The Ark in the Park

Five Year Plan
2016-2021

ark in the park

From the ridges to the sea: Restoration of the Waitākere Ranges to create a safe haven for native species which is rich and diverse, and is valued by present and future generations.

Approved by the Ark in the Park Governance Group

14th of March 2016

Revision history

Version	Date	Description	Authors

Figure 1 - A Kererū shows off its characteristically iridescent plumage. The resident Waitākere Ranges Kererū population has benefitted greatly from the restoration activities carried out in The Ark in the Park. (photo by Maurice Weststrate)

Cover photo – Aerial view of the Waitākere Water Reservoir and Dam situated in The Ark in the Park, Cascades Kauri Park (photo by Jeremy Painting)

Contents

Figure 2 – Auckland City Walk - Waitākere stream during a winter flood (photo by Keryn McCracken)

Map of “The Ark in the Park”

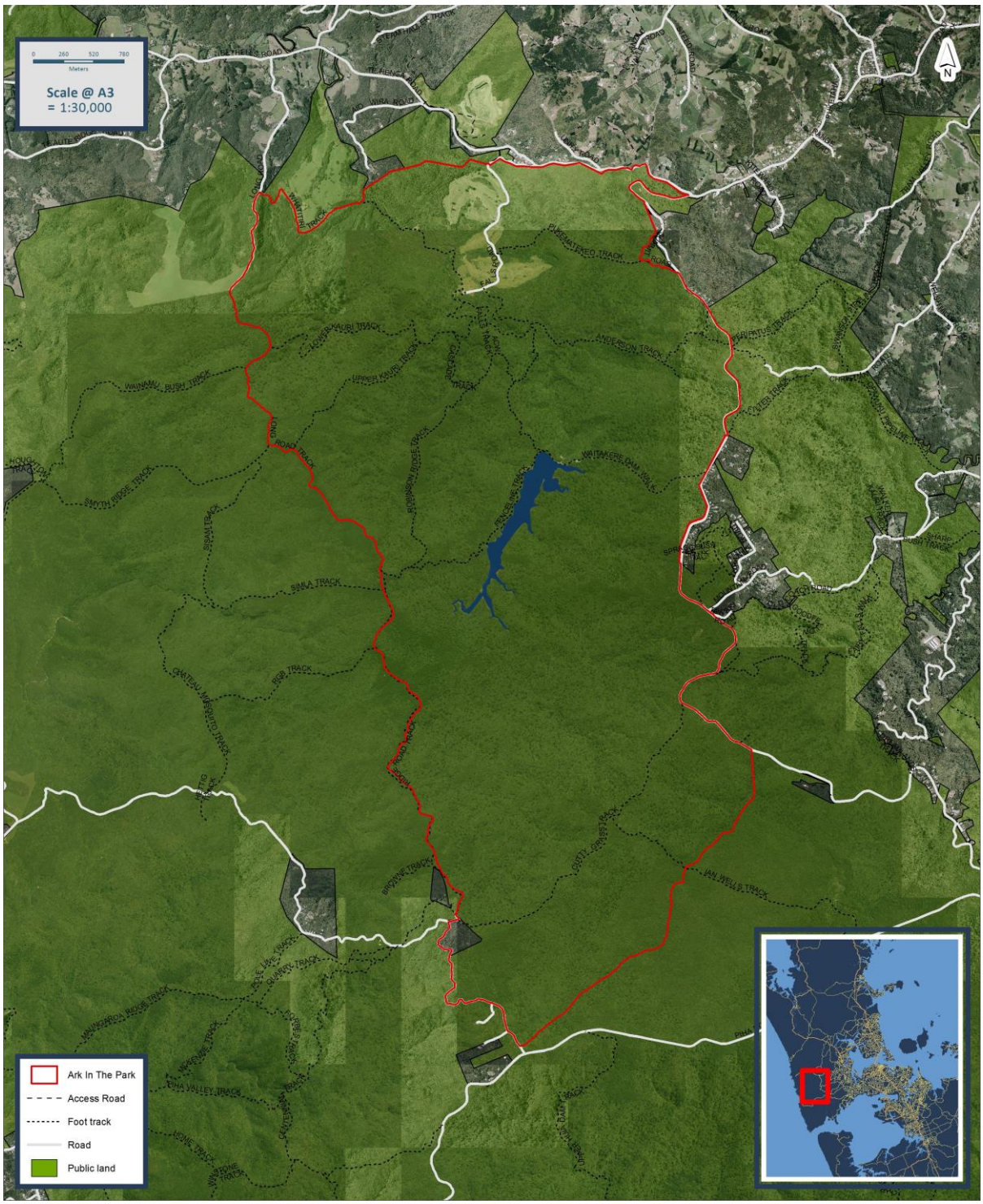

Figure 3 – Above: the 2100 hectare Ark in the Park is accessible to the 1.5 million inhabitants who make up the Auckland Region. While close to Auckland, the Ark sits within a rugged wilderness, merging without borders into 17,000 hectares of predominantly podocarp broadleaf forest. (Map provided by Auckland Council).

