NORTHERN TE UREWERA ECOSYSTEM RESTORATION STRATEGY

A MAINLAND ECOSYSTEM RESTORATION PROJECT

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SUMMARY

In ecological terms, Te Urewera is a fantastic place. It is the largest example of natural landscape and related ecosystems remaining in the North Island. This vast tract of lowland forest has a complement of vegetation, flora and fauna as complete as anywhere on mainland New Zealand, including a large kokako population. It has unique assemblages of land, vegetation, and threatened species, with a special Tuhoe history and character.

Previous agencies and the Department of Conservation have been carrying out active management in the northern Te Urewera for many years. It has now been decided to carry out even more intensive management of one part of northern Te Urewera (Otamatuna, in the Waimana Valley), with associated monitoring to assess the effectiveness of management. This is an active management programme with associated performance monitoring, rather than a research project. If successful, the intention is to use this as a template for wider ecosystem restoration management in Te Urewera. The Department's vision for this area is "To acknowledge and nurture the mauri of the northern Te Urewera ecosystem". This is a challenge that will not be easily attained, to protect and enhance the vegetation and wildlife as a representative example of healthy functioning lowland forest ecosystem.

This document provides an outline of the ecological characteristics of northern Te Urewera, the people involved in its management, a vision (or goal) for restoration, management objectives, and a strategy which places short term management in the context of a long term vision. Also included are implementation provisions (including timeframes), a summary, and provision for review of this strategy.

CONTENTS

APPENDICES

SECTION ONE : INTRODUCTION

This strategy outlines the management intentions of the Department of Conservation for the northern part of Te Urewera National Park for the next 10-15 years. It includes a vision for the future, an outline of the ecological and human character of the area, some background on the concept of mainland ecosystem restoration, and a management approach to achieve the vision.

The area referred to throughout this strategy as the "Northern Te Urewera" is that part of Te Urewera National Park which is bounded to the north by the northern boundary of the National Park. To the west, it follows the western boundary of the Park south to the Horomanga River, and then follows the Horomanga inland and then extends eastwards to meet the eastern boundary of the Park.

Privately owned indigenous forest in the Whakatane and Waimana Valleys is not encompassed by this strategy, however ecosystem restoration management within the National Park would complement the biodiversity values of contiguous natural areas.

SECTION TWO - MAINLAND ECOSYSTEM RESTORATION CONCEPT

This concept is a relatively recent one in New Zealand, having arisen from a number of initiatives. In the past, the most practical and ecologically safest option for Crown restoration initiatives has been to work on off-shore islands. Rare and endangered species would be relocated from mainland New Zealand to islands where pest species were absent or had been eradicated. Re-invasion by pest species was unlikely or was only to occur at manageable levels.

Since the late 1980's the off-shore island restoration concept has been applied to species restoration initiatives on the mainland, a 'sanctuary' being provided through topography, adjacent land use pratices, fencing, or intensive and continued management of pest species. Initially management of these 'mainland islands' was targetting particular threatened species such as kokako. Early successful attempts at this type of intensive management were initiated at Mapara, as part of a bigger project also involving intensive management at Kaharoa and Rotoehu, and in the Eglinton Valley for Mohua protection.

The concept has been further adapted in response to a growing realisation of the need for and commitment to *in situ* conservation of ecosystems and biodiversity. Norton (1993) described the *mainland habitat island* concept as "the restoration of natural areas to a condition where natural processes occur as free from human interference as possible." This is consistent with the international Convention on Biological Diversity, which New Zealand is a signatory to. The Department of Conservation is now refocusing and looking towards the protection of mainland representative ecosystems with multiple conservation values.

The Department is carrying out similar ecosystem restoration projects in Boundary Stream Scenic Reserve (Hawke's Bay), Trounson (Northland), Waipapa (Pureora), Hurunui (North Canterbury), and Lake Rotoiti (Nelson). Another mainland restoration project is underway in the Karori Reservoir Reserve in Wellington City.

Mainland ecosystem restoration is one extreme in a spectrum of management intensities and scale which ranges from a benign "do nothing" approach, through to intensive manipulation of individual threatened species and threat processes. In between these two extremes is a range of management that could include; fencing, animal pest and weed control (to varying levels), species monitoring, species releases, breeding manipulation, and so on. These could be single or combined actions. There is usually a strong emphasis on research or management trials in mainland ecosystem restoration, in order that results can be applied in other situations, and so that efficiences can be identified.

SECTION THREE - INTRODUCTION TO NORTHERN TE UREWERA

The northern sector of Te Urewera National Park has long been regarded as a particularly special place. It is a unique example of an extensive area of landscape and lowland forest with relatively sizeable populations of species which are under severe threat on the New Zealand mainland.

3.1 ECOLOGICAL CONTEXT

Northern Te Urewera is often thought of as being a great tract of relatively uniform forest. It is, however, a place of considerable diversity, spanning three ecological districts, reflecting the variation in topography and vegetation pattern. Most of the area is in the lowland bioclimatic zone. Greywacke is the basement rock, with a mantle of volcanic ash. Soils are derived from volcanic ash, mixtures of volcanic ash and greywacke, or skeletal greywacke.

Rimu/tawa forest is the most common forest type, with beech common or dominant on steeper country.

A considerable diversity of indigenous species is present, with some being nationally threatened; red mistletoe, a native forget-me-not, kiwi, kaka, kokako, kaeaea (NZ falcon), kereru, whio, kakariki, pekapeka (long-tailed bat and short-tailed bat), a tusked weta, and short-jawed kokopu. Almost the fully contemporary mainland complement of birds is present (weka is the only one absent).

The usual range of introduced mammals are present, including deer, possum, rats, cats, mice, stoats, ferrets, weasels, and rats. Pest plants are confined mostly to forest margins.

3.2 HUMAN CONTEXT

Tangata Whenua

Tuhoe are the tangata whenua of the northern Te Urewera, and have lived in and interacted with the area for many centuries. They have a particularly close relationship with Te Urewera, and all of the ridges, high points, streams, old habitation sites, and waahi tapu are named. Tuhoe have never been alienated from Te Urewera and tangata whenua still live on enclaves of private land within the National Park and along the margins of the Tauranga (Waimana) and Ohinemataroa (Whakatane) Rivers.

Tuhoe living in the area have never lost contact with the natural world of Tane, and have great knowledge and understanding of the land, and the plants and animals that inhabit it.

Community

Local communities have a strong interest in Te Urewera, with many children being introduced to the area on school trips. The valleys are popular summer camping destinations, and there are strong local communities of trampers and hunters. Hunters in particular use the area extensively with many former commercial deer or possum hunters (or more recently contract possum hunters), living nearby.

3.3 MANAGEMENT HISTORY AND PLANNING CONTEXT

The traditional Tuhoe occupation and interaction with Te Urewera must be acknowledged as the earliest form of administration and management. More recent (pre-1987) government regimes have included the Urewera National Park Board and the Department of Lands and Survey, with the New Zealand Forest Service responsible for wild animal control, and associated survey and monitoring. The Wildlife Service undertook limited fauna survey in the area, and was involved with law enforcement associated with kereru hunting.

Mainland ecosystem restoration management is compatible with the two major planning documents of particular relevance to the project; the East Coast Conservation Management Strategy (CMS), and the Te Urewera National Park Management Plan 1989-1999. Relevant extracts are presented in Appendix 5.

The Department of Conservation has administered Te Urewera since 1987, and has been undertaking intensive possum control for four years, as part of a programme to protect the special values of the area.

Refer to Apendix 4 for further information on the ecological and human character, and the main planning documents.

3.4 RESPONSIBILITIES AND OPPORTUNITIES TO RESTORE THE NORTHERN TE UREWERA ECOSYSTEM

The northern Te Urewera presents unique opportunities for ecosystem restoration. Moreover, its inherent values confer serious responsibilities to conserve the spectacular biodiversity there. As stated in the CMS, "The subregion is special in that the natural ecosystems are still relatively intact, threats are still controllable, there is a useful level of information available about the values within the subregion, and the values are mostly significant in a regional context, and often in the national context. The northern part of the National Park is therefore well suited to "whole ecosystem management" rather than any exclusive focus on only one or two aspects of the ecosystem...(s.1.2.4)" The following features illustrate these opportunities and obligations:

- The potential conservation gain for biodiversity *in situ* is incomparable in the North Island. The area is part of the largest tract of indigenous vegetation and wildlife habitat left in the North Island. It is also the largest remaining example of an indigenous ecosystem in the North Island.

