

4. ISSUES

This section looks at the issues associated with preventing the establishment of new pests, managing those that are here, legal responsibilities, ways of controlling pests, monitoring, research and community partnerships and education.

4.1 PREVENTING NEW PESTS

Biosecurity

Prevention is the most effective form of control.

The introduction of a new species into the country is dealt with by other organisations, under the provisions of the Biosecurity Act and the Hazardous Substances and New Organisms Act (HSNO). The legislation provides for rigorous procedures to assess the impacts of new organisms and whether the organism should be introduced. It also provides for measures to endeavour to prevent the accidental arrival of new organisms into the country.

It is the accidental arrival of new organisms, particularly those that have the potential to become pests in New Zealand, that poses a significant threat to New Zealand's biodiversity. Increased international trade and travel provide ready opportunities for unwanted organisms and potential pests to arrive.

Biosecurity is the responsibility of other government authorities. However, the presence of international shipping and an international airport create a level of risk for the city. The city can play its part in preventing the establishment of unwanted organisms through constant vigilance and reporting of any sightings of unusual or unidentified organisms.

Prevention

The prevention of new pest species arriving within the city from elsewhere is of prime importance. Changes in the climate and other environmental factors will influence the likelihood of new pest species arriving and establishing. The other prime factor in new pest establishment is the behaviour of people. Actions by individuals, whether intentional or accidental, can result in new pest species arriving.

Co-operation and awareness are the keys to preventing new species establishing: co-operation with other agencies with similar priorities such as adjacent territorial authorities, Greater Wellington Regional Council, Landcare, Department of Conservation, Ministry of Agriculture and Forestry, Ministry of Health and Ministry for the Environment, and raising awareness amongst the wider community of the risks and impacts, and what can be done to prevent new species establishing. This will build on relationships the Council already has with a wide range of community groups,

schools, clubs and organisations, as well as looking to raise awareness among the wider public. Legal action will remain an option.

Eradication or containment

The best time to eradicate or contain a pest species that is already present is in its early stages of infestation, when populations are small and localised. Control costs at this point are relatively low. The more widespread and established a pest, the more difficult and expensive it is to control.

Weed seed distribution patterns affect the level of threat. Weeds spread faster from numerous, widely spread infestations than from single, large infestations. Seedlings usually establish close to parent plants, so that removing outlying infestations reduces spread more rapidly. Control of outlying infestation generally takes priority over large, established infestations which can be controlled.

Weeds dispersed by wind or animals, particularly birds, are a much higher risk. The seedlings establish far from parent plants, creating large numbers of small infestations. Control of scattered individuals or small remote infestations, particularly of wind or bird-spread species, is therefore a priority over large established infestations.

There are indications that the pattern of Darwin's barberry spread mirrors closely the increased regeneration and distribution of bush areas that provide habitat for birds. Where there is no bush, the land is generally free from Darwin's barberry despite being quite close to large infestations.

This pattern of spread and correlation with regeneration will have significant implications for control programmes.

Aquatic pest organisms have their own particular patterns of spread and will need special attention.

Species-led programmes are particularly relevant in managing weeds and pest animals in the early stages of establishment when numbers are low and/or distribution is limited, when there is potential to minimise future control costs and environmental impacts, and minimise damage to biodiversity. It is a proactive approach to minimising future risk.

Species-led management must assess the potential impacts of a species, how fast and how well it establishes and spreads, and how practical it is to eradicate, contain or manage. Rapid response to a species is the optimum, but factors such as the size of the infestation, ease of control, effectiveness of control methods, involvement of others, and the need for supporting programmes will also have an influence.

Species-led programmes are generally larger than site-led programmes, and have been interpreted here to include programmes to contain a species and prevent it from establishing or re-establishing in non-infested non-priority areas.

Programmes are limited mainly to Council-owned land and therefore cannot deal with species-led programmes in their truest sense. Any species-led programmes will need to consider the impact of pests on private or non Council-owned land.

In Wellington, the greatest sources of new weeds in open space are garden escapes and dumping of garden waste. Nationally some 75 percent of land weeds and 50 percent of freshwater weeds originated in gardens or homes. Some will simply have climbed over a fence; others will have been spread by birds. People, animals and equipment can all carry seeds or small fragments from one area to another, unintentionally helping the weeds to spread.

Regrettably, many weeds establish because old plants, trimmings or cuttings, root fragments and seed heads have been dumped into open space instead of being composted on site or taken to the landfill for composting.

Community attitudes to weeds and the willingness to take preventative action early are a major factor in determining whether weeds become a significant problem. Some of this action may need to be tightly focused, such as educating garden centres not to stock plants which have the potential to become weeds, and may involve a range of agencies.

Other action will need to more broadly focus on the community in the form of education and awareness campaigns. These, too, may involve a range of agencies working together.

Animals with the potential to become pests may also be introduced through accidental escape from captivity or farms, or through the wilful release of animals for hunting purposes, or for economic reasons.

Consideration also needs to be given to the potential flow-on effects of increasing our biodiversity levels. Restoring indigenous vegetation and wildlife presents an opportunity for pest animals to invade areas that they previously did not occupy because of lack of habitat or food.