1.0 Introduction

Ark in the Park (AiP) is a collaborative project between Forest and Bird and Auckland Council, supported by our local iwi; Te Kawerau a Maki. This plan has been prepared in accordance with the Partnership Agreement (2014), which sets the foundation for this project. The plan includes goals and actions for the protection, management and restoration of the species and ecosystems of AiP for the next 5 years and beyond. It also contains goals and actions for the successful running of the project, particularly community participation, volunteer activities, learning opportunities and collaboration.

This plan replaces and builds upon the *Ark in the Park Restoration Plan* (Bellingham et al., 2009), and is consistent with the *Regional Parks Management Plan (2010)*. A working group made up of AiP volunteers who responded to an invitation to participate carried out initial development of the plan. The wider volunteer base was encouraged to submit comments and suggestions at a Forum event, via suggestion box and by email. The plan was developed further with input from the project partners as well as from external technical experts. In particular, representatives from the following organisations were consulted: Auckland Zoo, Supporters of Tiritiri Matangi, Department of Conservation and the Kōkako Recovery Group.

The Ark in the Park Governance Group has endorsed this plan.

Each year, the AiP Management Committee develops an Annual Work Plan based on the goals of this long-term plan. This is also submitted to the Governance Group for approval.

Flexibility and adaptability of this plan

This plan is intended to remain flexible and current, allowing resources to be redeployed when necessary to address opportunities and challenges as they arise.

2.0 Vision

The Partnership Agreement (2014) sets out the following vision:

To enhance indigenous biodiversity and ecosystem functioning within the project area. By doing so the project aims to showcase how natural values can be protected and enhanced through community involvement, inter-agency cooperation and public commitment.

The project aims to enhance indigenous biodiversity in the Waitākere Ranges, while conserving the natural, recreational, historical and cultural features of the Ranges.

3.0 Background

The concept for Ark in the Park originated with a Forest and Bird Waitākere branch member in early 1999, and was taken up soon afterwards by the branch committee. Invitations were made to the Waitākere Ranges Protection Society and a steering committee was set up in May 1999 to further the concept of an "open sanctuary", where, with increased predator control and targeted weed control, the ecology of the Waitākere Ranges could be restored and species that had been lost reintroduced to the ecosystem. In discussions with the former Auckland Regional Council and others, the concept of "The Ark in the Park" within the regional parkland was developed.

Fourteen potential sites around the Ranges were evaluated and three of these were short-listed. The site at the Cascades Kauri Park was selected in 2000 as the priority site for restoration for a number of reasons. It had an intact forest remnant, the presence of iconic species such as Hochstetter's frog and long tailed bat, a range of ecosystems and good access via tracks and roads. Good access made it both feasible and practical to carry out regular predator control, and it was hoped the resulting low predator numbers would facilitate successful species reintroductions.

Today, Ark in the Park is an open sanctuary where people and nature are relatively free to mix. Ancient forest giants provide a magnificent canopy that offers shelter to many and varied seedlings emerging from the understory. AiP volunteers report strong feelings of a sense of guardianship and personal well being gained through developing skills, fitness and social networks.

All Aucklanders, and indeed other visitors, benefit from having access to a healthy forest ecosystem and experiencing rare native species on the doorstep of New Zealand's largest city.

Figure 4 – Above: Banding a kōkako chick at Ark in the Park in 2013 (photo by Riki Bennett)

Figure 5 - Right: The North Island Robin, or toutouwai, was reintroduced into The Ark in the Park in April 2005 (photo by Keryn McCraken)

3.1 Te Kawerau a Maki: A Brief History

Te Kawerau a Maki were one of the earliest tribes to settle within the wider Auckland area. Our origins arise from the first inhabitants of the land - the Turehu, to the arrival of the Tainui, Aotea, Tokomaru, Kahuitara, and Kurahaupo canoes in the 14th century, and the Ngati Awa, Ngaoho, and Ngaiwi people who occupied the wider area prior to 1600. The eponymous ancestor Maki is an important figure in the history of Tamaki Makaurau. He was a famed warrior who conquered much of the region during the early 1600's after migrating with some 300 of his hapu to Tamaki Makaurau. In time Maki's descendants occupied lands from Hikurangi (West Auckland), to Te Whenua roa o Kahu (the North Shore), Whangaparaoa, Mahurangi, Matakanakana, Pakiri, southern Kaipara, and the gulf islands of Aotea (Great Barrier Island), Hauturu o Toi (Little Barrier Island) and Tiriti Matangi.

The Waitākere Ranges and Hikurangi/West Auckland are of high cultural significance to Te Kawerau a Maki. Our early ancestor, the Turehu chieftain Tiriwa, lived throughout the extensive forest which once covered West Auckland, the remnant of which is now the Waitākere Ranges. It is from this ancestor that the traditional name for Waitākere, Te Wao nui a Tiriwa – the great forest of Tiriwa, comes. Later ancestors including Rakataura (Hape) of the Tainui waka came by the area in the 14th century. The area contains many sites of significance including kainga (open settlements), pa (defended settlements), and wahi tapu (sacred sites). Te Kawerau's connection to the whenua is evident in the many carved pou throughout Hikurangi and the Waitākere Ranges.