- The physical landscape and vegetation of northern Te Urewera is diverse, being representative of three ecological districts, including outstanding examples of lowland podocarp/tawa-dominant forest on greywacke ranges.

- The ecosystem contains nearly the entire complement[1] of indigenous birds still present in the mainland forests of North Island.

- There are a number of rare and threatened species that could benefit from intensive management: kereru, kaeaea[2], kaka, kokako, tusked weta, red mistletoe, whio, kiwi, short-jawed kokopu.

- There is a long history of wild animal control in the northern Te Urewera, particularly for deer, possums, and pigs.

- Pest species (possums in particular) are increasing to levels which pose grave threats to recently healthy populations of threatened species.

- The tolerance levels of other ecosystem components to a range of pest species are relatively unknown and merit intensive management effort.

- There is now an established history of selected threatened species monitoring in the northern Te Urewera, particularly for kokako.

- Because of its large size, there is an opportunity to trial management techniques in small, stand-alone, mainland islands within the northern Te Urewera. If successful, these can be an incremental step towards future restoration of the larger area of mainland ecosystem.

- The large area of indigenous forest in the northern Te Urewera provides the potential for increased populations of threatened species to spread from the initial intensively managed 'mainland islands' into the wider northern Te Urewera.

- There is a cadre of keen, skilled and experienced field staff already participating in the project.

- There is an existing network of operational facilities, including huts and tracks throughout the northern Te Urewera.

- The area is strategically placed to provide opportunities for inter-conservancy co-operation and staff skill sharing.

[1] Weka are not currently present.

[2] Tuhoe name for North Island falcon - see Glossary (Appendix 6).

- The project has considerable public awareness opportunities, including the prospect of its developing into a 'flagship' for the conservancy and the Department, with strong support from tangata whenua, user-groups, local communities, the business sector, and the wider regional community. This support will enhance the sustainability of the project.

SECTION FOUR : ECOSYSTEM RESTORATION IN THE NORTHERN TE UREWERA

4.1 A MANAGEMENT PHILOSOPHY

The fundamental goal for the northern Te Urewera is embodied in the vision, below, and to see this vision become a reality for the wider forest tract of *c.*50,000 ha. To achieve the vision will be a massive undertaking, and is not achievable with current knowledge and resourcing levels.

Mainland ecosystem restoration in the northern Te Urewera will have several key features. The fact that the area eventually to receive treatment is unprecedented in size is an example of the factors influencing the style of ecosystem restoration proposed. Obviously it is beyond practical and financial resources to achieve restoration of around 50,000ha in one initiative. Restoration must therefore be undertaken strategically, in an integrated, incremental and synergistic manner which adds to our knowledge of ecological values, processes and relationships as the programme progresses. This knowledge then can be applied in a practical cost-effective manner to achieve restoration of a much larger area.

The achievement of a pest-free "island" will never be an objective for mainland ecosystem restoration in the northern Te Urewera. The topography does not lend itself to that aim, but the results of management to date indicate that the positive effects of "island" pest control can be achieved in the programme area by the sustainable reduction of pests to low levels.

The intention is to start small, with one area of *c.*1,300 ha (Otamatuna), get the techniques right, develop a cost-effective approach, and then to expand the intensive management programme systematically across the wider northern Te Urewera. Intensive management on this scale in a large forest tract will require the development of innovative techniques, careful attention to cost, the development of management regimes which maximise the ecological benefits from the inputs, excellence in personnel management, committed staff, and an emphasis on monitoring to capture and analyse key information to enable the programme to advance. Key unknowns relate to the particular characteristics of the area(s) being managed, especially "acceptable" pest levels and pest reinvasion rates.

The following sections describe key features of the restoration strategy planned for the northern Te Urewera.

4.1.1 AN EMPHASIS ON MANAGEMENT TRIALS

Because of the significant values and growing threats to healthy ecosystem function and process in the project area, the prime aim of mainland ecosystem restoration in the northern Te Urewera will be *to protect ecosystem values through management intervention*. While research and monitoring will be important aspects of the project, the project is not being undertaken in order to further research aims into

management techniques and ecosystem or pest/threatened species dynamics. Rather, intervention will be treated as management trials designed to answer questions which are relevant to the continued and improved success of and active ecosystem restoration management plan in the northern Te Urewera. The management trials will therefore function firstly to develop cost effective management programmes with outcomes that are predictable and replicable. Secondly, this will allow for the refinement of techniques, equipment, timing, levels of effort and other management variables - that is, to improve effectiveness. These two outcomes, if successful, should give confidence that might justify and enable expansion of effort. The trial results should also contribute to the knowledge of practical mainland ecosystem restoration in other lowland forest areas of New Zealand.

Management trials will be carried out in the immediate and medium term, against a background of regular and continually refined possum pest control in the wider northern Te Urewera. This background pest control will be for the purpose of "holding the line" while an intensive management programme is implemented in a smaller area.

4.1.2 USE OF SEPARATE MANAGEMENT AREAS

Different management components of the ecosystem restoration strategy (e.g. control of different pest species, survey and monitoring of threatened species and other ecosystem components) will be targetted to separate, smaller-scale Management Areas in the short and medium term of the project. Selection of new areas to receive intensive management will be based on further field survey of a range of resources. The survey process, and rationale for the selection of various Management Areas for comprehensive management intervention will be documented.

Most of the northern Te Urewera has received possum control since 1990 at various levels of intensity. The Otamatuna area has been treated far more intensively, and is proposed as the initial 'Management Area'. Otamatuna comprises *c.*1300ha, located on the eastern side of the middle reaches of the Waimana Valley (Appendix 2a). It was decided to concentrate the early stages of mainland ecosystem restoration at Otamatuna because:

- it contains a representative example of physical landscape and vegetation;
- there is a good complement of common and threatened species, including kiwi, kaka, kakariki, kaeaea, pekapeka, kokako, red mistletoe, and short-jawed kokopu;
- it contains a relatively robust population of kokako which has characteristics different to populations to the west;
- it is the most accessible area of kokako in the northern Te Urewera;
- tracks and other facilities have previously been established for recreational and pest control purposes;
- there is the opportunity to build on previous pest control programmes;
- there is an established programme of kokako monitoring (breeding, fledging, survival and dispersal rates);

- there is a good resource of general ecological information, including the results of management to date;
- initial results from management intervention have been promising in terms of pest control and threatened species recovery.

Three other areas (refer to Appendix 1) have been selected for less intensive ongoing monitoring in the initial stages of the restoration strategy; Onepu (between the Tauranga (Waimana) and Ohinemataroa (Whakatane) rivers), and Waikokopu-Apiti (in the northern Ikawhenua Range), and Okopeka (just south of Otamatuna, see Appendix 2b). Most of the northern Te Urewera has received at least the minimum level of one rotation of possum control, including the Okopeka area, which has been selected as a non-treatment management control, and will be monitored accordingly. The topography, vegetation and wildlife there is comparable to Otamatuna and other parts of the wider northern Te Urewera, and it is therefore well suited as a control monitoring area. Annual possum control is now carried out in Onepu and Waikokopu-Apiti areas, as part of the wider northern Te Urewera possum control programme. There may be other sites with very high values but which are not yet as well known.

Several areas within the northern Te Urewera warrant intensive pest control solely on the basis of what is known already: that almost all of the populations of the kokako that were robust five years ago are experiencing dramatic decline, and that previous research in Mapara, Rotoehu and Te Urewera has identified that kokako deaths are often due to predation by possums.

4.1.3 ROLE AND NATURE OF CONTROLS

Non-treatment management controls will be a basic component of the management trials with monitoring to compare treatment and non-treatment areas.

It is intended to utilise relevant experience in other mainland ecosystem restoration or threatened species projects.

A non-treatment control area will be based on a level of possum control equivalent to the level of control currently applied throughout the northern Te Urewera. It would not be appropriate to cease all treatment from a non-treatment control, as it would no longer represent a control in the northern Te Urewera context. There is no need for a pure non-treatment control area as previous New Zealand experience has shown a clear relationship between predators/ competitors and species decline.

4.1.4 INTEGRATION OF MANAGEMENT

In the past animal pest control was undertaken in accordance with national pest control priorities, kokako monitoring was undertaken in relation to other threatened species work and national kokako priorities. These activities were justified, planned, implemented and measured - but against different criteria. The Conservation Management Strategy planning process provides for integration of management activities within conservancies.