4.2 MANAGING PESTS

4.2.1 IDENTIFYING PRIORITIES

Rationale

The vision provides us with our two priorities.

- All weeds and pest animals that have significant adverse effects are controlled, starting with those that have the greatest capacity to cause damage.

- The ecosystems that are most ecologically valuable and contain the greatest biodiversity are identified and given priority in the management and control of weeds and pest animals.

To protect areas of high biodiversity, four actions are needed:

- (i) identify and prioritise the sites that are threatened by pests
- (ii) identify and prioritise the pests
- (iii) develop implementation programmes
- (iv) implement the programmes.

Wellington City has over 3,300 hectares of open space including primary remnant lowland forest, advanced secondary regrowth, coastal faces, sand dunes, streams, and wetlands.

Some of that land contains ecosystems with high biodiversity values. Surrounding those sites is land which has lower biodiversity values. For example, there still remain small scattered remnants of the primary forest that once covered the Wellington region. These are often surrounded by advanced secondary regrowth, where the forest is recovering. Further out from these may be areas that have been more recently cleared and so the regeneration is much younger.

There are also sites that contain high numbers of threatened species, in an environment such as the South Coast that is highly sensitive to damage and under considerable threat because of human activity.

Organisations such as Greater Wellington and DOC are responsible for the protection of biodiversity values across the Wellington area as a whole. The Council's focus is its open space and road reserve. Taking the protection of biodiversity values as the key driver, the focus of pest control is on specific sites and on protecting the values of those sites. The sites may be whole sites such as a reserve, several sites in close proximity and with similar values, or the sites might be part of a bigger site with areas of lesser biodiversity value that are lower in priority for management, such as primary remnant forest in a larger park.

The control programme for a site might include the site itself as well as buffer zones around the site, sites of other sources of infestation or re-infestation such as seed sources or colonies, or corridors for invasion. Some of these may be on land that is not Council-owned.

The pests to be controlled within a site are those that have the potential to adversely affect the biodiversity values of the site. These are generally widespread and known pest species, but can also include species that may be localised in distribution but have the potential to become significant in the future. A precautionary approach is used, as prevention is better than cure.

Consideration must also be given to the impact of pest control on the environment and the management required. Control of pests should not create opportunities for further

and possibly worse pests. For example, when clearing ground cover weeds, provision needs to be made to prevent reinvasion by replanting sites or ensuring that natural regeneration will occur faster than invasion of the site by weeds.

As every site is different, each site will require its own specific programme of work.

Criteria for determining priorities

The criteria to be used for determining both site and species priorities are based on those used by the Department of Conservation (Appendix II).

Other factors reflecting the biodiversity value of sites include:

- Representativeness
 - coastal forest, scrub, herbfield
 - beach and dune systems
 - lowland wetlands
 - mature and regenerating lowland forest
 - lowland riverine systems
 - coastal and inland cliffs and talus
 - alluvial forests
- Rarity
 - distribution of threatened species
 - uniqueness and vulnerability of naturally uncommon ecosystems
- Naturalness
 - species diversity and abundance
 - structural diversity
 - functioning of natural processes
- Distinctiveness
 - ecosystem type
 - ecosystem rarity
- Size and shape
 - fragmentation
 - shape
 - size
- Connectivity/linkages
 - gene pools
 - travel lanes/corridors
 - food sources
 - breeding and resting habitats
- Sustainability

predation of wildlife
browsing by introduced mammals
exotic plant invasion
destruction of seed
isolation of breeding populations
effects on natural processes including regeneration

Appendix II sets out the methodology for ranking sites. It scores each site on its botanical and wildlife values, creates a biodiversity score, identifies the significant weeds and pest animals that threaten the biodiversity values, and determines the overall urgency for control of both weeds and pest animals.

Each site can then be prioritised according to:

- ranking score
- prevention or early control of new invasions by pest species
- inter-relationships between pest animals and weeds – pest animal priorities may result in several priority sites being controlled in advance of weed control programmes
- community diversity – protecting a range of community types
- impact of non-pest threats – a site where only pests are a threat is of higher priority than a site where biodiversity values are being affected by other threats

and ensuring that each site programme is completed to ensure protection, before moving to a new site.

Other influences on priorities

While biodiversity is the key driver, there are other factors that need to be considered in determining final priorities and allocation of resources.

Community involvement in open space areas is an integral and valuable part of the managing of the land. However, the establishment of community groups does not always reflect the priority of the area in terms of ecological values and biodiversity. The Council is committed to supporting such groups and their projects. It works with groups to integrate them within the overall management of open space areas, and ensures that the projects are sustainable. This may result in resources being applied to open space in recognition of the community interest ahead of biodiversity values.

Biodiversity includes species that may not be indigenous to Wellington or to New Zealand. There may be cultural or historic associations that make it desirable for species and their habitats to be protected. The decision to allocate resources may differ in priority from those set out below. For example, the karaka groves around the Miramar Peninsula and South Coast have associations for local iwi, but karaka is not naturally occurring in the Wellington region, and may be regarded as a weed in some situations such as Otari-Wilton's Bush.

Non-native species can also provide valuable sources of food and roosting sites - eucalyptus species provide valuable nectar for tuis around the city.

