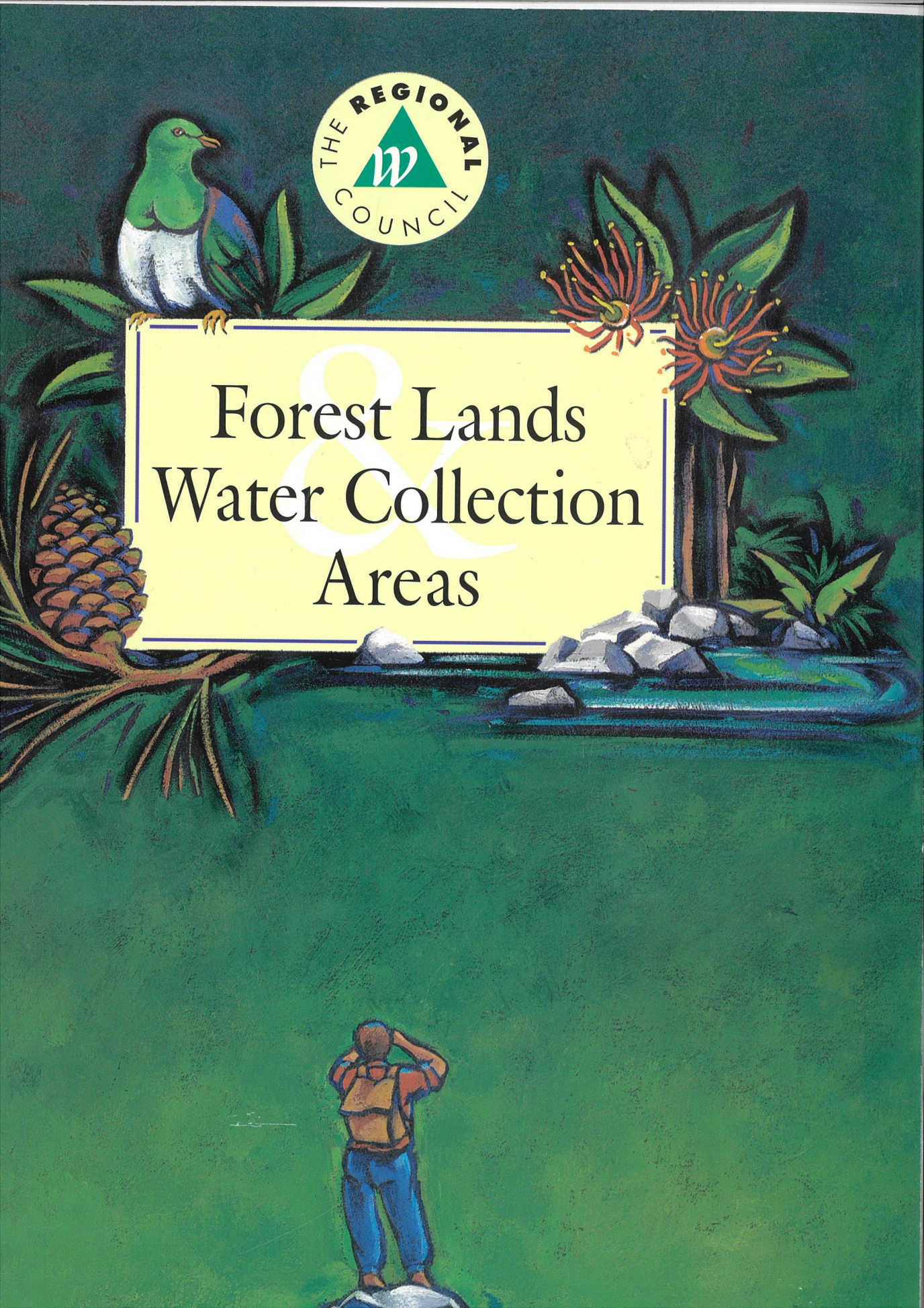
THE REGIONAL COUNCIL

Forest Lands & Water Collection Areas



Wellington Regional Council

Forest Lands and Water Collection Areas

Interim Management Plan

July 1996

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Preface

The Wellington Regional Council manages almost 40,000 hectares of forested hill country and mountain lands in the Wellington metropolitan area. This land, the subject of this management plan, is held by the Regional Council to provide a source of clean fresh water to the people of Wellington, Lower Hutt, Porirua and Upper Hutt.

The Region is fortunate to have such areas providing an ongoing source of water, a substance vital to our daily well being and survival. We are particularly fortunate as these areas are important natural ecosystems and regional landscapes, and provide excellent outdoor recreation and nature appreciation opportunities. These lands and the forest parks which adjoin them, form the mountainous backdrop to the metropolitan areas and are a part of the character that defines the region.

This plan expresses a philosophy of co-ordinated management and balanced, sustainable land use where the emphasis is on maintenance of the ecological health of the land and its ability to provide clean, fresh water for present and future generations. For the Council, this means co-ordination between its various functions, namely bulk water supply, indigenous forest management, plantation forestry, recreation and plant and animal pest management.

For the public, this management plan should clarify the Council's position on important management issues, such as public access to water collection areas, or the management of important natural or historic features. It should also give the people of the Region confidence that their future water supply is secure.

Section One

Introduction

1. Scope and Purpose of the Interim Management Plan and Future Planning Documents

The lands covered by this management plan are held by the Regional Council under the Wellington Regional Water Board Act 1972. Most of these lands have been set aside for water collection and managed by the Regional Council's predecessors since the early parts of this century. Smaller, peripheral areas were acquired more recently to supplement the plantation forestry areas in the Akatarawa and Pakuratahi blocks.

The Wellington Regional Water Board Act 1972 does not require the preparation of a comprehensive management plan, though it does require a working plan in respect of forestry operations (1985 - 1995 Forestry Management Plan). However, the Regional Council has chosen to prepare this plan in the interests of good land management rather than statutory reasons, an approach supported by the Regional Policy Statement (Ecosystem Method 13 on page 169). Therefore the plan's functions are:

- To provide a parent document to all other subsequent management or working plans for specific areas or functions within these lands, including the Forestry Working Plan.

- To co-ordinate the various functions of the Regional Council within these lands under one set of related policies, and their expression in the departmental business and annual plans.

- To fulfil the intent of the Wellington Regional Water Board Act 1973 in terms of land use and management, giving appropriate emphasis to bulk water supply and conservation of natural resources.

- To give effect to the principles of the Resource Management Act 1991, and the specific resource management objectives for the Region as set out in the Regional Policy Statement (the principal instrument of the Resource Management Act).

- To reflect the reasonable needs and wishes of the community (e.g., public access to water collection areas) within the available management constraints.

In fulfilling these functions the plan will assist the Regional Council to guarantee sound and sustainable management of these lands in the interests of the Region. A change to the 1973 Act to give this sort of plan a statutory basis, would be an improvement to the Act.

The relationship between this management plan and other plans referred to in the introduction is shown in Figure 1(a) and Figure 1(b).

1.1 Reasons for "Interim" Label

An "interim" label for this plan has been used on account of two factors which, during the main preparation phase were still in progress.

- ***Changes to Structure of the Regional Council***

  A new structure has recently been put into place. The Landcare Division is responsible for Conservation Forestry and Recreation. The Utility Services Division is responsible for Bulk Water Supply and Plantation Forestry. This management plan will assist the co-operation between these divisions in the management of the Forest Lands and Water Collection Areas.

- ***Preparation of Important Plans under the Resource Management Act 1991***

  With the completion of the Regional Policy Statement and progress on regional and district plans, the general management and legal setting for this management plan is beginning to clarify. This plan must be consistent with all plans prepared under the Resource Management Act 1991. The final content of regional and district plans will affect decisions about the role and content of a full and final management plan for these lands.

  The regional and district plans and their status at time of writing are:

  Regional Freshwater Plan (Draft)
  Regional Soil Plan (draft under preparation)
  Regional Landscape Plan (draft under preparation)

  Kapiti Coast Proposed District Plan
  City of Lower Hutt Proposed District Plan
  Upper Hutt City District Plan (Draft)
  Porirua City Proposed District Plan

A full and final management plan is anticipated for completion by the Regional Council in 1999. It is expected to contain general and area specific policies. In addition, it may include detailed operational statements for each of the main functional areas, namely bulk water supply, plantation forestry, conservation forestry and recreation. There will be clear and explicit links with the Council's departmental business plans, through which all activities of the Regional Council are projected and costed within a ten year time frame.

1.2 Regional Plans

The lands covered by this management plan constitute approximately 20 percent of the Region's hill country and mountain lands. Most of the remaining 80 percent are managed by the Department of Conservation as forest parks. These lands are important for soil and water conservation and have high value for their natural ecosystems, flora and fauna, landscapes and recreation opportunities. These values need to be maintained and protected.

The degree to which anticipated regional plans will address the specific needs of the Region's forested hill country and mountain lands resources is not yet known. The preparation of a regional plan for mountain areas specifically remains an option which the Regional Council can pursue if it is deemed necessary.

The state and content of anticipated regional plans, at date of publication, is

summarised below.

Regional Freshwater Plan

The Regional Freshwater Plan is being prepared to assist the Wellington Regional Council to carry out its functions for freshwater management under the Resource Management Act 1991. The Plan addresses the effects of human activities on fresh water resources. This includes the effects on values held by the tangata whenua, natural and amenity values, access, water quality, water quantity, and the beds of rivers and lakes. The Plan will also include provisions designed to avoid and mitigate the effects of flooding and erosion on people and communities.

The Plan will contain objectives, policies, methods and rules which establish the framework within which certain uses are permitted and other uses can be assessed. Through these provisions the Plan will provide consistency and clarity for existing and potential users of water bodies and the beds of rivers and lakes.

A non-statutory draft Plan was released for public comment in October 1995. A Proposed Plan will be notified in 1996 and this will be followed by the formal submission process.

Regional Landscape Plan

The Regional Landscape Plan is being prepared to assist the Council to manage the effects of use and development on the landscape. The Plan will provide a framework for managing the effects of human activities on landscapes which are highly valued by the regional community. The Plan will contain objectives, policies and methods against which the effects of use and development can be assessed.

Landscapes which are outstanding in the Region will be identified, and there will be provisions for managing the effects of use and development on the values of these landscapes. There will also be provisions for managing effects on outstanding landscape features, landforms, lakes and wetlands. In addition, the Plan will provide guidance for managing effects on other aspects of the landscape which have regional significance, such as areas of indigenous vegetation.

The Plan will create a regional framework for managing the landscape within which the territorial authorities can provide for more local landscape features, such as Wellington Town Belt.

An internal working draft was circulated on 22 April 1996.

Regional Soil Plan

The Draft Regional Soil Plan is the third of the Regional Plans being prepared that have direct relevance to Council lands.

The Draft Soil Plan largely deals with vegetation clearance and soil disturbance activities and the avoidance, mitigation or remedying of any potential adverse effects associated with such activities.

Where possible land use practises will be accorded **permitted activity** status, however where land has a serious erosion potential either **controlled** or **discretionary activity** status will be accorded.

Erosion potential will be based on the NZLRI Land Use Capability Classifications.

With particular respect to WRC catchment areas, if land within these catchments falls within erosion prone areas then some level of control over vegetation clearance and soil disturbance activities will need to be adhered to.

A non-statutory draft plan was released for public comment in June 1996 and this will be followed by a formal submission process.

Figure 1A : The Planning Framework

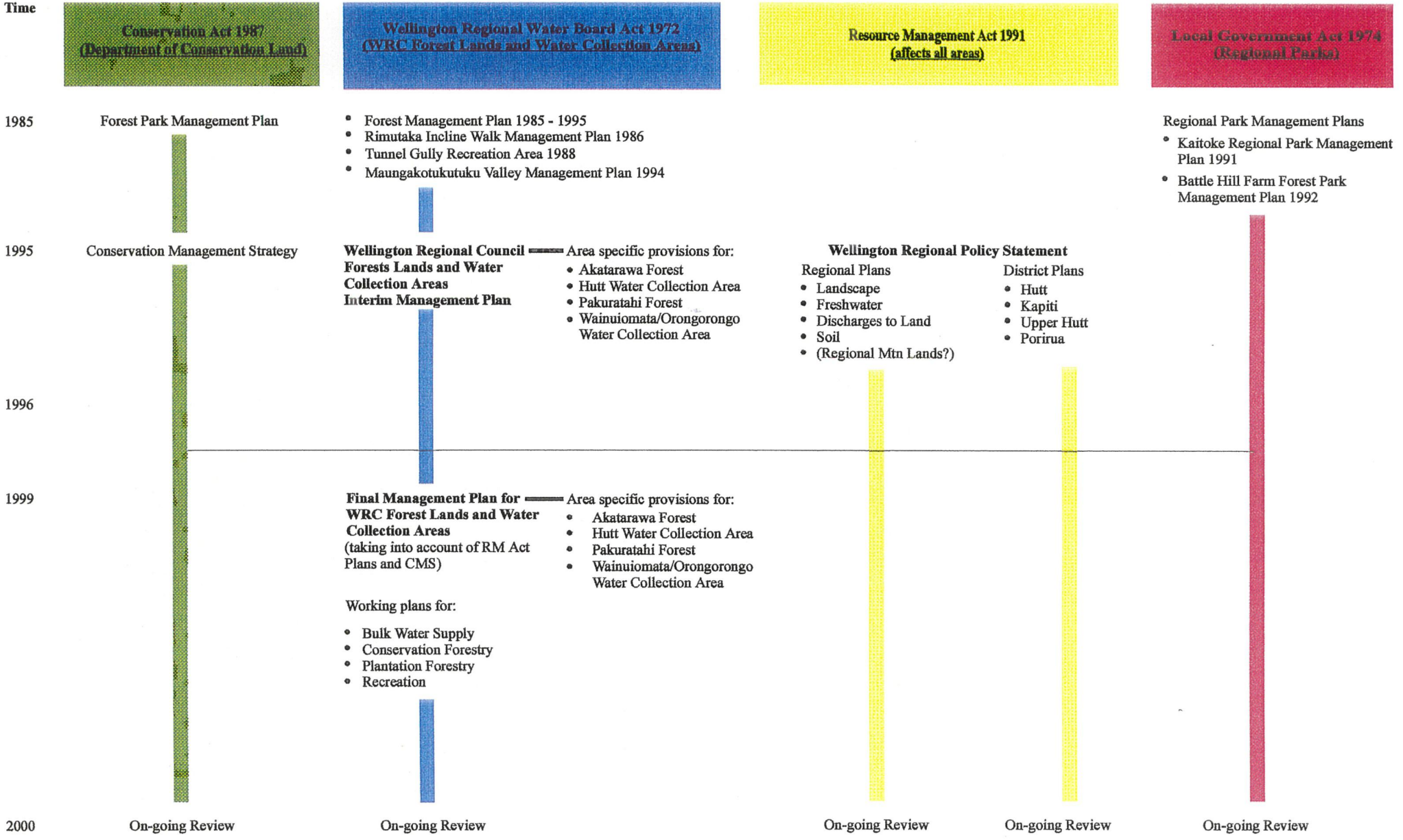
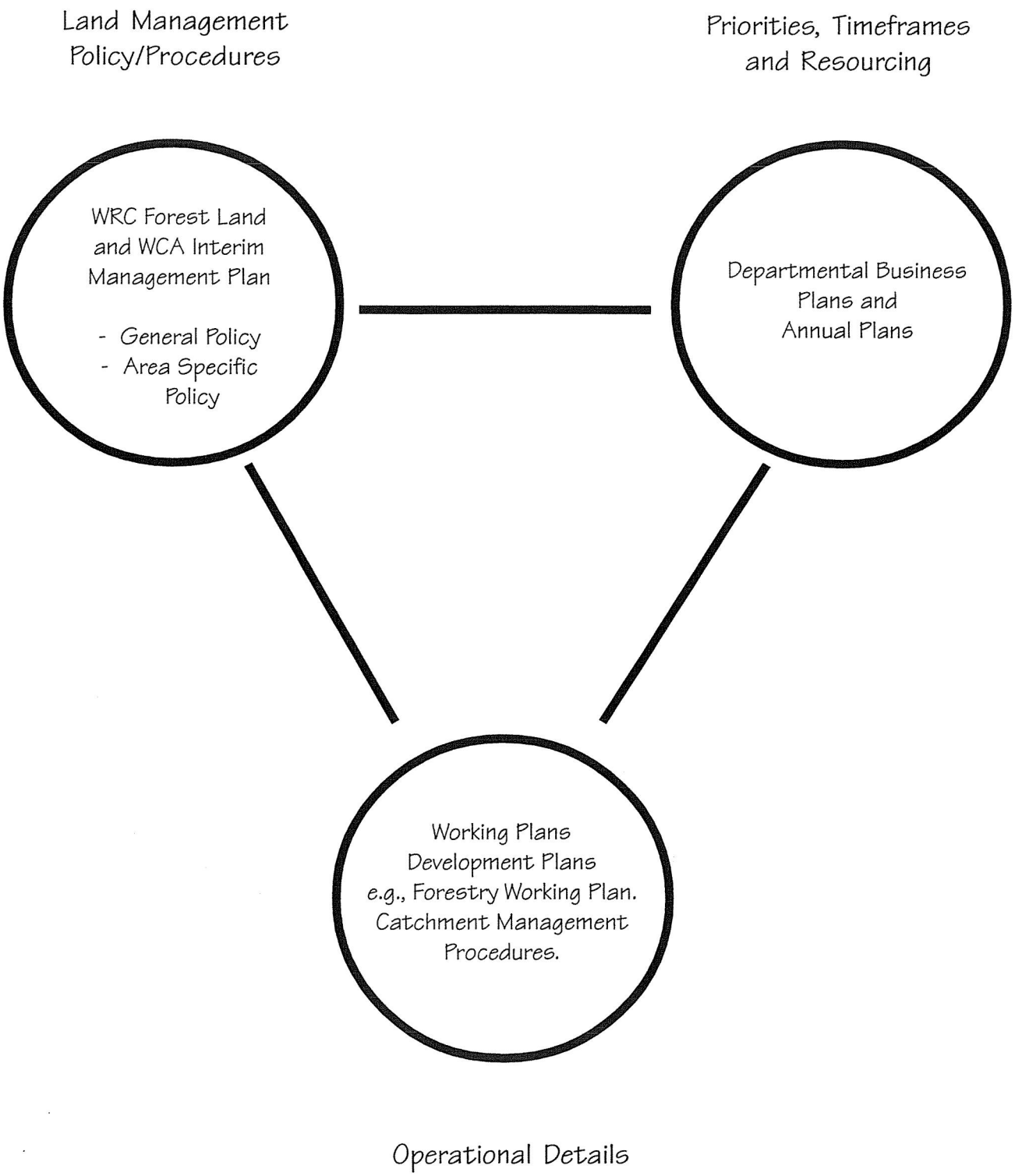


Figure 1B : Relationship to the Business Plan



2. Location and General Description

A total of 38,911 hectares of forest lands and water collection areas are to be managed according to the policies of this interim management plan.

Map 1 indicates their general location and size. Collectively they form the principal headwaters and upper catchment areas of the Hutt, Wainuiomata and Orongorongo Rivers. Some of the land also drains westward into Horokiri Stream (350 ha), Wainui Stream area (350 ha) and Maungakotukutuku Stream (1340 ha).

Overall, four distinct land areas are recognisable from Map 1.

(1) Akatarawa (15,438 hectares)

The Akatarawa block is held by Wellington Regional Council as a future water collection area. It contains areas of native forest, scrubland, retired grazing land and exotic plantation forests. It is extensively roaded with 4WD tracks, and forestry roads reflecting past and present forestry uses.

Current management aims to protect the land cover while providing for areas of exotic forestry and appropriate recreation opportunities. Recreation currently includes walking, tramping, orienteering, camping, horse riding, hunting, hang gliding, trail bike and mountain bike riding, and 4 wheel drive activities.

(2) Hutt Water Collection Area (8963 hectares)

The Hutt Water Collection Area is that part of the Hutt Catchment which lies upstream of Kaitoke. It is an area of forested hill country which supplies approximately 53 percent of the water used in the Wellington metropolitan area.

As a water supply area, management focuses on maintenance of the indigenous vegetation, soil and water in its natural condition. This plan includes policies for opening this area and the Wainuiomata - Orongorongo water collection area for public recreation. This will be the first time the public have had access to these areas since 1957. However, it is not anticipated that this or the Wainuiomata/Orongorongo Water Collection Area will ever be developed for recreational use to the extent of the Akatarawa and Pakuratahi blocks.

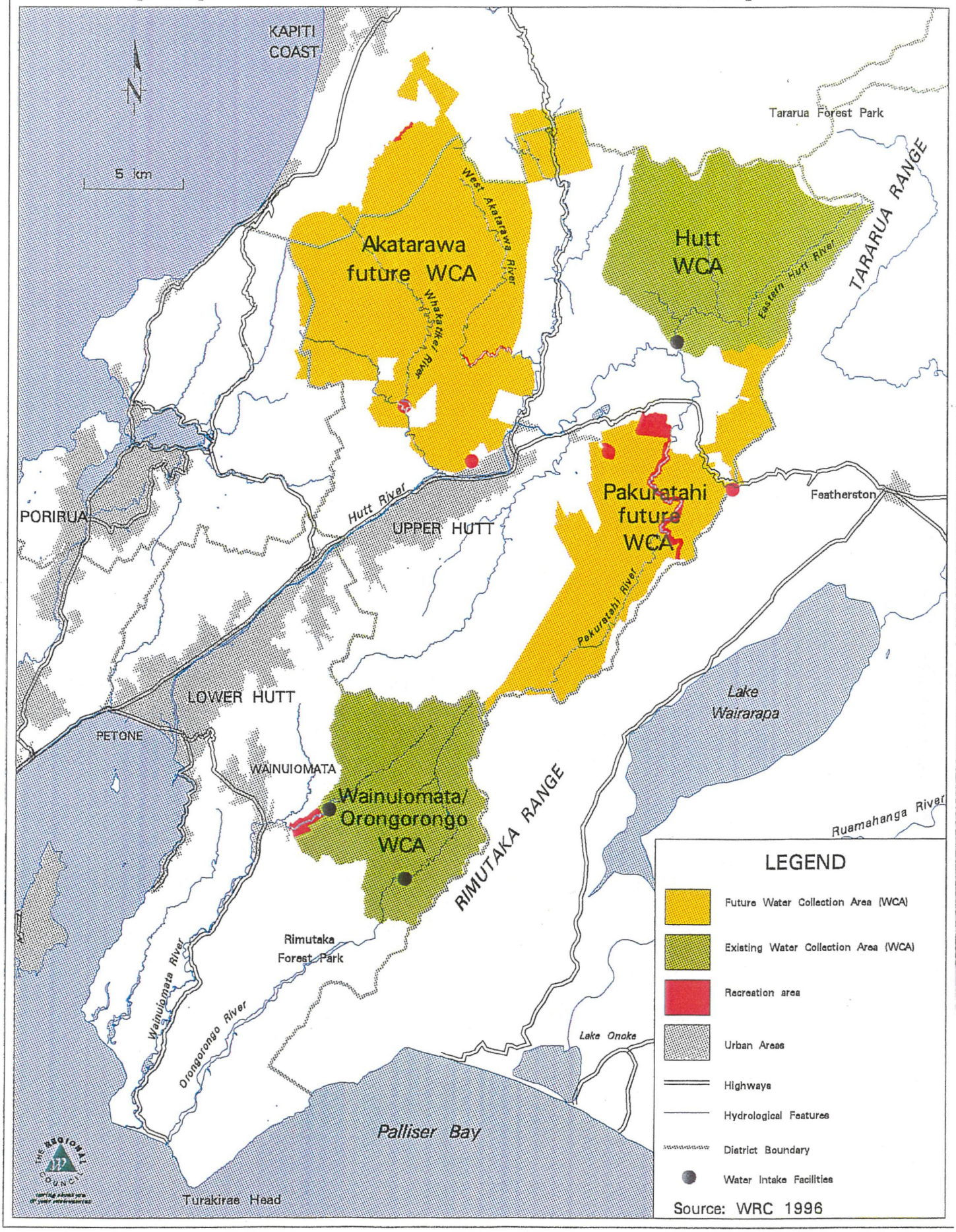
(3) Pakuratahi (8064 hectares)

This includes lands in the Kaitoke basin as well as the main Pakuratahi catchment area. A smaller area adjoining the main block but within the Mangaroa catchment area is also included in this description.

The Pakuratahi block is held by the Regional Council as a future water collection area. The main catchment is mostly covered with indigenous forest. However, the northern area is a modified area of regenerating native shrub, exotic forest and associated roads and recreation developments.

1. Management Areas

Wellington Regional Council Forest Lands and Water Collection Areas - Interim Management Plan 1996



Rimutaka Incline is a notable feature of the area and a popular recreation route used by more than 30,000 walkers, runners and cyclists each year. It is also used as a service road by the Regional Council. Other localised features within this northern area include a go-kart track, rifle range and an airstrip. Recreational activities pursued elsewhere include hunting, tramping and mountain biking.

Management is largely the same as that for the Akatarawa block and aims to protect the land cover while providing for areas of exotic forestry and appropriate recreation opportunities. The forestry operation here and in the Akatarawa block is entering a phase which will see harvesting activity increase as current plantings mature.

Land in the Kaitoke basin is mostly regenerating native scrub. This is an important part of the corridor of vegetation linking the Tararua Range with the Rimutaka Range.

(4) **Wainuiomata-Orongorongo Water Collection Area (6446 hectares)**

This area comprises the headwaters of the Wainuiomata and Orongorongo Rivers. Together, these catchments provide approximately 21 percent of the water supplied to the Wellington metropolitan area.

As with the Hutt Water Collection Area, it is covered by indigenous vegetation.

Management aims to maintain this vegetation and the soil and water in its natural condition. The area contains some notable vegetation types including a montane wetland and an area of lowland podocarp forest unmatched in size and quality within the Region.

The entrance area at Hine Road (Wainuiomata Waterworks Recreation Area) was previously the only part of these catchments available to the public. This plan provides for controlled public access to most of this catchment.

These lands together form the major part of the Regional Green Belt in the southwest of the Region and along with the adjacent Rimutaka Forest Park protect a continuous tract of forests and waterways of incalculable value to the Region's ecology, economy, character and social wellbeing.

3. Key Management Issues

A number of management issues have arisen from submissions and consultations. The following material summarises these issues and provides a background to the objectives and policies in Section Two.

3.1 Indigenous Forest Management

Protection and enhancement of native vegetation is a key objective of management in water collection areas. Vegetation is the fabric which binds the soil and maintains the physical and ecological integrity of catchment areas. A number of factors affect plant and vegetation health but the principal threats are wild animals - deer, goats and possums. The Conservation Forestry Department and regional pest management operations based in Wairarapa monitor and manage wild animal populations.

Initial submissions indicate some concern about the long-term management of wild animals such as deer. There are differences in opinion on whether deer should be officially recognised as a valuable recreation resource or only as an environmental threat.