Such integration is crucial in the planning and implementation of ecosystem restoration in the northern Te Urewera. It will require close liaison and collaboration between staff involved in monitoring, pest control, threatened species projects, and liaison with tangata-whenua and wider communities. This does not mean that all management activities will be occurring in the same place, rather that activities will be planned and undertaken in a manner which tends to capitalise on previous management, and which complements other management activity occurring at the same time. An example would be to utilise pest control ground operators in the wider northern Te Urewera in order to gain information on vegetation condition or key species distribution and numbers. Similarly, any other function-specific work undertaken within the northern Te Urewera should complement or support ecosystem restoration objectives in order that knowledge is built up in an efficient manner (eg. freshwater fish or invertebrate survey could be targetted to areas planned for or which have recently received intensive restoration effort). This will require efficient methods of acquisition, storage, and access to information.

Management work undertaken within the northern Te Urewera should at least be consistent with, and preferably complementary to the objectives and implementation of the mainland ecosystem restoration programme. All work should have the effect of furthering the progress of the programme towards the restoration of the wider northern Te Urewera ecosystem.

All research should complement and provide information which furthers the purpose of the programme, and related research initiatives will be encouraged. This should not, however, preclude other unrelated research if funded by other parties.

4.2 FUTURE PROSPECTS AND RISKS

4.2.1 PROSPECTS IF NO INTENSIFICATION OF MANAGEMENT

A large number of species have already been lost from this ecosystem in the last 150 years. Examples include tieke, hihi, huia, kiwi (from parts), matuhi (bush wren), and piopio.

There is already good recent evidence that there have been significant declines in the distribution and/or numbers of key species such as northern rata, mistletoe, kokako, kaka, and kiwi. It is probable that such declines will continue, leading to further extinctions from this ecosystem type.

A lack of action will severely and irrevocably limit the opportunities to sustain a healthy example of this ecosystem type and its key species.

4.2.2 PROSPECTS IF ACTION IS SUCCESSFUL

If the project is successful, it will initially provide a healthy, naturally functioning 'mainland ecosystem' example of approximately 1300 hectares of rimu-rata/tawa forest-greywacke hill country ecosystem at Otamatuna. It will also provide the information necessary for efficient and effective restoration of ecosystems in the northern Te Urewera. The approach and methods will be proven and documented.

In the medium term the project will enable application of the initial small scale mainland ecosystem approach to other strategic areas resulting in restored populations of currently threatened species, and continued provision of strategic information on techniques and application suited to the northern Te Urewera situation.

In the longer term the project will result in the ecosystem restoration of *c.*50,000ha of the northern Te Urewera.

4.2.3 RISKS

The techniques to be used to achieve project objectives have been tested in previous operations, or by scientific experimentation, and further evaluation will be undertaken as the programme proceeds. The area of greatest uncertainty is the sustainability of pest control in a vast tract of indigenous forest. Constant monitoring will be required to ensure success. The tactical risk of project failure is low as previous pest control in northern Te Urewera has had a demonstrably beneficial effect on threatened species.

Operational risk has been reduced by employing a full-time co-ordinator, upgrading accommodation and track facilities in the operational area, and by careful planning and scheduling of project tasks.

The risk of project operations causing adverse effects on biodiversity values is low. Poisoning operations are currently ground-based and all will be supervised or contracted to professional workers. Any poisoning of non-target indigenous species is likely to be at a very low level and will be outweighed by increased population productivity. Concurrent pest control will reduce the risks of prey switching or imbalancing ecological relationships between species.

The legal mandate is provided in the Te Urewera National Park Management Plan and the East Coast Conservation Management Strategy. All necessary resource consents will be obtained.

Iwi and public response to date is positive and supportive.

4.3 SUMMARY OF THE NORTHERN TE UREWERA ECOSYSTEM RESTORATION APPROACH

- The northern Te Urewera contains outstanding ecosystem values which are vulnerable to increasing threats. Protection and restoration of the ecosystem

requires urgent intervention, but arising from the initial management response, if successful, there is the potential to establish a relatively healthy and sustainable ecosystem in an extensive area of lowland forest.

- Restoration management is to be based on experience gained from other NZ mainland restoration projects. It will primarily be aimed at protection and enhancement of the ecosystem (or key components of it, in the first instance).
- Management trials will be used to refine and improve various intervention components at the same time as achieving positive ecosystem restoration outcomes.
- Several smaller management areas will be used as trials (beginning with the 1300ha Otamatuna Management Area) in the immediate and mid-term, in pursuit of this aim.
- Ecosystem restoration of the wider northern Te Urewera (*c.*50,000 ha) is seen as the long-term goal of this work.
- Research will be carried out to complement management, to increase understanding of ecological processes and the effects of management.

SECTION FIVE : RESTORATION STRATEGY FOR THE NORTHERN TE UREWERA

5.1 A VISION

Te ngahere ruruhau hei taunga manu	O sheltered haven the birds abide
Ko te wai maori huarahi rere tuna	Fresh streams a pathway for eels to pass
Te ringa tangata hei tuatua ia koutou	for man his hand at nature mock
He oi koa he ture he aroha koutou e manaaki	Alas for law and love, nature preserve

To acknowledge and nurture the mauri of the northern Te Urewera ecosystem.

The above statements are a long term vision for northern Te Urewera. The term *mauri* can be translated to mean health and life force. Any missing ecosystem component, or dysfunctional ecological process results in the degradation of the mauri of the northern Te Urewera. The use of the word *mauri* therefore conveys a particular challenge for the Department and others, for in order to nurture the *mauri* of the northern Te Urewera, restoration of the ecosystem must be as complete as achieveable (recognising that irretrievable losses have occurred).

5.2 MANAGEMENT OBJECTIVES

Because of the vast scope of the ecosystem restoration programme, the objectives outlined below contain an indicative time span within which each objective should be met. For the purposes of this strategy, the *immediate term* refers to the five year period 1997 - 2002. The *short term* includes the immediate term, and is a 10 year period between the 1997 and 2007. The *medium term* is 10-30 years (2007 - 2027). The *long term* is 30-50 years hence. Ecosystem restorations in northern Te Urewera is going to be a long term project.

5.2.1 To ensure the long term sustainability of the northern Te Urewera ecosystem, by undertaking management activities for the purpose of protecting the health and natural functioning of key components and processes in the northern Te Urewera ecosystem, e.g. retention of forest canopy and regeneration, regeneration of understorey species susceptible to browsing animals and necessary for healthy fauna populations, viable populations of keystone species (e.g. kereru), viable populations of what are now regarded as threatened species.

(i) to control currently known threats to levels which have a negligible effect on indicator species (e.g. rata, mistletoe, kokako, kiwi, and toutouwai) in the Otamatuna management area in the immediate term, and to maintain a level of browsing pest control that ensures healthy understorey composition and structure, and regeneration.

(ii) to develop effective, efficient, and predictable integrated management methods (including pest control prescriptions) in the immediate term, which are suitable for large scale application in the northern Te Urewera.

(iii) to prevent further increases of current ecological threats (ie. possums), and the establishment of new ecologically damaging pest species (e.g. goats) in the northern Te Urewera.

(iv) to develop detailed understanding of the key ecosystem components and processes (see 5.2.1. above) and their condition; the nature and impact of threats to the ecosystem; the relationships between key ecosystem components and processes, and threats; and ecosystem and threat responses to treatment in the Otamatuna and Okopeka areas in the immediate term, as well as an understanding of the tolerance thresholds of key indicators in the short term. To develop the same understanding in relation to the wider northern Te Urewera.

(v) to carry out restoration initiatives in a manner which maximises restoration gains (over the entire range of ecosystem components and processes) in relation to management effort.

5.2.2 To maintain and restore threatened species populations.

(i) to maintain resident threatened species and enable recovery of their abundance and distribution,

(ii) to implement the Kokako Recovery Plan (Rasch 1989) in the Otamatuna management area in the immediate term, and over the wider northern Te Urewera in the medium term.

(iii) to ensure the recovery of healthy populations of threatened species (short-jawed kokopu, pekapeka, kakariki, kiwi, kaeaea, whio, kaka, kereru, red mistletoe), in the Otamatuna management area in the immediate term, in other selected intensive management areas in the medium term, and over the wider northern Te Urewera in the long term.