Figure 6 – Above: The Waitākere Ranges is regarded as a significant ecological area. The environment is one of dense and richly diverse indigenous fauna and flora (photo by Joe Judd)

Figure 7 – A Tui stands sentinel over the characteristically red flowers of the New Zealand Flax - *Phormium tenax* or harakeke (image by Grant Capill).

Figure 8 – the Waitākere Water Reservoir at times is a watercolour landscape (image by Joe Judd)

Figure 9 – Page 8 (bottom left): Kōkako release (photo by Mark Darin)

Figure 10 – Page 8 (bottom right): Volunteers and iwi representatives at a bird release (photo by Chris Chadwick)

4.0 Achievements to date

Milestone	When achieved
Concept of Ark in the Park conceived	1999
Cascade Kauri Park selected as preferred location, out of 14 candidates, for The Ark in the Park Open Sanctuary	2000
Volunteers from the Royal Forest and Bird Protection Society of New Zealand begin animal pest control on a 250 hectare zone around Pukematekeo	2002
The area of pest control expanded to cover 600ha of the Waitākere River catchment, downstream of the Waitākere Reservoir	2004
First translocation of whiteheads	August 2004
First translocation of NZ robins	April 2005
Rat monitoring gives a result of below the targeted 5% for the first time	July 2005
Regular weekly volunteer sessions established	October 2006
Beginning of long-term bird monitoring (via distance sampling) inside AiP with a control outside	May 2007
First translocation of hihi	2007
Further expansion of pest control area to approximately 1100 hectares	2008
First translocation of kōkako	September 2009
Expansion to 1800ha	2010
First kōkako chick hatched at AiP since the reintroduction of kōkako to the ranges	December 2010
Canopy climbing group established	March 2010
Expansion to 1900ha	2011
Addition of a second weekly regular volunteer day	May 2011
Expansion to 2100ha	Early 2012
Stoat catches reach 1000	February 2015
Number of supporters registered to receive project bulletins passes 700	2015

5.0 Goals for the project

The following goals provide the framework and direction to continue building on what has been achieved to date.

5.1 Protecting and enhancing biodiversity

The biodiversity of AiP is protected and enhanced through effective management and restoration of its indigenous species and ecosystems.

5.1.1 Protection

Ecosystems are protected and regenerating, and native species present in AiP are recovering through the use of adaptive best practice methods that:

- Continue to significantly reduce animal pests (including cats, dogs, mice, mustelids, possums, pigs, rabbits, rats, sulphur-crested cockatoos, wasps);
- Continue to significantly reduce plant pests and diseases
- Ensure that pest control is consistent with the Regional Pest Management Strategy and Waitākere Local Board Weed Plan, where appropriate.

Dogs are effectively excluded from AiP, and the public is educated about the importance of keeping their dogs away for the protection of native species.

5.1.2 Restoration

Indigenous species (including birds, reptiles, amphibians, invertebrates and plants) that have been lost from the Waitākere Ranges are re-introduced to AiP, subject to conservation need, ecological suitability and feasibility.

The main goal of a translocation is to establish a self-sustaining and detectable population within AiP.
All potential translocations or re-introductions require careful evaluation to ensure they are appropriate. In addition, it is important to ensure that the factors that caused the original population to become locally extinct have been removed or controlled. Translocations also require long term planning and monitoring to assess outcomes and to identify the factors that have influenced success or failure. The considerations needed for potential reintroductions or translocations are detailed further in Appendix 1.

Compared to some other potential sites, two main constraints limit the range of species that could be reintroduced to AiP:

- AiP will always have some predators as it is unfenced; and,
- Dispersal of reintroduced species beyond the relative safety of AiP is a reality of mainland translocation. Individual birds released at AiP in the past have been recorded as having spread long distances within the Waitākere Ranges, and beyond. Individuals or populations that disperse outside the AiP area will be assessed on a case-by-case basis for the necessity and practicality of providing additional management effort, such as predator control and monitoring.

Figure 11 - Main image: Mature Kauri *(Agathis australis)* (photo by Chris Chadwick)

Figure 12 - Top left: Kākā (*Nestor meridionalis)* regularly visit the Ark (photo by Ben Mitchell)

Figure 13 – Above: Epiphyte garden in the canopy (photo by Grant Capill)

Figure 14 - Left: Mushrooms on the ground (photo by Andrew Murdoch)

5.2 Community participation

Community participation is the principal means for enhancing biodiversity at AiP.

5.2.1 Auckland communities and tangata whenua are actively engaged in conservation activities within the project area.

5.2.2 The AiP project provides volunteers with enjoyable and engaging experiences, and it encourages and maintains on-going involvement.

5.2.3 The AiP provides a diverse range of opportunities for hands-on conservation volunteering, and meaningful conservation opportunities are developed.