Monitoring indicates that red deer numbers are low compared to past levels and are manageable. More concern is held for the effect of goats and possums which, despite moderate numbers are having serious localised effects. For example, possums have had a devastating effect on certain plant species such as northern rata in the Wainuiomata Valley. Goats have different habits to deer and tend to congregate in small areas and cause considerable localised damage to vegetation and soil.

Control methods, poison in particular, are the subject of considerable debate nationally. In managing pests it is necessary to use methods which do not have serious environmental side effects. The Regional Council mainly use 1080, and is aware of the public concerns about its use in water collection areas.

The Conservation Forestry Department is also responsible for managing other threats such as fire and disease. In this regard it works closely with the Manager, Plantation Forestry.

The Regional Policy Statement includes a number of sections which have particular relevance for the environments of the lands under this proposed management plan. These include freshwater, soil, ecosystems, landscape, natural hazards, and recreation.

Some of these are discussed in other parts of this document. Freshwater, soils and ecosystems are the core considerations for management of the physical environment of these areas. Policies and methods in the Regional Policy Statement will provide guidance for the policies of this management plan, setting out a framework within which the Wellington Regional Council, as the landowners, can operate.

Map 4 shows the broad pattern of vegetation types.

3.2 Long-term Management of Water Resources

The Hutt and Wainuiomata-Orongorongo areas are used for existing water supply needs of the metropolitan area, while the other areas are held for future requirements.

Extra capacity will eventually be required to ensure supply during drought periods and provide for the needs of a gradually increasing population. This could be achieved by a number of means including various combinations of separate developments, each with a distinct set of costs and benefits. Some possible options are:

(1) Surface water sourced from river intake.

(2) Small dam.

(3) Large dam.

(4) Groundwater sources.

(5) Desalination, water reuse, roof tanks.

The construction of dams is likely to have major impacts on the catchments involved and these need to be considered in the overall management of these areas. Patterns of land use in future water supply areas could be dramatically altered by such developments and forward planning will be needed to minimise disruption and protect important values. Conversely, land uses other than water supply need to be considered in terms of their effect on the potential of each catchment for water supply.

The Regional Policy Statement contains a number of policies and methods having direct relevance for the future management of water supply areas. Some of these will be identified under other headings in this document. However, with respect to water supply, the policies generally reinforce the importance of protecting water resources used for public supply. They also recognise the importance of protecting water quality in all water sources for all uses. Recognition of the instream values of water in catchment areas will also be necessary.

The importance of recognising all forms of pollution, including non-point source pollution, is indicated and this is particularly important for catchment areas as many of the potential sources of pollution in these areas are of this type.

The Regional Policy Statement also encourages recognition of regionally important ecosystems of which the catchments are examples. Management of whole catchment ecosystems, rather than separate management of their components, will lead to better overall management.

Method 13 on page 169 of the Regional Policy Statement suggests that the Regional Council:

> *Review and where appropriate improve the management of protected and high priority ecosystems on Regional Council land, including the*

preparation of management plans, where appropriate.

3.3 Protection of Existing Water Supply and Management of Public Access

Public access to the existing water collection areas has been unavailable since 1957. Prior to 1957, a tramping route into the Tararua Range lay across the Hutt Catchment and was the main route to Mt Alpha on the Southern Crossing.

Public health concerns and the possibility of contamination of the water supply led to the prohibition of access and this has remained in force until this time. A review of public access policy was carried out as recently as 1991, in connection with the review of the Kaitoke Regional Park Management Plan. The resultant policy, which this management plan proposed to replace was as follows:

> *Public access to water collection areas is prohibited but may be reviewed upon provision of water treatment capable of achieving 99.9 percent removal of the pathogenic protozoa Cryptosporidium and Giardia.*

In practice this means being able to apply the three processes of flocculation/sedimentation, filtration and chlorination as standard treatment to all the water supplied from a particular collection area before public access can be permitted.

Recent developments in water treatment have occasioned a review of public access to WCA's concurrently with the preparation of the Interim Management Plan. These developments are:

- Revised criteria for monitoring water quality show that the Te Marua Water Treatment Plant routinely supplies water of a quality that is well within the standard required by the Wellington Regional Council policy on access to water collection areas.

- With the commissioning of the Wainuiomata Water Treatment Plant, it too will routinely provide water of a quality which is within the standard required by the Wellington Regional Council policy on access to WCA's.

- New perspectives on the risks associated with public use of WCA's (Works Consultancy Services, 1994) indicate that public access should be acceptable under an appropriate management regime. Their report concludes that controlled public use of WCA's for remote experience mountain recreation will not create a significant hazard for public health.

After considering these facts and the range of views still held on this issue, the Regional Council resolved to include policies in this plan which would allow for the provision of access subject to appropriate conditions. These conditions are summarised as follows and are stated fully in policy 7.1.

- Catchment areas will be available for day use only.

- Catchment areas are to be managed as remote areas with little or no provision of facilities.

- Monitoring of water quality and recreation activity is to be undertaken in order to assess any effects.

- Access is to be provided to both water collection areas subject to consistent achievement of the required treatment standard.

- The Regional Council will maintain provisions for temporarily closing or restricting access for appropriate management purposes when need arises.

3.4 Plantation Forestry Issues

Forestry operations have been managed according to the Forestry Management Plan 1985 - 1995. However, a broader set of policies was needed which clarify the role of forestry in the overall management of the catchment areas.

As the existing forests mature, their value to the Regional Council will increase and provide an ongoing source of revenue. Ensuring protection of this investment will be a key consideration of this management plan and any subsequent forestry management plan.

The Regional Policy Statement has particular relevance to plantation forestry planning and operations, as this land use involves the most direct interactions with soil, vegetation, water and landscapes in the catchments. Planning for integrated land management for catchments, based on the principle of sustainable management, will require more rigorous site selection procedures and reference to a wider range of environmental standards.

Existing areas of exotic forestry are shown on Map 4. While this plan sets out the broad framework within which they will be managed, detailed planning for forestry operations will be in the form of a new forestry working plan.

3.5 Recreation Management and Development

The issue of recreational access to existing water supply areas has already been discussed. However, there are questions of access to other areas which have been considered. Recreation is a long standing use of the future water collection areas but the task of fully managing this use has only recently been addressed. Some general principles and some specific policies guide the development and management of recreation.

Initial submissions indicate that recreation is one of the issues of most interest or concern to the public. The submissions express the view that it should be the public's right and not a privilege to have access to these areas, and that restrictive management is not justifiable.

A wide range of activities are already established in future water collection areas. The character of these lands affects the choice of recreation activities. For example, many of the best opportunities for back country off road vehicle access in the Region are on some of these lands.

The economic significance of recreation to the Region also needs to be recognised in the management of these lands. The growth of tourism and the growing interest in recreation opportunities in these areas indicates a likely increase in use and the need for clear policy and effective management. Visitor numbers of Rimutaka Incline, Tunnel Gully and in the Akatarawas are growing strongly. With the opening of catchments, higher visitor numbers are imminent.

The Regional Policy Statement contains policies on recreation which address recreation resource issues including the need to protect resources from the harmful effects of recreation. Those policies have implications which are reflected in this management plan.

Key recreation resources and proposed access management are illustrated in Map 3.

3.6 Heritage Protection

A wide range of landscape and heritage values have been discussed in submissions and consultations. Some of these values are described in existing documents.

The forest lands and water collection areas have considerable natural heritage value. They are notable for their extensive tracts of largely unbroken forest, including the podocarp forests in the Wainuiomata Valley; clean, unspoilt rivers and natural scenery. The existing water supply areas are particularly important as they are less modified and have something of a mystique due to their perceived remoteness and inaccessibility.

Historic features are also important. Rimutaka Incline is an historic feature of international significance. The water supply is also a part of the Region's heritage (Wellington Regional Council, 1985).

This management plan contains a schedule of *Special Protection Areas and Features* (refer Map 2) based on the information currently available. The improvement of heritage information and decisions about how important areas and features should be protected is a critical part of the ongoing work anticipated in this document.

3.7 Maori Issues

Environmental management needs to be considered from a Maori perspective to give balance to the policy. The Regional Council in consultation with iwi, has prepared a Charter of Understanding setting out how iwi/Council relationships will be managed. This will be a key document in the implementation of this plan.

3.8 Relationship to Adjoining Areas

Many of the issues dealt with in this plan are the same issues facing managers of adjoining lands. Similar values are also shared across many boundaries and co-operation on environmental management programmes and recreation management will provide significant benefits.

Department of Conservation lands border much of the catchment areas. Kaitoke Regional Park and Battle Hill Farm Forest Park adjoin the Hutt and Akatarawa areas

respectively, and are in many practical respects, part of the same resource.

Downstream effects of activities in catchment areas are also important boundary issues. Some boundary issues will be addressed within the framework of the Resource Management Act. However, the more immediate boundary issues and opportunities for voluntary and co-operative initiatives are addressed within this management plan.

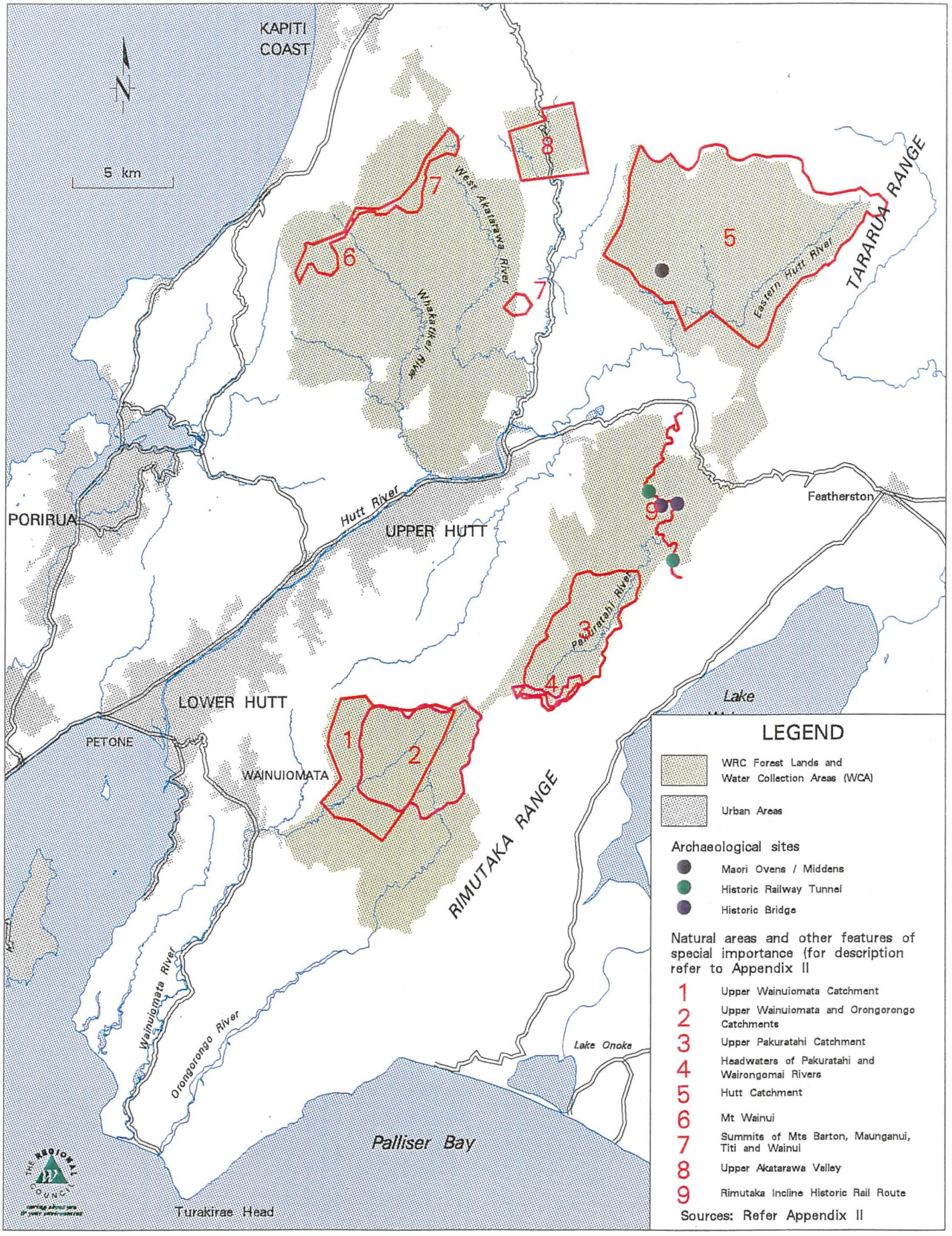
3.9 Implementation

An important task facing the Council, and part of the purpose of this Plan, is that of co-ordinating the various functional areas and activities affecting the lands under this management plan. Recent structural changes within the Regional Council include the establishment of a Landcare Division responsible for the management of all land resources, including the lands covered by the plan. The management principles which are reflected in this plan are consistent with the new structure of the organisation and should help with the achievement of the plan's objectives.

2. Natural and Cultural Heritage

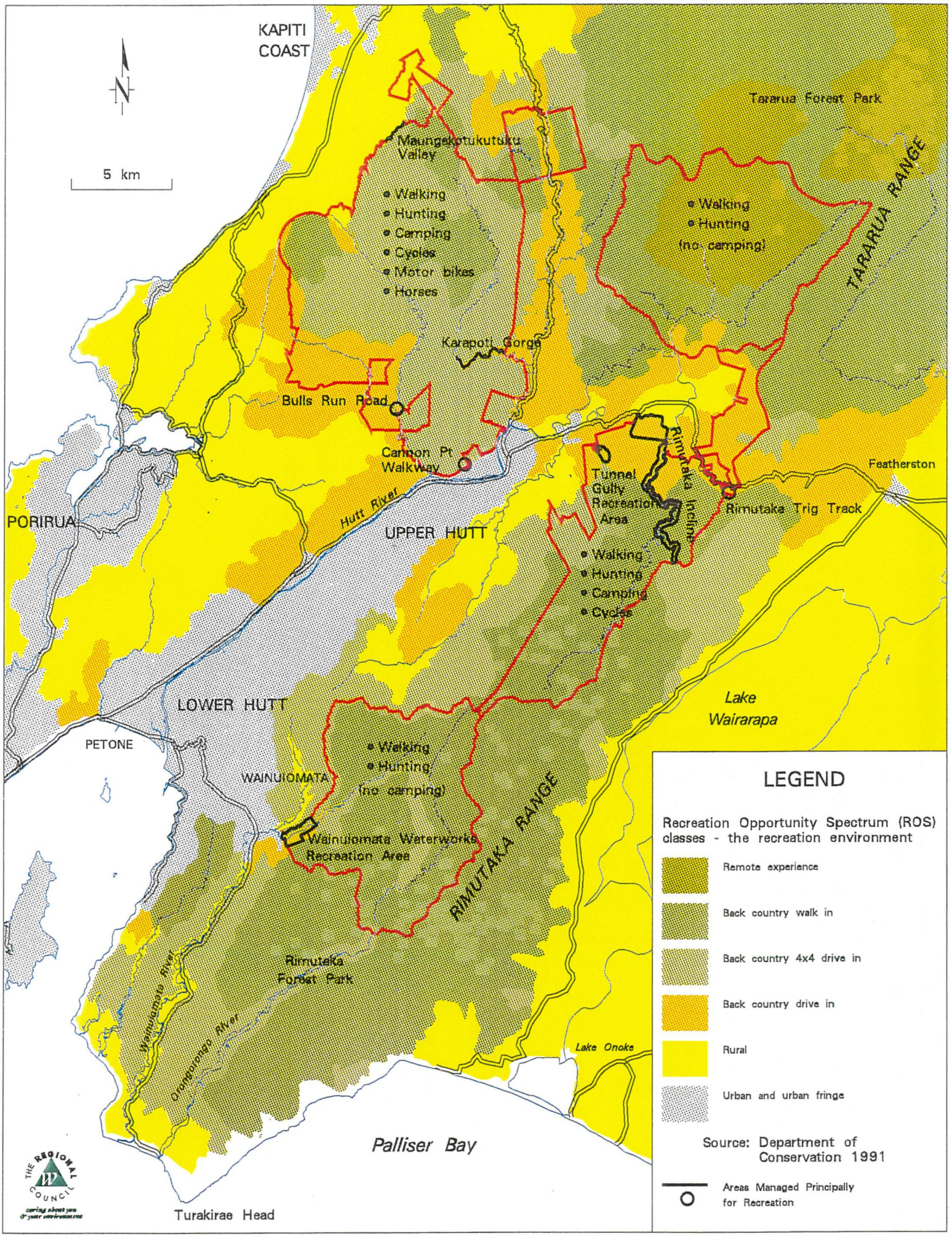
(Areas and Features of Special Importance)

Wellington Regional Council Forest Lands and Water Collection Areas - Interim Management Plan 1996



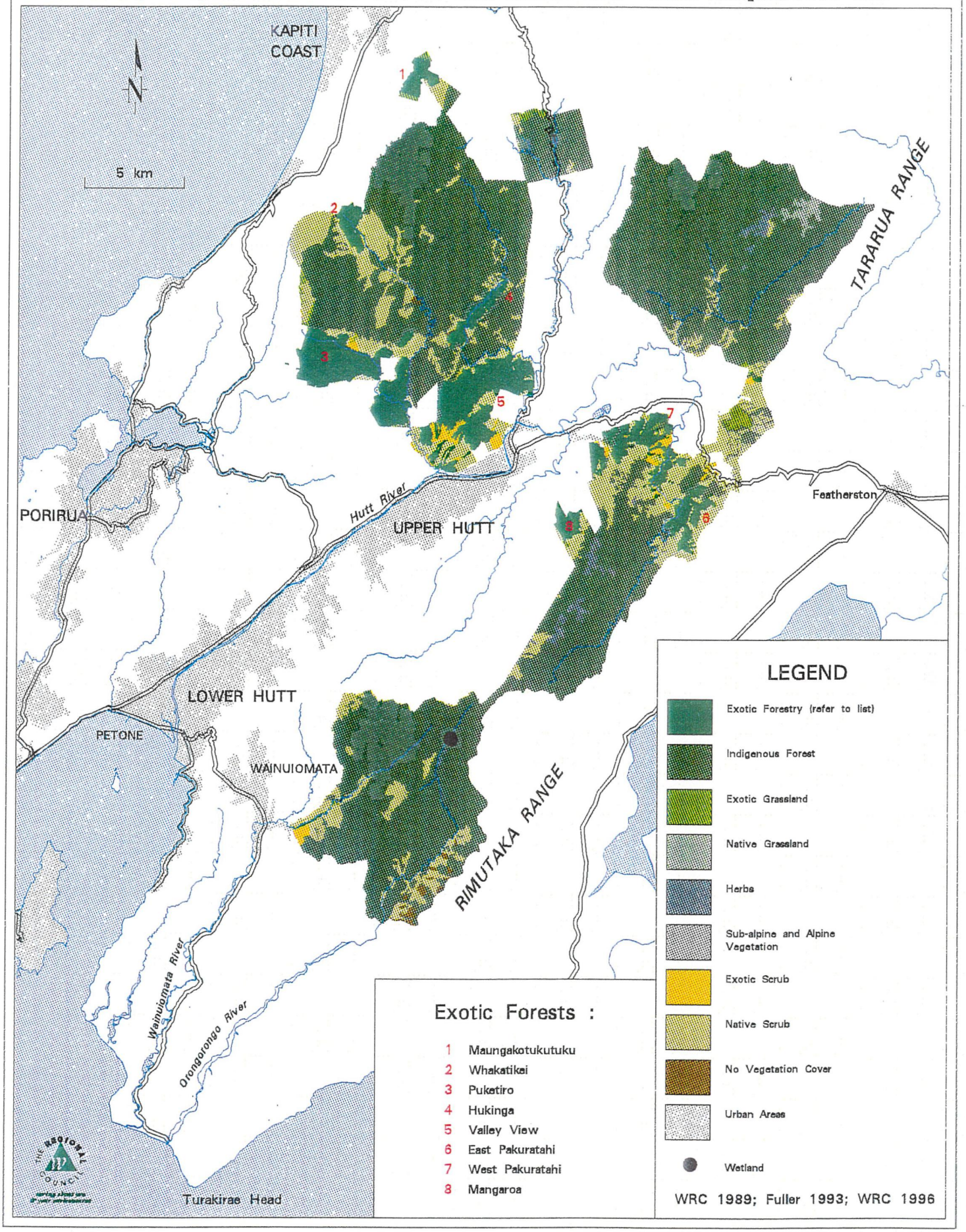
3. Recreation Resources and Management

Wellington Regional Council Forest Lands and Water Collection Areas - Interim Management Plan 1996



4. Land Cover

Wellington Regional Council Forest Lands and Water Collection Areas - Interim Management Plan 1996



Section Two

Management Aim, Objectives and Policies

Aim

To conserve the cultural values and indigenous ecosystems of the Wellington Regional Council's forest lands and water collection areas.

Explanation

The Wellington Regional Council's forest lands and water collection areas are managed principally for conservation and water supply. These are complementary uses. Healthy ecosystems are essential for water collection and supply.

For the purposes of this management plan, conserve is defined as: *to protect and enhance natural and cultural resources for the purpose of maintaining their intrinsic values, providing for their appreciation and appropriate use by the community, and safeguarding their potential and the options of future generations.*

The aim specifies cultural values which here encompass all legitimate aspects of the community's relationship with these lands. Alongside their formal role for water supply are other important roles, as in plantation forestry and recreation, and in the traditional use of these lands by the tangata whenua. They are also important landscapes. Within the various ecosystems of these lands are some of the finest remnant forests in this part of the country. These represent a heritage of great significance for the people in the Region. Conservation of these values is a vital part of the management regime for these lands.

Objectives

To achieve the Aim the Regional Council will pursue the following objectives.

Conservation

Ecosystems

To recognise, protect and enhance indigenous ecosystems within the forest lands and water collection areas.

Freshwater Resource Management

To protect and manage water resources to maintain their quality and quantity for ecological and community uses and values.

Soil

To maintain the quality and integrity of the soil cover.

Landscape and Heritage

To recognise and protect landscape and heritage values and provide for their appropriate use and enjoyment by the public.

Use and Development

Bulk Water Supply

To utilise water resources for bulk water supply for the Wellington Region.

Plantation Forest Management

To undertake plantation forestry for financial profit on suitable lands.

Recreation

To provide for appropriate recreation access and use in the forest lands and water collection areas.

Management

Implementation and Management

To co-ordinate the overall management of the lands covered by this management plan.

Tangata Whenua

To apply the principles of the Treaty of Waitangi in the management of these lands and resources and to foster a mutually satisfactory relationship between the Regional Council and iwi having traditional interests in these areas.

Liaison and Public Consultation

To liaise and consult with all the interested organisations and individuals in the implementation of this management plan.

Fire Prevention and Control

To exercise fire control responsibilities over the management area effectively and efficiently.

Plant and Animal Pest Management

To develop and maintain necessary levels of control over plant and animal pests.

General Policies : Conservation

1. Ecosystems

1.1 *Identification and Management of Ecosystems*

(1) The Regional Council will seek to identify, understand and monitor the particular ecosystems of the forest lands and water collection areas.

(2) The Regional Council will seek to maintain the natural diversity of ecosystems, and protect and enhance the natural and scientific values, special ecosystems, and indigenous plant and animal communities and species of the forest lands and water collection areas.

(3) The construction of fish passes will be investigated and implemented in accordance within the requirements of the Freshwater Fisheries Regulations 1983.

Explanation

The forest lands and water collection areas fall within the Wellington Ecological Region. The Regional Council recognises the need for research and inter-agency co-operation in specific areas to improve the understanding of the area's ecosystems. Ecosystem monitoring will become a standard aspect of management, supported by strategies to ensure an appropriate response to ecological problems within these lands.

1.2 *Special Protection Measures*

(1) The Regional Council will maintain the *Schedule of Special Protection Areas and Features* (Appendix II), which defines known important areas and features that warrant special protection by the Regional Council.

(2) The Regional Council will seek to provide permanent legal protection for the Special Protection Areas and Features in addition to that which is provided by this management plan. Protection will be consistent with the conservation values and significance of each area and feature.

1.3 *Forest Management*

(1) Indigenous forests will be managed for their protection and enhancement.

(2) Unauthorised damage to, or removal of plant material will not be permitted.

(3) Removal of indigenous plants or plant material may be permitted for cultural, scientific or management purposes, subject to these policies and the avoidance of harmful effects.

Explanation

This policy is supported by the bylaws of the Wellington Regional Council.

1.4 ***Control of Wild Animals and Plant Pests***

Wild animals and plant pests will be controlled, or eradicated where practicable, to enable the sustainable management of the indigenous ecosystems (refer Policy 12).

2. Freshwater Resource Management

2.1 ***Maintenance of Water Quality***

(1) Management of existing water collection areas will ensure delivery of water to quality standards adopted by the Regional Council in consultation with health authorities.

(2) Wellington Regional Council will undertake appropriate water quality monitoring within the catchments.

(3) The Regional Council will seek to avoid, remedy or mitigate any adverse effects on water resources from chemicals used in land management.

Explanation

The principal reasons for maintaining water quality are for public health and the protection of ecological values. Application of public health standards is essential in the existing water collection areas (clause (1)). These may be more stringent than standards which are acceptable in future water collection areas.

2.2 ***Water Abstraction***

(1) The priority for any water abstraction and distribution by Wellington Regional Council is to serve the bulk water needs of the Wellington metropolitan area. All other uses of abstracted water by the Regional Council will be secondary to bulk water supply.

Explanation

The rivers and streams in the forest lands are parts of ecological systems which span not only the lands under this management plan but the whole catchments of the rivers concerned. Abstraction is necessary in order to provide the metropolitan area with bulk water. Abstraction for this purpose is the priority and will remain so. In planning for future water supply the Regional Council will take account of other values affected by water abstraction. Future water supply may require the abstraction of water from all of the four main areas under this management plan.

This management plan recognises the Regional Freshwater Plan as the principal document affecting water allocation and the Regional Council's planning for water supply development. Within the parameters set out by or under the Regional

Freshwater Plan, the Council is able to make policy on its water supply priorities.

2.3 ***Streams or Rivers of Special Value***

The environments of streams and rivers or parts thereof which have particular ecological or heritage value, may be accorded special protection status in accordance with *Policy 1.2 Special Protection Measures*.

2.4 ***Other Land Uses***

The Regional Council will seek to avoid any adverse effects of any land uses or activities on the water resources of the forest lands and water collection areas.

3. **Soil**

3.1 ***Protecting Soil and Managing Soil Erosion***

(1) Appropriate means and practices will be used to ensure that erosion is minimised.

(2) In response to existing or potential erosion, appropriate means and practises will be those which are in sympathy with the ecological and landscape values of the area. As far as practicable, the use of exotics in the protection of soil will be minimised and where used will be as a temporary measure only. *Pinus contorta* will not be used in erosion control or for any other purpose under this management plan.