(iv) to work from knowledge of the full range of threatened species in the Otamatuna management area in the immediate term; of threatened species in the remainder of the Northern Te Urewera in the short term.

(v) to develop threatened species management methods which are effective, efficient, predictable and suitable for application to threatened species in the wider northern Te Urewera in the short term,

5.2.3 To give effect to the Treaty partnership between the department and tangata whenua throughout the planning and implementation of the ecosystem restoration programme.

5.2.4 To gain the support and co-operation of the wide community of interest (including the local residents, recreation, business, political, scientific, and education) in the ecosystem restoration programme; and to positively contribute to the wide community of interest in the immediate term and over the timeframe of the programme.

SECTION SIX : STRATEGY IMPLEMENTATION AND PERFORMANCE MEASURES

This programme will strategically progress from restoration of small parts of the northern Te Urewera through to restoration of the wider northern Te Urewera ecosystem over a considerable time period. There will be ongoing evolution and change associated with the information, technology, methods, funding, politics, staff, and the natural resources themselves, and many aspects of ecosystem restoration are new and evolving.

It is therefore appropriate that the strategy acts as a guide for future decisions, rather than confining the programme to a detailed prescription which is likely to become quickly outdated or inappropriate for a number of reasons. The following strategic implementation statements have been developed, in order to make management choices which maximise restoration gains over the long term, and to provide a rationale for future decision-making. An indicative performance measure has been assigned to each implementation statement. The implementation statements and performance measures should be reviewed by the Area Manager and Working Group on an annual basis.

The implementation statements are intended to guide future decisions on issues such as those of management areas, which ecosystem components or processes to target, and how the results of pest control, ecosystem and species recovery, research, and monitoring can best advance overall restoration aims.

CRUCIAL CONSIDERATIONS

6.1 PROJECT MANAGEMENT

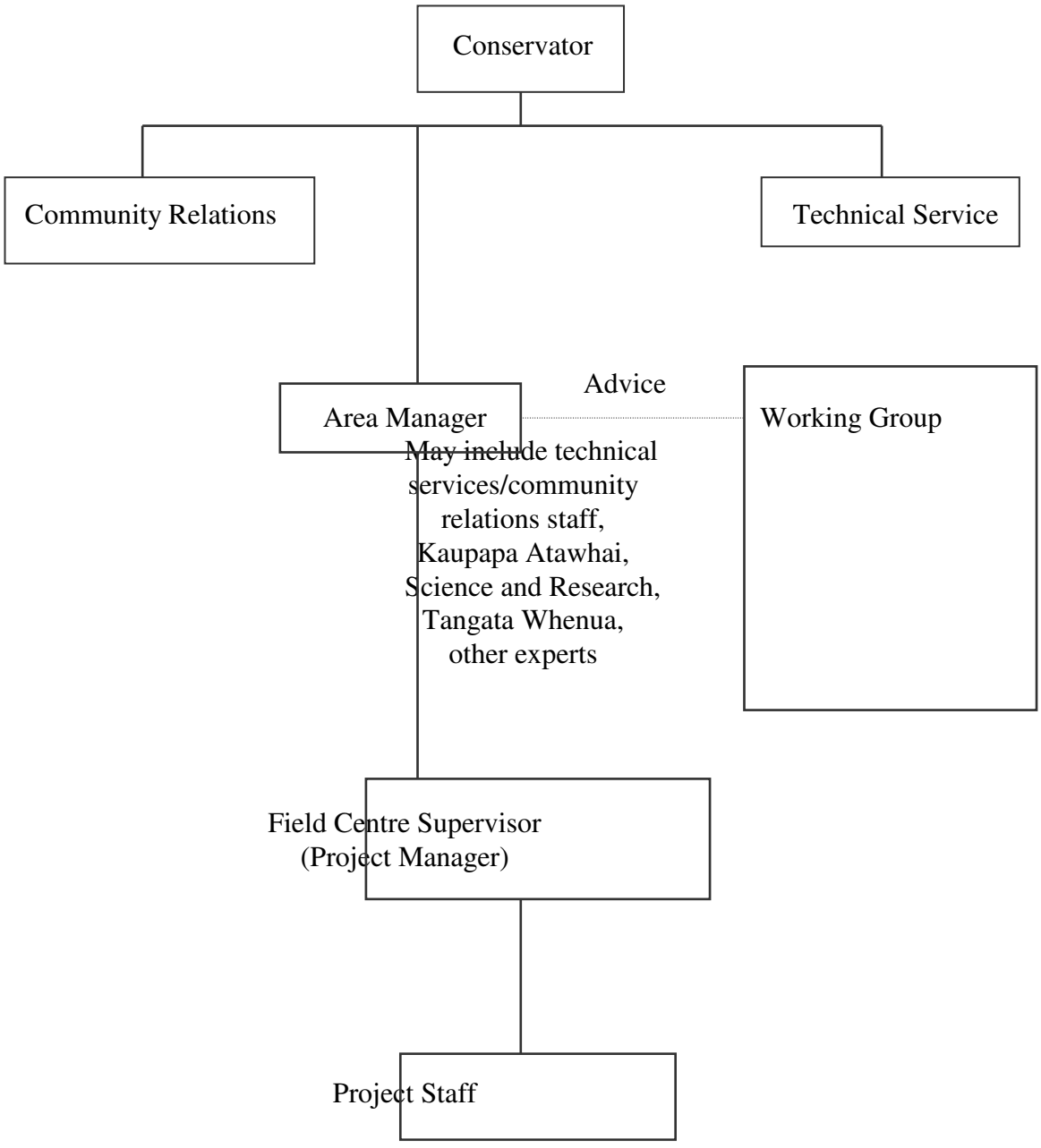
1. The field centre supervisor (project manager) will be responsible for the day-to-day project and staff management. The project manager reports to the Area Manager based in Opotiki.

   Performance Measure: Annual Planning and Performance Review, to be undertaken by Area Manager.

2. A Working Group will be established for the purposes of the northern Te Urewera ecosystem restoration programme. It will comprise at least one representative from all Departmental areas involved in the programme (e.g. field implementation, pest animal and pest plant control, threatened species protection, technical services, public awareness, kaupapa atawhai, conservancy management). The purpose of the Working Group will be to provide advice about the design of the programme and monitor its progress.

   Performance Measure: Working Group to be established by June 1998. Annual review of implementation measures, and advice to Area Manager (refer to Figure 1).

Figure 1 : Project Management Reporting Lines



3. The Working Group will seek advice from others as appropriate (e.g. tangata whenua, the Conservation Board, the Department's mainland island national co-ordinator, staff undertaking similar projects elsewhere). This may involve convening a technical advisory group to consider issues of particular concern or interest.

   Performance measure: Advice sought, and Technical Advisory Group convened as required.

4. The Area Manager and his/her staff will be responsible for communication with tangata whenua and the wider community of interest in the course of programme implementation. Information will be shared on issues on a regular basis, and consultation will be undertaken with individuals or organisations in order to provide appropriate opportunities for input into issues of mutual interest.

   Performance measure: Attitude of tangata whenua and wider community to project.

5. Integration - Management activities in the programme area will be integrated to ensure the most efficient and effective use of resources.

   Performance measure: Regular review of relevant management by Project Manager and Area Manager.

6. Priority Setting - Clear priorities will need to be established to enable efficient programme management. This will be done by the project manager and the Working Group, together with advice or guidance from others as required.

   Performance measure: Priorities to be prepared and reviewed annually as part of an annual work programme.

7. Information Management - A central repository of resource information will be established in the Area Office, to be managed by the project manager. This will include a central map collection showing key habitat/species distribution, reports/technical papers, files, and reports, and findings from management.

   Performance measure: System(s) to be established by June 1998.

6.2 HUMAN RESOURCES

1. Human resources management relevant to the northern Te Urewera programme will aim to establish and maintain experienced and professional staff in order to ensure that the programme is managed and implemented to a high standard.

Performance measure: Annual planning and performance review.

2. The conservancy will facilitate staff exchanges, training or development opportunities in ecosystem restoration for staff involved in implementing the northern Te Urewera programme. Staff involved in similar programmes elsewhere will be encouraged to participate in this project.

Performance measure: Annual budget provision for staff exchange and information sharing. Other personnel visit project each year.

3. All management activities within the northern Te Urewera will be undertaken in a safe manner and to specified standards. Staff will all be trained in relevant safe practices.