Implementation

Each site will require its own specific programme to control the pests identified through the ranking process. Each site will be different and each programme will reflect those differences.

Programmes will need to reflect the control techniques required for each identified pest. Weed species may be able to be controlled at the same time. However, selected species or specimens may need the attention of specialist operators - large trees will need the attentions of arborists.

Other factors such as weather, financial and labour resources will affect how and when programmes are carried out.

Buffer zones

Buffer zones are used to extend the level of protection given to priority sites, and prevent or slow re-infestation. Such zones can be immediately adjacent to a priority site that is part of a larger site such as a park, they can be the open space or road reserve between several sites being managed together, or they can be road reserve which is managed to control weed species that are significant to the priority site.

Additional weed and animal species may be included for control where they may not yet be present in the priority site, but have the potential to become significant pests. The size of the buffer zones is dependent on such factors as pest species present, their means of spread, prevailing weather and wind direction, and routes of invasion.

The use of buffer zones for pest animal species has not been explored fully to date, as the impacts of private land ownership and the mobility of pest animals makes it a more difficult tool to use effectively. For many pest animal species, the co-operation of the community is required. The management of domestic cats close to high-priority areas is a prime target for buffer zone use through education, de-sexing and curfews.

Private land

Because weeds and pest animals are unaware of land titles and ownership, they occur across private and public land.

Where the Council is intensively managing pests on land with significant biodiversity values, it is essential to consider how the reinvasion of these sites from adjoining non-Council land can best be managed.

Education of private land owners is useful but often of limited success and is generally a long-term project. Intensive pest management often requires a short-term or rapid response which has a higher chance of success.

There are circumstances where control of pests on neighbouring land would help prevent re-infestation of Council land and reduce the need for additional pest control. Many of the pests it is important to control are not those that are covered by statutory landowner responsibility and so cannot be required to be controlled. Education and advocacy are necessary here.

In such circumstances it could be beneficial both from technical efficiency and financial perspectives for the Council to undertake control of specific pests on private land.

Landowner/occupier consent would have to be obtained to access the land. Indications are that landowners are likely to react positively to the Council controlling pests on their land at no direct cost to the landowner. Landowners/occupiers would be told why the pest control was necessary and what benefits there would be.

4.3 LEGAL RESPONSIBILITIES – WHAT ARE THEY?

The following sections address only the legal requirements to control the pests identified. Additional control may be required to protect specific sites, and this will be identified in the individual site pest management plans.

National

There are a number of legislative provisions that affect pest control by the Council. The main provisions are outlined below.

Biosecurity Act 1993 provides for “... the exclusion, eradication and effective management of pests and unwanted organisms.”

Freshwater Fisheries Regulations 1983, section 65

provides for the identification of noxious fish species.

Hazardous Substances and New Organisms Act 1996 (HSNO Act)

provides for the management, or prevention, of the harmful effects of hazardous substances “in order to protect the environment and the health and safety of people and communities.”

Of primary importance are:

- the safe-guarding of the life-supporting capacity of air, water, soil and ecosystems
- the maintenance and enhancement of the capacity of people and communities to provide for their own economic, social and cultural well-being and for the reasonably foreseeable needs of future generations.

Resource Management Act 1991

has as its purpose the sustainable management of natural resources in a manner that “ enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety while

- sustaining the potential of natural and physical resources ...
- safeguarding the life-supporting capacity of air, water, soil and ecosystems; and
- avoiding, remedying or mitigating any adverse effects of activities on the environment.”

The Act is given effect through the preparation and application of Regional Policy Statements, Regional Plans and District Plans.

Reserves Act 1977

provides for the management and administration of reserves and in particular, “Ensuring as far as possible, the survival of all indigenous species of flora and fauna, both rare and commonplace, in their natural communities and habitats, and the preservation of representative samples of all classes of natural ecosystems and landscape which in the aggregate originally gave New Zealand its own recognisable character...”

Wild Animal Control Act 1963 provides for the control of harmful species of introduced wild animals.

Other relevant legislation is listed in Appendix III.

4.3.1 GREATER WELLINGTON REGIONAL PEST MANAGEMENT STRATEGY (RPMS)

Under the Biosecurity Act, regional councils may prepare a Regional Pest Management Strategy to address the control of pests in their region. The strategy is reviewed every five years.

Under the operative Greater Wellington RPMS, Wellington City Council is responsible for the following on council land:

total control (eradication) of

- wild ginger (*Hedychium gardnerianum*, *H. flavescens*)
- cathedral bells (*Cobaea scandens*)
- banana passionfruit (*Passiflora mollissima*, *P. mixta*)

control of

- old man's beard (*Clematis vitalba*) within 10 metres of the boundary where there has been a complaint by an adjoining land owner, whose land is clear or being cleared of old man's beard
- gorse (*Ulex europaeus*) within 10 metres of the boundary where there has been a complaint by an adjoining land owner, whose land is clear or being cleared of gorse
- ragwort (*Senecio jacobaea*) within 50 metres of the boundary where there has been a complaint by an adjoining land owner, whose land is clear or being cleared of ragwort
- variegated thistle (*Silybum marianum*) within 20 metres of their boundary where there has been a complaint by an adjoining land owner, whose land is clear or being cleared of variegated thistle.

and provides for the control of

- possums (*Trichosurus vulpecula*) as part of the Key Native Ecosystem Management programme
- rooks (*Corvus frugilegus*) as a containment pest
- feral rabbits (*Oryctolagus cuniculus cuniculus*) as a suppression pest
- magpies (*Gymnorhina tibicen*) as a site-led pest.