3.2 ***Soil Contamination***

The Regional Council will seek to minimise the contamination of soil from chemicals used in land management.

3.3 ***Land Uses and Soil Types***

Standard soil conservation practices will be applied in the management of all land uses and other activities, including exotic forestry and recreation, in the forest lands and water collection areas.

3.4 ***Soil Characteristics***

The Regional Council will seek to understand soil characteristics and conditions in the management area to help ensure protection of soil resources, and sound ecological management.

3.5 ***Mineral Prospecting and Mining***

(1) Mineral prospecting and mining will be opposed in all Special Protected Areas defined in this management plan.

(2) Mining will be opposed where it adversely affects the conservation of these lands or their viability for bulk water supply.

Explanation

As a general principle, mineral prospecting and extraction is not considered an appropriate use of forest lands and water collection areas. However, there may be situations where, with proper assessment and management, a mineral resource can be used for or contribute to ecological management (e.g., gravel for river works).

4. Landscape and Heritage

4.1 *Regional Landscape Values*

In managing the forest lands and water collection areas the Regional Council will take account of and provide for the role of these lands as regionally significant landscapes.

Explanation

The indigenous forests and the alpine grasslands above them form a large part of a regional greenbelt surrounding the Wellington metropolitan area. These lands are contiguous with Rimutaka and Tararua Forest Parks, which also make up much of the greenbelt.

4.2 *Landscape Management*

The management of forest lands and water collection areas will recognise the principal landscape units which comprise the area and seek to protect the particular landscape character and values of each area.

Explanation

Guidelines for the management of specific landscape units are set out in the policies for each area which follow the general policies.

4.3 *Landscapes of Special Value*

Areas, and features of significant landscape or heritage value will be accorded special protection status in accordance with Policy 1.2 Special Protection Measures.

4.4 *Assessment and Monitoring*

(1) Landscape impact assessments will be carried out for all proposed works in accordance with the *Procedures for the Approval of Works* (refer Appendix 3).

(2) The assessment should be appropriate to the scale of the proposed works.

(3) The Manager, Recreation Department will be informed of proposed works and consulted on the degree and type of assessment required.

4.5 *Heritage Research and Archive Development*

Research programmes will be undertaken to build an archive and provide a basis for the interpretation of the heritage resources of the forest lands and water collection areas.

4.6 *Management and Interpretation of Heritage Sites and Features*

(1) Heritage sites and features will be managed to preserve their historic value.

(2) Unauthorised exploration of heritage sites and features, or removal of material or artifacts from them will be prohibited. The finding of artifacts or materials of heritage significance must be reported to the Regional Council. Bylaws will be established to give effect to this policy.

(3) Appropriate interpretation of heritage sites and features will be provided. This may be on-site and in publications of the Regional Council.

General Policies : Use and Development

5. Bulk Water Supply

5.1 *The Roles and Uses of Water Collection Areas*

(1) In association with the relevant operational business plans, this management plan sets out the basis upon which the water collection areas will be managed.

(2) Existing water collection areas are indigenous forest areas managed for water supply and conservation. Recreation will be allowed subject to these principal uses and any relevant policies or bylaws of the Regional Council.

(3) Future water collection areas comprise mixed indigenous and exotic forest areas. These areas are managed for conservation, production forestry and recreation. Long-term management aims to protect the potential of these areas for future water supply uses.

(4) The Bulk Water Supply Department will manage the existing water collection areas according to *Catchment Management Procedures* (not yet written).

These procedures will be written so as to be compatible with the policies in this management plan. They will include details of inter-departmental and Bulk Water staff responsibilities.

Explanation

The Hutt and the Wainuiomata/Orongorongo catchments are existing water collection areas. The Akatarawa and Pakuratahi blocks are future water collection areas. Existing water collection areas are managed by the Bulk Water Supply Department of the Regional Council.

5.2 *Water Quality for Bulk Water Supply*

Existing water collection areas will be managed to provide raw water at current standards of quality, which is suitable for a public drinking water supply when treated.

5.3 *Future Water Supply Planning*

(1) The Regional Council will seek to integrate the management of water resources for bulk water supply with long-term management and protection of catchment ecological requirements.

(2) Planning and provisions for future water supply will take account of environmental and cultural values, as well as satisfying water supply and economic requirements.

Explanation

The aim of this management plan provides for the integrated management of conservation and water supply. The achievement of this requires recognition of conservation values in the planning and management of bulk water supply operations.

6. Plantation Forestry

6.1 *The Role of Plantation Forestry on Regional Council Lands*

(1) The Regional Council will manage and maintain exotic plantation forests primarily for financial profit subject to the policies of this management plan.

(2) While managing and harvesting production forests for profit, the Regional Council seeks to maintain the amenity, historical, landscape and ecological values of the forestry areas and any areas affected by forestry operations.

(3) Where exotic forests exist primarily for water and soil conservation purposes their effectiveness and ongoing management will be reviewed.

Explanation

Two of the principal reasons for the planning of many of the exotic forests in forest lands and water collection areas was to control the spread of noxious plants on retired farmland and to ensure the stability of the soils in these modified landscapes. However, the purpose for which they are now managed is principally the generation of revenue and ongoing harvesting of mature stands is now underway. For an account of the background to the Regional Council's forestry operation refer to Section 3 Background and Resource Description : (6) and (7.3).

A small number of forests were planted specifically for soil stabilisation reasons using *Pinus nigra*. These forests currently have little or no commercial value. A review of their value for soil stabilisation will be undertaken to determine if they can be safely removed over time. These forests are known to harbour an infectious disease of pines (*Dothostroma pini*) and have a negative value in production forestry terms. They are also known to spread in other parts of the country and their potential for infesting parts of the forest lands cannot be dismissed.

6.2 *Protecting, Managing and Harvesting the Exotic Forest Resource*

(1) The Regional Council will provide for the protection, management and harvesting of its exotic forests through the Annual Plan, and the Forestry Management Plan.

(2) In carrying out forest establishment and management operations care will be taken to ensure the least practicable disturbance to ecosystems, and soil and water values through application of the *Forestry Code of Practice*. Consultation with other departments involved will be carried out before formal applications are made for the necessary authorisations.

(3) The longer-term strategic and financial goals of exotic forest management will be set out in the Plantation Forestry Business Plan.

(4) Forestry planning and management will take into account the potential effect of the proposed forestry developments and operations on the quality and quantity of water available from these catchments for water supply purposes.

(5) Proposals for forestry developments, including clearing, roading and harvesting will be subject to the *Procedures for Approvals of Works*, in addition to any resource or land use consents required under the Resource Management Act.

6.3 *Development of Exotic Forests*

(1) The Regional Council will consider opportunities for rationalising exotic forest boundaries. In general it will seek to utilise the most suitable lands for forestry while seeking to retire from forestry those lands which are least suitable, or uneconomic, or for which there is no significant demonstrable benefit. (Refer policies 14.4 and 20.4 : Production Forestry Guidelines.)

(2) Prior to consideration of harvesting any exotic forest the Regional Council will assess the land's suitability for continued forestry use. This assessment will include conservation, future water supply, and landscape as well as economic and forest management considerations. Any future planting or replanting must be in accordance with this management plan. Refer Policies 14.4 and 20.4, Production Forestry Guidelines.

Explanation

In general it is anticipated that this policy will lead to a number of relatively small scale changes to the extent and pattern of exotic production forestry on forest lands with some forests expanding and others shrinking. Some may be harvested once and allowed to regenerate in native vegetation. Overall, there is considerable variation in the quality of forests and the suitability for this use of the lands on which they sit. To maintain the commercial value of the overall production forestry operation and to make improvements in the general management of the areas in which the forests sit the Regional Council needs to be able to carry out these types of measures. More specific comment on each of the principal production forestry areas is in the Area Policies which follow.

7. Recreation

7.1 *Access*

(1) Public access will be allowed into each of the future water collection areas in accordance with the purpose and management of each area and subject to the relevant general and area specific policies.

(2) Subject to Clause (3) public access will be allowed into each of the existing water collection areas for a trial period of five years, commencing no later than 30 June 1997.

(3) Public access to existing water collection areas can commence in line with Clause (2) if treated water from the treatment plants is of acceptable quality. The water is deemed to be of acceptable quality when:

(a) All determinants are in accordance with the 1995 Drinking Water Standards; and

(b) Turbidity of less than 0.1 NTU is reliably achieved for 95 percent of the time.

Explanation

The value of 0.1 NTU is taken from Section 3.2.2 of the *Drinking Water Standards* as a recommended value. Provision is made under these policies for control on public access if and when the treatment plants are not operating to the design standard. Monitoring of this value indicates whether the plant is operating to the required standard. If it is not then the risks associated with public access are increased and restrictions may need to be imposed.

(4) Testing will be undertaken to monitor water quality in the water collection areas. All necessary monitoring will be put in place within one year of the approval of this management plan.

(5) Access to existing water collection areas will be managed and monitored to ensure a high degree of understanding by visitors of catchment values, the conditions of use, and the need for compliance with these conditions. Management mechanisms will foster goodwill and co-operation.

(6) The Regional Council may from time to time review and modify the mechanisms by which these access provisions are administered. The processes of implementation and operation will emphasise the responsibility of individuals to know and understand the conditions of access, including periods of closure, and will be assisted in this by the provision of information in all suitable places and media. Bylaws may be developed to support these policies.

(7) The Regional Council will consult with the Medical Officer of Health in the course of developing management systems prior to implementation.

(8) The Recreation Department may from time to time undertake monitoring of recreation activity.

(9) Conditions and mechanisms in the management of access will emphasise existing bylaws and policies on the use of fire and the management of hygiene, such that breaches of these policies will be regarded as serious matters and treated accordingly. No litter receptacles will be provided within the catchments and all material taken in by visitors must also be removed.

(10) In providing for recreation, water collection areas will be managed as "*remote*" areas primarily for hunting, tramping, nature appreciation and related activities. Facilities or structures will only be constructed to manage the effects of

recreation on catchment ecosystems or the water supply functions. Specific provisions and restrictions include:

(a) Overnight stays will not be allowed.

(b) Toilets, litter receptacles and signs may be constructed at the main entrances.

(c) Tracks, bridges, barriers, signs and markers may be constructed or placed within the catchments where they are needed to minimise the effects of recreation.

(d) Existing tracks and huts serving catchment management requirements will be maintained while they continue to serve this purpose.

(11) All appropriate information, including prohibited areas, required routes, and other conditions of use will be conveyed to intending visitors in suitable locations and media. The Recreation Department will gather useful and relevant information on recreation within the catchments and make this available to the Manager, Bulk Water, as required. Advice on temporary closures will be publicly notified, circulated to mountain clubs and posted at entrances.

(12) Vehicle access will not normally be permitted except for appropriate purposes in accordance with these policies, taking account of the likely effects and benefits.

(13) The landing of aircraft within the water collection areas is prohibited except for approved management purposes and search and rescue.

(14) The Regional Council reserves the right to review or restrict public access to any area under this management plan for public health, safety, or other management reasons consistent with the purpose and management of each area. A review will be mandatory at the end of the five trial period. Following this review, access will only be revoked if:

(a) unacceptable effects on catchment ecology are determined to be caused by public use of the catchments; or

(b) an unacceptable increase in public health risk is determined to be caused by public use of the catchments; or

(c) the identified effects or risks cannot be remedied through appropriate management.

7.2 *Recreation Management and Development*

(1) The Recreation Department of the Regional Council has a primary management role in respect of the following areas and features (refer Policy 8.1):

- Rimutaka Incline and associated recreation facilities and areas.
- Rimutaka Trig Track.
- Tunnel Gully Recreation Area.
- Moonshine Recreation Area.
- Maungakotukutuku Recreation Area.
- Cannon Point Walkway.
- Karapoti Road and Entrance Area.
- Wainuiomata Waterworks Recreation Area.

(2) The Recreation Department will co-ordinate the development of buildings and facilities in these areas in accordance with the recreational and safety needs of the visiting public and the environmental management needs of the forest lands and water collection areas. Development work is subject to the Procedures for the Approval of Works (Appendix 3).

(3) The Recreation Department will prepare operational plans for the recreation areas under its control.

(4) Management of public use of existing water collection areas is the responsibility of the Conservation Forestry Department.

(5) Management of recreational use of future water collection areas and exotic forests is the responsibility of the Conservation Forestry Department and the Recreation Department.

Explanation

The Recreation Department may advise on, and carry out recreation management work in other forest lands and water collection areas for the Conservation Forestry Department or the Bulk Water Department and in this respect has a secondary management role in these areas.

7.3 *Information and Promotion*

(1) Information on the recreational opportunities in the Regional Council's forest lands and water collection areas will be provided in the Council's recreation promotional material.

(2) Visitor codes will be developed for use in information at principal entry points and in promotional materials.

(3) Use of the forest lands and water collection areas by educational institutions as a resource for outdoor and natural science education is encouraged provided it is undertaken in a manner that is consistent with the objectives and policies of

the management plan.

(4) The forest lands and water collection areas will be promoted as a heritage area reflecting the wealth of their natural and cultural resources.

(5) Interpretation of the natural and cultural heritage features and land uses may be provided in appropriate locations and in other promotional material.

(6) The Regional Council will provide opportunities for appropriate activities in forest lands and water collection areas as part of its summer recreation programme.

7.4 *Commercial Activities and Concessions*

(1) Provision for commercial activities will be in accordance with the Regional Council's policy for *Commercial Recreation and Related Services on Regional Council Lands* and the aim, objectives and policies of this management plan.

(2) The Regional Council will consider applications for commercial activities in forest lands and water collection areas.

7.5 *Baches and Dwellings*

(1) The erection and occupation of any private bach or dwelling is prohibited, subject to clause (2).

(2) Any existing private bach or dwelling will be removed from Council lands within a period determined by the Regional Council.

7.6 *Recreation Monitoring*

The Regional Council will carry out such monitoring as is needed to facilitate the enjoyment of these areas by the public and the mitigation of all associated impacts.

7.7 *Bylaws*

(1) Notwithstanding the more specific Area Policies, the *Wellington Regional Council Bylaws for Forest Parks and Recreation Areas* will apply in the management of recreation, and other activities of the public on these lands.

General Policies : Management

8. Implementation and Management

8.1 *Implementation and Funding*

(1) The policies of this management plan will be implemented by the Wellington Regional Council through the business plans and annuals plans of the Landcare Division and the Utility Services Division, according to priorities and timeframes determined by the Regional Council.

(2) The costs of particular activities will be met through the respective departmental annual plans. In some cases the cost of certain activities may be shared between the departments involved. In each case the costs will be proportional to the level of responsibility or the benefit received by each department in respect to that activity.

(3) Within each of the Regional Council's management functions there are three distinct levels of responsibility. These are listed below and will be recognised in the implementation of this management plan. (The responsibilities are also expressed in Table 1):

(a) *Business Plan Accountability (Overall responsibility, including funding)*

The division or department that has overall responsibility for ensuring the achievement of a particular management plan objective in a particular area, i.e., provision for the work in their Business Plan and Annual Plans, appropriate funding, and assurance that the work is carried out as planned, to the required standard. Where another department gains benefit from the same work, then recovery of an appropriate portion of the cost of the work may be negotiated between the respective departments through the annual planning process.

(b) *Operational Standards (Levels and methods of implementation)*

The division or department that is responsible for establishing and monitoring operational standards and levels necessary to achieve a particular objective in a particular area.

(c) *Operational Responsibility (Actual implementation)*

The division or department that is responsible for undertaking the on-the-ground work in relation to a particular objective in a particular area.

Explanation

The department will overall responsibility for a particular function in a particular areas is generally that department most closely involved with the area or the one which will benefit most from the function being carried out successfully. However, it may be another department which has the operational responsibility and expertise to undertake the on-the-ground work.

Table 1 : Management Responsibilities

Management Objectives	Business Plan Accountability			Operational Standards			Operational Responsibility		
Management Objectives	WC	FW	Re	WC	FW	Re	WC	FW	Re
1. Ecosystems (incl. Freshwater and Soil)	BW*	CF	R	BW / CF	CF	CF / R	CF	CF	CF / R
2. Landscape and Heritage	BW*	CF	R	BW / CF / R	CF / R	R	CF / R	CF / R	R
3. Bulk Water Supply	BW	BW	BW	BW	BW / CF	BW / R	BW	BW	BW
4. Plantation Forestry	N/A	PF	PF	N/A	PF / CF	PF / R	N/A	PF	PF
5. Recreation	R	CF/R/ PF	R	BW / CF / R	CF/R/ PF	R	R	R / CF	R
6. Fire Prevention and Control	BW*	CF / PF	CF	BW / CF	CF / PF	CF / R	CF	CF	CF / R
7. Plant and Animal Pest Management	BW*	CF / PF	CF	BW / CF	CF / PF	CF / R	CF	CF	CF / R

Key to Areas

WC : Water Collection Areas
FW : Future Water Collection Areas
Re : Recreation Areas

(Refer Map 1)

Key to Departments

Utility Services Division
BW : Bulk Water Department
PF : Plantation Forestry Department

Landcare Division
CF : Conservation Forestry Department
R : Recreation Department

* BW to fund to mandatory level (i.e., sufficient to maintain high quality water supply standards). Landcare Division to fund any additional discretionary work.

For example, as indicated in Clause (4) below, the management emphasis in existing water collection areas is on bulk water supply and conservation. The Bulk Water Department is the key user and beneficiary of the bulk water supply areas and has overall responsibility for ensuring their proper ecological management. However, the expertise for overseeing or carrying out ecological management lies with the Conservation Forestry Department. The levels and standards to which this work will be carried out will be determined jointly by both these departments. Table 1 indicates all the key areas of responsibility and departments to which these responsibilities fall.

(4) Implementation responsibilities reflect three principal land classes:

(a) *Existing Water Collection Areas*

Management emphasis on bulk water supply and conservation.

(b) *Future Water Collection Areas*

Management emphasis on conservation, and balanced multiple land use involving plantation forestry, recreation and future bulk water supply.

(c) *Recreation Areas*

Management emphasis on recreation uses and heritage protection and landscape enhancement.

(5) Where responsibilities are shared, the involved divisions and departments will jointly determine the levels and exact nature of their respective responsibilities, and co-operate as needed to ensure that the required work is carried out.

(6) The Biosecurities Department has a secondary management role in all areas for the provision of advice, and where appropriate, practical involvement in plant and animal pest management.

8.2 *Establishment of a Local Authority Trading Enterprise*

(1) In the event of a Council department becoming a Local Authority Trading Enterprise (LATE) or a commercial entity of another sort then provision may be granted for it to continue its operations within the Forest Lands and Water Collection Areas under a statement of corporate intent which is consistent with the objectives of the Management Plan.

(2) The following issues will be addressed in the drafting of the statement of corporate intent:

- The extent and nature of any control or authority of the LATE over land resources and the use of these lands by the public.
- The need to maintain and protect the ecological health of the catchments.
- The sustainable management of natural resources.

- Any other matters of public interest pertaining to the management of these lands including heritage protection and public recreation.

8.3 ***Completion of Full and Final Management Plan***

(1) The Interim Management Plan will remain operative until the completion of the full and final management plan for the Regional Council's Forest Lands and Water Collection Areas, due in 1999, or earlier.

(2) The full and final management plan will be a policy of the Regional Council. In addition to the management plan, a regional plan for regional mountain lands remains an option depending on the degree of coverage provided by other regional plans in respect of mountain lands issues and resources (refer **Introduction** for background and discussion of the status and purpose of the management plan).

(3) In addition to general and area specific policies for the particular land areas, the final management plan may contain appendices or subsections detailing the proposed operations and standards for each of the main functional responsibilities of the Regional Council on these lands.

(4) The full and final management plan will be prepared by the Landcare Division and the Utility Services Division, in consultation with other relevant departments of the Regional Council, outside groups, organisations and the public.

8.4 ***Information Systems***

As resources allow, the Regional Council will establish and maintain data-bases on ecological systems, Special Protection Areas and Features, heritage and landscape features and sites, recreation resources and exotic forest areas.

8.5 ***Leases and Licences***

(1) Leases and licenses may be granted for the use of sites or areas within the Regional Council's forest lands and water collection areas, where the use is consistent with the aim and objectives of this management plan.

(2) Wherever possible and practical, leases and licences shall allow for shared uses.

(3) Except in special cases the terms for leases and licences are:

- leases : 10 years
- licences : 5 years

Leases and licences may allow a right of renewal for a further term. (Refer to the *Regional Council's Policy on Commercial Recreation and Related Services on Regional Council Lands.)*

8.6 *Activity Assessment*

Applications for activities which do not clearly fit within the general purpose of this management plan will be considered in terms of:

- the extent of the area of land required
- the potential environmental effects
- the potential effects on other activities
- the potential effects on the management of the Regional Council's forest lands and water collection areas
- the ability of the applicant to provide safeguards and to guarantee compliance with the policies of the management plan
- whether the activity is likely to stimulate further developments which could have significant environmental impact.

Where appropriate, assessment will include consultation with public health authorities.

8.7 *Procedures for the Approval of Works*

(1) Significant new works of the Regional Council or other agencies and organisations are subject to the *Procedures for the Approval of Works* (Appendix 3).

(2) Significant new works do not include routine operations or maintenance, or other works which have already been approved in principle and in their detail.

Explanation

In the process of implementing this plan and carrying out their respective functions, departments of the Regional Council will need to undertake works within the management area. Occasionally works will be proposed by other agencies, such as Transpower or Transit New Zealand. Examples of possible works which would be subject to the *Procedures* include: the laying of a new water supply pipe; the building of a new road or track; a new building or treatment facility; clearance of an area of scrub or forest; the establishment of a new exotic plantation; installation of a communication device on a hill top.

The *Procedures for the Approval of Works* provide a consistent framework for internal Regional Council scrutiny of the proposed works and a means of determining the level at which final approval can be granted. The factors affecting the approval process include:

- The scale and nature of the proposed work.
- Degree of consistency with management plan policy.
- Number of affected divisions.
- Anticipated effects on natural, physical or historic resources and the public.

The *Procedures* are designed to satisfy the Regional Council's own requirements for the management of these lands as expressed in this plan and is separate from the processes under the Resource Management Act.

8.8 ***Review of the Legal Status of the Regional Council's Forest Lands and Water Collection Areas***

A comprehensive review of the legal status of the Regional Council's forest lands and water collection areas will be carried out before June 1997, in order to incorporate the findings in the final management plan.

Explanation

A review was carried out on the legal status of the upper Whakatikei Catchment block, comprising 5,578 hectares or 14.3 percent of the Council's forest lands and water collection areas. It raised a number of legal matters which could impact on policy development and day-to-day management activities for all of Council's forest lands and water collection area. To ensure the Regional Council is complying with its empowering legislation, legal advice and opinion is being sought on such matters as; the clarification of the status of former Gazette Notices, definitions of "water supply purposes" and "forestry purposes", and the relationship between the Wellington Regional Water Board Act 1972 and the Wellington City and Suburban Water Supply Act 1927 and its Amendment of 1947.

The legal advice received will assist the Council in carrying out a more comprehensive legal review beyond the confines of the Upper Whakatikei Catchment.

8.9 ***Land Management Rationalisation***

Where there are lands which the Regional Council does not need to administer, appropriate alternative arrangements for the future management of such lands by another authority or owner will be considered.

9. Tangata Whenua

9.1 ***Incorporating Tangata Whenua Environmental Management Ethics in the Management of these Lands***

(1) Consultation will be sought with the tangata whenua on the future use, development and protection of these areas.

(2) Opportunities for involving tangata whenua in the management of these lands will be explored.

9.2 ***Identifying and Protecting Sites of Significance to Maori***

(1) A schedule of known sites if significance to the tangata whenua will be developed and maintained.

(2) In order to protect waahi tapu and other sensitive sites of significance to tangata whenua, a "silent file" of these sites will be developed for cross-checking against management and development proposals.

Explanation

A "silent file" is one which is not published or available for public scrutiny and may be a list of sites. A proposal for an activity or land will be checked against the "silent file" so any issues arising from the proposed use can be indicated to the Regional Council by the iwi or hapu affected.

9.3 ***Opportunities for Cultural Aspirations and Tikanga Whenua with Respect to Natural and Physical Resources***

(1) The harvesting of materials for cultural uses may be permitted on a limited basis provided that this does not significantly deplete target species at any particular site and does not have a significant impact on ecological values. Permits will not be granted for the harvest of any species of indigenous flora which are locally, regionally or nationally endangered.

(2) The harvesting of materials which are intended for sale will be considered on the basis of policies for commercial activities.

(3) The harvesting of materials for cultural uses within Special Protection Areas (refer Policy 1.2) is prohibited, except where it is consistent with the values and purpose of each area.

Explanation

Indigenous fauna are protected under the Wildlife Act 1953.

10. Public Consultation

10.1 *Public Consultation*

(1) The Regional Council will consult with public authorities, neighbouring landowners, the tangata whenua, and special interest groups and individuals, to promote the co-ordinated and effective management of the forest lands and water collection areas.

11. Fire Prevention and Control

11.1 *Implementation*

(1) Fire prevention and control is the responsibility of the Conservation Forestry Department.

(2) Fire prevention and control will be managed in accordance with the Wellington Regional Council Rural Fire Plan (Metropolitan Area).

(3) The Regional Council will prepare and implement fire control strategies for forest lands and water collection areas as part of its fire control plan.

11.2 ***Liaison***

The Conservation Forestry Department will liaise with other departments of the Council, the Department of Conservation, adjoining landowners, district and city councils and appropriate community groups, to ensure an effective and co-ordinated implementation of fire control policies.

11.3 ***The Lighting of Fires***

(1) The lighting of fires (including charcoal or gas barbecues) by the public is confined by the bylaws to suitable designated sites in recreation areas. The lighting of fires by the public elsewhere is prohibited. People using the forests for recreation must use portable stoves for cooking or heating water.

11.4 ***The Effects of Fire Control Methods***

Methods used in the prevention or combat of fire will as far as practicable be in sympathy with the ecological and landscape values of the area.

12. **Animal and Plant Pest Management**

12.1 ***Animal Pest Management***

(1) Wild animals and animal pests will be managed in accordance with any operative Regional Council pest management strategies.

(2) Plant and animal pest management will be carried out in a manner and to levels which enable management of the indigenous ecosystems of the forest lands and water collection areas in accordance with the ecosystems policies.

(3) The Regional Council will liaise with neighbouring landowners on matters of mutual interest to do with wild animal and animal pest control.

12.2 ***Plant Pest Management***

(1) Plant pests will be managed in accordance with the Regional Council Noxious Plants Control Programme. The programme will be expanded as necessary to allow management of all noxious and troublesome plant species.

(2) The Regional Council Noxious Plants Control Programme will include provision to enable management of the indigenous ecosystems of the forest lands and water collection areas in accordance with the ecosystems policies.