Performance measure: Compliance with Health and Safety Plan.

6.3 TREATY OF WAITANGI

The programme will be undertaken in close liaison with tangata whenua, with regular consultation and information sharing. Advice will be sought on waahi tapu and significant sites and issues will be treated in a sensitive manner. Sustainable cultural harvest will need to be addressed (e.g. kiekie, rongoa, pikopiko).

Performance measure: Annual consultation with tangata whenua, or more frequently when new issues or initiatives arise.

6.4 COMMUNITY

A high level of information will be provided to the interest groups and relevant media (e.g. local and national newspapers). Educational material will be provided to local schools. Consultation and discussion will be essential for some aspects of future management. Future research on public perceptions of the programme would be advisable.

Performance measure: Project Manager to prepare list of interest groups, relevant media, local schools. An annual programme of meetings with interest groups and schools will be maintained. News releases to be made to relevant media whenever significant or interesting results are obtained or key decisions are made.

6.5 HISTORIC PLACES

Historic site locations will be ascertained, and management will take account of site protection requirements (see also Treaty of Waitangi above).

Performance measure: Project Manager to arrange collation of historic site information.

6.6 RECREATION

Recreational use of the area will be encouraged, particularly for hunting. Hunters' observations and kill records will provide useful information on pest populations. Access may need to be restricted for limited periods when intensive management is in progress.

Performance measure: Periodic meetings with recreational groups. Annual analysis of hunter kill returns.

MANAGEMENT TRIALS

6.7 SELECTION OF MANAGEMENT AREAS

Current intensive management is focussed in one area (Otamatuna), with a non-treatment control area to the south (Okopeka). Future management (and non-treatment control) areas will be selected to be representative of the catchments, landform/geology/soils, vegetation, and fauna, utilising practical management boundaries such as ridge lines or waterways.

Performance measure: Working Group to review selection of management areas, with input from relevant technical advisers.

6.8 MANAGEMENT TECHNIQUES AND IMPACTS

Management methods will be the most up-to-date available, in terms of ecological effectiveness and cost-benefit return, and will be selected to minimise undesirable side effects, such as non-target mortality. Research in northern Te Urewera and at other ecosystem restoration projects will be essential to ensure advances in management effectiveness. Future use of biocontrol techniques will be considered but will only be applied if likely impacts/roles are well understood.

Performance measure: Working Group to review management methods annually, with input from relevant technical advisers.

6.9 FOREST CONDITION (INCLUDING SOILS)

Achievement and maintenance of a healthy forest condition will be a key part of the programme, to ensure that regeneration is occurring, that browse-palatable species are common, that there are healthy invertebrate populations (including soil invertebrates), and that freshwater ecosystems are healthy.

Performance measure: That monitoring of above elements is established by June 1998.

6.10 PEST ANIMALS AND PLANTS

Populations of pest animals and plants that pose a threat to ecosystem or threatened species populations viability and sustainability will be a high priority for control. This will require monitoring, and periodic survey for new invasive species. Impacts of deer, possums, and pigs will need to be assessed at various population levels.

Performance measure: Annual inventory of pest populations. Records established and maintained of all exotic species (plants and animals) present and their distribution.

6.11 THREATENED SPECIES

Active management (survey, monitoring, population enhancement) of threatened species will be an important part of the programme. Management will need to recognise that some species use various habitat types, e.g. kaka, galaxiids (see 6.13 below).

Performance measure: Input to and review by relevant recovery group(s).

6.12 RIPARIAN PROTECTION

Active management will need to ensure that riparian vegetation and stream channels are protected. No tracking in streams; toxin levels in water to be kept at low levels.

Performance measure: Project Manager to ensure that appropriate management practices and relevant monitoring are carried out.

6.13 FISH PASSAGE

Removal of artificial barriers to fish passage will be a high priority, and the prevention of construction of new barriers.

Performance measure: No artificial fish barriers on waterways along the Waimana Valley Road within 3 years.

6.14 SURVEY

Inventory of key ecosystem elements will be undertaken to provide essential information for the selection of intensive management areas.

Performance measure: Working Group to identify survey requirements. Project Manager to implement.

6.15 MONITORING

Monitoring is an essential component of the programme. The monitoring programme will ensure that information is collected on key ecosystem components and responses to management.

Performance measure: Working Group to identify survey requirements. Project Manager to implement.

6.16 DOCUMENTATION OF MANAGEMENT AND FINDINGS

All active management will be documented, including the method(s) used, timing, results of monitoring, and recommended future actions.

Performance measure: Working Group to identify survey requirements. Project Manager to implement.

6.17 ECOSYSTEM RESTORATION RESEARCH

1. Departmental research within the northern Te Urewera programme area will be undertaken in a manner which maximises benefits for the ecosystem restoration programme, and considers the information requirements of the management programme.

2. Suggested research needs (in addition to those listed in Appendix 5) will be recorded as they arise, and will be forwarded from field staff, tangata whenua, external agencies), to the Working Group for consideration.

3. The Conservancy Advisory Scientist (CAS) will provide advice on matters regarding research proposals (planning, implementation and reporting). Other technical specialists will be consulted.

4. A research programme will be developed by the CAS in consultation with the working group. This will be an overview and a guide and starting point for the planning and implementation of research, and will be reviewed as new information becomes available.

5. Research proposals outputs and their documentation may need to be adapted in order to better integrate the potential benefits to the programme. If so, this will be done by the Working Group along with the research proposer.

6. Prioritising of Conservancy initiated research proposals will be done by the Working Group as part of the development of an annual research programme. Proposals from external agencies will be addressed as opportunities arise, and they will be considered along with Departmental proposals where possible.

7. The Conservancy will encourage the co-operation, and sharing of research results between those involved in the northern Te Urewera programme and the wider community of interest both within the Department, and externally (e.g. research providers, education institutions, corporate bodies involved in ecosystem restoration projects, tangata whenua, local community), to further the national understanding of mainland ecosystem restoration issues. Such information will be provided free or at nominal cost.

8. The Conservancy will encourage and facilitate research within the programme area which furthers the purpose of mainland ecosystem restoration in the northern Te Urewera. Educational institutes in particular will be encouraged to submit post-graduate study proposals. (Refer to Appendix 5 for examples of research opportunities relevant to the restoration programme).

SECTION SEVEN : STRATEGY REVIEW

This strategy should be reviewed in five years (2002), to ensure that the management approach is still appropriate.

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APPENDIX 1

NORTHERN TE UREWERA - NATIONAL PARK BOUNDARIES AND LOCATIONS OF ACTUAL AND POTENTIAL MANAGEMENT AREAS

APPENDIX 2a

OTAMATUNA MANAGEMENT AREA

APPENDIX 2b

OKOPEKA NON-TREATMENT MANAGEMENT AREA

APPENDIX 3

KEY TASKS FOR THE FIRST FIVE YEARS

APPENDIX 4

BACKGROUND INFORMATION ON NORTHERN TE UREWERA

4.1 ECOLOGICAL CONTEXT

Landscape Diversity

The northern Te Urewera has been subdivided into 3 ecological districts[1]: Ikawhenua, Waimana, and Waioweka. Most of the area covered by this strategy is in the Waimana Ecological District (part of the Urewera Ecological Region (ER)).

Ecological districts can be further subdivided into constituent land types (e.g. steep hills, alluvial plains) and bioclimatic zones.

The Waimana Ecological District (ED) is predominantly in the lowland bioclimatic zone, and is made up of rolling to steep ridges underlain by greywacke, with narrow terraces and alluvial fans on lower valley sides. The main vegetation type is rimu-rata/tawa-kamahi forest, with rimu/tawa-beech forest on very steep hills, and restricted areas of podocarp forest on terraces and fans.

The west and east comprises more uplifted and steeper country, lying within the Ikawhenua and Waioweka ecological districts respectively. (Waioweka ED is in the Raukumara ER). In these districts the ridges are higher, with steeper slopes, and beech forest is more prevalent.

The northernmost parts of the northern Te Urewera are in the Taneatua ED, which extends north to the Bay of Plenty coast. It has generally lower relief, with wide flat alluvial plains, and some volcanic parent material in places.

Altitude and Climate

The altitude in the northern Te Urewera ranges from 150m in the valley floors to more than 1000m on the ridges.

The climate of the northern-most fringes is generally mild and humid, with around 2000-2200 hours of sunshine per annum, and the area experiences warm summers and mild winters. Rainfall averages 1000-2000mm pa, and comes predominantly from the north and northeast weather flows, and often of high intensity.