The Greater Wellington Key Native Ecosystem (KNE) programme is designed to protect and enhance native flora and fauna at selected sites throughout the region. Areas are selected to represent a range of indigenous biodiversity in the region and are prioritised primarily on ecological criteria. Management focus is on the site rather than individual species.

The objective of the programme is to achieve a measurable improvement in the ecological health and diversity of Key Native Ecosystems using a range of suitable indicators. This will be achieved through a range of means including

- reviewing the way priorities are set based on ecological processes
- managing KNEs on a holistic basis
- adding new areas
- implementing integrated pest management plans for all KNEs
- ensuring legal protection
- undertaking pest control directly
- re-establishing locally extinct native species
- monitoring site recovery
- involving community groups
- seeking funding from territorial local authorities where KNEs are on their land
- using and supporting biological control agents
- managing external pressures
- promoting organisms that assist in pest control
- providing education and advice to the public.

The RPMS provides rules to enable the programme to be carried out, including prohibiting interference with materials or equipment, prohibiting the dumping of plant waste material, prohibiting stock from being allowed into an area, and prohibiting the lighting of fires.

Beyond the species individually identified within the RPMS are additional species for inclusion in the KNE programme (see Appendix IV).

Old man's beard

The previous RPMS had a specific programme for the Wellington City area which required the total control of old man's beard.

The Council has invested a lot of time and resources in controlling old man's beard in the past. While Greater Wellington Regional Council have moved from total control to 10 metre boundary control on complaint, for Wellington City Council to adopt a programme of boundary control only jeopardises the gains that have been made so far.

Old man's beard is able to revert to its previous levels of infestation quickly if control does not continue. Significant gains have been made in both open space and on road reserve in controlling old man's beard. Therefore, it seems prudent to continue control operations on open space and road reserve to capitalise on those gains.

Old man's beard is unlikely ever to be eradicated within the Wellington area as seed is thought to be viable for more than 15 years. By continuing to control old man's beard through destroying plants prior to seeding, the infestation will be reduced to levels that allow it to be managed as part of general weed control programmes.

Gorse

Gorse has been actively managed city-wide. Management has focused on boundary control following complaint by adjoining owners, either because of fire risk or because of weed spread.

Within the last two years a pro-active approach to the management of gorse has been adopted. A boundary is cleared of gorse for two successive seasons. Adjoining owners are supplied with low-fire-risk plants from the Council nursery to plant and maintain in the cleared area to prevent regrowth of gorse. While this approach has been adopted only in the last two years, it is proving popular with residents and is an effective method of preventing regrowth and reducing fire risk.

It is anticipated that the programme will pay for itself. Because gorse will continue to reinvade from surrounding areas, boundary control of gorse may be never-ending unless alternative vegetation is introduced. Rather than using grass along boundaries, which would require maintenance and still present a fire risk in late summer, it is considered better to invest in revegetating the site with native vegetation. This limits ongoing maintenance costs and provides for a better environment for the neighbour and the community generally.

There is the added advantage for many residents that revegetation will prevent access along boundaries by intruders. Some residents have found that once their boundaries have been cleared of gorse, they have been burgled for the first time, as the cleared area provides burglars with a discreet exit route.

Gorse is now widely recognised as valuable for its ability to act as a nurse crop, enhancing the survival of native species, and restricting the ability of weed species to establish. Therefore, gorse will not generally be regarded as a weed, and will be eradicated only as part of a specific programme.

Possums

Possums are probably the worst pest animal present in New Zealand. They destroy or damage native forest, eat the flowers and seeds that provide food for native birds, as well as preying on native animals, particularly eggs and young birds. Possums also damage crops, commercial forestry and gardens, and spread bovine tuberculosis to deer and cattle.

Wellington City Council works in partnership with the Greater Wellington Regional Council possum programme. The programme identifies areas throughout the city that will be targeted each year, based on Greater Wellington's Key Native Ecosystem Management programme. The Council contributes half the cost of the work undertaken on Council land in the programme.

The possum programme involves monitoring an area before control operations to assess animal numbers. An intensive eradication programme using poison appropriate to the location is undertaken over a year. Possum numbers are monitored following completion of the programme to establish its success. Bait stations are maintained for a further period of three years to maintain the population at low numbers, although this period may be increased

The RPMS notes that Greater Wellington intends to expand and intensify control programmes in the future. Such an expansion would provide the Council with an opportunity to identify any additional areas that should be targeted for possum control.

Miramar peninsula has been a particular target since 2003/2004, with the intention that the entire peninsula will become possum-free. The possibility exists for large parts of the city to become possum-free.

Rooks

Rooks are primarily located in the Wairarapa and are not currently known within Wellington city. The RPMS requires landowners to notify Greater Wellington of any rookeries on their land.