(3) All reasonable steps will be taken to ensure that the indigenous plant communities of the catchments remain free from infestation by noxious or troublesome plants.

12.3 ***Levels of Response***

(1) Minimum levels of response to wild animal pest populations will be in

accordance with the Regional Council's *Standard Levels of Response for the Control of Animal Pests.*

(2) Levels of response will be determined to satisfy ecological criteria, if not already prescribed in regional documents.

12.4 ***Effects of Pest Management on Adjoining Lands***

In implementing pest management the Regional Council will observe "good neighbour" practises. This will include notifying the owners and managers of land adjoining Regional Council land of the implementation of any control measures likely to affect them.

12.5 ***Special Wild Animal and Plant Pest Projects***

Within the management area, special wild animal and plant pest management projects may be put in place to provide levels of management beyond those prescribed for the general area. In particular, sites or features of particular ecological value may be subject to special attention for wild animal and plant pest management in order to provide a level of protection appropriate to the value of the site.

12.6 ***The Effects of Wild Animal and Plant Pest Management Measures***

(1) In the implementation of wild animal and plant pest management measures care will be taken to minimise any side effects on the indigenous ecology, water quality and landscape values of the target areas.

(2) Wild animal and plant pest occurrence will be monitored to establish the effectiveness of management measures and to identify any side effects on the indigenous ecology and landscape values of the target areas.

12.7 ***The Role of Recreational Hunters and Possum Hunters in Wild Animal Control***

(1) Recreational hunting may be used as a means of controlling populations of deer, pigs and goats in the identified hunting areas (Refer Area Policies). It will be subject to the control of the Manager, Conservation Forestry Department and will not take priority over other animal management techniques.

(2) Possum hunting for skins is permitted in designated areas, subject to the authorisation of the Manager, Conservation Forestry Department.

12.8 ***Special Control Zones***

Areas subject to particular animal or plant pest problems may be declared Special Control Zones by the Manager, Conservation Forestry Department, to facilitate the implementation of special control measures. Special control zones may be subject to access controls under the *Wellington Regional Council Bylaws for Forests, Parks and Recreation Areas.*

Area Policies : Akatarawa

The policies cover all lands in the Akatarawa Future Water Collection Area (Akatarawa block) as shown on Map 1.

13. Conservation

13.1 *Forest Management*

(1) Existing areas of indigenous vegetation, including shrubland, regenerating forest and mature forest are protected and will be managed to maintain or enhance and restore their ecological, conservation, soil and water, and amenity values.

(2) Existing small-scale exotic woodlots and stands will be preserved through their natural life for the sake of their amenity value and cultural associations. Upon the demise of these stands the land they occupy will be left to regenerate in indigenous forest, unless they are located within existing plantation forests, in which case they may be used for plantation forestry.

(3) The remains of the sites and structures from the early period of European use and development of the area and any other features of historic or cultural significance will be protected.

14. Use and Development

14.1 *Access*

(1) Subject to temporary or localised restrictions for appropriate management purposes the public are permitted access on foot to all parts of the Akatarawa block.

(2) Subject to periodic or localised restrictions for management purposes the public are permitted access by bicycle to all vehicle trails, and any other trails for which this use is specifically designated.

(3) Subject to periodic or localised restrictions for management purposes the public are permitted access by horse, or off road vehicle to roads for which each particular mode is specifically designated.

(4) The Regional Council will, if necessary, use a permit system to control and monitor the use of off road vehicles in this area.

(5) Specific designations for access will be shown on relevant site management plans, permits, brochures and maps produced by the Regional Council.

14.2 *Recreation Activities*

(1) Recreational hunting is allowed in the recreational hunting zone as specified on the hunting permit.

(2) Camping and overnight stays are permitted as designated sites only. These sites will be indicated at entrance areas and in relevant publicity material.

14.3 *Recreation Development*

(1) Valley floors at Bulls Run Road, Dude Ranch and Drapers Flat may be developed as focal points for recreational activity in this area.

(2) Subject to appropriate designations for access and use, roads and trails within the Akatarawa block will be suitably identified and signposted to enhance their safe use by the public.

(3) Subject to further analysis, recreation zones for particular types of activity may be delineated and implemented.

(4) Potential linkages for walking and horse riding between Battle Hill and Queen Elizabeth Park via the Akatarawa block will be investigated.

14.4 *Production Forestry Guidelines*

(1) Existing exotic forests will be managed on a long-term basis subject to this management plan.

(2) Riparian strips/buffer zones of permanent indigenous vegetation will be set aside on either side of the Akatarawa and Whakatikei Rivers and their tributaries.

(3) Slopes greater than 30 degrees and areas above 400 m altitude will be left to revegetate naturally in indigenous vegetation.

(4) No further afforestation will be undertaken within the catchments of the Akatarawa and Whakatikei Rivers except in accordance with clauses (5) and (6).

(5) Within these control, remaining modified grasslands in this area may be afforested and managed as exotic forest on a permanent basis.

(6) Within these controls, small scale adjustments to the boundaries of existing areas of exotic forest may be carried out to rationalise and improve the use of the suitable forestry lands, providing other policies are upheld.

15. Management

15.1 *Land Management Areas and Responsibilities*

(1) Subject to Clause (2), the Akatarawa Block is managed by the Conservation Forestry Department primarily for conservation, future water supply, plantation forestry and recreation in accordance with Policy 8.1.

(2) In designated recreation areas and principal public entrances, the emphasis of management is on recreation and landscape enhancement. These areas are

managed by the Recreation Department in accordance with Policy 8.1. The areas are:

- Moonshine Recreation Area;
- Maungakotukutuku Valley Recreation Area;
- Cannon Point Walkway;
- Karapoti Road and Entrance Area.

(3) Maungakotukutuku Valley Recreation Area is managed for recreation and conservation by the Recreation Department in co-operation and consultation with the Conservation Forestry Department, Kapiti Coast District Council and the Department of Conservation.

(4) Cannon Point Walkway is managed for recreation and conservation by the Recreation Department in co-operation and consultation with the Conservation Forestry Department and Upper Hutt City Council.

(5) Karapoti Road and associated recreation developments are managed for recreation and conservation by the Recreation Department in co-operation and consultation with the Conservation Forestry Department and Upper Hutt City Council.

(6) Each of these areas will be managed in accordance with site management plans where they exist, or where there is no site management plan, in accordance with this management plan.

(7) Other areas may be designated for recreation development and managed by the Recreation Department subject to agreement with the Conservation Forestry Department. Any such areas will be identified prior to completion of the full management plan in 1999.

Area Policies : Hutt

These policies cover all lands in the Hutt Water Collection Area as shown on Map 1.

16. Conservation

16.1 *Forest Management*

(1) Existing areas of indigenous vegetation, including shrubland, regenerating forest and mature forest are protected and managed for their ecological, conservation, water supply, soil and water, and amenity values.

17. Use and Development

17.1 *Bulk Water Supply*

(1) No new major works are intended to be undertaken in the area above the vicinity of the present intake at Kaitoke.

(2) Where works are required particular care will be taken to ensure protection of soil and water values and the remote character of the area.

17.2 *Access*

Access to the Hutt Gorge between Hutt Forks and the Kaitoke intake is prohibited unless authorised by the Manager, Bulk Water Department.

18. Management

18.1 *Land Management Areas and Responsibilities*

(1) The Hutt Water Collection Area is managed primarily for conservation and water supply by the Bulk Water Department in accordance with Policy 8.1.

(2) Day-to-day management of public access will be on the basis that the area is a special zone of Kaitoke Regional Park, as anticipated in the Kaitoke Regional Park Management Plan. The Ranger at Kaitoke will therefore have an operational role in the management of public access and use in the Hutt Water Collection Area.

Area Policies : Pakuratahi

These policies cover all lands in the Pakuratahi Future Water Collection Area and associated lands in the Kaitoke basin, (Pakuratahi block) as shown on Map 1.

19. Conservation

19.1 *Forest Management*

(1) Existing areas of indigenous vegetation, including shrubland, regenerating forest and mature forest are protected and will be managed to maintain or enhance their ecological, conservation, soil and water, and amenity values.

(2) Existing exotic forests which are protecting unstable slopes will be retained subject to a review of their effectiveness and long-term management. Where possible and practical these forests will be phased out and replaced with indigenous vegetation.

(3) The formation of the historic Rimutaka Incline Railway including the Tunnel Gully section and any associated historic structures will be protected. Extraction of logs from the exotic forests in this area, or any other activity, will be carried out at a way which ensures that adverse effects on these features are avoided, remedied or mitigated.

20. Use and Development

20.1 *Access*

(1) Subject to temporary or localised restrictions for appropriate management purposes the public are permitted access on foot to all parts of the Pakuratahi block.

(2) Subject to periodic or localised restrictions for management purposes the public are permitted access by bicycle to all vehicle tracks, and any other trails for which this use is specifically designated.

(3) In general the use of horses or vehicles is not permitted except for management purposes. Exceptions may however be made at the direction of the Manager, Recreation, and the Manager, Conservation Forestry, subject to these policies and any other conditions imposed by the Regional Council. Options for the provision of better access for horse riders will be investigated.

20.2 *Recreation Activities*

(1) Recreational hunting is allowed in the recreational hunting zone as specified on the hunting permit. Hunters may use the tracks and roads in this area to gain foot access to the hunting area in the upper Pakuratahi Catchment.

(2) Camping and overnight stays are permitted at designated sites only. These sites will be indicated at entrance areas and in relevant publicity material.

20.3 ***Recreation Development***

(1) Subject to appropriate designations for access and use, roads and trails within the Pakuratahi block will be suitably identified and signposted to enhance their safe use by the public.

20.4 ***Plantation Forestry Guidelines***

(1) A study into possible timber extraction routes from the East Pakuratahi Forest block will be carried out in the 1995/96 financial year. This study may have implications for the overall management of the block.

(2) All other plantation forests in the Pakuratahi block will be managed on a long-term basis as part of the Region's forest resource, subject to this management plan.

(3) Riparian strips/buffer zones of permanent vegetation will be set aside on either side of the Pakuratahi River and its tributaries and either side of the Rimutaka Incline.

(4) Slopes greater than 30 degrees and areas above 400 m altitude will be left to revegetate naturally in indigenous vegetation.

(5) No further afforestation will be undertaken within the catchment of the Pakuratahi River, except in accordance with clauses (6) and (7).

(6) Within these controls, remaining open areas of exotic grass or exotic scrub may be afforested and managed as exotic forest on a permanent basis.

(7) Within these controls, small scale adjustments to the boundaries of existing areas of exotic forest may be carried out to rationalise and improve the use of the suitable forestry lands.

21. Management

21.1 ***Land Management Areas and Responsibilities***

(1) Subject to Clause (2), the Pakuratahi Block is managed by the Conservation Forestry Department primarily for conservation, future bulk water supply, plantation forestry and recreation in accordance with Policy 8.1.

(2) In designated recreation areas and principal entrances, the emphasis of management is on recreation and landscape enhancement. These areas are managed by the Recreation Department in accordance with Policy 8.1. The areas are:

- Rimutaka Trig Track;
- Rimutaka Incline (Incline historic rail route, adjoining picnic and camping areas, interpretation kiosks) and Rimutaka Incline Recreation Area (area occupied by the kart track, rifle range, airstrip, and some of the adjoining land).

Area Policies : Wainuiomata/Orongorongo

These policies cover all lands in the Wainuiomata/Orongorongo Water Collection Area as shown on Map 1.

22. Conservation

22.1 *Indigenous Vegetation*

(1) Existing areas of indigenous vegetation, including shrubland, regenerating forest and mature forest are protected and managed for their ecological, conservation, soil and water, and amenity values.

23. Use and Development

23.1 *Access*

(1) Access through the intake area of the Wainuiomata River will be via a specified route. General access within this part of the valley is prohibited.

(2) Access on the road alongside George Creek between the lower intake and the Orongorongo pipeline tunnel is prohibited unless authorised by the Manager, Bulk Water Department.

(3) Access in George Creek by track upstream of the tunnel portal is prohibited unless authorised by the Manager, Bulk Water Department.

(4) Access in Big Huia Catchment and in the Orongorongo River in the vicinity of the intake facilities is prohibited unless authorised by the Manager, Bulk Water Department. An alternative route to allow access around this section of the river will be constructed if needed.

23.2 *Recreation Activities in the Wainuiomata Waterworks Recreation Area*

(1) Recreational hunting in the area is prohibited.

(2) Walking, picnicking and related activities are provided for in the Wainuiomata Waterworks Recreation Area.

(3) Camping is permitted at designated sites by special arrangement through the Manager, Recreation.

(4) All recreation activities are subject to these policies and any other rules or requirements specified by the Regional Council.

23.3 *Bulk Water Supply*

(1) Proposed works in the Wainuiomata/Orongorongo Water Collection Area are set out in the Department's Business Plan.

(2) Where works are required particular care will be taken to ensure protection of

conservation values and the character of the area, and will be assessed in terms of *The Procedures for the Approval of Works*.

Explanation

Proposed works include Orongorongo pipeline rehabilitation and replacement, intake and intake branch rehabilitation, power generation facility construction and Wainuiomata Lower Dam spillway decommissioning.

24. Management

24.1 *Land Management Areas and Responsibilities*

(1) The Wainuiomata/Orongorongo Water Collection Area is managed primarily for conservation and water supply by the Bulk Water Department in accordance with Policy 8.1.

(2) The Wainuiomata Waterworks Recreation Area is managed primarily for recreation and conservation in accordance with Policy 8.1.

Section Three

Background and Resource Description

1. Statutory Basis for Management

The following is a quick guide to the relevant statutes, policies and plans which currently exist and which empower or require the Regional Council to carry out the task of controlling and managing forest lands and water collection areas.

Empowering Acts

- Wellington Regional Water Board Act 1972
- Soil Conservation and Rivers Control Act 1941
- Agricultural Pests Destruction Act 1967
- Local Government Act 1974
- Forest and Rural Fires Act 1977
- Noxious Plants Act 1978
- Resource Management Act 1991
- Biosecurity Act 1993

Other Relevant Statutes

- Conservation Act 1987
- Reserves Act 1977
- New Zealand Walkways Act 1990
- Crown Minerals Act 1991

Bylaws

- Wellington Regional Water Board Bylaws 1976
- Wellington Regional Council Bylaws for Forests, Parks and Recreation Areas 1994

General Policy of the Regional Council

- Wellington Regional Policy Statement (a principal mechanism of the Resource Management Act 1991)
- Regional Plans (refer Section 1, page 2)

Specific Policy of the Regional Council

- Policy for Commercial Recreation and Related Services on Wellington Regional Council Lands

- Policy on Public Access to Water Collection Areas

Management Plans of Wellington Regional Council

- Forestry Management Plan 1 April 1985 to 31 March 1995

- Kaitoke Regional Park Management Plan, 1991
  (An area contiguous with the Hutt Water Collection Area.)

- Battle Hill Farm Forest Park Management Plan, 1992
  (An area contiguous with the Akatarawa block.)

- Tunnel Gully Recreation Area Management Plan, 1988
  (A part of the Pakuratahi block.)

- Rimutaka Incline Walk - Statement of Objectives and Policy, 1986
  (A part of the Pakuratahi block Management Plan currently under review.)

- Maungakotukutuku Valley Management Plan
  (Covers a small part of the Akatarawa block, including the northwestern entrance to the interior.)

Other Relevant Planning or Policy Documents

- Departmental Business Plans
- Annual Plan and Budgets
- Moonshine Recreation Area Development Concept (draft), 1991
- Standard Levels of Control for Wild Animals
- Forestry Code of Practise, (2nd Edition, 1993)
- Proposed Regional Animal Pest Management Strategy : Wellington Region 1996-2001
- Proposed Regional Plant Pest Management Strategy : Wellington Region 1996-2001

2. Management of Wellington Regional Council Forest Lands and Water Collection Areas

Wellington Regional Council's forest lands and water collection areas are managed by the Council's Landcare and Utility Services Divisions. Particular functions in the management of these lands are carried out by different departments within these Divisions, as set out below.

The Bulk Water Department is responsible for provision and management of facilities which draw water from the Hutt and Wainuiomata/Orongorongo water collection areas. The Conservation Forestry Department looks after indigenous forests, establishes and manages exotic production forests, and protects all forests from fire. The Recreation Department manages designated recreation facilities and areas such as the Tunnel Gully Recreation Area and the Rimutaka Incline, and provides support for the provision of recreation opportunities.

Other Council departments provide support as required. For instance, the Biosecurity Department is responsible for developing programmes for the management and control of wild animals and noxious plants within the Region. The extent to which their programmes cover these lands depends on the nature of the pest problems and the department's specific role under the Act.

This management plan provides for the integrated management of the Council's forest lands and water collection areas by the various departments involved. The plans, objectives and policies provide the basis of a consistent approach to this work by these departments.

3. Physical Resources

Information on the physical and biological resources of these catchments are contained within a wide range of publications. The Akatarawa block is the most poorly described area; the Hutt Water Collection Area the best. Three publications describe the resources of all or most of the forest lands.

Area	Key Reference
General References	Forestry Management Plan (WRC 1985) : Biological Resources of the Wellington Region (WRC 1984); Forests of the Hutt Catchment (Druce and Atkinson 1959)
Akatarawa/Whakatikei Block	Current information inadequate.
Hutt Water Collection Area	Kohler (1989); Park (1971); and others. Well described.
Pakuratahi block (including Wellington Regional Council land in Kaitoke Basin)	Clarke (1980); Clelland (1984); White (1951). Well described.
Wainuiomata/Orongorongo Water Collection Area	WRC (1993) : primarily describes physical resources. Biological resources partially described. NZ Forest Service (1982). The upper Orongorongo Catchment is rarely visited and poorly described in any of the available references.

Note: For the purposes of this description that part of the Pakuratahi block which is north of State Highway 2 (Kaitoke Basin) is treated as separate from the main Pakuratahi Catchment.

3.1 Climate

(1) *General*

Reliable long-term weather records have been kept at both Wallaceville and Taita climatological stations, supplemented by a number of rain gauges, which are present in each of the areas.

Differences in climate between the areas can be explained by differences in altitude, topography, aspect and their proximity to the coast. Rugged topography and proximity to Cook Strait influence the climate characteristics throughout the southwest part of the Region and cause considerable variability from place to place and over time. These result in substantial deviations from average values for wind, cloud, sunshine, and rainfall. This in turn is reflected in the variability of river flows (Section 5: Water Resources).

(2) ***Rainfall***

As altitude and distance up the Hutt Valley increases, rainfall increases proportionally. The Hutt Water Collection Area receives the highest rainfall, increasing from 2330 mm at the Headworks to 3161 mm on Renata Ridge and up to 6,400 mm on the main divide. At the Phillips rain gauge, on the south-eastern side of the collection area, rain falls on 199 days a year. Snow falls are common down to 450 metres in June, July and August and occur occasionally from May to October.

The Akatarawa/Whakatikei Catchments receive between 1707 mm at the lower reaches and 2388 mm on the western ridgeline, with the Akatarawa receiving slightly higher rainfall than the Whakatikei. The heaviest rainfall in these catchments occurs during northwesterly storms, reflecting their elevated position near the west coast. Rain falls on average 176 days a year at the top of both catchments.

The Pakuratahi receives the most uniform rainfall varying from 2160 mm in Centre Ridge to 2371 mm at Mt Climie. It is likely that the headwaters receive up to 2800 mm (Clarke 1980). Rain falls on average 192 days a year at the centre ridge station. Extreme rainfall storms that induce high Pakuratahi River flows are predominantly from the southerly direction.

The Wainuiomata/Orongorongo Catchments receive between 1920 mm and 2526 mm in the valley floors with the highest rainfall falling in the headwaters of the Orongorongo (Table 2). At the highest elevations, rainfall up to 4000 mm can be expected (NZFS 1982). With the exception of the Tararua Range, the Wainuiomata and Orongorongo Catchments have the highest mean annual rainfall in the Wellington Region. Rainfall occurs on average 184 days a year in the headwaters of the Orongorongo. Extreme rainstorms are usually associated with southerly flows but northwesterly storms can also lead to high river levels in these catchments. Snow occurs from time to time in these catchments every winter.

The following table lists mean annual rainfall as recorded at rain gauges throughout the four catchments.

Table 2 : Mean Annual Rainfall

Station	Grid Reference	Altitude (metres)	Mean Annual Rainfall (mm)
Akatarawa/Whakatikei:			
Akatarawa @ Warricks	R26: 848256	345	2388
Akatarawa @ Cemetery	R26: 863112	100	1795
Akatarawa @ Blue Gum Spur	R26: 797156	335	2028
Akatarawa @ Putaputaweta	R26: 786197	240	1707
Hutt/Kaitoke Basin:			
Hutt @ Kaitoke Farm	S26: 941120	223	2100
Hutt @ Kaitoke Headworks	S26: 936142	189	2330

Station	Grid Reference	Altitude (metres)	Mean Annual Rainfall (mm)
Hutt @ Renata (NZMS ?)			(3161)
Hutt @ Aston (WRC KRP)			(5600)
Pakuratahi/Rimutaka:			
Pakuratahi @ Centre Ridge	S27: 946059	510	2160
Pakuratahi; Ladle Bend (NZMS)			2244
Pakuratahi @ Mt Climie (NZMS)			2371
Wainuiomata/Orongorongo			
Wainuiomata @ Reservoir	R27: 767912	125	1952
Wainuiomata @ Skull Gully	R27: 788929	150	2047
Orongorongo @ Forest Station	R27: 747827	130	2404
Orongorongo @ Orongorongo Swamp	R27: 825937	420	2526

(3) ***Fogs and Orographic Cloud***

Frequent fogs are experienced above 200m in all areas. They are usually associated with a weak southerly airflow which bring stratus clouds and fog north into the Hutt Valley and up the Wainuiomata and Orongorongo valleys. They can also occur after a clearing southerly change. Fogs are prevalent between November and May. In the Akatarawa block they occur on average 21 days a year.

In the southern Tararua Range orographic cloud is a major climatic influence occurring on the top ridges up to 200 days of the year. In these cases it is bought about by prevailing northerlies and north-westerlies, although the southern Tararua Range also receives a lesser amount of fog brought in by southerlies (Zotov 1938a). Orographic cloud has three main ecological effects: reducing insolation; narrowing diurnal temperature range and creating a more humid environment. Reduction of solar radiation by continuous cloud or mist varies from 15 to 83 percent. In the alpine and subalpine areas of the Hutt Water Collection Area, a daily temperature range of 20°C can be reduced to as little as 2°C in cloud and rain. Precipitation can be increased several fold by condensation and leaf drip. At higher altitudes, leaf drip leads to waterlogging, poor root development and to a susceptibility to drought. Waterlogging also results in slow mineralisation of organic materials and decreased availability of nutrients. (Rowley 1970; Wardle 1986.)

(4) ***Wind***

Wind in the Wellington area is predominantly from the northwest, although strong salt-laden southerly winds occur frequently. Reid (1981) states, *Apart from Wharite Peak the highest measured mean speeds in New Zealand are found on the hills around Wellington.* These high winds are associated with a more continuously windy regime near Cook Strait than is found in other parts of New Zealand.

The effects of wind on each of the areas varies. The Hutt Water Collection Area lies the furthest from the coast but its height exposes it to extreme winds, particularly on its upper slopes. The predominant winds are from the north-west 50 percent of the time and south 30 percent. Maximum wind flows occur between September and January. In valleys and gorges channelling effects increase the velocity and turbulence of the wind. On exposed ridge tops gusts of up to 100 km/hr are experienced about 40 days each year.

The main western ridge of the Akatarawa block lies only a short distance from the Kapiti Coast and north-westerly gales have a marked effect on the ridge and upper slope vegetation. The Pakuratahi is perhaps the most sheltered valley with a north-easterly aspect, however slow regeneration following fire in the Mt Climie and Mt Rimutaka areas indicates the strength of winds on these exposed slopes.

Strong winds are frequent in the Wainuiomata and Orongorongo catchments due to their proximity to Cook Strait. These winds are gusty and turbulent. Winds are from the northwest and south with westerly winds exerting the greater influence because of higher average velocities. Occasional strong salt laden southerlies do cause extensive damage. On exposed faces and ridges gusts in excess of 160 km/hr are not uncommon, however the mean wind speed is between 33 and 43 km/hr.

The effects of wind on vegetation may be seen in windthrow, windshorn canopies, flag formed trees, poor growth, and protracted recovery of vegetation following disturbance.

(5) ***Temperature and Sunshine***

Few weather stations record sunshine and temperature so data for this section is incomplete. In the Hutt Valley two stations have recorded on average 1,896 and 1,856 hours of sunshine. At Kaitoke this is reduced to 1,746 hours, which is strongly seasonal, varying from a mean of 76 hours per month in June to 223 hours per month in January (WRC KRPMP 1991). At higher altitudes in each area total sunshine hours are expected to be less, reduced by orographic cloud and fog.

Temperature decreases with increasing altitude at a rate of approximately 0.5°C per 100 metres. Temperature is also affected by wind duration and strength. At Kaitoke weather station the annual average temperature is 11.5°C. Mean monthly temperatures on the Wainuiomata Coast Road range from 8°C in July to 16.5°C in January and February. The range of temperatures at Wallaceville is from 30°C to -2.9°C. Minimum temperatures at higher altitudes can be expected to be significantly lower.

Frosts can occur at any time of the year but are more common in winter. At Kaitoke ground frosts varied between 33 and 94 days of the year, on average occurring 65 days a year. In the Wainuiomata and Orongorongo catchments frosts are more common as a result of being sheltered from the dominant warm northwesterlies and their vulnerability to cold air ponding. High altitude frosts in the alpine and sub-alpine zones of the Hutt Water Collection Area are more frequent and severe, and have a strong effect on the vegetation in these areas.

The following table has been derived from Wellington Regional Council rain gauges and Meteorological Service weather stations.

(6) ***Implications for Use and Management***

The climate of all areas can be typified by high rainfall, extreme winds, and low temperatures compounded by frequent frosts and occasional snow, and highly variable sunshine hours. These extremes can be expected year round and from both the north and south. Combined they have a significant impact on vegetation growth, particularly at higher altitudes, and altitudinal zonation of vegetation is a major ecological feature of the areas described (see section 4.1). These climatic extremes also have an impact on soil formation and stability which is compounded at higher altitudes by slow plant growth and recovery.

3.2 Geology and Geomorphology

Unless otherwise specified the following tables are derived from the New Zealand Land Resource Inventory Worksheets (NWASCO 1975/79). These worksheets are stored digitally on the Wellington Regional Geographic Information System (WREGGIS) and the areas given have been obtained from this source.

(1) ***Geomorphic Development***

The Tararua and Ruahine Ranges are recent geological features created in the last two-three million years by the uplift and faulting of old and brittle greywackes and argillites. Four main fault lines: the West Wairarapa Fault, the Wellington Fault, the Owhariu Fault and the Pukerua Fault, have broken the Region into four blocks. Numerous smaller faults, both secondary faulting associated with recent movements, and more ancient faulting, complicate the picture. The uplifting, tilting and subsequent erosion of these blocks has been primarily responsible for the hills and valleys of our modern landscape.