The bulk of the northern Te Urewera is less sunny, with cooler winters, frequent ground frosts, and rainfall averaging 2000-2400mm pa. Snow falls a few times a year on the higher ridges.

1 New Zealand has been subdivided into 85 Ecological Regions and 268 Ecological Districts (McEwen 1987). See district boundaries in Te Urewera National Park management plan.

Severe rain storms occur once every few years. In March 1964, 39.7 cm (15.64 inches) of rain fell at Matahi in five days; the total was probably even higher over the main ranges (Nicholls 1969c). Rainfall frequently exceeds 50mm per day in the north-flowing valleys, however conditions are significantly drier to the west.

Strong winds also affect the area and have caused considerable forest damage (Shaw 1983a).

Geology, Landform And Soils

The northern Te Urewera is underlain by Urewera Group greywacke; hard sandstone and minor argillite. Preferential erosion of a major fault zone trending north-south has formed the Waimana valley. The rocks are fractured by many other minor faults and joints. They may be characterised as moderately strong, but brittle. Rather regular steep slopes are generally formed on these rocks.

The Ohinemataroa (Whakatane), Tauranga (Waimana) and Horomanga Rivers are the major river valleys, with the western catchments draining into the Rangitaiki River. The Ohinemataroa (Whakatane) and Tauranga (Waimana) rivers follow major fault lines and drain to the north. Large tributaries flow through gorges out into wider valley bottoms with colluvial footslopes and short sections of narrow alluvial terraces flanking gravelly stream-beds, while the small tributaries are in sharply incised valleys with waterfalls and gorges.

The higher ridges are generally broad crested, with a zone of moderate and gently undulating topography 50 - 400 m wide. These gentler slopes have retained layers of volcanic ash of varying structures and composition derived from the Okataina and Taupo volcanic centres to the west.

Yellow-brown pumice soils are derived from these materials. Soils downslope are steepland variants of mixed ash/greywacke parent materials (Rijkse, 1989) or skeletal greywacke soils, depending on how active the recent slope processes, including slips or landsliding, have been on a local scale.

Vegetation

The forest vegetation of northern Te Urewera is mapped and described in Nicholls 1969a, b, c; 1974; and 1978 (see also Nicholls 1976) and McKelvey (1993). Maps are also provided in Department of Survey and Land Information (1993) and Shaw (in press), with a descriptive account and a species list in the latter.

Semi-coastal forest (tawa-dominant with pukatea and kohekohe) occurs near the northern margins of the Park, while lowland (rimu-rata-kamahi[1]-tawa) forest covers most of the Whakatane and Waimana river catchments up to 670-820m asl.

A large part of the area is rimu-rata/tawa-kamahi forest and there is fire-modified versions of this forest on the lower flanks of the main valleys, and relatively small

[1] Tuhoe name for kamahi is tawhero.

areas where podocarps are abundant (rimu-matai-kahikatea/tawa-kamahi). There are significant areas of rimu-red beech/tawa-kamahi-tawari forest; a complex mixture of rimu/red beech forest on ridges and rimu/tawa forest in gullies and on valley sides. There are also some areas of secondary grassland and fernland in the main valleys, and herbfield or early successional shrubland in streambeds and on landslide scars.

Representative Areas

The northern Te Urewera contains several large areas which have been previously delineated as being representative of the landform, vegetation, and wildlife habitat within relevant ecological districts (Shaw 1986b & 1989). This was an early attempt, using information available at the time, to identify priority areas for management, recognising that intensive management could not be practically applied to the entire forest tract. Refer to the Te Urewera National Park Management Plan for a map of these areas. There are 2 areas in Ikawhenua Ecological District (Te Onepu and Ikawhenua); 4 areas in Waimana Ecological District (Rakautapu, Pukepohatu, Okopeka and Raroa); and 2 areas in Waioweka Ecological District (Ruatehuia and Kaharoa).

Indigenous flora

A range of indigenous species typical of semi-coastal and lowland forest is present[1]. A semi-coastal influence is evident, with kiekie (*Freycinetia baueriana subsp. banksii*) and nikau (*Rhopalostylus sapida*) present in greater abundance to the north and being found locally only further inland on sheltered or sunny sites (for kiekie).

Pirirangi or red mistletoe (*Peraxilla tetrapetala*) is present on Otamatuna ridge and may be present elsewhere - one possible leaf was found on the Pohatu ridge track a few years ago (WBS pers. obs.). Pirirangi is classed as 'vulnerable' (Cameron *et al.*, 1995). It is possible that other mistletoes are present; e.g. pirinoa (*Iseostylus micranthus*) - 'local', and taapia (*Tupeia antarctica*) - classed as 'rare'. A native forget-me-not, *Myosotis* "pottsiana" - 'vulnerable' is present alongside west-flowing streams. X.it, an unnamed member of the *Cunoniaceae* family occurs immediately to the south. Pua reinga or wood rose) (*Dactylanthus taylorii*) is likely to be present.

Exotic flora

Introduced plants such as lotus, Yorkshire fog, ragwort, catsear, and buddleia are present in stream beds and on landslide scars. Blackberry, pampas, pines, and willows have a more restricted distribution. Wall lettuce is ubiquitous in forest habitats but is in low numbers and appears to have little influence on forest structure or regeneration. Few exotic species currently present have the potential to alter community composition or structure to exclude indigenous species except for the early colonising species on open sites which may exclude early successional

[1] Some relevant species lists are provided in Shaw 1983b,c; 1984a-d; 1986e,f,g,; 1990b; 1997; in press.

indigenous herbs (e.g. *Epilobium* spp.) and grasses (e.g. *Rytidosperma* spp.) and willows which can become dominant on river margins.

Indigenous fauna

Because of its large size, and range and quality of habitats, the northern Te Urewera contains a fauna assemblage that is as comprehensive and intact as any left on the New Zealand mainland. Nearly all indigenous birds present in North Island forests are represented in the northern Te Urewera, including many threatened species. The only exception is weka.

Indigenous fauna includes the threatened kiwi (NI brown), kokako (NI), whio (blue duck), kaka (NI), kaeaea (NI falcon), kereru (NZ pigeon), kakariki (yellow crowned parakeet), and pekapeka (long-tailed bat and short-tailed bat). Other indigenous birds include toutouwai (NI robin), pipiwharauroa (shining cuckoo), koekoea (long-tailed cuckoo), titipounamu (rifleman), popokatea (whitehead), piwakawaka, tauhou (silvereye), miromiro (pied tit), riroriro (grey warbler), banded dotterel (restricted to riverbeds), parera (grey duck), and kawau (black shag).

A range of invertebrates is present, including a rare tusked weta species in the Ikawhenua Range. The threatened short-jawed kokopu is amongst a range of indigenous fish found in the river systems.

Introduced fauna

Red deer, possums, and feral pigs are present throughout. The pig population is widely spread and numbers are generally low but fluctuate. Estimated deer numbers range from low to moderate while possum numbers range from low to high. Stoats, feral cats, ferrets, weasels, mice, and ship rats occur throughout. These animals have wrought fundamental change to the structure and composition of the ecosystem, and ecosystem processes. They are major competitors and predators of indigenous fauna.

Rabbits are present in the river valleys and occasionally range further afield. Birds such as magpie, blackbird, song thrush, and chaffinch occur throughout. Pheasants, quail, myna, and spur-winged plover tend to be restricted to the main valleys. Various invertebrates occur throughout, with wasps being the most prominent. The ecological roles of introduced invertebrates are not known in this ecosystem type.

Previous Administration and Management

Northern Te Urewera has now been administered by a number of different government regimes.

The Crown acquired land interests in Te Urewera forests from the turn of the century to the 1920s. Agreements to consolidate landholdings in return for roading were made between the Crown and Maori[1]. Initially the area was to be subdivided

[1] Compensation for unbuilt roads was later paid to Tuhoe.

and balloted for farms, but a last minute assessment of the area's capability saw the area set aside as a reserve. In 1954 the catchment of Lake Waikaremoana was gazetted as National Park, followed by the ranges flanking the Whakatane and Waimana valleys in 1957. Various subsequent additions have been made. The Park was administered by the Urewera National Park Board from 1961 until the National Parks Act 1980 resulted in the Board's replacement by the East Coast National Parks and Reserves Board. This Board made policy for the Park which was implemented by the Department of lands and Survey from 1980 until 1987, when the Department of Conservation was established.