5.2.4 Volunteers' knowledge and feedback is listened to and their input into management decisions is encouraged.

5.3 Recognition of mana whenua

The role of Te Kawerau a Maki, as mana whenua for Te Wao nui a Tiriwa is acknowledged.

5.3.1 The AiP fosters its relationship with Te Kawerau a Maki and seeks opportunities to work together where appropriate (e.g. opportunities for youth mentoring).

5.3.2 The role of Te Kawerau a Maki is acknowledged in communications about the project.

5.3.3 The principles of the Treaty of Waitangi are taken into account in the management of the project.

5.4 Project continuity

The Ark in the Park project is sustainable and resilient.

5.4.1 Manage risks to AiP's core functions and outcomes by adapting methods and practices where necessary. Key areas where risks and mitigation strategies/actions need to be addressed include:

- Environmental conditions, including predator pressures.
- People resources, including staff and volunteers
- Health and Safety
- Financial stability
- Partnerships, including the on-going cooperation and support of project partners.
- On-going public support
- Work processes, records, monitoring, data back-up and archiving

5.5 Research and new methods

Research is encouraged and supported to extend knowledge and understanding of AiP's native species and ecosystems and to develop best practice management techniques.

5.5.1 Best practice management techniques are used in AiP.

5.5.2 The project is alert to emerging technology and adopts new practices where they provide improved outcomes and efficiencies.

5.5.3 Appropriate research within AiP is encouraged, including studies in the areas of ecology, communications and volunteer dynamics.

5.6 Learning and education

Learning, education, and recreation are promoted as ways of enriching the experiences of volunteers and visitors.

5.6.1 The AiP will work with Forest and Bird's Kiwi Conservation Club (KCC) to give club members practical conservation, learning and recreation experiences that support the project.

5.6.2 The AiP will engage with local primary and secondary schools to encourage learning and the use of the project area for school activities, where appropriate.

5.6.3 AiP advocacy activities and materials increase people's knowledge and interest in the Waitākere Ranges ecosystem, and their participation and support for the project.

5.7 Collaboration

The Ark supports, co-operates and shares information with others for the benefit of the project and conservation in general.

5.7.1 Local groups and networks in the Waitākere Ranges are informed about AiP activities and AiP representatives participate in networking opportunities.

5.7.2 AiP collaborates with conservation and restoration groups, government agencies, tertiary institutions and relevant subject experts.

5.7.3 AiP communicates regularly with volunteers, funders and supporters as well as other open sanctuaries throughout New Zealand.

6.0 Actions

Protecting and enhancing biodiversity

Protection actions:

1. Complete a programme of carefully organised seasonal and responsive baiting.
2. Carry out a trapping programme year-round in which a network of traps throughout the core and periphery of the Ark are serviced regularly.
3. Complete a programme of monitoring of pest populations. This includes monitoring via tracking tunnels as well as analysis of bait uptake and trap catch data.

4. Complete monitoring surveys of total bird counts (all species). Continue to gather long term data on native species, including species surviving without intervention at Ark in the Park. Celebrate and communicate the increases in population e.g. of tomtit, tui, kererū, grey warbler, fantail, morepork as well as other taxa such as invertebrates and reptiles.
5. Undertake appropriate weed control. Ensure weed methodologies are consistent with the local board weed plan
6. Follow kauri die back precautions carefully and actively promote good practice.
7. Continue with the Kōkako translocation programme underway to achieve 40 founders and long-term 500 individuals, as specified by the Recovery/Specialist Group. Releases will take place in 2016 and 2019.
8. Complete the whitehead translocation programme that is underway. In 2016 organise a review programme to evaluate the level of success so far and assess future options.
9. Action: Remain aware of potential self-reintroduction opportunities, in particular record kaka sightings and follow up with a sound anchoring proposal to encourage year round residence. Bellbirds may also self-introduce. Raise volunteers' awareness of the importance of reporting sightings.
10. Survey for Hochstetter's frog.
11. Work with Auckland Council Biodiversity to attempt to identify maternity roosts of long tailed bats.
12. Continue to carry out annual gecko monitoring in collaboration with AC biodiversity as well as continuing to deploy tracking cards in survey trees to record skink presence.

Restoration actions:

13. Investigations to date suggest several species that may be ecologically suitable to consider for reintroduction at the Ark. The feasibility of reintroducing the following species will be investigated this within the term of this plan. Feasibility studies will include checking historical records and/or field survey to establish presence or indicate absence.

- *Cyanoramphus auriceps/* Yellow crowned kakariki
- *Dactylanthus taylorii,* woodrose/Wae Wae Atua – an endemic parasitic flowering plant listed as 'chronically threatened – serious decline' and ranked as a high priority conservation species by DOC.
- *Deinacrida,* Wetapunga sp. – an endemic invertebrate, New Zealand's largest insect.
- Red and yellow admiral butterflies. *(Vanessa gonerilla* and *V. itea* respectively*)*
- *Dodonidia helmsi,* Helm's/ Forest Ringlet butterfly.
- *Ileostylus micranthus, Green Mistletoe/*Pirita
- *Korthalsella lindsayi,* Dwarf Mistletoe.

