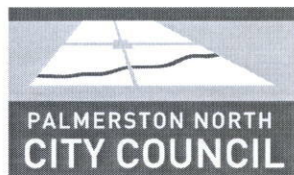




Turitea Reserve Management Plan



Turitea Reserve Management Plan 2006



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BACKGROUND

At over 3,500 hectares, the Turitea Reserve is the largest reserve administered by Palmerston North City Council. It is a strategic asset for the Council since the Turitea Steam supplies around 60% of the City's water. As the city's population grows this supply is likely to become more important. The reserve is also highly significant for biodiversity and provides for public recreation outside the water supply catchment. Part II of the plan (Planning and Resource Context) describes the resources currently or potentially available within the Reserve, and the threats and management challenges facing them. These include:

- A high quality water supply – at risk from contamination by harmful micro-organisms and chemicals, from excessive sedimentation and turbidity, and from loss of storage capacity through silting up of the dams
- Highly significant indigenous flora, fauna and ecosystems – at risk from introduced browsing animals, predators, pest plants and fire
- Radiata pine plantations which will soon be ready for harvest
- Landscape and amenity values
- Recreation opportunities including tramping and walking in Hardings Park, and hunting in the Turitea catchment under a permit system
- Cultural and historic resources, including experimental platinum mines in Hardings Park and historic water supply structures.
- Electricity generation.

The purpose of this management plan is to provide a clear long-term basis for managing these matters. The plan is a legal requirement under the Reserves Act 1977 (Part II describes the plan's legislative and policy framework in detail). Besides this legal requirement, the Council has prepared the plan in response to a range of new developments. These include increasing public interest in the reserve, changes to the Health Act 1956 and water grading guidelines, new knowledge about water-borne pathogens, demands for recreational access to the Reserve, power generation proposals and concerns over development in the Turitea Valley.

Part II provides the background or "database" for management. The management objectives and policies within Part I (this document) are aligned with the information presented in Part II.

For the purposes of classification (and management) the reserve has been divided into three zones: Water Supply Catchment; Water Structures Area; and Hardings Park. The distinction reflects the different purposes of management in each area, hence the objectives and policies in relation to each area also differ.

Implementing this management plan will improve the consistency and focus of reserve management. Results will include improved long-term protection of the water supply, and conservation of flora, fauna and ecosystems through the introduction of more targeted and intensive control of possums and other pests. Public access within Hardings Park will provide significant new opportunities for outdoor recreation close to the City.

MANAGEMENT OBJECTIVES & POLICIES

This section sets out the objectives and policies for management of the Reserve. They are grouped under 9 broad management areas. Under each of these management objectives are identified. More specific policies are defined to achieve these objectives and, where appropriate, specific actions to implement these policies are identified.

1. Management and Administration

Objectives

This management plan addresses the largest land resource administered by the Council and an area of very high strategic importance. In order to provide effective and stable management of the reserve the following objectives are set:

1. To establish a management structure with clear responsibilities and sufficient resources for efficient management of the reserve in accordance with this plan.
2. To ensure ongoing legal compliance of Reserve management.
3. To ensure ongoing review and continuous improvement of the management plan.
4. To develop and implement a consistent and effective process for consideration of activities not specifically addressed in this plan.

Policies

1.1 Responsibilities for management

Explanation

Management of the reserve has been changing rapidly in some areas, particularly Hardings Park. Long term responsibilities for matters such as development and maintenance of recreational tracks in Hardings Park, animal control throughout the reserve, etc, have not been determined. It is important that this occurs in order to ensure this plan is effectively implemented.

Presence of people "on the ground" will contribute to positive public relations, public education and implementation of the plan. This can be achieved by using a combination of both PNCC staff and authorised voluntary rangers as required, in relation to demand.

Policies

Actions

1. Clearly identify responsibilities within Council for implementation of the management plan in relation to particular areas and resources identified in the plan.	<ul style="list-style-type: none"> - Review Council staff responsibilities against all areas and resources covered by this plan - Ensure that responsibilities for implementation of all policies and actions, and monitoring of outcomes, are clear.
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|---|--|
| 2. Ensure there is sufficient presence of trained and authorised people in the reserve to achieve implementation of the plan's objectives and policies. | <ul style="list-style-type: none"> - Identify PNCC staff responsibilities in relation to field checks and visits. - Establish mechanisms for selection and training of voluntary rangers to informally monitor implementation in areas with open recreational access. - Establish a system for coordinating staff and volunteer activities at times of peak visitation. |
|---|--|

1.2 Health and Safety

Explanation

The Health & Safety in Employment Act 1993 places responsibilities on the Council in relation to the identification and management of hazards in the workplace. The Council must ensure it has effective health and safety management systems in place that address its liabilities in relation to staff and contractors, and effectively identify and manage workplace hazards to visitors. These could include hazards from road or track construction, animal control operations, or the provision of facilities.

Policies	<i>Actions</i>
1. Maintain health and safety management systems in compliance with the HSE Act 1993 .	- Maintain Council Health and Safety Management Systems, including checks on contractor Health and Safety Management practices.
2. Notify visitors to the Reserve of health and safety hazards and practical steps they can take to avoid these hazards.	- Incorporate general safety information and notification of specific hazards into interpretation pamphlets, access permits, signs etc.

1.3 Plan review

Explanation

This plan will need to be periodically reviewed in line with major changes in resources, community needs, or new information. Major changes might include the occurrence of a new pest or disease affecting vegetation of the area, or damage by fire. New information may arise from monitoring of flora and fauna or water quality. Significant changes in the management context may require changes to management practices.

A regular full review of the plan will be undertaken every 5 years.

Policies	<i>Actions</i>
1. Undertake ongoing review and improvement of the management plan in relation to changes in resources, community requirements, or new information.	<ul style="list-style-type: none"> - Define responsibilities and process for making minor changes to the plan. - Identify at what level formal public notification of plan changes is required. - Provide a process for feedback of amendments through proposed Reserve Advisory Committee (see policy 2.1(4)).
2. Undertake a full review ,as set out in section 41 of the Reserves Act 1977, of the management plan every 5 years.	- Undertake full public notification and associated processes outlined under Section 41 of the Reserves Act 1977.

1.4 Process for consideration of activities not covered by the plan

Explanation

Requests will sometimes occur for permission to undertake activities within the Reserve that are not directly covered by this management plan. It is important that the process for making decisions on such activities be consistent, to avoid inappropriate activities being permitted in the Reserve. There are activities that are subject to specific requirements under the Reserves Act 1977, such as the granting of easements, and licences for communication stations. Ongoing reference to the Reserves Act and consultation with the Department of Conservation will be required when considering activities in the Reserve.

One-off activities that have minor and short term effects can be rapidly evaluated by staff in relation to the criteria identified below and do not require detailed consideration. Such activities might include one-off access to the catchment area for activities such as photography, botanical study or seed collection.

Activities that are to be ongoing or may have more significant effects require more detailed evaluation. These may include activities such as application for ongoing tourist operations.

Policies	Actions
1. Consideration of activities that have minor impacts and are of short term duration may be undertaken by Council staff and a one-off permit issued. Consideration against the criteria in policy 1.4 (3), below, will be required in making the decision on whether to grant consent.	<ul style="list-style-type: none"> - Permit forms and books for recording permits issued - Define staff authorities for issuing permits. - Maintain records of permits issued and conditions attached - Monitor and enforce permit conditions
2. Consideration of activities with the potential for significant impacts and/or that are long term in duration, such as the granting of any leases or licences, shall be subject to an impact assessment prior to any decision on consent. Any approval will require: <ul style="list-style-type: none"> • Receipt of a formal written application describing the nature of the activity, its consistency with reserve objectives and policies, its potential positive and negative impacts on water supply quality, natural values of the Reserve, and other users, and any mitigation and enhancement measures proposed. • Evaluation of the proposal against the criteria in policy 1.4 (3) by Council staff and consideration of the application and staff recommendations by the Turitea Reserve Advisory Committee. • Written approval by the Council considering Advisory Committee recommendations and specifying any conditions. • Consent being conditional on the activity not conflicting with the objectives and polices of the management plan. 	<ul style="list-style-type: none"> - Identify staff responsibilities for managing process of any applications. - Develop a consent application form that clearly details the process and criteria for granting of consents. - Maintain records of consents granted including conditions attached.

-
3. Criteria for decisions on consents for new activities include consideration of:
- The activities compliance with the requirements of the Reserves Act 1977.
 - The activity's consistency with the objectives and policies of this management plan.
 - The potential effects of the activity on natural and cultural heritage values, water supply quality and other park users.
 - Whether the activity could reasonably be undertaken in another location – outside the Reserve.
 - The duration of the activity – preference will be given to short term activities.

1.5 Issuing of Access Permits

Explanation

Permits are required for some activities identified in the plan, and also where consent is given for new activities (see above). Consistent permit conditions are required.

Policies

Actions

- | | |
|---|---|
| <p>1. Permits for access to controlled areas will be subject to a variety of standard conditions, including:</p> <ul style="list-style-type: none"> • The applicant must give approval for Council access to health database records. • Council staff may check the health status of applicants and ensure they do not pose a public health risk to the water supply. • only those individuals named on the permit will be allowed access to the reserve • Access is only permitted for the purpose of the activity stated on the permit. • The registration number of any vehicle to be taken into the reserve is to be provided by the applicant. • Best practice regarding the disposal of carcasses and toilet waste is to be followed by permit holders. No carcasses are to be left within 20m of waterways or on floodplain areas. All toilet waste is to be buried at least 20m from waterways and to a depth of 150mm. | <ul style="list-style-type: none"> - Maintain records of all permits issued and conditions attached. - Perform health checks on permit applicants and ongoing regular or random checks on permit holders. - Enforce permit conditions – particularly ensuring that people without permits do not accompany permit holders. - Incorporate conditions on permits. |
| <p>2. Access permits for hunting are to include the following requirements in addition to those above:</p> <ul style="list-style-type: none"> • The permittee must abide by the requirements of the Arms Code and comply with all legal requirements relating to transporting and using firearms. | <ul style="list-style-type: none"> - Checks on compliance with hunting permit conditions. |
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- Where bow hunting is undertaken, special conditions applied by the Department of Conservation in the adjacent Tararua Forest Park will apply in the Reserve.
-

1.6 Statutes and Bylaws apply

Explanation

Statutes and some City Council bylaws apply to management of the Reserve as set out in section 1.2. Management activities will comply with these legal requirements.

Policies

Actions

- | Policies | Actions |
|--|--|
| 1. Management of the Reserve will comply with legal requirements | - Regular review of Reserve management activities against legal requirements. This includes the Water Supply Bylaw 1996 and Reserves Bylaw 1968. |
-

1.7 Coordination with the Management of City Infrastructure and Facilities

Explanation

Changes in the management of the Turitea Reserve will have potential implications for surrounding infrastructure. Greater recreational use of Hardings Park has increased vehicle numbers on Kahuterawa Road. Harvesting of pine plantations on South Range Road and adjacent to the reservoirs will result in a period of logging truck traffic on South Range Road and Turitea Road. Coordination within the Council will be required to manage these roading infrastructure demands. The management plan scope does not cover management of public roads. However coordination of their management with management of the reserve is important.

There are boundary issues associated with South Range Road in that the formed road in this area does not always follow the legal road. This has significance to neighbours and potential significance in relation to any re-alignment of the road for logging truck traffic prior to harvest of pine plantations in this area.

Policies

Actions

- | Policies | Actions |
|--|--|
| 1. Encourage the appropriate maintenance or upgrade of the public roads providing main access to the Reserve, including: <ul style="list-style-type: none"> • Increased maintenance in relation to any increase in visitor usage of the Reserve. • Road upgrade and maintenance in relation to plantation forest harvesting (see 7.1 (1)). • Maintaining the rural character of the roads • Improving sight lines to improve safety. | - Provision of information on plantation forest harvesting and recreational use to allow planning of road maintenance. |
| 2. To review and resolve the road line boundaries along South Range Road. | - |
-

2. Community Consultation and Involvement

Objectives

The Turitea Reserve is managed by the PNCC on behalf of the Palmerston North City community. It serves a wide range of needs from provision of the major portion of the city's water supply to biodiversity conservation and outdoor recreation in Hardings Park. Management must meet the needs of both current and future generations. This requires ongoing engagement with the community and consideration of community requirements. Management must give particular recognition to stakeholders such as tangata whenua who have important relationships with reserve resources, and neighbours whose activities have the potential to impact on management success.