Management History : Pest control

The New Zealand Forest Service was responsible for wild animal control from 1956-1987. In carrying out their animal control responsibilities the Forest Service established a network of hunting huts and tracks throughout the park for use by deer cullers. They maintained active deer control using deer cullers in the northern Te Urewera until 1980, by which time there were ground-based commercial deer and possum hunters operating throughout. These hunters continued to operate into the mid 1980s but declining skin and venison prices saw a marked decline in their level of activity. From the early 1980's there was a significant increase in the level of commercial helicopter hunting of deer.

In 1987 the Department of Conservation took over wild animal management, and has continued to rely on recreation or commercial hunting for control of deer, pigs, and possums. There are now significant levels of recreational hunting, particularly during the red deer 'roar', and intense seasonal commercial helicopter hunting in the spring. Recreational pig hunting occurs throughout the northern Te Urewera, between the months of May and October. Pig hunting using dogs has remained a traditional activity, particularly in the Whakatane River valley.

Animal pest control in the northern Te Urewera since 1990 has been focussed almost exclusively on reducing possum numbers. Contract possum hunters using poison baits and traps have been used extensively throughout the northern Te Urewera

.

Possum control is undertaken on a rotational basis. High priority area receive annual treatment (e.g. Onepu, and the Otapukawa catchment). Other areas have received the following levels of control :

1-2 year rotation - Raroa, Wharekahika, Pohatu, Onepu, Ohane, Te Panaa.
2-3 year rotation - northern Te Ikawhenua Range.
No control to date - Kanihi, Manaohau Right Branch.

An aerial 1080 possum control operation is proposed for the Kanihi-Manaohau Right Branch-Mangamako area.

Over the last five years animal pest control has become integrated with the threatened species work being undertaken to protect core kokako populations.

Those areas in the northern Te Urewera which have not been targeted as part of threatened species work have received regular ongoing control in an attempt to keep possums at a level where future intensive control will still be feasible.

Rats have been controlled as a by-product of possum control in the areas targeted for threatened species work. In 1996 stoats were targetted for control in the Otamatuna area, in an effort to further integrate pest control with threatened species work on kiwi.

Limited pest plant control has been undertaken, initially by the National Park Board and the Department of Lands and Survey, and by the Department of Conservation. Control has been focussed mainly on open habitats such as river beds, for species such as blackberry, buddleia, and pampas.

Management History : Survey and monitoring

Geological and soil maps are available for the entire area. The Forest Service maintained regular survey and monitoring programmes for browsing animals. A comprehensive network of permanently marked animal survey transects was established throughout. Exclosures (14) were established throughout the northern Te Urewera to provide on-going monitoring of the impacts of deer and pigs on the vegetation, and the success of deer control.

Exclosures are situated in the following locations: Tataweka (1), Te Waiiti (1), Te Pua (3), Kanihi (1), Ohane (1), Hanamahihi (1), Horomanga (1), Waihua (1), Ngahiramai (1), Otanetea (4).

All exclosure plots date from Forest Service administration. Ten sites (Te Pua, Te Waiiti, Te Panaa, Kanihi, Ohane, Tataweka, Otanetea, Horomanga, Waihua, and Ngahiramai) have been re-measured in recent work done by a university student, with the last 5 sites used for comparison with the Otamatuna Management Area.

The National Forest Survey and later Eco-Survey (late 1940's - early 1960's) collected vegetation data throughout Te Urewera and this provided the basis for a comprehensive set of forest class and type maps (scales 1:250,000 and 1:63,360), and descriptive accounts of the vegetation (Nicholls 1969a,b,c; 1974; McKelvey 1973). The Department of Lands and Survey organised a vegetation survey (Shaw in press), and plant species lists are available for many catchments (see References). Relatively little survey work was done in the National Park by the Wildlife Service. Staff of the National Park Board and Lands and Survey collected bird records from hunters and trampers in the 1970's - 80's. Information on kokako distribution was collected from commercial ground hunters in the mid-1980's (Shaw and Shaw 1988).

Since 1987, general survey information for the northern Te Urewera has largely been gathered in association with threatened species protection work aimed specifically at kokako. All of the ridge systems within the northern Te Urewera have been surveyed for kokako. Intensive kokako management in the Otamatuna

area (the Tawai Range) has been undertaken since 1991. In 1996 *c.*4500 ha of the Ikawhenua Range and *c.*800 ha in the Okopeka area were surveyed for kokako, in order to provide a comparison with an area of similar topography and vegetation.

Limited survey of invertebrates and fish has been done.

In summary, broad scale maps and descriptive accounts have been compiled for geology, soils, and vegetation. Lists of vascular plants are available for many catchments. A permanent browsing animal and vegetation monitoring network was established by the Forest Service, and some elements of this have been remeasured recently. Surveys of kokako have been undertaken across the entire tract and over 600 birds have been recorded, but there have been only limited surveys of other fauna.

Management History : Species Management

Prior to 1990 there was no intensive management of threatened species. Since 1991 Department of Conservation staff have undertaken intensive kokako monitoring in the Otamatuna area, in conjunction with increasingly intensive possum control operations. Kokako distribution surveys have also been undertaken acros the wider northern Te Urewera. The most recent of these surveys was undertaken in 1996, and documented the obvious decline of kokako in many parts of the area. Subsequent to surveys to assess kokako distribution and numbers there has been intensive management to protect and enhance the Otamatuna population.

Management History : Recreation

Over time the back country hut network established for browsing animal control came to be maintained as general recreational facilities as well as for pest control. The easy access afforded by the Tauranga (Waimana) and Ohinemataroa (Whakatane) valleys lead to increased recreational use of the northern Te Urewera for camping, tramping, and fishing, particularly on a seasonal basis. Nevertheless hunting has continued to be a major, and increasing, recreational activity.

Current Research

Two university student research projects are currently underway in northern Te Urewera; (a) a remeasurement and reassessment of exclosures and comparison with introducing browsing animal numbers, and with understorey composition in the Otamatuna Management Area; (b) a comparison between vegetation ecology and phenology, invertebrates, browsing animal impacts, and bird numbers in the Otamatuna Management Area and the Okopeka non-treatment management control area.

4.2 PLANNING CONTEXT

There are two major planning documents of particular relevance to the project; the East Coast Conservation Management Strategy (CMS) and the Te Urewera National Park Management Plan 1989-1999.

4.2.1 THE EAST COAST CONSERVATION MANAGEMENT STRATEGY

At the time of writing the draft CMS is awaiting final approval from the New Zealand Conservation Authority. It contains strategic policy and implementation guiding the management of all lands administered by the Department in the East Coast Conservancy for ten years. The policies and implementation within it have been tested through an intensive public participation process. Annual business planning and operations planning is based on the priorities and intentions outlined in the CMS.

While much of the CMS is generally applicable to the project area, sections on "A Vision for Conservation in the East Coast Conservancy (s.2.1), the "Introduction to Te Urewera" subregion (s.1.2.4), and the Department's management function relating to Ecosystems Management (s.3.3.12) refer to the need for and intention to undertake ecosystem restoration in the northern Te Urewera. Extracts specifically related to ecosystem restoration in the northern Te Urewera are reproduced below:

From "Conservancy Vision Regarding Natural Heritage" (s.2.1):

The vision statement describes long term conservation aims for the Conservancy.

> The natural areas ... have been maintained, and enhanced or rehabilitated as opportunities have arisen. Te Urewera National Park is managed with an emphasis on preserving the natural values there in perpetuity. Management there allows for recreation and tourism where these do not compromise natural values
>
> Biodiversity has been maintained through the protection of natural ecosystems... The range of habitats, and all indigenous life forms found throughout the conservancy have been protected, and are managed with an awareness of their role in their habitats or ecosystems. The protection of representative or unique examples of natural and physical resources has been ensured.... Threatened species ... have been protected. The Conservancy works with local people to foster the protection of threatened species in their area.
>
> The management of natural areas is grounded in comprehensive baseline information on the natural values present. Management is planned and implemented through wide consultation with interested individuals and organisations including Tangata Whenua. Efforts are made to involve local communities in the ongoing management of areas...