The shatter belts of these faults often account for the marked orientation of major drainage systems. The four main faults are considered active, the most recent movement occurring in 1855, with a major movement of the West Wairarapa fault.

Red rocks, (spillite) formed up to 120 million years ago from lava intrusions into the sedimentary crustal rocks, are to be found throughout the Rimutaka Range and less frequently within the Akatarawa Range. Several 15 to 25 cm deep rhyolitic volcanic deposits are to be found near Taita, Mangaroa, the Upper Hutt Valley, and on gently rolling slopes in the Tararua Range.

Frequent glacial episodes over the last three million years have left a number of features. A series of flat topped ridges extending from the Western Hutt and across the Akatarawa Range are remnants of an extensive plain capped by gravels that, during the ice age, were spread as an alluvial plain fringing the main mass of the Tararua Range. Subsequent erosion has removed most of these gravels and cut into the greywacke base rock, but the general landform remains and clearly separates the Western from the Eastern Hutt.

During these glacial periods the loss of forest vegetation resulted in vast screes of course angular rock fragments, seen as fossil screes, throughout the area and are a feature of the Kaitoke area and Western Hutt hills (Stephens 1975). Scree

building has led to the formation of a unique landform in the upper Orongorongo Valley where extensive fans extending from the eastern side of the valley has pushed the river bed across the valley floor and created a series of raised wetlands unique to the Region (Stephensen pers.com.).

The following tables show the main rock categories for the five areas. All areas are dominated by greywacke. The greater amount of loess in the Akatarawa block and Kaitoke basin is the result of a gentler topography.

Table 3 : Rock Categories (Hectares)

Top Rock (Hectares)		Akatarawa/ Whakatikei	Hutt	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	Total
Al	Undifferentiated floodplain alluvium	374	0	52	44	270	740
Cg	Conglomerate and breccia	0	551	0	439	0	989
Gr	Gravels	16	127	5	194	163	506
Gw	Greywacke	13,309	8,286	881	6,243	6,013	34,731
Lo	Loess	1,739	0	124	83	0	1,946
Town	-	1	0	0	0	0	1
Lake	-	0	0	0	0	0	0
Totals		15,439	8,963	1,062	7,003	6,446	38,913

Table 4 : Rock Categories (% of Catchment)

Top Rock (% of Catchment)		Akatarawa Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	% of Total
Al	Alluvium, colluvium, glacial drift	2	0	5	1	4	2
Cg	Conglomerate	0	6	0	6	0	3
Gr	Gravels	0	1	1	3	3	1
Gw	Greywacke	86	92	83	89	93	89
Lo	Loess	11	0	12	1	0	5
Town	-	0	0	0	0	0	0
Lake	-	0	0	0	0	0	0
Totals		100	100	100	100	100	100

(2) ***Existing Geomorphic Processes and Implications for Use and Management***

Uplift and mountain building of the Wellington Region is still occurring. The most recent activity was the 1855 movement of the West Wairarapa Fault which tilted the entire Wellington Peninsula, lifting the Rimutaka Range 3 metres and the Hutt Valley 1.8 to 2 metres. This earthquake created extensive slips throughout the Rimutaka Range, particularly in the Orongorongo Valley and increased the fall of the Hutt River and its tributaries. Uplift is occurring in the Rimutaka Range at an average rate of 4m per 1,000 years.

The steepness of the hills being formed by ongoing uplift and the weak nature of the greywacke rock which underlies most of the Wellington Region predispose the area to high rates of erosion. This is compounded by the climatic extremes experienced throughout the area (see section 3.1 : Climate) and the effect of the climate on plant growth and recovery.

Introduced noxious and domestic animals have caused accelerated erosion in many areas and are hindering recovery of erosion sites by preventing the recovery of vegetation. This is a particular problem in the Orongorongo Valley (Campbell pers. com.) and in the subalpine belt of the Hutt Catchment (Druce & Atkinson 1958).

The following tables indicate the degree and type of erosion in each catchment.

Table 5 : Erosion Types Within Catchments (Hectares)

Erosion Type (Hectares)		Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	Total
Da	Debris Avalanche	5,371	1,872	6	2,862	3,312	13,424
G	Gully	0	0	0	1	0	1
Sb	Streambank	213	0	0	44	53	310
Sc	Scree	696	2,177	0	422	501	3,797
Sh	Sheet	114	577	0	0	0	691
Ss	Soil Slip	531	0	359	587	3	1,480
ow	Wind	1	0	0	0	0	1
None	-	8,513	4,336	698	3,086	2,577	19,209
Totals		15,439	8,963	1,062	7,002	6,446	38,912

Table 6 : Erosion Types Within Catchments (% of Catchment)

Erosion Type (% of Catchment)		Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	% of Total
Da	Debris Avalanche	35	21	1	41	51	34
G	Gully	0	0	0	0	0	0
Sb	Streambank	1	0	0	1	1	1
Sc	Scree	5	24	0	6	8	10
Sh	Sheet	1	6	0	0	0	2
Ss	Soil Slip	3	0	34	8	0	4
ow	Wind	0	0	0	0	0	0
None	-	55	48	66	44	40	49
Totals		100	100	100	100	100	100

3.3 Topography

(1) *General Description*

All of the catchments are typified by steep sided valleys formed by continual geological uplift and rapid downcutting of stream systems through highly fractured bedrock material. The marked northeast/southwest orientation of many of the drainage systems is a result of the numerous faults which traverse the area in this direction.

The topography of the areas varies considerably despite their close proximity. The Hutt is the highest catchment reaching 1,376 metres. An average taken of the spot heights in each catchment area shows that the ridges and spurs of the

Hutt average 870 metres, more than 400 metres above those in the Akatarawa, and 250 metres above those in the Wainuiomata/Orongorongo (Tables 7 and 8). Similarly the Hutt is by far the steepest catchment with almost 60 percent of its area having greater than 35 degrees of slope.

The Pakuratahi and Wainuiomata/Orongorongo Catchment Areas are the most similar in both altitudinal range and slope. Both reach approximately 860 metres and their mean spot heights are around 620 metres. Their slopes are less extreme than the Hutt, but are still predominantly steep (26-35°) with 38 percent of its area having greater than 35 degrees of slope.

The Akatarawa Block is significantly lower and gentler than the other three areas rising to 722 metres on its western margin and with a mean spot height of only 435 metres. Only four percent of its area is classed as very steep, a marked difference from the other areas, with 42 percent of the catchment classed as rolling, strongly rolling or moderately steep. These differences are reflected in the types and amounts of erosion in each catchment. (Tables 5 and 6.)

The following tables show the altitudinal ranges and slope details of the catchment.

Table 7 : Altitudinal Range of Catchments

Catchment	Max alt (metres)	Name	Min alt (metres)	Mean Spot Heights
Hutt / Kaitoke	1,376	(Aston peak)	200	872
Pakuratahi	860	(Climie No.2)	180	616
Wainuiomata / Orongorongo	864	(spot 864)	100	622
Akatarawa / Whakatikei	722	(Mt Wainui)	100	435

Table 8 : Slope of Catchments (Hectares)

Slope (Hectares)		Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	Total
0-3^0	Flat to gently undulating	390	127	37	238	270	1,062
4-7^0	Undulating	0	0	21	0	163	184
8-15^0	Rolling	1,198	721	0	0	0	1,919
16-20^0	Strongly rolling	2,103	369	21	354	29	2,876
21-25^0	Moderately steep	2,657	405	151	841	887	4,941
26-35^0	Steep	8,455	2,119	828	2,887	3,324	17,613
>35^0	Very steep	635	5,222	4	2,682	1,773	10,316
Lake	-	0	0	0	0	0	0
Totals		15,439	8,963	1,062	7,800	6,446	38,912

Table 9 : Slope of Catchments (%)

Slope (% of Catchment)		Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	% of Total
0-3°	Flat to gently undulating	3	1	3	3	4	3
4-7°	Undulating	0	0	2	0	3	0
8-15°	Rolling	8	8	0	0	0	5
16-20°	Strongly rolling	14	4	2	5	0	7
21-25°	Moderately steep	17	5	14	12	14	13
26-35°	Steep	55	24	78	41	52	45
>35°	Very steep	4	58	0	38	27	27
Lake	-	0	0	0	0	0	0
Totals		100	100	100	100	100	100

3.4 Soils

(1) *General Description*

Soils of the Wellington Region are primarily derived from weathered to deeply-weathered greywacke, as well as colluvial debris, alluvium and loess. The soils, over the majority of the Regional Council's property are the podsolised yellow-brown earths and podzols, and related steepland soils.

Three soil types predominate in the forest lands and water collection areas: Renata Hill soils, Ruahine steepland soil and Rimutaka steepland soil. These are all shallow, infertile soils on strongly rolling to very steep slopes. They have high erosion potential. The Akatarawa/Whakatikei area has the greatest variety of soils, a result of gentler topography and less extreme climate.

The following tables list the main soil types within each catchment.

Table 10 : Soils of the Catchments - Dominant Soil (Hectares)

Dominant Soil (Hectares)		Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	Total
Recent Soils from Alluvium							
Ws	Waikanae sandy loam	0	0	0	0	52	52
Wg	Waikanae gravelly sand	0	127	0	44	217	388
Gley Soils (Wetland soils)							
G	Gollans heavy silt muck	61	0	0	0	0	61

Dominant Soil (Hectares)		Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	Total
Yellow Brown Earths and Related Steepland Soils							
H	Heretaunga sandy loam	97	0	0	0	0	97
Hs	Heretaunga stony silt loam	175	0	37	153	164	528
Hm	Heretaunga mottled silt loam	58	0	21	41	0	120
JH	Judgeford hill soil	102	0	0	0	0	102
N	Ngaio silt loam	3	0	0	0	0	3
B	Belmont silt loam	575	0	0	0	0	575
R	Renata silt loam	468	83	0	0	0	552
BH	Belmont hill soil	1,577	0	0	0	0	1,577
MkS	Makara steepland soil	179	0	0	0	0	179
TH	Taita hill soil	0	0	0	112	35	147
AH	Akatarawa hill soil	1,569	0	0	80	576	2,225
KH	Kaitoke hill soil	0	0	124	521	0	645
RH	Renata hill soil	1,665	1,412	23	482	305	3,887
RuS	Ruahine steepland soil	7,271	830	573	701	1,995	11,370
RmS	Rimutaka steepland soil	1,639	5,581	282	4,864	3,102	15,469
Tx	Tararua complex	0	345	0	0	0	345
u122		0	0	0	3	0	3
u123		0	585	3	1	0	588
Town		1	0	0	0	0	1
Totals		15,439	8,963	1,062	7,002	6,446	38,912

Table 11 : Soils of the Catchments - Dominant Soil (% of Catchment)

Dominant Soil (% of Catchment)		Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	% of Total
Recent Soils from Alluvium							
Ws	Waikanae sandy loam	0	0	0	0	1	0
Wg	Waikanae gravelly sand	0	1	0	1	3	1
Gley Soils (Wetland soils)							
G	Gollans heavy silt muck	0	0	0	0	0	0
Yellow Brown Earths and Related Steepland Soils							
H	Heretaunga sandy loam	1	0	0	0	0	0
Hs	Heretaunga stony silt loam	1	0	3	2	3	1
Hm	Heretaunga mottled silt loam	0	0	2	1	0	0
JH	Judgeford hill soil	1	0	0	0	0	0
N	Ngaio silt loam	0	0	0	0	0	0
B	Belmont silt loam	4	0	0	0	0	1
R	Renata silt loam	3	1	0	0	0	1
BH	Belmont hill soil	10	0	0	0	0	4
MkS	Makara steepland soil	1	0	0	0	0	0
TH	Taita hill soil	0	0	0	2	1	0
AH	Akatarawa hill soil	10	0	0	1	9	6
KH	Kaitoke hill soil	0	0	12	7	0	2
RH	Renata hill soil	11	16	2	7	5	10
RuS	Ruahine steepland soil	47	9	54	10	31	29

Dominant Soil (% of Catchment)		Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	% of Total
RmS	Rimutaka steepland soil	11	62	27	69	48	40
Tx	Tararau complex	0	4	0	0	0	1
u122		0	0	0	0	0	0
u123		0	7	0	0	0	2
Town		0	0	0	0	0	0
Totals		100	100	100	100	100	100

3.5 Implications for Use and Management

The erosion potential of the Ruahine and Rimutaka steepland soils, which combined make up 70 percent of the total area, is described as high to severe. Yet actual erosion is described as negligible if the vegetation cover is undisturbed (Heine 1975) (NB: disturbance does not infer removal). This has obvious implications for management of the indigenous forests found on most of these soils. High altitude beech forests in the upper Hutt Catchment have been considerably degraded through removal of floor cover and forest understorey by browsing and trampling of red deer and goats. This has prevented regeneration of the canopy species and areas of low sub-alpine forest are being replaced by wet turf or scree (Druce & Atkinson 1958).

Historically the soils found in each catchment supported extensive moor-forming beech forest, and beech podocarp associations. The result today being relatively low fertility soils. Many of these soils have some degree of erosion potential and many possess nutrient limitations. The formation of soil after erosion is slow.

Land Use Capability Classification is an assessment of the suitability of land for production. Generally classes I, II, III and IV are suitable for arable uses, V, VI and VII are suitable for non-arable uses and Class VIII land for protection only. These categories are subdivided on the major limitations to their use, typically climate, erosion, soil and wetness, and given a rating based on the severity of these limitations. As can be seen in the following tables 99 percent of the areas discussed fall within classes VI, VII and VIII. Over 70 percent of the Hutt is Class VIII. Clearly any management regime for these lands must emphasise protection of soil, water and vegetation.

Table 12 : Land Use Capability Classification (Hectares)

Land Use Classification (Hectares)	Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	Total
I	0	0	0	0	0	0
II	0	0	0	0	0	0
III	17	0	52	0	1	71
IV	257	0	5	44	52	358
V	0	0	166	0	0	166
VI	5,254	127	834	1,075	1,036	8,327

Land Use Classification (Hectares)	Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	Total
VII	9,101	2,370	4	2,745	2,935	17,156
VIII	809	6,467	0	3,138	2,421	12,834
Town	1	0	0	0		1
Totals	15,439	8,963	1,062	7,002	6,446	38,912

Table 13 : Land Use Capability Classification (% of Catchment)

Land Use Classification (% of Catchment)	Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	% of Total
I	0	0	0	0	0	0
II	0	0	0	0	0	0
III	0	0	5	0	0	0
IV	2	0	1	1	1	1
V	0	0	16	0	0	0
VI	34	1	79	15	16	21
VII	59	26	0	39	46	44
VIII	5	72	0	45	38	33
Town	0	0	0	0	0	0
Totals	100	100	100	100	100	100

Source: Ministry of Works and Development 1979.

4. Biological Resources

Information on the biological resources of the forest lands and water collection areas is limited. The most detailed information has usually been compiled by Honours, Masters and PhD students from Victoria University of Wellington (e.g., White 1951, Park 1971, Clarke 1980, Kohler 1989). However, these and other descriptive works are often out of date, and no organisation with responsibility or interest in these areas has taken upon itself the task of regularly monitoring the state of flora and fauna within these areas. It is only through regular monitoring that changes or deterioration to plant or animal populations can be readily identified.

The main source describing the biological resources of these catchments is *Biological Resources of the Wellington Region 1984.* This document was intended as an overview of the Region and drew mainly on existing sources of information. The Region was divided into sub units based upon vegetation and ecological uniformity. The four principal areas were subdivided into the following units.

Akatarawa Block

- 17a Mount Wainui
- 18a Summits of Mt Barton, Wainui, Maunganui, Titi
- 19a Upper Akatarawa Valley

- 19b Akatarawa Forest

Hutt Water Collection Area

- 19c Maymorn Ridge
- 20a Renata Hut area
- 20b Renata, Aston, Elder Ridges
- 20c Western Hutt River - slopes of Aston and Alpha
- 40a Omega
- 40b Slopes of Alpha and Omega
- 40c Hutt Water Supply Catchment

Pakuratahi Block and Kaitoke Basin

- 39a Kiwi Ranch
- 39b The Puffer
- 39e Dobson track area
- 37a Plateau bush
- 37b Mt Climie area
- 38a Headwaters of the Pakuratahi
- 39d Rimutaka Bush B
- 39c Rimutaka Bush A

Wainuiomata/Orongorongo Water Collection Area

- 32b Upper Wainuiomata Catchment
- 36a Upper Orongorongo
- 38b Upper Pakuratahi, Wainuiomata, Orongorongo

All four areas fall within the Wellington Ecological Region. Nevertheless they contain significant variation within, and between each unit.

4.1 Vegetation

(1) *Sources*

Four different sources have been used to describe the vegetation of these lands. The most ecologically sensitive map was produced by Druce & Atkinson (1958) and revised by Stephenson (1974). Vegetation types are based on key physiognomic species or associations of species in both the canopy and sub-canopy. This map covers the whole of the Hutt Catchment and while it does not cover the Wainuiomata/Orongorongo Water Collection Area vegetation patterns for these areas can be extrapolated.

New Zealand Land Resource Inventory Worksheets incorporate a vegetation component and these have been extracted to produce a vegetation map of New Zealand at a scale of 1:1,000,000. While the scale is small, it is a useful source for placing the Region's vegetation into a national context. (Ministry of Works and Development, 1986.)

In 1987 the Wellington Regional Council commissioned its own vegetation survey (WRC 1989). This survey was largely compiled from aerial photography. In general the detail and accuracy of this survey is high particularly in relation to grass and scrub types. However, it is extremely limited in describing mature

indigenous forest types: for example in its inability to separate the different beech and podocarp species and its use of the descriptive word "broadleaf" which could be describing a wide variety of species.

The most detailed vegetation mapping is held by the Department of Conservation. Wellington Conservancy has prepared a series of forest type maps at 1:50,000 (Department of Conservation, 1993) based on a 1967 Vegetation Survey by the New Zealand Forest Service (Franklin 1967, 1970). The division of forest types in these maps is according to New Zealand Forest Service classification (Nicholls 1976) and so classifications are often made at a generic level as with the Wellington Regional Council survey. However, it is generally more specific than the Wellington Regional Council maps, usually giving the main beech species and sometimes the podocarp species.

(2) ***Pre European Vegetation***

Vegetation of the hill country described here falls into fairly clearly defined altitudinal zones. Broadly these altitudinal zones are considered to be:

- Lowland sea level to 300m
- Montane 300m to 600m
- Subalpine 600m to 1200m
- Alpine 1200m to 1800m (Zotov et al, 1938)

Historically differences between the four areas were the result of the presence or absence of key physiognomic species, particularly silver and red beech. These species have very clearly defined ecological tolerances and where present they tend to form continuous uniform forests. Where they are absent a great variety of other species replace them in forests typically described as podocarp - mixed broadleaf.

The Akatarawa block had a variety of forests of halls totara, miro and kamahi which dominated higher altitude sites, while rimu, rata, hinau, kamahi and tawa dominated forests at middle altitudes (500m). Hard beech was locally present, usually on poorer soils or interspersed within the rata-rimu hinau kamahi forests.

In the Hutt Catchment, Kaitoke basin and the northern Pakuratahi all four beech species were present with silver beech dominating high altitude sites, red beech replacing silver beech at mid altitudes with emergent rimu, rata and varying amounts of kamahi and hinau. In the southern Pakuratahi red beech disappeared and was also absent from the Wainuiomata and Orongorongo valleys. Here silver beech replaces it down to approximately 600 metres. Below this miro, rimu and kamahi dominate with hinau and rata appearing at lower altitudes.

The following diagram is taken from Druce & Atkinson (1958) and shows this altitudinal sequences in these areas. It is assumed that the forests of the Wainuiomata and Orongorongo were similar to those described here for the Eastern Hutt hills.

Figure 2 : Altitudinal Sequences (Druce & Atkinson 1958)

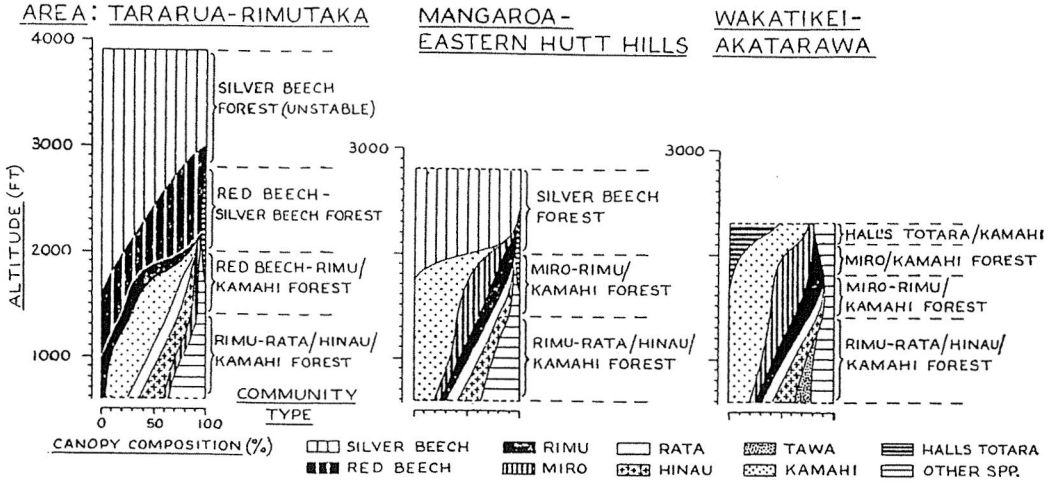


FIGURE 1.—*Altitudinal sequences in the Tararua-Rimutaka, Mangaroa-Eastern Hutt hills, and Wakatikei-Akatarawa areas of the Hutt catchment.*

(3) ***Present Day Vegetation***

It is significant that large areas of the Hutt, Pakuratahi, Wainuiomata and Orongorongo areas have retained vegetation which is largely original. In the Hutt Catchment fire has destroyed small areas on its margins but the interior forest has avoided both fire and timber extraction.

The Wainuiomata and upper Orongorongo Valleys also contain extensive areas of original forests. The upper Pakuratahi contains superb beech forest but the lower quarter of the valley and its western ridgeline have been significantly modified by fire and plantation forestry.

In all these forests the key influence has been browsing by deer, goats and possums. These have acted to reduce or eliminate some palatable species and in some areas have modified successional patterns by preventing regeneration of key species. Overall, however, they are some of the least modified forests in the Region.

The lower (northern) parts of the Pakuratahi have been modified by frequent fires, caused by sparks from the steam engines which used to travel the Rimutaka Incline. Subsequent production forestry has further modified the area. Today this area is a mosaic of cut-over podocarp remnants, dense regenerating shrublands, and exotic conifer plantations.

The Kaitoke Basin and the Akatarawa block are the most extensively modified areas. In the Akatarawa block most readily accessible rimu, matai, totara, kahikatea, and miro have been extracted. Isolated and unmerchantable podocarp remnants are scattered throughout the block. In addition to human modification possum have left a landscape of dead and dying northern rata, and many palatable forest species are being reduced or eliminated by constant pressure from possums, deer and goats. Loss of the original canopy species has exposed the remaining forests to wind, increased light and frost. Frost intolerant species,

in particular tawa, which would have formed a protected sub-canopy have been killed by frost. At higher altitude kamahi and other indigenous tree species have been affected by wind.

Fire from adjacent land has left a marginal mosaic of shrublands. Logging tracks and human use have introduced exotic weeds and interplanting of exotic conifers in some areas have further modified the vegetation.

In the Kaitoke Basin the majority of original vegetation has been removed by fire and early attempts at farming. The area is characterised by a mosaic of low forest, shrublands and scrub. The communities found here tend to mirror those found in the lower Pakuratahi, and in the surrounds of the Rimutaka Hill Road.

The following tables (14 and 15) shows the broad vegetation types now present in the four areas. It has been derived from the Wellington Regional Council's vegetation survey (WRC 1989).

Table 14 : Vegetation (Hectares)

Main Vegetation (Hectares)	Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	Total
Exotic grassland	423	0	101	97	24	645
Native scrubland (early successional or resistant to browsing)	598	5	0	126	2	731
Native scrubland (intermediate successional)	1,821	113	412	1,221	654	4,221
Sub alpine scrub associations	0	345	41	462	0	847
Exotic Scrubland mixed species	233	0	13	129	31	406
Indigenous forests	8,575	8,498	476	4,122	5,672	27,343
Exotic forests	2,096	0	16	840	22	2,975
Wetland communities	0	0	0	0	6	6
x ???	57	0	1	2	35	95
Unknown	1,634	2	3	3	0	1,642
Totals	15,439	8,963	1,062	7,002	6,446	38,912

Table 15 : Vegetation (% of Catchment)

Main Vegetation (% of Catchment)	Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	% of Total
Exotic grassland	3	0	10	1	0	2

Main Vegetation (% of Catchment)	Akatarawa/ Whakatikei	Hutt Water Supply Catchment	Kaitoke Basin	Pakuratahi	Wainuiomata/ Orongorongo	% of Total
Native scrubland (early successional or resistant to browsing)	4	0	0	2	0	2
Native scrubland (intermediate successional)	12	1	39	17	10	11
Sub alpine scrub associations	0	4	4	7	0	2
Exotic Scrubland mixed species	2	0	1	2	0	1
Indigenous forests	56	95	45	59	88	70
Exotic forests	14	0	2	12	0	8
Wetland communities	0	0	0	0	1	<1
Unknown	11	0	0	0	0	4
Totals	100	100	100	100	100	100

(4) ***Successional Trends and Changes in Forest Composition***

Prediction of successional trends in the four areas is difficult due to the lack of up-to-date information and the complex situation with regard to animal pests. Two main factors are probably driving successional trends. Firstly, browsing by possums, goats and deer are selectively removing palatable species from some forests. Northern rata is the most conspicuous of the palatable species and this tree species is under threat throughout the Region, however, there are a wide range of other palatable species which are similarly under pressure. Not only does browsing kill mature trees but it also prevents regeneration following disturbance or alternatively drives regeneration to less palatable and often less suitable species. This is preventing scree stabilisation in the Orongorongo Valley and creating screes in the Tararua Range.

Secondly, the continuing decline of indigenous forest birds. Many of our forest trees rely partly or completely on birds for the transport of their seed. The native woodpigeon (kereru) is perhaps the most important native bird responsible for the transport of larger seed of trees such as tawa, miro, and kohekohe. There is also growing evidence that the seed of some trees must pass through the crop of a bird to achieve adequate germination rates. Without these bird species key canopy trees will continue to diminish and less palatable or more robust species will dominate.

(5) ***Areas of Particular Importance***

Akatarawa Block

Despite the considerable modification of this catchment, small but significant areas of original vegetation which are regionally representative of podocarp broadleaf remain. These include montane Halls totara - kamahi forest on high ridges around Mount Maunganui, Wainui and Titi and montane miro - kamahi forest on upper slopes within the Mt Barton, Maunganui, Titi and Wainui areas. These forests have been little modified aside from the effects of deer, possum

and goat browsing (BRWR 1985).