Management of the reserve will:

1. Take account of community needs through informal and formal consultation.
2. Improve understanding of and support for management of the Reserve by including community groups and individuals in park management.
3. Maintain active relationships and cooperation between Council staff and reserve neighbours, to facilitate effective implementation of the plan and achieve common benefits.
4. Build relationships with and work in partnership with tangata whenua to ensure their involvement and practical achievement of kaitiakitanga in Reserve management.

Policies

2.1 Consultation

Explanation

The Reserve is the largest single land asset managed by the Council. It is of strategic importance to the whole community in relation to water supply, biodiversity and the potential for outdoor recreational use of certain areas. Effective community consultation as part of Reserve management is important to ensure that management provides maximum benefits to the current and future community of Palmerston North.

Policies	Actions
1. Continue to consult with individuals, groups and agencies with an interest in the Reserve including ecological and recreational interest groups, neighbours and regulatory authorities.	<ul style="list-style-type: none"> - Develop and maintain a stakeholder list identifying parties interested in management, and matters they are to be consulted on. - Develop a Turitea Reserve page on the PNCC website giving details of management programme and contacts.
2. Annually review any issues raised by the community in relation to the plan and identify any plan modifications required in line with policy 1.3(1).	<ul style="list-style-type: none"> - Establish a database for recording issues raised by the community and the Council's responses to these. - Incorporate database records into the annual review process.

3. Undertake full notification and wide community consultation as part of a regular five yearly review of the plan in line with the requirements of Section 41 of the Reserves Act 1977.	- Notification and consultation process to be undertaken every 5 years.
4. Establish a Turitea Reserve Advisory Committee that is: <ul style="list-style-type: none"> • Representative of user groups, reserve management interests, and tangata whenua. • Independent of Council political process to provide ongoing community input to management. 	- Determine the detail of committee composition and terms of reference, process for selection of members etc. - Establish the committee and hold meetings at least every 6 months.
5. Role of the Turitea Reserve Advisory Committee will include providing recommendations on Reserve management within the framework of the Management Plan. The committee will not have power to make decisions on Reserve management.	-

2.2 Community Involvement and Partnerships

Explanation

Involving the community, where appropriate, in reserve management activities and providing support for appropriate community-initiated projects has the potential to build community support for and improve the cost effectiveness of reserve management. The development of the Sledge Track by community volunteers is a good example of this approach.

Policies

Actions

1. Encourage and support community, business and individual initiatives that support management objectives and add value to Reserve management. Priority will be given to initiatives that: <ul style="list-style-type: none"> • align closely with objectives and policies of the plan • have wide community support. • Demonstrate ability to see project through and provide ongoing input. 	- Identify current initiatives being supported by the Council and determine the nature and level of ongoing support to be provided. - Evaluate new initiatives and determine the nature and level of ongoing support to be provided. - Review initiatives ability to implement projects and costs of contingencies of Council involvement if they fail.
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2.3 tangata whenua

Explanation

tangata whenua have important rights in relation to reserve management, through an obligation on the administering body to give effect to the principles of the Treaty of Waitangi (Local Govt NZ 1999). Implementing principles of partnership, control over taonga, and kaitiakitanga in relation to resources and taonga will require development of good working relationships and consultation with tangata whenua. Care will be required in ensuring relationships and consultation are coordinated within other Council contact in relation to major policy areas such as the Greening Strategy.

Policies	Actions
1. Develop and maintain relationships with tangata whenua including at least annual consultation on Reserve management progress.	<ul style="list-style-type: none"> - Define responsibilities for contact with tangata whenua . - Undertake consultation in a coordinated way within the wider Council framework of the Greening Strategy where appropriate. - Undertake regular contact, at least annually to discuss management issues.
2. Work with tangata whenua to establish a working group that can develop draft management approaches for wider consideration by tangata whenua.	<ul style="list-style-type: none"> - Consult with tangata whenua over best mechanism. - Assist establishment of any working group.
3. Work with tangata whenua to identify issues on which direct involvement and consultation are required, including: <ul style="list-style-type: none"> - Safeguarding of sites and values of importance to tangata whenua - Acknowledgement of tangata whenua in naming. - Provision of opportunities for practical achievement of kaitiakitanga. - Mechanisms for consideration of cultural harvest. 	<ul style="list-style-type: none"> - Consult with tangata whenua to identify important issues and best process.

2.4 Working with Neighbours

Explanation

Effective and cooperative relationships with neighbours will be required. The land-use activities of neighbours can influence the success of reserve management. Working in cooperation with neighbours can improve the effectiveness of animal and plant pest control, fencing, water supply security, and development of ecological linkages. The cooperation of neighbours is also critical to controlling risks to the catchment from fire, livestock and erosion resulting from land management practices.

Policies	Actions
1. Work with neighbours (both individually and in groups) to implement management objectives and policies, particularly in the areas of: <ul style="list-style-type: none"> • Catchment protection • Fencing • Animal and plant pest control, including managing the effects of domestic pets. • Enhancing flora and fauna and ecological links with neighbouring properties • Security 	<ul style="list-style-type: none"> - Establish an up to date database of all adjacent neighbours and update the database in line with changes to the Council's rating database. - Establish a mechanism for regular provision of information about reserve management issues to neighbours. This could include a regular meeting / forum and expanded annual information mail out). - Meet with affected neighbours to discuss any specific issues. - Provide rapid initial contact and information to any new neighbours.

3. Protecting Water Supply Quality and Storage

Objectives

Water supply from the Turitea Reserve is highly important and strategic to the city, providing around 60% of the city's water requirements. This resource will continue to be of major importance and its protection is a primary purpose of management over much of the reserve.

Protecting the water supply from the risk of contamination (particularly microbial contamination) will be undertaken in three ways:

- Keeping the source as clean as possible, by protecting the catchment and minimising the possibility of contamination.
- Treating the water to remove and/or deactivate any contaminants introduced.
- Protecting the water from recontamination during distribution.

The most successful approach is to use all three of these methods concurrently, to maximise the barriers to contamination / infection. Reserve management will continue to minimise all risks of contamination of the source water. This will maximise flexibility in terms of future treatment technology choices, potentially reducing the need for greater investment in technologies such as membrane filters needed for treatment of higher risk sources.

Input of sediment into the storage reservoirs can reduce storage capacity over time. Minimising sediment input to maintain storage capacity is an important management objective.

The following objectives will be adopted:

1. To maintain a high quality and secure water source.
2. To maintain a low level of risk of contamination and preserve options in terms of future barriers to contamination.
3. To minimise sediment input to reservoirs.

Policies

3.1 Catchment Protection

Explanation

Protection of the Turitea water supply catchment is important to the long term security and quality of the water supply. The Council's primary focus is on obtaining and maintaining "protected catchment" status, and minimising risks to the future quality of the water supply. Ministry of Health drinking water grading rules identify a protected catchment as: "A catchment which has major points of access fenced and is controlled so that there is only strictly controlled human access and limited feral animals. In most New Zealand situations controlled culling will be required in order to achieve a satisfactory level of feral animals."

There are many policies in this plan that are of direct importance to achieving catchment protection, but which relate to specific areas such as public recreational access and animal control. Relevant policies in other areas of this plan are reference below.

Policies	Actions
1. Maintain "protected catchment" status as defined by the Ministry of Health.	- Implement policies set out below.
2. To manage the catchment to maintain an "A" grading or equivalent for the Turitea Catchment Source.	- Implement policies set out below.

See policies related to:

- Feral animals 4.3.1(2, 3 & 4)
- Fencing 4.3.2(1)
- Grazing 4.3.3(1 & 2)
- Working with neighbours 4.2(1)
- Public Access 6.1

3.2 Risk Management

Management of risk in relation to the water supply source is essential to ensure that it is safe and of high quality now and in the future. Amendments to the Health Act 1956 make this a legal requirement, by requiring the introduction of Public Health Risk Management Plans for water supply catchments. There are a number of risks that will need to be managed within the catchment.

Livestock that are present on small areas of private land within the catchment are a potential source of contamination by harmful micro-organisms, particularly where these areas drain into the lower dam. It is important to work with private land owners on potential solutions to this risk.

Feral animals within the catchment are another potential source of harmful micro-organisms. Ongoing control of feral animals will be required as identified under section 4.3.

Chemical contamination by agrichemicals or fertilisers is a low risk to water supply quality due to the small area of pasture within the catchment and relatively low levels of chemical use in pastoral farming. However, working with neighbours on this matter will be important.

Uncontrolled public access to the water supply increases the risk of micro biological contamination as well as vandalism. Control of public access is identified under policies in 6.1.

Policies	Actions
1. To manage the water supply catchment, water source and abstraction from reservoirs in accordance with Public Health Risk Management Plans as identified under proposed amendments to the Health Act 1956.	- Prepare public health risk management plans. - Monitor compliance of reserve management with the Public Health Risk Management Plan for the Turitea water supply.
2. Work with neighbours to avoid use of chemical herbicides and pesticides within the catchment or close to boundaries.	- Provide information to neighbours on relevant issues and on chemicals that are of higher and lower concern. - Encourage neighbours to notify management staff of spraying operations. - If possible obtain information from neighbours on chemical use.

3. Selection of methods of pest control in the Reserve will consider their relative risk to the water supply. Where chemical control methods are used, chemicals which have lower toxicity, lower potential solubility and lower persistence in water will be favoured.	<ul style="list-style-type: none"> - Apply criteria to selection of methods - Check suitability of all chemicals prior to use, e.g. herbicides, from public health perspective.
4. Continue to develop and remain up to date with information on the risks of different potential sources of contaminants within the catchment and their relative significance.	-

See also policies related to:

- Feral animals 4.3.1(2, 3 & 4)
- Fencing 4.3.2(1)
- Grazing 4.3.3(1 & 2)
- Public Access 6.1
- Working with neighbours 4.2(1)

3.3 Control of Sedimentation

Explanation

Minimising sedimentation from the catchment will be achieved predominantly through maintaining and improving the condition of vegetation cover to reduce erosion. Improved levels of forest canopy cover and complexity of layers in the understorey have the potential to increase rainfall interception, reducing direct impact from rain on soils. Roots and forest floor vegetation and leaf litter also provide additional stability and reduce sedimentation.

Maintaining high quality management practices in relation to forestry operations and farming occurring on private land within the catchment will be important.

Policies	Actions
1. Maintain and improve vegetation cover in the catchment, including through: <ul style="list-style-type: none"> - Improving the condition of native vegetation. - Encouraging the establishment of forest on previously farmed areas within the catchment. - Working with neighbours to encourage changes in land use to forestry or native forest restoration on areas of private land within the catchment currently managed as pasture. 	<ul style="list-style-type: none"> - Implementation of animal control policies under section 4.3. - Implement other policies set out below.
2. Minimise soil disturbance that could result in erosion, particularly in areas close to waterways or reservoirs. Particular attention to minimising sediment release will be required in relation to: <ul style="list-style-type: none"> - Access road maintenance - Forest harvesting - New track construction 	<ul style="list-style-type: none"> - Ensure implementation of best practice in harvest planning and operational water and sediment control for forest harvest operations. - Ensure maintenance of effective water controls such as culverts, cut-outs, and sediment traps in access road maintenance. - Develop specific sediment control plans for larger scale activities.

See also policies related to:

- Feral animals 4.3.1(2, 3 & 4)
- Fencing 4.3.2(1)
- Grazing 4.3.3(1 & 2)
- Working with neighbours 4.2(1)
- Restoration 4.4(1)
- Fire 4.7(1-5)
- Forest harvesting 7.1(1 & 5)

4. Conserving and Restoring Flora and Fauna, Ecosystems and Natural Landscapes

Objectives

Maintenance and restoration of natural vegetation, wildlife and ecosystems within the reserve is central to achieving a variety of other management objectives. Maintenance of high quality forest cover is important to minimising sedimentation (thereby preserving water supply reservoir storage capacity) and to maintaining water supply quality. Control of animal pests provides benefits both in terms of protecting indigenous flora and fauna, and protecting water supply quality by reducing the risk of microbiological contamination.

High quality indigenous vegetation and wildlife contribute directly to the landscape, amenity, and recreational values of the area.

The flora, fauna, and ecosystems of the Reserve are highly significant in terms of the biodiversity resources that they contribute to the city. In terms of land area, the Reserve contains around 90% of the city's important ecological areas. The Reserve represents a reservoir of flora and fauna, from which linkages and corridors can be created onto neighbouring land and into the city.