Community participation actions:

14. Encourage and facilitate operation of the project so that one generation of volunteers can share experience and pass on tasks to the next generation (intergenerational participation).

15. Build on existing practices for recruitment, training and retention of volunteers. Staff will build project resilience by applying best practice to recruit and nurture volunteers and expand the volunteer knowledge and skills base.
16. Identify key demographic groups and organisations where there is a higher chance of recruiting volunteers. Form links with these organisations.
17. Develop task lists or standard operating procedures for sub-projects of Ark operations.
18. Identify and encourage suitably skilled and knowledgeable individuals to fill key roles while sharing their knowledge with others. This will ensure the project continues with minimal disruption should a key volunteer discontinue.
19. Continue to identify, facilitate and promote a range of meaningful conservation activities that cater for a range of ages, physical abilities, skills, levels of knowledge and motivations.

Recognition of Mana Whenua

20. Liaise with the Heritage and Environment Manager for Te Kawerau Iwi Tribal Authority to identify opportunities to engage Te Kawerau a Maki in the project.
21. Encourage a regular two-way flow of communication between Te Kawerau a Maki and Ark in the Park.

Project continuity

22. Monitor environmental fluctuations, including those thought to be associated with climate change in order to adapt management practices if necessary to maintain biodiversity in the face of changing conditions.
23. Human resourcing – recruit and retain volunteers by providing a positive volunteering experience.
24. Financial stability – build positive lines of communication with funders. Present them with complete, accurate applications and reports within specified timeframes.
25. Explore a range of funding sources.
26. Partnerships – continue to foster positive relationships with key project partners to secure on-going cooperation and support.
27. Public support – continue to educate the public about conservation, in particular predator control via the use of poison baits and traps. Promote positive stories.
28. Health and Safety – meet all regulatory obligations and standards for Health and Safety, and implement practical procedures to protect the health and safety of all volunteers and staff.
29. Archiving- continue to improve archiving, back-up and documentation processes.

Research and new methods

30. Use technology – adopt and optimise technology and methods to achieve effective pest control outcomes, overcome barriers faced by open-sanctuary projects, and ensure AiP is at the leading edge of open-sanctuary management, thereby setting an example for large scale mainland conservation projects.
31. Promote the Ark as a research and trial site. Liaise closely with universities and other research organisations to enable them to study conservation within an intensive pest control environment. This will ultimately benefit open-sanctuary management at AiP and across

New Zealand. Encourage research studies especially in the areas of ecology, communications and volunteer dynamics.

Learning and education actions:

32. Work with Forest &Bird's Kiwi Conservation Club (KCC) – work closely with KCC managers to ensure AiP adds value to, and benefits from, the KCC programme.
33. Engage with schools - directly engage with local primary and secondary schools using Ark-relevant material and the Ark project area as tools to promote conservation awareness.
34. Provide an internship programme for secondary school students, particularly local schools.
35. Advocate - create advocacy material to enhance people's knowledge and interest in conservation and, to encourage support, and new or renewed participation in AiP.
36. Plan and commence a programme of guided summer walks to raise the profile of AiP.
37. Work with Parks to encourage appropriate recreation within the Ark.

Collaboration actions:

38. Local groups and networks - communicate regularly with local groups in the Waitākere Ranges and participate in networking activities.
39. Regularly meet with and learn from relevant specialists regularly.
40. Communicate widely - communicate regularly with Ark volunteers, funders and supporters as well as other open sanctuaries throughout New Zealand.
41. Provide regular (weekly) email updates to Ark volunteers.
42. Hold volunteer forum events approximately twice per year
43. Have annual face to face meetings with funders, if desired by the funder.
44. Provide a regular newsletter to supporters.

7.0 Size of the Ark in the Park

The area designated as the Ark in the Park project currently stands at 2100 hectares. The gradual size increase to this point follows the stated intent in the previous plan, and also, reflects the decision made to expand further to the south to protect kōkako that established territories outside the managed area that existed in early 2012.

Further increasing the size is beyond the capacity of the current infrastructure and would require additional staff and facilities in order to ensure current outcomes are not compromised.

The land area of the Ark will be reviewed in 5 years from the date of this plan. Although, review of, this decision may be prompted by changing circumstances. These will be investigated on a case-by-case basis. Examples where expansion may be considered include:

- If reintroduced birds or other taxa are found to have established territories or nests outside, but near to, the current managed area.
- If populations of threatened flora or fauna are identified near to the current managed area.

A reduction in size would only be contemplated in a worst-case scenario, such as if resources (financial and the existing human resource) were to become significantly limited.

8.0 Our wider environment

The Ark has the potential to positively influence the biodiversity of neighbouring forest environments. It serves not only to create a 2100 hectare safe haven for nature, but also to work as part of a bigger conservation picture, with the landscape of the Waitākere Ranges containing an ever increasing area of land on which predator and plant pest control is undertaken by other organisations, groups and individuals.