An area of unlodged Rimu/Rata/Beech forest exists in the upper gorge of the west Akatarawa. Lowland forests of this type are particularly valuable.

Milling and logging of the Akatarawa area in the past has left a mosaic of forest, bush and shrublands which may provide for a high diversity of bird and insect life. Most native plant species have been recorded here (Parrish 1983).

Hutt Water Collection Area

This catchment contains a number of areas of high scientific and ecological value. These include extensive areas of superb silver beech and red beech forest which has not been modified, the largest areas of alpine tussocklands and the only alpine wet turf and subalpine sphagnum bog contained on Wellington Regional Council lands. This catchment is one of the few areas in the Region containing southern rata, a species endangered in the Region by possum browsing. These forests contain the greatest variety of indigenous forest birds in the Region. It is unclear whether breeding populations of kaka and parakeet are present but these now rare birds are frequently observed, as is the falcon.

Also of note is the marked difference between the geology of the Eastern and Western Hutt Rivers, the flat topped rolling summits of the Maymorn and Renata in the Western Hutt being remnants of an extensive glacial plain formed during the last glacial period. Although this geological feature continues across into the Akatarawa block, it is only in the Hutt that the original vegetation remains, making this regionally unique (Park 1979).

Pakuratahi Block (including Kaitoke Basin)

The lower (northern) end of the Pakuratahi and the western ridgelines have been considerably modified by fire and plantation pine (mainly *Pinus radiata*). However, the upper half of the catchment contains fine stands of red, silver and hard beech. All four beech species are found here forming complex associations with broadleaf and podocarp species. Sizeable beech-free stands of miro, mountain totara and kamahi occur locally. This catchment is regionally important as it contains the southern limit of red beech (Clarke 1980; BRWR 1985; PASAC 1975). To the south of this catchment in the Orongorongo and Wainuiomata where red beech is absent, its role is filled by silver beech creating regionally distinctive forest associations.

Immediately south of Mt Climie is an area of snow tussock. This is the only snow tussock in the Rimutaka Range, and it is possible that this is a natural occurrence resulting from climatic and soil conditions which have persisted since the last glacial period (PASAC 1975).

On the slopes at the eastern end of the Kaitoke Basin an area known as the Puffer contains some significant vegetation. Like much of the area it has been extensively modified by fire, however, this has led to the creation of shrub habitats ideal for a large number of small herbaceous species including 30 species of native orchid. It is the only location in the Wellington Region to carry such a diversity of indigenous orchid species.

Wainuiomata/Orongorongo Water Collection Area

The upper Orongorongo valley contains the only montane-alluvial wetland in the Region and possibly one of the largest in the lower North Island. It lies at an altitude of 540m at the upper limit of some lowland species. The swamp is dominated by *Baumea* sp. a regionally rare sedge, with *Gahnia* and a sparse shrubland of manuka. The wetland is actually a series of wetlands formed by fan building from the eastern slopes. Post pleistocene they were probably lakes and over time they will probably follow a successional path to kahikatea swamp forest. The forests on the surrounding hill slopes consist of silver beech with emergent rimu (Campbell pers. com.; BRWR 1985). The forests of this area are unmodified and contain a remarkably low inventive flora. All native bush birds still present in the Region have been seen here with the exception of kaka. Kakariki are present in unusually high numbers and may even be breeding in the area (Stephensen pers. com.).

The Wainuiomata Catchment contains the largest area of mixed podocarp broadleaf forest in the Region (perhaps one of the healthiest in the lower North Island) and some of the best rimu specimens in the lower North Island. Large areas of unlogged podocarp broadleaf forest are uncommon nationally and while there are a large number of "remnants" of this forest type in the Region the total area, is small (BRWR 1985, Ridewell 1982). Because of its early use as a water supply area the Wainuiomata Catchment has benefited from the control of animal numbers at reasonable levels, to the extent that it does not appear to have undergone extensive modification by overbrowsing.

(6) *Plant Pests and Pest Control*

Most of these areas contain a large inventive flora, primarily of grasses and herbs, and including a number of species such as gorse which will ultimately be replaced by indigenous species. Problem weeds are those which are able to regenerate beneath a forest canopy, capable of smothering the canopy, or are able to germinate above the bushline and invade our tussock grasslands. Overall there are few significant weed infestations in these forest lands but there is a need for vigilance against the invasion of a number of species.

In the Kaitoke Basin plantings of *Pinus contorta* are spreading into the low shrublands of the area. These trees and seedlings should be removed as soon as possible before the problem spreads. Contorta is capable of growing above the timberline and is a major threat to our tussock grasslands.

Buddleia, spanish heath and gorse are abundant throughout the Akatarawa block and spreads readily along logging tracks and stream beds. Buddleia has been recently seen in the Pakuratahi block.

Old Mans Beard is a plant which has the potential to cause considerable problems. It can be carried long distances by the wind or by birds. It is one of the few introduced weed species capable of smothering a mature forest canopy. Typically it requires open ground to establish and obvious sites for infestation are open river beds.

Willow is a threat to the riverbeds and plants should be destroyed. Tradescantia and wild ginger are two plants able to establish beneath a forest canopy, covering the forest floor, smothering the native vegetation and preventing regeneration of canopy species.

4.2 Wildlife

(1) *Birds*

No bird surveys have been conducted which are specific to any of the four study areas. Comprehensive species lists have been compiled for the Kaitoke Regional Park, a heavily modified area which can not be considered representative of the densely forested Hutt Water Collection Area. Similarly detailed species lists have been compiled for the lower Orongorongo River but this area extends to the coastline and cannot be considered representative of the upper Orongorongo or Wainuiomata catchments.

This lack of survey information makes it difficult to describe the current avifauna resource and impossible to quantify trends.

It would, however, appear from anecdotal evidence that a number of species are either static or gradually increasing, while many others are showing continual decline. Species such as fantail, silvereye, grey warbler, and locally, bellbird, seem able to cope with modified bush margins and urban settings and are still relatively common. In comparison species such as tui, woodpigeon, whitehead, tomtit, rifleman, kaka, kakariki and bush falcon seem less tolerant of habitat modification and the pressure of continuous predation by rats, cats and mustelids (stoats and weasels).

It is possible that, over time, some of these latter species may disappear from large parts of the Region, as have the North Island robin, kiwi, weka, fernbird and others, and become confined to undisturbed and protected refugia such as Kapiti Island (Munro pers. com.).

It would be a tragedy if, while resources were committed to studying currently threatened species such as kaka and kakariki, our "common" bush birds declined unnoticed. The areas under consideration in this report constitute the great majority of forest lands in the greater Wellington metropolitan area and some attempt to quantify bird abundance and population trends would be of immense value regionally and nationally.

(2) *Insects*

The largest gap in our knowledge of indigenous ecosystems is our insect fauna. No information has been found concerning litter invertebrates, or other insects in any of the areas under discussion here. It is fairly certain that the ship rat, stoat and weasel have had an impact on the larger invertebrates such as weta, and native land snail. Beyond this little is known.

(3) *Freshwater Fauna*

Surveys of indigenous fish populations have been carried out in all the catchments except the Hutt. The Whakatikei, Akatarawa, and Pakuratahi Rivers all contain a good variety of native fish in relatively unmodified stream beds. They are important spawning tributaries for the Hutt River and also maintain their own populations (Smith pers. com.).

In the Hutt Water Collection Area, and the Wainuiomata/Orongorongo Water

Collection Area the situation is more complicated. Most indigenous fish species are migratory, either requiring different spawning and adult habitat within a river system, or needing to complete part of their life cycle in the sea. Dams or weirs in each of these rivers are effective barriers to most of these species. A few such as the longfined eel and the koaro (*Galaxis brevipinnis*) may be able to climb the weirs. This situation is described in the Wainuiomata Water Resource Statement (WRC 1993). Here, of the 14 fish species present in the Wainuiomata River, only three were present above the lower dam culvert and only two of these were native. It is likely that the same situation occurs in the Hutt and upper Orongorongo, although surveys have not been conducted in these areas.

Invertebrate populations within the four areas are thought to be good. A macro invertebrate survey of the Wainuiomata showed a high diversity of macro-invertebrates in the upper catchment and an abundance of pollution intolerant species. This indicated not only good water quality, but a diversity of habitats supported by the surrounding mature forests.

Downstream from Morton Dam, macro invertebrate scores decreased, possibly through the influence of deforestation and urban pollution. The decommissioning of Morton Dam in 1989 has removed a barrier to downstream dispersal of macro invertebrate species and there appears to have been an increased species diversity in the reach between the dam and Wainuiomata Stream (WRC 1993). It is likely that this pattern of downstream dispersal applies to the Akatarawa and Pakuratahi blocks and that the presence of these areas ensures abundant invertebrate fauna in the more modified Hutt River.

(4) ***Other Indigenous Fauna***

The native bat is the only indigenous mammal in New Zealand and is endemic. It is possible that short or long tailed bats are present in one or more of the catchment areas, although none have been sighted in recent years except on Kapiti Island, and it is likely that this population is the only one remaining in the Wellington Region. Both species were widespread in the North and South Islands but have disappeared with the clearance of forest habitat and the arrival of ship rat and stoat.

Native frogs have not been recorded in the Region and it is unlikely that they are present in any of the catchments (Stephensen 1977).

(5) ***Animal Pests***

Large animal pests evident in the Region include possum, goats, deer and pigs. Use of the catchments for water supply purposes necessitates the control of wild animal numbers.

There is evidence that the indigenous forests in these catchments have suffered from browsing in the past. In the Akatarawa block this has resulting in the loss of key forest species, particularly northern rata (WRC 1985). In the Hutt the few remnants of southern rata are under threat, while browsing and trampling by deer and goats has modified sensitive alpine and subalpine vegetation, altering forest successions and enhancing scree formation (Druce & Atkinson 1958). In the Wainuiomata/Orongorongo deer and goats have accelerated erosion and prevented recovery of screes (Campbell 1984).

In the Akatarawa block recreational hunting is controlling goats and deer, but possums are a considerable problem. In the Pakuratahi Block deer and goats are at low levels but maintenance hunting is required. In the Hutt Catchment deer numbers may be increasing. Possum numbers are relatively low except in the podocarp belt along the valley floors.

In the Wainuiomata/Orongorongo Catchment Area goat and possum numbers are consistently high. It is not clear whether existing culling operations are sufficient to maintain the ecological health of the podocarp forests. There is, for example, evidence of the dying off of mature rata trees in Wainuiomata Valley.

Recent illegal liberation of sika deer in the Kaitoke and Akatarawa Areas is of concern. These deer are potentially as damaging as goats and may force out red deer.

Adequate resources should be provided for maintenance control and monitoring in all four catchments. This should be supported by pellet lines, vegetation enclosures and photo-points. The maintenance of animal numbers at low levels is considerably more cost effective in the long-term than responding at intervals to increases in population.

Less conspicuous but also of importance are the smaller pests, including cats, mustelids and rodents. These animals are known to have a devastating effect on indigenous fauna.

4.3 Macro-Ecology

(1) *Corridors and Green Belts*

The forest lands described here, together with the Rimutaka Forest Park, Tararua Forest Park and various scenic and allied reserves held by the Department of Conservation, form a largely indigenous green belt. The social, cultural, ecological and environmental values of this green belt can not be underestimated.

Physically these forests play a significant role in soil and water protection. From an ecological perspective these forest lands play an critical role in the health of the flora and fauna of the Hutt and Wainuiomata Rivers, providing corridors for fish and invertebrate species, and habitats for fresh water plants.

The forest lands provide corridors for the movement of native birds throughout the Region. It is probable that several bird species, some of which are now rare in the Region, are migrating from saturated populations on Kapiti Island to the forests of the west coast of the North Island, from where it is possible that they are moving along forest corridors to the southern Tararua Range and south into the Rimutaka Range. Recent sightings of kaka and kakariki, in the Hutt Water Collection Area may well have been birds from Kapiti. Both of these species are now considered rare in the Region and neither have been recorded breeding in these areas in recent times.

(2) *The "Landscape" as an Ecological Unit*

While it is possible to describe at any time the biological resources which are present in these areas, it is not possible to describe changes to populations, communities or ecosystems. The landscape unit is seen as a group of ecological

systems which are susceptible to similar influences and are linked in such a way that an activity at one point will have an impact at another. To achieve this "holistic" approach landscape boundaries must incorporate social, political and land management components.

Recent awareness of the importance of ecological "thresholds", a concept once applied to species, is now being applied to entire ecological systems. Here an ecosystem is able to maintain itself with little apparent deterioration up to a certain level or threshold. Once that threshold is exceeded decline is often dramatic and irreversible.

(3) ***Conclusion***

The high scientific and conservation values of all the areas discussed here suggest a need for a significant conservation aspect to their management. Management for conservation is seen as highly compatible with management for water collection. It is also important that at some level of management the inter-connectedness between the areas is recognised.

5. Water Resources

5.1 Akatarawa Block

Most of the Akatarawa block is drained by the Whakatikei River and the western branch of the Akatarawa River, both tributaries of the Hutt River. Both catchments have intricate run-off patterns with many small tributaries joining the main streams.

Flow measurements for the Akatarawa and Whakatikei Catchments are taken at Regional Council recording stations: Akatarawa @ Cemetery (Grid Reference R26:863112) and Whakatikei @ Dude Ranch (Grid Reference R26:806119). Tables 16-19 display the general flow statistics for each station.

Table 16 : Akatarawa @ Cemetery Monthly Minimum, Mean, and Maximum Flow (L/s)(1982-1992)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Min	1970	1200	1370	1240	2410	1790	2840	2300	1900	2600	2330	1870	4110
Mean	3720	2810	3420	3940	6100	6610	7200	7650	5710	7460	4590	6450	5190
Max	7680	6640	7510	8020	16290	11240	11730	11650	14620	13980	7360	19130	6410

* This table is calculated from all years of record with no missing data.

Table 17 : Akatarawa @ Cemetery Minimum, Mean, and Maximum Flows (L/s)

Min	Mean*	Median	Max
589	5688	3281	445655

This mean values for all available data.

Table 18 : Whakatikei @ Dude Ranch Monthly Minimum, Mean, and Maximum Flow (L/s)(1982-1992)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Min	436	255	202	292	1067	563	940	748	518	543	579	465	1231
Mean	1391	913	1215	1454	1877	2039	2191	2129	1677	1938	1786	1883	1756
Max	2832	2107	4793	4087	4728	3999	4131	3393	3669	3709	5491	5723	2423

* This table is calculated from all years of record with no missing data

Table 19 : Whakatikei @ Dude Ranch Minimum, Mean, and Maximum Flows (L/s)

Min	Mean*	Median	Max
101	1705	1050	154781

* This mean values for all available data.

5.2 Hutt Water Collection Area

The Hutt Water Collection Area occupies the upper portion of the Hutt Catchment upstream of Kaitoke Weir. It drains the southern end of the Tararua Range and has an area of approximately 9000 hectares. Water supplied by the Hutt water supply scheme

is taken from the river at Kaitoke Weir.

The many small streams which drain the steep hillsides of the water collection area feed into two main streams, the eastern and western branches of the Hutt River. These streams and the Kerekere Stream, join the Hutt River, upstream from the weir.

High rainfall intensities, a high surface impermeability, and no natural lakes to hold water flows, result in high flood flows with river flow characteristically increasing and decreasing rapidly.

High flows in the Hutt River result from northwesterly and southerly storms. Southerly storms have potentially the greater effect due to orographic enhancement as they travel up the catchment towards the watershed on the Tararua Range.

River flow statistics for the Hutt River, measured at Kaitoke Weir (grid reference S26:942150), are given below.

Table 20 : Hutt @ Kaitoke Monthly Minimum, Mean, and Maximum Flow (L/s)(1982-1992)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Min	1970	1240	1630	1680	3250	3810	4880	434	3890	4090	2430	2190	4580
Mean	5270	4160	5020	6050	8560	9280	10210	9710	9390	9090	7010	7280	7560
Max	16260	9470	15260	12140	13940	14610	17530	16960	21670	15240	12270	20510	10450

* This table is calculated from all years of record with no missing data.

Table 21 : Hutt @ Kaitoke Minimum, Mean, and Maximum Flows (L/s)

Min	Mean*	Median	Max
800	7588	4309	496137

5.3 Pakuratahi Block

The Pakuratahi Block is drained largely by the Pakuratahi River. Smaller streams on the western side of the block drain into the Hutt River via the Mangaroa Stream (Collins Stream in Tunnel Gully and other tributaries of the Mangaroa). The Pakuratahi River joins the Hutt River at the Pakuratahi Forks in Kaitoke Regional Park.

The Pakuratahi Catchment is long and narrow and is aligned in a northeast-southwest direction, opening to the north. It has an area of 7,800 hectares. The main channel of the Pakuratahi River flows for 26 km and has a gradient of between 1° and 3°.

The general flow statistics from Pakuratahi at Pakuratahi (Trestle) Bridge (grid reference S27:937069) flow recording station are given in Table 22. Because the Truss Bridge station is situated midway in the catchment it represents only half of the total catchment run-off. Pakuratahi Bridge flows multiplied by two gives an approximation of total flow from the catchment at its confluence with the Hutt River.

Table 22 : Pakuratahi @ Bridge Monthly Minimum, Mean, and Maximum Flows (L/s)(1982-1992)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Min	294	205	466	320	1355	913	1477	748	732	879	729	579	1793
Mean	1137	1130	1806	1294	2226	2805	3078	2608	2166	2278	1966	2302	1939
Max	3357	2763	5196	2410	3836	4647	5071	3991	4823	5137	3418	4378	2118

* This table is calculated from all years of record with no missing data.

Table 23 : Pakuratahi @ Bridge Minimum, Mean, and Maximum Flows (L/s)

Min	Mean*	Median	Max
142	2063	895	115575

This mean values for all available data.

5.4 Wainuiomata/Orongorongo Water Collection Area

The Wainuiomata/Orongorongo Water Collection Area drains the southwestern corner of the Rimutaka Range. Essentially, this Area comprises two separate smaller catchment areas - the Wainuiomata Catchment and Orongorongo Catchment. Both catchments are long and narrow in shape with moderate to steep slopes.

The Wainuiomata Catchment has an area of 2470 hectares. Its headwater tributaries begin at elevations of 600-800 m where Skull Gully Stream, the Wainuiomata West Branch and Wainuiomata East Branch drain the upper 2,500 hectares of the catchment. These tributaries converge to form the Wainuiomata River just upstream of the flow recording station Wainuiomata/Manuka Track (grid reference R27:786924).

Two major streams, Sinclair Creek and George Creek, join the Wainuiomata River from the true left side upstream of the Morton Dam site. These streams drain the steepest and most rugged part of the catchment.

Water is drawn from the Wainuiomata Catchment at an intake on the Wainuiomata River 1.5km upstream from the Morton Dam and at two intakes on George Creek.

The Orongorongo Catchment has an area of approximately 3,000 hectares. It is generally at a higher altitude than the Wainuiomata Catchment. The main Orongorongo River channel drains the top 12 km of the catchment upstream of the Orongorongo Weir.

There is a flow recording station at the Upper Dam site (grid reference R27:825927). This recording station is located at approximately the mid point of the catchment area above the Orongorongo Weir. A correlation has been developed by the Wellington Regional Council Hydrology Department, for flow in the Orongorongo Weir compared with the flow in the river at the Upper Dam site.

Three major tributaries which join the Orongorongo River on the true right bank just downstream from the weir are also in the Orongorongo Catchment. These are Big Huia Creek, Little Huia Creek and Telephone Creek. These tributaries flow from the steep watershed separating the Orongorongo and Wainuiomata Catchments.

Weirs and water intake structures are located on the Orongorongo River, Big Huia Creek, Little Huia Creek and Telephone Creek.

The general flow statistics for Orongorongo @ Upper Dam Site and Wainuiomata @ Manuka Track are given in Tables 24-27.

Table 24 : Wainuiomata @ Manuka Track Monthly Minimum, Mean, and Maximum Flow (L/s)(1982-1992)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Min	238	175	222	173	402	269	763	377	388	435	471	437	692
Mean	475	392	572	570	1088	1059	1436	1203	884	1079	718	847	888
Max	915	930	1957	1405	3260	1898	2540	1837	1932	3532	1416	2372	1279

* This table is calculated from all years of record with no missing data.

Table 25 : Wainuiomata @ Manuka Track Minimum, Mean, and Maximum Flows (L/s)

Min	Mean*	Median	Max
89	901	550	60000

This mean values for all available data.

Table 26 : Orongorongo @ Upper Dam Site Monthly Minimum, Mean, and Maximum Flow (L/s)(1982-1992)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Min	67	29	108	46	146	165	278	123	143	224	220	148	345
Mean	224	215	241	253	527	540	583	474	352	501	392	374	384
Max	619	514	980	613	842	830	901	699	943	1192	645	788	427

* This table is calculated from all years of record with no missing data.

Table 27 : Orongorongo @ Upper Dam Site Minimum, Mean, and Maximum Flows (L/s)

Min	Mean*	Median	Max
11	410	155	62770

This mean values for all available data.

Tables 24 and 25 illustrate that flow at Manuka Track has a mean of 901 L/s, and a mean annual low flow of 181 L/s. The highest flow of 59810 L/s was recorded in 1982. In addition Manuka Track has a mean annual flood of 28000 L/s, or 1.8 metres stage.

Tables 26 and 27 show that mean flow at the Orongorongo @ Upper Dam Site is 410 L/s, and that the highest flow is 62770 L/s, which was in 1981. In addition, Upper Dam Site has a mean annual low flow of 35 L/s.

5.5 Regional Water Supply

The annual (1992/93) consumption of water by the Wellington metropolitan area is

approximately 56,000 Ml. Sources of the Wellington metropolitan area water supply and the proportion of the total supply contributed by each source were as follows:

- Hutt River (Kaitoke) 52.5 percent
- Hutt Artesian Supply 30.1 percent
- Wainuiomata River 9.9 percent
- Orongorongo River 7.5 percent

Approximately 70 percent of the water supplied to the Wellington metropolitan area comes from the Hutt and Wainuiomata/Orongorongo Water Collection Areas.

Water supplied by the Hutt River Water Supply Scheme is distributed to Upper Hutt, Porirua and Wellington City. Water supplied by the Wainuiomata and Orongorongo water supply schemes is distributed to Wainuiomata and Wellington City. Hutt City and some contribution to Wellington City are supplied by the Hutt artesian system.

6. Production Forestry

In 1927, 28,000 hectares of virgin forest land designated as Provisional State Forest, was vested in the Wellington City Council under the Wellington City and Suburban Water Supply Act 1927. These formed the nucleus of the forest lands and water collection areas which today are held as existing or future water collection areas.

In areas held for future water supply, native forest logging was an early land use. Some of the land was planted in pines between 1930 and 1958 but most of it was left to regenerate.

The Wainuiomata/Orongorongo Water Collection Area was included with the formation of the Wellington Regional Water Board in 1972. Two other blocks on the southern and southeastern boundaries of the Akatarawa block (Valley View and Puketiro) were purchased, increasing the total land holding to around 46,000 hectares, close to the current total area.

Exotic forestry followed indigenous forest logging in parts of the Akatarawa and Pakuratahi blocks since 1929. A variety of species were initially used, however, *Pinus radiata* is now almost exclusively used.

Table 28 : Exotic Forest Composition (Hectares)

Trees Planted (Age)	P. radiata	Douglas Fir	Macrocarpa	Eucalyptus
Pre 1968 (> 25 years)	335	10	-	-
1968 - 1977 (16 - 25 years)	826	4	-	-
1978 - 1987 (6 - 16 years)	2,142	7	71	18
1988 - 1993 (under 5 years)	460	14	12	-
Total	3,763	35	83	18
Grand Total	3,899			

Since 1980, these forests have been managed by the Conservation Forestry Department of the Wellington Regional Council which also has responsibilities for indigenous forest management and rural fire control.

Current exotic forest management is carried out in accordance with the Forestry Management Plan: 1 April 1985 - 31 March 1995. The objectives of this plan indicate that exotic forestry served a variety of purposes, however they can be summarised as:

> *The utilisation of suitable land not currently required for water collection, in order to maximise profit to the benefit of ratepayers.*

The objectives also recognise related benefits including the generation of wood resources for local timber industry, the creation of jobs and the provision of recreation opportunity.

There are now six exotic forests in the Council's forest lands. These exotic forests form a band through the southwest and south of the Akatarawa block and on through the northern parts of the Pakuratahi block. In total area they cover approximately 3900 hectares. (Refer Map 4.) They are distinguished mainly by location but also differ in size, age, altitude, accessibility, exposure, soil type and susceptibility to weed infestation.

In addition to this area of exotic production forest there is also another 60 hectares of "protection" forest composed of *Corsican pine.* These forests have little or no practical value may in fact harbour disease which affects the production forests.

6.1 Forest Management

Forest management deals with a number of issues. Many of these have wide resource management implication and are considered in relation to management of other physical resources and management areas such as soil, water, habitat, wild animal control and so on. Examples of these issues include:

- choice of species
- roading development
- land clearance - choice of area, method of clearance
- restocking and blanking, fertilising, etc
- tending
- use of stock
- harvesting techniques
- control of fire
- management of recreation.

The Forestry Management Plan 1985-1995 addresses some of these issues. Fire control and public access are also addressed in the Bylaws.

Current operations include ongoing management of existing stock. Harvesting began in 1994 is expected to and continue on a non-declining sustainable basis.

7. Cultural Resources and History

7.1 Landscape

The Wellington metropolitan area is enclosed on its northern and eastern sides by a broad tract of forested hill country and mountain land - the southern end of the Tararua Range and the Rimutaka and Akatarawas Range. This "rugged landscape" acts as a counterpart of the urban area, providing a backdrop and setting which give Wellington its special character. To a large extent it determines urban form, the urban area having developed mainly on the easier country on the coasts and in the valleys on the margins of this hill and mountain landscape. The vegetation in private gardens, parks and reserves within the urban area is seen against a backdrop of forested hills and mountains.

The hill and mountain systems of the Tararua, Rimutaka and Akatarawa Ranges may be considered regionally significant landscape features. They are regional in scale, crossing district boundaries, and are essential elements of the Region's landscape character.

The Wellington Regional Council's forest lands and water collection areas lie within this tract of forested hill country and mountain lands, comprising a substantial proportion of its total area. The remainder lies largely within the Tararua and Rimutaka Forest Parks (Department of Conservation).