Conserving the flora, fauna, ecosystems and natural landscapes of the Reserve sits within the wider framework of the proposed Council "Greening Strategy" which aims to improve the biodiversity and quality of green spaces within the City. The size and ecological significance of the Reserve means management of biodiversity value in the Reserve is very important to the success of the Greening Strategy.

Objectives of management are:

1. To protect indigenous flora and fauna, habitats and ecosystems within the Reserve.
2. To promote the restoration of indigenous plants, animals and habitats within the Reserve.
3. To control and where practicable eradicate exotic plant pests from the Reserve.
4. To control exotic animals to levels that allow protection and restoration of native plants, animals and habitats and minimise risks to water supply quality.
5. To preserve and where practicable enhance the natural landscape values of the reserve, except where another objective in this plan is pursued in which case the impact on landscape values will be mitigated.
6. To minimise risks of damage to natural values from fire.
7. To develop the Reserve as an ecological reservoir for the city by encouraging the development of ecological linkages and corridors, and helping to facilitate the implementation of the above objectives on private and public land adjacent to the Reserve

Policies

4.1 Ecological Management Zones

Four ecological management zones (see Table 1 and map 1) are identified in relation to the relative significance of flora, fauna and ecosystems and potential benefits from management.

Table 1: Ecological Management Zones

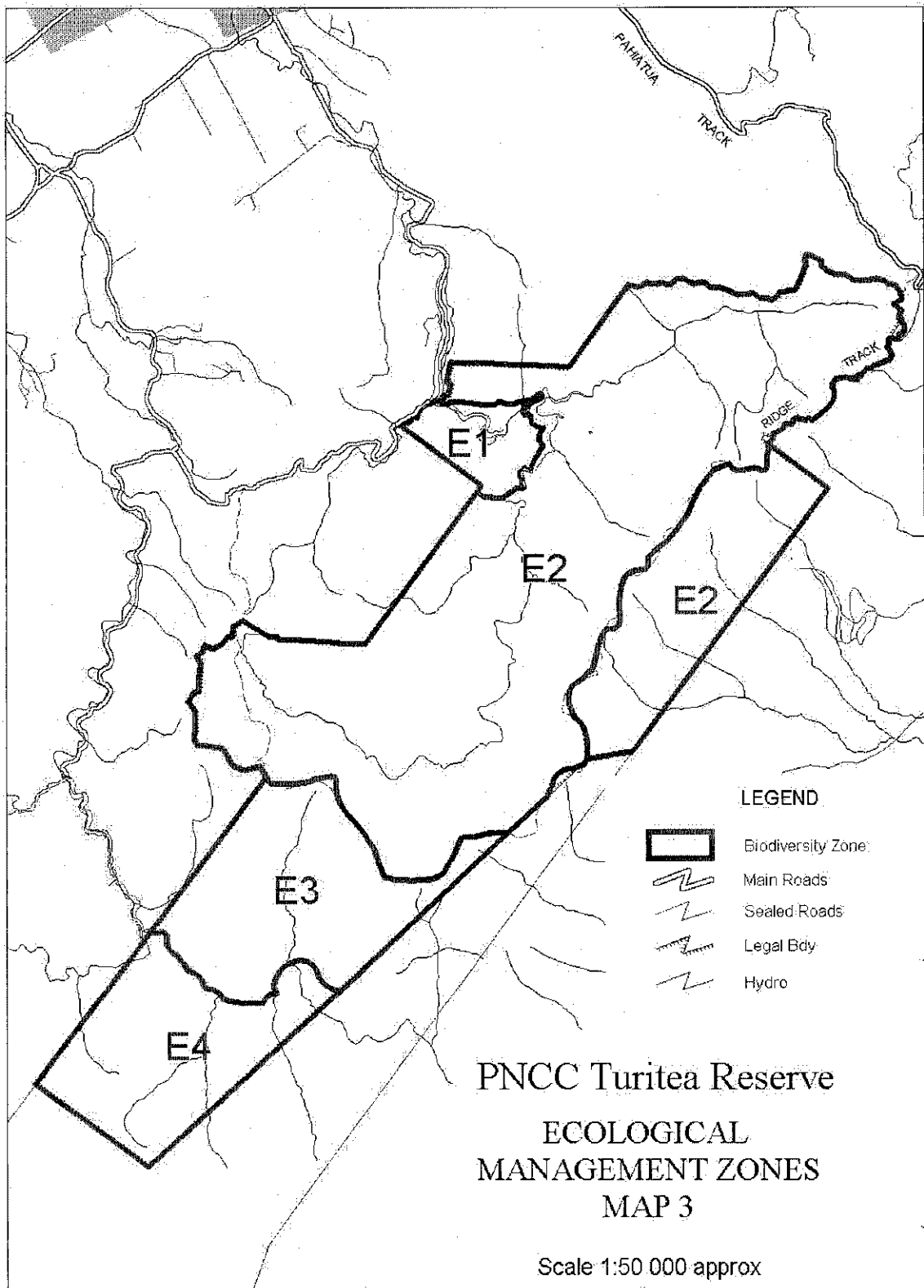
Zone Name	Code	Area (ha)	Description
Ecological Management Zone 1	E1	112	Area of lowland tawa forest close to the lower dam.
Ecological Management Zone 2	E2	2095	Remainder of the water supply catchment
Ecological Management Zone 3	E3	921	Area east and south of the catchment, flatter northern areas of Hardings Park.
Ecological Management Zone 4	E4	434	Remaining southern and higher altitude area of Hardings Park.

Management policies are defined for animal control in these Zones under 4.3.1.

Management within E1 will be given a high emphasis due to:

- The presence of high quality lowland tawa / podocarp vegetation with nikau.
- Easy access for control and maintenance of boundary control of pest animals and plants.
- Benefits of intensive animal control on reducing public health risks associated with the water intake and lower reservoir.
- Benefits for security of regular patrol of this area by personnel involved with animal control.
- Close proximity to potential "green corridor" areas of the Turitea Valley and areas that benefit from the amenity values of this zone.
- The opportunity to closely control any public access to the area in the future due to the established surveillance requirement in relation to the treatment plant and intake.
- Close proximity to the city for visitor access.

Management of E2 is highly significant since the area forms the water supply catchment, contains large areas of lowland tawa podocarp forest in the Little Turitea and lower Turitea, and is closely linked to E1 and the potential biodiversity corridors. The defined boundary and access to E2 provided by the Water Catchment Access Road and neighbouring farmland allows efficient access and potential for boundary control to allow maintenance of animal control.



Management of E3 will provide a buffer to E2, slowing the migration of animal pests back into E2 following control. E3 will also provide open public access within Hardings Park in areas with good biodiversity values. It also forms a spillover area for wildlife from E1 & E2.

Strategic Direction

E1

- Restoration of species and ecosystems historically present.
- Investigate opportunities for a predator proof fence, which would also provide security to water supply assets.
- Possible re-introduction of native species (e.g. NI Robin, weka, kokako, kaka, kiwi) in consultation with DOC.
- Controlled public access (e.g. small guided tours and controlled viewing areas).

E2

- Development as main biodiversity reservoir for the city.
- Restoration of species and ecosystems historically present.

E3

- Provision of relatively high biodiversity values in an area with open public access.

4.2 Weed Control

The reserve is currently relatively free of serious exotic weeds. However, a variety of weed species are present in localised areas, particularly between the reservoirs and the bottom of Turitea Gorge, and to a lesser extent along the Water Catchment Access Road. Control of localised areas of important weeds is a high priority.

The Horizons.mw Regional Plant Pest Management Strategy (RPPMS) became operative in August 2001. This identifies a variety of weeds to be controlled and specifies rules regarding levels of control required. Control is undertaken by Horizons.mw on certain control plants and on containment plants outside certain containment areas. Old mans beard (*Clematis vitalba*) in the Turitea Gorge is outside the containment area defined in the RPPMS and consequently is subject to control by Horizons.mw. The RPPMS also identifies potential for control by Horizons.mw in relation to high value conservation areas (HVCAs) on some other weed species. Turitea Reserve is identified as a HVCA. Other weed species present in the reserve include Tradescantia, blackberry, gorse and ragwort.

Further introduction or spread of weeds within the reserve must be avoided. Introduction of weed seeds on machinery or in road metal is a very common means of weed spread and is likely to be the primary source of current weeds in the Reserve. Particular attention to preventing this form of spread is required.

Surveillance is required to quickly identify and control new introductions or spread.

Policies	Actions
1. Maintain compliance with the Manawatu – Wanganui Regional Pest Plant Management Strategy and maintain contact with Horizons.mw on plant pest control policies.	<ul style="list-style-type: none"> - Boundary ragwort and gorse control - Liaison with Horizons.mw over old mans beard - Ongoing contact with Horizons.mw
2. Develop a programme to eradicate particular weed species within the reserve where they meet the following criteria:	<ul style="list-style-type: none"> - Surveillance survey of weed species present. - Prepare a weed control plan

<ul style="list-style-type: none"> • Have recently become established within the region. • Place biodiversity conservation values within the reserve at risk • Can be easily controlled and eradicated. • Have a low risk of re-invasion. • Score highly in terms of weed characteristics under national classification systems (e.g. DOC). 	<ul style="list-style-type: none"> - including potential eradication of OMB, Banana Passionfruit, and Tradescantia. - Check any chemicals for suitability from public health perspective.
<p>3. Develop a programme to contain the spread of other weed species that could damage biodiversity values and consider eradication in certain areas.</p>	<ul style="list-style-type: none"> - Prepare weed control plan
<p>4. Prevent new introduction or spread of weeds through mechanisms including:</p> <ul style="list-style-type: none"> • Thorough wash down and inspection of construction or road maintenance machinery prior to moving into the reserve. • Avoid the use of metal from sources containing significant weed plants.. • Educate new neighbours and coordinate with existing neighbours on the importance of preventing weed introduction (see also 2.4 (1)). 	<ul style="list-style-type: none"> - Education of contractors and staff - Checks on machines prior to entry - Examination of metal sources and identification of preferred sources.
<p>5. Undertake annual surveillance for the presence of weeds in the reserve and implement appropriate control in relation to the above objectives – covering the following areas:</p> <ul style="list-style-type: none"> • All access roads and boundaries between public roads and the reserve (South Range Road). • All known areas of weed infestation. 	<ul style="list-style-type: none"> - Identify responsibilities for annual surveillance. - Train staff or use contractors for annual surveillance. - Obtaining and maintain good quality surveillance records e.g. GPS location and assessment form. - Keep a database of weed sites including sites identified through surveillance and details of treatment and follow-up. - Undertake 2 yearly aerial surveillance of areas of potential Old Mans Beard infestation, particularly in the Turitea Gorge and around the Reservoirs.

4.3 Animal Control

4.3.1 Feral Animals

Introduced animals present in the reserve include possums, deer, goats, pigs, rats, mice and mustelids. These animals have the potential to cause major damage to indigenous flora, fauna and ecosystems through browsing, predation, and competition for key food sources. These animals can also spread harmful micro-organisms that could contaminate the water supply.

The Horizons.mw Regional Animal Pest Management Strategy (RAPMS) became operative in January 2002. This identifies the rook, possum and rabbit as animal pests to be controlled and a variety of other surveillance pests. Control may be undertaken or assisted by Horizons.mw on some animal pests in relation to High

Conservation Value Areas (HVCA). Turitea Reserve is identified as a HVCA and may be eligible, particularly in relation to possum control.

Animal control contributes to achieving a wide range of reserve management objectives. Animal control is to be targeted to where it will provide the greatest overall benefit in terms of conservation and water supply objectives. For this reason ecological management zones E1 & E2 have the highest priority due to the higher quality lowland forest habitat they contain and their significance as the catchment area for the water supply.

The Reserve covers a long east-west boundary between the Wairarapa / Southern Hawkes Bay and Manawatu. Although Bovine Tuberculosis is not currently present in livestock in the vicinity of the Reserve, it is present further south on the eastern side. Coordination with the Animal Health Board in relation to TB monitoring and control and ongoing possum control work will be important to ensure that the reserve does not become a source of TB spread.