As populations of native species establish within AiP, there is the potential for natural dispersal to occur throughout suitable habitat in the Ranges. There are opportunities to work with other conservation organisations, groups and individuals who are working on compatible projects.

Buffer zones

AiP's predator control has expanded to include a buffer zone of approximately 700ha of neighbouring properties in two geographic areas. Engaging the residents of buffer zones with predator control assists both in managing pest reinvasion at AiP, as well as fostering links between the project and the local community.

Approaches will be made to residents of other properties (who are not yet participating) both in Bethells Valley and Scenic Drive with the intention of recruiting more participants.

1.The Bethells Valley buffer zone

AiP, in association with AC Biosecurity staff and Auckland based Forest and Bird staff, has assisted with predator control on about 70% of the properties to the west and north-west of the project area. This has provided a wildlife corridor between the Ark in the Park, Forest & Bird's Matuku Reserve and Habitat Te Henga.

2. The Scenic Drive buffer zone

Directly to the east, the section of Scenic Drive from Pukematekeo to Mountain Road consists of low density residential properties. A number of the residents of these properties support the predator control efforts of AiP by carrying out baiting or trapping on their properties. Many of these residents are also AiP volunteers.

9.0 Measure performance (monitor)

Monitoring is essential to assess progress towards achieving the goals and objectives of this plan. Progress must be measurable. Monitoring will be reported and used to inform management decisions and to generate data as a record for the future.

- Assess and report progress against the AiP Annual Work Plan.
- Report pest control results
- Report indigenous flora and fauna information gathered through monitoring and surveying
- Record the commitment of key stakeholders and, the number and contribution level of volunteers.
- Report regularly to the AiP Management Committee and Governance Group.

Figure 15 – Above: Fungi from the Clavaria genus on the forest floor (photo by Andrew Murdoch)

Figure 16 - Right: The bright blue colour of *Entoloma hochstetteri* resembles the blue wattle of the kōkako bird; hence the Māori name for this fungus; werewere-kōkako (image by Chris Chadwick).

Appendix 1: Reintroduction Guidelines

When feasibility studies of introducing new species are undertaken the following factors will be assessed.

Rationale/justification

Does this species fit with our rationale for ecosystem restoration?

Ecological requirements

What are the ecological requirements of this species and do they exist in AiP?

- Size of the area
- Predator control levels
- Food availability
- Any additional management required (e.g. feeder stations, nest boxes)

Ecological interactions

What are the interactions and impacts of the species on others already present at AiP, e.g. competition, predation, hybridisation, disease, behaviour.

Expected outcome

Is it thought that a self-sustaining population can be established at AiP?

Species distribution

What is the known species distribution (former and current)? Is there a resident population already existing within the AiP or Waitākere Ranges?

Reasons for decline/localised extinction

What were the reasons for the species decline/disappearance and have these been remedied?

Post release monitoring

Has a detailed understanding been gained of post release monitoring requirements and does AiP have the resources (financial, human resource, skills and equipment) to complete this to a high standard?

Dispersal

What is the species propensity to disperse?

Potential source populations

What populations are available to harvest from?

- Consider the effect on the source population
- Consider the distance and method of transport for the species being translocated
- Check the genetics of the source population for suitable diversity (if known)

Recovery/Specialist Group

What involvement/support is needed from the relevant recovery/specialist group? How does the translocation fit with the national species recovery plan (if one exists)?

Future translocations/long term plans

Will it be a one-off translocation (over one season) or will a series of translocations be needed?

Iwi liaison

Have the wishes of both donor iwi and Te Kawerau a Maki been taken into account?

Translocations to other sites

Has this species been previously translocated? If so what lessons can be learnt?

Security

Is there a risk of theft for collection or trade?

Financial resource

Are funds available to cover the translocation and post-release monitoring costs?

Research opportunities

Are there particular research gains that could be achieved through translocation of this species to AiP?

Figure 17 - Above: Kōkako were first re-introduced in September 2009 with the first chicks hatched in December 2010. This photo was taken during a bird census in 2016. (photo by Mark Darin)

Figure 18 - Right: Initally kōkako released at the Ark were fitted with transmitters. Now they are tracked each spring as part of the census using automatic recorders and surveys on foot. (photo by Jason Hosking)

Appendix 2: Assessment of species suitability for translocation

Refer to table on page 21 and 22.