In landscape terms, the Regional Council's forest lands and water collection areas are part of Wellington's hill country setting and so are regionally significant landscapes. While much of their area is unseen from the urban areas and settled lands, hidden behind the frontal ranges, the higher features are components of the Wellington Region's skyline. Wainui (722 metres) in the Akatarawa block dominates the approach to Wellington on State Highway 1 between Raumati and Paekakariki. The panorama of the Tararua Range, as seen from Wellington and the Hutt Valley, lies largely within the Hutt Water Collection Area. The ridge of Mt Climie (830 - 860 metres) in the Pakuratahi block provides the southern backdrop (and windbreak) to Upper Hutt and is part of Wellington Harbour's northern skyline. Orongorongo (816 metres) and Puketaha (767 metres) in the Wainuiomata/Orongorongo Water Collection Area are located north of Mt Matthews on the long skyline of the Rimutaka Range as seen across Wellington Harbour from Wellington city. Thus, the management of the Regional Council's forest lands and water collection areas, especially the higher parts of this land, has a bearing on the Region's landscape setting.

(1) *Akatarawa Block*

The Akatarawa block has the most complex landscape of the forest lands and water collection areas. The sources of this complexity are the block's topography and land use history.

Topographically the block comprises a complex system of deep valleys (up to 300 metres). The ridges between these valleys are roughly concordant in height, generally between 500 metres and 550 metres. A crest of higher hills along the northwestern boundary rises above the general level of hilltops in the block - Wainui (722 metres), Titi (613 metres) and Maunganui (708 metres). On the eastern side of the block, Mt Barton (627 metres) also stands above the general level of hills in the block. Away from these high points the many deep valleys and the absence of skyline reference points gives the block considerable complexity.

This complexity gives it a high capacity to absorb land use change. Because of the visual isolation between valleys, land use developments in one valley have little impact on the landscape character of neighbouring valleys.

In terms of land cover the block can be divided into three separate landscape zones, reflecting the different land use history of these areas.

(a) *Southern Landscape Zone*

The southern end of the Akatarawa Block contains the greatest landscape diversity. Large areas of this retired farmland have been planted in exotic forest. The remainder possesses a variety of land cover including areas of open grassland, exotic forest of various ages, exotic shrubland (gorse), native shrubland (tauhinu), regenerating native forest (kamahi), and remnants of the native forest that formerly covered this area. In a number of places, valleys widen forming attractive basins that have potential for development as recreational foci. An area of native forest on the eastern side of the Whakatikei River separates Hukinga and Puketiro forests.

(b) *Central Landscape Zone*

The central landscape zone is forested, largely in native vegetation (logged and unlogged), interspersed with compartments of exotic trees of various species. This area was logged for native timber and contains an extensive network of forest roads. The character of the native vegetation reflects this history. Tall dominant species are absent and much of cover is second-growth of relatively low stature. The different exotic forest plantings and the evidence of previous activities in this area provide local character to the valleys and points of interest that enliven the landscape of this zone.

(c) *Northern Landscape Zone*

The northern end of the block, between the Akatarawa River West and the Maungakotukutuku Stream, is relatively homogenous in character, and the land cover entirely native forest. Although this zone was logged there are few tracks, relative to the central zone, and it is the most remote part of the Akatarawa block, having the character of remote natural hill country.

(2) ***Hutt Water Collection Area***

The Hutt Water Collection Area occupies the southern watersheds of the Tararua Range. It is comparable to the rest of the Tararua Range in character, comprising rugged bushed hill country and mountain lands.

This Area contains three landscape zones. Two are distinguished on the basis of their relative simplicity and low visual absorbance: the Eastern Hutt and the Quoin/Alpha/Aston zone. The third - the Western Hutt/Kerekere Stream zone is distinguished on the basis of its relative complexity.

(a) *Eastern Hutt Landscape Zone*

The Eastern Hutt landscape zone comprises a single large valley enclosed by Marchant Ridge to the south and Quoin Ridge to the north. The

distinguishing characteristic of this zone is its scale and bold simplicity of form. The valley is 8 km in length and runs in a straight line along a northeast/southwest axis. The hillsides on either side climb over 800 metres (2640 feet). The height of these hills is further emphasised by the altitudinal sequence of their vegetation, changing from podocarp/hardwood forest in the valley to beech forest on the mid-slopes to sub-alpine and alpine vegetation on the open tops of the Quoin/Alpha/Aston landscape zone (see Figure 1, 4.1(2)).

The visual simplicity of the Eastern Hutt landscape zone gives it a high degree of visual sensitivity, with a correspondingly low visual absorbance capacity. This means that even relatively small developments such as tracks, huts and helicopter set-down sites, and changes in land cover resulting from accidental events such as fire, landslip or windthrow, can have very significant impacts on the visual character of this valley.

(b) *Quoin/Alpha/Aston Landscape Zone*

The Quoin/Alpha/Aston landscape zone comprises the open tops above the 1,000 metre contour. This zone is distinguished by its elevation and alpine character, and is frequently covered by snow in winter.

This zone is visible from the Hutt Valley and Wellington city as a mountain crest that forms the northern terminus of the Wellington/Wellington Harbour/Hutt Valley visual axis - an axis that links the city at one end and the mountains at the other, underlining the practical connection between them. These mountains provide a focus for northern views from Wellington. Rising 1,370 metres (4,500 feet) above the lower Hutt Valley, they are both literally and figuratively the high point of Wellington's mountain setting. As much as any other features on the Wellington Harbour/Hutt Valley skyline, these mountains determine the character of Wellington's setting.

The visibility of these mountains and the fragile nature of their alpine environment make them very sensitive. Their role as visual features that determine the character of Wellington's setting needs to be given priority in their management.

(c) *Western Hutt/Kerekere Stream Landscape Zone*

The Western Hutt/Kerekere Stream landscape zone is a complex valley system of major streams and their tributaries. Clad in mixed podocarp/hardwood and beech forests, according to aspect and altitude, this zone has the character of remote bushed hill country.

South of the elevated Aston-Renata watershed which forms the Hutt Water Collection Area's northern boundary, the hilltops to the west of the Western Hutt River are much lower than Quoin ridge to its east, rising only 800 - 850 metres. The valleys here are in the order of 300 metres in depth and are similar to those in the Akatarawa block in their sinuous complexity.

Their complexity makes them less visually sensitive than the Eastern Hutt zone. This is offset to some degree by their visibility from the Aston/Alpha Ridge, which is part of the popular Southern Crossing

tramping route, and their visual role as the foothills of this mountain crest, isolating it from the human modified landscape of the rural and urban areas.

(3) ***Pakuratahi Block***

The Pakuratahi block comprises two broad landscape zones distinguished on the basis of land use and complexity - the Goat Rock/Rimutaka zone and the Upper Pakuratahi zone.

(a) *Goat Rock/Rimutaka Landscape Zone*

The Goat Rock/Rimutaka landscape zone comprises the catchments at the northern end of the Mt Climie ridge, the mid-Pakuratahi valley up to the Summit Tunnel and the west-facing slopes to the north of Rimutaka summit. The zone adjoins settled farmland in the Mangaroa valley and Kaitoke basin and is generally accessible by vehicle. Its present landscape character reflects its varied land use and history. On lower slopes of the northern end of the Climie Range small exotic forests planted on retired farmland are interspersed with areas of native forest of varying age. In Tunnel Gully there remains a stand of mature podocarp forest, flanked on either side by exotic forest compartments. Above Tunnel Gully the western flanks of Climie are clad in a native vegetation mosaic of different age classes, reflecting the history of bush fires that swept across the range following settlement of the Hutt Valley. In the mid-Pakuratahi valley the native forest is interspersed with exotic forest compartments planted on the scars of fires caused by sparks from steam engines on the old Rimutaka railway.

The dissected topography and the variety of indigenous and exotic forest types on the lower slopes of the Climie Range and the mid-Pakuratahi valley create an interesting and diverse landscape capable of absorbing a range of activities and uses. The higher slopes and ridges add to the drama and interest of this zone but their greater visibility and more even cover of native vegetation give them high visual sensitivity.

On the slopes north of Rimutaka Summit, extending to the Puffer track and beyond, the native forest regeneration process is well advanced. Manuka shrubland is supplanting gorse over extensive areas. In the damper gullies regeneration of hard beech forest is well advanced. These slopes are part of the scenic corridor of the Rimutaka Hill Road. As a result they are very sensitive visually with a very low capacity to absorb changes in land use without loss of amenity value.

(b) *Upper Pakuratahi Landscape Zone*

The upper Pakuratahi landscape zone, comprising the upper catchment of the Pakuratahi River, is perhaps the least visible of the forest land areas, hidden between the two northern branches of the Rimutaka Range. It is isolated visually from the Kaitoke basin, into which it flows, by the complex course of the mid-Pakuratahi valley. The zone's western boundary, the Mt Climie Ridge and the western branch of the Rimutaka Range, forms the southern skyline seen from Upper Hutt. Mt Climie is just visible from Wellington where it is seen as a distant crest above the Eastern

Hutt hills. Otherwise, the upper Pakuratahi zone cannot be seen from outside its own boundaries.

Internally the upper Pakuratahi valley is complex. The river bed is deeply cut and follows a sinuous course. The valley is clad in largely unmodified podocarp/hardwood and beech forest and is part of the natural landscape tract of the Rimutaka Range. Its landscape character is that of a remote wilderness area. Its seclusion and its natural forest cover give it especial charm.

The internal complexity and the visual isolation of the upper Pakuratahi valley give the interior of this zone a low visual sensitivity rating, corresponding to a high visual absorbance capacity. However, the Mt Climie ridge on the zone's western boundary has very high visual sensitivity because of its prominence on the Hutt Valley skyline. The Mt Climie Ridge, the focus of development activity within this zone to-date, is part of Wellington's hill and mountain setting and is especially sensitive visually.

(4) ***Wainuiomata/Orongorongo Water Collection Area***

The Wainuiomata/Orongorongo Water Collection Area comprises two landscape zones - the Wainuiomata Waterworks and the upper Wainuiomata and Orongorongo valleys.

(a) *Wainuiomata Waterworks Landscape Zone*

The Wainuiomata Waterworks landscape zone comprises the valley downstream from the Wainuiomata intake and the lower hill slopes on either side. The vegetation and landforms in the valley floor have been extensively modified by waterworks development over the last 100 years. Until recently, parts of the lower terraces have been grazed by sheep. Stands of exotic trees have been planted on parts of these terraces. The lower slopes on either side carry regenerating native forest.

This zone has a high visual sensitivity because of its relatively simple form and visibility.

(b) *Upper Wainuiomata and Orongorongo Valleys Landscape Zone*

The upper Wainuiomata and Orongorongo valleys landscape zone is an area of outstanding natural beauty. Its native forest cover is largely unmodified, except for the effects of introduced browsing animals. The valley floors and lower slopes have high visual absorbance capacities resulting from the vertical depth of the forest and the complex landforms. The higher slopes and ridges, however, have very high visual sensitivity, with a correspondingly low visual absorbance capacity. Large parts of these hills are visible from Wainuiomata and Wellington City. The Puketaha and Orongorongo summits, for instance, are both visible from Wellington and are essential components of the harbour's mountain backdrop.

7.2 Recreation

Forest lands and water collection areas are approximately 40,000 hectares in sum,

which is five percent of the Region, or roughly 25 percent of the Greater Wellington Area.

Up until the adoption of this management plan the Hutt and Wainuiomata/Orongorongo water collection areas (15,400 hectares) are unavailable for recreation under the Wellington Regional Water Board Bylaws. This draft management plan proposes the provision of access by permit to these areas under strict guidelines. Access to the Akatarawa and Pakuratahi future water collection areas will continue as before.

Initial submissions raised a number of recreation issues. A prominent issue is the liberalisation of access to water collection areas.

An analysis of recreation settings (Department of Conservation, 1991) in existing and future water collection areas indicate that these areas occupy that part of the Recreation Opportunity Spectrum from "Rural", through "Back Country" to "Remote". However, each area has a particular set of recreation "settings".

(1) ***Akatarawa***

The Akatarawa block is a large and complex area which is extensively roaded, particularly in the south. Significant areas remain unroaded, particularly in the higher levels. The main recreation settings are back country "walk in" and "drive in" (Map 3).

A number of trail based activities occur in this area but the main ones are trail biking, 4 wheel driving and mountain biking. To a lesser extent, but also important, are walking and horse riding. Hunting and fishing occur and to some degree are facilitated by the road network.

The main access points are Maungakotukutuku Valley and Karapoti Road. Other entrances are becoming more important as recreation patterns change and diversify. Riders of mountain bikes can gain access from more points than riders of trail bikes or horses.

Linking the two main entrances is a route called the Pram Track. This is one of the few back country rides available to riders of trail bikes in this part of the Region. A variation on this route is used in the "Karapoti Classic", an annual mountain bike event which attracts upward of 1,000 participants and spectators. This is the largest event of this type in New Zealand.

Though this area is large, visitors have little choice but to use the network of trails. In fact this network represents a major recreational resource. The Moonshine Recreation Area Development Concept (WRC 1991) provides a concept which will rationalise access and segregate those activities which are least compatible, such as horse riding and trail bike riding.

Other important considerations include the relationship of the Akatarawa block and Battle Hill Farm Forest Park, the effects of recreation on the environment and exotic forestry operations, and responsibilities for recreation management in this and other forest areas. Important development issues include entrance area development and trail improvement and signage are the main recreation development issues in the Akatarawa block.

(2) ***Pakuratahi***

The Pakuratahi block has two recreation areas of particular importance - Tunnel Gully and Rimutaka Incline. Both are in the northern part of this block and within "Drive-in" settings associated mainly with forestry or communication facilities on Mt Climie. The southern or upper reaches of the Pakuratahi Catchment are entirely within a large "Walk In" setting. Apart from hunting and a small amount of tramping activity, most significant recreation is centred on Tunnel Gully and Rimutaka Incline.

Tunnel Gully is the junction of several tracks and roads leading variously to Mt Climie, Maymorn Station and Rimutaka Incline. For management purposes the area has been divided into two zones: an inner Recreation Zone (containing the principal amenities - car parks, picnic areas, toilets and information) and an outer Forestry - Recreation Zone. The main activities in the area are walking, picnicking and mountain bike riding.

Rimutaka Incline is the historic rail route between Wellington and Wairarapa. The Incline provides primarily for walking as the main recreational activity, however, in recent years mountain biking has become very popular. The Big Coast is an annual cycle trek which takes in the Incline en route to Wellington's south coast. This event attracted over 700 participants in only its second year of operation. Annual events also include a run and walk involving up to 1,400 participants in 1992 and a triathlon of which the Incline forms the running stage.

Three factors in particular distinguish Rimutaka Incline as a recreation facility:

- It links Wairarapa with the Hutt Valley and Wellington.
- It provides opportunities suitable for a wide range of abilities, including families.
- It has internationally recognised historic value.

The western entrance to the Incline is used by several recreation clubs. Their facilities include a kart track, a rifle range and an airstrip.

(3) ***Hutt Water Collection Area***

Currently the Hutt Water Collection Area is closed to public access. However, there is increasing pressure from outdoor recreation groups for access.

This Area provides recreation opportunities which are remote. Limited track and facility development means self-sufficiency and experience is required by recreationalists. At present, the opportunity to experience remote areas is in the adjacent Tararua Forest Park.

(4) ***Wainuiomata/Orongorongo Water Collection Area***

The majority of this Area is classified "Back Country Walk In", although, on account of a service road which runs into the Orongorongo Catchment, there is some "Drive In" opportunities. The unmodified character of the catchment, and in particular the presence of such a notable podocarp forest, suggests that from a recreational perspective, this is a feature of considerable significance.

7.3 Recent History

(1) *Water Supply Developments*

Wellington's first public water supply system was opened in 1874, supplied from a reservoir on the south branch of the Kaiwharawhara Stream impounded by an earth dam, the lower Karori dam. A second dam, the upper Karori dam, was built in 1908. Water is no longer taken from the Kaiwharawhara Catchment but the lower Karori dam is still in use as a reservoir for water supplied from the Hutt and Wainuiomata schemes.

Development of the Wainuiomata Catchment for water supply purposes was first proposed in 1878. The lower dam was completed in 1884. With Morton dam, completed in 1911, the Wainuiomata Valley supplied water to Wellington City, supplementing the supply from the two Karori Reservoirs.

Following increased demand for water supply a report in 1919 recommended the development of a water supply scheme from the Orongorongo Valley. This involved the construction of river intakes, a pipeline tunnel between the Orongorongo and Wainuiomata valleys, and a new pipeline to Wellington. The scheme was opened in 1926.

Development of a Hutt water supply scheme taking water directly from the Hutt Catchment in the southern Tararua Range was first proposed in 1929. This proposal was not implemented directly, the various local authorities involved instead developing artesian supplies from the Hutt aquifer during the 1930s.

Increasing growth of Wellington's urban area saw the approval of the Hutt Scheme in 1943, with financial backing from the Government. Development commenced in 1946 but was impeded by shortages of labour and materials in the aftermath of World War II. The project involved the development of the intake and pipeline tunnels at Kaitoke and the construction of a 56 kilometre pipeline to the lower Karori dam, supplying reservoirs in the Hutt Valley, Porirua and the northern suburbs of Wellington on the way. The project was opened in 1956.

In 1985 the capacity of the Hutt Scheme was further increased by the development of a new pumping station, storage lakes and treatment plant at Te Marua.

The Morton dam on the Wainuiomata was decommissioned in 1991, the supply from the Wainuiomata River being drawn directly from the river at new intakes on Georges Creek and the Wainuiomata River above the old dam.

(2) ***Indigenous Forestry***

The Akatarawa block has a history of logging dating from about 1910. The Whitemans Family had a mill at the Karapoti Road area of the Little Akatarawa block. They pushed a tram up the gorge to "Hukinga" from their mill near the Old Trestle Bridge. The tram was later widened into a narrow road by a Mr Price who had a mill on the flats where Hukinga Exotic Forest now stands. The remains of the foundations still show. He sold to "Campbell's" who continued to log the area and farm the valley flats until it was purchased by the then Wellington City and Suburban Water Supply Board. This area was added to the rest of the Akatarawa block previously vested in the Board by the State Forest Service. The vested land was to provide an income from log sales for water supply purposes.

In Hukinga and along the ridge of the "Pram" Track, old trams and equipment still exist. Wooden rails and trestle bridges are still visible. There are some cable drums from an old Steam Hauler on one ridge and an old boiler gully in Valley View Forest.

Two old steam haulers later modified to run by petrol engines exist in the Akatarawa block, and another in far better condition, that would still be capable of operation, is over the boundary behind private land in the Kaitoke Regional Park. It would be a simple job to salvage this "Vulcan" hauler for an exhibit.

A large red beech stump on Matai Flat in Hukinga has jigger board cutouts in its trunk showing methods used to fell trees with cross cut saws. This stump could possibly be preserved with "Tanalith" or something similar, on-site. A tram with wooden rails still in evidence, runs up "Matai Creek" where there is a stand of very large "Californian Coast Redwoods" (*Sequoia Gigantea*).

(3) ***Rimutaka Incline Historic Rail Route***

The former Rimutaka Railway between Upper Hutt and Featherston via Mangaroa, Pakuratahi and Cross Creek has considerable historic significance. The Rimutaka Incline section proper (Summit tunnel to Cross Creek) is of international importance, being the only fully working example of the Fell engine system in the world remaining after 1883. Standard engines operated over the rest of the Rimutaka Railway. The Railway was in use from 1878 to 1995, closing only five days prior to the existing line opening.

Although the rails have since been pulled up and five of the six Fell locomotives cut up for scrap, the Rimutaka Railway can still be clearly identified on the ground today. The sixth Fell locomotive, *Mont Cenis*, has been fully restored and now resides in the Fell Engine Museum in Featherston.

Major activities visible along the route of the former railway are as follows:

(a) *Settlements, Station Yards*

- Summit - remains of old dumped locomotives, pieces of concrete foundation and a drop pit, concrete piles, remnants of the brick fireplace of a cottage.

- Cross Creek - circular, concrete turntable pit, locomotive depot.

(b) *Bridges, Tunnels and Culverts*

- Munitions Bend Bridge (to the west of the Pakuratahi tunnel, much of this structure has been washed out).
- Pakuratahi tunnel - 241 ft long, first concrete block structure in New Zealand (close to the tunnel's eastern portal is the ventilation shaft of the existing Rimutaka railway tunnel.
- Dry River Culvert - 2-3 m clear opening with a similar height, semi-circular masonry arch.
- Pakuratahi Bridge - 24 m long, timber truss bridge.
- Ladle Bend Bridge - two span structure parallel to the Pakuratahi River and crossing a tributary of the river, 18 m in length.
- Summit Tunnel - 576 m in length. Close to the eastern entrance at floor level is a small metal plate. On this from 1880 to 1955 was mounted a bell used to warn train crews of the start/finish of the Fell system's centre rail. This bell is displayed today in the Fell Engine Museum in Featherston.
- Siberia Tunnel - 120 m in length, and built on a very steep gradient of 1 in 13.
- Price's Tunnel - 98 m long "S" shaped.
- Short Span Bridge - five between Kaitoke entrance to the Rimutaka Incline Recreation Area and the Summit tunnel, approximately 2.5-3 m long.

(c) *Other Features*

- Remnants of rails along the route of the former railway (e.g., Pins).
- Kaitoke to Tunnel Gully - "Station Drive", platform and old formation of the former Kaitoke Station, formation of railway through Pakuratahi Forest, Mangaroa Valley, and the Mangaroa tunnel (221 m) in the Tunnel Gully Recreation Area.
- "Collie's" Track - believed to have provided access for railway construction workers from the main road (now Rimutaka Hill Road) to the site of the Summit settlement and to the "Golden Fleece Hotel" at Pakuratahi.

The New Zealand Archaeological Association has recorded archaeological sites along the route of the former Rimutaka Railway. However, these sites are fewer in number than the features outlined above. In addition, NZAA recording of sites does not mean they are legally protected under the New Zealand Historic Places Act 1993 or under any other statute. Those features east of the main ridge of the Rimutaka Range (e.g., Siberia tunnel, Cross Creek settlement) are, however, accorded protection under the Conservation Act 1986 as they are part of the Rimutaka Forest Park.

Appendices

Acknowledgements

Bibliography

Appendix 1

Legal Description

Table 29 : Forest Lands and Water Collection Areas - Provisional Legal Descriptions

CT	Legal Description	Comments
	Akatarawa Block	
41D/398	Lot 1 DP 71399, Sec 1 Titi District, City of Upper Hutt and District of Kapiti Coast	(Fee simple) 5578.4817 ha
13C/916	sec 97, pt sec 96, 98, 99 Block IV Paekakariki Survey District	1979 Wellington Regional Water Board (fee simple) 1981 Wellington Regional Council (WRC) 97.3933 ha
437/58	Sec 408, 409; pt sec 402, 403, 404, 405, 406, 407, 409, 410, 412 Hutt District	1933 Wellington City Council for purpose of water supply and other purposes under Part II Wellington City and Suburban Water-supply Act 1927. (Fee simple) 1975 Vested Wellington Regional Water Board under WRWB Act 1972 1981 WRC 900.0209 ha
10D/831	Lots 1, 5, 6 DP 8994; pt sec 414 Hutt District : Lots, 1, 5, 6 DP 8994	1973 WCC for water supply purposes (fee simple) 1975 Vested in WRWB 87.9730 ha
10D/832	Pt Sec 413 Hutt District	1973 WCC for purposes of the Wellington City and Suburban Water-supply Act 1927 (fee simple) 1975 Vested in WRWB pursuant to WRWB Act 1972 1981 WRC 95.3794 ha
814/4	Sec 19, Block I; sec 8 Block VI; secs 18, 19, 20 Akatarawa Survey District (Paper Road)	1958 WCC Reserve for water supply pursuant to Reserves and Domains Act 1953 (fee simple) 1975 Vested in WRWB 1981 WRC 50.3833 ha
488/297	Pt Sec 15, Block I, Akatarawa SD, DP 10581	1941 WCC (fee simple) 1974 Vested in WRWB 1981 WRC 87.1085 ha

CT	Legal Description	Comments
Akatarawa Block		
437/134	Sec 1, 2, 3, 4, 5 Block V Akatarawa SD, DP 614; Sec 1, 2, 3, 4, 5, 6, 7 Block VI Akatarawa SD, DP 620	1933 WCC for water supply and other purposes under Part II Wellington City and Suburban Water-supply Act 1927 (fee simple) 1975 Vested WRWB 1981 WRC 2165.4750 ha
26D/778	Pt Sec 383, 384, 387 Hutt District	1985 WRC for water catchment purposes (fee simple) 32.3353 ha
411/118	Sec 11, 12, 13, pt Sec 6, 7, 8, 9, 10 Block IV Akatarawa SD DP 631; sec 1, 2, 3, 4, 5 Block X Akatarawa SD, DP 613	1929 WCC (fee simple) 1974 Sec 1, 2, 5 vested in WRWB 1981 WRC 1634.1813 ha
19C/1400	Lot 1, DP 631; pt sec 6, 7, 8, 9, 10 DP 4705	1979 WRWB (fee simple) 1981 WRC 471.1553 ha
326/97	Closed Road adjoining or passing through Sec 354 Hutt District	1925 Upper Hutt Town Board (fee simple). Under S148 of Land Act 1924 1982 UHCC 1982 WRC 0.1780 ha
31A/562	Sec 21, Block IX Akatarawa SD	1987 WRC S 54 Land Act 1948 1.7839 ha
25A/510	Lot 6, 7 DP 613; Lot 1, 2 DP 9869; pt Lot 1, 2 DP 9905 and 9906; Sec 10, 11, 12, 13, 14, 15, 16, 18, 19, 32; pt sec 20, 21, 22 Block XIII Upper Hutt; Sec 1, 2 Block XIV Akatarawa SD; pt Sec 213, 421 Hutt District	1983 WRC (fee simple) 1979 Forestry agreement under S 5 Forestry Encouragement Act 1962 1983 Forestry encouragement agreement under S 5 Forestry Encouragement Act 1962 1615.2796 ha
451/130	Pt Sec 355 Hutt District; All land DP 10570; Water Right	1934 UH Borough Council for purposes of a Reservoir for the Conservation of Water Supply for UH Borough (fee simple) 1982 WRC 0.9965 ha
20B/569	Pt Sec 358, 359, 362, 363 Hutt District and parts closed Road.	1980 WRWB 1981 WRC 267.2480 ha
226/68	Pt Sec 354 Hutt District DP 2966	1914 Upper Hutt Town Board (fee simple) 1976 Vested WRWB 1981 WRC 60.4736 ha