Policies	Actions
1. Maintain compliance with the Manawatu – Wanganui Regional Animal Pest Management Strategy and maintain contact with Horizons.mw on animal pest control policies.	-
2. Undertake animal control sufficient to minimise risks of pathogens under a Public Health Risk Management Plan and achieve protected catchment status under NZ drinking water grading system.	-
3. Undertake the animal control to achieve the targets set out in table 10 below	<ul style="list-style-type: none"> - Prepare an animal control plan. - Coordinate with Horizons.mw - Engage contractors and manage contract control operations. - Monitoring (see 4.5)
<p>4. Use appropriate control methods which are cost effective, and have a low risk to non target species and the water supply. This will include:</p> <ul style="list-style-type: none"> • Giving priority to ground control operations. • Where poisons are to be used, those with the lowest risk to the water supply will be used. • Applying best practice will be used in all control operations. • Using only approved operators meeting standard criteria for skill, experience and qualifications such as poison licences. • Use of recreational hunting for control of deer and pigs, provided this gives sufficient control to meet targets. Where any additional control is required, contract hunting may be undertaken. • Use of contract hunting to control goats. 	<ul style="list-style-type: none"> - Current focus for possum control is likely to be on trapping and the hand application of Cyanide, Cholecalciferol and Brodifacoum. - Continue to review methods of control such as improved toxins or traps, so best practice is maintained. - Include detail on methods within the animal control plan.
5. Work with neighbours and the Animal Health Board to keep the reserve free of TB and ensure it does not become a source of TB spread.	-

Table 2: Control Targets for Introduced Animals in the Turitea Reserve.

Animal	Zone	Control target
Possum	E1	<ul style="list-style-type: none"> <5% possum Relative Trap Catch (RTC) Maintain a stable canopy of main canopy species and avoid the removal of vulnerable canopy species by possums.
	E2	<ul style="list-style-type: none"> <5% possum Relative Trap Catch (RTC) Maintain a stable canopy of main canopy species and avoid the removal of vulnerable canopy species by possums.
	E3	<ul style="list-style-type: none"> <10% possum RTC and to a level sufficient to maintain an effective buffer to E2 Maintain a stable canopy of main canopy species and avoid the removal of vulnerable canopy species by possums.
	E4	<ul style="list-style-type: none"> Possum control may be required in relation to any specific problems or decline in vegetation condition.
Goat	E1	<ul style="list-style-type: none"> Take all practicable steps to eradicate
	E2	<ul style="list-style-type: none"> Take all practicable steps to eradicate
	E3	<ul style="list-style-type: none"> Sufficient control to minimise movement into E2. Eradicate where feasible.
	E4	<ul style="list-style-type: none"> Sufficient control to minimise movement into E3. Eradicate where feasible.
Red Deer	E1	<ul style="list-style-type: none"> To a level that allows adequate regeneration of main canopy tree species and palatable understorey species.
	E2	<ul style="list-style-type: none"> To a level that allows adequate regeneration of main canopy tree species and palatable understorey species.
	E3	<ul style="list-style-type: none"> To a level that allows adequate regeneration of main canopy tree species and palatable understorey species.
	E4	<ul style="list-style-type: none"> Control may be required in relation to any specific problems or decline in vegetation condition.
Pigs	E1	<ul style="list-style-type: none"> Maintain at a level where there are no significant impacts on forest regeneration or water supply.
	E2	<ul style="list-style-type: none"> Maintain at a level where there are no significant impacts on forest regeneration or water supply.
	E3	<ul style="list-style-type: none"> Maintain at a level where there are no significant impacts on forest regeneration or water supply.
	E4	<ul style="list-style-type: none"> Control may be required in relation to any specific problems or decline in vegetation condition.
Mustelids	E1	<ul style="list-style-type: none"> No direct control.
	E2	<ul style="list-style-type: none"> No direct control.
	E3	<ul style="list-style-type: none"> No direct control.
	E4	<ul style="list-style-type: none"> No direct control.
Feral Cats	E1	<ul style="list-style-type: none"> No direct control.
	E2	<ul style="list-style-type: none"> No direct control.
	E3	<ul style="list-style-type: none"> No direct control.
	E4	<ul style="list-style-type: none"> No direct control.
Rodents	E1	<ul style="list-style-type: none"> No direct control.
	E2	<ul style="list-style-type: none"> No direct control.
	E3	<ul style="list-style-type: none"> No direct control.
	E4	<ul style="list-style-type: none"> No direct control.

Strategic Direction

- Reduce possum RTC in E1 & E2 to <3%.
- Examine the feasibility of mustelid and feral cat control in E1 & E2 to a level that would enhance the breeding success of vulnerable bird species currently present within the Reserve.
- Examine the feasibility of rodent control in E1 & E2 to a level that would achieve conservation aims of enhancing the viable seed crop of key canopy tree species and enhancing the breeding success of vulnerable bird species currently present within the Reserve.
- Examine the need for some "buffer" protection into E3 if any future control of mustelids, rodents or feral cats is undertaken in E1 & E2.

4.3.2 Fencing

The reserve has a boundary with private land. The western side and northern end of the reserve are now effectively fenced and these fences will require ongoing maintenance. The eastern side of the reserve has a difficult, broken boundary with numerous "fingers" of bush crossing the boundary onto private land. Stock are at time gaining access to the reserve from the eastern boundary, though in small numbers. There have also been problems with goats entering the reserve from properties to the east. Upgrading fences needs to be done in cooperation with neighbours. In some cases opportunities for shifting boundary fences onto private land should be examined where the boundary between forest and pasture is outside the reserve. This will provide for more straightforward fencing and also potentially expand biodiversity protection benefits through protection of additional areas of forest on private land.

Policies	Actions
1. Establish and maintain stock proof boundary fences where neighbours are undertaking livestock farming. Priority is given to areas where: <ul style="list-style-type: none"> • There is known stock access to the reserve • There is farming immediately adjacent to the reserve boundary • There is farming adjacent to the catchment boundary • Goats are present on farmland adjacent to the Reserve. • Stock can obtain access to the ridgeline track and move through reserve • Fences can realistically be established and maintained. 	- Survey of Reserve Boundary and assessment of fencing priorities.
2. Work with the Department of Conservation to improve eastern boundary fencing, including the eastern side of the narrow northern strip of Tararua Forest Park.	- Work with DOC to achieve a logical solution to boundary fencing on the eastern side of the Reserve.

Strategic Direction

- Examine the feasibility of a predator proof fence around Ecological Management Zone 1, which would also provide security to water supply assets.

4.3.3 Grazing

A grazing licence exists for a small area of land under pine forest on the eastern side of the Water Catchment Access Road, adjacent to the South Range Road access gate. Small numbers of cattle are grazed here periodically behind electric fences. This is having a relatively minor impact, and is less significant for water supply quality than grazing that occurs on private land within the catchment area. Nevertheless, this grazing introduces a risk of stock escape within the reserve and this practice presents an unnecessary risk to biodiversity and water supply values.

Grazing occurs on some areas of private land within the water supply catchment, on small areas adjacent to South Range Road, in Tutaewhare Stream and in the upper Turitea Stream. There should be continued work with neighbours to move away from grazing within the catchment.

Policies	Actions
1. Cease grazing of stock within the Reserve	- Consult with lessee about termination of grazing licence.
2. Work with the owners of private land within the catchment to eliminate access by stock, particularly cattle, to the catchment. This will include consideration of the following options:	- Early discussion with neighbours over the potential to work together. - Ongoing consultation with neighbours - Implementation of any agreed options.
<ul style="list-style-type: none"> • Cooperation and education. • Joint venture afforestation. • Leases • Purchase. 	

4.4 Restoration of Ecosystems

Restoration of indigenous ecosystems will be primarily encouraged by high quality weed and animal control, as set out in policies under 4.2 and 4.3. However a number of specific "active" restoration projects may be undertaken.

There are some areas of old pasture within the catchment that have been retired from farming, such as Browns Flat. Re-afforestation / restoration projects may be valuable in these situations but need to be prioritised in relation to the range of potential projects and to other biodiversity inputs such as pest control.

New Zealand native freshwater fisheries have been greatly modified by a combination of forest clearance, land use change and the introduction of exotic species such as trout. The Turitea water supply dams form barriers to the passage of exotic species such as trout into the upper catchment. While trout are present in the main lake, they could potentially be eradicated. This would provide an opportunity to introduce non-migratory native freshwater fish species into a protected environment. The costs, funding sources and general feasibility of such a project have yet to be fully investigated. Any moves to eradicate trout from the reservoir would need to be undertaken in conjunction with Fish and Game, due to their statutory responsibility for trout.

Where high levels of sustained animal pest control are undertaken, there is an opportunity to restore a relatively predator free "mainland island". Opportunities to further increase possum control and possibly begin control of rodents and mustelids

will be examined in the future for ecological management zones 1 & 2 (see map 1). If predator proof fencing around E1 is found to be feasible in the future this would provide further benefits such as potentially making possible the re-introduction of more vulnerable species such as Kiwi. The relative merits of predator proof fencing verses other options such as intensified animal control over a wider area will need to be fully considered if such fencing is investigated. Any possible future re-introductions would need to be carefully investigated in conjunction with DOC, but have the potential to increase the amenity values of the area.

Restoration projects will be coordinated with other initiatives under the Council Greening Strategy.

Policies	Actions
<p>1. Restoration of native vegetation on some ex-pasture sites within the reserve may be undertaken provided that a plan for restoration is completed, including the consideration of natural regeneration in preference to assisted regeneration (with planting), and one or more of the following criteria are met:</p> <ul style="list-style-type: none"> • Restoration is within the catchment and has a direct positive impact on water supply quality. • Restoration develops linkages with, or toward, other natural vegetation on private land or public land, and contributes to the biodiversity corridors strategy (see map 3) or wider Greening Strategy. • Restoration provides important shelter or other protection of key biodiversity assets in the reserve. 	<ul style="list-style-type: none"> - Identify priorities for restoring vegetation. - Prepare plans for restoration where high priority projects are identified. - Implement restoration plans.
<p>2. Restoration of native plant species that have been removed from the Reserve or greatly reduced in their distribution by the impacts of animal pests may be undertaken.</p>	<ul style="list-style-type: none"> - Investigate the benefits and practicalities of re-establishing northern rata (<i>Metrosideros robusta</i>) or other species now extinct or rare in the Reserve
<p>3. All restoration of vegetation will be done using appropriate species and local seed sources.</p>	<ul style="list-style-type: none"> -
<p>4. Identify opportunities for native fishery restoration above the Turitea dams and investigate their feasibility.</p>	<ul style="list-style-type: none"> - Review the potential and practicality of native fishery restoration. - If the project is attractive, prepare a restoration plan and undertake steps of trout eradication and introduction of native species in consultation with local DOC and local specialists.
<p>5. Investigate the feasibility of more intensive animal control in E1 & E2 toward a possible future "Mainland Island".</p>	<ul style="list-style-type: none"> - Once control targets for E1 & E2 are achieved, examine the feasibility and value of further reducing possum populations and undertaking control of mustelids and rodents.

4.5 Monitoring

Explanation

Monitoring of indigenous flora and fauna and ecosystems is essential to identify whether management is successful in protecting them, or if they are becoming further degraded. Monitoring of exotic plants and animals is also essential to see if control operations are successful and if targets are met.

Monitoring provides a means of identifying if changes to management are required in order to ensure the objectives of this plan are met. For example, monitoring of vegetation can examine whether adequate regeneration of main canopy tree species and palatable understorey species is being achieved (see control targets under 4.3.1) This helps to review the effectiveness of current management, such as the use of recreational hunters to control deer.

Monitoring within the Reserve has links to wider state of the environment monitoring by Council. Reserve monitoring will be developed to provide information for wider state of the environment reporting.

Monitoring in relation to protection of flora, fauna and ecosystems can usefully be grouped into two types. The first is "outcome monitoring" which identifies the impacts of management operations such as animal control on indicators such as canopy condition, bird abundance etc. The second is "operational monitoring" which monitors the performance of a particular operation such as possum control.

Establishment of monitoring should precede major changes in management such as increased animal control.

Policies	<i>Actions</i>
1. Develop and implement a programme to monitor conservation outcomes from management policies including: <ul style="list-style-type: none"> • Forest canopy condition, particularly of browse susceptible species. • Understorey condition including regeneration of main canopy species and maintenance of a diverse understorey including species of importance to birds. • Abundance of vulnerable bird species such as kereru • Diversity and abundance of a range of bird species. • Consideration of monitoring of invertebrates and herpetofauna. 	<ul style="list-style-type: none"> - Prepare monitoring plan identifying specific monitoring methods and sampling design etc. - Undertake monitoring and survey work prior to changes in management. - Regular analysis and reporting against objectives, and policies.
2. Operational monitoring of possum control operations will involve the use of standard trap catch protocols published by the National Possum Control Agencies. As a minimum, post operation trap catch monitoring will be undertaken where areas over 200 hectares are treated.	<ul style="list-style-type: none"> - Implement trap catch monitoring in relation to possum control operations.
3. Develop and implement monitoring of large exotic animal populations, particularly deer, using a range of methods that may include: <ul style="list-style-type: none"> • Kill return records 	<ul style="list-style-type: none"> - Prepare monitoring plan - Undertake survey work - Regular analysis and reporting against objectives, and policies.

