Fill Reserves	Kay Road Bale Fill Site and adj. council owned land	50.84	P
Moire Park Reserves	Moire Park	37.07	T
	Manutewhau Walk	5.60	T
Laurieston Park Reserves	Laurieston Park	2.61	T
	Valron Esplanade	1.35	T
	Tirimoana Reserve	2.61	T
	McLeod Park	4.73	T
	Akatea Park	2.24	T
Massey West	Cyclarama Reserve	2.02	T
Titirangi Reserves	Bishop Park	2.61	T
	Daffodil Scenic Reserve	0.67	T
	Beverly Hills Scenic Reserve	1.12	T
	Tainui Reserve	1.67	T
	Woodside Glen	0.72	T
	South Titirangi Recreational Reserve	1.75	T
	Opou Reserve	1.73	T
	Titirangi War Memorial	1.84	T
	Lapdell Plant Reserve	0.20	T
Laingholm Reserves	Laingholm Scenic Reserve	6.89	T
	Warner Park	2.39	T
	Laings Esplanade	0.73	T
	Little Muddy Creek Esplanade Reserve	5.23	T
	Tane Walk	0.23	T
Waitakere	Awhiroangi Reserve	1.42	T
	Armour Bay Reserve	11.8	T
	Les Waygood Park	6.06	T
	Cascade Reserve	5.87	T
	Claude Abel Reserve	2.26	T

	Laingholm Drive Esplanade Reserve	2.03	T
	Big Muddy Creek Landing	0.54	T
	Pendrell Reserve	0.3	T
	Big Muddy Creek Esplanade	3.72	T
Massey	Colwill Esplanade	2.2	T
	West Harbour Esplanade	6.61	T
New Lynn	Kowhai Park	5.07	T
	Karaka Park	1.33	T
	Manukau Margin	0.54	T
Rewarewa Reserves	Rewarewa Esplanade	0.73	T
<b>TOTAL</b>		<b>325.53</b>	

### Year Two - Ongoing: 2007/2008- Ongoing

As described above, the lack of data collected at this stage makes it difficult to predict when resources would be available to add reserves to the possum control programme. For this reason a prioritised list of areas is provided that should be included into the programme as funds allow. Priority 1 is considered the top priority for adding reserves into the programme. Reserves of less than a hectare are included when they are near a larger piece of bush already prioritised for control. Refer to the above section on adaptive management to ascertain when additional reserves may be included.

**T = Trapping (Timms traps), P = poisoning (Brodifacoum in bait stations).**

Ward	Reserve name	Hectares	Priority	Recommended Control Methodology
Waitakere	Seibel Scenic Reserve	11.49	1	T
New Lynn	Waikumete Cemetery	108.04	2	T
Henderson	Harbourview Lowland Reserve	57.96	3	T
Waitakere	Kauri Reserve	24.96	4	T
New Lynn	Rimu Esplanade	6.06	5	T
Massey	Zita Maria Park	4.83	6	T
Massey	Lowherthurst	4.74	7	T
Waitakere	Ruru Reserve	3.74	8	T
Waitakere	Waiatarua Recreation	3.42	9	T
Waitakere	Driving Esplanade	2.13	10	T
New Lynn	Wirihana Park	1.68	11	T
New Lynn	Inaka Esplanade	1.4	12	T
Henderson	Colletta Esplanade	1.22	13	T
New Lynn	Kaurimu Park	0.88	14	T
New Lynn	Konini Reserve	0.27	15	T
New Lynn	Okewa Reserve	0.22	16	T
Henderson	Taipari Strand	14.3	17	T
Waitakere	Douglas Scenic	4.65	18	T
New Lynn	Gill Esplanade	4.02	19	T
Henderson	Spinnaker Strand	3.87	20	T
Massey	Manutewhau Reserve	3.23	21	T

Waitakere	Taumatarea Esplanade	2.85	22	T
Waitakere	Taumata Scenic	1.22	23	T
Waitakere	Foster Strand	1.02	24	T
Massey	Wickstead Strand	0.84	25	T
Waitakere	Waitoru	15.5	26	T
<b>TOTAL</b>		<b>269.04</b>		

**6.0**

## References

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- Waitakere City Council. 2005. Waitakere City Biodiversity Monitoring Programme:  
1) Avifauna, 2) Vegetation and Phenology, 3) Terrestrial Invertebrates, 4)  
2) Lizards. Unpublished report prepared on behalf of the Waitakere City  
Council by Envirollogic Limited.
- Waitakere City Council. 2005b. Project Twin Streams Ecological Monitoring  
Programme: 1) Avifauna, 2) Vegetation and Phenology, 3) Lizards, 4)  
Long-Tailed Bats, 5) Pest monitoring. Unpublished report prepared on  
behalf of the Waitakere City Council by Envirollogic Limited.