From Ecosystems and Habitats - Ecosystems Management (3.3.12)

The Department makes a commitment to ecosystem restoration in the northern Te Urewera in the following CMS objectives and implementation statements:

(Objective ii)

"To maintain the full diversity of native terrestrial, aquatic and marine ecosystems found in the conservancy, through the integration of whole ecosystem management concepts in all of the conservancy's management activities,"

(Objective iii)
"To develop specific management techniques and systems to achieve this in areas managed by the conservancy, and to advocate their adoption elsewhere,"

(Objective iv)
"To facilitate a programme of whole ecosystem monitoring, research and management trials in the northern Te Urewera forest tract."

(Implementation i)
The Conservancy will ensure that the management activities within this strategy are implemented in a co-ordinated manner which integrates all ecological, cultural and other management concerns in furthering the primary goal of whole ecosystem management."

(Implementation iii)
"The Conservancy will remain receptive to developments in this [MER] field. In liaison with Head Office, universities and research and other organisations, the conservancy will participate in natrional efforts to develop whole ecosystem management techniques and systems for optimising indigenous biodiversity conservation."

(Implementation iv)
"The Conservancy will facilitate a major programme of whole ecosystem monitoring, research and management trials in the northern part of Te Urewera National Park. The trials will be designed to clarify mainland forest ecosystem functioning and to develop optimal and practical management techniques for full *indigenous* biodiversity conservation."

(Strategic Implications for Te Urewera Subregion)
- National resources will be sought for the proposed northern Te Urewera research / whole ecosystem management trials
- Current management activities (eg possum control operations and kokako monitoring) will be more tightly co-ordinated than at present
- The conservancy will pursue comprehensive research into the forest fauna, the ecological processes and interactions, and the effects of varying managemnt regimes
- Ecological monitoring techniques will be developed and applied intensively over at least six years.

From Ecosystems and Habitats - Ecological Information, Survey and Monitoring (3.3.13)

The following describes priorities for ecological information, survey and monitoring relating to the northern Te Urewera:

(Strategic Implications for Te Urewera Subregion)

- "this sub-region will receive the highest ecological monitoring activity in the conservancy, in association with whole ecosystem management trials
- publication of vegetation survey information relating to Te Urewera National Park."

From "Strategic Directions for Management in Te Urewera Subregion (s.2.3)"

This section identifies the priority conservation management actions intended for Te Urewera. They include:

- "Monitoring of ecosystems, whole ecosystem management proposals in the northern Te Urewera...
- [Fish] species distribution surveys...
- Threatened species management (eg kokako), species surveys...
- Plant and goat pest control on the fringes of Park, possum control in the northern Te Urewera in conjunction with threatened species and whole ecosystem management...
- Partnership with Tangata Whenua over management issues in general, consultation..."

4.2.2 TE UREWERA NATIONAL PARK MANAGEMENT PLAN 1989 - 1999

The Te Urewera National Park Management Plan was prepared under the National Parks Act 1980, and included a comprehensive public consultation process. Although the CMS has been prepared since the Plan came into force, the Plan is recognised in the CMS as the immediate guiding document for the National Park to the extent that it is consistent with the CMS.

The most relevant objectives of the Plan relate to preservation of natural resources :

(Objective One : Preservation)

(a) To protect native plant and animal communities and to preserve them as far as possible.
(b) To monitor and protect rare, threatened and endangered species and to enhance their chances of survival where this is deemed necessary.
(c) To maintain the soil, water and forest conservation values of the park.
(d) To preserve the historical and archaeological values as far as possible.

Ecosystem restoration is entirely in accord with the objectives of the Te Urewera National Park Management Plan. Also, the need and opportunity for restoration of the northern Te Urewera ecosystem (and associated activities such as monitoring and survey) has been recognised as a high priority in relation to all other management activities in the East Coast Conservancy.

APPENDIX 5

NORTHERN TE UREWERA
SUGGESTED RESEARCH TOPICS

The Conservancy will carry out or seek research on the following priority issues:

Intermediate Term

- Effective control techniques for mustelids.
- Effective monitoring techniques for mustelids.

Short Term

- Effective control techniques for cats.
- Effective monitoring techniques for cats.
- The ecological impact of magpies.
- Home ranges and seasonal movements of kereru, tui and bellbird.
- Predator population levels and the sustainability of healthy populations of threatened species and other ecosystem components.
- Impacts of deer and pigs in tawa-dominant forest (at various population levels).

Medium Term

- Home ranges and seasonal movements of kereru, tui and bellbird in the remainder of the Northern Te Urewera.
- Predator population levels and the sustainability of healthy populations of threatened species and other ecosystem components.
- Impacts of deer and pigs (at various population levels) in the remainder of the Northern Te Urewera.
- Invertebrate communities.

Long Term

- Ecosystem process and function.

Suggested University Research topics :

- Vegetation dynamics and succession under different management regimes.
- Invertebrates as forest condition indicators.
- Changes in soil characteristics with forest recovery; comparison with differently managed sites.
- Magpie control.
- Genetic distinctiveness of threatened plants (red mistletoe).
- Genetic distinctiveness of threatened birds (kiwi, robin, kokako, kaeaea).

- Threatened bird biology, ecology, behaviour and recovery.
- The use of lure plants and plant lures in browsing animal control.
- Tree seedling establishment and survival.
- Alternative methods for bird census and monitoring.
- The potential for intensively managed areas to provide a pool of threatened species to recolonise or increase numbers in adjacent areas of forest.
- Water quality and stream fauna composition as management indicators (comparison of sites under different landuse and management regimes).
- Impacts of rodents on aquatic invertebrates (terrestrial phase).
- Changes in microclimate with forest recovery; comparisons between sites with different management sites.
- Patterns of public visitation of and response to the project.

APPENDIX 6

GLOSSARY

blackbird	*Turdus merula*
buddleia	*Buddleia davidii*
cat	*Felis catus*
catsear	*Hypochaeris radicata*
chaffinch	*Fringilla coelebs*
dog	*Canus familiaris*
forget-me-not	*Myostis* "pottsiana"
hihi (stitchbird)	*Notiomystis cincta*
horse	*Equus caballus*
huia	*Heteralocha acutirostris*
kaeaea (NI falcon)	*Falco novaseelandiae*
kahikatea	*Dacrycarpus dacrydioides*
kaka (NI)	*Nestor meridionalis*
kakariki (yellow-crowned parakeet)	*Cyomoramphus auriceps*
kamahi (tawhero)	*Weinmannia racemosa* var. *racemosa*
kereru (NZ pigeon)	*Hemiphaga novaeseelandiae*
kiekie	*Freycinetia baueriana* subsp. *banksii*
kiwi (NI brown kiwi)	*Apteryx australis*
koekoea (long-tailed cuckoo)	*Eudynamis taitensis*
kokako (NI)	*Callaeas cinerea*
lotus	*Lotus pedunculatus*
magpie	*Gymnorhina* sp.
matai	*Prymnopitys taxifolia*
matuhi (bush wren)	*Xenicus longipe*
nikau	*Rhopalostylis sapida*
pekapeka (bats)	
long-tailed bat	*Chalinolobus tuberculatus*
short-tailed bat	*Mystacina tuberculata*
pig	*Sus scrofa*
piopio (NZ thrush)	*Turnagra capensis*
pipiwharauroa (shining cuckoo)	*Chalcites lucidus*
pirinoa	*Ileostylus micranthus*
pirirangi (red mistletoe)	*Peraxilla tetrapetala*
popokatea (whitehead)	*Mohoua albicilla*
possum	*Trichosurus vulpecula*
rabbit	*Oryctolagus cuniculus*
ragwort	*Senecio jacobaea*
rata	*Metrosideros robusta*
red beech	*Northofagus fusca*
red deer	*Cervus elaphus*
red mistletoe (pirirangi)	*Peraxilla tetrapetala*
rimu	*Dacrydium cupressinum*

song thrush	*Turdus philomelos*
spur-winged plover	*Lobibyx novaehollandiae*
taapia (mistletoe)	*Tupeia antarctica*
tawa	*Beilschmiedia tawa*
tawari	*Ixerba brexioides*
tieke (saddleback)	*Philesturnus carunculatus*
titipounamu (rifleman)	*Acanthisitta chloris*
toutouwai (NI robin)	*Petroica australis*
tusked weta	'Hemiandrus' sp.
wall lettuce	*Mycelis muralis*
wasp	*Vespula* spp.
whio (blue duck)	*Hymenolaimus malacorhynchos*
Yorkshire fog	*Holcus lanatus*