<ul style="list-style-type: none"> • Formal hunter effort monitoring • Pellet counts 		
<p>4. Develop and implement monitoring of small animal pests including rodents and stoats in E1 & E2 using tracking tunnels , or trap catch and/or other accepted methods.</p>	<ul style="list-style-type: none"> - Prepare monitoring plan - Undertake survey work - Regular analysis and reporting against objectives, and policies. 	

4.6 Landscape protection

Explanation

The reserve represents a highly significant landscape feature for the Palmerston North City area. Operations such as vegetation clearance or construction of structures or vehicle tracks on the ridgeline area could compromise these values. Harvesting of plantation areas will also need to be undertaken carefully to minimise soil disturbance or tracking that could impact on the landscape. Some opportunities exist to improve the landscape through removing isolated areas of plantation forest.

Inappropriately sited tracks or structures, or tracks or structures that clash with the natural landscape can negatively affect landscape values. An example of this is the current colour of the water treatment plant. Future repainting of the plant will be undertaken in more natural colours.

It is also important to note that policies related to the protection and restoration of indigenous flora, fauna and ecosystems will directly contribute to landscape and amenity values. Examples include visual improvement in the health and vigour of vegetation, increased numbers of birds in the area, and the development of green corridors improving amenity values across the City.

The installation of a windfarm in the water supply catchment area will have an impact on the landscape values of the reserve. However, it is considered that these issues need to be evaluated in conjunction with mitigation strategies developed through a resource consenting process under the Resource Management Act.

Policies

Actions

<p>1. Ensure that the potential detriment of the landscape qualities of the reserve are minimised through a resource consent process with mitigation of effects considered.</p>	<ul style="list-style-type: none"> - Ensure that methods to instigate landscape effects are considered. - No landscape intrusion into Hardings Park permitted.
<p>2.1. Structures, tracks and other facilities should be sited, constructed and coloured so as to minimise impact on the natural landscape.</p>	<ul style="list-style-type: none"> - Revegetate or mitigate effects of all earthworks to minimise visual impacts.

4.7 Protection from Fire

Explanation

The major catastrophic threat to the Reserve is fire. Major loss of vegetation through fire would impact on the achievement of many objectives under this plan through damage to flora, fauna and ecosystems and degrading the quality of the water supply. A high level of fire protection and risk management will continue to be required.

Policies	Actions
1. Maintain an effective current rural fire plan including Turitea Reserve	- Continue maintenance of fire plan
2. Review fire hazards within and around the Reserve and implement any actions that can be taken to reduce fire risk	- Undertake a fire hazards assessment of the reserve. Identify any recommendations and improvements to reduce risk e.g. vegetation change in boundary areas, public road risks, power lines etc.
3. Maintain fire fighting facilities including water supply dams within the reserve.	- Maintain fire ponds, access tracks, signs. - Prepare a fire resources description map
4. Where class A foam is used for suppression of fires within the catchment, its use should be avoided near waterways where it may enter the water supply.	- Include in fire resources description map.
5. Liase with and provide information to neighbours and reserve users to minimise risk.	- Ongoing contact with neighbours - Inclusion of fire risk minimisation information as part of interpretation.
6. Close the reserve to all public access during times of extreme fire risk, when a prohibited fire season is introduced.	-

4.8 Facilitating linkages and corridors

Explanation

Boundaries of the reserve, particularly in the east, are often contiguous with areas of forest on private or DOC land. Working with these neighbours to improve fencing, undertake animal control, etc will enhance the protection and value of the reserve and also work toward wider Council strategies of promoting green corridors and enhancing the natural environment through the Greening Strategy. Legal boundaries are often impractical to fence, and moving fences outside the reserve and onto the forest / pasture margin is often cheaper and more effective than attempting to fence through forest areas.

The reserve forms the major biodiversity reservoir for the city and contains the most intact and largest natural ecosystems in the city. This strength can be expanded on by creating ecological linkages. Management will work to assist the development of "green corridors" along the Kahuterawa and Turitea valleys, forming ecological linkages between the reserve and the city / Manawatu River. These corridors would also provide connections between many of the city's other significant ecological sites

(see map 3). Additional potential to develop corridors across private land, north to the Manawatu Gorge, will also be examined.

Policies	Actions
<p>1. Actively encourage the development of ecological linkages on neighbouring properties through:</p> <ul style="list-style-type: none"> • Provision of information to neighbours • Coordination of animal and weed control with neighbours • Working with neighbours to fence areas beyond the reserve boundaries where this also contributes to reserve protection. • Working with neighbours to share forest restoration experience and encourage restoration on areas of private land such as riparian margins that will provide links between the reserve and isolated remnants. 	<ul style="list-style-type: none"> - Develop information and pamphlets for neighbours on developing linkages, animal and weed control etc. - Ongoing contact and discussions with neighbours. - Preparation of a fencing plan taking into account linkages to neighbour properties. - Examine options for financial assistance. - Contact with neighbours in relation to animal and weed control operations and coordination.
<p>2. Give priority to the development of ecological linkages from the reserve which contribute to the development of "green corridors" to lowland areas via the Turitea and Kahuterawa Valleys.</p>	<ul style="list-style-type: none"> - Identify best opportunities for creating linkages and corridors. - Work to implement these projects first.
<p>2.3. Develop concepts of 'ecological corridors' and 'virtual forest' to establish contribution to citywide and regional biodiversity.</p>	<ul style="list-style-type: none"> - Ensure that other Council strategies such as the greening strategy are reviewed to take account and further develop these concepts.
<p>2.4. Develop concept of linkages with other biodiversity reservoirs such as Mt Bruce, Totara Reserve and Bushy Park.</p>	<ul style="list-style-type: none"> - Identify and liaise with key stakeholders such as Forest & Bird and the Department of Conservation with regard to further developing these concepts.

5. Protecting Cultural and Historic Resources

Objectives

Cultural and historic resources within the Reserve will be protected for their intrinsic values and where appropriate to enhance recreational enjoyment and understanding of the area by visitors. It may not be appropriate to identify sites that are of significance to tangata whenua. Objectives are:

1. To identify, assess and record cultural and historic resources.
2. To protect and, where appropriate, enhance representative cultural and historic resources.
3. To maintain a partnership with tangata whenua in terms of the identification and management of cultural and historic sites of importance to tangata whenua.

Policies

There are sites within the reserve of historic and cultural significance to Europeans and to tangata whenua. There are legal requirements for the protection of cultural and historic resources contained within the Reserves Act 1977, The Historic Places Act 1993 and the Antiquities Act 1975. Requirements to give effect to the principles of the Treaty of Waitangi also place importance on working with tangata whenua to protect sites and resources of importance to them.

There are some sites and resources of general importance to Rangitaane within the reserve. There may be opportunities in the future to provide public interpretation on the cultural history of Rangitaane, and regional pathways used by them. This may promote knowledge and understanding of Rangitaane within the community. However any such initiatives should be at the discretion of Rangitaane and not be undertaken without their widespread support.

Policies	Actions
1. All management of cultural and historic resources will comply with the Historic Places Act and the Antiquities Act.	-
2. Where sites and resources of importance to tangata whenua are present, the Council will work with tangata whenua and heritage agencies to identify and develop management requirements.	- Consultation with tangata whenua over potential areas of interest (see policies on consultation under 2.1).
3. Identification and protection of historic and cultural features within the Reserve will be undertaken in relation to their significance and threats they face, and in consultation with heritage protection agencies and tangata whenua, as appropriate.	- Archaeological survey of mines area and recommendations for protection and safety.
4. Public information on the location and nature of sites of importance to tangata whenua will only be made available with tangata whenua approval.	- Consultation with tangata whenua (see 3.2.3).
5. Accidental discovery: Where archaeological sites or features are discovered during reserve management operations or from reports by users, the following process will be implemented:	- Information to staff and contractors.

-
- Stop all work or access to the particular area (e.g. tape it off)
 - Notify appropriate agencies such as Historic Places Trust and tangata whenua
 - Work will not re-commence without authority from the NZ Historic Places Trust.
-

6. Providing for Outdoor Recreation, Education and Ecotourism

Objectives

The Reserve will be managed to provide for outdoor recreational opportunities where these do not conflict with the objectives for protecting water supply quality or protecting flora, fauna and ecosystems. Recreational use of the Hardings Park area of the Reserve is intrinsically less in conflict with water supply objectives and this is where the principal focus of recreational use will be.

The Reserve is close to Palmerston North City, and adjacent to popular outdoor recreation areas such as the Kahuterawa Valley. Management will work to develop links with other current or potential outdoor recreation resources within the City such as the Kahuterawa Valley, Gordon Kear Forest, and the Manawatu River.

Given the priorities for management of the reserve, it is considered appropriate that the primary focus of information and services for visitors is on the natural values of the reserve and on increasing recreational users' understanding and appreciation of flora, fauna, ecosystems, and ecological processes within the Reserve.

The objectives of management are:

1. To provide for public access and enjoyment in locations and/or under circumstances where this does not conflict with water supply protection or the protection of biodiversity values.
2. To ensure that sufficient visitor services and facilities are provided to allow visitors to enjoy and appreciate the Reserve in ways that are safe, appropriate for the particularly area of the Reserve, and that minimise conflicts with other users.
3. To encourage outdoor recreational linkages with wider recreational resources and opportunities of the city.
4. Provide opportunities for outdoor education.
5. To encourage controlled ecotourism associated with increasing biodiversity values in the reserve

Policies

6.1 Zoning for public access

6.1.1 Definition of Access Zones

Table 3: Access Zones

Name	Code	Description
Open Access Zone	OA	Hardings Park to the Reserve classification boundary, 200m south of the ridgeline around the water supply catchment.
Controlled Access Zone 1	C1	The area classified Water Supply Structures and a boundary extending 50m inland from the edge

Name	Code	Description
		of the upper reservoir.
Controlled Access Zone 2	C2	The Water supply catchment classification area, excluding the area covered by C3.