Rabbits

Rabbits were introduced to New Zealand in the 1840s to establish a meat and fur industry, but later became a serious agricultural pest. They affect agricultural production, and threaten biodiversity values by eating native plants, contributing to unpalatable weed species becoming established and to erosion through grazing and burrowing. They also help to maintain populations of pests such as ferrets and feral cats.

Rabbits prefer drier grassland areas and are found in greatest numbers on the drier coastal areas of Miramar. They also favour dune systems where they threaten rare plant species such as pingao (*Desmoschoenus spiralis*) and shrubby tororaro (*Muehlenbeckia astonii*).

Numbers are thought to have decreased since the introduction of RHD (Rabbit Haemorrhagic Disease), although the full impact of the disease on rabbit populations over a long period is still not fully known, particularly in urban areas.

Greater Wellington will undertake control of rabbits on riverbanks, esplanades and similar public commons. Wellington City Council as landowner is responsible for maintaining rabbit numbers at or below level 5 of the Modified McLean Scale as specified in the RPMS. Level 5 of the Modified McLean scale is, "Sign very frequent with faecal heaps less than 5m apart in pockets. Rabbits spreading."

Rabbit control is sometimes undertaken to protect revegetation plantings or city amenities such as sports fields.

Magpies

The operative RPMS provides for Greater Wellington to undertake control of magpies following a complaint. Greater Wellington will provide advice, education and assistance to landowners wanting to undertake magpie control.

Greater Wellington has been participating in research to assess the impacts of magpies on native bird species. Indications from recent research are that magpies affect the visibility of birds such as tui and kereru, but the native species are otherwise unaffected.

Key native ecosystem management

The KNE programme is paralleled closely by this pest management policy but being regionally focused is less specific than the Wellington City programme.

Under the RPMS, Greater Wellington will undertake control of pests identified in the management plan for each KNE and a financial partnership will be sought where the KNE is on Council land.

Areas that are identified as regionally significant KNEs will also be significant within the local Wellington City area. It is therefore important that the management responsibilities of Greater Wellington and Wellington City Council are co-ordinated to avoid duplication or conflicting activities.

Management plans for KNE areas should be prepared in consultation with Greater Wellington, and close liaison maintained in operations.

Climbing Asparagus/Snakefeather

Climbing Asparagus/Snakefeather (*Asparagus scandens*) was included in the Council weed control programme in the expectation that it, too, would require total control in the new RPMS. However, it was not included in the plan finally adopted.

The inclusion of Climbing Asparagus/Snakefeather in the Total Control species programme will need to be reviewed to determine if its distribution is sufficiently localised to justify its being controlled, or whether it should be dealt with as part of the priority site programme.

4.3.2 PUBLIC HEALTH

Rats and mice

Rat and mouse control are the responsibility of the landowner. Rodent control operations may be required for public health reasons rather than in accordance with the priorities set for the protection of biodiversity values. Council Environmental Health Officers may require the control of rats where they are a nuisance, and the taking of all necessary steps to get rid of them.

Rats and mice often move closer to houses in cooler weather or into areas in response to readily available sources of food. Open space areas often provide prime residential territory for rats and mice. However, often they become a problem to people only when they are attracted by such things as alternative accommodation, and good sources of food. Accommodation can include old newspapers, boxes, rags, and other materials in basements, piles of bricks, timber, rubble, garden waste, or non-rodent proof compost bins. Rats usually stay within 40 metres of their nests.

The dumping of garden waste or household rubbish into open space and road reserve areas encourages rodents. Similarly, the feeding of birds in gardens and in open space such as beaches or parks also encourages rodents. Much of the city's coast provides good habitat for rodents, in particular rats, and well-meaning acts of feeding birds with leftover food often provide a bonanza for rats. Rats take far more of the food left for birds than most people realise.

4.3.3 WILD ANIMAL CONTROL

Deer and goats, not suitably identified and farmed behind fences, and pigs not being herded or domestic or not behind fences, are deemed to be wild animals under the

Wild Animal Control Act 1977. It is unlawful to release any wild animal without the Minister of Conservation's approval, and it is unlawful to hunt wild animals without the express approval of the land owner. A fine of up to \$50,000 may be imposed for releasing wild animals.

Goat farming is a controlled activity under section 15.2.2 of the District Plan, as a means of ensuring goats do not escape and to provide for a method of owner identification.

Goats

Goats are extremely adaptable animals with broad dietary preferences. Their ability to stand on their hind legs and reach up into trees gives them the potential to destroy the understorey of native forests. Their grazing habits often lead to erosion and can seriously limit the biodiversity of forests through destruction of habitat, prevention of regeneration and altering the species balance to favour unpalatable species.

Goats are most prevalent in the south-western and northern areas of the city where animals tend to move in and out of open space land from adjoining rural land, as boundary fencing is often not goat-proof, is in poor repair or non-existent. Small populations of goats have been observed elsewhere around the city, their mobility making them difficult to pinpoint.

While goat numbers can be controlled through the use of hunters assisted by specially trained dogs, it is expensive and often not as effective because of the animals' ability to move off Council owned land onto private land and then return. For control programmes to be most effective, the co-operation of adjoining landowners is needed.