Reference

Ark in the Park Restoration Plan (Bellingham et al., 2009)

Figure 19 - Above: Hochstetter's Frog prefers moist gaps under shaded debris, like rocks and logs and along streams and seepages in native temperate rainforest along undisturbed stream banks within the Ark. Within the right environment, these frogs can live for 40 years (photo by Maurice Weststrate)

Figure 20 - Left: Hochstetter's Frog (photo by Jacqui Geux)

Active programmes of translocation and/or monitoring	
Kōkako (*Callaeas wilsoni*) Top up population to achieve 40 founders.	**Underway** Population established and plans to achieve goal. Ongoing since 2009.
Whitehead/popokotea (*Mohoua albicilla*) Difficult to ascertain how successful the translocation programme is. Review in 2016.	**Underway**
Geckos Ground based (closed cell foam covers on tree trunks), spotlighting and arboreal monitoring tunnels reveal the presence of Pacific and Forest geckos at the Ark.	**Underway/ Realistic**
Hochstetter's Frog **Requirements**: Having sufficient undisturbed damp, wet stream environments. Surveys undertaken by EcoQuest determine abundance and population changes.	**Realistic** Hochstetter's are known to be present in the Ark.
Possible self "re-introduction"	
Kākā (*Nestor meridionalis*) Flocks are regularly seen at the Ark in winter, no confirmed year round residence or breeding has been recorded. The aim is to establish a permanent breeding population. Sound anchoring will be used to encourage Kaka to remain year-round. If Kaka do not establish breeding population within 5 years via sound anchoring or naturally, then use of an aviary for translocation and soft-release will be considered.	**Realistic**
Bellbird/korimako (*Anthornis melanura*) **Requirements:**- Reinforce wildlife connections with Shakespeare/Tiritiri Matangi to encourage natural re-introduction. Monitoring programme. **Constraints:** Birds susceptible to predation, and sensitive to translocation. Unknown migration time-frame, and dependent on conservation efforts beyond the Ark zone.	**Possible** that natural re-introduction may occur. **Not realistic** to translocate.
Requiring translocation to re establish	
Kiwi (North Island Brown) (*Apteryx mantelli*) **Requirements:** Effective dog control, enforcement and monitoring programmes. Possible enclosure structures for a nursery. **Constraints:** Kiwi prone to dog attacks. Bylaws would need to ban dogs from the Ark zone and involve compliance checks.	**Realistic over a longer time period with improved dog control.**
Mistletoe (Green or dwarf) **Requirements:** Effective predator control and monitoring programmes.	**Realistic**
Wētāpunga/giant wētā (*Deinacrida heteracantha*) **Requirements:** Ongoing low predator numbers.	**Realistic** Auckland Zoo now breeding Wetapunga. Invertebrates respond well to management because they have a high rate of productivity.
Dactylanthus/pus o te reinga (*Dactylanthus taylorii*) **Requirements:** low numbers of possums and pigs. Protection from browsing of these pests at the low numbers that will still exist	**Realistic**

Rifleman/titipounamu (*Acanthisitta chloris*) **Requirements:** Effective predator control and monitoring programme. Funds for translocation permit and staff time. **Constraints:** Dispersal factor unknown. Can't carry transmitters. Helicopter transport for translocation is costly.	**Possible** Achievable with significant financial resource and pending population density and genetic advice.
Grey-faced Petrel/Oi (*Pterodroma macroptera*) Are at nearby Bethells Beach. Important to bring back nutrients into forest ecosystem.**Constraint:** The Ark may be too far inland to be a viable nesting site. Chick translocation is expensive, but sound luring is viable.	**Possible**Use of sound luring might attract birds to nest
Weka (*Gallirallus australis*) **Requirements:** Effective predator control and monitoring programmes. **Constraints:** Require bait station and trap modification. May limit future species. Heavy predation on invertebrates.	**Possible**
Yellow-crowned Kakariki (*Cyanoramphus auriceps*) **Requirements:** Effective predator control and monitoring programmes. An aviary enclosure probably required. **Constraints:** Difficult to monitor because birds disperse. Susceptible to predation.	**Possible**
Forest Ringlet Butterfly **Requirements:** Comprehensive wasp control. Cutting Sedge (Gahnia sp.) in lowland North Island habitats. **Constraints:** Having sufficient habitat. Prone to predation by wasps. Dispersal may also cause a monitoring challenge.	**Possible**
Rock Wren/piwauwau (Xenicus gilviventris) **Requirements:** Very effective predator control and monitoring programme. Funds for translocation permit and staff time. **Constraints:** Several characteristics of rock wren make them vulnerable: they nest in holes making them easy prey; they tend to nest only once in a season; they are short-lived.	**Not realistic**
North Island Saddleback/Tieke (Philesturnus rufusater) **Requirements:** Very effective predator control and monitoring programmes. **Constraints:** Very vulnerable to predation.	**Not realistic** Vulnerable to predation
South Island Takahe (Porphyrio hochstetteri) **Requirements:** Very effective predator control and monitoring programmes. Requires large area of open grassland.	**Not realistic** Within current area. Pae O Te Rangi may be a possible site in the future.
Lesser short-tailed Bat/pekapeka (*Mystacina tuberculata*) **Requirements:** Effective predator control and monitoring programmes. **Constraints:** Introduced predators such as rats, cats and stoats are thought to be the main reason for the decline in bat numbers. Dispersal from release site a problem.	**Not realistic** at current time. Recovery group priorities state that mainland sanctuaries will not be considered in the near future.
Archey's Frog/pepeketua (*Leiopelma archeyi*) **Requirements**: **Constraints:** Prone to predation, and lives at high altitude. Chytrid fungus (Batrachochytrium dendrobatidis) could be an ongoing threat to species survival.	**Possible/Not realistic** High altitude living
Northern tuatara (): Vulnerable to predation.	**Not realistic**
Hihi/Stitchbird (*Notiomystis cincta*): Dispersal was identified as a key reason for the failure of the reintroduction. This factor is still present so it is unwise to try this species again.	**Not realistic**