6.1.2 Open Access Zone

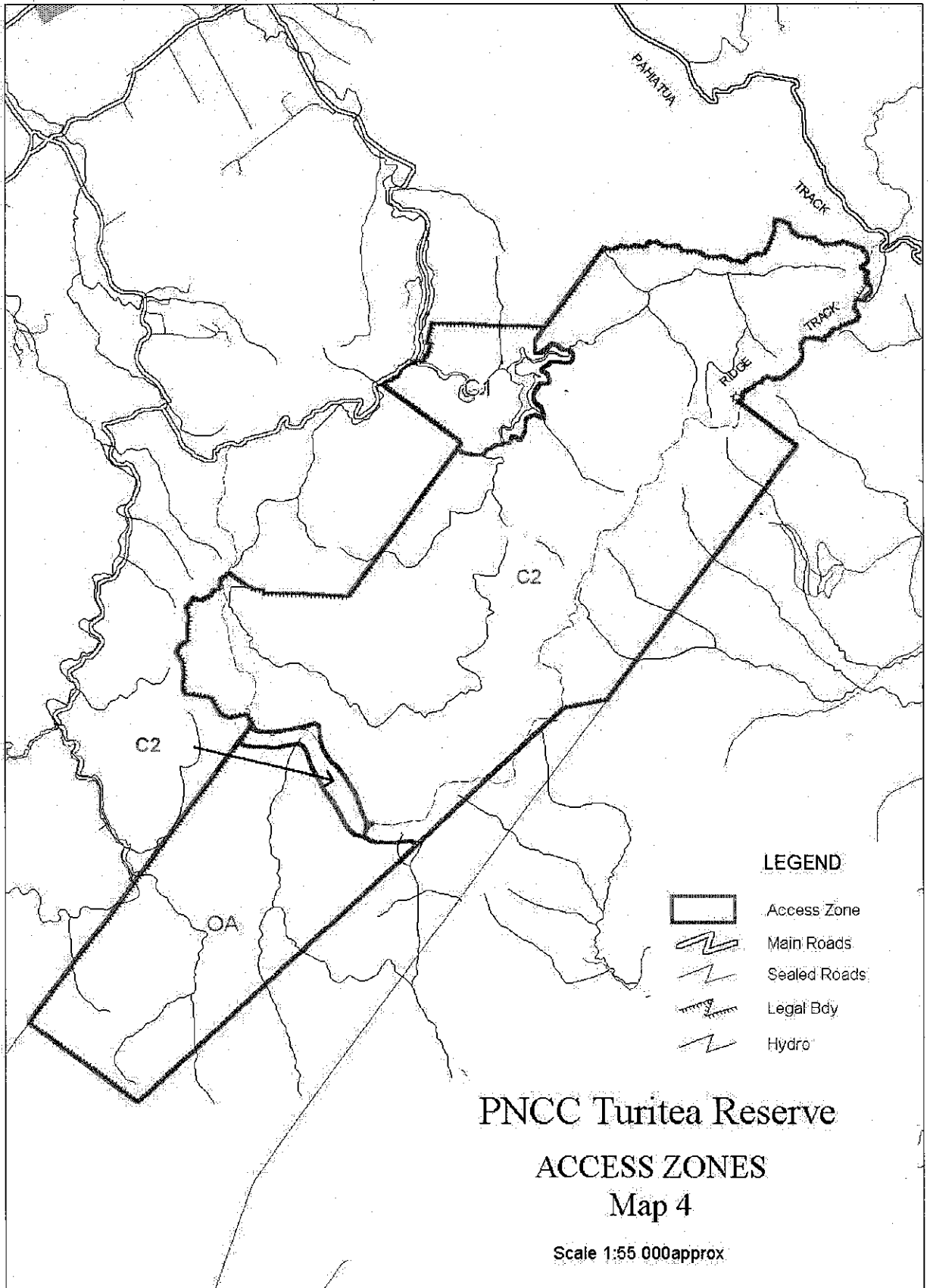
Policies	Actions
1. Open public access on foot is allowed.	- Provision of interpretation information identifying boundaries, controls on access to other areas and reasons
1.2. Development of tracks for day trips and across the Tararua Ranges	- Provision of tracks, signs and shelters to an appropriate standard.

6.1.3 Controlled Access Zone 1

Policies	Actions
2.1. No access for recreational hunting.	- Provision of information to hunters
3.2. Directly supervised access may be provided, involving organised groups authorised by or under control of PNCC staff.	- Development of controlled activities within the zone for paying visitors.

Strategic Direction

- Examine the opportunity for controlled tours through this area in relation to the future restoration of ecosystems in C1.



6.1.4 Controlled Access Zone 2

Policies	<i>Actions</i>
2.1. Access under permit for other activities such as ecotourism, recreation, research or restoration projects may be granted, subject to evaluation under 1.4, and standard permit conditions under 1.5.	

6.1.5 Controlled Access Zone 3 – Change Status to C2

Strategic Direction

- Maintain public walking access provided no problems occur or increased risks to the water supply are identified.

6.2 Recreational activities

6.2.1 Hunting

Explanation

Hunting will continue in the reserve for the purposes of animal control. The need for hunting in the reserve for this purpose will be the subject of ongoing review in as the effectiveness of other pest control methods become apparent.

Policies	<i>Actions</i>
1. Access will be provided to hunters for the purposes of animal control subject to compliance with policies under 1.5 and 6.1	-

6.2.2 Camping

Explanation

Most areas of the Reserve are within 2-3 hours walk of vehicle access points and allow good opportunities for day tramping or hunting. Overnight stays introduce increased risks of damage and litter within the reserve. They introduce a need for provision of additional facilities such as toilets. Overnight stays may also increase conflict between hunters and other recreational users due to the presence of more people in the reserve at favoured dawn and dusk hunting times. Campfires will not be permitted in the Reserve as they increase risk of wildfire and can have negative biodiversity impacts

Policies	<i>Actions</i>
1. Overnight camping will not be permitted within the reserve	- Provide information on signs and other interpretation making it clear that no camping is permitted.
2. Campfires will not be permitted within the Reserve.	- Provide information on signs and other interpretation making it clear that fires are not permitted.

6.2.3 Dogs

Explanation

There is use of dogs by hunters in the Reserve to assist with finding animals. Department of Conservation (DOC) policies on adjacent Tararua Forest Park land allow people to take dogs into the Park provided they are under control at all times. DOC allow a maximum of 2 dogs with each hunting permit issued. Policies for dogs in Turitea Reserve will be aligned with requirements on the adjacent Tararua Forest Park. Restoration of native fauna in some areas of the Reserve may require restriction of access by dogs to some areas in the future.

People accessing the park in accordance with public access policies (see 6.1) will be permitted to take dogs. Dogs must be kept under close control to avoid possibility of nuisance to other recreational users or trespass onto adjacent private land

Policies	Actions
1. Hunting permit holders may take a maximum of 2 dogs per permit holder into the Reserve.	-
2. The registration details of all dogs used for hunting in the Reserve must be included on relevant hunting permits.	-
3. Where people are accessing the Reserve for purposes other than hunting or management, they may take a maximum of 2 dogs per group.	-
4. All dogs in the Reserve must be under close control at all times.	-
5. Further restrictions or prohibition on dogs in areas of the Reserve may be imposed during animal control operations.	-

Strategic Direction

- Review ongoing access for dogs in relation to any future threats to native fauna or neighbouring farming operations.

6.2.4 Fishing

Explanation

The major influence of management on fishing is through the maintenance of high water quality suitable for trout spawning in the Turitea and Kahuterawa Streams, which are important in populating the lower Manawatu catchment. This management is also important to maintaining permanent fish stocks in these streams.

In line with policies on minimising risk to the water supply (see 3.2), control of access for fishing will be the same as for other recreational activities (see 6.1). Access for fishing will be provided within Hardings Park but will not be provided to the reservoirs.

Due to the need to exclude public access to the reservoirs, and the interest in potentially restoring a protected native aquatic ecosystem above the dams (see 4.4), the feasibility of removing trout from the reservoirs may be examined. Any such consideration will be undertaken in conjunction with Fish and Game New Zealand.

Policies	Actions
<ul style="list-style-type: none"> • Manage the catchment to maintain water quality and minimise impact on trout spawning and trout stocks in the Kahuterawa Stream and the Turitea Stream below the Dams. 	<ul style="list-style-type: none"> - Implement policies related to control of sedimentation (see 3.3).

6.2.5 Tourism

Explanation

Small scale tourism focusing on natural values and features can have benefits for the city as well as to the tourists from outside the area. Management will provide for tourism activities where they are compatible with this plan and with the requirements of other users of the Reserve.

Policies	Actions
<ol style="list-style-type: none"> 1. Access by small tourist groups is acceptable within the reserve in line with public access policies, provided the following criteria are met: <ul style="list-style-type: none"> • The tourism experience focuses on the natural values and features of the Reserve • Groups are small and do not conflict with other users of the reserve. 	<ul style="list-style-type: none"> - Alter licence and monitor organised tourist group use of the area and any conflicts with other users.
<ol style="list-style-type: none"> 1.2. Access by small tourist groups is acceptable within ecological zones E1 and E2. 	<ul style="list-style-type: none"> -

6.2.6 Motor vehicles

Explanation

There is an inherent conflict between allowing more open motor vehicle access (4WD vehicles and motorcycles) to the Water Catchment Access Road and the need to control public access to the catchment. Motor vehicle access also has the potential to conflict with the protection of biodiversity values. There is however considerable potential to develop further recreational vehicle access to Gordon Kear Forest where a network of forest access tracks offer a wide range of opportunities, and where there are no conflicts between public access and water supply security.

Providing vehicle access to the ridgeline track for recreational hunters contributes significantly to the effectiveness of animal control in the Reserve.

Policies	Actions
<ol style="list-style-type: none"> 1. The development of recreational motor vehicle access within the adjacent Gordon Kear Forest will be investigated. 	<ul style="list-style-type: none"> - Plan for possible recreational development in Gordon Kear Forest.
<ol style="list-style-type: none"> 2. Permit Holders-holding a current access permit are able to use motor vehicles on the access track in controlled access zones 2 & 3. 	<ul style="list-style-type: none"> -

6.2.7 Mountain bikes

Explanation

As with recreational four wheel drive vehicles, there is conflict between allowing access to the Water Catchment Access Road and the need to control public access to the catchment. The nearby Gordon Kear Forest offers opportunities for expansion of mountain bike activity without conflicting with water supply security. This area has logical links to the Back Track area which is popular with mountain bikers.

Policies	Actions
1. Investigate the further development of mountain bike access within Gordon Kear Forest.	- Plan for possible increased recreational development in Gordon Kear Forest.

6.2.8 Horses

Explanation

As with vehicles and mountain bikes, access to the ridgeline access track would conflict with the need to control access to the catchment. There is potential to develop access for horse riding within Gordon Kear Forest, without conflicting with water supply security.

Policies	Actions
1. Investigate the development of access opportunities for horses in Gordon Kear Forest.	- Investigate recreational development in Gordon Kear Forest.

6.3 Buildings, Facilities and Services

6.3.1 Track classification

Explanation

Using a classification system such as that set out in the table below provides important information to users as to the quality of track they can expect. A track classification system provides a means of ensuring that appropriate opportunities are provided for each level of user, e.g. walking tracks close to road ends where there are visitor numbers, and tramping tracks and routes in more remote areas.

Policies	Actions
1. To use the classification system set out in table 12 in determining the construction standards and signage requirements on any tracks:	-

Table 4 – Track Classification

Classification	Standards (see DOC 1998 for full standard)
Walking Track (DV*)	<ul style="list-style-type: none"> • Suitable for relatively inexperienced visitors with little backcountry experience. • Well defined and generally benched track • The major part (over 80%) can be walked without getting footwear wet or muddy. • Drainage / boardwalks provided over wet areas. • Maximum track gradient of 20 degrees.
Tramping Tracks (BCA*)	<ul style="list-style-type: none"> • Marked tramping track that can be over a wide range of terrain. • Natural track surface with roots, imbedded rocks etc left. • Steps and boardwalks not generally used. • Vegetation cleared to ensure there is a clear view of track markers and a clear passage.
Routes (RS*)	<ul style="list-style-type: none"> • A marked, but unformed, lightly cut route catering for experienced backcountry visitors.

Notes: * These are Department of Conservation track service standards based on their predominant user groups. These groups are defined in DOC 1998.

DV = Day Visitor

BCA = Back Country Adventurer

RS = Remoteness Seekers

6.3.2 Track development

Explanation

Construction and maintenance of tracks gives priority to those that provide loops and follow routes that do not cross the catchment boundary.

Map 6 (Development Plan) includes several new tracks. Routes will be provided south from Hardings Park, including Arawaru, to provide views and draw people away from catchment area. This development is subject to Department of Conservation approval for construction of a route through an area of Tararua Forest Park. Provision of a higher quality short loop through the head of the Otangane Stream will provide an opportunity for walkers to experience remoteness without undertaking a major expedition. It will also provide easy access to areas of high biodiversity value as these are enhanced in the future through increased animal control in Hardings Park and the adjacent catchment area.

Map 6 shows a route that includes a short section of the ridgeline track which forms the boundary between Hardings Park and the water supply catchment. Formalising this alignment is a way to control use of the route, which has been occurring informally for some time. Priority will be given to maintaining clear signage to demarcate the catchment boundary and emphasise that public access to the catchment is prohibited.

Within the water supply catchment access routes will be provided solely for the purpose of wild animal control by contractors, and to allow maintenance of electricity generation installations.

Policies	Actions
1. To develop and maintain tracks for walking and tramping in Hardings Park, and for hunting access in the Catchment. The track network is set out in table 13 and priorities for construction are provided.	- Planning, mapping and marking of new tracks - Track Construction
2. When considering proposals for the development of additional tracks within the Reserve, priority will be given to tracks that meet one or more of the following criteria: <ul style="list-style-type: none"> • Providing loops that incorporate existing tracks. • Providing links to other recreational areas or walkways. • Providing opportunities that encourage recreational walking in areas where potential conflict with water supply security is minimised. • Providing access for animal control. 	- Review any new track proposals against these criteria.