Landowners need to be reminded of their obligations under the Act and the District Plan to suitably identify their animals and to have goat-proof fencing, if they wish to retain them. This would allow those landowners in an area who wish to eradicate goats from their land to do so.

For the Council, goats in open space areas present a considerable threat to the biodiversity values, either directly through grazing and destruction, or through their proximity to and ability to access areas important for biodiversity values.

Deer

Deer prefer broad-leaved hardwood tree species, typically sub-canopy species and some ferns. The continued presence of deer will result in the replacement of preferred species with a smaller number of less palatable species. Dieback can occur, and where possums are also present die-back can be more immediate and severe as possums kill trees and deer prevent their regeneration.

Deer are a known carrier of bovine tuberculosis and present an animal health risk to adjoining farms.

Fallow deer have been sighted on open space land to the south west of the city. Indications are that they have been unlawfully introduced, possibly by recreational hunters keen to establish a game hunting resource close to the city.

There have been anecdotal reports of other species of deer in the same south-western area of the city.

In assessing control programme priorities, consideration will be given to the principle that early eradication of small populations is desirable, as this is the most effective time in terms of resources and likelihood of success to undertake control operations.

Pigs

Feral pigs are pests primarily because of the damage they cause to forest habitats in searching for food. Their omnivorous dietary preferences make them consumers of plant matter, seeds, fruits and insects, small animals, eggs, dead animals and much else that may be edible. Their habit of rooting for tubers or rhizomes destroys surrounding vegetation and opens up sites for weeds to invade.

Pig sign has been reported recently in open space to the south-west of the city. It is not clear whether these are survivors of previous populations, have entered the area from adjacent farm land, or have been introduced by recreational hunters

4.4 CONTROL METHODS - HOW TO CONTROL PESTS

- A variety of control methods are available including biological, physical and chemical, or control through changed management practices.

Biological control

Biological control is the use of parasites, predators and pathogens to permanently lower the incidence of a target species. Predominantly, biological control is used against weeds and involves the use of insects or fungi. Complete eradication is not the intention or the control agent will die out, rather the target species is reduced to a permanently low level.

Weed species that have had a biological agent introduced and established include:

alligator weed	broom	Californian thistle
gorse	hawkweeds	heather
Mexican devil	mist flower	nodding thistle

old man's beard	piripiri (agent not established)	
ragwort	Scotch thistle	St John's wort.

Others being investigated include:

boneseed	banana passionfruit	Chilean needle grass
nassella tussock	climbing asparagus	wild ginger
woolly nightshade	moth plant	pampas grass
privet	variegated thistle	wilding pines
lagarosiphon	buddleia	blue morning glory.
barberry	blackberry	

Several major pest animals in New Zealand are the result of failed attempts to use predators to control other pest animals, such as the introduction of stoats, ferrets and weasels to control rabbits, and the introduction of carp to control water weeds. More recently, the RHD virus was introduced unlawfully and widely used as a biocide against rabbits. Observations to date suggest that the disease is more effective if left to move naturally in the population and supported by other control methods. Used as a biocide it appears to be variable in its effectiveness and liable to create a resistant population.

There are risks associated with biological control. Determining and introducing a bio-control agent is a very costly and time-consuming exercise, with no guarantee of success. Reducing one species may have little ecological benefit if another species fills the vacated ecological niche, particularly if the new species is a worse pest. Despite testing before release, there is still the risk that the bio-control agent will have adverse effects on indigenous species.

The benefits of successful biological control can be high. The need for conventional, often chemical, control can be substantially reduced, sometimes to nil. Successes are permanent and highly cost effective, as well as being highly specific.

Biological control is often best as part of integrated pest-management programmes.

The city is already the recipient of bio-control agents introduced nationally, such as ragwort flea beetle and cinnabar moth. There have been various releases of biological agents for the control of old man's beard in Wellington City.

Physical barriers

For goats, pigs, deer and livestock such as sheep and cattle, stock-proof fencing is one of the most effective means of excluding these animals. It can, however, be expensive to erect and maintain. In particular, deer- and goat-proof fencing is expensive, particularly where fences are long.

The Fencing Act requires both owners to contribute a half share to a boundary fence of the type specified in the Act.

Where exclusion of stock is required, the principle of fencing stock into their owner's property will generally be applied, rather than fencing to exclude stock. Owners of livestock are responsible for ensuring their stock does not stray. The Council recognises its obligations as landowner to ensure that stock cannot stray from Council-owned land that is being grazed.

Trapping

Trapping is an effective method of control for some animal pest species. Any trap systems used will meet the recognised standards for humaneness and meet animal welfare standards.

Drainage

Aquatic pests occur in both standing and flowing water, from streams and rivers, to lakes and wetlands. Control methods are often specific and require specialist attention. Options can include drainage of an area to either kill or allow efficient removal of a pest.

Herbicide and pesticide control

While other methods of control are preferred (e.g. physical), herbicides and pesticides may be the most effective, least environmentally damaging and/or most humane method of controlling a given pest.

Reduction in the use of sprays is achieved by the use of topical applications such as gel or paste.