Appendix 3 Monitoring and evaluation framework

STRATEGIC ALIGNMENT	INDICATOR	DEFINITION	OUTCOMES	BASELINE	TARGET	FREQUENCY	RESPONSIBLE	REPORTING
5.1. protecting and enhancing	**Rat monitoring percentages**	The number of tracking tunnels showing rat footprints after one night with the addition of a peanut butter lure are counted. This value is then turned into a percentage for northern blocks, a percentage for southern blocks as well as an overall result for AiP.	Knowledge of rat presence levels and location is gained More effective predator control Baiting and trapping effort is adjusted and targeted	80% in 2002.	Below 5%	4 times per year	AiP staff to plan the monitoring and analyse results and AiP volunteers to undertake fieldwork.	Volunteer bulletins, Management committee, governance group, funders, reports to species recovery groups
5.1. 1. protecting and enhancing	**Forest species bird counts**	The number of birds recorded via the distance sampling method across set loops inside and outside AiP.	Recovery of bird populations can be tracked to evaluate the impact of predator control undertaken at AiP.	Ark: Autumn 45, Spring 58, Summer 76 Fairy Falls: 44, 56, 54	More birds recorded within the Ark than the control site	3 times per year	A key volunteer or contractor	Volunteer bulletins, funders, management committee, governance group
5.2 and 5.3	**Number of project supporters**	The number of people registered in the project data base – either receiving weekly email bulletins or actively volunteering (or both)	Project supporters are informed about the project and inspired to take action	800 in mid 2016	1000 project supporters within the life of the current 5 year plan		AiP staff	Volunteer bulletins, funders, management committee, governance group
5.4	**Rate of success of funding applications**	Ratio of funds sought to funds received in dollar value.	AiP is securely and adequately funded		AiP forecasted operating costs are met	Ongoing	AiP and F&B staff	Management committee, governance group, F&B leadership team.
5.4	**H&S**	H&S reporting including incidents, near misses, results , annual H&S review, training or refresher sessions held, inductions	AiP is a safe place to volunteer where identified risks are proactively reported and mitigated.	A culture becomes embedded in which reporting is encouraged and supported	All incidents and near misses are reported.	The same day of the incident. Reviews 2 monthly or immediately for more serious incidents	Aip volunteers, volunteer coordinator and manager	All incidents are reported to AC, MC, GG, volunteer base as appropriate to facilitate learning and systems improvement.
5.4	**Reporting against the AiP Annual Work Plan & 5 yr plan.**	Reporting against the AWP in the form of an annual report to stakeholders		Previous annual reports submitted	Annual report produced			

Figure 21 - (Previous page main image): The Waitākere Ranges and Hikurangi/West Auckland are of high cultural significance to Te Kawerau a Maki. An early ancestor, the Turehu chieftain Tiriwa, lived throughout the extensive forest which once covered West Auckland, the remnant of which is now the Waitākere Ranges. It is from this ancestor that the traditional name for Waitākere, Te Wao nui a Tiriwa – the great forest of Tiriwa, comes. (photo by Maurice Weststrate)

Figure 22 - (Previous page top right image): A group of volunteers have become trained canopy climbers and use their skills to monitor flora and fauna in the canopy. (photo by Grant Capill)

Figure 23 - (Previous page centre left): Rat numbers are monitored through tracking tunnels. The target is 5% or lower so as to ensure native species can regenerate or breed safely. (photo by Jason Hosking)

Figure 24 - (Previous page bottom right): Seeds and tree material are collected in stockings hung underneath black plastic funnels located in the Ark as part of a nationwide study aiming to identify long term changes. This could help our understanding of climate changes and in predicting food linked changes in predator populations. (photo by Laurence Bechet)

Figure 25 - Cave Weta. The invertebrate monitoring programme at the Ark records diversity and abundance of insects including weta found within and outside areas of predator control (photo by Joe Judd)

Figure 26 - (Above): Young Ruru (*Ninox novaeseelandiae),* or Morepork. This species is known for its haunting, melancholic call. Its Māori name, ruru, reflects this call (photo by Chris Chadwick)

Figure 27 – (Below): The Mātātā (*Bowdleria punctata*), or Fernbird, is a small insectivorous passerine. While present at the Ark and nearby Te Henga wetland and Lake Wainamu. Mātātā are rarely seen because of their secretive behaviour and excellent camouflage (photo by Grant Capill)

Figure 28 – (Back cover page): Waitākere Stream during the summer months (photo by Chris Chadwick)