Table 5: Track Development

Recreational Tracks

Location	Priority	Broad description	Classification
Sledge Track	1	From Black Bridge, runs adjacent to the Kahuterawa Stream, crosses Ross Creek then climbs to a vantage point on the spur between Ross Creek and Quartz Creek.	Tramping Track (BCA)
Platinum Ridge & mines	1	From Kahuterawa Stream (near Quartz Creek) to Platinum Ridge, then along Platinum Ridge to point 556 and mines.	Tramping Track (BCA)
Toetoe Flat Loop	1	Alternative route from point 556, down Otangane Stream past Toetoe Flat and back to junction on Platinum Ridge.	Tramping Track (BCA)
Hardings Park Long Loop	1	From mines to Water Catchment Access Road. East along road to point 622, south down Army Track to point 573, then down into Otangane and back to Platinum Ridge Junction	Route (RS)
Arawaru & Gordon Kear	2	From Quartz Creek, up to point 624, then on up to a junction, with one track to Arawaru, the other continuing on to Scrub at head of Gordon Kear Forest.	Route (RS)
Crossing to Wairarapa	3	Investigate the practicality and potential impacts of developing a track crossing from west to east through Hardings Park	Route (RS)

Animal Control Tracks

Location	Priority	Broad description	Classification
Water supply catchment.	2	All main ridgelines	Routes (RS)

Some tracks in table 13 are now completed or close to completion. This includes the Sledge Track Platinum Ridge and Mines, and the Toetoe Flat Loop.

6.3.3 Huts & Shelters

Overnight stays in the Reserve are not permitted so huts for overnight stays will not be provided. A variety of informal huts and shelters have been constructed by hunters in the Reserve over many years. Maintenance of these huts will not be permitted. Where practical they may be removed.

Provision of a day shelter in Hardings Park will be considered. It has been suggested that this could be sited at the junction of the track from Kahuterawa Stream and Platinum Ridge, and could include a small viewing platform to provide a view above the regenerating scrub, and also toilets and a water supply for visitors. This would be strategically located at the top of the climb from the sledge track and at the junction with a short loop in Hardings Park that takes in the mines and Toetoe Flat. Any shelter would provide only basic shelter and space for an interpretation sign. It would be constructed to discourage unauthorised overnight use.

Policies	Actions
<p>1. Huts for overnight stays will not be provided, however the provision of a day shelter in the open access zone (OA) in Hardings Park will be considered where the following criteria are met:</p> <ul style="list-style-type: none"> • Provides safe shelter serving a variety of tracks and users. • Provides a logical objective for walking trips. • Is not in a location that will draw users toward conflict with other activities such as water supply. • Is located in an area where a visitor interpretation facility would be useful. • Is in a logical location for provision of visitor facilities such as toilets and water supply. 	<ul style="list-style-type: none"> - Examine the feasibility and costs and benefits of a shelter at the Sledge Track – Platinum Ridge junction. This includes consideration of risks of vandalism and overnight stays. - If project is attractive, construct shelter -
<p>2. The maintenance of existing huts that have been constructed without Council approval will not be allowed. Where practical these structures will be removed from the water supply catchment.</p>	<ul style="list-style-type: none"> -

6.3.4 Internal Access Roads

Explanation

The Water Catchment Access Road from the end of South Range Road is critical to the effectiveness of management activities such as pest control and fire control. It provides access for control of deer by recreational hunters. Regular (annual) maintenance of drainage and the road surface will reduce the need for more substantial repairs.

Policies	Actions
1. The ridgeline access track from South Range Road will be maintained to an easy 4WD standard.	<ul style="list-style-type: none"> - Annual maintenance programme including grading and drainage - Inspections and, if necessary, repair following severe weather events.

6.3.5 Visitor interpretation services

Interpretation services are required to ensure visitors understand reserve facilities, management and natural features (including conservation of flora, fauna and ecosystems). Interpretation will be provided through a combination of signage, pamphlets, notice boards, and direct contact.

Policies	Actions
1. To provide visitor interpretation services ,(through a combination of signage, notice boards and direct contact) as required in order to: <ul style="list-style-type: none"> • Promote safe recreational use that minimises impacts on other users • Protect reserve resources such as biodiversity and water • Provide education and information about reserve resources and their management. 	<ul style="list-style-type: none"> - Identify and provide interpretation materials to be provided such as pamphlets, signs, website information. - Use the Environmental Care Code to promote considerate behaviour towards the environment and other users via signage and publications.
2. Priority will be given to interpretation services that provide information on: <ul style="list-style-type: none"> • Flora, fauna and ecosystems, and the history of vegetation change. • Tracks and recreational information • Historic sites. • Safety. • Avoiding trespass onto adjacent private land. • Tangata whenua and their relationship to the area. 	-

6.3.6 Signage

Explanation

The provision of clear signage for recreational users will contribute to user safety and help avoid management conflicts, such as entry of the public to the water supply catchment. Signage needs to be consistent and coordinated, and in keeping with the natural environment.

Policies	Actions
1. Signage will be provided to <ul style="list-style-type: none"> • Inform users about reserve facilities • Enable users to safely navigate the track network (including at track junctions) • Assist with the interpretation of key features and management activities within the Reserve. • Clearly delineate the boundaries of the protected catchment area. • Identify safety hazards. 	<ul style="list-style-type: none"> - Identify all signs required. - Produce and install signs
2. Ensure signage is consistent and in keeping with the predominantly natural values of the reserve, including consideration of the materials and colours used, and location.	<ul style="list-style-type: none"> - Implement or prepare a standard sign design for the reserve.

6.4 Building Recreational Links

The reserve is located close to current or potential outdoor recreation areas such as the Kahuterawa / Back Track and Gordon Kear Forest. There is potential to increase recreational linkages between these areas and Hardings Park. This may be achieved through a combination of interpretation, signage and appropriate track development. Important high level links to Gordon Kear Forest will be developed and a possible crossing to the east will also be investigated and encouraged where appropriate.

Some apparently logical linkages between the Reserve and public roadways exist across neighbouring properties, which can lead to trespass problems for landowners. The Council will need to work with neighbours to resolve this through creating other links on public land or, developing controlled access across private land in cooperation with landowners.

Policies	Actions
1. Encourage and facilitate the development of links to other recreational opportunities in the City, including: <ul style="list-style-type: none"> • Links to lowland walkways such as the Manawatu River. • Creation of high level links to Gordon Kear & Tararua Forest Park • Working with neighbours to explore opportunities for coordinated recreational access. 	<ul style="list-style-type: none"> - Identify priorities for development. - Work with neighbours to identify any opportunities for cooperation. - Develop tracks and links.

7. Commercial Management of Exotic Plantations

Objectives

If well managed, commercial pine plantations within the Reserve can provide direct economic benefit as well as soil and water and biodiversity benefits. Management of these plantations will firstly need to be compatible with other Reserve objectives, with a secondary aim of achieving maximum economic return.

The objective is:

1. To manage plantation forest areas for maximum economic return through wood production while complying with the objectives and policies of the Turitea Reserve Management Plan.

Policies

7.1 Harvesting

Explanation

Harvesting of some areas of exotic plantations within the reserve may begin within the next 5 years. Management of this harvesting operation will impact on the objectives of this plan, particularly those related to water supply and landscape.

There is a need for excellent harvest planning, high quality roading and harvesting practice to minimise impacts. Harvesting will necessitate roading development for logging trucks. This will include improvements to South Range Road, and development of access to the lower forest area adjacent to the dams. Some resolution of legal road boundaries may be required on South Range Road.

Neighbours adjacent to South Range Road have identified significant value in the shelter currently provided by some areas of PNCC-owned pines adjacent to their boundary. Consideration will be given to maintaining some areas adjacent to dwellings where this is practical, however this is expected to be difficult given the likelihood of wind-throw of remaining trees.

Policies	Actions
1. Schedule, plan and undertake harvesting to maximise financial returns while complying with all other policies in this management plan	<ul style="list-style-type: none"> - update of economic analysis of harvest scheduling. - Schedule harvest - Harvest planning + notifications and consents - manage harvesting
2. Ensure any road line legal requirements are resolved prior to the need to begin road upgrade or construction.	<ul style="list-style-type: none"> - Review legal issues related to South Range Road upgrade. - Undertake any necessary work on boundaries. -
3. Consider the commercial and marketing benefits of coordinating the harvest sequence with harvesting and marketing of wood from Gordon Kear Forest.	<ul style="list-style-type: none"> - Examine marketing strategy for wood from all Council forests.

<p>4. In harvest planning for the South Range Road block, consideration will be given to options for retaining small stands of trees on the eastern boundary where these would provide significant shelter to an adjacent dwelling. Leaving any such trees would be dependent on:</p> <ul style="list-style-type: none"> • Their likelihood of remaining wind-firm following harvesting of remainder of the block. • The financial impact of leaving the trees. • The impacts on landscape values of the remaining trees. 	<ul style="list-style-type: none"> - Analysis of options as part of harvest planning
<p>5. Apply forest industry best practice in undertaking harvesting operations (see also 3.3(2)).</p>	<ul style="list-style-type: none"> - Incorporate clear and specific best practice standards into harvesting contracts and audit against these in management of operations.

7.2 Replanting or new establishment

Explanation

There are a variety of areas where decisions will be required on whether to replant current areas with production forest, and/or on planting boundaries following harvest. Some areas where plantation forests are currently established (particularly on South Range Road) have very poor growth rates and are unlikely to be worth re-establishing following harvest. Some of the lower forestry areas are planted very close to the reservoir, or to Tutaewhare Creek, making harvest difficult and increasing the risks to water quality and storage capacity from harvesting activities.

Policies	Actions
<p>1. Re-establishment of production forest will be confined to areas that provide a worthwhile combination of financial return and other services such as soil and water protection. Areas will be removed from production following harvest where:</p> <ul style="list-style-type: none"> • Production forestry conflicts with meeting reserve management objectives • Production forestry provides a poor economic return 	<ul style="list-style-type: none"> - Identify any areas for removal using the criteria. - Undertake economic analysis of re-establishment to assist decision on whether to re-plant. - Review suitability for re-establishment considering Reserve classification and management objectives.
<p>2. Where areas are removed from exotic forest management following harvest, a regeneration plan will be developed. (see 4.4.4).</p>	<ul style="list-style-type: none"> - Removal of regenerating pines and key weeds in areas to be converted to native species. - Development of regeneration plans for areas where production forest will not be replanted.

8. Electricity Generation

Objectives

To allow electrical generation activities in the Reserve that do not compromise the reserve's function as a water supply catchment and ensure adverse effects and other values are appropriately mitigated.

Policies

Explanation

Following interest in development of large scale wind generation in the reserve, Council has undertaken a Request for Proposal process to determine the feasibility of a windfarm on the reserve. Information shows that a windfarm may be able to be undertaken with minimal impact on the reserve, with the opportunity to enhance the value of the reserve as allowed for in this plan.

Allowance for transmission lines and communications equipment will also be required. The possibility of raising lake levels within the reserve to improve water storage and enhance generation needs to be considered.

It is noted that the Resource Management Act is the appropriate legislation to control external impacts from the development of a large scale electricity generation in the reserve.

The Turitea Reserve has been divided into areas where turbines will be permitted and areas where turbines will not be permitted as shown in Map 4A attached. Wind turbines or other structures are inappropriate in areas where it is identified that turbines will not be permitted.

Policies	Actions
1. Electrical generation projects will be considered in the reserve where these do not compromise the achievement of the objectives of this management plan.	<ul style="list-style-type: none"> - Exclude Hardings Park from consideration for the installation of a windfarm. - Create an electrical generation zone in the reserve.
1.2. Allow the installation of transmission lines and communication equipment as required by development of electricity generation.	<ul style="list-style-type: none"> - Exclude Hardings Park from development for electrical transmission lines and communication equipment unless effects are minimal.

9. Facilitating Research

Objectives

The Reserve is very close to major research institutions such as Massey University and Landcare Research Ltd, providing potential opportunities for research into biodiversity management and water supply protection. The forest collapse history of the Reserve also provides opportunities for research into this and subsequent ecological succession. The focus on increased animal control and ecological restoration, particularly in areas such as Ecological Management Zone One and Two, will also provide research opportunities. Research has the potential to benefit management of the Reserve and will be encouraged where appropriate.