Council has a range of policies, guidelines and procedures for chemical use. These include:

- No-Spray Register – a list of properties where the occupier does not want sprays used on adjacent road reserve and weed control is undertaken by the occupiers themselves
- Certification of Council staff and contractors - those working with agrichemicals must be appropriately certified
- Approved list of agrichemicals – Council-approved list of agrichemicals that can be used around the city.

4.5 MONITORING

The cost of monitoring means that the choice of what is monitored and how needs to be carefully considered.

Monitoring outcomes

Monitoring has tended to focus on measuring aspects of operational performance, such as numbers of possums killed. What such figures do not tell us is how well the wider strategic outcomes of the city such as “enhancing the range of native habitats for plants and animals”, are being achieved. For example, a possum eradication programme may remove all possums, but if it allows rats to increase substantially the overall improvement in the environment may be far less than expected.

With the shift to outcome-based strategies, new ways have had to be developed to measure effectiveness.

The Ministry for the Environment (MfE) has been developing criteria for its Environmental Performance Indicator (EPI) programme, which measures the health of our environment.

The Council has developed indicators to measure the strategic outcomes set within the Natural Environment Key Achievement Area of the city’s Strategic Plan:

- | | |
|------------------|--|
| 5.1 Biodiversity | the city environment hosts and protects a representative range of indigenous and non-indigenous plants and animals in their natural communities and habitats |
| 5.2 Ecosystems | the city’s varied marine and land-based ecosystems are valued and where appropriate, protected and restored. |

Baseline monitoring has been started for the following indicators:

- the distribution and relative abundance of native forest bird species
- the structure and composition of forest and coastal plant communities
- the extent of vegetation cover classes in natural areas managed by Wellington City Council
- the condition of forest vegetation sensitive to possum browse.

An additional indicator is to be established to monitor the relative abundance and distribution of weeds in open space areas.

The continued monitoring programme for these indicators includes:

- **The distribution and relative abundance of native forest bird species**
Counts carried out twice a year in spring and autumn at the same time of year and day and in the same weather conditions as previously experienced
- **The structure and composition of forest and coastal plant communities**
Re-measurement of seedling and sapling layers within plots every three to five years with a complete survey every 10 years. Additional plots to be established in some vegetation classes under-represented

- **The extent of vegetation cover classes in natural areas managed by Wellington City Council**
Already being monitored by Greater Wellington Regional Council in some reserves. Future monitoring on an annual basis is being co-ordinated with Greater Wellington
- **The condition of forest vegetation sensitive to possum browse**
Mapping of vegetation will be repeated every 10 years
- **The relative abundance and distribution of weeds in reserves (proposed)**
Yet to be determined.

Monitoring performance

Part of monitoring is checking on performance.

Regular audits need to be done to check that stated performance targets of control programmes and operational policies are met, to ensure sound financial management and use of resources.

Site or pest-specific monitoring

Many other agencies and organisations, particularly those with national or regional responsibilities, do long-term monitoring of major weeds and pest animals. For example, Greater Wellington Regional Council monitors possum numbers as part of the possum-control programme, and also monitors other pest animals such as rats and mustelids in the Wellington City area.

While there may be occasions where there is a clear need and benefit associated with site or pest - specific monitoring, this needs to be considered in terms of the guiding principles. In particular, the need for early prevention, eradication, containment or control of pests, or lack of knowledge are not sufficient reasons to fail to act.

4.6 RESEARCH

There are still vast gaps in understanding the biological processes associated with weeds and pest animals, their ecology, control methods, interrelationships and impacts. Agencies such as Greater Wellington Regional Council, DOC and Landcare have responsibilities for research in fields that are relevant to the management of pests on the Council's open space.

There are three strands of research into pest management:

- literature search
- practical trials and experience
- innovative research.

Literature

With pest control research being given increasing priority by institutions and large landowners, there is a constant flow of new information becoming available. Some of the information is directly relevant to Wellington City and some of indirect relevance, looking at principles and theory. Sources include both New Zealand and overseas material. Keeping up to date on research will assist in ensuring pest-control planning and implementation are in accordance with the latest information available.

Practical trials and experience

Because of the size and nature of the land resource under its control, the Council has a valuable resource which can be made available for study by others or can be used by its own staff for research and investigation.

As hands-on manager of open space, the Council has the potential to do research into pests that are particularly significant locally, particularly weed control. For example, the Council could undertake research into Darwin's barberry control and management, because of the large area of Council land infested with it.

Because the mix of environment and pests is specific to Wellington, there is constant learning by the Council's staff and contractors, leading to continual improvement of management strategies and control techniques. Encouragement of an open learning style leads to sharing of useful information in the field.

The Council's field staff and contractors are the people who are in the field. With appropriate support and training they are the frontline in the early identification of new pest species and the subtle changes that come about early in changes in pest levels.

Innovative research

Innovative and specific research tends to be expensive and generally beyond the Council's resources. The Council can most effectively work with research organisations to identify areas of study that have direct and practical application to open space pest management.

4.7 COMMUNITY AWARENESS/EDUCATION

People are the key ingredient in change. Individually and collectively, their decisions and actions are critical in conserving and enhancing our biodiversity.