CT	Legal Description	Comments
Akatarawa Block		
26A/229	Pt Sec 7, 8 Block XIII Akatarawa SD	1984 WRC for water supply purposes (fee simple) 53.4300 ha
18D/243	Sec 37, pt sec 38 Block XIII Akatarawa SD	1986 WRC 1.1051 ha
18B/965	Pt sec 5 Block XIII Akatarawa SD	1977 WRWB in connection with a water collection area 1981 WRC 113.3120 ha
618/54	Sec 33, 34, 35, 36 Block XIII Akatarawa SD	1982 Sec 34, 36 taken for waterworks. Gazette Notice 503741.1 - new CT 22D/167 vested in WRC 1986 Sec 33, 35 vested in WRC 63.4572 ha
444/233	Sec 30, 31 Block X Paekarariki SD, Sec 1, 3 Block XIII Akatarawa SD	1982 Sec 3 Block XIII Akatarawa SD taken for waterworks Gazette Notice 503741.1 - new CT 22D/167 vested in WRC 1986 WRC 96.1062 ha
20C/477	Sec 2, 3 Block IX Akatarawa SD	1980 WRWB (fee simple) 1981 WRC 257.9870 ha
18B/963	Sec 12, Block VII Paekakariki SD	1977 WRWB for water supply purposes (fee simple) 83.7699 ha
16C/728	Sec 2, 3 Block VII Paekakariki SD, DP 610; Lots 3, 4, 10, DP 8106	1976 WRWB for water supply purposes (fee simple) 1981 WRC 852.9148 ha
22B/305	Lot 2 DP 48535	1982 WRC for water collection area (fee simple) 38.2200 ha
22B/306	Lot 3 DP 48535	1982 WRC for water collection area (fee simple) 39.8700 ha

CT	Legal Description	Comments
Hutt Water Collection Area		
589/40	Pt Sec 3, 6, 12 Block III; pt Sec 2, 3, 4 Block VII Akatarawa SD, Lots 1, 2, 3, 4, 5, 6, 8, 9 DP 10208	1951 WCC for water supply purposes (fee simple) 1975 Vested in WRWB (WRWB Act 1972) 1981 WRC 685.3856 ha

CT	Legal Description	Comments
Hutt Water Collection Area		
589/41	Pt Sec 5, 6, 7 Block VII; pt Sec 1 Block XI Akatarawa SD; pt Lots 1, 2 DP 10209	1952 WCC for water supply purposes (fee simple) 1975 Vested in WRWB (WRWB Act 1972) 1981 WRC 591.5492 ha
16B/1131	Sec 4, DP 1820 Blocks XI and XII Akatarawa SD	1976 WRWB (fee simple) 1981 WRC 1255.6889 ha
570/103	Sec 24 Pakuratahi District, Block XVI Akatarawa SD	1951 WCC (fee simple) 1975 Vested in WRWB (WRWB Act 1972) 1981 WRC 33.9936 ha
821/44	Pt Sec 8, 30 Pakuratahi District, and pt old river bed	1959 WCC for water supply purposes (fee simple) 1975 Vested in WRWB (WRWB Act 1972) 1981 WRC 17.5052 ha
20C/1015	Sec 3 DP 1820	1980 WRWB for waterworks (fee simple) 1981 WRC 394.9731 ha
30B/396	Sec 953 Hutt District; Sec 4, 5 Block XI; Sec 8, 9 Block VII, Akatarawa SD; Lot 2, DP 1820; Lot 2 DP 615	1987 WRC for purposes of WRWB Act 1974 (fee simple) 1155.6768 ha
37A/679	Sec 1, 2 Survey Office Plan 36338	1990 WCC (fee simple) 1990 WRC 7600.1000 ha
41A/458	Sec 1 Survey Office Plan 36768	1992 WRC (fee simple) 683.5700 ha

CT	Legal Description	Comments
Pakuratahi Block		
31B/647	Lot 3 DP 61445	1987 WRC 333.2000 ha
508/216	Sec 11; pt sec 10 Block XV Akatarawa SD; DP 12335	1945 WRC - Wellington City and Suburban Water-supply Act 1927 First Schedule (fee simple) 1975 WRWB (WRWB Act 1972) 1980 WRC 231.2348 ha

CT	Legal Description	Comments
Pakuratahi Block		
474/167	Pt sec 438 XV Akatarawa SD	1939 WCC (fee simple) 1975 WRWB (WRWB Act 1972) 1981 WRC 63.6063 ha
5C/781	Pt Sec 419, 438 Hutt District; pt Sec 9, 10 Block XV Akatarawa SD; pt State Forest Reserve; pt Lots 41, 42 DP 618	1968 WCC for purposes of waterworks - Wellington City and Suburban Water-supply Act 1927 (fee simple) 1975 WRWB (WRWB Act 1972) 1981 WRC 141.5500 ha
C2/432	Pt Sec ? Pakuratahi District; pt Lot 4 DP 22895	1964 WCC Water Supply Purposes 175.5161 ha
28/83	Sec 20, 21 Pakuratahi District	1954 Proclamation 5102 taking land for water supply purposes and vesting in WCC 1975 Vesting in WRWB (WRWB Act 1972) 1981 WRC 213.6740 ha
410/171	Sec 28 Pakuratahi District	? information post 1939 omitted for CT copy 16.5440 ha
35/601	Pt Sec 19 Pakuratahi District	1989 WRWB for water supply purposes 1989 Vested in WRC 59.9694 ha

CT	Legal Description	Comments
Wainuiomata/Orongorongo Water Collection Area		
48/27	S90 Blocks XV and XVII Belmont SD	1888 WRC (fee simple) 1975 Vested WRWB pursuant to WRWB Act 1972 1981 WRC 269.5206 ha
29C/243	Pt Sec 94 Wainuiomata District	1986 WRC for water supply purposes S105(i) WRWB Act 1972 (fee simple) 22.1843 ha
21D/577	Pt Sec 26, 34, 35, 67, 68, 69 Block XVII Belmont SD; pt sec 94 Wainuiomata District	1981 WRC for waterworks purposes 244.1856 ha

CT	Legal Description	Comments
Wainuiomata/Orongorongo Water Collection Areas		
20C/867	Pt sec 104 Wainuiomata District	1980 WRWB for water supply purposes (fee simple) 1981 WRC 1987 Gazette Notice 843531.1 (p 643) classifying Reserve as Local Purpose (water supply and growth and preservation of timber) subject to Reserves Act 1977 2331.3475 ha
704/51	Pt sec 74, pt sec 34 Wainuiomata District	1956 WCC for water supply purposes (fee simple) 1972 Vested in WRWB pursuant to WRWB Act 1972 1981 WRC 31.3365 ha
37/289	Sec 70, 71; pt sec 93 Wainuiomata District	1884 WCC - originally granted 09/12/1867! 1975 Vested in WRWB pursuant to WRWB Act 1972 1981 WRC 421.6823 ha
121/100	Pt sec 93 Wainuiomata District	1903 WCC 1975 Vested WRWB pursuant to WRWB Act 1972 1981 WCC 42.3550 ha
248/72	Pt sec 7 Block VIII Rimutaka SD; sec 8 Block XV Belmont SD DP 983	1917 WCC for the purposes of waterworks (fee simple) 1975 Vested in WRWB pursuant to WRWB Act 1972 1981 WRC 33.7931 ha
253/199	Pt sec 6 Block VIII Rimutaka SD; Lot 1 DP 3864	19? WCC (fee simple) 1975 Vested in WRWB pursuant to WRWB Act 1972 1981 WRC 1987 Gazette Notice 843531.1 (p 643)classifying Reserve as Local Purpose (water supply and growth and preservation of timber) subject to Reserves Act 1977 13.7618 ha
253/202	Part sec 13A Block V Rimutaka SD, Lot 4 DP 3864	1917 WCC (fee simple) 1975 Vested in WRWB (WRWB Act 1972) 1981 WRC 1987 Gazette Notice 843531.1 reserve as local purpose (as above 253/199) 46.5388 ha

CT	Legal Description	Comments
Wainuiomata/Orongorongo Water Collection Area		
102/186	Sec 5 Block XV Belmont SD DP 983	1899? WCC 1972 Vested in WRWB (WRWB Act 1972) 1981 WRC 374.1318 ha
124/20	Pt sec 4 Block XV Belmont SD DP 983	1903 WCC 1975 Vested in WRWB (WRWB Act 1972) 1981 WRC 21.2708 ha
648/43	Sec 2, 3 Block XVII Belmont SD; Sec 2 Block X Rimutaka SD	1955 WCC for water supply and other purposes (fee simple) 1975 Vested in WRWB (WRWB Act 1972) 1981 WRC 152.1896 ha
38D/47	Sec 2 Survey Office Plan 36269	1990 WRC (fee simple) (need an earlier title) Gazette Notice 1916 p 2619 2120.0000 ha
36A/180	Pt sec 34, 35, 67 Wainuiomata District	1989 WRWB for purposes of water supply (WRWB Act 1972) (fee simple) 1990 WRC 15.8713 ha
485/234	Sec 36, 37, 38, 72, 73; pt sec 35 Wainuiomata District	1941 WCC (fee simple) 1975 Vested in WRWB (WRWB Act 1972) 1981 WRC

Appendix 2

Table 30 : Schedule of Special Protection Areas and Features

No.	Name	Locality	Description	Reasons for Significance	Existing Protection	Recommended Protection
A.	**Ecological**					
1	Upper Wainuiomata Catchment	General area	Lowland podocarp forest	Regionally and nationally representative of large areas of original forest. Not previously logged. Contains some of the best rimu specimens in the lower North Island (nationally significant). Diverse bird and invertebrate habitat, and bird corridor from Rimutaka Range to coast and residential areas. BRWR, 1984 (32b)	WRWB Act This management plan.	Subject to further investigation of options
2	Upper Wainuiomata and Orongorongo Catchments	General area (overlaps with 1)	Extensive podocarp and beech forests	Extensive "virgin" podocarp forests. The largest tract of silver beech-podocarp/Kamahi on the Rimutaka Range. Recommended by PASAC for protection as an extension to the Papatahi Ecological Area which would protect a fully representative area of the eastern Rimutakas. PASAC, 1985	WRWB Act This management plan.	Subject to further investigation of options
3	Upper Pakuratahi Catchment	General area	Extensive beech forests	Extensive mixed beech forests including the southern limit of red beech in New Zealand. Recommended by PASAC for protection as an extensive to the Bawbaw Ecological Area which would protect representative beech forest types of the Rimutaka Range. PASAC, 1985	WRWB Act This management plan.	Subject to further investigation of options

No.	Name	Locality	Description	Reasons for Significance	Existing Protection	Recommended Protection
4	Headwaters of Pakuratahi and Wairongomai Rivers	General area (overlaps with 3)	Montane to subalpine red beech/silver beech forest. Rimu/miro/silver beech forest; silver beech forest	Southern limit of red beech in New Zealand. Contains northern rata and is relatively unmodified. BRWR, 1984 (38a)	WRWB Act This management plan.	Subject to further investigation of options
5	Hutt Catchment	General area	A range of alpine to lowland vegetation types in an unbroken sequence covering a large area of the southern end of Tararua Range	Relatively unmodified climax forest types. Contain notable plants in wet turf. Some areas containing southern rata. Large area of silver beech forest. High value for wildlife habitat. Important corridor functions - contiguous with Tararua Forest Park, Kaitoke Regional Park and Akatarawas. *BRWR, 1984. Blake RM 1994* (40a, b, c; 20a, b)	WRWB Act This management plan.	Subject to further investigation of options
6	Mt Wainui	General area	Lowland to montane miro-rimu/Kamahi forest on lower hillslopes; Montane halls totara - kamahi forest on upper hill slopes	A regional example of montane miro-kamahi forest. Contains rare ferns. Contains the original pre-European forest types for the area. Relatively unmodified on upper slopes. *BRWR, 1984* (17a)	WRWB Act This management plan.	Subject to further investigation of options
7	Summits of Mts Barton, Maunganui, Titi and Wainui	General area	Montane miro-kamahi forest on hillslopes and summits; montane halls totara - kamahi forest on main ridges	Representative examples of montane podocarp - broadleaved forest types, little modified from pre-European times. *BRWR, 1984* (18a)	WRWB Act This management plan.	Subject to further investigation of options

No.	Name	Locality	Description	Reasons for Significance	Existing Protection	Recommended Protection
8	Upper Akatarawa Valley	General area	Lowland to montane red beech - rimu/kamahi forest and rimu - rata / hinau / kamahi forest Lowland podocarp - tawa - kamahi forest; lowland to montane hard beech forest; montane kamahi forest	One of few remaining large areas of accessible and reasonably unmodified native forest. High scenic and recreational value. Important habitat and natural corridor values. *BRWR, 1984* (19a, b)	WRWB Act This management plan.	Subject to further investigation of options
B.	**Cultural/Recreational**					
9	Rimutaka Incline	Linear feature within Pakuratahi Block	Bed and formation of historic railway link between Wellington and Wairarapa. Includes cuttings and culverts	Originally built in the 1870s. The route was notable for the application of special engineering techniques to cope with the difficult terrain on the Wairarapa side. A steep gradient and a special traction system brought trains to the summit from Cross Creek. Conventional trains operated on the Wellington side. Has been described as a "railway curiosity of international significance". The Incline is recognised by the NZAA. High amenity value. Used by over 30,000 visitors per annum. Has particular value as an "easy" bicycle route in a back country setting.	None	Subject to further investigation of options

No.	Name	Locality	Description	Reasons for Significance	Existing Protection	Recommended Protection
10	Rimutaka Incline bridges and tunnels	Part of the Incline	Wooden bridges and concrete tunnels built around 1870 as parts of the Incline route	Sites individually listed on the NZAA database. Historic and engineering interest.	Existing management plans. This management plan.	
11	Maymorn Archaeological Site	Maymorn Ridge	Archaeological site. Possible remains of a Maori camp site	Uncertain significance - requires further survey. Listed on the NZAA database. NZAA	This management plan.	
12	Hutt Catchment (overlays with 5)	Northern/Central area	"Remote Experience" area	Only "Remote Experience" area within the Wellington metropolitan area, based on Recreation Opportunity Spectrum survey of Wellington Conservancy. DOC, 1991	This management plan.	Subject to public access policy
13	Remains of early indigenous forest logging operations.	Akatarawas - scattered	Cuttings, equipment, tree scars, etc.	Provides evidence of methods used for log extraction. Educational interpretive resource.	This management plan	Subject to further investigation of options.

Potential protection mechanisms include:

- Reserves Act
- QE II National Trust Covenant

Appendix 3

Procedures for the Approval of Works

in Wellington Regional Council forest lands, water collection areas, regional parks and recreation areas

1995

Recreation Department
Wellington Regional Council

THE REGIONAL COUNCIL

caring about you & your environment

The Purpose and Scope of this Document

Proposed works of the Regional Council or any other body which are on Regional Council controlled lands require, in addition to applicable resource consents, formal approval by the Regional Council or its designated officers.

This document describes procedures and principles to guide managers in the consideration of proposed works and the level from which final approval should come.

The overriding principle forming this policy is that single use land management strategies are not sustainable or in keeping with modern standards of resource management. Therefore decisions affecting land resources may impinge in areas of interest and responsibility of more than one department or division.

In all cases the management plan for the area involved will be the principal standard for assessment of proposed works.

Three general scenarios are anticipated by this policy:

1. Works are proposed by a department of the Regional Council which are anticipated by, and consistent with, the operative management plan. Assessment of the detailed plans of the proposal is required.

2. Works are proposed by a department of the Regional Council which are not anticipated by the operative management plan. Assessment of the proposal and any detailed plans is needed to determine consistency with the management plan.

3. Works are proposed by an outside organisation. Assessment of the proposal and any detailed plans is needed to determine consistency with the management plan.

Levels of Approval

The level at which final approval is needed will depend upon:

- the scale of the proposed works
- the nature and level of any prior assessment or approval, including any provision within the management plan
- the degree of public interest
- the advice of affected departments or divisions
- the nature and scale of statutory resource consent requirements.

Decisions on the level of final approval for proposed works will be matters of judgement, by the relevant divisional managers, and the General Manager, as the details of each case dictate, and in accordance with these guidelines.

Levels of Approval

Level 1: Divisional Managers
Level 2: General Manager
Level 3: Council Committees
Level 4: Full Council

Procedures for the Approval of Works

1. **Review and Approval of Works by the Divisional Managers (Level 1)**

1.1 All works within the scope of this policy will be reviewed in the first instance by the Divisional Manager, Landcare and/or the Divisional Manager, Utility Services, depending on the nature of the work and its implications for each Division.

1.2 The Divisional Manager most closely involved will seek comment from all Council divisions and departments that may be affected by proposed works.

1.3 A Divisional Manager has authority to approve works that only affect departments within his or her division, after providing an opportunity for other divisions to comment.

1.4 In reviewing proposals for such works a Divisional Manager shall refer to the relevant management plan. Approval may be given for works subject to their implementation and purpose complying with the aims, objectives and policies of the management plan.

1.5 If a proposal for particular work conflicts with the objectives and responsibilities of another department within the same Division, the Divisional Manager will resolve the issue in a manner that best complies with the management plan.

The lands covered by these procedures are managed by the Landcare Division and the Utility Services Division. This section ensures that all departments within these divisions and other groups within the Council that may be affected by proposed works have the opportunity to comment. It provides for the identification and resolution of issues arising between departments within and between divisions in relation to works on Council lands.

2. **Review and Approval of Works by the General Manager (Level 2)**

2.1 Where a proposal for a work affects or conflicts with the objectives and responsibilities of both the Landcare Division and the Utility Services Division, it shall be reviewed by the General Manager.

2.2 In reviewing such works the General Manager shall be guided by the aims, objectives and policies of the relevant management plan.

2.3 The General Manager has authority to approve such works provided that they comply with the aims, objectives and policies of the relevant management plan.

2.4 The General Manager may have an issue referred to the respective committees for their consideration and direction.

3. **Approval of Works of Other Agencies**

3.1 Approval in accordance with these procedures may be given to works of other agencies subject to their implementation and purpose complying with the aims, objectives and policies of the management plan.

4. Approval of Non-complying Council Work and Publicly Notified Work (Levels 3 and 4)

4.1 Where a particular issue arising from a proposed Council work cannot be resolved in compliance with the relevant management plan, it may be referred to the respective committees for consideration.

4.2 Approval for a non-complying work by the committees (Level 3) or the full Council (Level 4) shall be made as a revision to the relevant management plan. An application for a revision of the management plan for a non-complying work shall be subject to public review prior to its being heard by a Committee (see section 7.2 below).

4.3 Proposals for works which have been publicly notified subject to section 7.2 below, are to be resolved by concurrence between more than one committee. If concurrence is not found then the matter will be referred to the full Council.

5. Procedures for the Approval of Works which also require Resource Consents

5.1 In the case of works which also require resource consents under the Resource Management Act 1991, and for which no Council approval has previously been given, approval within the Council will be applied for in addition to the application for any resource consent.

5.2 Public notification of an application for Council approval shall be made in addition to, but separate from, the public notification of the application for any resource consent that may be required for the work.

The public review of resource consent applications under the Resource Management Act 1991 is limited to the immediate effects of the issues for which consent is sought. Special provision for the public review of works in their entirety as part of the Council approval process, in addition to the resource consent process, ensures that the full scope of proposed works is subject to public review. In effect, the same public review process can be used for both the Council approval process and the resource consent process. However, care is needed to convey to the public the difference between the two processes so they can make it clear as to which process their submissions relate.

6. Content of Proposals

Proposals for Council works and applications from other agencies for approval for works shall contain the following:

6.1 A description of the proposed work. This shall contain sufficient information to convey a clear understanding of the proposed work and its purpose.

6.2 An account of the necessity for the proposed work. In the case of applications for approval of works from other agencies this shall include a summary of alternative sites considered and an account of the reasons for selecting the chosen site.

6.3 An outline of the plan showing the extent of the proposed work, identifying the components of the work and showing the location of these on the site.

6.4 An account of the proposed works' compliance with any planning designation that may apply to the site.

6.5 An account for the proposed works' compliance with the management plan for the land affected by the land.

6.6 An assessment of the effects that the proposed work will have on the site including its effects on the site's physical, biological and cultural values. Cultural values include matters of significance to the tangata whenua, other historical and archaeological values, landscape values and recreational values.

6.7 An account of the measures to be taken to mitigate any adverse effects expected to result from the proposed work.

6.8 Evidence of consultation with interested and affected parties, including a list of persons and organisations consulted, a statement of issues identified in the consultation process, and an account of steps to be taken to meet any concerns expressed about the proposed work.

7. Projects to be Subject to Public Review

7.1 Non-complying works for which a revision of the relevant management plan is sought under section 4.2 above are also to be subject to public review, as set out below.

7.2 If, in the opinion of a Divisional Manager or the General Manager, a proposed work is likely to have significant environmental impacts or is likely, by virtue of its scale and extent, to arouse public concern it may be subject to public review as set out below.

7.3 Proposals for work which have been publicly notified are to be considered by the relevant committees, following the period for public comment.

8. Procedures for Public Review

8.1 A notice will be placed in appropriate newspapers to inform the public of the review of the proposed work and inviting public comment on it. The Regional Council shall take reasonable efforts to ensure that all persons likely to be affected by the proposed work are made aware of it.

8.2 The public will have 20 working days from the date of notification to submit comments on the proposed work.

8.3 A summary of public submissions received and recommendations from the officers in respect of these submissions shall be submitted with the application when it is presented to a committee for determination.

8.4 Prior to the committee meeting, a copy of the summary of submissions and the officers'

recommendations will be sent to all submitters. Submitters may attend the committee meeting to speak in support of their submissions.

This review process is based on the process for consulting with interested and affected parties set out in section 1 (h) of the Fourth Schedule of the Resource Management Act 1991, enabling simultaneous but separate public review of applications for Council approval and applications for resource consents under the Resource Management Act 1991 for the same work.

Appendix 4

Public Access to Water Collection Areas - Background Information

Report on the Risk Assessment of Catchment Activities (Summary of Text)

Hazard Identification

In an open and developed surface water catchment there are many potential contaminants which could have an impact on the water supply, including organisms such as bacteria, viruses, protozoa, parasitic worms, and algae, suspended sediment, minerals and chemicals.

A wide range of contaminants are monitored by the Regional Council at the six existing intakes and the proposed Te Marua intake site. This monitoring generally confirms the high quality of water taken from the protected catchments.

Illegal Access

It is believed that illegal access to water collection areas occurs at present, especially during April (the roar) and also during the Christmas/New Year period. A Department of Conservation culler working in the Hutt Water Collection Area on Christmas period reported coming across seven parties containing a total of 15 people. Vandalism to remote water supply facilities is also a problem under the existing management regime.

Prohibition of access to water collection areas is very difficult to enforce.

Establishment of Risk Levels

The risk of various contaminants entering the treatment plants increases with the relative openness of the catchment. However, the risk of contaminants entering the treatment plant from a catchment with limited recreational access is rated negligible to low.

The immediate area around the raw water intakes is particularly vulnerable to greater public access. Acts of vandalism (or negligence) close to the intakes can have a direct impact on the quality of water drawn from the river. These areas should be considered as separate from the main water collection areas.

The introduction of vehicles and machinery into the catchments increases the risk of fuel spills and other contaminants. This is not considered significant in the existing catchments because of the limits on vehicle use. However, it could be significant in the catchment of an intake at Te Marua, which would be crossed by State Highway 2.

It is probable that agriculture represents the greatest potential risk to water quality. Agriculture produces contaminants such as nitrates, microbiological and biological pathogens and pesticides as part of its routine operation. There are also risks associated with the use, transportation and storage of pesticides and other chemicals.

Both the Te Marua and Wainuiomata (once it is fully commissioned) Treatment Plants are rated highly effective in the treatment of microbiological contaminants.

The exclusion of the public from water collection areas is part of a multiple-barrier approach to the protection of the public water supply. The other barriers are: direct filtration to remove larger particles; flocculation and sedimentation to remove dissolved impurities and microbiological organisms, and; disinfection with chlorine to kill any remaining micro-organisms.

With existing treatment processes, risks to public health would increase with increasing opening up of the catchments. However, the risk involved in the restricted recreational use of the catchments is assessed as negligible.

Mitigation

Mitigation measures can offset any increased risk associated with a move to open a catchment. Mitigation measures can include:

- stringent controls on permitted activity to minimise risks of contaminants being introduced;
- river and water monitoring;
- provision of buffer storage;
- restriction of access around raw water intakes;
- additional treatment processes.

Hutt Valley Health Response

Hutt Valley Health is responsible for upholding and promoting public health. It is represented on the Working Party.

Hutt Valley Health's preference is that the water collection areas remain protected. It considers that these catchments are a unique resource. As currently managed, the public health risks to the raw water quality are minimised. Hutt Valley Health is concerned that public access to the catchments will increase the public health risk to the raw water quality, creating a public health hazard of low probability but very significant consequences.

Hutt Valley Health will not, however, oppose public access to the water collection areas provided:

- measures are taken to manage and control the public health risks to the raw water quality;
- there is continuous full treatment of the water taken from the catchment for drinking water supplies;
- the water leaving the water treatment plants meet the standards prescribed in the latest edition of the New Zealand Drinking Water Standards and any other public health water quality criteria promoted by the Ministry of Health;

- all aspects of the water supply system are managed, developed and maintained in accordance with New Zealand public health requirements.

Water Quality Standards

The Drinking Water Standards for New Zealand 1995 will be adopted by the Ministry of Health from 1 January 1995. These set out detailed standards for the quality of water in public water supply systems. Water from the Te Marua Treatment Plant complies with these standards.

The Te Marua Water Treatment Plant typically delivers water with a turbidity of less than 0.1 NTU. For the removal of *Cryptosporidium, Giardia* and faecal coliforms the standard requires a value for this parameter of less than 0.5 NTU with a recommended target value of less than 0.1 NTU.

A chlorine residual of 0.6 mg/l is achieved routinely at the Te Marua Water Treatment Plant. For the removal of faecal coliforms the standard requires a value for this parameter of at least than 0.2 mg/l.

Interest in Recreational Use of Water Collection Areas

The public review of the Kaitoke Regional Park Draft Management Plan drew a lot of comment and support for the principle of allowing public use of the Hutt Water Collection area (HWCA). Mountain recreation groups were approached specifically on this issue. They provided information that suggested that public access under conditions such as were proposed in the draft Management Plan would not result in a significant increase in the numbers of people using the HWCA and would make existing use legitimate and manageable. Access to the HWCA is very hard to control without frequent ranging and it is known that many people already use the area illegally.

Tangata Whenua Concerns

It is known that the tangata whenua in the area covered by the water collection areas have a particular interest in protecting the quality of the freshwater resources in these areas.

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Barry Chalmers, Manager, Recreation, Wellington Regional Council (Chair)
Neil McDougall, Manager, Bulk Water Supply, Wellington Regional Council
Rob Blakemore, Headworks Engineer, Bulk Water Supply, Wellington Regional Council
Geoff Cameron, Manager, Conservation Forestry, Wellington Regional Council
Robyn Fisher, The Hutt City Council
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Len Weldon, Hutt Valley Health
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Joe Puketapu, Hutt Valley Health

Wellington Regional Council Officer Involvement in the preparation of this draft Management Plan:

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Wendy Basire, Planner.
John Duggan, Treatment Engineer.
Martin Heatherington, Senior Advisory Officer : GIS.
Dennis Lee, Senior Advisory Officer : GIS.
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