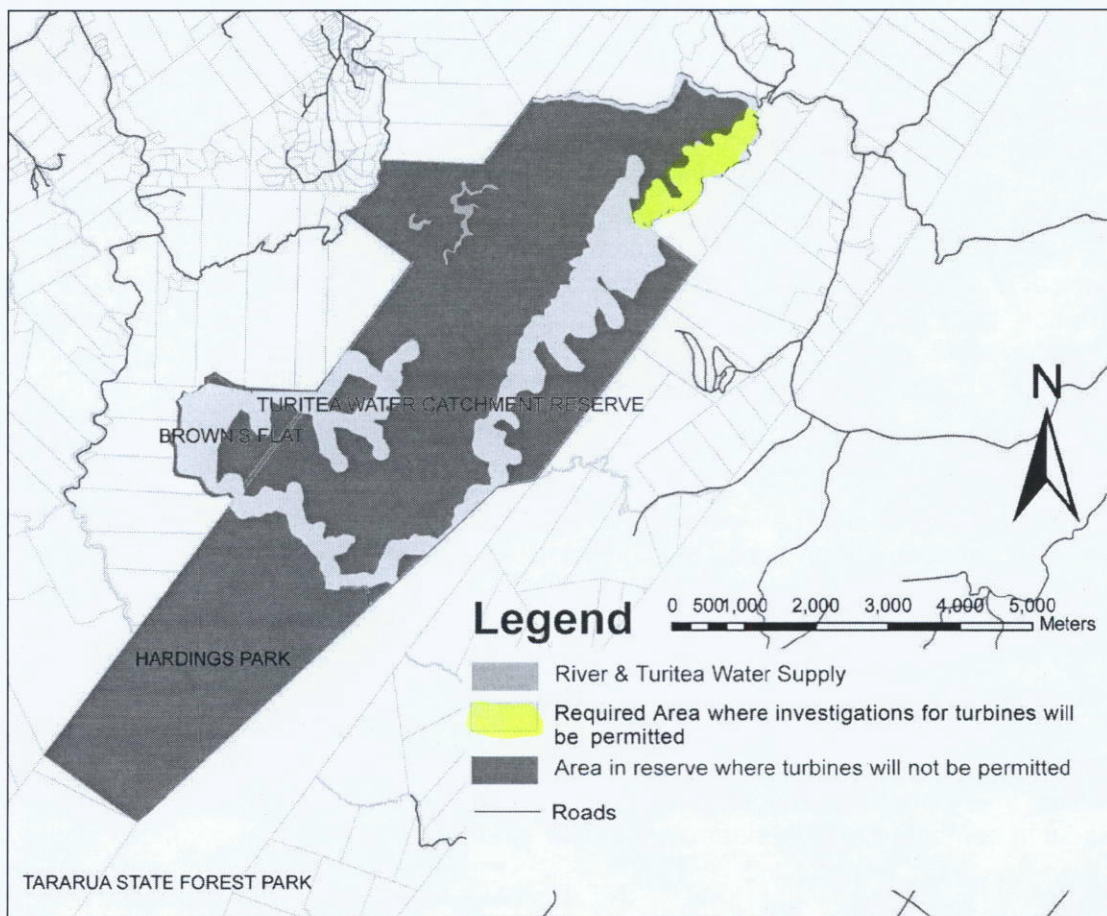
The objective is:

1. To facilitate the use of the Reserve as a research resource where this will benefit reserve management and does not conflict with Reserve management objectives and policies.

Policies

Several major research institutions located near the Reserve are potentially interested in undertaking research within the reserve. Some research has the potential to contribute to Reserve management, and this will be encouraged.

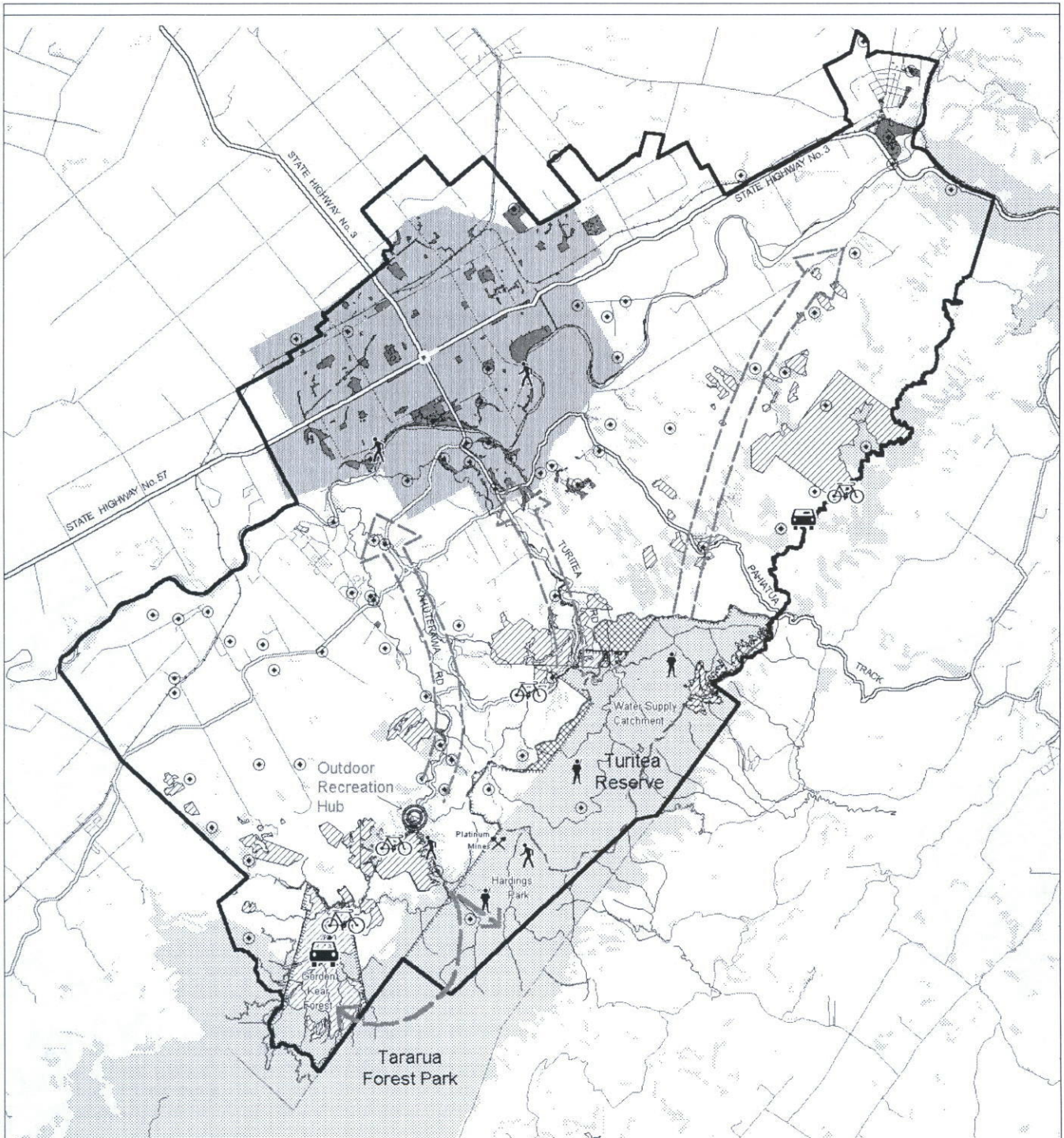
Policies	<i>Actions</i>
<ol style="list-style-type: none"> 1. Encourage relevant research projects within the Reserve. Priority will be given to projects that: <ul style="list-style-type: none"> • Have potential to provide short to medium term results that are directly relevant to meeting the objectives and policies of this plan. • Are undertaken by experienced researchers with peer review. • Provide research results to the Council. • Involve minimal cost to the Council. • Do not conflict with the objectives or policies of this management plan. 	<ul style="list-style-type: none"> - Provide information to research organisations on the potential and preferred research topics. - Make decisions on approval for research access as per the access permit policy (1.5(1)) - Monitor research and ensure results are obtained.



MAP 4A

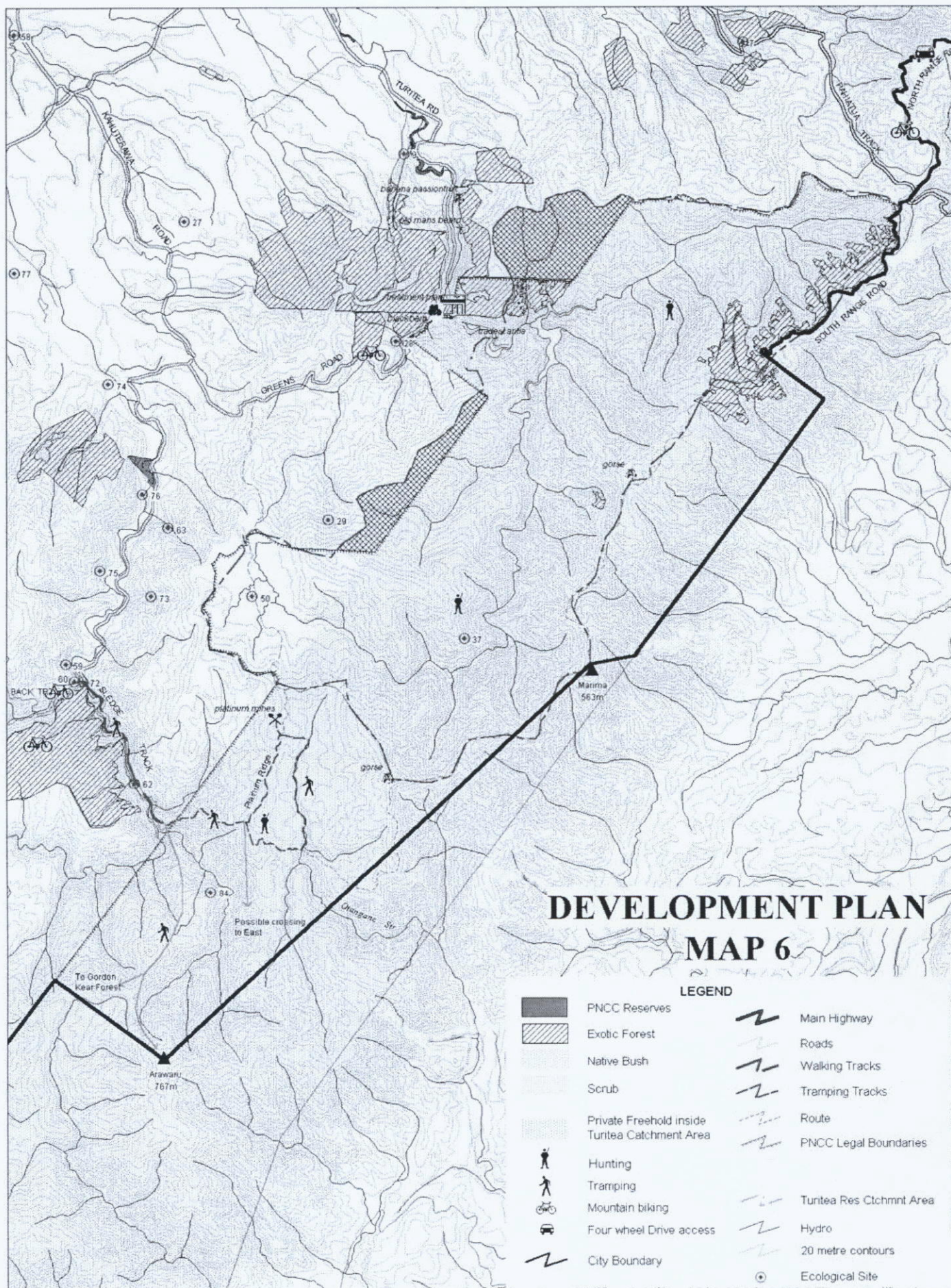
TURITEA WATER RESERVE

EXCLUSION AREAS



Turitea Reserve - Development Plan Map 5

LEGEND					
	Hunting		PNCC Urban area		City Boundary
	Tramping		PNCC Reserves		Main Roads
	Mountain biking		Exotic Forest		Roads
	Four wheel Drive access		Private land inside catchment		Tracks
	Recreational Link & Green Corridor		Native Bush & Scrub		PNCC Legal Boundaries
	Walking Link		Ecological Site		Turitea Reserve Catchment Area



DEVELOPMENT PLAN

MAP 6

LEGEND

	PNCC Reserves		Main Highway
	Exotic Forest		Roads
	Native Bush		Walking Tracks
	Scrub		Tramping Tracks
	Private Freehold inside Turitea Catchment Area		Route
	Hunting		PNCC Legal Boundaries
	Tramping		Turitea Res Cchmnt Area
	Mountain biking		Hydro
	Four wheel Drive access		20 metre contours
	City Boundary		Ecological Site