## APPENDIX A – Advantages and disadvantages of poison in possum control.

Trade name/ Form	Active ingredient	Positives	Negatives
<b>Talon®/ Pest Off®</b>  A green dyed cereal pellet.	Brodifacoum	<ul style="list-style-type: none"> <li>• 60g is a lethal dose for possums.</li> <li>• Most possums will die in their dens, therefore a low risk to scavenging dogs.</li> <li>• It is not soluble in water, therefore does not contaminate.</li> <li>• The green dyed pellets are not attractive to cats and most birds.</li> <li>• Ability to control possums at low levels for sustained periods without inducing bait shyness.</li> <li>• Comparatively low risk to the public and pets – enabling its use in areas where acute toxins would be unacceptable.</li> </ul>	<ul style="list-style-type: none"> <li>• Repeated large doses of brodifacoum can be harmful to humans, as toxins can build up in the liver.</li> <li>• Repeated large doses will be harmful to pets</li> <li>• It can be harmful to birds</li> <li>• At low concentrations it can affect human health by interfering with the synthesis of vitamin K1 (important compound for blood clotting).</li> <li>• Careful handling is required to avoid skin and eye irritation.</li> <li>• The possum may require several feeds before it gets a lethal dose.</li> </ul>
<b>Campaign®</b>  A green dyed cereal pellet.	Cholecalciferol (i.e. Vitamin D3)	<ul style="list-style-type: none"> <li>• A 10-15g single dose is lethal for a possum.</li> <li>• The green dyed pellets are not attractive to cats and most birds.</li> <li>• Very unlikely those scavengers eating Campaign-poisoned carcasses will be harmed.</li> <li>• It breaks down quickly on contact with moisture and does not affect the soil.</li> <li>• It is insoluble in water, so does not contaminate it.</li> </ul>	<ul style="list-style-type: none"> <li>• It is harmful to humans if swallowed repeatedly in large doses.</li> <li>• It can be harmful, possibly fatal, if eaten by pets.</li> <li>• Livestock should be kept well away from poison bait stations.</li> </ul>
<b>Feratox®</b>  A encapsulated pellet containing cyanide	Cyanide	<ul style="list-style-type: none"> <li>• It breaks down rapidly in the carcass, so scavengers are not at risk.</li> <li>• The possum dies within 3 to 4 minutes.</li> <li>• It does not build up in soil, or the food chain, or contaminate water.</li> <li>• The cereal-based pellets are not usually</li> </ul>	<ul style="list-style-type: none"> <li>• It is a deadly poison and requires a licence to store, handle and use.</li> <li>• When used on public land, permission is to be given from the Medical Officer of Health</li> <li>• The project must be publicly advertised.</li> </ul>

Trade name/ Form	Active ingredient	Positives	Negatives
		attractive to cats, dogs or birds. <ul style="list-style-type: none"> <li>• The bait station is designed to prevent birds &amp; other small animals getting the bait.</li> </ul>	<ul style="list-style-type: none"> <li>• Public land is to be closed with warning signs posted.</li> </ul>
<b>Cyanide paste</b>  Paste	Cyanide	<ul style="list-style-type: none"> <li>• It breaks down rapidly in the carcass, so scavengers are not at risk.</li> <li>• The possum dies within 3 to 4 minutes.</li> <li>• It does not build up in soil, or the food chain, or contaminate water.</li> </ul>	<ul style="list-style-type: none"> <li>• It is a deadly poison and requires a licence to store, handle and use.</li> <li>• Dogs have been known to die after licking paste from the mouth of a dead possum.</li> <li>• When used on public land, permission is to be given from the Medical Officer of Health</li> <li>• The project must be publicly advertised.</li> <li>• Public land is to be closed with warning signs posted.</li> <li>• If not used properly, it could contaminate water.</li> </ul>
<b>Xtinguish</b>  Wasp bait	1% Fipronil	<ul style="list-style-type: none"> <li>• Low – insignificant risk to human and /or environmental health.</li> <li>• Can be used to control social wasps in small and large areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for adverse effects on beneficial invertebrates.</li> </ul>