The whole community must become involved in the control of pests. Management of pests on Council open space land cannot be undertaken in isolation. Pests do not respect boundaries and often invade from outside open space areas. An example of this is the very high proportion of weeds in open space that are garden escapes.

While there are parts of the community that are well informed about the risks pests pose to our biodiversity, there are still large sections of the community who are either unaware or who simply don't care.

Any programme of pest control on open space must be supported by a longer-term strategy of community education and raising of awareness.

Community awareness programmes need to be designed to ensure that they reach their target audiences. Joint programmes with other agencies and organisations can offer economies of scale and avoid the duplication of resources.

Community partnerships

Iwi

The Council recognises the importance of the mana whenua relationship and has formal memoranda of understanding with Wellington Tenth Trust and Ngati Toa Rangatira.

Under the memoranda of understanding each party recognises the authority of the other to exercise their responsibilities – kawanatanga (governance) by the Wellington City Council and rangatiratanga (customary authority) and kaitiakitanga (guardianship) by tangata whenua.

Actions taken under this plan will reflect these principles and are intended to provide opportunities for discussion and to develop partnerships. At the time of writing the memoranda of understanding are under review.

“Wai 262” claim.

This claim to the Waitangi Tribunal, lodged in 1991, includes ownership and use of indigenous flora and fauna, their genetic resources, related knowledge and intellectual property rights, and their management and conservation. Although the Waitangi Tribunal granted the claim urgency, the hearing of the claim and its determination has yet to be completed.

Community groups

Council works in partnership with a wide variety of community groups which have interests in open space around the city. These range from local residents, “Friends” groups and the Karori Wildlife Sanctuary Trust, to long term environmental programmes in schools.

Community groups are encouraged to take an active interest in local open space areas. Groups do however need to have a high level of ongoing commitment from members to ensure that the groups will be able to complete projects that they initiate, even though individuals may come and go.

While there are limitations in respect of the work such groups can do as a result of health and safety issues, the members are of great assistance. Familiarity with and frequency in visiting sites mean that up-to-date information can be passed back to the Council's operational staff. This becomes increasingly important in the control of pests where early identification of infestations greatly assists control.

As many of the members of such groups are local residents, their awareness of pest control issues is communicated to the owners of surrounding properties, and assists in the prevention of gardens plants escaping and with other pest control on private land.

In addition to the more formal groups, there are an increasing number of organisations whose members are willing to participate in open space-related projects around the city on an occasional basis. This includes community service days for businesses, community work skills programmes, schools and social organisations. Such groups are often involved in the revegetation planting programme.

Other agencies

Partnerships with other land-management agencies such as Greater Wellington Regional Council, other territorial local authorities, and DOC allow information sharing and the opportunity to work jointly in areas of common interest.

There is also a need to develop greater relationships with agencies such as Transit New Zealand and Tranz Rail whose land holdings throughout the city are substantial. Their land holdings provide a substantial reservoir and corridor for pests.

Such agencies should be encouraged to adopt similar programmes for pest control to those in place for the surrounding environment, as part of their commitment to good corporate citizenship and environmental reporting.

4.8 IMPLEMENTATION

Implementation plan

The adoption of this pest management plan is the first of the two stages needed to make the new focus for the control of pests a reality. The second stage is the implementation plan which develops operational practices to prevent the arrival of new pests, eradicate or prevent newly arrived or existing pests from spreading, and which identifies and prioritises the ecologically important sites throughout the city.

The implementation plan is appended to this document (see *Appendix VI*).

The implementation plan clarifies the costs associated with control programmes and sites, and identifies areas where funding adjustments, including increases, may be required. Options for differing levels of service will be proposed and their funding impacts examined. The balance between control levels, available financial resources

and public expectations will also be examined. The implementation plan allows the community to know when specific sites are likely to be addressed, so that their expectations can be managed effectively.

Each priority site identified in the implementation plan will have an individual pest management plan which will include the species or ecosystems present that make the site valuable, identify the pests that need to be controlled and develop a programme to undertake the control.

In determining the control operations to be undertaken, the need to further manage the site will be taken into consideration. Clearance of large areas of weeds will require that the cleared land be managed to prevent re-infestation.

Species such as Darwin's barberry that need to be prevented from spreading further are identified and will have specific operational programmes developed.

Buffer zones are identified reflecting the needs of the site and the pests to be managed. For example, an urban buffer zone may extend to the top of the nearest ridge-top or catchment. In rural or urban fringe open space, buffer zones may extend much further to cater for a wide ranging mobile pest such as goats.

Private land may be included within the buffer zone where it would be beneficial to the priority site for the Council to undertake pest control, or for landowners to work with the Council to achieve maximum effectiveness.

Impacts of implementation

The change in the focus of pest control from specific species to priority sites may have some flow-on effects that will require time and education for the community to accept.

By directing existing resources into priority areas, non-priority areas will receive less attention. This could result in a perception of increased weeds in low priority sites that are currently actively managed. Some of the likely priority areas are less visible to the public, and the removal of pest species may not be immediately obvious.

Consequently, it will be important to educate the public about why some sites appear to have less attention, and to highlight the work being done in priority sites.